

Political Style, Individual Preference and Consumption Pattern: A Behavioral Approach

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Abstract:¹

This paper studies the connections between culture, political systems and consumption. Panel data from 67 countries are analyzed from the perspective of the quasi-hyperbolic discounting model and its proposed determinants in the realms of political systems and cultural factors. From the perspective of cultural preferences, long-term orientation will restrain people's consumption, while individualism is usually associated with excess purchase. The results also indicate that in characterizing a nation's political style, transparency in public sectors has a strong positive impact on individual's consumption behavior, while corruption and government intervention reduces people's demand. Inspired by the policy efforts to stimulate domestic demand in China, this study furthers the analysis of the relationship between culture and consumption behavior

Key Words: National Culture; Individual Preference; Consumption; Hyperbolic Discounting

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1. Introduction

In the year 2015, the Chinese government was committed to carrying out reforms to upgrade Chinese economy, such as optimizing resource allocation and stimulating the sluggish domestic demand.² Since its reform and liberalization, Chinese economy has experienced a period of rapid development, characterized by high saving rates and low consumption levels. However, in 2015, domestic expenditure only accounted for 50.83% of GDP, which was well below that of developed countries. By comparison, this figure was 64.55%, 76.42%, 82.55%, and 84.48% for Korea, Japan, the US, and the UK, respectively. Since 2000 onwards, Chinese consumption level has remained relatively low. Zhou (2014) found that consumption had a positive relationship with economic growth and that consumption was viewed as the most effective momentum for a sustainable economic growth in China. Li (2015) noted that an increase in consumption demand would magnify, then translate to economic growth in various sectors throughout the value chain. From this angle, it is not difficult to identify the sources of the slow-down in economic growth in China during the past few years.

What is the root cause of low consumption in China compared to other countries? Scholars have managed to explain such phenomenon from the perspectives of precautionary savings behavior, buffer stock savings and liquidity constraints, for instance, Ren and Qin (2006) and Yi et al. (2008). Few of these empirical studies have ever touched upon issues of individual cultural perceptions, with the exception of Ye et al. (2012), which used Confucianism and self-control to explain national consumption differences. One reason why scholars seldom conducted cultural analysis is that culture is often too vague to quantify for the purpose of empirical analysis.

This paper attempts to integrate culture into a behavioral framework to understand the extent to which culture influences consumption and the implications it will have for policy-making. Currently, the Chinese government has implemented a series of economic transformation policies to boost the economy. Ever since 2000 savings rates have remained high, hindering the national consumption. Consumption as a fraction of GDP only grows at 0.3% annually, which means that policies guided by the traditional theories of precautionary savings, buffer-stock theory of savings, and liquidity constraints failed to stimulate domestic demand.

Figure 1 suggests that differences in consumption levels seem smaller within continents of the world, especially for countries sharing borders. For those Asian countries including China, Japan and Korea, consumption seems much less than those of European and American countries of similar industrialization levels. However, lower consumption does not necessarily mean that the total income and wealth of these countries is below that of the Western developed countries. From some economic benchmarks, China, Japan and Korea outperform other industrialized nations. This again suggests that traditional consumption theories based largely on income alone cannot explain this discrepancy between countries. It is possible that geographical factors, such as similar cultural heritages shared by contiguous countries are driving reasons that account for such differences. Our study furthers the understanding of consumption culture by allowing political style, personal cultural preferences such as individualism and long-term orientation, to differ across countries. In this way, cultural impacts on consumption behavior can be taken into consideration. The analysis broadens

² Ouyang et al. (2016) did an empirical research based on the Threshold Cointegration Model with the annual data ranging from the year of 1955 to 2013. They found that the key to transform the investment-driven Chinese economy to one pulled by demand, was to enlarge the relative proportion of domestic consumption. To achieve this, a reform in the supply side would enable markets to cater to consumers' needs.

the horizon for policy-making as an effort to help economies which are currently less consumption driven to prosper.

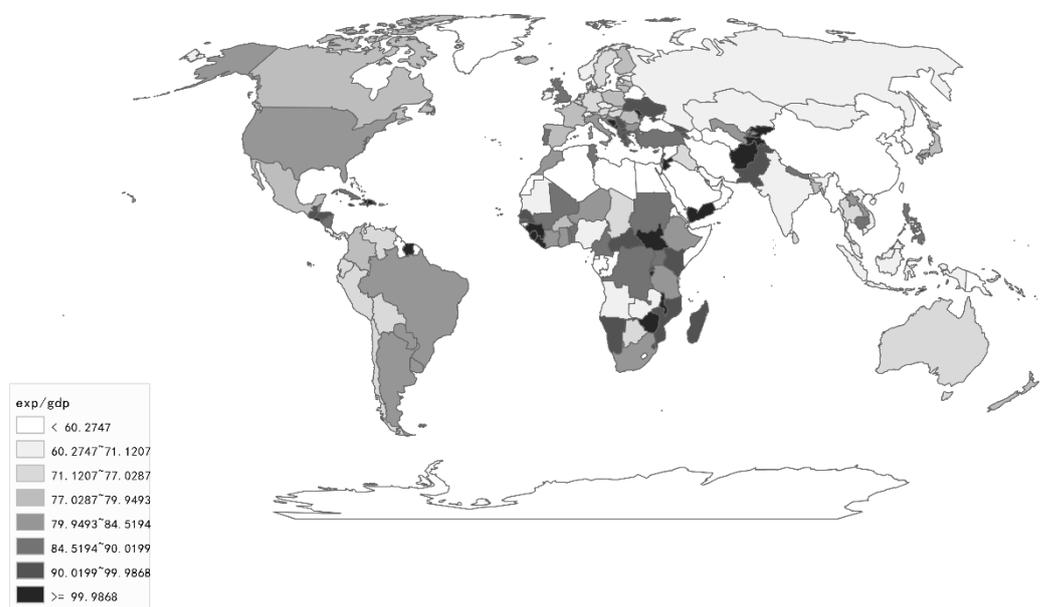


Figure 1: Different consumption levels in 2015 throughout the world

Note: The data describe the ratio of final consumption expenditure to GDP (denoted by *Consumption*)³ in the year of 2015 and cover 176 countries, which can be sourced to the World Bank database.

The main contributions of this paper are threefold: First, at the theoretical level, a quasi-hyperbolic discounting model is introduced to provide a framework for understanding the mechanism of abnegation of consumption. Political styles and individual cultural preferences help shape people's consumption inclinations through their valuation of consumption during different time periods. Second, at the empirical level, corruption, transparency and government intervention indices are used to describe the political style of a country, while equality of power, individualism, long-term orientation and self-restraint characterize individuals' cultural perceptions. With cross-national panel data, the mechanism of how culture affects people's consumption behavior is analyzed by way of conscious self-restraints on consumption. Third, this paper provides novel insights to policy-making to stimulate the sluggish domestic demands hindering Chinese economic growth and that of other countries.

The structure of this paper is as follows: In Section 2, a literature review is presented to show the previous work on the determination of consumption behavior. In Section 3, a detailed analysis and discussion is conducted to describe how cultural preferences affect consumption via the quasi-hyperbolic discounting model. Next, results of the empirical analysis of the relation between culture and consumption are shown in Section 4. Section 5 provides policy recommendations. Section 6 concludes the paper.

2. Literature Review

³ *Consumption*, defined as the ratio of final consumption expenditure to GDP, is the dependent variable in the empirical analysis of this study.

2.1 Traditional consumption models

The earliest studies on consumption behaviors can be dated back to *The General Theory of Employment, Interest, and Money* written by Keynes in 1936. Keynes then introduced the concept of propensity to consume, which stated that consumption had a positive relation with income and that such inclination decreased as income increased. However, Keynes's theoretical framework could not specifically explain the abnormal consumption and savings behavior after the Great Depression. Pigou (1943), Brady and Friedman (1947), and Duesenberry (1949) then developed the Absolute Income Theory as well as the Relative Income Theory. These theories all suggest a positive relationship between consumption and income. However, they did not analyze consumption behavior across several time periods, and such limitation was overcome by the intertemporal analysis. Modigliani and Brumberg proposed the Life-cycle Hypothesis in 1954, in which consumers smoothed their lifetime expenditure according to the life cycle of income and of consumption "needs" of households. The Modigliani and Brumberg model started from the utility function of an individual consumer: one's utility was assumed to be a function of his own aggregate consumption in current and future periods. The individual was then assumed to maximize his utility subject to the resources available to him, with his resources being the sum of current and discounted future earnings over his lifetime and his current net worth. Later, Friedman (1957) proposed the Permanent Income Hypothesis, in which income could be categorized as permanent or temporary and that consumption was a function of permanent income.

