J. Andrew Petersen, Tarun Kushwaha, & V. Kumar

Marketing Communication Strategies and Consumer Financial Decision Making: The Role of National Culture

Consumers frequently make important financial decisions that have short- and long-term impacts on their welfare. The authors expect that these financial decisions are a function of consumers' past experiences and interactions with a financial services firm as well as consumers' long-term priorities (e.g., national culture). They determine how three cultural dimensions (long-term orientation, uncertainty avoidance, and masculinity) and marketing communication type (promotion focused vs. prevention focused) affect three key consumer financial decisions: (1) savings rate, (2) use of credit, and (3) spending pattern. To do so, they empirically test both the direct effect of national culture on consumer financial decision making and its moderating effect on the link between a firm's marketing efforts and consumer financial decision making. Drawing on regulatory focus theory, the authors develop and empirically test their hypotheses using a customer database from a multinational financial services firm based in the United Arab Emirates, with customers originating from 34 countries. They find that national culture directly affects consumer financial decision making and moderates the impact of marketing efforts by the financial services firm, which suggests that financial services firms should account for national culture when managing customers.

Keywords: consumer financial decision making, marketing responsiveness, message content, regulatory focus theory, multicultural marketing communications

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Consumers frequently face financial decisions that have a direct impact on their short- and long-term welfare, and they often take into account their past experiences and long-term priorities when they choose to act (Lynch 2011). The differences between these past experiences and long-term priorities across consumers can often explain a significant portion of the heterogeneity in how

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they make financial decisions both independent of and in response to a firm's marketing efforts. In this research, we define past experiences as prior interactions between the consumer and the firm (whether through a previous purchase or other interaction with the firm) and define long-term priorities as the long-lasting socioeconomic, economic, and personal experiences the customer has had since childhood (Berkman, Lindquist, and Sirgy 1997; Gatignon, Kimberly, and Gunther 2004). National culture is one such long-lasting personal experience that is considered a "collective programming of the mind" that distinguishes one group of people from another (Hofstede 2001, p. 9). These cultural values are deeply embedded in people since early childhood, and they often persist by helping consumers set long-term priorities throughout their lives.

Understanding the direct impact of national culture and economic conditions on systematic differences in consumer behavior across countries has been the focus of much marketing research at the firm and consumer levels. At the consumer level, previous studies have examined the role of national culture in new product diffusion (Gatignon, Eliashberg, and Robertson 1989; Kumar, Ganesh, and Echambadi 1998; Tellis, Stremersch, and Yin 2003), customer innovativeness (Steenkamp, Hofstede, and Wedel 1999), website value (Steenkamp and Geyskens 2006), perceived brand value (Steenkamp, Batra, and Alden 2003), brand positioning (Alden, Steenkamp, and Batra 1999), and brand imagery (Roth 1995). At the firm level, previous studies have examined the role of national culture in new product

development (Nakata and Sivakumar 1996), mode of market entry (Kogut and Singh 1988), and advertising spending (Deleersnyder et al. 2009). Other studies have examined how social and economic differences influence market potential and the speed of adoption (Takada and Jain 1991), penetration potential and the rate of takeoff (Talukdar, Sudhir, and Ainslie 2002), and the growth rate of new products (Stremersch and Tellis 2004). A stream of research indicates that some differences in customer behaviors can be attributed to both national culture and macroeconomic factors. For example, Kumar and Krishnan (2002) find that cultural and economic similarities explain consistency in product diffusion patterns observed across nations. Similarly, Van den Bulte and Stremersch (2004) find that income inequality and national culture explain heterogeneity in the social contagion effects observed in new product diffusion.

Consumer financial decision making has also been of considerable interest to researchers in marketing, psychology, and economics. Previous research has considered such aspects of consumer financial decision making as budget allocations across categories (Du and Kamakura 2008) or with ordinary and exceptional purchases (Sussman and Alter 2012); variations in expenditures over time (Kamakura and Du 2012); the impact of self-construal (Mandel 2003) and gender (Powell and Ansic 1997; Schubert et al. 1999) on financial risk taking; the impact of cognitive abilities (Agarwal and Mazumder 2013), literacy (Lusardi 2008), and numeracy (Lusardi 2012) on the quality of financial decision making; the impact of nonlinear reasoning (McKenzie and Liersch 2011), earmarking (Soman and Cheema 2011), and the future self (Hershfield et al. 2011) on saving behavior; the impact of debt consolidation accounts (Amar et al. 2011), financial literacy (Bolton, Bloom, and Cohen 2011), and minimum required payments (Navarro-Martinez et al.

2011) on debt repayment; and the impact of credit (Soman and Cheema 2002; Wilcox, Block, and Eisenstein 2011) on spending behavior.

However, to this point, relatively little empirical evidence exists linking a consumer's national culture of origin, a firm's marketing efforts, and that consumer's financial decision making. One exception is Hsee and Weber's (1999) study, in which the authors conduct lab experiments and find that Chinese participants are less risk averse than their American counterparts with regard to investment decisions. However, their study was limited to only two nationalities and considered only one aspect of financial decision making. We have found some anecdotal evidence in terms of the differences in the average savings rates, average borrowing rates, and average spending rates across countries, which suggests that significant differences in consumer financial decision making exist across the world. We collected data from the Organisation for Economic Co-operation and Development (OECD) on the average household saving rates, total household debt-to-gross domestic product (GDP) ratios, and the total household spending-to-GDP ratios across 25 of the OECD countries in 2011 (see Figure 1).

Figure 1 illustrates the significant variance in savings rates across 25 OECD countries (min: Denmark, –1.1%; max: France, 15.4%), total household debt-to-GDP ratios (min: Slovak Republic, 29%; max: Denmark, 149%), and their total household spending-to-GDP ratio (min: Norway, 40%; max: United States, 69%). Furthermore, we observe a weak positive correlation between the household savings rates and the total household debt-to-GDP ratios ($\rho = .16$), a weak negative correlation between the total household debt-to-GDP and total spending-to-GDP ratios ($\rho = -.22$), and almost no correlation between household savings rates and the total spending-to-GDP ratio ($\rho = -.03$). This finding

FIGURE 1
Average Consumer Financial Decision Making Across Countries
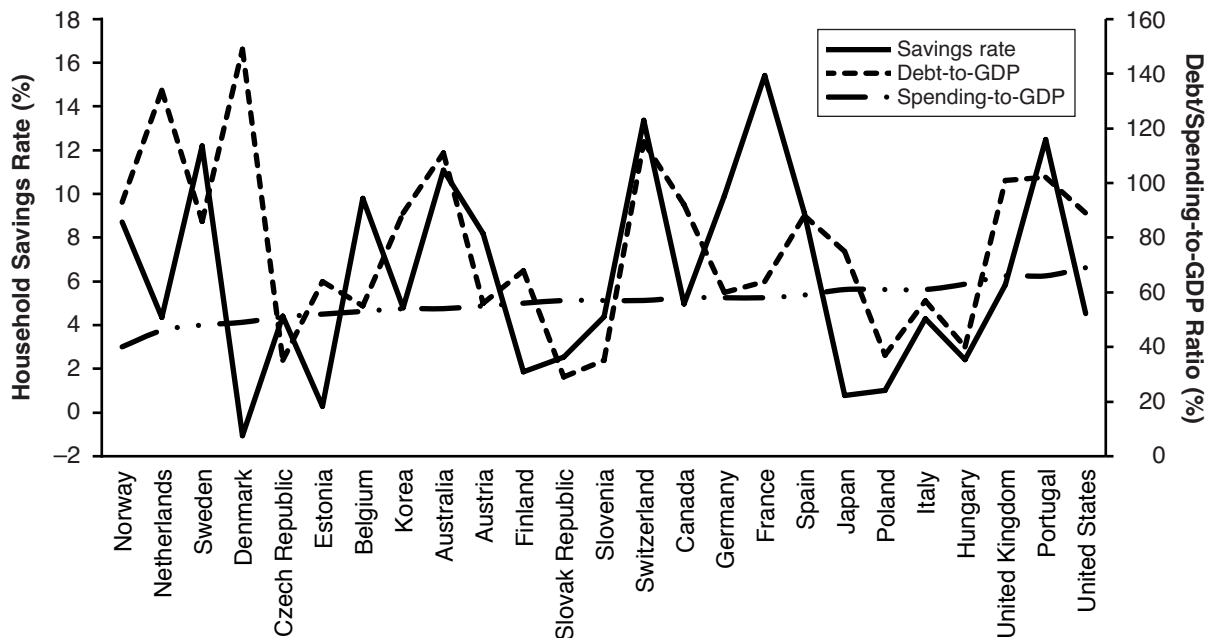
suggests significant variation across countries with regard to a given financial decision. However, it is not yet clear whether a systematic pattern to these differences can be detected across countries. Furthermore, it is important to understand whether firms can leverage any such systematic differences across consumers to successfully influence their financial decision making. Thus, we address two important research questions in this study. First, does a consumer's national culture explain the heterogeneity in his or her financial decision making? Second, does national culture moderate the link between a firm's marketing efforts and a consumer's financial decision making?

To answer these questions, we develop a theoretically grounded conceptual model that integrates a customer's[1] national culture into the exchange process in terms of both a direct impact on consumer financial decision making and a moderating impact on the link between marketing efforts and consumer financial decision making. Next, we develop hypotheses for the direct effect of national culture on a consumer's financial decision making using theories of cultural differences (Hofstede, Hofstede, and Minkov 2010). We also develop hypotheses with respect to the moderating impact of national culture on a customer's responsiveness to the marketing efforts of the firm using regulatory focus theory (RFT) (Avnet and Higgins 2006). Here, we evaluate the influence of two types of marketing message content (prevention- and promotion-focused marketing) and national culture on three consumer financial decision making behaviors: (1) savings rate, (2) use of credit, and (3) spending patterns. We measure promotion- and prevention-focused marketing efforts as expenditures incurred by a financial institution toward promoting asset (savings) and liability (spending) products, respectively, to its customers.

We test our conceptual model and hypotheses in a unique empirical setting: a financial services firm in the United Arab Emirates (UAE). In this setting, we observe stark differences in the national cultures of the customers of a firm that operates in a single country, which enables us to control for several exogenous factors such as macroeconomic conditions, regulatory environment, and competition. First, we find that a consumer's national culture has a direct impact on his or her financial decisions. With regard to our hypotheses, we find that customers from countries that are higher in long-term orientation (LTO) are more likely to have a higher savings rate, customers from countries that are higher in uncertainty avoidance (UAI) are less likely to use credit, and customers from countries that are higher in masculinity (MAS) are more likely to spend more relative to their income level. Second, we find that the impact of the firm's marketing efforts on its customers' financial decisions varies depending on the customers' countries of origin. Specifically, our results suggest that prevention-focused marketing efforts are more effective in increasing the savings rates of customers from countries that are higher in LTO. We also find that promotion-focused marketing efforts are more effective in increasing the use of

credit by customers from countries that are lower in UAI as well as in increasing the spending of customers from countries that are higher in MAS.

Our findings contribute to both marketing theory and practice. From a theory perspective, our study provides evidence of national culture's direct and moderating role in consumers' financial decision-making processes. From a practice perspective, our study provides evidence that firms can leverage consumers' national culture, thereby increasing the effectiveness of marketing efforts on consumer financial decision making.

Conceptual Model and Hypothesis Development

Traditionally, the firm–customer exchange process consists of interactions between firms and customers in which value is traded between the two through interactions of the firm's marketing efforts and the customer's behavior (Gupta and Zeithaml 2006). In this study, we focus on consumer financial decisions involving a core set of consumer behaviors that directly affect consumers' short- and long-term financial situations. A 2011 special issue of the *Journal of Marketing Research* focuses on consumer financial decision making and outlines a set of core financial decisions that consumers make, including saving, debt repayment and use of credit, spending patterns, emotional and "irrational" influences on investing, and the role of financial advisers (Lynch 2011). For our study, we chose to focus on three of the five core consumer financial decisions, specifically (1) savings rate, (2) use of credit, and (3) spending patterns. This core set of behaviors related to a consumer's financial decision making constitute a basic financial equation that involves generating financial resources and allocating them wisely to various priorities (Katona 1974). Each of these decisions has received considerable attention in the marketing, economics, and psychology disciplines. In Figure 2, we provide a graphical representation of our conceptual framework.

We expect that consumers' financial decisions are influenced not only by individual past interactions and experiences but also by the norms and beliefs of the cultural environment in which they are raised (Triandis 1989). Thus, we expect that after controlling for individual differences between consumers, group differences between consumers (e.g., national culture) will also have a direct impact on consumer financial decisions. Consumers from certain national cultures may be more prone to make certain financial decisions such as having a higher savings rate, relying more on credit for making purchases, or having a distinct spending pattern. Specifically, we are interested in understanding the direct effect of three of Hofstede's (2001) six cultural dimensions (LTO,[2] UAI, and MAS) on three consumer financial decisions (savings rate, use of credit, and spending patterns). Drawing from previous research, we

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[1]Hereinafter, we use the term "customer" to refer to a customer of a firm who is a consumer of banking services and makes financial decisions.

[2]Long-term orientation is also known as the pragmatic versus normative dimension. We use the term "LTO" because this is the terminology used in prior literature. We also note that none of the LTO scores for the countries in our sample differ from the new pragmatic versus normative scores.

FIGURE 2
Conceptual Model
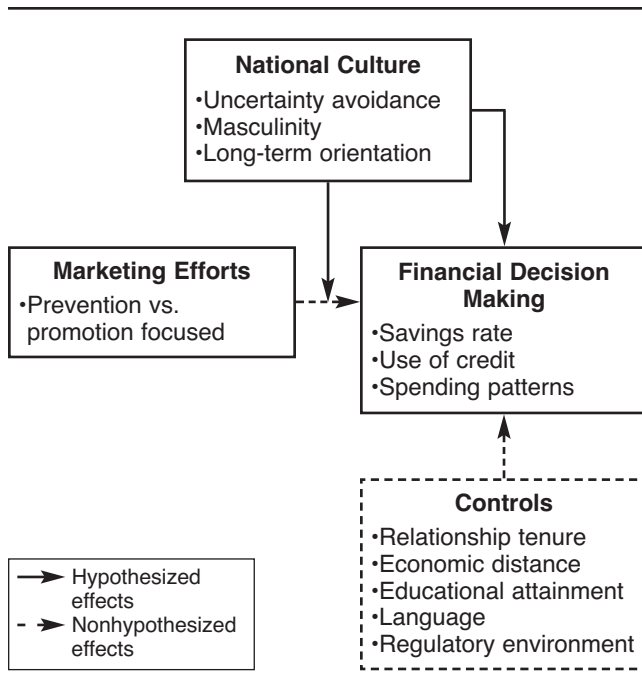
map each of the aforementioned three cultural dimensions to an applicable consumer financial decision. In this case, we investigate the impacts of LTO on savings rates, UAI on use of credit, and MAS on spending patterns.

Furthermore, we also expect national culture to have an indirect impact on consumer financial decision making by moderating the influence of the firm's marketing efforts on consumers' financial decisions. When communicating with customers, firms must decide on an appropriate communication strategy to evoke desirable customer behavior. We expect that how a firm communicates with a customer regarding the content of the communication is likely to play a key role in how the customer responds to the firm's marketing efforts. Specifically, we examine the role of two types of marketing message content: content that promotes asset products versus content that promotes liability products.

