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Corporate Cash Holdings, National Culture, and Multinationality

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Corporate Cash Holdings, National Culture, and Multinationality

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Abstract

We examine the relations between national cultures, the multinationality of the firm and its holdings of cash. We develop several hypotheses from well known corporate finance theories and theories of the multinational firm, positing that cultural factors as well as the degree of multinationality of firms influence their decisions to hold cash. In particular, firms in countries with high uncertainty avoidance, as a national culture, hold more cash as a way to hedge against undesired states of nature. Furthermore, as a reflection of their longer business cycles, multinational firms typically hold more cash. At the same time, however, the multinationality of the firm moderates the effects of culture on the firm's decision to hold liquid assets. Based on a large panel of firms in forty countries, we present evidence consistent with these hypotheses. While firms in countries with high levels of uncertainty avoidance tend to hold more cash, the degree of multinationality of the firm is positively correlated with holdings of cash. On the other hand, the effect of national culture on firm's cash holdings is lower for multinationals.

JEL Codes: G32, M14, N20

Key Words: Cash, Culture, Finance

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Introduction

One of the most important financial decisions the firm makes is how much cash to hold as a buffer against future uncertainty. Firms hold a significant portion of their assets in the form of cash. The largest corporations around the world reported a total of \$1.5 trillion in liquid cash, almost 9 percent of the book value of their assets, at the end of 1998 (see, Dittmar et al. (2003)). Corporate cash holdings of the S&P 500 companies alone amount to \$716 billion in 1994 (Opler et al. (1999)). Microsoft reported a cash balance of \$60 billion on its 2004 fourth quarter earnings announcement, and is reported to have accumulated cash at a rate of \$1 billion per month. In April of 2006, Apple Computer had 59% of its total assets in the form of cash and short term investments. Moreover, there appears to be a significant variation in liquid asset holdings across firms as well as across countries. Dittmar et al. (2003) report the median cash-holdings in the U.S. to be \$19.5 million per firm as compared with \$31.5 million in Switzerland. Cash holdings range from a mere 0.3 percent of assets in Kenya to 15.5 percent in Japan to 29.6 percent in Egypt.

What explains the cross-sectional variations in liquid-asset holdings across firms and countries? In this paper, we propose to answer the question based on the national culture in which the firm resides in, and the degree of its internationalization. We develop several hypotheses of how culture and multinationality interact with each other in influencing corporate holdings of cash, while controlling for all other known determinants. Specifically, we conjecture that firms in countries high on uncertainty avoidance, as a cultural dimension, will hold more cash. Additionally, and against commonly held views in cash management, firms high in their degree of internationalization will hold more liquid assets. On the other hand, we propose that the impact of culture on firm liquidity should be moderated by the degree of the firm's multinationality. We test these hypotheses on a sample of firms from 40 countries and almost 70 thousand firm-year observations over the period 1990 through 2000.

The paper provides a number of important contributions to the literature on firm liquidity. First, based on a detailed cross-country panel, we document that, in addition to the firm-level determinants of liquidity, national culture explains a significant portion of the cross-country variations in liquidity. Second, we identify and document that, in spite of common cash pooling practices, the multinationality of the firm also contributes to its greater holdings of cash. Third, we, however, report that the multinationality of the firm interacts with national culture in moderating the effect of the latter on the firm's cash holdings. Fourth, we document that once controlling for multinationality and national culture, some results reported in previous research do not seem to hold. Our paper identifies new and economically important determinants of liquid asset holdings, both at the firm and country levels after controlling for all determinants identified in the extant literature (e.g., Opler et al. (1999) and Pinkowitz et al. (2003)). In a broader sense, we introduce an interdisciplinary perspective in understanding firm holdings of liquidity, encompassing the literatures in finance, culture and the theories of the multinational firm from international business.

One of the motives for holding cash, advanced in the finance literature, is a precautionary one of avoiding the risks and costs of shortage of liquidity. Firms hold liquid assets to provide a buffer to meet unexpected contingencies. Firms' liquid asset holdings increase with increases in its operational and macroeconomic uncertainty (see, e.g., Keynes (1934) and Baum et al. (2005) for recent evidence). We argue that the degree to which firm managers respond to uncertainty depends also on their cultural predisposition towards it. Individuals vary in their perception as well as tolerance of uncertainty. A large body of literature in psychology reports that an individual's perception of uncertainty and her coping mechanisms are influenced significantly by the national culture in which the individual resides. Hofstede (2001), for example, documents a wide variation in the perceived level of uncertainty and the extent of uncertainty avoidance behavior across national cultures. We, therefore, propose that, *ceteris paribus*, firms residing in a country with high level of uncertainty avoidance, as a cultural attribute,

would hold more liquid assets, and hence cash, on average.

Theories of the multinational enterprise provide us with rationale for the existence of the MNC as distinct from domestic firms. Multinationals are different, because they are exposed to new cultures and business practices because of their frequent foreign contacts. According to Kogut and Zander (1993), firms operating in diverse national settings develop a richer knowledge base and stronger technological capabilities than firms that are exposed only to domestic markets. As a result, firms and managers that remain in only one country will have a less rich pool of experiences upon which to base their decisions. Thus, the goals and decisions of a purely domestic firm with domestic managers will only reflect the values of the society in which it exists. These domestic firms lack experiential knowledge of foreign markets and international competition. Under this isolation, managers and firms will likely incorporate only the local culture into their decisions, behaviors and processes. Thus, we conjecture that an increase in the multinationality or internationalization of the firm reduces the impact of (local) national culture on firm behavior, including its holdings of liquid assets such as cash.

We examine empirically the relations among national culture, multinationality and corporate liquid-asset holdings using data from a large panel of firms across 40 countries for the period 1990 through 2000. We find strong evidence consistent with our hypotheses. First, we find that national culture – particularly, uncertainty avoidance as a cultural attribute – is an economically and statistically significant predictor of firms' liquid asset holdings. Firms in countries with high uncertainty avoidance hold more liquid assets. A one standard deviation change in the uncertainty avoidance index across countries produces a five percent increase in liquid assets holdings. Second, the degree of multinationality of the firm increases its holdings of liquid assets. Third, the predictive power of culture as an explanatory variable of liquid asset holdings decreases with the degree of internationalization of the firm. Indeed, the interaction between the culture proxy and multinationality is negative.

These findings have important implications for future research. First, the evidence that multinational firms' decisions are different from domestic firms' implies that cross-country comparisons should account for the multinationality of the firms in their samples. Second, while our evidence indicates that culture affects corporate financial decisions, it also underscores that national culture does not affect all firms in the same way. Because of the interaction, the impact of national culture is more pronounced for firms with less foreign exposure. The implication is that the effects of culture on the financial decisions of the firm should take into account the moderating effects of multinationality.

The remainder of the paper is organized as follows. The next section presents a brief summary of the motivation and develops the hypotheses. Section 3 presents the data and the empirical results, and section 4 provides concluding remarks.

Theoretical background and hypotheses

Three main lines of literature have motivated the paper. The first is research on the determinants of corporate liquid asset holdings. The second relates to culture and its possible influence on financial decisions of the firm. The third line of research is theories of the multinational firm from the international business literature. This section provides a brief synthesis of these literatures and develops testable hypotheses.

Corporate liquid holdings and its determinants

Models explaining liquid holdings

For a value-maximizing manager, the level of liquid assets to hold solely depends on the marginal costs and benefits of each additional dollar on hand. There is an optimal level of liquid-asset holding that reflects the tradeoff between these costs and benefits. Early models such as the ones

presented by Keynes (1934) and Baumol (1952) adopt this view and take an inventory approach to the problem. In these models, liquid assets are held because they provide two main benefits; the first use of liquid assets is *transactional*. Liquid assets are cheaper to use than fixed assets to finance daily operations². The second use of liquid assets is *precautionary*; firms hold cash as a buffer against undesired states of nature. On the other hand, holding liquid assets entails an opportunity cost because of the liquidity premium.

A third reason, not explicitly included in previous models, for firms to hold cash is for speculative uses. Firms can easily deploy liquid assets to take advantage of opportunities. Myers and Majluf (1984) propose a model in which there is asymmetric information between the owner manager and the equity market. The owner manager knows the real value of assets in place but the equity market does not. The choice of financing by the firm becomes a signal of the value of the assets. Under this model, the firm will hold cash as a financial slack so that it can be used to finance investments when equity or debt financing is too expensive. The model's key prediction is a "pecking" order in corporate financing, in which cash will always be preferred to debt and equity.

Jensen and Meckling (1976) propose that managers will prefer holding liquid assets to debt or equity because cash increases their discretion while debt and equity are accompanied by external monitoring. Jensen (1986) proposes that managers of firms with free cash flow will likely engage in value decreasing acquisitions rather than increasing dividends to shareholders.