Apart from these traditional views such as Income Theory, Life-cycle Hypothesis and Permanent Income Hypothesis, scholars also proposed theories such as Precautionary Savings and Liquidity Constraint. Early in 1954, Modigliani began to elaborate on how uncertainties affected savings. He maintained that precautionary motives and buying durable goods in advance were exactly how uncertainties influenced people's saving and consumption behavior. Leland then in 1968 initiated Precautionary Savings by using the two-period consumption model and suggested that savings could help avoid future potential risks to some extent. Sibly (1975) and Miller (1976) improved upon this theory by extending the model into more periods and came to the same conclusion. Deaton (1989) asserted that consumers who were more prudent and earned relatively unstable income tend to maintain higher levels of precautionary savings, and thus lower levels of consumption. Zeldes (1989) and Dynan (1993) went further by proving that uncertainty avoidance caused individuals to consume less and save more. Moreover, Kimball (1990) showed that under standard assumptions about utility and expectations, the introduction of uncertainty in noncapital income increased the marginal propensity to consume (MPC) at a given level of consumption, but not necessarily at a given level of wealth; and Carroll and Kimball (1996) showed that the introduction of uncertainty caused the marginal propensity to consume to rise at any given level of wealth, and to increase more for consumers at lower levels of wealth. On the basis of the work of Dreze and Modigliani (1972), Kimball and Weil (2009) found that the elasticity of precautionary motive to uncertainty avoidance was greater than 1 for consumers. Therefore, individuals might overreact by consuming far less than the optimal amount. Another theory concerning consumption was that of Liquidity Constraints. In 1989, Zeldes thought that individuals might cut down on spending to avoid liquidity frustrations. Besides these, Carroll (1992, 1997, 2004) initiated the Buffer Stock Savings Theory in which individuals continuously sought a balance between consumption and permanent income to maintain wealth at a certain level and smooth the lifetime consumption. However, Jappelli and Modigliani

(1998) argued that consumption behavior was only determined by personal preferences, and that it had nothing to do with wealth.

These traditional theories are relevant to this day. Scholars have carried out empirical analysis to prove the effectiveness of Life-cycle Hypothesis, Liquidity Constraints and Buffer Stock Savings Theory. For example, Carroll (2009) used a Constant Relative Risk Aversion utility function to elaborate that people's marginal propensity to consume declines when facing a shock, which showed the existence of precautionary savings afterwards. In a cross-country analysis, Selvanathan and Selvanathan (1993) found that tastes for consumption are significantly different among OECD countries.

2.2 Behavioral models on consumption

From a behavioral economics' point of view, personal preferences affect consumption behavior as well. Evidence has shown that consumers' preferences do not always agree with the classical hypotheses, and are featured by hyperbolic preferences and time inconsistency, in which short-run preferences can bring more instantaneous benefits than long-term orientations. Throughout history, discussions over consumption and savings were based on the utility optimization framework, with the Standard Discounting Model proposed by Modigliani and Brumberg (1954) as the foundation. The model could be written as $U(c_1, c_2, \dots, c_T) = \sum_1^T \delta^{t-1} * u(c_t)$, and it assumed that each consumer lived for T periods. In each period, individual was to purchase the amount of c_t of goods, and δ represents the fixed (exponential) time discounting factor. Individuals then decide for themselves the amount of consumption that maximizes their utility. Laibson (1997) then improved this model by introducing β as the parameter of present-bias, which represents the taste for instant gratification, thus introducing the quasi-hyperbolic discounting model. The main difference from the standard exponential discounting model is that optimal consumption paths will vary over time as consumers continuously make decisions for the maximization of utility. The principle remains the same in that consumers will maximize $U(c_t) + \beta[\sum_{k=t+1}^T \delta^{k-t} u(c_k)]$ over time.

Applying the above model towards empirical analysis, Angeletos et al. (2001) found that many consumers did not make optimal consumption decisions. Bernheim and Rangel (2005) proposed an alternative savings model, in which individuals were allowed to make mistakes. Another two theoretical models for self-control and consumption are Gul and Pesendorfer (2001), who proposed temptation averse preferences, and Fudenberg and Levine (2006), who adopted a dual-self assumption. Wang and Zheng (2012, 2015) extended the individual decision-making model by Fudenberg and Levine (2006) to a game-theoretical framework. Instead of from the dynamic consumption perspective, Lien and Zheng (forthcoming) studied consumers' self-control problem across different domains of activities including consumption in food.

Based on these previous studies, the current study takes hyperbolic preferences and time inconsistency into the analysis of consumption behavior. It divides individuals into two groups to allow the degree of consumption self-restraints to differ structurally.

2.3 Population aging and a prudent culture

Based on the Life-cycle Hypothesis, Suarez (1983) and Palsson (1996) stated that people's awareness of risk-aversion increased as they grew older. However, Riley and Chow (1992) argued that an individual's risk attitude represented a U shape: before retirement, risk-aversion decreases over time and then increases after the break point. Bakshi and Chen (1994) carried out empirical

analysis of risky investments to test the Life-cycle Risk Aversion Hypothesis. The result suggested that people's relative risk aversion increased with age. Similarly, Ma and Li (2011) found that people aged above 45 were more risk-averse in terms of venture investment in China. Risk attitude could thus directly influence people's saving and consumption behavior.

Based on these empirical analyses, this paper hypothesizes that as people grow older, they will become more prudent and cautious so that the propensity to spend becomes weaker.

2.4 National culture

Geert Hofstede proposed the Cultural Dimensions Theory based on the studies of how values in the workplace were influenced by culture. He collected employee value scores within the company IBM in more than 70 countries and the respondent groups were then extended to commercial airline pilots, students, civil service managers, 'up-market' consumers and 'elites' to validate the earlier results. It is by far the most convincing studies on culture. Hofstede defined culture as "the collective programming of the mind distinguishing the members of one group or category of people from others." Assisted by Gert Jan Hofstede, Michael Minkov and their research teams, Hofstede asserted that culture could be subdivided into six dimensions as power distance, individualism, uncertainty avoidance, masculinity, long-term orientation and indulgence. The last two dimensions were added based on the empirical studies conducted among the southeast Asia countries and that long-term orientation and self-restraint were believed to be associated with Confucianism. In the 2010 edition of the book *Cultures and Organizations: Software of the Mind*, scores on the dimensions were listed for 76 countries, partly based on replications and extensions of the IBM study on different international populations and by different scholars.

Their study proposed several key concepts to characterize the different cultures. Power distance expresses the degree to which individuals accept inequality of power. In countries with a high-power distance, a hierarchical order prevails. However, people strive to equalize the distribution of power and demand justification for inequalities of power in countries with a low degree of power distance. A country's position on the dimension of individualism is reflected in whether people focus more on self-recognition and self-realism. Masculinity represents a preference in society for achievement, heroism, assertiveness and material rewards for success. Society at large is more competitive. Its opposite, femininity, stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented. More than these, the uncertainty avoidance dimension expresses the degree to which the members of a country feel uncomfortable with uncertainty and ambiguity. In addition, countries that score high on long-term orientation think highly of pragmatism, which encourages thrift and efforts in modern education as a way to prepare for the future. Indulgence occurs in a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint characterizes a society that suppresses gratification of needs and regulates it by means of strict social norms.

At first, dimensions of long-term orientation and indulgence were proposed to elaborate the culture shared by 23 Asian countries, which was supposed to be Confucianism. The analysis then extended to 76 countries and that the opposite sides of these dimensions were added to enable quantification for countries worldwide. It proposed that long-term orientation and self-restraint were closely related to Confucianism. However, long-term orientation does not necessarily bring about a culture of restraint in desire. This paper conducts a correlation analysis regarding the different dimensions of culture and finds that the correlation coefficient is only -0.53 between long-term

orientation and indulgence. Being moderately correlated, it's necessary to separate the two dimensions when analyzing their effects on consumption. Therefore, this paper makes an advancement on the study by Ye et al. (2012), which implemented Confucianism as a dummy variable without separating these two dimensions into the analysis. The Hofstede approach has been used by Kristjansdottir et al. (2017) to study the relationship between national culture and international trade.

The Economic Intelligence Unit utilizes the Country Risk Model, which provides risk scores and ratings of six risk categories, including sovereign debt, currency, banking sector, political, economic structure, and overall country risk. Each category contains 10 variables and by adjusting the weights of these 60 aspects, attention can be drawn to different risk categories. There are three aspects concerning the political risk a country faces, which are corruption, transparency in public sectors and state intervention in banks. This paper operates under the premise that governance style, characterizing a country's political culture, is consistent across time. Hence we adopt the score assessed in February to represent the entire year, and these data originate from the EIU (Economist Intelligence Unit) Country Risk Model. In this way, countries' political culture could be quantified to conduct the analysis.

2.5 Summary

In general, traditional theories concerning individuals' consumption behavior as Life-cycle Hypothesis, Liquidity Constraint and Precautionary Savings have been elaborated thoroughly. However, these theories all focus on financial factors. So far, few scholars have ever referred to the issue of culture, until Ye et al. (2012) who made self-control the explanatory variable and took Confucianism into consideration. Though providing new insights into the consumption analysis, their work did not distinguish the different perspectives of Confucianism. Our work overcomes such limitation and advances the study of consumption pattern due to cultural factors. It aims to uncover the internal mechanism of how national political culture and individual cultural preferences affect consumption in order to provide guidance to policy-making to stimulate the sluggish domestic demands.