We draw on RFT to better understand the role of culture and marketing efforts on consumers' financial decisions. This theory posits that people can be classified according to their regulatory orientation: prevention focused versus promotion focused (Avnet and Higgins 2006). Customers with a more prevention-focused regulatory orientation concentrate on safety, security, and responsibility, whereas those with a more promotion-focused orientation emphasize hope, advancement, and achievement. Moreover, RFT postulates that people are more likely to make choices that are consistent with the alignment of their regulatory orientation. When such choices sustain their regulatory orientation, people experience harmonious "it feels just right" thoughts, leading them to continue to pursue their goal.

We argue that because culture is ingrained in peoples' subconscious from their formative years, it has significant impact on guiding their regulatory orientations. Thus, we expect that customers from countries with high (vs. low)

LTO, high (vs. low) UAI, and low (vs. high) MAS are more likely to have a higher prevention-focused (vs. promotion-focused) regulatory orientation. In line with RFT, we expect that customers with a higher prevention (vs. promotion) focus have a higher savings rate (vs. higher credit usage and spending).

In the context of marketing communications, Aaker and Lee (2006) argue that framing a message on the basis of an outcome that is consistent with a person's regulatory orientation can help achieve a desirable behavior. Specifically, they suggest that "prompting promotion-focused people to think about gains and non-gains (versus losses and non-losses) and prompting prevention-focused people to think about losses and non-losses (versus gains and non-gains) should bring about the 'just-right feeling'" (p. 16). Similarly, Zhao and Pechmann (2007) demonstrate that messages framed with a prevention (promotion) focus when targeted toward adolescents with a prevention (promotion) focus are most effective at persuading them to quit smoking. Ramanathan and Dhar (2010) also show that sales promotions framed as gains (vs. nonlosses) appeal to promotion-focused (vs. prevention-focused) customers, thus leading to larger basket size.

Marketing content that promotes asset or savings (vs. liability or spending) products is framed to evoke consumers' prevention-focused (vs. promotion-focused) regulatory orientation. Thus, we refer to these two types of marketing efforts as prevention- and promotion-focused marketing efforts. Again consistent with RFT, we expect prevention-focused (promotion-focused) marketing efforts targeted at customers with higher prevention-focused (promotion-focused) regulatory orientations to evoke behavior that is consistent with their regulatory orientation. From this RFT-based theoretical framework, we offer several empirically testable hypotheses related to the moderating impact of a customer's national culture on his responsiveness to the firm's marketing efforts.

LTO and Savings Rates

Consumers desire a smooth pattern of consumption over their entire life cycle. To reduce the risk of not having enough financial resources in the future, consumers need to set aside money (i.e., savings) that may be needed in the future. A customer's savings rate has becoming increasingly important because many firms across the world are changing from defined-benefit to defined-contribution retirement plans, and many governments are reducing (or, at least, not increasing) support for people after retirement. Here, we define "savings rate" as the increase in a customer's assets in a given time period relative to that customer's income. Hofstede identifies a key cultural dimension that can potentially influence a consumer's desire to save for the future: LTO.

Long-term orientation represents the fostering of virtues that are oriented toward future rewards (Hofstede, Hofstede, and Minkov 2010). Customers from cultures that rate highly on LTO are more forward-looking than customers from cultures that do not rate highly on LTO. In addition, customers from cultures that rate highly on LTO are willing to postpone rewards and gratification today (i.e., short-term

sacrifice) on the conviction that the future will benefit from this thrift and perseverance (i.e., long-term gain). This thrift leads to the desire for savings and the desire to have the availability of capital for reinvestment by oneself or one's relatives (Hofstede, Hofstede, and Minkov 2010). Thus, we hypothesize the following:

> H_{1a}: Customers from countries with higher LTO are likely to have a higher savings rate than customers from countries with lower LTO.

We are also interested in the degree to which these consumers might be more (or less) responsive to a firm's marketing efforts. Kees, Burton, and Tangari (2010) show that the relationship between an advertisement's message development (e.g., prevention focused vs. promotion focused) and a customer's behavioral intentions is moderated by his or her temporal orientation. In line with RFT, we anticipate that customers from cultures with high LTO will be more responsive to marketing efforts that emphasize products relating to long-term relationships and delayed gratification (prevention focused) than marketing efforts that promote more short-term relationships and instant gratification (promotion focused). Because prevention-focused marketing efforts map with the regulatory orientation of customers from countries with high LTO, we expect these marketing efforts to encourage higher savings rates among these customers. Thus, we hypothesize the following:

> H_{1b}: A customer's likelihood of responding to prevention-focused marketing efforts by increasing his or her savings rate is enhanced when that customer comes from a country with higher (vs. lower) LTO.

UAI and Use of Credit

When consumers want to make purchases and for any reason want to delay payment, they require the use of credit. Here, we define use of credit as the increase in a customer's liabilities in a given time period relative to her income. This use of credit is a type of liability that a consumer incurs when purchasing a good or service in lieu of a cash payment. Common types of credit consumers use include, but are not limited to, credit cards and loans (e.g., personal, auto, mortgage). Hofstede identifies a key cultural dimension that can be related to a consumer's desire to use credit: UAI.

Uncertainty avoidance represents the degree to which people in a group feel threatened by risk or uncertainty, and it therefore denotes their risk tolerance threshold. The higher the culture's UAI, the greater its people's risk averseness. Conversely, the lower the culture's UAI, the greater its people's willingness to accept risks and uncertainty. People from countries with higher UAI feel less comfortable facing decisions that present larger degrees of uncertainty, whereas people from countries with lower UAI tend to feel less anxiety toward uncertain situations (Hofstede, Hofstede, and Minkov 2010). In financial situations, people from countries with higher UAI are more likely to take fewer risks (De Mooij and Hofstede 2002), leading to a lower likelihood that they will leverage debt to make purchases. Thus,

> H_{2a}: Customers from countries with lower UAI are more likely to use credit than customers from countries with higher UAI.

Furthermore, we are interested in identifying the degree to which consumers also might be more (or less) responsive to firm marketing efforts that are guided toward increasing consumers' use of credit. Hofstede (2001) argues that people from cultures high in UAI tend to respond better to marketing content with a prevention focus because their cultures have a greater emphasis on security and cautiousness. Customers that originate from these high-UAI countries are also less likely to engage in behaviors with firms that are considered risk taking or uncertain. Instead, research has shown that customers who rate higher on UAI are more likely to purchase products that provide them with a greater sense of comfort and security (i.e., prevention-focused products) (Rank, Pace, and Frese 2004). This stream of research suggests that a prevention focus is synonymous with risk-averse behavior (i.e., avoiding pain), whereas a promotion focus is consistent with risk-seeking behavior (i.e., seeking gain). High-UAI cultures are associated with a greater prevention focus, and low-UAI cultures are associated with a greater promotion focus. Thus, promotion-focused marketing targeted toward people from low-UAI countries will match their regulatory orientation, leading to a better fit and higher responsiveness. Thus, we posit the following:

> H_{2b}: A customer's likelihood of responding to promotion-focused marketing efforts aimed at increasing his or her use of credit is enhanced when that customer comes from a country with lower (vs. higher) UAI.

MAS and Spending Patterns

In a given time period, consumers may make purchases to fulfill their needs and wants. The money to make these purchases can come from one of three main sources: income from employment, increasing use of credit, or drawing down on assets. We would expect that in an ideal situation, a customer would like to live within her means—that is, be able to make purchases without increasing her use of credit or drawing down on her assets. However, we observe that in many cases, consumers overextend in their spending patterns, leading to either an increased use of credit or a decrease in assets relative to their level of income. Here, we define spending pattern as the outflow of money from a customer in a given time period relative to her income. In this case, consumers with spending patterns greater than 1 would be spending more in a given month relative to their income level by taking out additional liabilities and/or drawing down on assets. In contrast, consumers with a spending pattern less than 1 would be using some of their income to pay down debts and/or increase assets. Hofstede identifies a key cultural dimension that can be related to a consumer's spending patterns: MAS.

Masculinity represents the degree to which a national culture is assertive and aspirational. Countries that are high in MAS emphasize success, goals, aspirations, wealth, and greater material good (Hofstede, Hofstede, and Minkov 2010). Consumers in countries with higher MAS show the

desire to own products that are more expensive and more closely tied to higher degrees of social status (De Mooij and Hofstede 2002), even when the general wealth of the country is not high. We expect that regardless of his level of wealth, a consumer from a culture that is higher in MAS would be more inclined to have a spending pattern that overextends the normal levels of his monthly income by using credit or drawing down on assets to make purchases. Formally,

> H_{3a}: Customers from countries with higher MAS are more likely to overextend in their spending pattern than customers from countries with lower MAS.

We are also interested in the degree to which these consumers are more (or less) responsive to marketing efforts that are aimed at increasing the degree to which consumers overextend themselves to make purchases. Previous research has shown that cultures with higher MAS are often drawn to promotion-focused initiatives (Hofstede 2001; Holt and Thompson 2004). Customers from cultures that rate highly on MAS have a greater desire to acquire possessions (i.e., be materialistic) because possessions can act as status symbols (Belk 1985), and these customers are also likely to respond to promotion-focused marketing content. Thus, promotion-focused marketing efforts targeted at customers from high-MAS countries are likely to sustain their regulatory orientation, thus further encouraging them to spend more. Therefore,

> H_{3b}: A customer's likelihood of responding to promotion-focused marketing efforts by overextending his or her spending pattern is enhanced when that customer comes from a country with higher (vs. lower) MAS.

Empirical Application

Research Context

Identifying an empirical setup that can address our research questions presents unique challenges. Although we need relevant data from several countries to accurately test the moderating impact of cultural characteristics, such a data set could suffer from severe limitations, including heterogeneity in macroeconomic factors, a varying degree of competition, and differences in the quality of marketing efforts, among other factors. All of these issues could threaten the validity of our results. To reduce these potential limitations, we chose a sample of customers from a single firm who originated from different countries. We sourced this sample from the database of a large multinational bank that has been operating in the UAE for more than 25 years. In addition to each customer's country of origin, the bank maintains detailed time-series information on (1) the marketing efforts targeted toward each customer, (2) all customer and exchange characteristics, and (3) the profits earned (or losses incurred) from each customer. The data consist of monthly observations for each customer from April 2004 to March 2007 (36 months). The monthly level of aggregation is consistent with business-to-customer banking operations, in which monthly statements are issued to customers for banking products such as credit cards, mortgages, loans, and current accounts. This is consistent with the banking practices followed in the UAE for two key reasons. First, according to Article 54 of the law that governs UAE banking operations, each bank in the UAE must provide its customers with a monthly statement (Union Law No. 10 of 1980 Concerning the Central Bank, the Monetary System and Organization of Banking 1980). Second, the bank sets up quotas for its managers on a monthly basis; in other words, managers' decisions directly affect monthly customer behavior.

The UAE provides an excellent empirical context to answer our key research questions because (1) in 2006 (the median year in our data window), 83.02% of the people residing in the nation were expatriates (United Arab Emirates National Bureau of Statistics 2010); (2) the residing expatriates represented more than 100 nationalities with significantly varied national cultures; (3) the average length of stay for expatriates is not long enough to deeply alter their original cultural characteristics (Grant 2008); (4) the country does not grant citizenship to its immigrants; (5) a significant proportion of temporary workers migrate without their families; and (7) the expatriate phenomenon is relatively recent to the UAE (only 25–30 years in the making).

The combination of these factors creates a multicultural society with little or no cultural integration. Anecdotal evidence in the business press has also alluded to the "salad bowl" nature of multiculturalism in the UAE. HSBC Bank International's annual expatriate survey (Shaheen 2009) records that "only 39 per cent of expatriates in the UAE reported making friends with locals, as opposed to an average of 76 per cent in other countries. The country ranked 23 out of 26 in the number of expatriates who joined local community groups." Similarly, a *Forbes* study indicates that "72 percent [of immigrants] admit to knowing very little about their host country" (Ferris-Lay 2012). Such a quasiexperimental setting enables us to isolate the impact of culture while controlling for alternate explanations such as heterogeneity in (1) the quality of efforts across competing firms, (2) the efficiency of channels of communication across nations, (3) the extent of competition in a given industry across nations, and (4) the macroeconomic conditions and legal regulations across nations.

Furthermore, Inglehart and Baker (2000) discuss the results from several waves of the World Value Survey to understand the cultural changes and persistence of traditional values in a society. They find that despite several decades of modernization and economic progress, the differences in values within a society are much smaller than cross-national differences. Similarly, Becker (1996) argues that because people have more control over social capital than their culture, ethnicity, race, and so on, they are often "given" their culture.

Sampling

Inglehart and Baker's (2000) work suggests that education is one of the key mechanisms through which national culture is ingrained. Evidence from our data suggests that the immigrants in the UAE who hail from emerging markets tend to be less educated than their counterparts from developed markets. Thus, it is possible that the immigrants from emerging markets come from less socially advantaged households, whereas the immigrants from developed mar-

kets come from more socially advantaged households. In addition, the people who immigrate to the UAE may not be representative of the educational profile of their counterparts who decide to stay in their home country. Thus, to ensure that the national culture scores that we use are reflective of the immigrants in the UAE, we adopt a carefully designed sampling algorithm.

Consistent with Inglehart and Baker (2000), we use level of education as a proxy for a person's socioeconomic class. In our data, we classify customers' educational attainment into four ordinal levels: (1) limited/no education, (2) primary education, (3) secondary education, and (4) college/postgraduate/professional education. We use the Barro–Lee (2013) data set (which the World Bank uses extensively) to identify the proportion of the adult population (25 years of age and older) that has attained various levels of education in each country in our sample.[3] Because countries use different classification levels for the attainment of education, the data set uses a standardized classification developed by the UNESCO Institute of Statistics (2014) for mapping across nations. The International Standard Classification of Education was developed in 1997 and provides mapping for more than 100 nations. As an example, we provide the one-to-one mapping frameworks for India and China (based on the International Standard Classification of Education from 1997 and our data) in Web Appendix A. On comparing the countries in the Barro–Lee data set with the countries in our data set, we identify 34 unique countries that we can use for our sample. These 34 countries constitute 65.13% of the world population and 73.25% of the world economy (see Figure 3). Of the 34 countries in the sample, 20 are classified as emerging markets (World Bank 2014a). We take a

stratified random sample of the customers from each country with the country-specific proportions of education attainment at these four levels of education. Furthermore, we ensure that the sample size across these 34 countries is consistent (n = 100), thereby guaranteeing that differences in sample sizes across countries will not affect our results. Web Appendix B presents the data on educational attainment from the Barro–Lee data set and our stratified sample. Web Appendix C reports the scores on Hofstede's cultural dimensions (Hofstede, Hofstede, and Minkov 2010) and the classification of these countries on the "emerging" and "developed" dimensions. Our final sample consists of 3,400 respondents from 34 nations who were tracked over a period of 36 months.

Measures

Consumer financial decision making. We define a consumer's savings rate as the increase in a customer's assets in a given time period relative to her income. This can be computed as the change in assets divided by the income level of customer i at time t, or $(\Delta \text{Asset}_{i, t-1 \rightarrow t}/\text{Income}_{it})$. We define use of credit as the increase in a customer's liabilities in a given time period relative to her income. This can be computed as the change in liabilities divided by the income level of customer i at time t, or $(\Delta \text{Liability}_{i, t-1 \rightarrow t}/\text{Income}_{it})$. Finally, we define a consumer's spending pattern as the outflow of money from a customer in a given time period relative to her income. This can be computed as the sum of the income, growth in liabilities, and decline in assets of customer i at time t, or $[(\text{Income}_{it} + \Delta \text{Liability}_{i, t-1 \rightarrow t} - \Delta \text{Asset}_{i, t-1 \rightarrow t})/(\text{Income}_{it})]$. Note that spending pattern is a composite variable that can be algebraically derived from the other two dependent variables (i.e., spending pattern = 1 + use of credit – savings rate).