The predictions of these classic models of firm-liquidity are summarized in Table I. In general, firm-level liquid asset holdings appear to be motivated by capital market imperfections. Otherwise, with perfect capital markets, firms will hold liquid assets only to cover normal operations. If cash is

² This used to be the shoe sole argument; it is less expensive to hold some level of liquid assets than to go to the bank every time money is needed.

needed for other purposes, it can be raised at no cost in the form of debt or equity. Hedging via accumulation of liquid assets makes sense only if access to capital markets is costly due to imperfections, including transaction costs, agency problems and informational asymmetry. The models provide specific predictions of corporate holdings of liquid assets that depend on the specific market imperfection considered by the respective model.

Firm-level determinants of liquid holdings - evidence

Opler et al. (1999) provide an extensive empirical analysis of the determinants of liquid assets at the firm level. Their study concentrates on US firms; their sample is comprised of almost 90 thousand firm-year observations over the period 1971 through 1994. In particular, focusing on firm cash-holdings, they provide evidence that supports both the static tradeoff and the agency theory models. They find that firms with strong growth opportunities, in general, hold more cash. Firms that invest more (high capital expenses) and research more tend to hold more liquid assets. Alternatively, firms with greater access to capital markets such as large firms (with less asymmetric information problems) hold lower levels of cash. Additionally, they find that leverage is negatively correlated with cash holdings.

Country-level determinants of liquid holdings - evidence

More recently, Pinkowitz et al. (2003) have expanded the extant evidence to include determinants of cross-country differences in cash holdings of firms. They find that country specific characteristics such as country risk, and corruption explain a significant portion of the cross-country variation in cash holdings. They argue that countries with high country-risk and corruption may impose higher agency costs on firms. The low quality of governmental, financial and / or regulatory institutions could entice managers to divert corporate resources for private benefits. Since liquid assets

could be more easily diverted, Pinkowitz et al. (2003) argue that firms in countries with high country-risk should hold more cash. Based on a sample of firms in 35 countries over the period 1988 through 1999, they find that the level of cash-holdings is positively correlated with country risk and corruption. They also report inflation as having a negative impact on cash holdings. Firms prefer to lower their holdings of cash in anticipation of it losing value during inflation.

Culture and Finance

Culture

The most common operationalization of culture is to view it as a value system. Values can be defined as "... an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite" (Rokeach (1973)). Under this framework, culture can then be defined as a set of rules and standards abstracted from individuals' values (Parson and Shils (1951)), or as "... patterned ways of thinking feeling and reacting..." (Kluckhohn (1954)) or as "... the collective programming of the mind that distinguishes the members of a group from another (Hofstede (2001)).

Undoubtedly the most popular and frequently cited work on culture as a value system is Hofstede (1980, 2001)³. The popularity of the Hofstede's concepts of culture in academia cannot be underestimated. Appendix I summarizes the number of business related journal articles that have "Culture's Consequences" in their references⁴. As a former IBM employee, Geert Hofstede

³ Since the publication of the first edition of *Cultures Consequences*, many researchers have successfully replicated Hofstede's findings. For example, Søndergaard (1994) finds support in a review of 61 replications of different characteristics. Hoppe (1990), using the same IBM questionnaire on a sample of business leaders of European countries, was able to obtain the same dimensions. The validity of Hofstede's findings has also been corroborated by studies using different samples. For example Helmreich and Wilhelm (1998) and Merritt (1998) using a sample of 15,000 airline pilots from 23 countries found that pilots replicated the IBM country score-differences for 3 of the 4 dimensions. Other non academic studies (conducted by market research firms) have corroborated Hofstede's findings. For example Inter/View International used the Values Survey Module 1994 which included a consumer panel survey across 15 European countries.

⁴ The fame of Hofstede's dimensions does not imply that his work is exempt of criticism. The main criticisms to

administered 117,000 questionnaires in 66 countries during 1967 through 1973. Even though the research project was designed as a management tool and not as an effort to measure world values, it provided a unique experimental setting where samples could be matched to control for many factors that could induce to error. A key feature of the study is that, having matched organization, occupation, gender and age of the respondents, then, all other differences can be attributed to national culture differences. Hofstede's study derived five dimensions of culture that are deemed universal and centered over basic problems that all societies must confront but on which their answers may vary. The dimensions identified by Hofstede are: *Power distance*, relating to how society deals with human inequality; *Uncertainty avoidance*, which is related to the level of stress in a society while confronted with unknown future; *Individualism versus collectivism*, associated with how individuals are integrated to groups; *Masculinity versus femininity*, related to the division of emotional roles between men and women; *Long-term versus short-term orientation*, related to people's choice of focus between the future or the present. While all dimensions of culture are available to the manager, they need not to influence the cash holding decision. Culture is shared but also situational; people do not use all five dimensions in every situation they face. Masculinity and power distance are helpful in explaining other business practices such as differences in organizational structures in cross-country studies, but do not have a clear theoretical implication for liquid asset holdings.

There are several mechanisms through which culture affects behavior. According to Schwartz

Hofstede's works have been presented by McSweeney (2002) and Baskerville (2003). In essence, both studies argue that national borders should not be equated to cultures, and that work values cannot be equated to national values. McSweeney (2002) questions the methodology and assumptions used by Hofstede, noting how the IBM responses can shed light about work values but not necessarily about overall or general values since they were work-related questions administered in the formal work place. Baskerville (2003) argues that the Hofstede's cultural dimensions may be "embedded" in socio-economical data. For example, Power Distance is highly correlated with education while Uncertainty Avoidance is highly correlated with age of the respondent. as Individualism is correlated to organizational size and GNP, and Masculinity is correlated with the percentage of professional and technical females in the work force. In Baskerville's view, Hofstede's dimensions could be replicated by simply using a pool of socio-economic data.

(1999), cultural values are the shared basis for specific norms that indicate to individuals and organizations what is appropriate and preferred in different situations. Social institutions such as schools, organized religion, and economic and political systems set their goals and objectives with these cultural restrictions in mind. Welzel, Inglehart and Klingemann (2003) propose that institutions socialize citizens into the common traditions that hold national communities together. Nations tend to create central inclinations among their citizens; therefore, the variability will be larger between citizens of different nations than among those within the same nation. Culture as defined per Schwartz (1999) is shared abstract ideas about what is good, right and desirable in a society. Culture is then the basis for the specific norms that tell individuals and organizations what is appropriate in different situations.

Accordingly, all social institutions (including family, school system, religious establishment, and political system) will include and propagate these values in their goals and conduct. As a result, cultural dimensions can provide corporate managers, as members of the social institutions, incentives or disincentives to the holdings of corporate liquid-assets by imposing an additional cost or benefit to the manager-shareholder making the decision. For example, in an uncertainty-averse society, a manager who wants to reduce inventory by adopting a Just In Time (JIT) inventory system may be seen as “taking too much risk” and will face higher (perhaps non-pecuniary) costs than a manager in a uncertainty- neutral culture.

Uncertainty avoidance as a cultural dimension and liquid-asset holdings

The economics literature has attempted a variety of approaches to empirically measure agents’ degree of risk aversion. For example, Kritzman, Lowry and Van Royen (2002) derive a risk aversion

coefficient from global portfolio flows and holdings. Relying on the notion of decreasing relative risk aversion, Becker (2003) has directly used executive compensation data as a proxy for risk aversion. Harlow and Brown (1990) used neurochemical activity in the brain of subjects participating in experimental auctions to assess the levels of the enzyme monoamine oxidase, which is believed to influence people's attitudes towards risk.

Social scientists, however, have taken a different approach; they believe that culture in general and risk aversion in particular, can be assessed by measuring individuals' values and attitudes towards specific situations. Research in culture suggests that people's attitudes and behavior toward risk has a social component. Different groups of people (such as a country) may have systematically different levels of risk aversion. Hofstede's uncertainty avoidance focuses on the level of tolerance for uncertainty and ambiguity within the society (i.e. unstructured situations). According to Hofstede, a low ranking indicates that the country has high tolerance for uncertainty, it is less concerned about ambiguity and the future and has more tolerance for a variety of opinions. This is reflected in a society that allows rule breaking, more readily accepts change, and takes more and greater risks. A high uncertainty avoidance ranking indicates the country has low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and other controls in order to reduce the amount of stress that uncertainty creates in individuals. Managers in countries with high values of uncertainty avoidance will be less willing to take risks and will perceive cash as an instrument to hedge against future undesired states of nature.

Managers use a variety of risk-management tools to cope with risks of different types at a variety of costs. These hedging tools differ in terms of costs and benefits, the specificity of the risk covered and their availability. The most risk-specific tools include financial derivatives and insurance, which offer a hedge against a specific undesired state of nature. Other less specific tools include debt arrangements such as the use of letters of credit, contingent debt, equity offerings and the holdings of

liquid assets. Liquid assets can be considered negative debt which can be quickly deployed when the state of nature is not favorable, they can be considered as a very versatile risk management tool. There is an opportunity cost to holding liquid assets because of the liquidity premium. All else equal, risk-averse firm-managers should hold higher levels of liquid assets. To the extent that an individual's perception of risk and uncertainty as well as her coping mechanisms are significantly influenced by the national culture in which the individual resides, we expect managers in countries high on the cultural attribute of uncertainty avoidance to hold more liquid assets, on average. Thus, to formalize, we propose that:

H1: The cash holdings of a firm are positively correlated with the degree of uncertainty avoidance of the national culture in which it resides.