3. Model and Hypothesis

We adopt the quasi-hyperbolic discounting model proposed by Laibson (1997), which can be represented by a lifetime utility function of $U(c_t) + \beta[\sum_{k=t+1}^T \delta^{k-t} u(c_k)]$. Hyperbolic discount functions are characterized by a comparatively high discount rate over short horizons and a relatively low discount rate over longer horizons. This discount structure sets up a conflict between today's preferences, and the preferences that will be held in the future. The discount factors can thus be written as $(1, \beta\delta, \beta\delta^2, \dots, \beta\delta^t)$. This model could be applied in the analysis of individual's inconsistent consumption behavior over time. c_t represents the consumption amount an individual determines for period t , and δ is the discount factor between any two successive periods. In addition, β shows an individual's cognitive deviation from the optimal choice. Based on the discount function, the favorable consumption level will be different across time. More than that, Krusell et al. (2002) pointed out that: If $\beta = 1$, individuals had standard, time-consistent, geometric preferences; When $\beta \neq 1$, there was time inconsistency at period 0, and the trade-off between periods 1 and 2 was perceived differently from period 1. To be more specific, if $\beta > 1$, individuals felt an incentive to

save excessively, and if $\beta < 1$, individuals had a strong compulsion to consume. Using the hyperbolic discounting model, we further the studies of self-control and consumption behavior as elaborated by Koszegi (2005). The self-denial on consumption arises from the degree of egotism (or individualism), choice between long-term and short-term orientation and so on. The mechanism of self-restraint can be represented as $\beta > 1$ in the hyperbolic discounting model. Besides these, we extend the group analysis used in Ye et al. (2012) by classifying consumers according to their ages. As stated in the previous sections, different age groups have distinctive preferences regarding uncertainties. In summary, this paper takes culture into consideration to elaborate the factors that cause the consumption level to differ across countries.

Under a political culture featured by corruption, opaque government operations and high intervention in financial sectors, individuals are more tolerant with inequality of power, and individualism therefore is not the dominant personal preference. Those who perform self-restraint, are more prudent and cautious which is in line with the pursuit of long-term development. Self-denial of satisfaction of desire will bring about low consumption levels, which under the hyperbolic discounting preferences is represented by $\beta > 1$. In the following section, we will further the analysis of such a mechanism as consumption self-restraint.

Basic model:

For simplicity, we assume that each individual lives for three periods, $t = 0, 1, 2$, while $t = 0$ represents a dynamic planning period, $t = 1$ represents an endowment period where an individual receives a wealth of W ,⁴ and consumption takes place in both periods 1 and 2. To maximize his lifetime utility, an individual optimally allocates his wealth either in consumption or investment.⁵ In period 0, an individual will make a plan for his optimal allocation of wealth between consumption and investment in period 1. This is also a choice between long-term and short-term orientation. When period 1 arrives, an individual will implement his allocation of wealth to maximize his utility from periods 1 and 2.

Let I represent the amount of investment (or saving) in period 1, thus $(W - I)$ is the amount for consumption in period 1. Since investment can generate return, for which we use R to denote the rate of return, in period 2, a wealth of $I(1 + R)$ is received by the individual and is spent for consumption at that period. We assume that the utility from a consumption level of C is $u(C)$, where $u(\cdot)$ is an increasing and concave function. In addition, we assume that investment I has a direct psychological utility gain of $v(I)$ to the individual in period 1, where $v(\cdot)$ is also an increasing and concave function.

According to the hyperbolic discounting model, in period 0, the discounting structure is $(1, \beta\delta, \beta\delta^2)$ for the 3 periods. In period 0, the decision maker's utility maximization problem is as follows:

$$\text{Max}_I \beta\delta \cdot [u(W - I) + v(I)] + \beta\delta^2 \cdot u(I(1 + R)) \quad (1)$$

Therefore, the optimal level for planned investment is uniquely determined by:

$$u'(W - I_0^*) = v'(I_0^*) + \delta(1 + R)u'(I_0^*(1 + R)) \quad (2)$$

However, when period 1 arrives, the decision maker has a different utility maximization

⁴ For simplicity, we assume that the wealth W is exogenously given. Similar results can be obtained by allowing individuals to make labor supply decisions through their utility maximization problem.

⁵ Investment in this paper is in its broadest meanings, which includes any behavior as an effort to accumulate wealth (i.e. earn financial profits) other than consumption.

problem, as follows:

$$\text{Max}_I [u(W - I) + v(I)] + \beta\delta \cdot u(I(1 + R)) \quad (3)$$

The optimal implemented investment level is uniquely determined by:

$$u'(W - I_1^*) = v'(I_1^*) + \beta\delta(1 + R)u'(I_1^*(1 + R)) \quad (4)$$

Comparing equations (2) and (4), due to extra parameter of β in the last term in equation (4), the optimal choices for investment (and consumption) differ in period 0 and period 1. Such difference is caused by self-restraint. If $\beta < 1$, implemented investment at period 1 (I_1^*) is less than the optimal planned investment at period 0 (I_0^*), which implies over-consumption at period 1; If $\beta > 1$, individual has self-denial of consumption and the precautionary investment is greater than the optimal planned amount ($I_1^* > I_0^*$); If $\beta = 1$, individual makes time-consistent purchase decisions. We characterize these findings in the following proposition.

Proposition 1: When $\beta < 1$, $I_1^* < I_0^*$; When $\beta > 1$, $I_1^* > I_0^*$; When $\beta = 1$, $I_1^* = I_0^*$.

Note that in our model for simplicity, we assume individuals only consume in two periods and hence only save once. It can be easily extended to the case of more than two periods and individuals can therefore save (or invest) in multiple periods, and our main result still holds. Since there is a negative relationship between saving and consumption, countries with a population of low β is featured by a high propensity to consume and a high consumption level, while countries with a population of $\beta > 1$ will present a pattern of low consumption level. Based on this reasoning, we propose our first hypothesis for empirical testing.

Hypothesis 1: Consumption has a negative relation with abnegation as determined by cultural preference. The greater the β , the greater the self-repression and the lower the consumption level.

Extended model:

Based on the previous analysis, a society's aging problem will bring about a prudent culture, in which people tend to have a high precautionary motive and that it will have a direct negative impact on the domestic consumption. To extend our basic model, we now divide individuals into two age groups, with the first having a high level of self-restraint represented by the elderly population and the second being more indulgent. The first group, consist of old people, takes the share of θ in the society, and the second group, made up of young people, takes up $(1 - \theta)$ in the society. The discount factors between present and future are β^O and β^Y for the two groups respectively. (Note: $\beta^O > \beta^Y$.)

In period 0, the overall utility model for the society is as follows:

$$\theta\{\beta^O \delta \cdot [u(W^O - I^O) + v(I^O)] + \beta^O \delta^2 \cdot u(I^O(1 + R))\} + (1 - \theta)\{\beta^Y \delta \cdot [u(W^Y - I^Y) + v(I^Y)] + \beta^Y \delta^2 \cdot u(I^Y(1 + R))\} \quad (5)$$

The optimal planned investment choices are thus determined by:

$$u'(W^O - I_0^{O*}) = v'(I_0^{O*}) + \delta(1 + R)u'(I_0^{O*}(1 + R)) \quad \text{and} \\ u'(W^Y - I_0^{Y*}) = v'(I_0^{Y*}) + \delta(1 + R)u'(I_0^{Y*}(1 + R)) \quad (6)$$

In period 1, the overall utility model for the society becomes:

$$\theta\{[u(W^O - I^O) + v(I^O)] + \beta^O \delta \cdot u(I^O(1 + R))\} + (1 - \theta)\{[u(W^Y - I^Y) + v(I^Y)] + \beta^Y \delta \cdot u(I^Y(1 + R))\} \quad (7)$$

The optimal implemented investment choices are thus determined by:

$$u'(W^O - I_1^{O*}) = v'(I_1^{O*}) + \delta(1 + R)u'(I_1^{O*}(1 + R)) \quad \text{and}$$

$$u'(W^Y - I_1^{Y*}) = v'(I_1^{Y*}) + \delta(1 + R)u'(I_1^{Y*}(1 + R)) \quad (8)$$

Since $\beta^O > \beta^Y$, assuming $W^O = W^Y = W$, it is easy to show that $I_1^{O*} > I_1^{Y*}$. Since the total investment of a society is $I_1^{Total*} \equiv \theta I_1^{O*} + (1 - \theta)I_1^{Y*}$, given $I_1^{O*} > I_1^{Y*}$, we can easily conclude that the greater θ is, the higher the total investment is. We summarize these findings in the following proposition.

Proposition 2: Assuming $W^O = W^Y = W$ and $\beta^O > \beta^Y$,

$$(1) I_1^{O*} > I_1^{Y*}; (2) \frac{\partial I_1^{Total*}}{\partial \theta} > 0.$$

Based on the results in Proposition 2, we should observe in reality that in societies with a severe aging problem, consumption self-restraint will be enhanced. This gives our second hypothesis.

Hypothesis 2: Self-repression in consumption behavior is greater for countries with a large elderly population characterized by a large θ .

