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Abstract: Although in recent years researchers have attempted to examine the consumption behavior of Chinese residents during economic transition, there still exists a clear gap in the literature to adequately explain the consumption behavior of Chinese urban residents during economic restructuring. This paper, attempting to shed some light on this relationship, proposes a hypothesis of Chinese urban resident consumption behavior during economic transition in China and examines the hypothesis using quantitative models. The conclusion suggests that the consumption of Chinese urban residents is guided by traditional Chinese civilization, and this results in intermittent and cyclical fluctuations in consumption behavior during systemic change.

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I. Introduction

The sweeping global economic crisis of 2008 affected both the developed and developing countries. Although the crisis began with the subprime catastrophe in the United States, it quickly spread worldwide, including to China. The first legislative action of Barack Obama's administration in Washington in January 2009 was to pass a $787 billion economic stimulus package to save the struggling U.S. economy. At the same time, the Chinese government issued an urgent ten-point measure to fight off the worsening economic situation, but only time will tell whether it will work. The measure mainly focused on stimulating domestic consumption (Qin, 2008). An understanding of how Chinese residents save and consume can serve as a starting point for effective government measures regarding domestic consumption.

The current paper has three objectives. First, we explore whether Western theories of consumption are applicable to the Chinese situation. Second, we test our hypothesis on the intermittent and cyclical nature of Chinese urban consumption. Finally, based on our theoretical analysis, we propose recommendations for Chinese policy makers to serve as a basis for further measures to sustain economic growth and for policy makers in other emerging economies that are facing a similar current economic slowdown.

II. Literature Review

Western economists have proposed many theories about consumption, such as Keynes's (1936) Absolute Income Hypothesis (AIH), Duesenberry's (1948) Relative Income Hypothesis (RIH), Friedman's (1956) Permanent Income Hypothesis (PIH), Hall's (1978) Life Cycle-Permanent Income Hypothesis (LC-PIH), the Excess Sensibility Hypothesis (Flavin, 1985), the λ Hypothesis (Campbell and Mankiw, 1991), the Buffer Inventory Deposit Hypothesis (Deaton, 1991), the Precautious Saving Hypothesis (Caballero, 1990, 1991), the Liquid Constraints Hypothesis (Zeldes, 1989; Jappelli and Pagano, 1994), and so

forth. These theories are primarily based on micro-rational behavior and on the premise that the system is definite; hence systemic change and population and income differences are ignored. Although these theories have played an inspirational role in analysis of consumption behavior in the developing countries, a close examination of the conclusions reveals their limitations. In particular, it is difficult to explain the problems of the developing countries, such as China, based on these theories.

Before the economic reform, China was characterized as an economy of shortage, thus there were resource restrictions or supply restrictions in the patterns of resident consumption. The consumption patterns of 80 percent of the Chinese residents were identical. With the deepening of reforms, China's economic system shifted from a traditional planned economy to a socialist market economy. The national economy developed quite smoothly through the expansion of investment, domestic demand, and international trade. Since the beginning of the Ninth 5-Year Plan (1996), however, China's rapid economic growth and its residents' consumption behavior appear to be at odds. On the one hand, due to the economic development, income levels have continuously increased; on the other hand, consumption levels have grown at a much slower rate. According to statistics, the ratios of urban residents' final consumption from 1995 to 2008 were 60.8 percent, 59.9 percent, 58.3 percent, 57.3 percent, 57.5 percent, 58.9 percent, 58.5 percent, 58.7 percent, 60.3 percent, 61.3 percent, 59.8 percent, 58.2 percent, 57 percent, and 55.4 percent respectively (*China Statistical Yearbook*, 2008). But, based on empirical research, Chenery (1975) has shown that the average final consumption ratio of most countries is above 70 percent when GDP per capita reaches $1,000. In comparison, the final consumption ratio in China appears to be much lower. Even the East Asian countries, whose savings rates are considered very high, have consumption ratios exceeding 65 percent (Chenery, 1975). To determine why Chinese consumption rates do not match the level of economic growth during the economic transition, Chinese scholars resorted unsuccessfully to foreign consumption theories. Thus, it is necessary to re-examine the relevant factors in Chinese consumption behavior so as to provide the theoretical explanations and practical directions that guide consumption behavior. Chinese scholars recently showed that Western theories are limited to explain consumption behavior in China (Deng and Jin, 2008).