Theories of the multinational firm and liquid-asset holdings

While culture could explain cross-country variations in corporate liquidity, the effect of culture may not be uniform across firms within the same national culture. In addition to the firm-level determinants of liquidity, the international experience of firms can serve as a moderator of the effects of country-specific cultures and may account for the within-culture diversity in corporate liquid-asset holdings.

To begin, the internationalization of firms' operations would more likely increase the need for liquid-asset holdings because it will extend its business cycle. The need to support export activities would require longer terms of credit, less stringent credit policy and maintenance of larger inventories, all of which contributes to a higher level of working capital. In addition, the operation of a complex network of subsidiaries tends to increase the number and degree of contingencies that require maintaining a larger buffer in the form of, among others, liquid-asset holdings.

An alternative hypothesis, suggested in international finance text books is the practice of cash pooling by MNCs. The objective of cash pooling for the multinational firm is to bring together debit and credit balances of all subsidiaries. This way the MNC creates an internal capital market that could more efficiently allocate resources and thus store a lower amount of liquid assets. Therefore, the answer to this question should be an empirical one. However, cash pooling is a practice also available to any mid size and large domestic firm with divisions in different industries or subsidiaries in different regions within the country. The practice of cash pooling should be captured with our proxy for size. Consider two firms equal in every respect except that one is geographically diversified within its own country and the other across countries. We argue that the internationalized firm will face a longer and more unpredictable business cycle which will increase their need for liquid assets. For these reasons we posit

H2 Liquid asset holdings of the firm are positively correlated with its degree of multinationality;

On the other hand, multinational corporations learn from and adapt to their diverse foreign experiences, which prevent them from excessive influences of only one national culture. Thus, internationalization could also have a moderating role on the effect of national culture on firm liquid-asset holdings.

As the firm begins to trade and expand internationally, managers are provided with opportunities to learn other cultures' "ways of doing things." This learning could be illustrated by an example. In the first stage, the firm's international activities are restricted to foreign trade. The marketing division is most likely the functional department that has information about foreign markets and potential foreign customers. Information from foreign markets may imply that firms need to make simple adjustments to meet the new needs. These changes could be product labeling and/or packaging

or adjustment of order sizes that better satisfy customer demands. Subsequent stages of internationalization can lead firms to opening sales subsidiaries abroad, followed by acquiring other firms or launching operating facilities. These developments force the firm to deal with evermore complex issues such as effective communication with language barriers, and psychic distance that influence the management of operations.

The organizational learning theory developed in Kogut and Zander (1993) and expanded in Barkema and Vermeulen (1998) suggest that firms are social communities specializing in the transfer of knowledge and that firms operating in diverse national settings can develop a richer knowledge structure and stronger technological capabilities than firms that are exposed only to domestic markets. As a result, firms and managers that remain in one country will have a less rich pool of experiences upon which to base their decisions. Experience is a source of learning, and diverse environments increase new ideas and events to which the firm and/or manager are exposed. In this knowledge-based framework, the goals and decisions of a purely domestic firm with domestic managers will only reflect the values of the society in which it exists. External influences will be restricted to objective knowledge⁵; these domestic firms will then lack experiential knowledge of foreign markets and international competition. Under this isolation, managers and firms will likely incorporate only the local culture into their decisions, behavior and processes. Since the opportunity to learn from foreign competition is limited, domestic firms can only look inside their countries for examples and guidance.

The foregoing review suggests that multinational firms are different from domestic firms in that they have foreign exposure and experience in operating in multiple cultures. Therefore multinational firms have a much richer pool of experiences from which to make their decisions and, since the multinational firm is no longer embedded only in the domestic culture, we thus propose:

⁵ Penrose (1959) proposes two kinds of knowledge: Objective knowledge, which can be taught and, experiential knowledge, which can only be acquired through personal experience.

H3 The impact of culture as a determinant of corporate liquid asset holdings is lower for multinational firms compared to their domestic equivalents.

Data and analysis

To examine the veracity of our hypotheses empirically, we assemble detailed data on a large panel of firms across forty countries with close to 70 thousand firm-year observations for 1990-2000. The firm-level data for the study are obtained from the Worldscope database. We exclude firms in the financial sector (SIC codes 6000 to 6999) because their holdings of liquid assets could be the result of government regulation or arise from reasons different from those discussed in the previous sections. Other industries excluded for similar reasons are utilities (SIC codes 4300 to 4399) and postal services (SIC codes 4900 to 4999). We also exclude firm-years with negative or missing values for sales, total assets, cash and short-term investments and working capital.

Dependent variable

For the purpose of replication and comparability, most variables in our study have been constructed following Opler et al. (1999) and Pinkowitz et al. (2003). Cash & short-term investments (CASH) is our proxy for liquid assets, CASH is measured as the ratio of cash and short term investments over the difference between total assets minus cash and short-term investments.

Main explanatory variables

Our measure of culture is UNCERT, the country level uncertainty avoidance from Hofstede (2001) which measures the degree of tolerance for uncertainty and ambiguity within society as an attribute of its national culture. According to Hofstede, a low uncertainty avoidance ranking reflects a society that is less rule-oriented, more readily accepts change, and takes more and greater risks.

Countries with low scores in uncertainty avoidance are more tolerant to a changing environment; higher values of uncertainty avoidance imply that managers are less willing to take risks and are willing to hold more liquid assets in exchange for some risk hedging. In line with our H1, we expect this coefficient to be positive and significant indicating that firms in risk averse countries use more liquid assets as a hedging tool.

Foreign sales as a percentage of total sales (FGN_SALES), is the proxy for the degree of internationalization of the firm. The higher the percentage of sales generated abroad, the higher degree of foreign exposure of the firm. This proxy has been extensively used in international business literature. From our H2 we expect this coefficient to be positive which would be indicative of multinational firms holding more liquid assets to fulfill their longer business cycle.

The interaction between multinationality and culture is estimated using FGN SALES X UNCERT. From H3, we expect this coefficient to be negative and significant indicating that multinationality lowers the impact of culture on corporate liquid asset holdings.

Firm level controls,

Growth opportunities (GROWTH), firms with high growth opportunities will be more likely to have more projects to invest in. In an asymmetric information framework, managers of these firms may find it difficult to convey the real value of the investment opportunity to the debt and equity markets and prefer to hold cash as financial slack. It is expected that GROWTH will be positively correlated with liquid asset holdings. GROWTH is calculated as the ratio of market capitalization plus total assets plus total liabilities over total assets.

Firm size (L_ASSETS), large firms have lower information asymmetries compared to small firms. It is less costly for large firms to convey information about the real value of their projects so they access debt and equity markets to obtain financing. Therefore the relation between liquid asset

holdings and firm size should be negative. L_ASSETS is measured as the log of total assets at the end of each year.

Research and development (RD_SALES) can be considered another instance of information asymmetries because they represent investments in assets whose values are hard to measure. Firms with high R&D expenses are expected to hold more liquid assets. In our study, RD_SALES is measured as the ratio of research and development expenses over total sales.

Cash flow over assets (CF_ASSETS) firms with higher cash flows will be more likely to accumulate liquid assets. Agency costs of managerial discretion indicate that entrenched managers would prefer to hold liquid assets as a mechanism to avoid oversight by banks and deriving private benefits. However, if managers' goals are in line with those of shareholders, and if the quality of institutions is good, they should hold less cash. CFASSETS is estimated as the net cash flow of operating activities over the difference of total assets minus cash and short-term investments.

Capital expenses (CAPEXP), Myers and Majluf (1984) suggest that firms save financial slack to fund future investment opportunities. For this reason we expect that firms with high levels of current investment should have lower levels of liquid assets. CAPEXP is calculated as the ratio of additions to fixed assets over total assets.

Corporate debt (LEVERAGE), firms with high leverage will be subject to monitoring and financial covenants from banks and bond holders. In an agency framework managers will prefer to have low debt to divert liquid assets to derive private benefit. On the other hand, firms with high leverage need liquid resources to service it, therefore it is expected that leverage should be negatively correlated with liquid asset holdings, LEVERAGE is calculated as total liabilities over total assets.

Net working capital (NWCASSETS), cash is not the only choice of liquidity a firm has, we utilize working capital as a control and we expect it to be negatively correlated with our dependant variable. NWCASSETS is measured as the ratio of net working capital over net assets. Net working

capital is computed as working capital minus cash & short-term investments, while net assets are computed as total assets less cash & short-term investments.

Country level controls

Pinkowitz et al. (2003) argue that the quality of institutions in a country explains corporate liquid asset holdings. They use an agency theory approach to suggest that when the quality of institutions in a country is low, managers will prefer liquid assets because they can derive private benefits from them more easily than non liquid assets. To account for the quality of institutions identified in Pinkowitz et al. (2003) we utilize the following country level controls,

Gross domestic product (GDP) is presented per capita, it proxies and controls for economic development. It is expected that liquid asset holdings be positively correlated with GDP. The data was obtained from the World Bank files.