4. Empirical Analysis

4.1 Data and basic statistical analysis

The panel data includes 67 countries ranging from the year of 2000 to 2015 and can be sourced to the World Bank.⁶ These countries cover all the G20 countries, and their total GDP accounts for more than 90% of the world economy. The quantitative cultural dimension originates from *Cultures and Organizations: Software of the Mind* written by Hofstede in 2010 (for measures on individual preferences) and the EIU Country Risk Model (for measures on political styles).⁷

Table 1: Variables, statistics, and data resources

Variable	Mean	Std Err	Min	Max	Definition and sources of data
<i>Age</i>	10.09	5.65	1.85	26.34	The percentage of people aged 65 and above in the entire population ^①
<i>Consumption</i>	77.52	12.30	38.71	107.62	The percentage of final consumption expenditure in GDP ^①
<i>Corpt</i>	2.75	1.17	0	4	Corruption, [0,4] ^③
<i>Credit</i>	85.84	63.26	-16.38	357.32	The percentage of domestic credit provided by financial sectors to GDP, and it reflects the development of financial market ^①
<i>Indiv</i>	40.41	22.65	6	91	Individualism, [0, 100] ^②
<i>Indul</i>	47.31	23.46	0	100	Indulgence, [0, 100] ^②
<i>Lgdppc</i>	8.89	1.48	5.01	11.67	Per capita GDP in logarithm (current dollars) ^①
<i>LTO</i>	43.44	23.30	4	100	Long-term orientation, [0, 100] ^②
<i>PD</i>	63.84	20.88	13	100	Power distance, [0, 100] ^②
<i>Rint</i>	5.40	9.00	-60.80	93.92	Real interest rate ^①

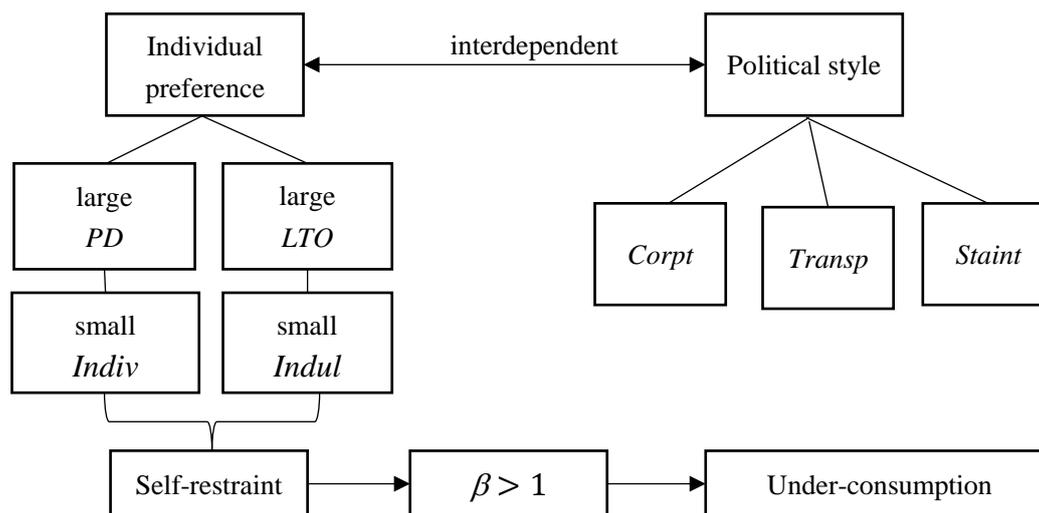
⁶ These countries are Angola, Albania, Argentina, Australia, Bangladesh, Belgium, Bulgaria, Brazil, Canada, Switzerland, Chile, China, Colombia, Czech Republic, Denmark, Dominica, Egypt, El Salvador, Estonia, Finland, France, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, Indonesia, India, Iran, Ireland, Iceland, Israel, Italy, Jamaica, Jordan, Japan, Kenya, Korea, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Malta, Mexico, Morocco, Mozambique, Malawi, Malaysia, Namibia, Nigeria, Netherlands, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Saudi Arab, Serbia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Thailand, Trinidad and Tobago, Tanzania, Turkey, Ukraine, Uruguay, United Kingdom, United States, Venezuela, Vietnam.

⁷ Country data of the political variables are listed in Table A1 in the appendix.

<i>Saving</i>	11.16	10.91	-41.64	53.12	The percentage of savings to GDP ^①
<i>Staint</i>	1.99	1.07	0	4	State intervention in banks, [0,4] ^③
<i>Transp</i>	1.83	1.09	0	4	Transparency in public sector (a lower score referring to a higher level of transparency) ^③

Note: Numbers ① to ③ represent different data sources: ①. World Bank; ②. *Cultures and Organizations: Software of the Mind*; ③. EIU Country Risk Model.

4.2 Mechanisms in the formation of consumption pattern



The logic of this paper is that since governmental style remains consistent within a generation, a political culture is formed this way. Not only is the political style a reflection of individual cultural preferences, but also it helps shape the habits and preferences of individuals. Such cultural perception can be further subdivided into different dimensions as power distance, individualism vs collectivism, long-term vs short-term orientation, and indulgence vs self-restraint. Moreover, individual saving behavior is affected by the cultural preferences, which determines the aggregate level of saving within a country. The discount factor β can be used to explain saving pattern for different countries. Since consumption and saving are negatively related, if $\beta < 1$, then individuals have the propensity to overconsume at the present, which is reflected by the high consumption level. Furthermore, if $\beta > 1$, the precautionary demand for wealth accumulation (in the form of investment or saving in this paper) is greater so that consumption level is lower comparatively. This paper aims to analyze the internal mechanism of culture's influence on consumption, through both channels of national political culture and individual cultural preferences.

To compare the difference between national consumption levels quantitatively, this paper makes the percentage of final consumption expenditure to GDP (*Consumption*) the dependent variable to quantify national consumption level, and uses per capita GDP (*Lgdppc*), real interest rate (*Rint*), the percentage of domestic credit provided by financial sectors in GDP (*Credit*) as the control variables suggested in the previous literature.

Political culture can be measured from three perspectives, corruption (*Corpt*), transparency in public sectors (*Transp*) and state intervention in banks (*Staint*). Yang and Zhao (2004) found that corruption would lead to an increase in the purchase of luxury goods and thus raise the overall consumption level of a country. Nevertheless, we hypothesize that corruption will lead to a declining

consumption level since it entails a culture of submissiveness and prudence. Individuals will postpone their consumption behavior and increase the relative proportion of investment in their allocation of wealth. Besides, suppose individuals are rational and forward-looking, they are likely to further cut down their expenses to avoid future frustration brought by uncertainties. In a transparent political environment, individuals will have clearer understanding about risks at both microeconomic and macroeconomic levels. Therefore, eliminating the motive of precautionary investment can stimulate consumption. From this perspective, transparency will raise the consumption level. Similar analysis can be applied to state intervention in banks. It is widely acknowledged that a market economy will facilitate effective allocation of resources, thus accelerating economic growth. A high intervention in banks not only empowers government officials, which might bring about corruption, but also make public sectors more opaque. Indeed, Zhang and Wan (2004) found that liquidity constraints and increased uncertainty during the post-reform period in China was responsible for low consumption levels.

The political culture can represent values and beliefs shared by individuals in a society, which is a type of cultural preference as well. Such cultural perception can be reflected in individuals' degree of egotism, acceptance towards inequality of power, degree of long-term/short-term orientation, and degree of self-restraint/indulgence. A transparent and upright political environment promotes self-recognition and realism, which mitigates the motive for precautionary savings or investment, leading to a culture of individualism. In such a society, individuals are likely to have little acceptance towards power distance, since such culture encourages self-expression. In addition, a culture which is long-term oriented, focuses more on long-run development instead of short-run satisfaction. Therefore, people in such a society tend to have stronger motive for self-restraint. Present-focused preferences represent a kind of short-sightedness with which people might indulge themselves in overconsumption as they see little need to save and invest for the future. Therefore, a culture of indulgence rather than self-restraint prevails.

To quantify the political culture between countries, this paper adopts the Country Risk Model proposed by EIU, which indicates that *Corpt*, *Transp* and *Staint* will have a negative relation with consumption.⁸ We also use the Hofstede Cultural Dimensions Theory to reflect personal cultural preferences. According to the previous analysis, a culture of individualism usually goes with a high consumption propensity. The division of Long-term Orientation is first put forward to elaborate Confucianism, characterized by pragmatism and frugality, which causes delay in consumption behavior. Therefore, the consumption level is lower than the optimal level at each period, with β greater than 1. After taking income level into consideration, the consumption level falls behind other countries. Moreover, the division of indulgence and self-restraint is also used in the analysis of Confucian Culture. Confucianism strongly advocates abnegation and self-denial of desire. As people consume to satisfy the intrinsic desire, a culture of self-restraint will transfer people's desire for happiness at the present to seeking long-run development by cutting down consumption. Long-term Orientation and Self-restraint are two representative perspectives of Confucianism, which leads to a low consumption level. In this paper we assume that *PD*, *LTO*, *Indiv* and *Indul* may have different impacts on consumption behavior and that it is more appropriate to separate them especially in the analysis of the cultural influence on consumption.

The preference structure for uncertainties can be elaborated by dividing population into two age

⁸ By EIU Country Risk Model, a country which scores high on transparency in public sectors indeed has an opaque political culture.

groups. As discussed in the previous sections, an aging population help shape a more prudent culture, which increases individuals' precautionary needs to save or invest rather than consume. Let the percentage of people aged above 65 in the entire population (*Age*) represent the aging structure. A country that scores higher on *Age* tends to have fewer propensity to consume (**Hypothesis 2**).

Based on the discussion above and our two hypotheses, we expect to see the following pattern on the relation between cultural variables and consumption, shown in Table 2.