First, Keynes's AIH may well explain consumption behavior during the planned economic

period (Zang, 1994), but there are limitations when it attempts to explain Chinese consumption behavior during the economic transition (Wang, 1996; Qi, 2000). The economic reform in China since 1980 has brought many changes to the economic system that have directly impacted the people's lives. The nature of the transitional economy has had an obvious effect on consumption behavior. Based on this observation, scholars have concluded that Chinese consumption behavior before and after the reform cannot be explained by the same AIH theory. Unfortunately, many scholars still do not adequately recognize the differences between the two different economic periods when they examine consumption behavior. Even if they recognize the differences during the two periods, they still attempt to use the same theory to analyze consumption behavior, thus their conclusions remain unconvincing (Li and Chen, 1992). For instance, Li and Chen (1992) used the AIH to build a resident consumption model but at the same time used the PIH to build a resident savings model. As a result, their conclusions were inconsistent. In general, the AIH is only suitable to explain resident consumption and savings behavior before the start of the economic reform and during the early period of economic change; it is less effective to explain resident consumption behavior during economic transition when there is a widening of the income distribution gap (Wang, 1996).

Second, very few scholars have employed the relative income hypothesis to explain resident consumption behavior. Zang (1994) used cross-sectional data of urban and rural residents, grouped by income levels during the 1981-91 period, to build an econometric model. He concludes: (1) The consumption behavior of urban and rural residents during the 1981-91 period fits the relative income hypothesis, that is, under the established relative income distribution, family consumption is decided by the relative income position and is not affected by the absolute level of income; (2) Whether for an urban resident or a rural resident, the demonstration effect of consumption is enhanced as the income distribution gap becomes larger; (3) The demonstration effect among rural residents is stronger than that among urban residents, as a result, from Zang's (1994) perspective, the relative income hypothesis is stronger than the absolute income hypothesis in explaining resident consumption behavior during the transitional period. However, the explanation for resident consumption behavior during the transitional period is still incomplete because if the relative income hypothesis were to completely explain consumption behavior during the period, then the larger income distribution gap would result in a decline in savings to increase consumption. However, the

opposite is the case, thus demonstrating that there are limitations to the explanation of the relative income hypothesis to explain consumption behavior during transition.

Third, scholars have used LC-PIH to explain resident consumption behavior during the economic transition. For example, Zang (1994) used time series total data and family budget sample investigation data to test the LC-PIH. Using the two methods to test the life-span hypothesis from the point of view of the residents' assets, he concludes that the LC-PIH can better explain Chinese consumption behavior. Fan and Yu (1992) analyzed the bank savings of Chinese urban residents and their results also accord with the LC-PIH hypothesis. Wang (1992) built a simple permanent income life-cycle model based on the permanent income hypothesis, the life-cycle hypothesis, and the theory of consumption and time's reasonable distribution in life. Using cross-sectional data of urban and rural families' consumption and savings in 1987 to conduct an econometric test, she concluded that the accumulated assets of urban and rural families increase when their permanent income increases, when the capital market becomes increasingly perfect, and when there are more opportunities to invest and diversify assets. Zhao (1998) conducted an empirical analysis of the life-cycle hypothesis, reflecting the basic changing tendencies in residents' savings behavior. To increase the explanatory power of the model, he included in the model the interest rate, inflation rate, and non-economic variables representing the systemic and cultural changes. However these factors did not provide a good explanation for the change in the savings rate. He concludes that the nominal interest rate has a significant impact on the savings rate. In addition, the savings rate is negatively influenced by the inflation rate, but it is not influenced by the real interest rate or by the gradual systemic change in China.