Inflation (INFLATION) can be seen as a cost of holding liquid assets and at the same time is a proxy for the quality of institutions of the country. Inflation is expected to negatively impact corporate holdings of liquid assets. INFLATION is calculated as the yearly average inflation over the period 1990 through 2000 and the data is obtained from the International Monetary Fund World Outlook reports.

Economic freedom (EFW) is a comprehensive index that measures overall freedom of a society. The index measures how well a country scores on a list of 50 independent variables divided into 10 broad factors of economic freedom. Low scores are more desirable. The higher the score on a factor, the greater the level of government interference in the economy and the less economic freedom a country enjoys. It is expected that firms in economies that are free will require lower levels of liquid assets. The Economic Freedom of the World Ranking is published annually by The Heritage Foundation.

Property Rights (PROP) measures the degree of protection of private property and property rights; the extent to which the government respects property rights by enforcing the law; and how safe private property is from expropriation. Managers in countries with low investor protection will prefer liquid assets because they can appropriate them easier. It is expected that countries with better property rights protection should hold lower levels of liquid assets. This variable is also obtained from the Economic Freedom of the World reports.

Quality of the banking system (BANK) refers to the quality of the banking system measured by the government involvement in the financial sector; more regulations would imply lower freedom. It is expected that firms in countries with low quality banking system will hold more liquid assets as a precautionary measure. This variable is also obtained from the Economic Freedom of the World reports.

Legal system (CIVIL LAW), the influence of legal systems as an explanatory variable is controlled for using a dummy variable that takes the value of one if the country has a civil law system. Countries with civil law system have also been described as being bank oriented (instead of market oriented). It is expected that firms in civil law countries hold lower levels of liquid assets. The data for this variable was obtained from LLSV (1998).

Country risk (COUNTRY RISK), firms in countries with high political risk should hold higher levels of liquid assets. COUNTRY RISK is obtained from the rankings of Coface.

Corruption (CORRUPTION) Pinkowitz et al. (2003) propose that when corruption is high, firms face the need to pay off functionaries and need to have liquid assets available. In this case managers will hold high levels of liquid assets. An alternative view, proposed here, suggests that companies recognize that in an environment of corruption managers' discretion should be limited. If this were the case, firms should have lower levels of liquid assets to "avoid temptation". CORRU is the corruption index published by Transparency International.

Table II presents summary statistics of the key variables by country; the first column shows the count of firm-year observations. As expected, developed countries contribute more firms to our sample. The United States has the largest number of firms in the sample accounting for 28% of both the overall sample. The second largest country in the overall sample is Japan with 9,589 firm year observations, amounting to 14%. The second column shows the count of firm-year observations of a subsample comprised of companies reporting foreign sales greater than zero. The United States, United Kingdom, Germany and Japan combined account for almost 46% percent of this subsample. It is clear from the table that some countries have a greater proportion of multinational firms than others. The third column of Table II shows the proportion of internationalized firms in each country. Over 60% of the firms in small developed countries like Austria, Netherlands and Switzerland are international. On the other hand small underdeveloped countries have fewer than 5% of their firms being internationals⁶.

Column four of Table II shows the levels of cash held in each country which vary widely. Firms from Norway and Sweden hold on average cash ratios greater than 0.3 while firms in Portugal and New Zealand on average hold a ratio of 0.05

Table II also illustrates in column five, that our proxy for culture levels also varies widely; Belgium, Japan, Poland and Portugal are amongst the countries with the highest values for UNCERT while Denmark, Sweden, Hong Kong and Singapore are the countries with the lowest values. Column six shows the mean foreign sales by country. It can be seen that while a significant portion of US firms (34%) are selling abroad, their level of internationalization is not very high (12%). On the other hand, only 29% of Norwegian firms sell abroad but their foreign sales comprise 56% of total sales. Columns

⁶ One potential limitation of the dataset is that, because of different disclosure standards and reporting requirements amongst countries, some firms may choose to not report foreign sales. A common problem in databases is that recent years tend to have more information than older years. As time passes more and more firms are reporting their foreign sales information. To control for this possible bias, we have run the analysis restricting the data to the 1995 – 2000 period and the results presented in this paper are unaltered.

seven through thirteen show the mean values for our control variables.

We can further our understanding of our sample by reading table III which presents the Pearson correlation coefficients for selected variables. This preliminary evidence seems to be in disagreement with our H1, the correlation between UNCERT and CASH is negative. In the case of our H2, the correlation between CASH and FGN SALES is positive yet insignificant. In line with theory and previous evidence, the correlations between CASH and the proxies for information asymmetry (GROWTH, L_ASSETS, and RDSALES) have the expected signs. The same can be said of the proxies for quality of institutions, (such GDP and INFLATION).

Regression Results

To examine the relations between culture, multinationality and liquid-asset holdings that are emerging from the data while controlling for other known determinants, we estimate regression equations of the following form:

$$CASH_{ict} = \alpha + \beta_1 UNCERT_c + \beta_2 FGN_SALES_{ict} + \beta_3 FGN_SALESxUNCERT_{ict} + \beta_4 FIRM_{ict} + e_{ict} \quad (1)$$

where the subscript ict refers to firm, country and year respectively

The FIRM control variables are used in Opler et al. (1999) as firm-level determinants. For robustness, the model is estimated using the Generalized Method of Moments obtaining Newey West heteroskedasticity and autocorrelation consistent covariance matrix and fixed industry and year effects.

Table IV shows the results of estimating equation 1, panel A includes all the firm-year observations in our sample. Consistent with our hypotheses, the higher the uncertainty avoidance a country exhibits, the higher the holdings of liquid assets, holding all other determinants constant. After controlling for all firm level determinants of cash holdings, culture matters: managers in

countries high on uncertainty avoidance hold more liquid assets than those in countries lower on uncertainty avoidance.

Panel B of Table IV shows the results of estimating equation 1 using the sub sample of firm-years with foreign sales greater or equal to zero and greater than zero respectively. This specification allows testing the impact of multinationality (H2) and its interaction with culture (H3) as determinant of liquid holdings. The impact of culture is robust to this new specification. From the table, it can be seen that the coefficient for UNCERT remains positive and significant. Furthermore, consistent with our hypothesis, the coefficient of FGN SALES is positive and significant both statistically and economically. A one standard deviation change in multinationality corresponds to a 3% change in the holdings of liquid assets. The more a firm exports, the higher the need for liquid holdings. Intuitively, items such as receivables and inventory are likely to be higher for firms engaged in foreign trade, resulting in higher overall liquid-asset holdings.

Finally, consistent with our hypothesis (H3), the coefficient on the interaction of FGN SALES and UNCERT is negative and significant. This finding is consistent with our proposition that as firms become international, they “learn” and adopt best practices regardless of their country of origin, managers begin comparing their performance on a global scale rather than simply locally. This learning makes the manager of the firm less subject to the influence of his or her culture.

Different reporting disclosure requirements in different countries could introduce a bias in our sample. Companies reporting foreign sales as zero may not be any different from those firms that simply do not report this information. For this reason, the same model is estimated for the sub sample of firms with foreign sales strictly greater than zero. Results are not materially different from those of the overall sample. Panel C of Table IV shows the results for this specification. It can be seen that for this sub sample, our results hold. Culture (uncertainty avoidance) is an economically and statistically significant determinant of the liquid holdings of firms. This influence, however, is diminished by the

degree of multinationality of the firm.

These results are both statistically and economically significant. From the model in panel C, a one standard deviation change in the uncertainty avoidance implies a 5% change in the holdings of liquid assets of the firm. These results are also robust to the proxy used for liquid assets. Results not reported here reveal the same findings using NWC_ASSETS as the proxy for liquid assets instead of CASH⁷. The coefficients for parameters of the other controls are in line with those of identified in Opler et al. (1999)⁸.

Due to the nature of the data, some degree of heteroskedasticity is expected, for this reason a White test was performed on the regression and the results suggest that the hypothesis of no heteroskedasticity cannot be rejected. Consequently, a White consistent variance covariance matrix is calculated and used to test whether the coefficient on UNCERT = coefficient on FGN SALES = coefficient on FGN SALES X UNCERT = 0. The results suggest that the null hypothesis can be strongly rejected in all cases.

As suggested by Pinkowitz et al. (2003), country specific institutional variables such as country risk and corruption are significant predictors of liquid asset holdings. It is possible that the results presented so far arise simply because we do not control for institutional variables or because the proxy for uncertainty avoidance measures these country institutions and not what it is intended to measure. In order to test this we estimate the following equation

$$CASH_{ict} = \alpha + \beta_1 UNCERT_c + \beta_2 FGN_SALES_{ict} + \beta_3 FGN_SALESxUNCERT_{ict} + \beta_4 FIRM_{ict} + \beta_5 COUNTRY_c + \beta_6 COUNTRY_{ct} + e_{ict} \quad (2)$$

⁷ In fact, the economic significance of culture increases when using net working capital as a proxy for liquid assets. A one standard deviation change in UNCERT implies a eight percent change in NWC_ASSETS.

⁸ It is important to note that the coefficient for CF_ASSETS is negative for the whole sample while positive our subsample of strictly international firms.