Table 2: Relations between consumption and chosen variables

Variable	<i>Age</i>	<i>Corpt</i>	<i>Transp</i>	<i>Staint</i>	<i>PD</i>	<i>Indiv</i>	<i>LTO</i>	<i>Indul</i>
Sign	negative	negative	negative	negative	negative	positive	negative	positive

In Table 2, a negative sign means that an increase in the variable leads to a decrease in consumption, whereas a positive sign means that an increase in the variable leads to an increase in consumption. Since a higher level of *Corpt*, *Transp*, *Staint*, *PD*, and *LTO* is associated with a greater β , by Hypothesis 1, we should expect to see a lower consumption level for countries of this type. Similarly, since a higher level of *Indiv* and *Indul* is associated with a smaller β , by Hypothesis 1, we should expect to see a higher consumption level for countries of this type. Last, since a higher level of *Age* means a larger θ , by Hypothesis 2, we should observe a lower consumption level.

4.3 The regression model

To estimate the impact of governmental culture (political style) on consumption, we use a Fixed Effects Model, where X_{it} are explanatory variables representing age structure (*Age*) and political culture, the latter including corruption (*Corpt*), transparency in public sectors (*Transp*) and state intervention in banks (*Staint*). $Control_{it}$ are control variables, including per capita GDP (*Lgdppc*), real interest rate (*Rint*) and the degree of financial development (*Credit*).

$$Consumption_{it} = \alpha X_{it} + \gamma Control_{it} + \delta_t Year_t + c + u_{it}$$

Since there is only one observation for each country concerning each cultural division throughout these years from the Hofstede Cultural Dimensions Theory, no data is available for the trend analysis. Because this paper only uses data from the year 2000 to 2015, we make a reasonable assumption that culture is relatively stable and will not experience drastic changes during this relatively short time horizon. Therefore, in our analysis the four divisions characterizing a country's culture are consistent during these years. Overlooking annual differences in the four divisions, we then use a Random Effects Model.

$$Consumption_{it} = \alpha X_i + \gamma Control_{it} + \sigma X_i Confuc_i + \delta_t Year_t + c + u_{it}$$

X_i are the cultural variables including *PD*, *Indiv*, *LTO* and *Indul*. *Confuc* is a dummy variable for countries under the influence of Confucianism. *Confuc* is 0 for countries outside the Confucian cultural circle, and 1 for those that have a Confucian heritage.⁹

We then use the OLS regression method on a year by year basis to demonstrate the robust effect of culture on consumption and to conduct a trend analysis. In other words, for each year we implement

$$Consumption_i = \alpha Lgdppc_i + \sigma Indiv_i + \gamma LTO_i + c + u_i$$

⁹ Countries that score 1 in *Confuc* include China, Indonesia, Japan, Korea, Malaysia, Philippines and Vietnam.

Coefficients are then compared across years to observe the changing effects of the explanatory variables over time, given repeated cross-sections of countries.

4.4 Empirical results

We first investigate the correlation between political cultural variables and individual cultural preferences variables, and the results are listed in Table 3.

Table 3: Correlation analysis of political culture and individual preferences

Variable	<i>PD</i>	<i>Indiv</i>	<i>LTO</i>	<i>Indul</i>	<i>Corpt</i>	<i>Staint</i>	<i>Transp</i>
<i>Corpt</i>	0.48	-0.46	-0.14	-0.15	1.00		
<i>Staint</i>	0.40	-0.44	-0.12	-0.17	0.70	1.00	
<i>Transp</i>	0.49	-0.39	-0.26	0.00	0.62	0.69	1.00

The results indicate that *Corpt*, *Transp* and *Staint* have moderate positive correlations with *PD*, and moves negatively with *Indiv*. Lack of integrity of the government officials and tolerant attitudes among the residents both contribute to the prevalence of corruption. A culture of corruption may create social norms in which people tend to make moral compromises rather than perpetuate an individual sense of ethics. Therefore, the score on *PD* is higher, and self-denial also accounts for a culture of weak individualism. A similar argument can be applied to transparency as well. Furthermore, a statistically strong correlation is shown between the three political culture variables, which is in line with the previous analysis. We can determine that the political culture discussed in this paper is a balance between centralized or decentralized governmental style.

It is also noted that the four dimensions of personal preferences coexist and interact over time. To show this, we conduct a similar analysis on the correlation of the four individual cultural preferences variables, as shown in Table 4.

Table 4: Correlation analysis of individual preferences

Variable	<i>PD</i>	<i>Indiv</i>	<i>LTO</i>	<i>Indul</i>
<i>PD</i>	1.00			
<i>Indiv</i>	-0.71	1.00		
<i>LTO</i>	-0.08	0.24	1.00	
<i>Indul</i>	-0.26	0.12	-0.46	1.00

We observe that *Indiv* has a strong negative relation with *PD*, and that *Indul* has a moderate negative relation with *LTO*. One interpretation is that strong individuality may lead to a preference for decentralization of authority as individuals are willing to be involved in the policy-making procedure. Thus, acceptance towards inequality is weaker and desire for individual pursuit of utility is stronger, which may lead to a high consumption level. Furthermore, long-term orientation is related to pragmatism and the motive for self-restraint is stronger.

Table 5: Political impact on consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Lgdppc</i>	-2.28***	-3.16**	-3.16***	-2.92***	-3.45***	-3.60***	-3.36***
	(-2.67)	(-2.42)	(-4.76)	(-4.30)	(-3.62)	(-4.36)	(-4.09)
<i>Rint</i>	0.12***	0.11***	0.11***	0.10***	0.14***	0.09***	0.09***

	(4.58)	(4.43)	(5.63)	(5.48)	(5.09)	(4.24)	(4.22)
<i>Credit</i>	0.03*	0.02	0.02***	0.02***	0.04***	0.03***	0.04***
	(1.79)	(1.50)	(2.59)	(2.66)	(2.78)	(2.74)	(2.96)
<i>Age</i>				0.09			
				(0.35)			
<i>Corpt</i>					-4.37**		
					(-2.23)		
<i>Staint</i>						-1.33***	
						(-2.62)	
<i>Transp</i>							-1.03**
							(-2.19)
<i>Constant</i>	94.53***	102.00***	102.00***	99.04***	104.33***	107.20***	104.33***
	(14.27)	(9.85)	(18.75)	(15.99)	(15.73)	(16.17)	(16.02)
<i>Country fixed effects</i>	No	No	Yes	No	No	No	No
<i>Year fixed effects</i>	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1052	1052	1052	1036	814	814	814
<i>Adjusted R²</i>	0.14	0.22	0.89	0.26	0.20	0.23	0.20

Note: (1) ***, ** and * represent significance at 1%, 5% and 10% level separately. The t-values in parentheses are calculated using the cluster robust standard errors. (2) The dependent variable is the percentage of final consumption expenditure in GDP (*Consumption*).

For the first column in Table 5, only variables as suggested in the previous literature are included in the regression. It shows that as income increases, people's propensity to consume declines, as suggested in Keynes's Relative Income Theory. However, our regression shows real interest rate has a significant positive relation with consumption. The literature on the relationship between interest rates and savings has in fact debated the theory and empirical evidence on this issue, which depends on how households respond to higher savings rates, and other factors occurring in the economy simultaneously. Weber (1970) found using US data, that interest rates and aggregate consumption were positively related. Elmendorf (1996) provides an analysis of the interest elasticity of savings in a lifecycle model, deriving various conditions for the relationship between interest rates and savings. Focusing on developing countries, Giovannini (1985) argues that the relationship between interest rate and savings in an international context depends on the financial reform status in countries.

In the second regression, time effects are added to the analysis. For most years, the time dummy variables are significant so we continue to take yearly effects into consideration in the later regressions.¹⁰ However, once country fixed effects are added to this model in the second regression, the R^2 increases by 67% to 89%. This indicates that some time-constant variables within countries such as culture and tradition can explain 67% of the difference in consumption levels. Subsequently, we add national cultural variables into the original regression in column 1 one by one, aiming to open the black box which contains these time-constant factors affecting consumption. In column 4, the age variable is added to the model. While we hypothesize that an aging population tends to result in a lower consumption level through practiced self-restraint, the negative effect is not statistically significant. As an interpretation, the proportion of aging population also indicates the financial and

¹⁰ The dummy variables are not significant for years before 2008, but significant at 1% level for the year dummy variables starting from the year of 2008 to 2015. The F-value is 2.38 for the joint test with the p value of 0.01.

economic development of a country. More advanced economies have a better healthcare system so that the life span of its residents is longer, but may simultaneously have higher consumption ratios. Similarly, in an affluent society people tend to live longer as well. Indeed, the correlation coefficient between *Lgdppc* and *Age* is significant at 0.38.

Corruption is the main variable of interest in column 5, which has a significantly negative effect on consumption. The intuition is that corruption causes inefficiency in the allocation of resources, and as a result, people have less disposable income for consumption. Similarly, as shown in column 6, government intervention in banking institutions tends to reduce people's propensity to consume significantly. In the last column, opaque government policies have a negative relationship with the consumption level. In summary, Table 5 indicates that political culture has a significant influence on consumption behavior.