He (1998), using a numerical simulation to research the life-cycle hypothesis, reaches the following conclusions. If consumers do not expect an increase in future income, then the savings rate will increase by the increased income rate under a steady state. If consumers expect an increase in future income, then the savings rate will not increase by the rate of the increase in income. However, when Wang (1996) examined the PIH, he found that residents have steady expectations. Consequently, his conclusions are problematic because during the economic reform, Chinese expectations about the future were not certain. Also the Chinese consumer credit system had not developed properly and residents could not balance income and expenses through loans. Therefore, the PIH does not provide a complete

explanation of consumption behavior during this period. Furthermore, the LC-PIH contends that the closer a person reaches the end of her life, her possession-consumption ratio will be larger. In contrast, Chinese residents become more thrifty as they become older because they are saving not only for their old age, but also for their children. At the same time, Chinese consumption relates to life events and not to permanent income (Zhang, 1997).

Yuan and Song (1992) used the preventive savings hypothesis and the liquidity constraints hypothesis to explain the reason for a reduction in Chinese consumption. They conclude: (1) The uncertainty of future income is the reason why residents make preventive savings. According to the preventive savings hypothesis, as long as Chinese residents' cross-elasticity of substitution is not large, the uncertainty will convince residents to increase their preventive savings. From this we can conclude that income uncertainty is the main reason why Chinese residents reduce consumption. (2) Liquidity constraints are also the main reason for the reduction in Chinese consumption during the transitional period. The authors state that the liquidity constraints may be divided into three types: a spot liquidity constraint, a future liquidity constraint, and a conception of a liquidity constraint. Currently, the latter two constraints have the most effect, especially the conception of a liquidity constraint which has an obvious larger effect. This is because according to traditional Chinese culture, thriftiness is a virtue.   Consumption-based credit is considered an act of incompetence.

Although Western scholars explain consumer behavior from various points of view, they fail to sufficiently explain consumer behavior in China, especially during the transition period. Most Western scholars have attempted to empirically study Chinese consumer behavior based on their own theories rooted in contemporary Western social and economic systems that differ widely from those in China and thus they have failed to develop a theory for the transitional economies.   It is reasonable that Western theories do not fully explain Chinese consumption behavior. Even if these scholars are able to provide partial explanations or interpretations, their conclusions often tend to be superficial and biased.

In summary, Western consumer behavior theories emphasize the impact of income on consumption, but in fact income is only a necessary condition for consumption; the most fundamental factor is the motive for consumption. How strongly the motive influences consumption is determined not only by economic factors, but also by social factors.   The social factors include: the economic system and economic organization, social conventions

(customs formed by race, education, religious beliefs, and social morality), past experiences and present expectations, "rules of the game" regarding the distribution of wealth in society, and so forth. The impact of these factors will lead to different consumption behavior patterns. Thus, only by understanding the formation of consumer motivations can one fully explain consumer behavior. However, Western theoretical analyses and discussions of consumer behavior are based on the assumption that social systems are relatively stable and social reform is relatively insignificant. This precondition has little relevance to present Chinese conditions during the economic transition The Chinese socio-economic structure is undergoing major changes, and the background upon which consumer motivations for consumption are based is not stable. This is the main reason why Western consumer behavior theory cannot fully explain Chinese consumer behavior (Jin *et al*., 2004). Furthermore, China's official statistics suffer from periodic omissions and errors due to both objective and human factors. As a result, the estimated values of the same economic variables by different scholars may differ greatly and these differences will affect their conclusions. In addition, as the Chinese reform is ongoing, consumption motivations are affected by the dynamic changes in the economic structure. These changes will certainly result in increased difficulties and errors in data processing. Conclusions based on superficial data and not on the basis of a thorough understanding of the changing economic system are unconvincing. Therefore, a comprehensive study of Chinese residents' consumption behavior must be based on the transitional nature of the economic system.

III. A hypothesis of intermittent cyclical fluctuations in consumer behavior during the Chinese economic transition.

Because there are limitations to Western consumer behavior theory in explaining Chinese consumer behavior, we need to interpret Chinese consumer behavior based on a Chinese perspective. In order to develop a comprehensive interpretation of Chinese residents' consumption behavior during the transition, we draw on Western scholars' research methods (Madsen and McAleer, 2000) to propose a new hypothesis to explain Chinese consumption patterns.

