IMPLICATIONS OF DISPOSABLE INCOME AND INTEREST RATE OF DEPOSIT ON PRIVATE CONSUMPTION OF URBAN RESIDENTS IN CHINA, 2001-2010

BY
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ECONOMICS OPTION

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April 2012

We hereby recommend that Project by Miss Chan Kwan Yu Erica entitled “Implications of Disposable Income and Interest Rate of Deposit on Private Consumption of Urban Residents in China, 2001-2010” be accepted in partial fulfillment of the requirements for the Bachelor of Social Sciences (Honours) Degree in China Studies in Economics.

__________________________  __________________________
Dr. Cheng Yuk Shing  Second Examiner
Project Supervisor
Acknowledgements

I would like to thank my supervisor Dr. Cheng Yuk Shing for guiding me through the entire study. Thanks are also due to Dr. Chan Hing Lin and Dr. Hung Wan Sing for their guidance in EViews 7 and Econometrics.

____________________________
Student’s signature

China Studies Degree Course
(Economics Option)

Hong Kong Baptist University

Date: ______________________
ABSTRACT

The focus of this study would be on examining the significance of Chinese urban resident’s disposable income and the interest rate of deposit on variation of the private consumption level in the Year 2001 to 2010. After an empirical analysis, it is found that for Chinese urban residents, changes of per capita current disposable income and changes of per capita permanent income were highly significantly related to changes of their per capita private consumption. However, all interest rates of deposit were found to be highly insignificant to changes of per capita private consumption of Chinese urban residents. Moreover, the empirical results showed that variation in changes of disposable income, no matter current or permanent one, could only explain 18% to 34% of variation in changes of private consumption of Chinese urban residents, in 2001 to 2010. This result implies that perhaps the rest of changes of Chinese urban residents’ private consumption could be explained by other factors, or, was unexplainable.
TABLE OF CONTENTS

1. Introduction.................................................................................................................................1
2. Consumption Theories and Literature Review ...........................................................................4
3. Methodology of Study ..................................................................................................................10
4. Results and Interpretations .........................................................................................................16
5. Discussion ....................................................................................................................................24
6. Suggestions .................................................................................................................................34
7. Conclusion ...................................................................................................................................40

Appendix A: Data Summary ............................................................................................................41
Appendix B: Panel Unit Root Test Results ......................................................................................43
Appendix C: Full Regression Output by EViews 7 .........................................................................44
Bibliography ......................................................................................................................................64
1. Introduction

In the past 30 years, the overall economy of People’s Republic of China (China) experienced a substantial improvement. It is said that Chinese export-led strategy and successful accession to World Trade Organization opened up the country and thus contributed to its rapid economic growth. However, heavily relying on export has led to the imbalance in consumption, investment and net export which, in long term, is unfavorable to Chinese sustained economic growth since the country may be vulnerable to macro-environmental shocks such as financial crises, natural disasters, or changes on trade policies or regulations. In other words, volume of export of China can be greatly fluctuated and thus uncertainty is likely to occur. Therefore, to retrieve the balance of consumption, investment and net export, it is strongly suggested that China should focus on increasing its consumption.

According to data from World Bank, the private consumption rate of China kept decreasing and has remained relatively stable at 35% in recent years while it was about 60% in the world and other major economies (Table 1). As a result, assuming no income leakage, Chinese domestic saving rate continued increasing and it was over 50% in 2010 which was at least 2 times of that in the world and other major economies (Table 2).
### Table 1 Private consumption rate (% of GDP), World Bank WDI Database

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### Table 2 Gross domestic savings (% of GDP), World Bank WDI Database

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Chinese relatively low private consumption rate indeed can be unfavorable to long-term investment since company profit generated from private consumption is one of the vital factors in business production decision. It is supposed that the more production profits a company gains, the more savings it has and thus the more capital it hold for future investment, say production in next period. Therefore, the Twelfth Five-Year Plan has kept urging to stimulate private consumption to expand domestic demand.

The level of private consumption can be determined by many factors. People’s disposable income and the interest rate of deposit are two of them. The focus of this study would be on examining the significance of these 2 factors on variation of the private consumption level in the Year 2001 to 2010. Although increasing rural resident’s private consumption has been a hot discussion recently, there is still big room for improvement in increasing urban resident’s one. So, the study scope would be further concentrated at urban residents.
2. Consumption Theories and Literature Review

Research on consumption has long been studied. There are some economic theories with econometric analysis. In the following, theories of absolute income hypothesis, permanent income hypothesis, economic principles about interest rate and consumption, and views from Chinese scholars will be introduced.