[3]See http://datatopics.worldbank.org/education/.

FIGURE 3
Countries Represented in the Sample
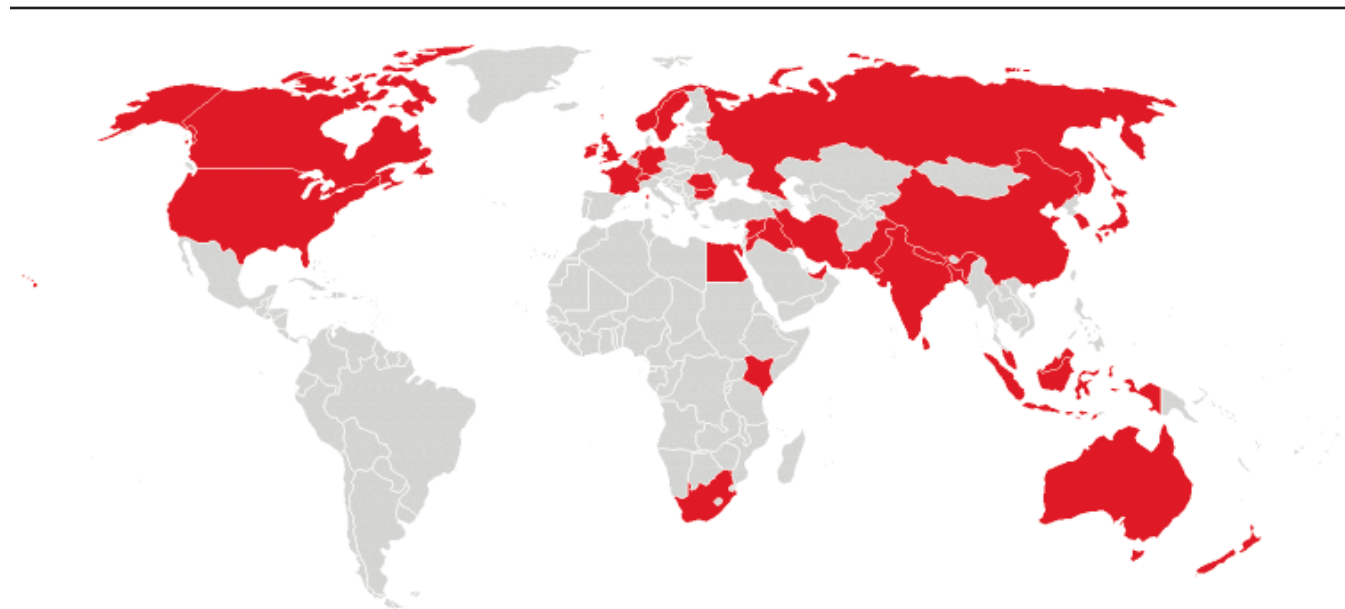
Notes: Total nominal GDP of sample nations = $51.42 trillion (73.25% of the world's economy). Total population of sample nations = 4.61 billion people (65.13% of the world's population).

As is common with data in the financial services context, a small population of customers creates a significant right skewness to the data in the sample. In cases when the data are distributed chi-square, it is common to use a cube root transformation of the variable to induce normality (Chen and Deo 2004). We found that by taking a cube root of the three consumer financial decision-making variables, we significantly reduced the skewness of the data. We report the distribution characteristics of the transformed as well as nontransformed variables in Web Appendix D. Shapiro–Wilk's W (Shapiro and Wilk 1965) is often used for evaluating the normality of a distribution. The closer the value of W to 1, the smaller the violation of normality assumption. We find that the range of Shapiro–Wilk's W for nontransformed and cube root–transformed variables is between .02 and.03 and .66 and .89, respectively, suggesting that the cube-root transformation helps in normalizing each of the three financial decision-making variables. We note that the parameter estimates we obtain cannot be transformed back to their original level for interpretation; thus, the size of the effect is difficult to interpret. However, the sign and significance level of the parameter estimate can be interpreted in the same way as the original variable. As part of a robustness analysis, we subsequently test our hypotheses using the middle 90% values (cutting 5% off each tail) of the nontransformed variables.

Marketing efforts. Self-regulation systems often guide consumer financial decisions. These systems can be divided into two types: prevention focused and promotion focused (Avnet and Higgins 2006). Prevention-focused decisions are guided by the desire to avoid financial losses, whereas promotion-focused decisions are guided by the desire to make gains (Zhou and Pham 2004). Thus, consumers with a prevention focus are likely to be interested in avoiding risks that can potentially lead to greater losses, such as taking out a loan when money is not readily available. In contrast, consumers with a promotion focus are likely to be interested in taking some financial risks that might lead to greater gains, such as taking out a loan to purchase an asset that might increase in value instead of merely saving the money in a low-interest savings account. As a result, many financial services firms make an effort to tailor marketing communications for different products to induce a customer's desire for avoiding losses or making gains. This same message framing is generalizable across most financial services firms. We provide a set of examples of marketing communications for asset and liability products from different financial services firms in Web Appendix E. In the case of the focal firm in this study, we find that the firm's marketing efforts toward inducing customers to adopt or increase use of asset products were framed to encourage them to avoid losses by saving or investing money (e.g., current account, savings account, deposit account, investment account, insurance account). In contrast, the firm's marketing efforts toward inducing customers to adopt or increase use of liability products were framed to encourage them to take advantage of opportunities (e.g., overdraft account, personal loan account, vehicle loan account, home loan account, credit card account). Thus, we define prevention-focused (promotion-focused) marketing efforts as the total expenditure incurred by the financial services firm in a given time period toward encouraging a customer to increase his or her asset (liability) accounts.

National culture. Hofstede, Hofstede, and Minkov (2010) provide the ratings of the three cultural dimensions used in this study: UAI, MAS, and LTO. Although Hofstede's original data collection on cultural dimensions of national culture (excluding LTO) took place more than 40 years ago, strong theoretical and empirical evidence indicates that the concepts that define the dimensions are still theoretically relevant and empirically similar to other approaches that use similar constructs (Soares, Farhangmehr, and Shoham 2007). We believe that this evidence provides significant justification for using Hofstede's dimensions of national culture.

Controls. In addition to the measures of customer financial decision making, marketing efforts, and national culture, we use several other categories of measures, including other country characteristics (i.e., language and regulatory environment) and customer characteristics (i.e., tenure, educational attainment, and economic distance). Table 1 provides a description of each of these variables and the customer behaviors.

Model Specification

Our conceptual model of the direct and moderating impact of cultural characteristics (CUL_j) of customer i from country j on the relationship between prevention- and promotion-focused marketing efforts ($PRVMKTG_{ijt}$ and $PRMMKTG_{ijt}$) directed toward customer i at time t and a given financial decision ($DESC_{ijt}$) involves variables at two hierarchal levels. The customers at Level 1 are nested within the country at Level 2. To test our hypotheses, we use the following hierarchical model specification:

Level 1: Across time by customer.

$$(1) \quad DESC_{ijt}^k = \alpha_{0j}^k + \alpha_{1j}^k PRVMKTG_{ijt} + \alpha_{2j}^k PRMMKTG_{ijt}$$

$$+ \alpha_{3j}^k TEN_{ijt} + \alpha_{4j}^k ECON_{ijt} + \alpha_{5j}^k EDU_{ijt} + \sum_{q=6}^{40} \alpha_{qj}^k TIME + \chi_i^k + \varepsilon_{it}^k,$$

where k corresponds to the three financial decisions of interest: savings rate (SAVING), use of credit (CREDIT), and spending pattern (SPEND).

Level 2: Across country.

$$(2) \quad \alpha_{0j}^k = \beta_{00} + \beta_{01}^k ENG_j + \beta_{02}^k ARB_j + \beta_{03}^k REG_{jt}$$

$$+ \sum_{\ell=4}^{6} \beta_{0\ell}^k CUL_j^\ell + \theta_j^k + u_{0j}^k;$$

$$(3) \quad \alpha_{1j}^k = \beta_{10}^k + \beta_{11}^{k;\ell} CUL_j^\ell + u_{1j}^k;$$

$$(4) \quad \alpha_{2j}^k = \beta_{20}^k + \beta_{21}^{k;\ell} CUL_j^\ell + u_{2j}^k;$$

$$(5) \quad \alpha_{rj}^k = \beta_{r0}^k + u_{rj}^k; \text{ and}$$

$$(6) \quad \alpha_{sj}^k = \beta_{s0}^k;$$

where ℓ = LTO, UAI, or MAS; r = 3–5; s = 6–40; and k = SAVING, CREDIT, or SPEND. In Level 1, we include

TABLE 1
Variable Operationalization

Construct	Variable	Operationalization
National Culture		
Uncertainty avoidance	UAI_j	UAI score for customer i of country j
Masculinity	MAS_j	MAS score for customer i of country j
Long-term orientation	LTO_j	LTO score for customer i of country j
Marketing Efforts		
Prevention focused	$PRVMKTG_{ijt}$	Marketing expenditures on asset products to customer i of country j in time t (asset products: current account, savings account, deposit account, investment account, and insurance account)
Promotion focused	$PRMMKTG_{ijt}$	Marketing expenditures on liability products to customer i of country j in time t (liability products: overdraft account, personal loan account, vehicle loan account, home loan account, and credit card account)
Financial Decisions		
Savings rate	$SAVING_{ijt}$	Cube root of the change in assets for customer i from time t − 1 to t divided by the income level of customer i in time t, or $(\Delta Asset_{it, t-1 \rightarrow t}/Income_{it})$
Use of credit	$CREDIT_{ijt}$	Cube root of the increase in liabilities for customer i from time t − 1 to t divided by the income level of customer i in time t, or $(\Delta Liability_{it, t-1 \rightarrow t}/Income_{it})$
Spending patterns	$SPEND_{ijt}$	Cube root of the sum of income of customer i in time t, growth in liabilities of customer i in time t, and the decline in assets of customer i in time t divided by the income of customer i in time t, or $[Income_{it} + \Delta Liability_{it,t} - \Delta Asset_{it})/(Income_{it})]$
Country-Level Control Variables		
Language	ENG_j ARB_j	Indicator variables for English and Arabic as official primary language of the country to which customer i belongs (Central Intelligence Agency 2013)
Regulatory	REG_{jt}	Corruption perception index of country at time t of customer i on a ten-point scale, where a higher score indicates less corruption (i.e., higher regulation) (Transparency International 2014)
Customer-Level Control Variables		
Educational attainment	EDU_{ij}	Educational attainment of customer i on a four-point ordinal scale used in the Barro–Lee (2013) data set, where a higher score indicates greater educational attainment (World Bank 2014b)
Economic distance	$ECON_{ijt}$	Difference in income (in thousands of USD) of customer i from that of the GDP per capita of the country of origin of the customer i for his or her educational attainment level in time t (data: World Bank 2014c)
Tenure	TEN_{ijt}	Months since customer i has been a customer with the bank in time t

three customer-specific controls: economic distance between the customer's income and the education-adjusted GDP per capita of his or her country of origin ($ECON_{ijt}$), length of tenure of the customer with the firm (TEN_{ijt}), and educational attainment level (EDU_{ij}). The terms χ_i^k and θ_j^k denote the customer- and country-specific unobserved time-invariant random effects, ε_{ijt}^k is the disturbance term, and α^k are the response parameters for a given behavior j. In Level 2, ℓ corresponds to three dimensions of Hofstede's scale: LTO, UAI, and MAS. Because the firm uses two languages in its business operations (English and Arabic), we include two dummy variables for the official language of customer i's country of origin (ENG_j and ARB_j). In addition to cultural characteristics and economic distance, the regulatory environment of a country may play a role in shaping both the firm's strategies and operations and consumers' financial decision making. Although the regulatory environment in the UAE is invariant across customers, it is plausible that customer i's financial decision making is shaped during her formative years by the regulatory environment of her country of origin. In line with this argument, we include the measure of regulatory environment (REG_{jt}) of customer i's country of origin.

Substituting Equations 2–6 in Equation 1 yields the following hierarchical linear model:

$$(7) \quad DESC_{ijt}^k = \beta_{00} + \beta_{01}^k ENG_j + \beta_{02}^k ARB_j + \beta_{03}^k REG_{jt}$$

$$+ \sum_{\ell=4}^{6} \beta_{0\ell}^k CUL_j^m + \beta_{10}^k PRVMKTG_{ijt}$$

$$+ \beta_{11}^{k,m} PRVMKTG_{ijt} \times CUL_j^m + \beta_{20}^k PRMMKTG_{ijt}$$

$$+ \beta_{21}^{k,m} PRMMKTG_{ijt} \times CUL_j^m + \beta_{30}^k TEN_{ijt}$$

$$+ \beta_{40}^k ECON_{ijt} + \beta_{50}^k ECON_{ijt} + \sum_{s=6}^{40} \beta_{s0}^k TIME$$

$$+ \chi_i^k + \theta_j^k + \psi_{ijt}^k,$$

where k = SAVING, CREDIT, and SPEND and m = LTO, UAI, and MAS. Here, ψ_{ijt}^k is a composite error term given by $\epsilon_{it}^k + u_{0j}^k + u_{1j}^k \times PRVMKTG_{ijt} + u_{2j}^k \times PRMMKTG_{ijt} + u_{3j}^k + u_{4j}^k + u_{5j}^k$. The statistical significance of the coefficients β_{04} to β_{06}, β_{11}, and β_{21} in each financial decision equation provides the empirical test for our hypotheses.

Accounting for Endogeneity of Marketing Efforts

The marketing efforts expended by a firm are endogenously determined by the firm's marketing team in line with past (and expected) customer behaviors; that is, customers with profitable behavior in the past are likely to be targeted in the future. We resolve this endogeneity using an instrumental variable approach. A good instrument in this context is one that influences the firm's decision to implement marketing efforts but not the customer's financial decision making. The level of marketing efforts a firm expends is dependent on the planned marketing budget for prevention- and promotion-focused efforts ($PRVBUD_t$ and $PRMBUD_t$), and the expected profitability [$E(PRFT_{ijt})$] of that customer in time period t.

The annual budgeting exercise undertaken by marketing managers takes a top-down approach in which an aggregate marketing budget is determined on the basis of several criteria, such as availability of resources, competitive scenario, state dependence, and plans for launch of new initiatives. The firm then allocates this aggregate budget to different product categories and different customers. Here, we observe the total budget allocated by the firm on prevention- and promotion-focused efforts ($PRVBUD_t$ and $PRMBUD_t$) in each month in the data window. Then, given the budget, the manager must decide how to allocate the resources to each customer in each time period. We expect that changes in the firm's budget will greatly affect the amount of resources each customer receives but that changes in total budget should not affect an individual customer's financial decision making, thus making it an appropriate instrument.