Although Chinese consumption behavior is increasingly influenced by many elements of modern Western civilization, Chinese patterns of consumption remain unique. The following

basic assumptions accord with China's consumer behavior during the transition period:

Assumption 1: Given that the consumers exist in a specific time frame, their consumption levels are positively correlated with their incomes. With the development of China's social productive forces and the continuous improvement of the socialist market economic system, Chinese people's income levels will continue to improve and, accordingly, consumption levels will also rise.

Assumption 2: The rise and fall in Chinese consumption accords with major events and stages of life. This contrasts with a basic of tenet in Western economic theory whereby people are assumed to make their own consumption decisions during their lifetimes and to pursue maximizing lifetime utility. Chinese tend to arrange their savings and consumption to cope with the spending peaks at different stages of life, for instance for marriage, housing, children's education, health, pensions, and so forth. In order to pay these necessary expenses at the different stages of life, one must make changing consumption arrangements.

Assumption 3: Household consumption expenditures must remain within the income range, meaning that there are no outside loans. Families with no internal or external debts are regarded as models worthy of emulation in of the consumer culture. Whereas Westerners have long been accustomed to over-consumption on credit, the vast majority of Chinese maintain balanced (or even surplus) budgets.

Assumption 4: In the face of income and credit constraints, consumer spending can be divided into two types: basic consumption (C_1) and extra spending (C_2). Basic consumption refers to consumption for necessities, and extra spending refers to consumption for non-necessities. In general, consumers always meet their basic consumption needs before making decisions regarding allocations of their current disposable income for extra spending or savings. As basic income levels improve, basic consumption also improves. However, extra consumption levels vary from individual to individual. After satisfying their basic consumption needs, most Chinese households pursue a "savings" policy so as to be able to cope with the peak in consumption expenditures for marriage, housing, child rearing, education, children's marriage, health issues, pensions, and tourism, Therefore, there is a cyclical movement in consumption patterns, which can be expressed as savings – consumption – savings – consumption.

Assumption 5: A typical consumer is rational and risk-averse. He/she will use all

available information to rationalize current income and will try to consume all the income and wealth at the different stages of life (including during peak consumption periods) in order to achieve maximum effectiveness during one's life span.   Due to her risk aversion, decision making regarding consumption and savings is based on a risk/benefit analysis. When the yields are similar, consumers always prefer savings with lower risks; when the risks are similar, consumers are inclined to choose savings with higher yields.   In comparison with during the traditional planned economic system, during the economic transition Chinese residents spend far more.   Before the economic reforms began in 1980, the Chinese government paid for residents' housing, medical services, and pensions, but residents today have to meet these expenses on their own.   As a result, they need to make appropriate advance arrangements for future expenditures.

Based on the above assumptions, we propose the following hypothesis on the consumption behavior of Chinese urban residents during the economic transition:

H1: The dynamic nature of the social, economic, and cultural changes in China generates intermittent and cyclical fluctuations in Chinese residents' consumption arrangements.

Chinese residents do not have a sound "social security system" such that found in Western societies whereby people are able to meet their consumption needs based on advance consumer credit. As a result, as soon as they have some independent income Chinese residents have to make arrangements for their future lifetime consumption behavior.   Accordingly, Chinese consumption can be divided into several phases, where $S_1, S_2, S_3 \cdots S_N$ represent the different stages of life.

The first stage (S_1):   At this stage, aside from a small group of young people who are living on deficit monthly budgets due to their unrestrained consumption, most people save for future events like marriage or housing, thus during this stage Savings>Income, and from the perspective of the relationship between consumption and income, Consumption < Income.

The second stage (S_2):   At this stage, after several years of employment young people start to consider or plan their marriages.   For this occasion, they usually have to borrow (domestic or external debt) to make a decent wedding.   Therefore, at this stage, Consumption > Income.

The third stage (S_3): S_2 can be seen as the first consumption peak in a consumer's

lifetime.   After this peak, planning is begun for the next consumption peak, which is saving for the purchase of a house or car.   This expenditure can be regarded as the largest lifetime expenditure and it usually takes a long time to accumulate sufficient savings. Thus, in this stage, Consumption < Income.