2.1 Consumption Theories

(1) Absolute Income Hypothesis

This is the well-known aggregate consumption function introduced by John M. Keynes in his book *The General Theory of Employment, Income and Money* in 1936. Keynes suggested that current consumption level was a function of current disposable income:

\[ C_t = \alpha + \beta Y_d_t \]

where \( C_t \) represents current consumption, \( \alpha \) represents autonomous consumption, \( \beta \) represents the marginal propensity to consume (MPC), and \( Y_d_t \) represents the current disposable income.
In his model, Keynes assumed that the average propensity to consume (APC) would decrease as disposable income increased:

$$APC = \frac{C_t}{Ydt} = \frac{\alpha}{Ydt} + \beta$$

Moreover, if MPC declines as disposable income increases, it means that when disposable income increases, consumption will increase at a decreasing rate because the ratio of consumption to disposable income eventually diminishes. (Levacic & Rebmann, 1984; Sun, 2002; Xu, 2007)

In 1942-1946, Simon S. Kuznets, however, questioned the validity of Keynes’s Absolute Income Hypothesis in long run. By examining data of United States households from 1869 to 1938, Kuznets found that the ratio of consumption to income and APC kept relatively constant even though the national income in 1938 was 7 times of that in 1869. In other words, Kuznets showed that Keynesian’s absolute income hypothesis might only suit short run data well but not for long run. (Levacic & Rebmann, 1984; Sun, 2002)

(2) Permanent Income Hypothesis

It was introduced by Milton Friedman in *A Theory of the Consumption Function* in 1957. The theme of this hypothesis challenges Keynesian’s absolute income hypothesis in which Friedman assumes that when people determine their current consumption level, they would consider their “future income and future consumption possibilities” in their whole life. In other words,
income expectation and real wealth are considered but not the current disposable income. A simple equation illustrating Friedman’s permanent income hypothesis is:

\[ C = \beta Y_p \]

where \( C \) represents the current consumption level, \( \beta \) represents the MPC, and \( Y_p \) represents the permanent income. (Levacic & Rebmann, 1984; Deaton, 1992)

However, it is impossible to know exactly how much wealth a person has in his whole life. According to Friedman, the weighted average of current and past levels of income can only be measured as the proxy permanent income (Deaton, 1992).

Since both current income and permanent income have been supported by strong theories, both types of income would be considered in examining the Chinese data to see their significances to Chinese urban residents’ private consumption level.

(3) Interest Rate of Deposit and Consumption

Referring to Xu Yongbing’s book, interest rate of deposit affects economic benefit of depositors such that they will adjust their spending accordingly. If interest rate stands high, people prefer saving more but reducing the
consumption level. It is same to substitution effect of interest rate on deposit. Apart from substitution effect, according to modern economic principles, interest rate also has the income effect on deposit. That is increasing the interest rate of deposit means that a depositor’s interest earning in bank deposits will also be increased. In other words, his future income will increase. Therefore, the depositor no longer needs to save as much as it is, now. Instead, he could choose to reduce his current saving accordingly and increase his consumption level. (Xu, 2007)

If substitution effect dominates, interest rate would be positively related to saving. Conversely, if income effect dominates, the two would be negatively related. Moreover, if the two effects offset each other, then interest rate and saving is unrelated. (Xu, 2007)

Since the effect of interest rate of deposit is ambiguous, it is included as one of the factors to be studied in the empirical model in this study.

2.2 Literature Review on Research on Chinese Data

The above consumption theories were overwhelming the entire Western and developed countries. Similar researches were also carried out by some Chinese scholars.

Numbers of research proved that a person’s income was an important factor in determining his private consumption, no matter before or after the
Chinese social and economic reform (Guo, 2010). Zang Yuheng in 1994 claimed that the Keynesian absolute income hypothesis explained better Chinese residents’ consumption behavior in Chinese planning economy era (Xu, 2007). However, Zang used data of gross income and gross consumption for estimation (Jiang & Deng, 2011). In terms of interest rates of deposits, only studies on impact of interest rates of deposits on saving level could be found. 