The firm also uses past profits as a proxy for future expected profits such that $E(PRFT_{ijt}) = f(PRFT_{ijt-1})$. Here, the profit the financial services firm obtains from each customer is a function of a customer's total assets, total liabilities, and fees paid to the financial services firm for various services at a given time, which makes a customer's past profit very weakly correlated with a customer's current financial decision making for two reasons. First, we are measuring flow variables (period over period amount), rather than stock variables (cumulative amount), to represent a consumer's financial decision making. Second, we are dividing each dependent variable by each customer's income level to make highly profitable and unprofitable customers with similar financial decisions look the same. Thus, we expect that the firm is more likely to increase marketing efforts to customers with higher expected profitability. However, we do not expect a customer to change his financial decision-making behavior on the basis of how profitable (or unprofitable) he was with the firm in the last time period, making it a good instrument.

The marketing efforts variable in Equation 7 also interacts with the culture variable, creating four endogenous variables for each financial decision outcome (Wooldridge 2010). Because cultural dimensions are exogenous variables in the system, we generate additional instruments by observing three instruments ($PRVBUD_t$, $PRMBUD_t$, and $PRFT_{ijt-1}$) in the context of the respective cultural dimension. We specify our first-stage regression equation as follows:

$$(8) \quad ENDO_{ijt} = \gamma_0 + \gamma_1 TEN_{ijt} + \gamma_2 ECON_{ijt} + \gamma_3 EDU_{ij}$$
$$+ \gamma_4 ENG_i + \gamma_5 ARB_i + \gamma_6 REG_{jt}$$
$$+ \sum_{n=7}^{9} \gamma_n CUL_j^m + \gamma_{10} PRVBUD_t$$
$$+ \gamma_{11} PRMBUD_t + \gamma_{12} PRFT_{ijt-1}$$
$$+ \sum_{n=13}^{15} \gamma_n PRVBUD_t \times CUL_j^m$$
$$+ \sum_{n=16}^{18} \gamma_n PRMBUD_t \times CUL_j^m$$
$$+ \sum_{n=19}^{21} \gamma_n PRFT_{ijt-1} \times CUL_j^m + \xi_{ijt}^{PRVMKTG},$$

where ξ_{it} are disturbance terms; γ are response parameters; ENDO = PRVMKTG, PRMMKTG, PRVMKTG × CUL^m, PRMMKTG × CUL^m; and m = LTO, UAI, and MAS. To resolve the endogeneity, we substitute the predicted values from this equation in Equation 7.

Estimation and Inference

In our model, customers are nested within countries, which provides a hierarchical model structure. Thus, estimating parameters of Equation 7 by using an ordinary least squares regression would lead to biased estimates and standard errors that are too small (Aitkin, Anderson, and Hinde 1981; Hofmann and Gavin 1998). This hierarchical linear model draws on the variation in the culture scores from each country, thereby permitting us to test the moderating impact of national culture on the effectiveness of marketing efforts as an individual-level effect. Consistent with previous studies in marketing (Steenkamp and Geyskens 2006; Steenkamp, Hofstede, and Wedel 1999) and management (Hofmann and Gavin 1998), we mean-center the Level 1 variables within each country and grand-mean-center the Level 2 variables. Moreover, because some variables have variations over time, we perform group- and grand-mean-centering for each time period (i.e., month). We use an iterative maximum likelihood estimation, which permits a simultaneous estimation of relationships at multiple levels. We use the procedure XTMIXED in STATA 12.1 for estimation. We perform single-equation estimation for each of the three versions of Equation 7, corresponding to each consumer financial decision.[4] We correct the standard errors of the instrumented variables generated by the aforementioned estimation procedure because the estimates of variance are

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[4]Because each equation has exactly the same set of parameters, seemingly unrelated regression is not more efficient that single equation estimation. However, as a robustness check, we account for the error correlation between the three equations when the independent regressors in the set are different.

based on predicted values of these variables and not their true observed values. For further details, see Web Appendix F.

Results

First-Stage Regression

We present the results of the first-stage regression in Table 2. We perform two types of tests to evaluate the quality of our instruments. First, we evaluate the strength of the instruments. The first column ("Exog.") contains the results of the model with only exogenous variables—that is, tenure, economic distance, education, language dummies (ENG and ARB), regulatory environment, and cultural characteristics. The second column ("Full") contains the results of the model with the instruments along with the included exogenous variables. A comparison of Akaike information criteria (AICs), F-statistics, and R^2 values across the two models in each case suggests that including the instruments in the first-stage regression improves the fit substantially. For example, the AIC associated with the "Exog." model (859,109) for prevention-focused marketing (PRVMKTG) is greater than the AIC associated with the "Full" model (857,506).[5] Similarly, the F-statistics and R^2 of the "Full" model for PRVMKTG variable are superior to those of the "Exog." model. In addition, Staiger and Stock (1994) suggest that the bias introduced by the weak instruments is of the order of the inverse of the F-statistic from the first-stage regression. Stock and Watson (2003) suggest that an F-statistic greater than 10 is acceptable because it corresponds to a bias of less than 10% in the estimates. Staiger and Stock's test for the first-stage regression in our data does not indicate the presence of poor instruments. The lowest F-statistic for a "Full" model in Table 2 is 15.23. Thus, any weak instrument introduces, at worst, a less than 6.5% bias. These tests suggest that the instruments are not weak.

Second, we test for the exogeneity of instruments by (1) evaluating correlation between instruments and outcome variables and (2) conducting the Sargan–Hansen test. The correlations between $PRVBUD_t$ ($PRMBUD_t$) and the three dependent variables ($SAVING_{ijt}$, $CREDIT_{ijt}$, and $SPEND_{ijt}$) are small: $-.0012$ ($-.0007$), $.0092$ ($.0015$), and $.0056$ ($.0014$). Similarly, the correlations between $PRFT_{ijt-1}$ and the three dependent variables ($SAVING_{ijt}$, $CREDIT_{ijt}$, and $SPEND_{ijt}$) are also small: $-.1018$, $-.0039$, and $.0865$. The Sargan statistics for three versions of Equation 7 (i.e., one for each financial decision variable) are 3.38 ($p = .49$), 3.12 ($p = .54$), and 2.93 ($p = .57$), respectively.[6] The null hypothesis for the Sargan–Hansen test is that instruments are uncorrelated with the error term in Equation 7. We fail to reject the null hypothesis in each case. These results suggest that our instruments are valid and exogenous.

Summary Statistics and Model Fit

We present the summary statistics of and the correlation between the key variables in our data in Table 3. The sum-mary statistics suggest a significant variation in the variables of interest. We compare several nested model structures to understand the marginal impact of different variables. We report the AIC associated with these nested models in Table 4. For each of the three financial decisions, we find that adding main and interaction effects improves the models' fit, which suggests that cultural variables not only help explain variation in customer behavior but also explain the heterogeneity in marketing responsiveness.

Hypothesis Test

In the interest of conserving space, we only report the results of the full model of financial decision making in Table 5. For ease of exposition, we present the interaction effect between national culture and the firm's marketing efforts in Figure 4. Consistent with previous research (see Kalaignanam, Kushwaha, and Eilert 2013), we plot the impact of a 1 SD change in a managerially relevant variable on an outcome variable for different values of the moderating variable. Specifically, we plot the impact of a 1 SD change in prevention- and promotion-focused marketing efforts ($\mu^{MKTG} \pm 1 SD^{MKTG}$) on a given financial decision for high ($\mu^{CUL} + 1 SD^{CUL}$) and low ($\mu^{CUL} - 1 SD^{CUL}$) levels of a given cultural dimension.

Savings Rate

The results suggest that prevention-focused marketing ($.00420$, $p < .01$) has a much stronger impact on the savings rate than promotion-focused marketing ($.00026$, $p < .05$). We expected this finding because prevention-focused marketing efforts are measured as spending on promoting asset and savings products. However, we note that promotion-focused marketing efforts are also likely to increase savings rate. This finding may have occurred because promotion-focused marketing efforts, while intended to promote liability and spending products, may influence the savings rate because of a "mere salience" effect by which the financial institution's brand name is brought to salience in the customer's mind. This finding may also be due to an operational requirement that customers maintain certain minimum balances in accounts to obtain revolving credit. We also find that LTO has a direct and positive impact on the savings rate ($.00256$, $p < .01$), which suggests that customers from high-LTO cultures (e.g., China, Germany, South Korea) are more likely to have a higher savings rate than those from low-LTO cultures (e.g., Canada, the United States). Thus, we find support for H_{1a}.

The statistical significance of the interaction coefficients between LTO and prevention-focused marketing ($.00027$, $p < .01$) and LTO and promotion-focused marketing ($.00004$, $p < .01$) suggests that LTO moderates the relationship between marketing efforts and a customer's savings rate. Specifically, we find that a 1 SD increase in prevention-focused marketing efforts increases the savings rate of a customer from a high-LTO culture to a greater extent than that of a customer from a low-LTO culture (diff = .85, $p < .01$). We also find that a 1 SD increase in promotion-focused marketing efforts increases the savings rate of a customer from a high-LTO culture to a greater extent than that of a customer from a low-LTO culture (diff = .24, $p < .01$). However, the

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[5]Lower AIC indicates better fit.

[6]Because the system has 12 instruments and 8 endogenous variables, the p-value of the chi-square statistics is at 4 d.f.

TABLE 2
Results from First-Stage Regressions

	$PRVMKTG_{ijt}$ Exog.	Full	$PRMMKTG_{ijt}$ Exog.	Full	$PRVMKTG_{ijt} \times LTO_j$ Exog.	Full	$PRMMKTG_{ijt} \times LTO_j$ Exog.	Full	$PRVMKTG_{ijt} \times UAI$ Exog.	Full	$PRMMKTG_{ijt} \times UAI_j$ Exog.	Full	$PRVMKTG_{ijt} \times MAS_j$ Exog.	Full	$PRMMKTG_{ijt} \times MAS_j$ Exog.	Full
Exogenous Variables																
Intercept	.909	−70.945	24.618***	−180.609	−1,116.965	5,937.900	622.766	−6,427.149	−1,232.531***	6,773.591	445.941	−3,364.730	−1,387.058	5,520.585	611.086	−3,051.228
$TENURE_{ijt}$	.112***	.140***	.160***	.166***	6.003***	7.125***	7.279***	7.523***	6.599***	7.833***	8.927***	9.266***	5.301***	6.543***	8.010***	8.339***
$ECON_{ijt}$	.000***	.000***	.000	.000	.003***	.002***	.001	.000	.003***	.002***	.001	.001	.002***	.002***	.001	.001
EDU_{ij}	2.011**	−.010	.421	−.234	115.842**	26.453	27.986	−.057	128.542*	48.006	64.149	30.350	122.346*	34.210	−67.709	−103.499
ENG_i	10.154***	8.316***	17.336***	16.768***	229.853	187.562	833.722***	817.328***	404.098***	359.447***	701.043***	679.326***	549.779***	424.861***	1,156.424***	1,119.747***
ARB_i	.898	.614	−1.662	−1.853	110.752	101.064	84.278	74.371	−14.544	−51.025	−248.941	−255.930	84.378	67.229	−95.754	−102.853
REG_{ijt}	2.685***	2.344***	.060	.019	191.144***	170.528***	9.000	6.053	166.879***	150.094***	−27.844	−30.389	128.982***	119.181***	−31.577	−33.645
LTO_j	.084*	−1.082	−.041	.239	22.018***	−201.707***	11.907***	−63.588	5.985*	−72.768*	−4.849	24.790	7.398***	−72.220*	−2.992	24.333
UAI_j	.101**	1.389*	.039	.977	5.115*	53.232	2.166	60.406	23.808***	−80.628*	19.674***	−47.143	6.258**	62.072	3.751	26.921
MAS_j	.076	−1.931**	−.122	.632	10.403***	−126.766**	−10.096*	45.054	8.649***	−124.929***	−7.071	10.939	27.060***	−263.902***	8.432	−68.621
Instrumental Variables																
$PROFIT_{ijt-1}$		.083***		.011***		3.675***		.447***		2.535***		.626***		3.338***		.809***
$PRVBUD_t$		1.026*		−28.411*		1,174.495*		−1,260.468*		1,085.661***		−746.083		909.798*		−560.863
$PRMBUD_t$		−2.550		42.414***		−612.555		1,739.337***		−482.691		999.541**		−369.916		801.473**
$PROFIT_{ijt-1} \times LTO_j$		.000***		.000		−.001		−.002		−.008***		−.003		−.014***		−.004
$PROFIT_{ijt-1} \times UAI_j$		−.001***		.000		−.025***		−.003		−.007*		−.003		−.034***		−.007
$PROFIT_{ijt-1} \times MAS_j$		.000***		.000		−.028***		−.001		−.021***		−.002		.002		−.001
$PRVBUD_t \times LTO_j$		.147*		−.010		24.873***		−4.470		9.705**		2.188		11.086*		−.765
$PRVBUD_t \times UAI_j$		−.148*		.359**		−6.421		17.367**		7.848		2.809		−6.850		19.982
$PRVBUD_t \times MAS_j$		.290***		−.099		21.350***		−2.741		18.669***		−2.859		30.962***		−24.629*
$PRMBUD_t \times LTO_j$		−.059		−.008		−9.069**		9.748		−3.946		−4.156		−5.095		−1.041
$PRMBUD_t \times UAI_j$		.071		−.421***		3.561		−21.249***		−.406		1.930		3.605		−21.332*
$PRMBUD_t \times MAS_j$		−.139		.046		−11.018**		−1.080		−8.784*		1.650		−10.547*		29.878***
Model Fit																
F-statistic	18.00	28.37	5.76	16.72	27.50	30.37	7.84	16.46	23.47	27.43	6.90	15.23	30.73	31.38	8.28	16.32
AIC	859,109	857,506	941,327	941,289	1,378,253	1,377,972	1,431,186	1,431,144	1,382,355	1,382,130	1,447,879	1,447,853	1,376,160	1,375,823	1,455,012	1,454,976
R-square	.22%	1.08%	.07%	1.18%	.37%	1.05%	.09%	1.17%	.34%	1.73%	.07%	.96%	.39%	.95%	.10%	1.20%

*$p < .10$.
**$p < .05$.
***$p < .01$.
Notes: Exog. = includes exogenous variables only; Full = includes exogenous variables and instrumental variables.

TABLE 3
Summary Statistics and Correlation Between Variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. $SAVING_{ijt}$	.03	.99													
2. $CREDIT_{ijt}$	−.06	.74	.01												
3. $SPEND_{ijt}$	.78	1.09	−.23	.22											
4. $PRVMKTG_{ijt}$	31.61	57.54	.08	−.01	−.09										
5. $PRMMKTG_{ijt}$	35.10	63.04	−.01	.03	.04	.04									
6. UAI_{ij}	57.36	20.12	.08	−.08	−.02	.00	−.01								
7. MAS_{ij}	49.99	17.45	.01	.03	.07	.01	.00	.05							
8. LTO_{ij}	49.88	23.35	.09	−.00	.00	.01	.00	.24	−.10						
9. TEN_{ijt}	46.24	45.96	.01	.01	−.05	−.03	−.02	.06	.00	−.11					
10. $ECON_{ijt}$	28,198.70	97,123.84	.00	.00	−.01	.02	.01	−.02	−.01	.02	−.01				
11. EDU_{ij}	2.51	.96	.01	.09	−.03	.02	.01	−.01	.01	.07	−.20	.09			
12. ENG_{ij}	.22	.42	.00	−.06	.01	.02	.02	−.46	.30	−.30	−.11	.02	.27		
13. ARB_{ij}	.15	.36	.00	.07	−.01	−.01	−.01	.22	.01	−.42	.15	−.04	−.17	−.22	
14. REG_{ijt}	5.18	2.67	.02	−.03	−.01	.04	.01	−.27	.08	.09	−.14	.02	.39	.57	−.19

Notes: The correlations are based on both cross-sectional and time-series variation.