Table 6: Impact from individual cultural preferences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Lgdppc</i>	-3.95*** (-9.60)	-3.59*** (-8.48)	-4.24*** (-10.37)	-4.25*** (-10.31)	-2.14*** (-4.50)	-1.85*** (-3.84)	-3.00*** (-6.59)	-2.91*** (-6.40)
<i>Rint</i>	0.13*** (6.25)	0.13*** (6.20)	0.13*** (6.29)	0.13*** (6.28)	0.12*** (5.79)	0.12*** (5.77)	0.13*** (5.81)	0.13*** (5.78)
<i>PD</i>	-0.11* (-1.74)	-0.05 (-0.78)						
<i>PD*Confuc</i>		-0.12** (-2.43)						
<i>Indiv</i>			0.13** (2.16)	0.13** (2.16)				
<i>Indiv*Confuc</i>				-0.26** (-2.19)				
<i>LTO</i>					-0.18*** (-4.92)	-0.08 (-1.59)		
<i>LTO*Confuc</i>						-0.13*** (-2.60)		
<i>Indul</i>							0.13*** (3.14)	0.10** (2.09)
<i>Indul*Confuc</i>								0.05 (0.86)
<i>Constant</i>	182.60*** (17.65)	171.59*** (15.67)	177.91*** (17.67)	177.91*** (17.66)	138.42*** (12.42)	128.46*** (11.07)	145.43*** (11.52)	144.49*** (11.83)
<i>sigma_u</i>	10.44	9.84	10.16	10.15	8.78	8.52	10.06	8.98
<i>sigma_e</i>	4.26	4.26	4.26	4.26	3.97	3.97	4.00	4.00
<i>rho</i>	0.86	0.84	0.85	0.85	0.83	0.82	0.86	0.83
<i>Country fixed effects</i>	No							
<i>Year fixed effects</i>	Yes							
<i>N</i>	840	840	840	840	731	731	699	699
<i>overall R²</i>	0.22	0.30	0.25	0.25	0.25	0.32	0.11	0.11

Note: (1) ***, ** and * represent significance at 1%, 5% and 10% level separately. The t-values in parentheses are calculated using the cluster heteroscedasticity robust standard errors. (2) The dependent variable is the percentage of final consumption expenditure in GDP (*Consumption*). (3) Since *Mcredit* is not significant in these regressions, it isn't included in the final regression model.

Table 6 shows how individual preferences affect consumption using a Random Effects specification. The first regression mainly analyzes how power distance is negatively associated with consumption. It indicates that tolerance of power inequality restrains consumers' propensity to spend. Furthermore, results in the second column show that countries under the influence of Confucianism tend to have even lower levels of consumption. The results from column 3 and column 4 indicates that a culture of individualism encourages consumption and that Confucianism restrains people's consumption behavior even if the culture emphasizes self-awareness and self-realism. It can therefore be stated that the β representing future-bias for these countries in the Confucius Circle is larger and that people's motivation for future oriented decisions becomes stronger. Column 5 shows that countries with long-term orientation tend to consume less in order to take up opportunities to accumulate wealth. The result is similar for the interaction term with Confucianism. The seventh and eighth columns show how consumption moves positively with indulgence. All in all, the cultural impacts on consumption can be briefly interpreted as the motive of self-restraint and thus self-denial of consumption. People living in a culture that emphasizes on individualism may be more concerned about self-recognition and self-realism. This may develop into a higher propensity to consume for personal enjoyment and living for the moment. Such cultural features are likely to be short-term oriented and that is how these cultural variables interact with each other. This mechanism can be applied to the analysis of Confucianism, which emphasizes on collectivism, long-term orientation and self-restraint.

We further rank these 67 countries according to their scores on each of the four cultural dimensions. Malaysia and Philippines are among the top five in terms of power distance. Indonesia is ranked third from the bottom in terms of individualism. Moreover, Korea, Japan and China are at the top from the perspective of long-term orientation. Countries in the Confucian Circle all have the tendency to scatter near the two poles in the four dimensions. This again provides evidence on the internal mechanism of how Confucianism affects consumption.

Table 7: Trend analysis of the impact of individual cultural preference on consumption

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
<i>Lgdppc</i>	-4.52*** (-3.55)	-4.87*** (-4.07)	-5.58*** (-4.78)	-5.62*** (-4.39)	-5.89*** (-4.68)	-5.43*** (-4.40)	-4.52*** (-3.75)	-5.88*** (-4.26)	-5.24*** (-3.97)	-5.51*** (-4.05)	-5.35*** (-4.22)	-4.42*** (-4.07)	-4.32*** (-4.30)	-3.86*** (-4.05)	-4.03*** (-4.62)	-3.80*** (-3.75)
<i>Indiv</i>	0.13* (1.96)	0.17** (2.73)	0.21*** (3.40)	0.23*** (3.35)	0.26*** (3.75)	0.25*** (3.71)	0.19*** (2.84)	0.27** (3.16)**	0.24*** (2.98)	0.30*** (3.59)	0.28*** (3.48)	0.18*** (3.45)	0.20*** (3.10)	0.14** (2.31)	0.16** (2.79)	0.16*** (2.46)
<i>LTO</i>	-0.18*** (-3.69)	-0.13*** (-2.84)	-0.12*** (-2.62)	-0.10** (-2.00)	-0.09* (-1.72)	-0.10** (-2.01)	-0.12** (-2.50)	-0.08* (-1.84)	-0.10** (-1.77)	-0.05 (-0.78)	-0.07 (-1.24)	-0.08* (-1.73)	-0.09** (-2.05)	-0.09** (-2.16)	-0.12*** (-3.02)	-0.10** (-2.00)
<i>Cons</i>	110.49*** (10.75)	107.76*** (11.11)	112.71*** (11.73)	109.66*** (10.49)	109.72*** (10.83)	105.59*** (10.74)	103.69*** (11.08)	108.61*** (10.09)	102.89*** (10.08)	97.14*** (9.36)	99.50*** (10.45)	97.49*** (12.09)	98.49*** (13.36)	97.72*** (13.95)	96.89*** (15.04)	92.73*** (12.17)
R^2	0.46	0.43	0.44	0.38	0.38	0.38	0.35	0.32	0.33	0.32	0.33	0.34	0.37	0.36	0.45	0.33
F	11.94	11.32	12.04	9.42	9.70	9.46	8.46	7.42	7.65	7.14	7.67	7.88	8.98	8.85	12.79	7.80
N	62	66	67	67	67	67	67	67	67	67	67	67	67	67	67	67

Note: (1) ***, ** and * represent statistical significance at 1%, 5% and 10% level, respectively. The t-statistics in parentheses are calculated using the white heteroscedasticity robust standard errors. (2) The dependent variable is the percentage of final consumption expenditure in GDP (*Consumption*). (3) The results in this table are from the OLS regression specification using the cross-sectional data.

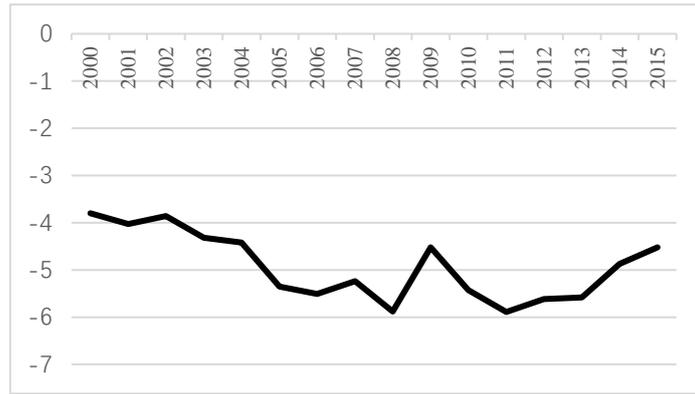


Figure 2: Coefficients of *Lgdppc* in Table 7

Although we cannot apply a fixed effects model in the analysis of country based preferences, one limitation of the random effects model is that not all the hypotheses can be met. Since the pooled OLS method analyzes only the average effects of individual cultural preferences over time and does not include the dynamic year-by-year effect of consumption, the OLS regression method is used on a year by year basis to validate the earlier results and to conduct the trend analysis of the coefficients. Due to collinearity between the variables, regressions in Table 7 only include parts of the cultural variables and the control variable of *Lgdppc* in the analysis. Figure 2 graphs the coefficients of *Lgdppc* and for visual presentation of the findings.

From Note 10, since the year dummy variables are only significant after 2008, it suggests that the overall consumption level rises greatly after 2008. Therefore, in the interpretation of the results in Table 7, this paper divides these 16 years into two periods, with one starting from 2007 to 2015. This shows that during 2007 to 2015, the positive influence of individualism is weakened from time to time. If *Indiv* increases by 1, *Consumption* will rise by 0.13% to 0.27% accordingly. Last but not least, the negative impact on consumption from long-term orientation is enhanced throughout the years. If *LTO* increases by 1, *Consumption* will decline by 0.08% to 0.18%. However, in the year from 2007 to 2009, the fluctuations of the slope coefficients are abnormal. In 2008, the world-wide subprime mortgage financial crisis occurred, which affected people’s financial well-being and also potentially their psychological well-being.

4.5 Robustness checks

As a robustness check, we use the saving rate as a substitute for consumption to redo the regressions. The results are shown in Table 8 and Table 9. Similar to the previous analysis, the coefficient between real interest rate and saving is not significant. From the perspective of corruption, transparency and intervention, political culture does have significant impacts on saving. In terms of individual cultural preferences, *PD* and *LTO* have positive relations with *Saving*, while *Indiv* and *Indul* move negatively with it. From those interaction terms, it can be inferred that Confucianism makes people more cautious as they raise their precautionary saving needs.