In Table V, we explore the relations between cash, culture and multinationality, controlling for country specific institutional variables. Pinkowitz et al. (2003) estimate their model using one institutional proxy at a time. We estimate our model differently; we believe that the model is misspecified unless all proxies for quality of institutions are included at the same time. While undoubtedly some proxies will be correlated, in essence they try to measure distinct aspects of the quality of the institutions of a country. We use a number of proxies for the quality of institutions in estimating the basic model. Since by construction, low values of FREEDOM, PROP and BANK indicate better institutions, we expect positive coefficients. Low values of CORRUPTION and COUNTRY RISK indicate poor institutions so we expect a negative coefficient for these variables.

Table V confirms that our main results are robust after controlling for institutional quality of countries. The coefficients of UNCERT and FGN SALES are significantly positive, while the interaction term is robustly negative. Turning to the institutional variables, the results are in general consistent with the evidence presented in Pinkowitz et al. (2003). However, two important distinctions should be made. The coefficients for INFLATION and CORRUPTION are positive and significant. Additionally our proxy for COUNTRY RISK is insignificant. There is only mixed evidence that firms residing in countries with good institutions (regardless of how we measure the quality of institutions) hold less liquid assets on average.

Robustness Tests

To rule out potential mechanical explanations of the results reported so far, we provide a series of robustness tests in this section. First, a concern one may have about the data is the possibility of multicollinearity among the right-hand variables that could blur the interpretation of the coefficient estimates. For this reason we perform a Variance Inflation Factor (VIF) test, the results of which are not reported here. All values for VIF are smaller than 10, including those of the interaction of

uncertainty avoidance and foreign sales. These results suggest that none of the variables should be dropped in the regressions. Additionally, we perform procedures of maximum R-square and Mallow's Cp. These tests, although not reported here, suggest that uncertainty avoidance and foreign sales have more explanatory power over cash holdings than some of the variables suggested by Opler et al. (1999).

Second, in order to account for all possible firm specific sources of variation in liquid-asset holdings we perform an in between estimation of our model. We calculate the means over time for all relevant variables by firm and then estimate equation 2 for the overall sample as well as for the sub samples of multinational firms using GMM with Newey West robust errors. The results shown on Table VI are consistent with those reported in Tables IV and V, namely that uncertainty avoidance and multinationality are positively and significantly correlated with the firm's holdings of liquid assets. Furthermore, the results confirm that the effects of culture are moderated by multinationality. One potential issue that could be driving the results of estimating our models is the endogeneity of CASH and NWCASSETS. These variables represent two forms of liquidity and are hardly independent. For this reason we estimate the following system of equations,

$$CASH = \alpha_1 + \beta_1 FGNSALES_{ict} + \varphi_1 UNCERT_c + \varphi_1 FGNSALESxUNCERT_{ict} + \gamma_1 X_{ict} + e_{1ict} \quad (3)$$

$$NWCASSETS = \alpha_2 + \beta_2 FGNSALES_{ict} + \varphi_2 UNCERT_c + \varphi_2 FGNSALESxUNCERT_{ict} + \gamma_2 X_{ict} + e_{2ict}$$

where X is a vector of firm and country level controls. Results for CASH are presented in Table VII and are in accordance with the evidence presented so far. Culture and the degree of internationalization are important determinants of cash holdings. At the same time their interaction moderates the impact of culture. Additionally, in this specification the coefficient for CFASSETS becomes positive, providing support to the agency cost of managerial

discretion interpretation. It can be claimed the firms in more volatile environments should hold more cash.

If this is true, our results may be more related to the uncertainty of the environment than with culture. To control for this possibility we create a new variable, GDP growth volatility, calculated as the standard deviation of the growth of GDP. Table VIII Panel A shows the results of estimating equation 2 including our proxy for the uncertainty of the environment. As expected, the volatility of the economic environment is positively correlated with cash holdings. However, uncertainty avoidance remains significant, hence our findings are again robust to this new specification. Finally, Mansi and Reeb (2002) have questioned (using capital structure as dependant variable) the assumption of linearity in the relation between the degree of internationalization and the firms' financial decisions. Our results could be driven by our failure to incorporate this possibility. Table VIII Panel B incorporates the square of foreign sales a robustness control. The coefficient for this proxy is negative indicating that as firms reach high levels of internationalization they reduce their cash holdings.

Summary and conclusions

What explains the cross-sectional variations in liquid-asset holdings across firms and countries? The paper provides explanations based on differences in national culture and differences in firms' degree of internationalization. We develop several hypotheses of how culture and multinationality interact to influence corporate holdings of liquid assets, controlling for all other known determinants. Firms residing in countries that are high on uncertainty avoidance, as a cultural attribute, would hold more liquid assets, as would firms with high degree of internationalization because of their longer business cycle. On the other hand, the impact of national culture on firm liquidity is moderated by the degree of the firm's multinationality.

We examine empirically the relations among national culture, multinationality and corporate

liquid-asset holdings using data on a large panel of firms across 40 countries for the period 1990 through 2000. We find strong evidence consistent with our hypotheses. We find that both national culture and the degree of internationalization of the firm are economically and statistically significant predictors of firms' liquid asset holdings. Firms in countries with high uncertainty avoidance hold more cash. A one standard deviation change in the uncertainty avoidance index across countries produces an 5 percent increase in liquid assets holdings. Moreover, we find that multinationality moderates the effects of national culture on liquid-asset holdings. The predictive power of national culture as an explanatory variable of liquid-asset holdings decreases with the degree of internationalization of the firm.

The paper makes a number of contributions. First, based on a detailed cross-country panel, we identify and document that, in addition to the firm-level determinants of liquidity, national culture explains a significant portion of the cross-country variations in liquidity. Second, against the commonly held view that cash pooling would reduce cash holdings, we report that multinational firms hold more cash than their domestic counterparts. Third, the paper identifies the degree of internationalization of the firm as a potential determinant of its liquidity that moderates the enduring effects of national culture on firm's liquid-asset holdings. Fourth, we provide evidence that after controlling for the internationalization of the firm, previous findings on the quality of institutions of a country do not seem to hold. Finally, we introduce an interdisciplinary perspective in understanding firm's decisions on liquidity, linking the literatures in finance, culture and the theories of the multinational firm.

The findings of the paper provide important implications for future research. While the evidence indicates that culture affects corporate financial decisions, it also underscores that national culture does not affect all firms in the same way. The impact of national culture seems to be more

pronounced for firms with less foreign exposure. The implication is that the effects of culture on the financial decisions of the firm should take into account the moderating effects of multinationality. The evidence that multinational firms' decisions are different from domestic firms' implies that cross-country studies on corporate behavior should properly account for the impacts of firms' degree of internationalization.

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Table I: Predictions of finance models regarding cash holdings

Model	Author	Liquid asset holdings increase when
Static Tradeoff	Keynes (1934) and Baumol (1952)	Cash volatility increases
Static Tradeoff	Keynes (1934) and Baumol (1952)	Taxes decrease
Static Tradeoff	Keynes (1934) and Baumol (1952)	Interest rates and other costs of raising debt increase
Static Tradeoff	Keynes (1934) and Baumol (1952)	Asset specificity increases
Static Tradeoff	Keynes (1934) and Baumol (1952)	Cost of hedging decreases
Static Tradeoff	Keynes (1934) and Baumol (1952)	Size of dividend decreases
Information asymmetry	Myers and Majluf (1984)	Information asymmetry is higher
Agency cost of debt	Jensen and Meckling (1976)	Growth opportunities are higher
Agency theory (private benefits)	Jensen and Meckling (1976)	Quality of institutions is low
Agency cost of management discretion	Jensen (1986)	\$1 of cash is worth less than \$1

Table II
Descriptive Statistics

Descriptive statistics for selected variables. Our sample includes firms from 40 countries from 1990-2000, it is drawn from Worldscope. The dependant variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, PGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, PGN_SALES x UNCERT. The control variables at the firm level are GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets, L_ASSETS is the log of total assets, RDSALES is the ratio of research and development expenses over total sales, CPASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments, CAPEXP is capital expense total assets. Leverage is total liabilities over total assets. NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments.