TABLE 4
Model Comparison

AIC	Savings Rate	Use of Credit	Spending Pattern
Controls only	160,944	477,234	700,102
Controls + main effects	160,898	477,220	700,096
Full model	160,892	477,211	700,091

difference between the effectiveness of prevention- and promotion-focused marketing efforts is significant (diff-in-diff = .61, $p < .05$). Thus, we find support for H_{1b}. Overall, the results suggest that promotion-focused marketing efforts in general are more effective at increasing a customer's savings rate but are most effective when targeted toward customers from high- (vs. low-) LTO cultures.

Use of Credit

The results suggest that promotion-focused marketing efforts have a positive and significant effect (.01257, $p < .01$) on promoting the use of credit among customers, whereas prevention-focused marketing has a negative impact (–.00469, $p < .01$). We expected this result because promotion-focused marketing efforts are aimed at promoting products that increase a customer's liability, whereas prevention-focused products are tailored toward enhancing asset accumulation. The main effect of UAI on the use of credit is negative and significant (–.00078, $p < .01$), suggesting that people from high-UAI cultures (e.g., UAE, France, Japan, Russia) are likely to avoid the use of credit, whereas those from low-UAI cultures (e.g., Ireland, India, Sweden, Singapore) are more likely to use credit. Thus, we find support for H_{2a}.

The statistical significance of the interaction coefficients (promotion: –.00013, $p < .01$; prevention: .00003, $p < .05$) suggests that UAI moderates the relationship between the type of marketing efforts and a customer's use of credit. Specifically, we find that a 1 SD increase in promotion-focused marketing efforts has a significant impact on the credit usage of a customer from a low- (vs. high-) UAI culture (diff = .39, $p < .01$). For a 1 SD increase in prevention-focused marketing efforts, the credit usage by customers from both high- and low-UAI cultures reduces and is not statistically significantly different (diff = –.03, $p > .10$). Thus, we find support for H_{2b}. Overall, the results suggest that promotion-focused marketing efforts help increase the use of credit in general but to a significantly greater extent when they are targeted toward customers from low- (vs. high-) UAI cultures.

Spending Patterns

As noted previously, spending pattern is a composite variable that can be algebraically derived from the other two dependent variables. Prior research (for further discussion, see Farris, Parry, and Ailawadi 1992) has suggested that under the assumption of a deterministic model—that is, when the error variances in the savings rate and use of credit model are zero—the coefficients of the spending pattern model can be calculated as $\beta^{CREDIT} - \beta^{SAVING}$. We find that the main effect of MAS ($\beta_{COMPOSITE} = .00353$) and its interaction with prevention-focused marketing ($\beta_{COMPOSITE} = -.00013$) are in the 95% confidence interval of their estimated values, respectively. We also find that the interaction between

MAS and promotion-focused marketing ($\beta_{COMPOSITE} = .00024$) is within the 99% confidence interval of its estimated value. Of the remaining 15 variables, we find that 9 and 3 are within the 95% and 99% confidence interval of their estimated values, respectively. This finding suggests that the computed error variances in the savings rate and use of credit models cause the point estimates of spending pattern to differ from the calculated composite scores. However, the error variances do not significantly affect our substantive interpretation, because most of our estimates are statistically similar to their composite scores.

The substantive interpretation of the results suggest that promotion-focused marketing efforts have a positive and significant effect (.00387, $p < .01$) on altering the spending patterns among customers, whereas prevention-focused marketing has a negative impact (–.00111, $p < .01$). We expected this result because promotion-focused (prevention-focused) marketing efforts are aimed at promoting products that increase a customer's liability (savings), leading customers to increase (decrease) their spending relative to their incomes. The main effect of MAS on spending is positive and significant (.00587, $p < .01$), which suggests that people from high-MAS cultures (e.g., Japan, the Philippines, South Africa, the United States) are likely to spend relatively more, relative to their income, than those from low-MAS cultures (e.g., Sri Lanka, the Netherlands, Thailand). Thus, we find support for H_{3a}.

The statistical significance of the interaction coefficients between MAS and prevention-focused marketing (–.00011, $p < .10$) and MAS and promotion-focused marketing (.00037, $p < .01$) suggests that MAS moderates the relationship between a firm's marketing efforts and a customer's spending pattern. We find that for a 1 SD increase in promotion-focused marketing efforts, the spending of customers from a high-MAS culture increases to a greater extent than that of customers from a relatively low-MAS culture (diff = 1.02, $p < .01$). We find that for a 1 SD increase in prevention-focused marketing efforts, the spending of customers from a high-MAS culture is not significantly different than that of customers from a relatively low-MAS culture (diff = –.01, $p > .10$). Thus, we find support for H_{3b}. Overall, the results suggest that promotion-focused marketing efforts help increase a consumer's spending in general but to a significantly greater extent when they are targeted toward customers from high- (vs. low-) MAS cultures.

Other Effects

Customer level. We find that customers' education level plays a significant role in their savings rate, with more educated customers being more likely to save at a higher rate (.01451, $p < .01$). This is consistent with prior research (see Lusardi 2008) that suggests that higher education is often associated with higher financial literacy and rational decision making. We find that customers with longer tenure are less likely to use credit (–.00163, $p < .01$). We anticipate that this result is driven by UAE citizens, who have significantly longer tenure than immigrants but are less likely to use credit because of the Islamic banking practices they follow.

Country level. In addition to the culture scores, we find three significant country-level effects. First, we find that the

TABLE 5
Results from Hierarchical Linear Model

|	Coefficient	Savings Rate (SAVING$_{ijt}$) Coefficient	SE	Use of Credit (CREDIT$_{ijt}$) Coefficient	SE	Spending Pattern (SPEND$_{ijt}$) Coefficient	SE	Hypothesis
Intercept	β_{00}	.00637	.02094	−2.09889***	.24662	2.05053	1.40740	
Customer-Level Effects (Level 1)								
Prevention-focused content (PRVMKTG$_{ijt}$)[a]	β_{10}	.00420***	.00023	−.00469***	.00136	−.00111***	.00039	
Promotion-focused content (PRMMKTG$_{ijt}$)[a]	β_{20}	.00026**	.00012	.01257***	.00141	.00387***	.00081	
Tenure (TEN$_{ijt}$)	β_{30}	−.00002	.00009	−.00163*	.00092	.00058	.00053	
Economic distance (ECON$_{ijt}$)[b]	β_{40}	−.00698	.03730	−.09690	4.17000	.06590	2.38000	
Education (EDU$_{ij}$)	β_{50}	.01451***	.00488	−.02261	.05022	−.12761	.28657	
Country-Level Effects (Level 2)								
English (ENG$_j$)	β_{01}	.00105	.01470	−.07395	.15065	−.31488	.85975	
Arabic (ARB$_j$)	β_{02}	−.00396	.01375	−.32940**	.14025	−.83241	.80038	
Regulatory environment (REG$_{jt}$)	β_{03}	−.00006	.00190	.00750	.01944	.00798	.01110	
Long-term orientation (LTO$_j$)	β_{04}	.00256***	.00022	−.00145	.00229	−.00889	.01306	H$_{1a}$ supported
Uncertainty avoidance (UAI$_j$)	β_{05}	.00371**	.00162	−.00078***	.00024	−.00778***	.00135	H$_{2a}$ supported
Masculinity (MAS$_j$)	β_{06}	−.00366	.00242	−.00013	.00247	.00587***	.00141	H$_{3a}$ supported
Moderating Effect of Culture (Cross-Level)								
Prevention × LTO (PRVMKTG$_{ijt}$ × LTO$_j$)[a]	β_{11}^{LTO}	.00027***	.00008	.00001	.00010	−.00154***	.00057	H$_{1b}$ supported
Promotion × LTO (PRMMKTG$_{ijt}$ × LTO$_j$)[a]	β_{21}^{LTO}	.00004***	.00001	−.00009	.00007	.00024	.00042	
Prevention × UAI (PRVMKTG$_{ijt}$ × UAI$_j$)[a]	β_{11}^{UAI}	.00005	.00009	.00003**	.00001	.00076	.00062	H$_{2b}$ supported
Promotion × UAI (PRMMKTG$_{ijt}$ × UAI$_j$)[a]	β_{21}^{UAI}	−.00006	.00005	−.00013**	.00006	−.00051	.00033	
Prevention × MAS (PRVMKTG$_{ijt}$ × MAS$_j$)[a]	β_{11}^{MAS}	.00015	.00009	.00002	.00011	−.00011*	.00006	H$_{3b}$ supported
Promotion × MAS (PRMMKTG$_{ijt}$ × MAS$_j$)[a]	β_{21}^{MAS}	−.00006	.00006	.00018***	.00006	.00037***	.00004	
Time dummy	$\beta_{60}-\beta_{400}$	None significant		34 significant		2 significant		

*$p < .10$.
**$p < .05$.
***$p < .01$.
aPredicted from full model of first-stage regressions.
bFor an AED1 million increase.

FIGURE 4
Moderating Impact of Cultural Characteristics on Marketing Effectiveness

A: Savings Rate

B: Use of Credit

C: Spending Patterns
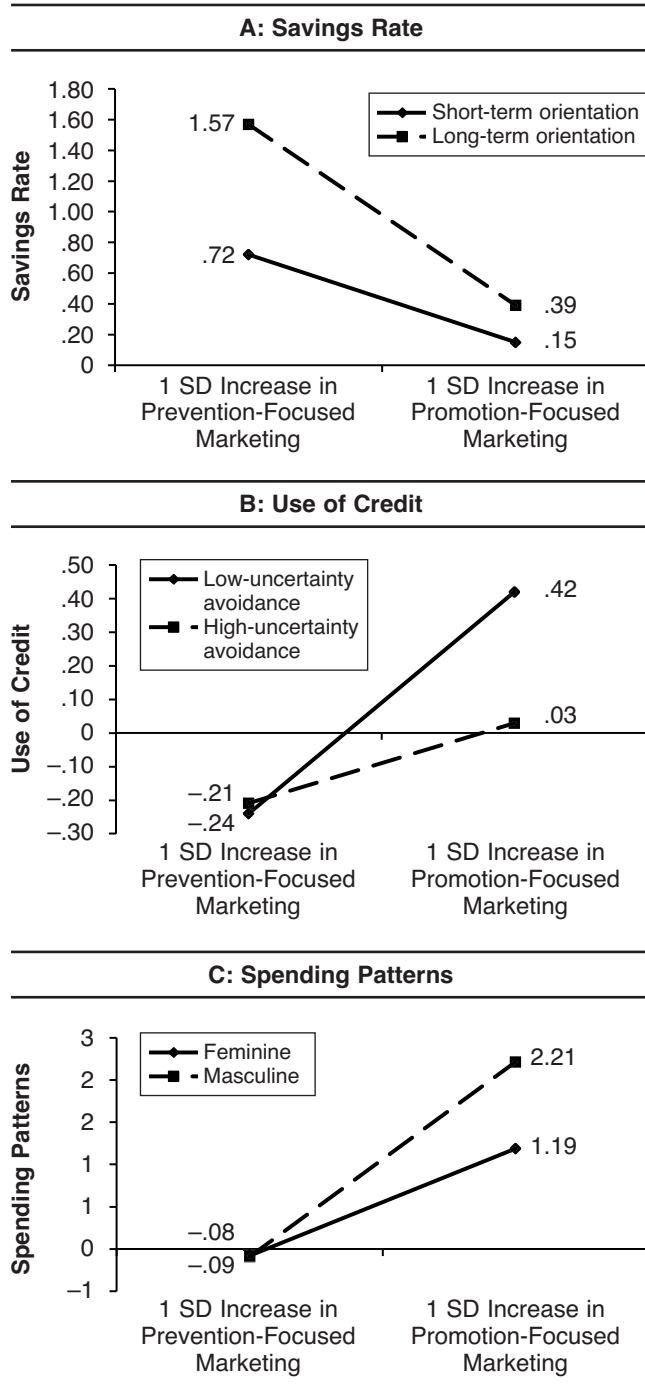
customers from Arabic-speaking countries are less likely to use credit ($-.32940$, $p < .05$). Again, this result may be reflective of the tenets of Islam and banking practices that strictly prohibit the practice of interest payments, which in turn could directly arise from the use of credit. Second, we find that customers from countries high in UAI are more likely to have a higher savings rate ($.00371$, $p < .05$). Finally, we find that customers from countries high on UAI are less likely to spend more relative to their income ($-.00778$, $p < .01$). These last two results are in line with our expectations

because cultures with higher UAI (i.e., cultures that value avoiding losses vs. leveraging gains) seem to use less credit in general, save at a higher rate, and spend only relative to their income and assets.

Robustness Checks

We conduct several robustness checks to ensure stability of our results. First, consistent with Bijmolt, Van Heerde, and Pieters (2005) and Steenkamp and Geyskens (2014), we drop the nonsignificant ($p > .10$) interaction terms from the model. However, doing so also means that the regressors in each of the three financial decision-making equations are no longer the same, which would suggest that a joint estimation of the system would be more efficient. We use CMP, a user-written procedure in STATA 12.1, to perform the joint estimation of system of hierarchical equations in context of panel data (Roodman 2011).[7] We report the results of this estimation in Web Appendix G. The coefficients are consistent in magnitude and direction with those reported in Table 5. In addition, the standard errors are marginally smaller, thus making our hypothesis tests stronger.

Second, we test the sensitivity of our results to the cube root transformation. We use the cube root transformation for our key dependent variables to ensure normality and reduce the influence of outliers. As a robustness test, we estimate our proposed model's nontransformed values. To ensure that extreme outliers do not unduly influence our results, we omit the top and bottom 5% values. Web Appendix H reports the results of the analysis. We find support for all the proposed hypotheses.

Third, we perform a holdout sample analysis to ensure the face validity of our results. For the 34 nations included in our sample, we randomly chose 10 customers of each nationality (i.e., 340 customers in total) and used parameter estimates from the remainder of the sample to predict the three financial decisions. In a second test, we also used data from customers of 10 randomly held-out nations. Web Appendix I presents the mean absolute percentage errors (MAPEs) from these holdout samples along with those from the main model (i.e., Table 5). The in-sample and out-of-sample MAPE values are in the acceptable ranges (8% to 11% and 11% to 17%, respectively). The MAPE values for holdout samples are larger than those for the in-sample, but they are only 10%–15% larger, suggesting the generalizability of our parameters across samples.

Discussion and Implications

Implications for Theory

The theories related to cross-cultural research suggest that national culture plays a significant role in influencing consumers' behavior. Moreover, it is especially important to understand the role of long-term priorities such as national

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[7]The general command of conditional mixed processes fits a wide variety of simultaneous equation systems, including seemingly unrelated regression. Recent advances in the technique also permit joint estimation of several hierarchical linear equations (see http://www.stata.com/statalist/archive/2012-11/msg01121.html). The procedure uses simulated maximum likelihood for estimation.

culture in consumer financial decision making. In this article, we empirically test both the direct effect of national culture on consumer financial decision making and its moderating effect on the link between a firm's marketing efforts and consumer financial decision making. We find that national culture helps explain consumer financial decision making in the following ways:

1. Consumers from countries with higher LTO are more likely to have a higher savings rate and are more likely to respond positively to prevention-focused marketing efforts to increase their savings rate than consumers from countries with a lower LTO.