The fourth stage (S_4):   After a period of (S_3) accumulation, consumers will buy an apartment and a car, constituting the second consumption peak.   This is the highest expenditure in one's life. Thus, during this phase, Consumption > Income.

The fifth stage (S_5):   After the two consumption peaks, the next major expenditure is investment in education for children; some people even begin to consider investment in education before they have children.   Thus, once again, Consumption < Income.

The sixth stage (S_6):   Investment in education can be divided into several expenditures, namely, primary, secondary, and university educations, and special training.   China is deeply influenced by Confucian culture, in which Chinese parents may abandon all non-essential spending, but will never abandon investment in education. Therefore, consumption expenditures at this stage are characterized by Consumption > Income.

The seventh stage (S_7):   As people are about to enter the final stage of their careers, they hope to accumulate substantial savings for their retirement and future medical expenses. At the same time, according to Chinese tradition, parents also hope to have substantial savings for their children's life events.   Therefore, this phase may be considered the highest stage of savings, and the relationship between savings and income is characterized as Savings > Income.   In terms of the relationship between consumption and income, Consumption < Income.

The eighth stage (S_8):   During this beginning of a retirement phase, aside from basic consumption, extra consumption is relatively small.   A portion of one's pensions is used to meet basic life needs and the remainder goes into savings.   In terms of the relationship between consumption and income, here Consumption < Income.

In summary: Chinese residents base their consumption decisions on traditional Chinese culture.   Despite the ongoing institutional and economic changes, typical consumer spending is based on intermittent cyclical fluctuations.

IV. Empirical test of the intermittent cyclical fluctuations in consumer behavior during

the economic transition

According to the above hypothesis, we can divide the life cycle of an individual into eight stages. The values of consumption, income, and remaining savings at each stage are: c_i, y_i and s_i, respectively, where i=1…8; an individual's beginning wealth is W_0; the interest rate is r_f; the discount rate is r; and the optimal individual consumption and its cross- time effectiveness can be expressed as :

$$\max U = U(c_1, c_2, \cdots, c_8)$$

Satisfied: $\sum_{i=1}^{8} \frac{1}{(1+r)^i} c_i + \sum_{i=1}^{8} \frac{1}{(1+r_f)^i} s_i = \sum_{i=1}^{8} \frac{1}{(1+r)^i} y_i + W_0$

Using Lagrange's multiplier, a consumer's best consumption path is equal to the plan whereby

$$\max_{c_i, \lambda} L = U(c_1, c_2, \cdots, c_8) + \lambda \left(\sum_{i=1}^{8} \frac{1}{(1+r)^i} c_i + \sum_{i=1}^{8} \frac{1}{(1+r_f)^i} s_i - \sum_{i=1}^{8} \frac{1}{(1+r)^i} y_i + W_0 \right)$$

Each individual consumer has different expectations regarding consumption and savings at different stages. But by nature, every two of the eight stages are correlated, which means that when the value of consumption is less than that of income, savings is a preparation for the next period when the value of consumption will be more than that of income. Therefore, every two periods are an integrated unit, making an individual's life cycle a fluctuating consumption process. Meanwhile, the relationship is comparatively less integrated between non-bordering periods. The entire savings from the former period can be used as the beginning wealth of the current period. In order to simplify the analysis, an individual's consumption can be divided into two separate periods, i.e., the current period and the future period. Thus, the optimal consumption process is:

$$\max_{c_1, c_2} U = U_1 + \beta U_2$$

satisfying the budget constraint:

$$c_1 + s_1 = W_0(1+r_f) + y_1$$

$$c_2 + s_2 = s_1(1+r_f) + y_2$$

The individual consumption utility is a function of actual consumption; therefore the utility function should have the following form:

$$U_i = U_i(c_i, \frac{p_i}{p_{i-1}}) \quad \text{where} \quad \frac{\partial U_i}{\partial c_i} > 0, \frac{\partial U_i}{\partial (p_i / p_{i-1})} < 0, \quad i = 1,2.$$

On the one hand, it helps to eliminate intermediate parameters s_1 by substituting the second constrained condition equation into the first constrained condition equation, giving us one constrained condition including the two periods:

$$c_1 + \frac{1}{(1+r)} c_2 + \frac{1}{(1+r)} s_2 = y_1 + W_0(1+r_f) + \frac{1}{(1+r)} y_2$$