COUNTRY	Count of all firms in sample	Count of firms with % of firms with		CASHALL	UNCERT	PGN_SALES	GROWTH	L_ASSETS	RD_SALES	CP_ASSETS	CAPEXP	LEVERAGE	NWC_ASSETS
		PGN_SALES>0	PGN_SALES>0										
ARGENTINA	103	7	7	0.056	86	4.532	3.825	12.846	0.000	0.087	0.057	0.462	0.051
AUSTRALIA	565	308	36	0.150	51	20.908	2.825	11.729	0.026	0.105	0.900	0.463	0.093
AUSTRIA	202	144	71	0.144	70	59.040	2.207	10.205	0.007	0.082	0.083	0.807	0.078
BELGIUM	250	139	56	0.150	94	64.481	2.857	8.872	0.006	0.092	0.092	0.838	0.018
BRAZIL	1304	77	6	0.108	76	6.364	1.862	11.850	0.001	-0.080	0.034	0.550	-0.075
CANADA	191	12	6	0.257	46	28.027	3.721	8.523	0.216	-0.226	0.102	0.347	-0.148
CHILE	364	13	4	0.076	86	10.912	2.142	12.188	0.001	0.097	0.073	0.367	0.073
CHINA	667	13	2	0.165	30	0.908	2.215	11.878	0.000	0.016	0.030	0.485	-0.038
COLOMBIA	78	1	1	0.059	80	0.055	1.821	12.351	0.000	0.045	0.038	0.300	0.005
DENMARK	503	257	35	0.025	23	41.635	2.805	11.232	0.112	0.041	0.051	0.546	0.008
FINLAND	659	258	44	0.170	59	38.349	2.414	9.936	0.012	0.046	0.078	0.537	0.072
FRANCE	4049	1591	39	0.202	86	39.045	2.455	9.545	0.010	-0.015	0.031	0.812	0.054
GERMANY	4316	1937	45	0.180	85	32.782	2.576	10.841	0.015	-0.024	0.097	0.858	0.104
HONG KONG	1996	1231	82	0.259	29	47.540	2.332	12.127	0.003	0.059	0.055	0.481	-0.038
HUNGARY	79	18	20	0.072	82	11.528	2.191	10.889	0.004	0.030	0.049	0.388	-0.021
INDIA	1243	6	0	0.070	40	0.491	3.086	12.012	0.004	0.083	0.082	0.550	0.102
INDONESIA	500	39	5	0.177	46	2.894	2.379	11.008	0.001	0.085	0.070	0.881	-0.157
ISRAEL	146	59	40	0.157	81	31.388	1.980	12.231	0.030	0.052	0.044	0.458	0.020
ITALY	1188	591	50	0.180	75	40.101	2.282	5.235	0.009	0.025	0.039	0.811	-0.008
JAPAN	9589	1899	19	0.175	92	7.444	2.415	13.098	0.005	0.181	0.355	0.598	0.441
KOREA	1858	2	0	0.148	85	0.232	2.005	12.457	0.004	0.047	0.059	0.889	-0.054
MALAYSIA	1886	235	14	0.177	36	6.304	3.073	11.454	0.000	0.033	0.059	0.541	-0.098
MEXICO	452	54	12	0.075	82	13.028	2.296	13.091	0.000	0.037	0.035	0.481	-0.015
NETHERLAND	1146	741	85	0.173	53	46.682	2.883	10.540	0.010	0.041	0.057	0.808	0.089
NEW ZEALAND	231	88	29	0.053	49	17.612	2.435	11.754	0.001	0.090	0.087	0.462	0.088
NORWAY	540	156	29	0.201	50	55.730	3.293	11.838	0.011	0.049	0.110	0.548	0.028
PERU	234	6	3	0.074	87	4.879	2.261	11.508	0.005	0.090	0.058	0.378	0.048
PHILIPPINES	466	17	4	0.128	44	0.768	2.370	11.377	0.003	0.083	0.084	0.408	-0.037
POLAND	232	18	8	0.093	98	2.931	2.277	10.854	0.000	0.082	0.077	0.441	0.114
PORTUGAL	384	111	28	0.047	104	19.239	2.093	6.343	0.000	0.015	0.024	0.588	0.031
SINGAPORE	1013	594	59	0.210	8	37.901	2.387	11.719	0.001	0.044	0.088	0.442	-0.027
SPAIN	566	172	29	0.077	86	20.925	2.423	7.436	0.001	-0.006	0.032	0.571	0.021
SWEDEN	664	379	44	0.206	29	53.658	3.422	11.733	0.046	0.009	0.084	0.518	0.105
SWITZERLAND	1092	716	86	0.182	56	59.714	2.463	12.544	0.015	0.050	0.048	0.588	0.081
TAIWAN	530	71	9	0.036	89	5.804	2.631	12.737	0.012	0.088	0.075	0.407	0.071
THAILAND	2130	82	3	0.092	84	1.232	2.215	10.939	0.000	0.053	0.042	0.559	-0.081
TURKEY	82	1	2	0.210	85	1.007	2.866	9.826	0.004	0.011	0.325	0.505	0.114
UNITED KINGDOM	5910	2798	47	0.257	35	28.977	3.442	11.429	0.101	0.027	0.088	0.835	0.001
UNITED STATES	19191	8541	34	0.254	46	12.638	3.285	11.892	0.171	0.051	0.255	0.512	0.127
VENEZUELA	81	11	15	0.061	76	30.008	1.884	12.877	0.000	0.055	0.043	0.342	0.015
Mean				0.200	58.5607423	18.878	2.787	11.490	0.084	0.055	0.182	0.550	0.107
Standard Deviation				0.439	22.2403213	33.779	3.025	2.212	1.184	0.299	1.394	0.343	0.498

Table III
Pairwise Pearson Correlation Coefficients

Our sample includes firms from 40 countries from 1990-2000. It is drawn from Worldscope. The dependent variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, PGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, PGN_SALES x UNCERT. The control variables at the firm level are GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets, L_ASSETS is the log of total assets, RDSALES is the ratio of research and development expenses over total sales, CFAASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments, CAPEXP is capital expenses total assets, Leverage is total liabilities over total assets, NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. Control variables at the country level include: GDP is the GDP per capita for each country, INFLATION is the yearly average inflation of 1990-2000, EPW is the Economic Freedom of the World index which control for difference in opportunities available to firms in each country, PROP measures property rights, BANK measures the quality of the banking system, CIVIL LAW is legal system dummy, COUNTRY RISK measures the risk of the country and CORRU measures the corruption of the country.

	CASH	UNCERT	PGN_SALES	PGN_SALES x UNCERT	GROWTH	L_ASSETS	RDSALES	CFAASSETS	CAPEXP	LEVERAGE	NWC_ASSETS	GDP	INFLATION	EPW	PROP	BANK	CIVIL LAW	COUNTRY RISK
UNCERT	-0.07 .0001																	
PGN_SALES	0.01 0.0002	-0.09 .0001																
PGN_SALES x UNC	-0.01 0.0004	0.13 .0001	0.30 .0001															
GROWTH	0.19 .0001	-0.10 .0001	0.00 0.0002	-0.02 0.0002														
L_ASSETS	-0.08 .0001	-0.01 0.0003	0.07 .0001	0.02 .0001	-0.08 .0001													
RDSALES	0.08 .0001	-0.03 .0001	0.00 0.0006	-0.01 0.0002	0.07 .0001	-0.03 .0001												
CFAASSETS	-0.17 .0001	0.07 0.0001	-0.01 0.0007	-0.02 0.0001	-0.13 .0001	0.19 .0001	-0.12 .0001											
CAPEXP	-0.02 .0001	0.02 .0001	-0.02 .0001	-0.02 .0001	0.03 .0001	-0.01 0.0001	0.02 0.0001	0.04 0.0001										
LEVERAGE	-0.20 .0001	0.10 .0001	0.03 .0001	0.05 .0001	0.04 .0001	0.00 0.0001	-0.02 0.0001	-0.09 .0001	0.00 0.0001									
NWC_ASSETS	-0.39 .0001	0.18 .0001	-0.04 .0001	-0.02 0.0002	-0.10 .0001	0.05 .0001	-0.03 .0001	0.28 .0001	0.04 .0001	-0.15 .0001								
GDP	0.10 .0001	-0.05 .0001	0.05 .0001	0.03 .0001	0.08 .0001	0.14 .0001	0.04 .0001	0.06 .0001	0.06 .0001	-0.01 0.0002	0.18 .0001							
INFLATION	-0.04 .0001	0.14 .0001	-0.04 .0001	-0.03 .0001	-0.04 .0001	0.04 .0001	-0.01 0.0001	-0.06 0.0001	-0.01 0.0001	-0.01 0.0001	-0.05 .0001	-0.32 .0001						
EPW	-0.09 .0001	0.50 .0001	-0.18 .0001	-0.05 .0001	-0.08 .0001	0.01 0.0001	-0.04 0.0001	0.02 .0001	-0.02 .0001	0.07 .0001	0.01 0.0002	-0.67 .0001	0.27 .0001					
PROP	-0.09 .0001	0.40 .0001	-0.19 .0001	-0.10 .0001	-0.09 .0001	0.01 0.0001	-0.04 .0001	0.03 .0001	-0.02 .0001	0.03 .0001	-0.01 0.0003	-0.69 .0001	0.35 .0001	0.04 .0001				
BANK	-0.09 .0001	0.56 .0001	-0.13 .0001	0.01 0.0001	-0.10 .0001	0.00 0.0001	-0.05 0.0001	0.03 .0001	-0.02 .0001	0.10 .0001	0.04 .0001	-0.58 .0001	0.13 .0001	0.88 .0001	0.78 .0001			
CIVIL LAW	-0.05 .0001	0.37 .0001	0.12 .0001	0.27 .0001	-0.05 .0001	-0.34 .0001	-0.02 .0001	-0.07 .0001	-0.04 .0001	0.03 .0001	-0.09 .0001	-0.39 .0001	0.35 .0001	0.36 .0001	0.43 .0001	0.25 .0001		
COUNTRY RISK	-0.08 .0001	0.20 .0001	-0.06 .0001	0.02 .0001	-0.07 .0001	-0.10 .0001	-0.03 .0001	-0.06 .0001	-0.04 .0001	0.03 .0001	-0.11 .0001	-0.73 .0001	0.48 .0001	0.88 .0001	0.70 .0001	0.55 .0001	0.56 .0001	
CORRUPTION	0.09 .0001	-0.31 .0001	0.26 .0001	0.18 .0001	0.07 .0001	0.02 .0001	0.02 .0001	-0.01 0.0002	0.02 .0001	-0.03 .0001	0.06 .0001	0.72 .0001	-0.30 .0001	-0.82 .0001	-0.63 .0001	-0.64 .0001	-0.31 .0001	-0.71 .0001