2. Consumers from countries with lower UAI are more likely to use credit for making purchases and are more likely to respond positively to promotion-focused marketing efforts to increase their use of credit than consumers from countries with higher UAI.

3. Consumers from countries with higher MAS are more likely to overextend in their spending patterns and are more likely to respond positively to promotion-focused marketing efforts aimed at overextending their spending patterns than consumers from countries with lower MAS.

We empirically test these findings using a sample of customers of a single bank, in a single country, who originate from 34 countries (including both emerging and developing markets). We believe this study design offers a strong test of empirical generalizability given the broad context of the countries of origin tested. Furthermore, these findings add to the rich literature in cross-national and cross-cultural investigation (Alden, Steenkamp, and Batra 1999; Deleersnyder et al. 2009; Steenkamp and Baumgartner 1998; Steenkamp, Hofstede, and Wedel 1999). In addition, the results of this study begin to answer Sheth's (2011, p. 167) question: "Should a company extend its marketing mix (the four P's of marketing), or should it adjust it to suit the local markets?" The answer seems to be that understanding the differences in national culture across customers' countries of origin can be extremely beneficial in understanding their financial decision making and response to marketing efforts.

This article also contributes to the literature on RFT by investigating how cultural identities help explain a customer's regulatory orientation as well as by analyzing the impact of promotion-focused and prevention-focused communications on a customer's financial decision making. Specifically, we find that national culture can explain a customer's regulatory orientation and that the fit of this regulatory orientation with promotion-focused or prevention-focused marketing efforts affects a customer's financial decision making.

Implications for Practice

With regard to the direct impact of national culture on financial decision making, two types of firms can gain insight from our findings: (1) firms operating in multicultural societies and (2) multinational corporations (MNCs) exploring new market entry. Multicultural societies are characterized by the presence of customers of different nationalities. Using a report from the UN Department of Economic and Social Affairs (2006), we identify the countries in our sample with a significant multicultural presence. The UAE and Singapore have the highest proportion of first-

generation immigrants in their populations. In addition, the United States, Germany, and France have the largest populations of immigrants: these three nations constitute 30% of the world's immigrant population. Needless to say, it is in the interest of the firms that operate in these five multicultural countries to understand that the heterogeneity in financial decision making is a function of past experience, interactions, and long-term priorities such as national culture.

Furthermore, as MNCs begin to explore expansion into new markets, they must understand how consumers make financial decisions and how to market in each country because implementing homogeneous and focused strategies across or within countries is not necessarily ideal (Khanna and Palepu 1997). This holds true, regardless of the MNC's country of origin or destination market. Moreover, given the breadth of our sample of customers, this guidance would be relevant not only to MNCs from developed markets that are entering other developed and emerging markets but also to MNCs from emerging markets that plan to enter developed/emerging markets. According to the OECD, a group of the 34 most-developed economies of the world, the member countries made more than $1.4 trillion worth of foreign direct investment (FDI) in just six nations: the BRICS (Brazil, Russia, India, China, and South Africa) and Indonesia (see www.oecd.org). During the same time period, firms from these six emerging markets together made an FDI of $580 billion in other countries. This amount is more than one-third of the FDI inflow that these countries received, and it has quadrupled during this time period. Thus, emerging markets not only are investment destinations for foreign capital but also have increasingly become a source of capital investment.

In both cases, the direct impact of national culture on consumer financial decision making can help with initiatives such as new product introductions. When a financial services firm introduces a new product such as a savings account designed to help customers increase their savings rate, the firm can expect this product to be more successful in the countries or the specific populations within countries that have a higher degree of LTO (e.g., consumers from South Korea, Japan, China, Russia). However, if the product were a new type of loan/mortgage designed to serve as a channel of additional credit, the firm could expect this product to be more successful in the countries or the specific populations within countries with a lower degree of UAI (consumers from, e.g., Singapore, Sweden, Ireland).

With regard to the moderating impact of national culture on financial decision making, we found evidence suggesting that financial services firms can enhance the effectiveness of their marketing efforts by targeting customers on the basis their national culture. We already know that firms selectively target customers with marketing efforts that they expect to be more effective (see Table 3). For example, we observed that in aggregate, more marketing efforts were spent on customers who had a higher past profitability ($PROFIT_{ijt-1}$), regardless of whether the effort was prevention or promotion focused (i.e., all coefficients were positive and significant in each model). However, a pertinent question that arises is whether firms already take a customer's coun-

try of origin into account to help with selection and resource allocation. To test whether the country characteristics already influence the firm's marketing efforts, we regress country-specific dummy variables against first-differenced total marketing efforts ($\Delta Mktg_{ijt} = Mktg_{ijt} - Mktg_{ijt-1}$, where $Mktg_{ijt}$ is just the sum of prevention- and promotion-focused marketing efforts) to customer i from country j at time t. By first-differencing marketing efforts, we control for time-varying, unobserved customer-level characteristics. None of the 33 dummy variables in this model are statistically significant, indicating that there is no systematic variation in the marketing efforts across the nations in our sample (for plots of t-statistics for these dummy variables, see Web Appendix J). In addition, we regress the first-differenced marketing efforts against the country characteristics. The results suggest that none of these characteristics are statistically significant either. Thus, we find no evidence that the focal firm in this study systematically varies its marketing efforts across consumers from different nations, which suggests that this firm is losing some of its marketing investment returns by failing to leverage the differences that exist across its customers' national cultures, thus missing a great opportunity to optimize the effectiveness of its marketing efforts. Our research provides guidance to managers about which type of marketing content to use in which countries to influence a given financial decision-making behavior.

Limitations and Further Research

We also point out the limitations of our study and some opportunities for further research. First, we carried out our study in the context of a single nation with a single firm. The decision to choose customers from a single nation was motivated by the desire to control for the variability of marketing efforts across firms and the macroeconomic conditions across nations. Although we are confident in our findings that culture indeed plays a significant role in influencing consumer financial decision making and consumer responsiveness to marketing efforts, further research should carry out studies across several diverse geographical markets and with other core consumer financial decisions to broaden the applicability of our findings.

We focused on the link between three of Hofstede's six cultural dimensions. Our goal in this study was to focus on already established links of cultural dimensions and consumer decision making. This approach of selectively utilizing appropriate cultural dimensions for a given research context is consistent with research in marketing (for an application, see Deleersnyder et al. 2009); however, further research should consider how other aspects of a consumer's culture can influence each of the five core areas of consumer financial decision making.

We duly note that there are several paradigms for studying national culture. The two most prominent cultural framework paradigms are those from Hofstede (2001) and Inglehart (1997). Two considerations influenced our choice to use the Hofstede framework. First, Hofstede's paradigm has been influential in the marketing domain, whereas Inglehart's has been dominant in sociology and political science (for a review, see Steenkamp and Geyskens 2012). Second, the theoretical foundation of Hofstede's work is in microprocesses of socialization, a phenomenon through which a person's behavior is guided. Future studies can adopt the Inglehart paradigm to evaluate its impact on the financial decision making of people from different nations.

In our article, we consider three important financial decisions consumers make. Clearly, consumers make many types of financial decisions, and the choice of three in our research is not exhaustive. Our choice of these decisions was guided by recent work in marketing (for a discussion, see Lynch 2011) that highlights their importance in consumers' financial well-being. Further research could examine other aspects of financial decision making, such as choosing mortgages, funding current consumptions, use of payday loans, and investing in the stock market.

Moreover, in our sampling procedure, we tried to remove as much potential selection bias as possible by drawing a stratified sample of customers on the basis of the home country's proportion of educational attainment. In this way, we have a sample of customers who best represent the appropriate distribution of socioeconomic classes. We note that the possibility of selection bias still remains, resulting from the possibility that certain types of people from a given country might be more likely to emigrate from their home country to the UAE. However, we tend to believe that this potential selection problem will not have a significant impact on our findings. Further research can focus on collecting data to have a better control of the selection bias, if needed.

Finally, our theorization hinges on the assumption that customers are likely to perceive the marketing of asset and savings products (vs. liability and spending products) as prevention (vs. promotion) focused. Although we provide anecdotal evidence of marketing communications used by several financial institutions that suggests the robustness of this assumption, further behavioral research could evaluate its merits.

In the current dynamic marketplace, with constantly shifting demographics and majority groups, it is more imperative than ever to gain knowledge of how cultural diversity can influence consumer decision making and a firm's marketing effectiveness. Our study aims to address the knowledge gap that prevails in the domain. We hope to arm scholars and practitioners alike with strategies to effectively understand how consumers from different national cultures make decisions and how firms can effectively market to cross-cultural and cross-national audiences.

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Web Appendix

**Marketing Communication Strategies and Consumer Financial Decision Making:
Role of National Culture**

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One-to-One Mapping using ISCED Classification for "India"

Government of India Classification	ISCED97 Level	Barro-Lee Classification	Data Provider Classification
Program Name	**ISCED Name**	**Name**	**Name**
Illiterate	None	No Schooling	Limited/ None
Pre-primary Education	Pre-primary Education		
Primary Education	Primary Education	First Level	Primary
Primary - Ed Guarantee Scheme and Alternative and Innovative scheme (EGS & AIE)			
Upper Primary	Lower Secondary Education	Second Level	Secondary/ High School
Senior Secondary / Intermediate	Upper Secondary Education		
High School			
Senior School level Cerificate			
Industrial Training Institute (ITI), lower-level technical and vocational			
Technical Education Training	Post-secondary Non-tertiary Education		
Junior basic teacher's training / Nursing			
Tertiary, Professional (1st)	Tertiary Education (First Stage)	Post-Secondary	Graduate/ Post Graduate/ Professional
University (1st - short)			
University (2nd)			
Master's Degree (2nd)			
University (2nd)			
Tertiary, technical			
Doctor of Philosophy (1st)	Tertiary Education (Second Stage)		
Doctor of Letters (2nd)			
Master of Philosophy (1st)			

One-to-One Mapping using ISCED Classification for "China"

China Classification	ISCED97 Level	Barro-Lee Classification	Data Provider Classification
Program Name	**ISCED Name**	**Name**	**Name**
Illiterate	None	No Schooling	Limited/ None
Pre-primary	Pre-primary Education		
Primary	Primary Education	First Level	Primary
Lower secondary (junior secondary school)			
Lower secondary	Lower Secondary Education	Second Level	Secondary/ High School
Upper secondary (senior secondary school)	Upper Secondary Education		
Upper secondary (senior secondary school)			
Upper secondary (senior secondary school)			
Post-secondary, non-tertiary	Post-secondary Non-tertiary		
Tertiary, non-university	Tertiary Education (First Stage)	Post-Secondary	Graduate/ Post Graduate/ Professional
Tertiary, non-university			
University			
University			
Master's			
Doctorate	Tertiary Education (Second Stage)		

Web Appendix B

Overlap between Barro-Lee Dataset and Countries with Sizeable Presence in our Dataset on Educational Attainment

Code	Country Name	Population Proportion from Barro-Lee				Sample Proportion (n=100 for each country)			
		Level 1 No Schoolin	Level 2 First Level	Level 3 Second Level	Level 4 Post-Secondary	Level 1 Limited / None	Level 2 Primary	Level 3 Secondary / High School	Level 4 Graduate/ Post Graduate/ Professional
AE	UAE	72.2%	5.2%	16.7%	6.0%	72.0%	5.0%	17.0%	6.0%
AU	Australia	2.2%	24.4%	43.6%	29.8%	2.0%	24.0%	44.0%	30.0%
BD	Bangladesh	55.7%	27.7%	13.4%	3.3%	56.0%	27.0%	13.0%	3.0%
BG	Bulgaria	4.1%	39.3%	37.5%	19.1%	4.0%	39.0%	38.0%	19.0%
CA	Canada	1.7%	18.6%	26.6%	53.0%	2.0%	19.0%	27.0%	52.0%
CH	Switzerland	4.6%	24.4%	55.0%	16.0%	5.0%	24.0%	55.0%	16.0%
CN	China	20.9%	40.7%	35.7%	2.7%	21.0%	41.0%	35.0%	3.0%
DE	Germany	5.2%	25.1%	52.3%	17.5%	5.0%	25.0%	52.0%	18.0%
EG	Egypt	46.1%	17.8%	25.4%	10.7%	46.0%	18.0%	25.0%	11.0%
FR	France	0.7%	43.7%	37.3%	18.4%	1.0%	44.0%	37.0%	18.0%
GB	UK	2.9%	38.9%	39.1%	19.1%	3.0%	39.0%	39.0%	19.0%
ID	Indonesia	36.2%	37.0%	21.8%	5.0%	36.0%	37.0%	22.0%	5.0%
IE	Ireland	4.2%	31.8%	44.7%	19.4%	4.0%	32.0%	45.0%	19.0%
IN	India	44.5%	33.2%	17.4%	4.8%	45.0%	33.0%	17.0%	5.0%
IQ	Iraq	40.1%	33.7%	17.7%	8.6%	39.0%	34.0%	18.0%	9.0%
IR	Iran	40.7%	29.8%	22.8%	6.7%	40.0%	30.0%	23.0%	7.0%
JO	Jordan	29.5%	16.3%	33.3%	20.9%	30.0%	16.0%	33.0%	21.0%
JP	Japan	0.0%	28.1%	47.9%	24.0%	0.0%	28.0%	48.0%	24.0%
KE	Kenya	32.8%	51.6%	14.3%	1.2%	33.0%	52.0%	14.0%	1.0%
KR	South Korea	8.0%	16.7%	49.5%	25.8%	8.0%	17.0%	49.0%	26.0%
LK	Sri Lanka	16.8%	38.3%	42.2%	2.7%	17.0%	39.0%	41.0%	3.0%
MY	Malaysia	13.9%	35.6%	43.0%	7.5%	14.0%	35.0%	43.0%	8.0%
NL	Netherlands	2.4%	30.2%	45.4%	22.0%	2.0%	30.0%	46.0%	22.0%
NP	Nepal	67.2%	17.3%	12.9%	2.5%	67.0%	17.0%	13.0%	3.0%
NZ	New Zealand	0.0%	32.2%	26.3%	41.6%	0.0%	32.0%	26.0%	42.0%
PH	Philippines	6.3%	40.1%	31.4%	22.2%	6.0%	40.0%	32.0%	22.0%
PK	Pakistan	70.1%	13.1%	14.0%	2.8%	70.0%	13.0%	14.0%	3.0%
RO	Romania	5.1%	22.0%	64.0%	8.9%	5.0%	22.0%	64.0%	9.0%
RU	Russia	0.0%	31.0%	48.9%	20.1%	0.0%	31.0%	49.0%	20.0%
SE	Sweden	2.0%	17.7%	57.2%	23.1%	2.0%	18.0%	57.0%	23.0%
SG	Singapore	12.7%	28.3%	48.5%	10.6%	13.0%	28.0%	48.0%	11.0%
SY	Syria	26.8%	39.7%	20.4%	13.1%	27.0%	40.0%	20.0%	13.0%
US	USA	1.0%	9.3%	39.6%	50.1%	1.0%	9.0%	40.0%	50.0%
ZA	South Africa	16.4%	25.7%	47.5%	10.4%	16.0%	26.0%	48.0%	10.0%

Countries Represented and Dimensions of National Culture

Country Code	Country Name	Emerging§	IDV	UAI	PDI	MAS	LTO
AE	United Arab Emirates	1	25	80	90	50	22*
AU	Australia	0	90	51	36	61	21
BD	Bangladesh	1	20	60	80	55	47
BG	Bulgaria	1	30	85	70	40	69
CA	Canada	0	80	48	39	52	36
CH	Switzerland	0	68	58	34	70	74
CN	China	1	20	40	80	66	87
DE	Germany	0	67	65	35	66	83
EG	Egypt	1	25	80	70	45	7
FR	France	0	71	86	68	43	63
GB	United Kingdom	0	89	35	35	66	51
ID	Indonesia	1	14	48	78	46	62
IE	Ireland	0	70	35	28	68	24
IN	India	1	48	40	77	56	51
IQ	Iraq	1	30	85	95	70	25
IR	Iran	1	41	59	58	43	14
JO	Jordan	1	30	65	70	45	16
JP	Japan	0	46	92	54	95	88
KE	Kenya	1	25	50	70	60	22*
KR	South Korea	0	18	85	60	39	100
LK	Sri Lanka	1	35	45	80	10	62
MY	Malaysia	1	26	36	104	50	41
NL	Netherlands	0	80	53	38	14	67
NP	Nepal	1	30	40	65	40	62
NZ	New Zealand	0	79	49	22	58	33
PH	Philippines	1	32	44	94	64	27
PK	Pakistan	1	14	70	55	50	50
RO	Romania	1	30	90	90	42	52
RU	Russia	1	39	95	93	36	81
SE	Sweden	0	71	29	31	5	53
SG	Singapore	0	20	8	74	48	72
SY	Syria	1	35	60	80	52	22*
US	United States of America	0	91	46	40	62	25
ZA	South Africa	1	65	49	49	63	34

These values were imputed by using the average value of the region since they were not directly available from Hofstede's 5 dimensions of national culture.