Table 8: Robustness test – impact from political culture

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Lgdppc</i>	5.07*** (4.36)	7.17*** (5.72)	7.17*** (12.49)	7.21*** (11.75)	5.68*** (4.92)	5.68*** (4.92)	5.68*** (4.92)
<i>Rint</i>	-0.01***	0.01	0.01	0.01	0.01	0.01	0.01

	(-0.09)	(0.17)	(0.35)	(0.41)	(0.25)	(0.25)	(0.25)
<i>Credit</i>	-0.09***	-0.08***	-0.08***	-0.08***	-0.10**	-0.10***	-0.10***
	(-5.14)	(-4.49)	(-7.16)	(-7.07)	(-5.37)	(-5.37)	(-5.37)
<i>Age</i>				0.07			
				(0.2)			
<i>Corpt</i>					4.99**		
					(2.15)		
<i>Staint</i>						3.32**	
						(2.15)	
<i>Transp</i>							4.99**
							(2.15)
<i>Constant</i>	-109.51***	-162.09***	-162.09***	-164.07***	-137.05***	-129.81***	-133.24***
	(-3.78)	(-3.07)	(-11.43)	(-10.07)	(-5.85)	(-5.01)	(-5.39)
<i>Country fixed effects</i>	No	No	Yes	No	No	No	No
<i>Year fixed effects</i>	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	775	775	775	761	523	523	523
<i>adjusted R²</i>	0.06	0.10	0.84	0.31	0.33	0.33	0.33

Note: (1) ***, ** and * represent significance at 1%, 5% and 10% level separately. The t-values in parentheses are calculated using the cluster heteroscedasticity robust standard errors. (2) The dependent variable is *Saving*.

Table 9: Robustness test - impact from individual cultural preferences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Lgdppc</i>	3.37***	3.13***	3.54***	3.25***	3.56***	2.71***	4.32***	3.93***
	(5.45)	(5.26)	(5.70)	(5.29)	(6.84)	(5.07)	(9.08)	(9.20)
<i>Credit</i>	-0.07***	-0.08***	-0.07***	-0.08***	-0.08***	-0.08***	-0.08***	-0.08***
	(-8.64)	(-9.32)	(-8.51)	(-9.13)	(-8.22)	(-9.67)	(-8.02)	(-8.32)
<i>Rint</i>	0.01	0.01	0.01	0.01	0.03	0.03	0.03	0.03
	(0.36)	(0.51)	(0.30)	(0.48)	(1.04)	(1.26)	(0.99)	(0.83)
<i>PD</i>	0.18***	0.11*						
	(3.13)	(1.95)						
<i>PD*Confuc</i>		0.19***						
		(4.64)						
<i>Indiv</i>			-0.19***	-0.13**				
			(-3.66)	(-2.49)				
<i>Indiv*Confuc</i>				0.44***				
				(3.53)				
<i>LTO</i>					0.16***	0.13***		
					(4.09)	(2.68)		
<i>LTO*Confuc</i>						0.27***		
						(6.35)		
<i>Indul</i>							-0.16***	-0.12***
							(-3.81)	(-3.36)
<i>Indul*Confuc</i>								-0.01
								(-0.1)
<i>Constant</i>	-28.12***	-19.00**	-5.94	-7.09	-80.49***	-4.66	-80.06***	-76.97***
	(-3.14)	(-2.59)	(-1.25)	(-1.52)	(-6.59)	(-1.01)	(-6.02)	(-6.97)
<i>sigma_u</i>	9.18	8.34	9.08	8.73	8.28	7.36	8.49	6.37

<i>sigma_e</i>	4.38	4.38	4.38	4.38	4.65	4.21	4.69	4.69
<i>rho</i>	0.81	0.78	0.81	0.80	0.76	0.75	0.77	0.65
<i>Country fixed effects</i>	No							
<i>Year fixed effects</i>	Yes							
<i>N</i>	884	884	884	884	784	784	644	644
<i>overall R²</i>	0.24	0.24	0.24	0.24	0.28	0.28	0.15	0.16

Note: (1) ***, ** and * represent significance at 1%, 5% and 10% level separately. The t-values in parentheses are calculated using the cluster heteroscedasticity robust standard errors. (2) The dependent variable is *Saving*.

An important caveat to our analysis is the endogeneity of the control variables we examine to the consumption ratio. Therefore, these results should be interpreted as correlations, and further efforts may discover approaches for the identification of the effects of these variables on national consumption.

4.6 Additional Cultural Variables

Thus far our study has focused on how Confucianism affects consumption behavior through several dimensions. In this section we explore the common features of consumption in other cultural circles, in particular Islamic countries, Socialist countries and Catholic countries. We again utilize the random effects approach, and the results are listed in Table 10. In the model, X_l includes variables *Confuc*, *Islm*¹¹, *Socialism*¹² and *Catholicism*¹³. These are all dummy variables representing whether a certain country belongs to the Confucian cultural cluster, Islamic countries, Socialist countries or Catholic countries. The same as before, control variables $Control_{it}$ include *Lgdppc*, *Rint* and *Credit*.

$$Consumption_{it} = \alpha X_l + \sigma Control_{it} + \delta_t Year_t + c + u_{it}$$

The first column shows clearly that the consumption levels of those Confucian countries are much lower, which is in congruence with the previous findings. In addition, people who observe Islam hold the Koran as their strong belief. The Five Pillars of Islam are the framework of the Muslim life: they are the testimony of faith, prayer, giving zakat (support of the needy), fasting during the month of Ramadan, and the pilgrimage to Makkah. The culture of fasting during the month of Ramadan will have certain effects in their daily life as they are more likely to abstain from their desires. Therefore, purchase behavior might also be restrained. The empirical results validate such hypothesis that Islam is associated with lower consumption. In addition, socialist countries which have only one party in power, can be highly correlated with the centralization of power. According to our previous analysis, centralization of power is likely to lead to corruption, which will stymie people's consumption behavior thereafter. From this perspective, one will think that the consumption levels of the socialist countries will be lower. However, the regression results do not arrive at a statistically significant conclusion. Last but not least, based on Catholicism, the avoidance of the seven deadly sins may encourage resistance of temptations thus citizens may also be likely to restrain their desire to a greater extent. In this way, Catholicism could also be associated with under-

¹¹ In the empirical analysis, countries that score 1 in *Islm* include Albania, Bangladesh, Egypt, Indonesia, Iran, Kuwait, Malaysia, Morocco, Nigeria, Pakistan, Saudi Arab and Turkey.

¹² Countries that have a socialism origin include Albania, Bulgaria, China, Czech Republic, Hungary, Poland, Romania, Slovak and Vietnam.

¹³ The catholic countries include Argentina, Belgium, Chile, Columbia, Czech Republic, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Mexico, Peru, Philippines, Poland, Portugal, Uruguay, Latvia, Slovak, Slovenia and Latvia.

consumption. As is the case for the socialist countries, the empirical results cannot statistically validate this hypothesis.

Table 10: Analysis of other cultural circles

	(1)	(2)	(3)	(4)
<i>Lgdppc</i>	-3.04*** (-6.47)	-3.07*** (-6.18)	-2.88*** (-5.80)	-2.98*** (-5.96)
<i>Rint</i>	0.11*** (5.77)	0.11*** (5.86)	0.11*** (5.83)	0.11*** (5.83)
<i>Credit</i>	0.02*** (3.21)	0.02*** (2.58)	0.02*** (2.64)	0.02*** (2.72)
<i>Confuc</i>	-12.09*** (-4.37)			
<i>Islm</i>		-7.43*** (-2.30)		
<i>Socialism</i>			-1.93 (-0.64)	
<i>Catholicism</i>				3.32 (1.39)
<i>Constant</i>	101.52*** (25.04)	101.34*** (23.23)	99.02*** (22.98)	98.57*** (23.17)
<i>sigma_u</i>	7.99	8.87	9.13	9.03
<i>sigma_e</i>	3.86	3.86	3.86	3.86
<i>rho</i>	0.81	0.84	0.85	0.85
<i>Country fixed effects</i>	No	No	No	No
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes
<i>N</i>	965	956	965	965
<i>adjusted R²</i>	0.38	0.27	0.21	0.23

Note: (1) ***, ** and * represent significance at 1%, 5% and 10% level separately. The t-values in parentheses are calculated using the cluster heteroscedasticity robust standard errors. (2) The dependent variable is *Consumption*.

5. Policy Implications

The relationships between cultural variables and consumption provide hints about policy guidance for countries seeking to increase the consumption share of the economy.

Under the unchanging political environment, anti-corruption, promotion of transparency in government and less intervention in banks will boost the efficient allocation of resources, increase residents' disposable income and thus stimulate domestic consumption to accelerate economic growth.

In terms of individual cultural preferences, educators could emphasize more on individualism. Although the teachings of Confucianism can continue to remain the guiding principle and core of the social value for China, with pragmatism and frugality being the traditional virtues, existing education may overstress the importance of self-restraint. Therefore, future education of the next generation could do better on highlighting self-realism, which could stimulate consumption attitudes.

Last but not least, the aging population may currently be raising the precautionary needs for saving and disincentivizing people to spend freely. Currently, since China has introduced the two-

child policy, perhaps consumption level can increase through demographic means in the years to come.