Table IV

Cash Culture, Multinationality and Firm Controls

Regressions coefficients for equation 1, our sample is drawn from Worldscope and consists of firms in 40 countries for the 1990-200 period. The dependant variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, FGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, FGN_SALES x UNCERT. The control variables at the firm level are GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets. L_ASSETS is the log of total assets. RDSALES is the ratio of research and development expenses over total sales. CFASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments. CAPEXP is capital expenses total assets. Leverage is total liabilities over total assets. NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. The model is estimated using fixed year and industry effects and Newey-West robust standard errors. Panel A includes all firms in the sample; Panel B includes only those firms with foreign sales greater or equal to zero and Panel C includes only those firms with foreign sales greater than zero.

		PANEL A	PANEL B	PANEL C
		All firms in Sample	Only firms with FGN_SALES >=0	Only firms with FGN_SALES>0
Main Explanatory Variables	UNCERT	1.01 <.0001	1.74 <.0001	2.03 <.0001
	FGN_SALES		0.79 <.0001	0.90 <.0001
	FGN_SALES x UNCERT		-0.02 <.0001	-0.02 <.0001
	GROWTH	19.87 <.0001	18.74 <.0001	27.98 <.0001
Firm Level Controls	L_ASSETS	-4.21 <.0001	-3.55 <.0001	-5.88 <.0001
	RD_SALES	15.20 <.0001	16.42 <.0001	15.31 <.0001
	CF_ASSETS	-56.58 <.0001	-17.63 0.0055	125.13 <.0001
	CAPEXP	-4.12 <.0001	-3.41 0.0048	-5.92 0.0188
	LEVERAGE	-343.38 <.0001	-350.40 <.0001	-423.79 <.0001
	NWC_ASSETS	-368.28 <.0001	-388.27 <.0001	-386.01 <.0001
	Adjusted R ²	0.2849	0.3143	0.3007
	N	67,950	46,124	21,738

Table V

Cash Culture, Multinationality Firm and Country Controls

Regressions coefficients for equation 1, our sample is drawn from Worldscope and consists of firms in 40 countries for the 1990-2000 period. The dependant variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, FGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, FGN_SALES x UNCERT. The control variables at the firm level are GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets. L_ASSETS is the log of total assets. RDSALES is the ratio of research and development expenses over total sales. CFASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments. CAPEXP is capital expenses total assets. Leverage is total liabilities over total assets. NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. Control Variables at the country level include, GDP is the GDP per capita for each country. INFLATION is the yearly average inflation of 1990-2000. EFW is the Economic Freedom of the World index which control for difference in opportunities available to firms in each country. PROP measures property rights. BANK measures the quality of the banking system. CIVIL LAW is legal system dummy, COUNTRY RISK measures the risk of the country and CORRU measures the corruption of the country. The model is estimated using fixed year and industry effects and Newey-West robust standard errors. Panel A includes all firms in the sample; Panel B includes only those firms with foreign sales greater or equal to zero and Panel C includes only those firms with foreign sales greater than zero.

		PANEL A	PANEL B	PANEL C
		All firms in Sample	Only firms with FGN_SALES >=0	Only firms with FGN_SALES>0
Main Explanatory Variables	UNCERT	0.53 <.0001	0.60 <.0001	1.57 <.0001
	FGN_SALES		0.67 <.0001	0.65 <.0001
	FGN_SALES x UNCERT		-0.01 <.0001	-0.01 0.0029
Firm Level Controls	GROWTH	17.92 <.0001	16.78 <.0001	27.08 <.0001
	L_ASSETS	-15.08 <.0001	-15.31 <.0001	-17.08 <.0001
	RD_SALES	13.21 <.0001	14.76 <.0001	14.15 <.0001
	CF_ASSETS	-57.71 <.0001	-14.16 0.0235	128.16 <.0001
	CAPEXP	-6.82 <.0001	-5.93 <.0001	-8.74 0.0005
	LEVERAGE	-354.78 <.0001	-356.32 <.0001	-415.09 <.0001
	NWC_ASSETS	-401.62 <.0001	-414.33 <.0001	-400.41 <.0001
	GDP	0.01 <.0001	0.01 <.0001	0.01 <.0001
	INFLATION	0.04 0.0088	0.10 <.0001	0.20 <.0001
Country Level Controls	EFW	4.90 0.6886	32.63 0.0274	-3.74 0.8664
	PROP	40.00 <.0001	40.07 <.0001	58.89 <.0001
	BANK	29.22 <.0001	24.32 <.0001	11.85 0.0242
	CIVIL LAW	-69.23 <.0001	-56.47 <.0001	-85.83 <.0001
	COUNTRY RISK	0.01 0.9932	-0.78 0.6261	2.06 0.3756
	CORRUPTION	9.40 <.0001	7.68 0.0005	15.36 <.0001
	Adjusted R^2	0.3105	0.3402	0.3129
N	67,950	46,124	21,738	

Table VI

Cash Culture, Multinationality Firm and Country Controls In between estimation

Regressions coefficients for equation 2, mean values for each variable between 1990 and 2000 for each firm. Our sample is drawn from Worldscope and consists of firms in 40 countries for the 1990-2000 period. The dependent variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, FGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, FGN_SALES x UNCERT. The control variables at the firm level are: GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets. L_ASSETS is the log of total assets. RDSALES is the ratio of research and development expenses over total sales. CPASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments. CAPEXP is capital expenses total assets. Leverage is total liabilities over total assets. NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. Control Variables at the country level include, GDP is the GDP per capita for each country. INFLATION is the yearly average inflation of 1990-2000. EPW is the Economic Freedom of the World index which control for difference in opportunities available to firms in each country. PROP measures property rights, BANK measures the quality of the banking system, CIVIL LAW is legal system dummy, COUNTRY RISK measures the risk of the country and CORRU measures the corruption of the country. The model is estimated using fixed year and industry effects and Newey-West robust standard errors. Panel A includes all firm level controls; Panel B includes both firms and country level control.

		PANEL A			PANEL B		
		All firms in Sample	Only firms with FGN_SALES >=0	Only firms with FGN_SALES >0	All firms in Sample	Only firms with FGN_SALES >=0	Only firms with FGN_SALES >0
Main Explanatory Variables	UNCERT	1.20 <.0001	1.92 <.0001	1.82 <.0001	0.64 0.0073	0.56 0.0636	0.92 0.079
	FGN_SALES		1.17 0.0001	0.84 0.0192		1.01 0.0011	0.55 0.1364
	FGN_SALES x UNCERT		-0.03 <.0001	-0.02 0.0067		-0.02 0.0033	-0.01 0.3599
	GROWTH	14.00 <.0001	10.91 <.0001	14.08 <.0001	12.79 <.0001	9.88 <.0001	13.01 <.0001
Firm Level Controls	L_ASSETS	-7.70 <.0001	-6.41 0.0003	-5.72 0.0125	-17.41 <.0001	-15.56 <.0001	-18.01 <.0001
	RD_SALES	4.88 0.0202	4.75 0.0241	14.20 0.0213	3.10 0.1326	3.31 0.1097	12.48 0.0406
	CF_ASSETS	-186.44 <.0001	-165.22 <.0001	-81.07 <.0001	-177.96 <.0001	-149.04 <.0001	-66.60 0.001
	CAPEXP	-4.33 0.0168	-1.83 0.3839	7.37 0.1572	-6.47 0.0003	-4.18 0.0427	2.94 0.5696
	LEVERAGE	-380.04 <.0001	-373.68 <.0001	-541.04 <.0001	-393.94 <.0001	-383.81 <.0001	-545.87 <.0001
	NWC_ASSETS	-396.43 <.0001	-419.82 <.0001	-448.71 <.0001	-432.74 <.0001	-444.06 <.0001	-467.77 <.0001
	GDP				0.01 <.0001	0.01 <.0001	0.01 <.0001
	INFLATION				0.10 0.005	0.12 0.0201	0.27 0.0009
	EPW				-10.61 0.6932	39.42 0.2065	21.71 0.6348
	Country Level Controls	PROP				37.46 0.0098	30.80 0.0093
BANK					46.80 <.0001	31.25 0.0007	23.54 0.0426
CIVIL LAW					-93.14 <.0001	-55.89 0.0035	-91.38 0.0001
COUNTRY RISK					1.20 0.593	2.34 0.5039	4.32 0.4051
CORRUPTION					21.11 <.0001	12.20 0.0188	19.77 0.017
Adjusted R ²	0.3838	0.4098	0.3809	0.4076	0.432	0.3962	
N	14,856	10,740	5,246	14,856	10,740	5,246	