§ *Measure based on World Bank classification; 1 = emerging market; 0 = developed nation*

This table provides the list of 34 countries used in this study along with each country's corresponding score on Hofstede's 5 dimensions of national culture (Individualism (IDV), Uncertainty Avoidance (UAI), Power Distance (PDI), Masculinity (MAS), and Long-term Orientation (LTO)).

Web Appendix D
Distribution of Non-transformed and Cube Root Transformed Variables

Non-Transformed	Cube Root Transformed
Savings Rate	**Savings Rate**

Mean = -.2903; S.D. = 49.3661; W = .0178
Skewness = 11.3847; Kurtosis = 12491.49

Mean = .0302; S.D. = .9942; W = .8874
Skewness = -.5498; Kurtosis = 26.1784

Use of Credit | **Use of Credit**

Mean = -.1422; S.D. = 30.2703; W =. 0182
Skewness = 63.0527; Kurtosis = 18190.81

Mean = -.0598; S.D. = .7407; W = .8908
Skewness = -.1071; Kurtosis = 24.7557

Spending Patterns | **Spending Patterns**

Mean = 1.1480; S.D. = 57.5224; W = .0262
Skewness = 1.6966; Kurtosis = 8153.59

Mean = .7873; S.D. = 1.0918; W = .6567
Skewness = -1.7092; Kurtosis = 25.2601

Each of the three non-transformed variables have a skewness of greater than one and very high value of kurtosis (>3). On the contrary, cube root transformation helps in reducing the skewness in the data. The general rule of thumb suggests that symmetric distribution should have skewness between negative one and positive one. As noted in the right side panel of the above figures, the skewness of cube root transformed variables is in this range for savings rate and use of credit.

As a formal test we calculate the Shapiro-Wilk's W for testing normality of these variables (Shapiro and Wilk 1965). The highest value for the statistics is one and the closer the value to one the less is the violation of normality assumptions (see Kalaignanam et al. (2013) for a similar approach). We find that the Shapiro-Wilk's W for non-transformed variables are very small (less than .03). However, the Shapiro-Wilk's W is .89 each for the cube root transformed values of savings rate and use of credit. The same is .66 for spending patterns. These results suggest that cube root transformation helps us to achieve normality of distribution of dependent variables, a key assumption underlying hierarchical linear models.

Web Appendix E

Examples of Marketing Communications from Financial Services Firms

We argue that consumer financial decisions are guided by self-regulation systems, either prevention- or promotion-focused in nature. The prevention-focused self-regulation systems are guided by the desire to avoid financial losses, while the promotion-focused self-regulation systems are guided by the desire to make financial gains (Avnet and Higgins 2006).

Financial services firms are constantly communicating with their customers about increasing their activities (e.g., opening accounts). And, it is often the case that these marketing efforts either encourage customers to avoid risk (prevention-focused) or leverage opportunities (promotion-focused). We provide a set of advertisements from an array of financial services firms which can be grouped into prevention- or promotion-focused marketing campaigns.

Prevention-focused Marketing Communications
Prevention-focused marketing communications are meant to encourage customers to avoid the risk of loss. In Figure X1 we provide 2 different marketing campaigns from 2 different banks (Ally and Barclays) which encourages customers to avoid risks by putting money into asset accounts including IRAs, Savings Accounts, and/or Certificate of Deposit (CD) Accounts (see Figure E1).

Figure E1: Ally and Barclays IRA, Savings, and CD Account Promotions
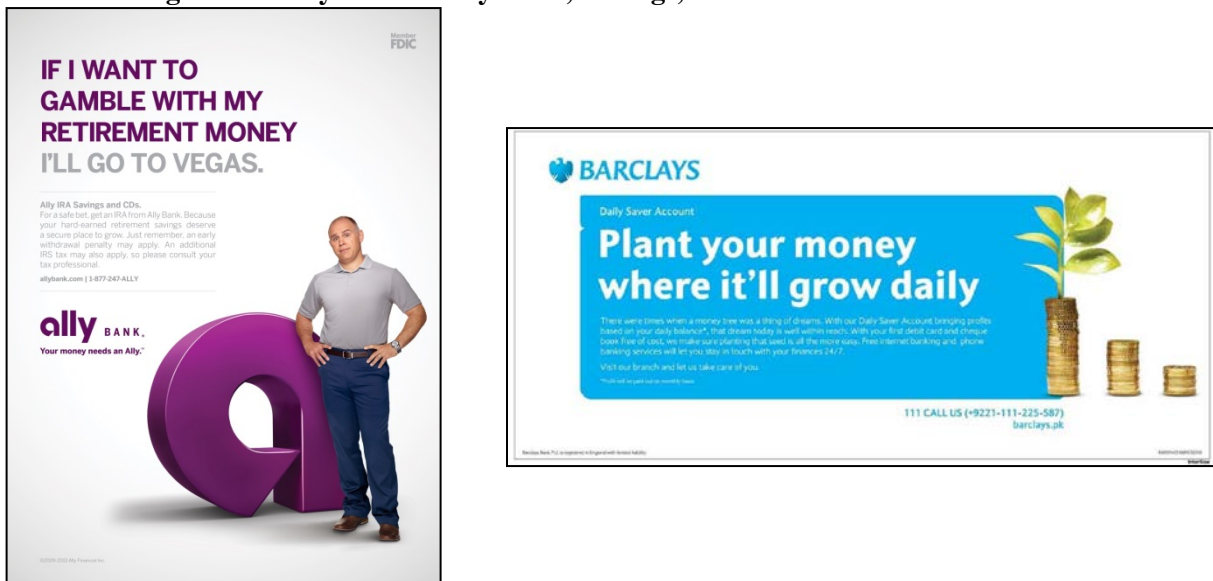
We can see that these ads are directly appealing to customers which have concerns about preventing financial losses. These ads are generally representative of ads other financial services firms have used to encourage customers to open or increase usage of asset accounts. Thus, in our study we operationalize prevention marketing as dollars spent by the financial services firm on encouraging the customers to open or increase the usage of asset accounts.

Promotion-focused Marketing Communications
Promotion-focused marketing communications are meant to encourage customers to leverage opportunities to expand and grow. In this section we provide examples from 2 types of liability products

(home loan and credit cards) from 3 different banks (Bank of America, Citibank, and Chase) which are promotion-focused. First, we provide an example of an ad from Bank of America promoting a home loan product (see Figure E2).

Figure E2: Bank of America Home Loan Promotion
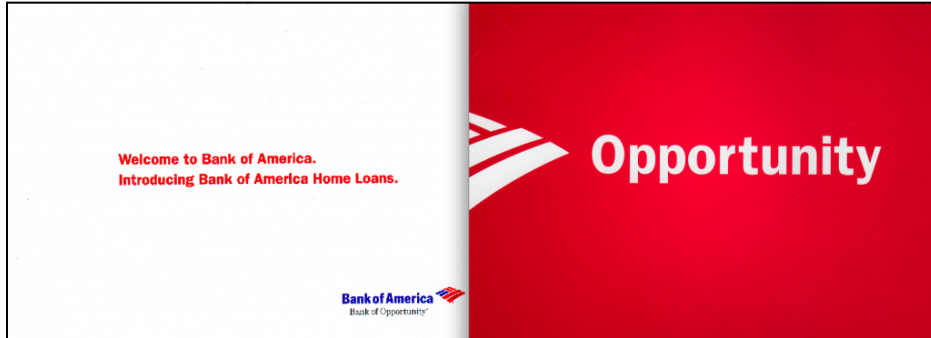
We can see that Bank of America is encouraging customers to leverage of the opportunity to buy a new home using a home loan from Bank of America. This is meant to align with promotion-focused customers who are looking to expand and/or grow their living arrangement by using a liability product.

Second, we provide an example of ads from Citibank and Chase promoting credit cards (see Figure E3).

Figure E3: Citibank and Chase Credit Card Promotions

We can see that these ads are trying to encourage customers to leverage a new credit card to make wish list or big purchases. This is meant to align with promotion-focused customers who are looking to expand and/or grow through increasing their purchase behavior by leveraging debt. These 3 ads are generally representative of ads other financial services firms have used to encourage customers to open or increase usage of liability accounts. Thus, in our study we operationalize promotion marketing as dollars spent by the financial services firm on encouraging customer to open or increase the usage of liability accounts.

Web Appendix F

Correcting the Standard Errors

We estimate the variance of ψ as:

(F1) $\quad \hat{\sigma}_\psi^2 = \dfrac{\hat{\psi}^2}{n-p-1}$, where n is sample size and p is the number of estimated coefficients

(F2) $\quad \hat{\psi} = \sum_{i=1}^{n} [DESC_{ijt} - \hat{\beta}_{00} + ... + \hat{\beta}_{10}^{k} PRVMKTG_{ijt} + \hat{\beta}_{11}^{k,m} PRVMKTG_{ijt} * CUL_j^m + \hat{\beta}_{20}^{k} PRVMKTG_{ijt}$

$\qquad\qquad + \hat{\beta}_{21}^{k,m} PRVMKTG_{ijt} * CUL_j^m + ...]$

Please note that in the above equation, the variables associated with $\hat{\beta}_{10}^{k}$, $\hat{\beta}_{11}^{k}$, $\hat{\beta}_{20}^{k}$, and $\hat{\beta}_{21}^{k}$ are

observed rather than predicted values. The asymptotic standard errors for these coefficients are:

(F3) $\quad SE(\hat{\beta}_{ab}^{k}) = \sqrt{\dfrac{\hat{\sigma}_\psi^2}{SST_x * \rho_{x,k}^2}}$

where, when $a=1$ and $b=0$, $x=PRVMKTG$; when $a=1$ and $b=1$, $x=PRVMKTG *CUL^l$; when $a=2$ and $b=0$, $x=PRMMKTG$; when $a=2$ and $b=1$, $x=PRMMKTG *CUL^l$. k and l are as defined previously. SST is the total sum of square for observed value endogenous variable x and ρ is the correlation between observed value endogenous variable x and the financial decision k. Since ρ^2 is always less than one, the adjusted standard errors are smaller than those produced by XTMIXED procedure. The statistical significance of the coefficients associated with instrumented endogenous variables is inferred using the corrected standard errors from Eq(F3).[1]

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[1] The STATA code for the error correction is available from authors upon request.

Web Appendix G

Results from the Joint Estimation using Conditional Mixed Process Model (CMP)

		Coeff.	Savings Rate $(SAVING_{ijt})$		Use of Credit $(CREDIT_{ijt})$		Spending Pattern $(SPEND_{ijt})$		Hypotheses
			Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	
	Intercept	β_{00}	.00704	.01988	-2.09902[c]	.69426	2.26282	1.15074	
Customer Level Effects (Level 1)	Prevention Focused Content $(PRVMKTG_{ijt})$ [1]	β_{10}	.00429[c]	.00020	-.00555[c]	.00128	-.00133[b]	.00057	
	Promotion Focused Content $(PRMMKTG_{ijt})$ [1]	β_{20}	.00029[c]	.00011	.01113[c]	.00134	.00352[c]	.00041	
	Tenure (TEN_{ijt})	β_{30}	-.00002	.00008	-.00163[a]	.00094	.00058[b]	.00031	
	Economic Distance $(ECON_{ijt})$ [2]	β_{40}	-.00926	.02060	-.10810	1.0500	4.04800[c]	.77000	
	Education (EDU_{ij})	β_{50}	.01423[c]	.00479	-.02302	.04341	-.11267	.15980	
Country Level Effects (Level 2)	English (ENG_j)	β_{01}	.00071	.01516	-.07401	.09371	-.38808	.48391	
	Arabic (ARB_j)	β_{02}	-.00148	.01376	-.32917[b]	.12696	-.90939	.79823	
	Regulatory Environment (REG_{jt})	β_{03}	-.00006	.00189	.00751	.01302	.01089	.00644	
	Long Term Orientation (LTO_i)	β_{04}	.00254[c]	.00022	-.00145	.00189	-.01946[b]	.00732	H1a, Supported
	Uncertainty Avoidance (UAI_j)	β_{05}	.00533[b]	.00240	-.00093[c]	.00016	-.00738[c]	.00179	H2a, Supported
	Masculinity (MAS_j)	β_{06}	-.00435[a]	.00263	-.00013	.00194	.00838[c]	.00079	H3a, Supported
Moderating Effect of Culture (Cross Level)	Prevention* LTO $(PRVMKTG_{ijt}*LTO_i)$ [1]	β_{11}^{LTO}	.00017[b]	.00007			-.00314[c]	.00053	H1b, Supported
	Promotion*LTO $(PRMMKTG_{ijt}*LTO_j)$ [1]	β_{21}^{LTO}	.00005[c]	.00002					
	Prevention * UAI $(PRVMKTG_{ijt}*UAI_j)$ [1]	β_{11}^{UAI}			.00005[b]	.00002			H2b, Supported
	Promotion * UAI $(PRMMKTG_{ijt}*UAI_j)$ [1]	β_{21}^{UAI}			-.00011[b]	.00005			
	Prevention * MAS $(PRVMKTG_{ijt}*MAS_j)$ [1]	β_{11}^{MAS}					-.00024[c]	.00004	H3b, Supported
	Promotion* MAS $(PRMMKTG_{ijt}*MAS_j)$ [1]	β_{21}^{MAS}			.00010	.00012	.00024[c]	.00003	
	Time Dummies	$B_{60}\text{-}\beta_{400}$	None Significant		34 Significant		None Significant		