6. Conclusions

As an intensely discussed topic, consumption has been frequently analyzed by scholars in the past. However, traditional analysis fails to fully explain the consumption discrepancy between nations. National culture, which shapes the basic value principles of the residents, will strongly influence people's behavior and hence consumption. This paper investigates how political culture and cultural preferences affect people's choices between consumption and investment. In addition, this paper further explains the mechanism of how Confucianism constrains people's spending behavior. Individualism, power distance, long-term orientation and indulgence are the four dimensions that can be applied in the analysis for Confucianism.

We use the hyperbolic discounting model with β representing present/future-bias in citizens' discount functions. The empirical analysis covers 67 countries and the data range from the year of 2000 to 2015. Taking income, real interest rate and financial development as control variables, cultural dimensions are then added into the regression model to analyze their impacts on consumption. Time-constant factors including culture can explain almost 67% of the differences between countries, and that individual cultural preferences may be influenced or determined by the political environment. If people have strong preferences for individualism, they may tend to bear resentment towards inequality, indulge in themselves and live for the moment. Therefore, they have the propensity to over-spend. Mathematically, this is reflected in the β being lower than 1. Likewise, a pragmatic and frugal culture tends to be more long-term oriented, thus restraining people's desire to consume. Under such circumstance, β may be larger than 1. Last but not least, in terms of policy-making, preventing demographic shifts such as population aging, advocating anti-corruption, increasing the public sector's transparency and educating based on individualism could all be possible culture-based ideas for stimulating domestic demand and boosting the economy.

Appendix

Table A1: Country data

Country	<i>Mconsumption</i>	<i>Indiv</i>	<i>Indul</i>	<i>LTO</i>	<i>PD</i>	<i>Mcorpt</i>	<i>Mstaint</i>	<i>Mtransp</i>	<i>Mage</i>	<i>Mcredit</i>	<i>Mlgdppca</i>	<i>Mrint</i>
Albania	88.39	20	15	61	90	3.00	2.00	3.00	9.73	58.81	7.99	10.34
Angola	69.67	18	83	15	83	4.00	3.50	3.06	2.37	10.41	7.73	3.51
Argentina	78.50	46	62	20	49	3.13	2.19	2.40	10.32	34.57	8.93	-0.05
Australia	74.12	90	71	21	36	0.56	0.00	0.00	13.35	133.86	10.58	4.57
Bangladesh	79.74	20	20	47	80	3.75	3.13	2.13	4.46	50.72	6.43	6.22
Belgium	74.36	75	57	82	65	1.00	1.00	1.00	17.32	115.20	10.54	5.91
Brazil	80.63	38	59	44	69	3.00	1.13	1.00	6.32	87.05	8.79	36.75
Bulgaria	83.37	30	16	69	70	2.88	1.00	1.00	18.04	48.22	8.44	4.95
Canada	75.83	80	68	36	39	0.00			13.85	178.70	10.56	1.98
Chile	73.50	23	68	31	63	1.00	1.00	1.00	9.19	96.29	9.13	3.08
China	52.83	20	24	87	80	3.31	3.50	4.00	7.93	141.89	7.96	2.14
Colombia	81.38	13	83	13	67	2.94	2.00	2.00	5.63	53.60	8.39	7.29
Czech rep	68.88	58	29	70	57	2.00	1.00	2.00	15.11	55.57	9.58	4.02
Denmark	73.24	74	70	35	18				16.23	201.23	10.81	5.03
Dominica	98.47	30	54	13	65	3.36	2.93	3.00		53.78	8.70	7.25
Egypt	87.32	25	4	7	70	3.00	2.00	2.00	5.04	87.90	7.57	3.01
El Salvador	102.52	19	89	20	66	3.50	2.00	1.29	6.87	59.92	8.07	
Estonia	71.90	60	16	82	40	2.00	1.00	0.00	17.09	71.16	9.36	1.64
Finland	73.68	63	57	38	33	0.00	1.00	0.00	16.92	119.97	10.60	3.41
France	78.33	71	48	63	68				17.08	129.17	10.47	4.78
Germany	74.94	67	40	83	35				19.36	138.38	10.51	8.99
Ghana	90.89	15	72	4	80	2.44	2.00	2.13	3.37	30.90	6.69	
Hungary	74.54	80	31	58	46	1.44	1.25	2.00	16.32	65.45	9.27	4.01
Iceland	78.75	60	67	28	30				12.16	184.80	10.71	8.00
Indonesia	68.05	14	38	62	78	3.94	2.88	2.00	4.92	44.60	7.53	4.25
India	69.24	48	26	51	77	3.00	3.00	2.75	4.97	66.00	6.82	5.61
Iran	59.18	41	40	14	58	3.81	4.00	2.00	4.81	48.79	8.27	-4.43
Ireland	60.90	70	65	24	28		1.00		11.19	173.60	10.76	-0.52
Italy	79.51	76	30	61	50	3.00	2.00	1.00	20.06	135.12	10.35	3.59
Japan	75.54	46	42	88	54				21.50	314.87	10.56	2.79
Korea	65.87	18	29	100	60	2.19	2.00	0.00	10.17	140.71	9.86	3.80
Latvia	80.35	70	13	69	44	2.38	1.44	1.00	17.63	60.44	9.12	3.53
Lithuania	83.21	60	16	82	42	1.92	1.00	1.00	16.68	42.14	9.12	4.25
Luxembourg	50.81	60	56	64	40				14.13	165.43	11.36	
Malaysia	59.63	26	57	41	100	2.75	1.63	2.00	4.80	130.04	8.84	2.23
Malta	78.75	59	66	47	56				15.17	136.89	9.79	3.10
Mexico	79.02	30	97	24	81	3.00	1.00	2.63	5.64	38.95	9.03	2.06
Morocco	76.88	46	25	14	70	2.81	2.00	2.00	5.82	88.59	7.74	11.70
Mozambique	95.73	15	80	11	85	3.00	1.56	2.00	3.24	17.41	6.01	11.61
Netherlands	70.73	80	68	67	38	0.00	0.80	0.00	15.17	188.93	10.66	1.17

Nigeria	78.64	30	84	13	80	0.00	1.00	1.00	2.76	19.16	7.06	4.51
Norway	62.51	69	55	35	31				15.13	114.18	11.17	1.45
Pakistan	87.94	14	0	50	55	3.31	3.00	3.00	4.33	44.41	6.78	
Peru	76.40	16	46	25	64	3.25	2.56	2.00	5.90	20.86	8.21	18.13
Philippines	83.90	32	42	27	94	3.50	2.81	3.00	3.83	52.29	7.41	4.32
Poland	80.62	60	29	38	68	2.31	1.44	1.38	13.54	53.13	9.14	7.82
Portugal	84.44	27	33	28	63	2.00	2.00	2.00	18.17	167.72	9.84	
Romania	81.06	30	20	52	90	3.13	1.75	1.00	15.51	31.01	8.61	5.90
Russia	68.36					4.00	3.00	2.00	13.29	32.39	8.81	-1.46
Saudi Arabia	54.94	25	52	36	95	2.94	1.00	2.44	2.82	16.38	9.63	
Serbia	95.04	25	28	52	86	3.40	2.00	1.93	15.09	40.06	8.28	0.64
Singapore	49.34	20	46	72	74	0.00	0.00	0.00	8.93	85.58	10.50	4.32
Slovak republic	75.59	52	28	77	100				12.22	57.05	9.44	4.60
Slovenia	73.30	27	48	49	71	0.67	1.83	1.00	16.07	67.27	9.85	4.83
Spain	76.24	51	44	48	57				17.18	190.28	10.16	1.02
Sweden	71.27	71	78	53	31	0.00	0.00	0.00	18.02	128.57	10.72	3.36
Switzerland	66.77	68	66	74	34		0.00	1.00	16.46	167.61	11.04	2.54
Tanzania	83.05	25	38	34	70	3.44	2.00	2.00	3.05	13.11	6.29	5.74
Thailand	69.52	20	45	32	64	3.31	1.63	2.00	8.36	133.98	8.22	4.02
Trinidad and Tobago	64.07	16	80	13	47	3.00	2.00	1.53	7.82	31.29	9.50	7.52
Turkey	83.80					3.38	1.00	1.00	6.77	60.34	8.90	
UK	85.08	89	69	51	35				16.33	164.83	10.57	0.95
Ukraine	83.05	25	18	55	92	4.00	2.00	2.00	15.47	64.88	7.62	4.06
Uruguay	81.91	36	53	26	61	1.54	1.00	2.00	13.76	43.56	9.03	17.25
US	83.03	91	68	26	40				12.95	222.44	10.73	2.89
Venezuela	68.09	12	100	16	81	4.00	3.19	3.50	5.23	23.61	8.89	-4.52
Vietnam	73.31	20	35	57	70	3.56	3.13	2.75	6.56	83.01	6.88	2.07

Note: Variables as *Mconsumption*, *Mcorpt*, *Mstaint*, *Mtransp*, *Mage*, *Mcredit*, *Mlgdppca* and *Mrint* are means of *Consumption*, *Corpt*, *Staint*, *Transp*, *Age*, *Credit*, *Lgdppca* and *Rint* of a specific country from the year of 2000 to 2015.

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