Table VII

Cash Culture, Multinationality Firm and Country Controls, Seemingly Unrelated Regressions

Regressions coefficients for equation 2, mean values for each variable between 1990 and 2000 for each firm. Our sample is drawn from Worldscope and consists of 1 in 40 countries for the 1990-2000 period. The . The dependant variable is CASH, defined as cash and short term investments over the difference of total assets minus and short term investments. The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, FGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, FGN_SALES x UNCERT. The control variables at the firm level GROWTH is the ratio of market capitalization plus total assets plus total liabilities over total assets, L_ASSETS is the log of total assets, RDSALES is the ratio of research and development expenses over total sales, CFASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments, CAPEXP is capital expenses total assets, Leverage is total liabilities over total assets, NWC_ASSETS is working capital over assets, which is calculate the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. Control Variables at the country level include, GDP is the GDP per capita for each country, INFLATION is the yearly average inflation of 1990-2000, EPW is the Economic Freedom of the World index which control for difference in opportunities available to firms in each country, PROP measures property rights, BANK measures the quality of the banking system, CIVIL LAW is legal system dummy, COUNTRY RISK measures the risk of the country and CORRU measures the corruption of the country. The model is estimated using fixed year and industry effects and Newey-West robust standard errors. Panel A includes all firm level controls; Panel B includes both firms and country level control.

	PANEL A All firms in Sample	PANEL B Only firms with FGN_SALES >=0	PANEL C Only firms with FGN_SALES >0	
Main Explanatory Variables	UNCERT	1.32 <.0001	1.10 <.0001	2.411 <.0001
	FGN_SALES		0.80 <.0001	0.77 <.0001
	FGN_SALES x UNCERT		-0.01 <.0001	-0.01 <.0001
	GROWTH	15.43 <.0001	13.62 <.0001	21.88 <.0001
Firm Level Controls	L_ASSETS	-19.84 <.0001	-19.77 <.0001	-19.91 <.0001
	RD_SALES	12.45 <.0001	14.71 <.0001	15.32 <.0001
	CF_ASSETS	47.28 <.0001	100.85 <.0001	212.52 <.0001
	CAPEXP	-5.30 <.0001	-4.09 0.0006	-5.46 0.029
	LEVERAGE	-414.43 <.0001	-397.53 <.0001	-478.3 <.0001
	NWC_ASSETS	-670.84 <.0001	-671.36 <.0001	-674.84 <.0001
	GDP	0.01 <.0001	0.01 <.0001	0.01 <.0001
	INFLATION	0.06 0.0001	0.13 <.0001	0.24 <.0001
	EPW	29.29 0.0166	75.64 <.0001	14.87 0.504
	Country Level Controls	PROP	53.10 <.0001	34.02 <.0001
BANK		30.97 <.0001	26.37 <.0001	13.70 0.0091
CIVIL LAW		-110.99 <.0001	-85.58 <.0001	-115.12 <.0001
COUNTRY RISK		1.44 0.164	0.78 0.6272	3.58 0.1296
CORRUPTION		15.50 <.0001	11.25 <.0001	19.50 <.0001
System Weighted R ²	0.6166	0.6667	0.6902	
System Degrees of Freedom	135,732	92,076	42,586	

Table VIII

Cash Culture, Multinationality Firm and Country Controls, Robustness

Regressions coefficients for equation 2, mean values for each variable between 1990 and 2000 for each firm. Our sample is drawn from Worldscope and consists of firms in 40 countries for the 1990-2000 period. The dependant variable is CASH, defined as cash and short term investments over the difference of total assets minus cash and short term investments.

The explanatory variables are the proxy for culture, Hofstede's Uncertainty Avoidance UNCERT, the proxy for foreign exposure, FGN_SALES, measured as the ratio of foreign sales over total sales, and the interaction of them, FGN_SALES x UNCERT. The control variables at the firm level are GROWTH, the ratio of market capitalization plus total assets plus total liabilities over total assets, L_ASSETS is the log of total assets, RDSALES is the ratio of research and development expenses over total sales, CF_ASSETS is net cash-flow of operating activities over the difference of total assets minus cash and short term investments, CAPEXP is capital expenses total assets, Leverage is total liabilities over total assets, NWC_ASSETS is working capital over assets, which is calculated as the ratio of working capital minus cash & short term investments over the difference of total assets minus cash & short term investments. Control Variables at the country level include, GDP, the GDP per capita for each country, INFLATION is the yearly average inflation of 1990-2000, EPW is the Economic Freedom of the World index which control for difference in opportunities available to firms in each country, PROP measures property rights, BANK measures the quality of the banking system, CIVIL LAW is legal system dummy, COUNTRY RISK measures the risk of the country and CORRU measures the corruption of the country. The model is estimated using fixed year and industry effects and Newey-West robust standard errors. Panel A includes the GDP GROWTH VOLATILITY, calculated as the standard deviation of GDP growth for each country for the 1990-2000 period. Panel B includes FGN_SALES^2 the square of FGN_SALES.

	PANEL A			PANEL B			
	All firms in Sample	Only firms with	Only firms with	Only firms with	Only firms with		
		FGN_SALES >=0	FGN_SALES >0		FGN_SALES >=0	FGN_SALES >0	
Main Explanatory Variables	UNCERT	0.44 <.0002	0.61 <.0002	1.65 <.0001	UNCERT	0.71 <.0001	1.94 <.0001
	FGN_SALES		0.55 <.0001	0.64 <.0001	FGN_SALES	1.05 <.0001	1.52 <.0001
	FGN_SALES x UNCERT		-0.01 <.0003	-0.01 <.0046	FGN_SALES x UNCERT	-0.02 <.0001	-0.02 <.0001
	GROWTH	18.07 <.0001	16.93 <.0001	27.14 <.0001	GROWTH	16.71 <.0001	26.74 <.0001
Firm Level Controls	L_ASSETS	-15.02 <.0001	-14.90 <.0001	-16.79 <.0001	L_ASSETS	-15.76 <.0001	-17.36 <.0001
	RD_SALES	13.04 <.0001	14.57 <.0001	14.14 <.0001	RD_SALES	14.64 <.0001	13.66 <.0001
	CF_ASSETS	-60.57 <.0001	-17.06 <.0066	128.30 <.0001	CF_ASSETS	-13.49 <.0001	130.45 <.0001
	CAPEXP	-7.01 <.0001	-6.13 <.0001	-8.85 <.0004	CAPEXP	-5.89 <.0001	-8.88 <.0004
	LEVERAGE	-360.44 <.0001	-361.26 <.0001	-416.42 <.0001	LEVERAGE	-357.00 <.0001	-414.23 <.0001
	NWC_ASSETS	-404.39 <.0001	-416.54 <.0001	-401.28 <.0001	NWC_ASSETS	-413.30 <.0001	-399.02 <.0001
	GDP	0.01 <.0001	0.01 <.0001	0.01 <.0001	GDP	0.01 <.0001	0.01 <.0001
	INFLATION	-0.23 <.0001	-0.08 <.0024	0.18 <.0079	INFLATION	0.10 <.0001	0.20 <.0001
Country Level Controls	EPW	-11.67 <.0001	18.64 <.0001	-5.21 <.0001	EPW	37.66 <.0001	5.13 <.0001
	PROP	52.66 <.0001	53.42 <.0001	59.27 <.0001	PROP	38.53 <.0001	55.42 <.0001
	BANK	20.78 <.0001	15.30 <.0001	9.72 <.0001	BANK	24.74 <.0001	11.42 <.0001
	CIVIL LAW	-74.75 <.0001	-64.32 <.0001	-89.25 <.0001	CIVIL LAW	-57.34 <.0001	-87.40 <.0001
	COUNTRY RISK	0.54 <.0001	-1.11 <.0001	1.14 <.0001	COUNTRY RISK	-0.93 <.0001	1.94 <.0001
	CORRUPTION	4.95 <.0004	4.66 <.0048	13.26 <.0042	CORRUPTION	6.87 <.0019	13.50 <.0003
Robustness Control	GDP GROWTH VOLATILITY	327.68 <.0001	211.66 <.0011	14.95 <.0844	FGN_SALES^2	-0.0003 <.0004	-0.001 <.0001
	Adjusted R^2	0.3134	0.3429	0.3129		0.34	0.3137
	N	67,950	46,124	21,738		46,124	21,738

Appendix I: Refereed literature citations of Geert Hofstede, 1980 2001, Culture's Consequences.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Bus / Mgmt / Acc	27	34	30	44	60	71	92	79	152	59	68	85	79	106	92
Decision/Comp uter	0	1	0	0	0	5	8	9	16	2	8	12	9	14	12
Eco/Fin										3	10	9	20	14	10
Total	27	35	30	44	60	76	100	88	168	59	72	86	86	107	97

Source: 1990 – 1998 taken from Baskerville 2003, 1999 – 2004 from www.sciencedirect.com

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