On the other hand, from the nature of the effectiveness function, we know that if there is a monotone incremental relationship between effectiveness and consumption, any effectiveness function that has the same nature as consumption can express this relation. Furthermore, considering the relationship between the actual consumption data and other factors, we assume that the effectiveness function has the following form:

$$U_i = (\frac{p_i}{p_0})^{-1} \log c_i, i = 1,2.$$

Using the Lagrange first-order condition that optimizes consumption, we obtain the following general form of the consumption function as follows:

$$c_i = c_i(\frac{p_0}{p_i}, y_1, \frac{1}{(1+r)}, r_f, W_0, s_2), \quad i = 1,2.$$

Thus far, the analysis covers only micro personal consumption behavior based on individual behavior. If all the residents' effectiveness function and constraints terms are identical, from a macro point of view the residents' whole consumption function might be a magnification of the individuals' micro economic behavior. This means the whole society also is characterized by fluctuating intermittent consumer behavior. Taking this into consideration, the consumption function of Chinese residents, especially urban residents, selected according to our Chinese conditions has the following form:

$$C = C(P, P_0, Y, \frac{1}{(1+r)}, r_f, W_0, S)$$

Continuing our examination of the data, the inflation rates use all the previous years' price indexes, income, savings, prices, interest rates, and so forth based on the *Chinese Statistical Yearbook* for the sample periods from 1978 to 2008. Considering function consistency and the

actual data for all the variables, the statistical examination consistently employs a logarithm linear form. According to the sample data and using Ordinary Least Squares (OLS), we obtain the following models:

$$\log(C_t) = -3.00 + 0.53 \log y_t + 0.52 \log y_{t-1}$$

$$+ 0.64 \log p_t^e - 0.01 \log i - 0.06 \log S_{t-1}$$

$$D.W = 1.87, \qquad R^2 = 0.999$$

In the model, the T value of all the equation coefficients are significantly larger than 2.

Here; $C_t, y_t, y_{t-1}, p_t^e, i, S_{t-1}$ represents current consumption, current income (mainly wages), the residents' expected inflation rate, interest rate, and the residents' prior period savings.

From the model, it is satisfying that $D.W = 1.87$ and $R^2 = 0.999$ before there is any adjustment of the data. The coefficients of the independent variables also meet the requirements. This means that current consumption is positively correlated with current income, prior period income, and the rate of inflation, but it is negatively correlated with the interest rates and savings. Because part of the prior period income and savings is included in the two-stage analysis of current wealth, resulting in a flexibility coefficient of 0.46, our analysis of the theoretical model is supported.

From the theoretical model and empirical test, it is clear that Chinese residents' consumption is characterized by intermittent and cyclical behavior. This is due both to China's unique cultural background and the dynamic social and economic transitions that are underway in China.

V. Conclusions and Implications

This paper applies econometric models and an empirical test of the intermittent and cyclical fluctuation hypothesis of China's urban residents' consumption behavior. The basic conclusion is that Chinese urban residents' consumption behavior is characterized by intermittent and cyclical fluctuations, which result from both traditional Chinese culture and the dynamic economic transition. To a large extent, such consumption behavior will have a negative impact on government policy to stimulate domestic demand. To ensure the

effectiveness of China's stimulus policies, measures must be taken to correct consumer behavior by: (1) narrowing the rural-urban economic development gap as national GDP grows; (2) establishing a sound social security system, including unemployment insurance, old age pensions, medicare, housing assistance, educational loans, and so on to relieve current consumer spending worries; (3) actively promoting consumer credit systems, expanding the scale of consumer credit, and promoting the development of a consumer credit market; (4) promoting a new consumption orientation in the direction of more rational consumption behavior; (5) enhancing the clarity of the reform policy so that Chinese residents will be able to maintain stable expenditure expectations during the transition and hence will be able to increase current spending; and (6) increasing adjustments in the income distribution policy so as to narrow the gap between the rich and the poor, which will substantially increase the buying power of the less-privileged groups and thus will increase the overall spending in the society.

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