Error Correlations

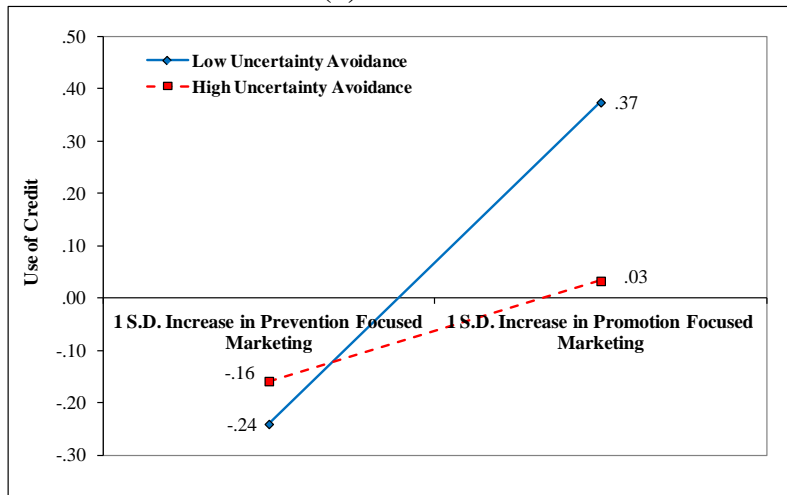|	$\psi^{Savings}$	ψ^{Credit}	$\psi^{Spending}$
$\psi^{Savings}$	1		
ψ^{Credit}	-.0181[a]	1	
$\psi^{Spending}$	-.2510[c]	.1832[c]	1

Notes: [1]Predicted from full model of first stage regressions; [2]For a 1m AED increase; [c] $p<.01$; [b] $p<.05$; [a] $p<.10$. S.E. = Standard Error

x

Two by Two Plots for Moderating Effects: Joint Estimation using Conditional Mixed Process Model (CMP)

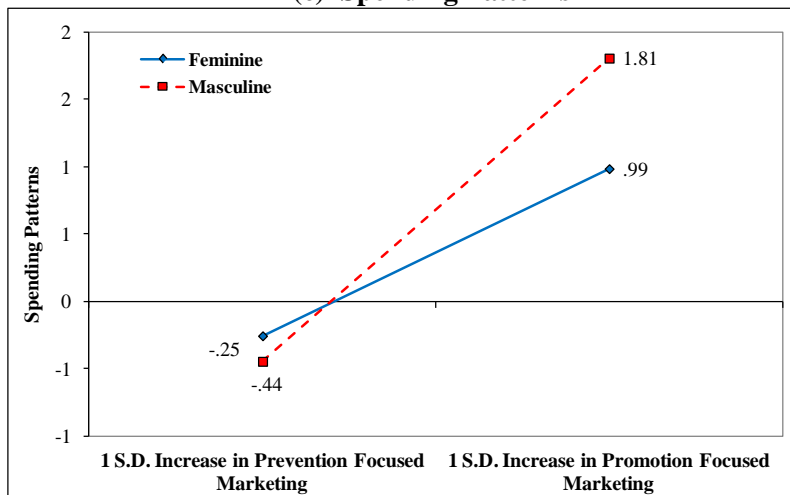### (a) Savings Rate

(b) Use of Credit
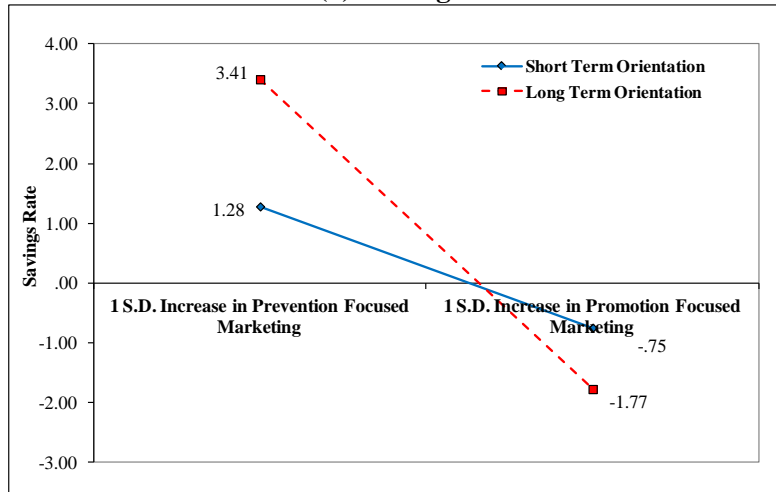

(c) Spending Patterns

		Coeff.	Savings Rate $(SAVING_{ijt})$		Use of Credit $(CREDIT_{ijt})$		Spending Pattern $(SPEND_{ijt})$		Hypotheses
	Mean; S.D.; W; Skewness; Kurtosis		.0267; .4188; .8254; .0588; 7.5323		-.0374; .2514; .8682; -.2099; 6.9121		.8164; .4739; .8281; -1.7316; 6.6523		
			Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	
	Intercept	β_{00}	.10166^c	.01454	-4.7713^c	.79767	2.05053	1.40740	
Customer Level Effects (Level 1)	Prevention Focused Content ($PRVMKTG_{ijt}$) [1]	β_{10}	.00131^b	.00064	-.03494^c	.01064	-.00174^a	.00101	
	Promotion Focused Content ($PRMMKTG_{ijt}$) [1]	β_{20}	-.00257^c	.00075	.02845^c	.00433	.00861^c	.00174	
	Tenure (TEN_{ijt})	β_{30}	-.00020^c	.00005	-.00168	.00240	.00038^c	.00008	
	Economic Distance ($ECON_{ijt}$) [2]	β_{40}	.00308^a	.00191	.06310	1.1010	.16807^c	.02281	
	Education (EDU_{ij})	β_{50}	.01189^c	.00278	.04313	.12907	.04163^c	.00399	
Country Level Effects (Level 2)	English (ENG_j)	β_{01}	.00106	.00841	-.02601	.38620	-.00300	.01215	
	Arabic (ARB_j)	β_{02}	-.00637	.00791	-.70951^b	.36007	.00727	.01146	
	Regulatory Environment (REG_{jt})	β_{03}	-.00518^c	.00109	.07326	.04985	-.00033	.00157	
	Long Term Orientation (LTO_i)	β_{04}	.00469^c	.00128	.00224	.00587	-.00078^c	.00019	H1a, Supported
	Uncertainty Avoidance (UAI_i)	β_{05}	.00326^b	.00133	-.00414^b	.00208	-.00033^b	.00013	H2a, Supported
	Masculinity (MAS_i)	β_{06}	-.00533^c	.00139	.00031	.006	.00060^c	.00021	H3a, Supported
Moderating Effect of Culture (Cross Level)	Prevention* LTO ($PRVMKTG_{iit}*LTO_i$) [1]	$\beta_{..}^{LTO}$	.00070^c	.00024	.00046	.00041	.00011	.00087	H1b, Supported
	Promotion*LTO ($PRMMKTG_{ijt}*LTO_j$) [1]	β_{21}^{LTO}	-.00042^b	.00019	-.00021	.00023	-.00015	.00013	
	Prevention * UAI ($PRVMKTG_{iit}*UAI_i$) [1]	$\beta_{..}^{UAI}$	.00018	.00088	.00025^c	.00008	-.00017^a	.00010	H2b, Supported
	Promotion * UAI ($PRMMKTG_{ijt}*UAI_j$) [1]	β_{21}^{UAI}	.00046^a	.00026	-.00044^c	.00015	.00076	.00115	
	Prevention * MAS ($PRVMKTG_{iit}*MAS_i$) [1]	$\beta_{..}^{MAS}$	-.00037	.00086	-.00083	.00016	-.00060^c	.00010	H3b, Supported
	Promotion* MAS ($PRMMKTG_{ijt}*MAS_j$) [1]	β_{21}^{MAS}	-.00019	.00036	.00033^a	.00017	.00012^a	.000077	
	Time Dummy	B_{60}- β_{400}	34 Significant		33 Significant		34 Significant		

Notes: [1]Predicted from full model of first stage regressions; [2]For a 1m AED increase;
^{c} $p<.01$; ^{b} $p<.05$; ^{a} $p<.10$. S.E. = Standard Error

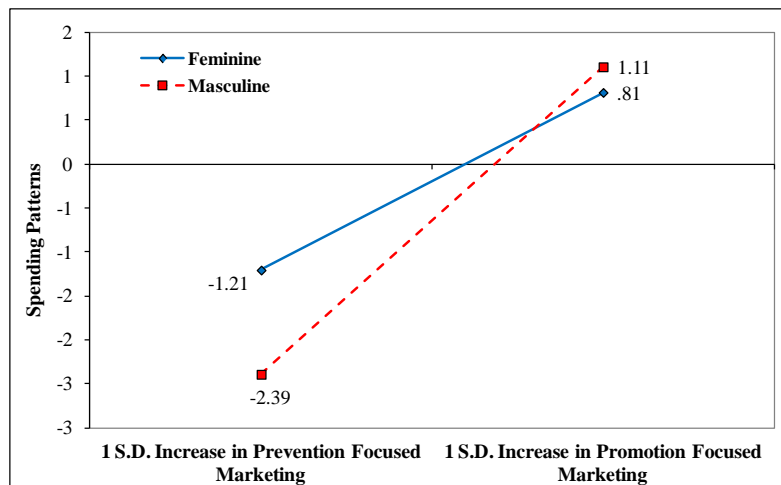**Two by Two Plots for Moderating Effects: Non-Transformed Variables in Mid 90 Percentile Range**

(a) Savings Rate



(b) Use of Credit
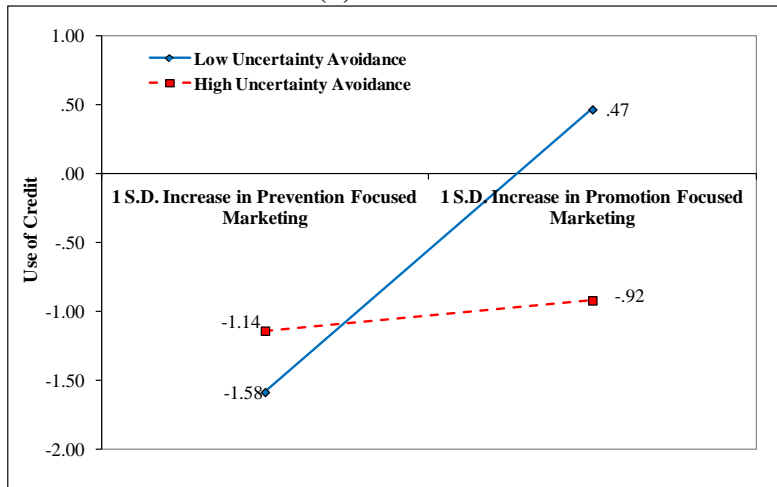
(c) Spending Patterns

Web Appendix I

In- and Out-of-Sample Holdout Validation Tests

Mean Absolute Percentage Error	Main Model (Table 5)	Holdout: 10 Randomly Customers for each Country	Holdout: 10 Randomly Chosen Countries (100 customers each)
Savings Rate	8.83%	11.30%	14.55%
Use of Credit	9.36%	13.59%	16.38%
Spending Patterns	11.15%	13.80%	16.83%

T-Statistics for Country Dummies from First Differenced Marketing Efforts Regression
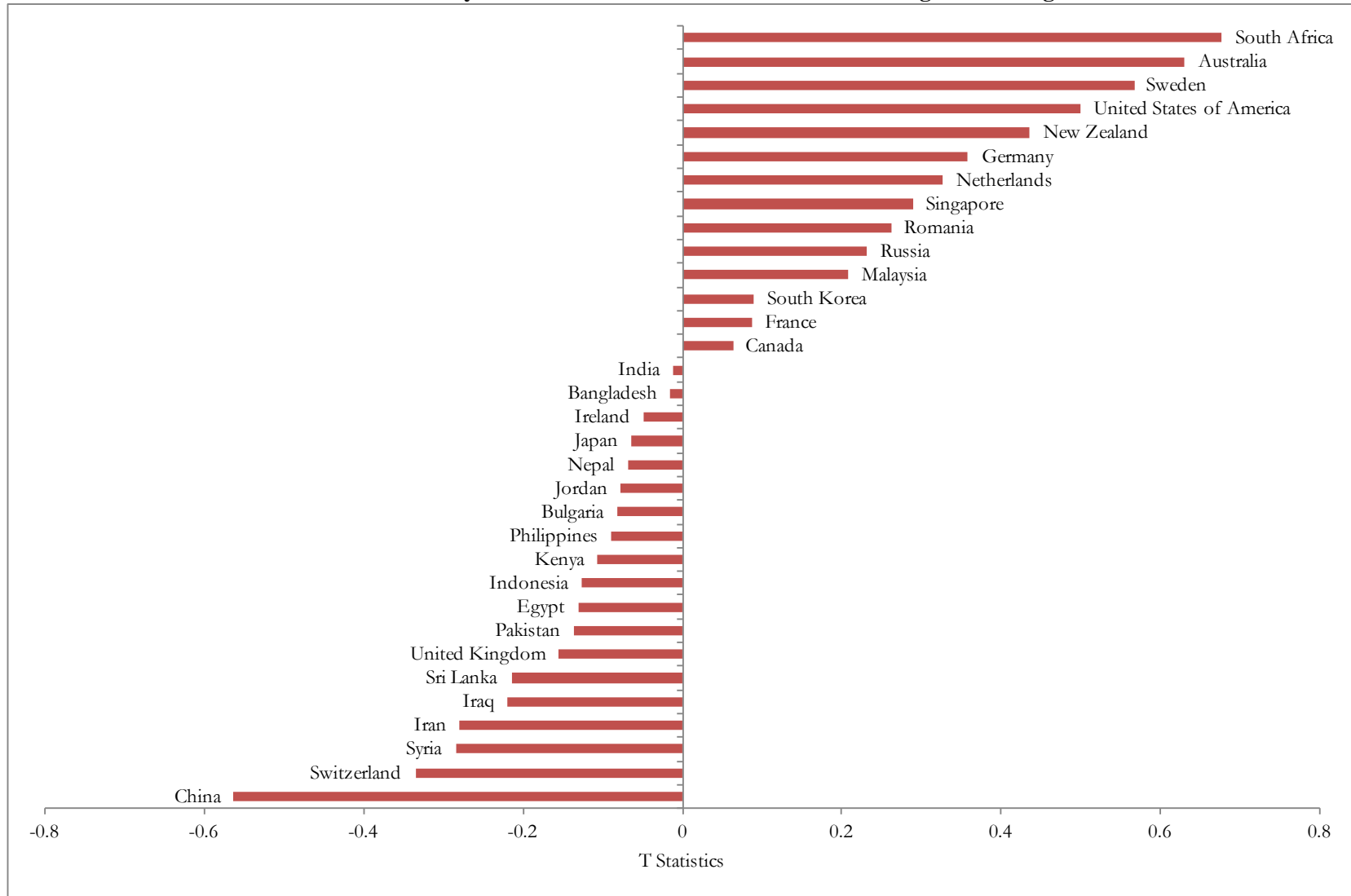
WEB APPENDIX REFERENCES

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Kalaignanam, Kartik, Tarun Kushwaha, J.B.E.M. Steenkamp, and Kapil Tuli (2013), The Effect of CRM Outsourcing on Shareholder Value: A Contingency Perspective", *Management Science*, 59(3), 748-769.

Shapiro, S. S. and M. B. Wilk (1965), "An Analysis of Variance Test for Normality (Complete Samples)," *Biometrika*, 52 (3/4), 591-611.