Yet, findings of these studies about interest rate also varied. Xie Ping used data from 1978 to 1987 and found that resident saving was sensitive to real interest rate and they were positively related; Zhang Wenzhong and Tian Yuan said impact of current interest rate on saving was little while Li Yan said it was ambiguous. (Xu, 2007)

However, Xu Yongbing additionally suggested that the western consumption theories might not be suitable if they were directly used in private consumption study in China. He claimed that firstly western consumption theories reflected western ideology which was greatly different from the Chinese social system and Chinese ideology. Secondly, he suggested that western theories neglected the differences in culture, consumption motivation, resident’s saving habit. Thirdly, China adopted a highly government controlled economic system which was different from the market-oriented economic system in western, specifically, the developed countries. But he did agree that the western research method and the way of thinking should be learned and adopted. (Xu, 2007)
All in all, there are many studies on relationship of consumption and income but relatively rare on consumption and interest rate of deposit. So, it is new that this study is going to examine the significance of a Chinese urban resident’s disposable income and the different types of interest rate of deposit to his private consumption level by using Chinese provincial data from 2001 to 2010. Also, it is new that comparison of current disposable income and permanent income, and that of different types of interest rate of deposit will be made in this study. To increase validity and credibility, instead of gross data, per capita data would be used.
3. Methodology of Study

In this section, a set of variables for empirical analysis will be defined. Variable description and data source will be clarified. Then, an empirical model for the study will be introduced and explained.

Since there are provincial disparities, models simply examining the time-series national data would not have high validity and credibility. So, a panel dataset consisting of 10 years of data, from 2001 to 2010, of 31 provinces, municipalities and autonomous regions in China\(^1\) will be used for the examination of the designed empirical model.

3.1 Assumption

In this empirical analysis, for easier estimation, it is assumed that there was no income leakage. In other words, after subtracting the amount of private consumption from disposable income, the rest would be considered as savings.

3.2 Data

(1) Dependent Variable:

- \(\text{LN(CONS)}\)

It is the natural logarithm value of the urban resident’s real per capita

---

\(^1\) All provincial level administrative regions are included; but Taiwan and 2 Special Administrative Regions, Hong Kong and Macau, are excluded in the research.
private consumption level in Yuan. The numbers were calculated from the nominal value of per capita private consumption level of Chinese urban residents in 2001 times a set of comparable price index which setting previous year as 100.

(2) Independent Variables:

- **LN(Y1)**

Because of the proved close relationship of current disposable income and current consumption by Keynes, the natural logarithm of urban resident’s real per capita annual disposable income at current year would be used as one of the regressors in the empirical model. It is treated as the current income. For data collection, similarly, the numbers were calculated from the nominal value of per capita disposable income of Chinese urban residents in 2001 times a set of comparable price index which setting previous year as 100. In this study, LN(Y1) is used as the control variable and expected to have a positive coefficient.

- **LN(Y5)**

This is the permanent income in Yuan for this study. It represents the natural logarithm of average of previous 5 years of urban resident’s real per capita disposable income. The values of Y5 were calculated by data in Y1. The permanent income regressor is expected to have a positive coefficient.
- R0

This is the real annual average interest rate of saving deposit, in %, which provincial inflation rate was subtracted from the calculated average interest rate of saving deposit. According to economic theories discussed, the coefficient of this independent variable is expected to be ambiguous.

- R025, R05, R1, R2, R3, and R5

These are the real annual average interest rates of time deposits, in %, which provincial inflation rate was subtracted from calculated average interest rates of time deposits. Specifically, R025, R05, R1, R2, R3 and R5 refer to the interest rate of a 3-month, 6-month, 1-year, 2-year, 3-year and 5-year time deposit respectively. Similar to R0, the expected signs for the coefficients of these control variables are also ambiguous.

3.3 Data Source

Provincial data of per capita disposable income, per capita private consumption, Consumer Price Index (CPI) by region of Chinese urban residents are collected from *China Statistical Yearbook 2002-2011* (provincial inflation rate is calculated from CPI). The different types of interest rate of deposit are collected on the website of The People’s Bank of China. The statistics of provincial per capita disposable income of urban resident index from 2001 to 2010 are collected online on the website of China Infobank. A summary of variable description and data source of a specific variable is in Appendix A.
3.4 Empirical Model

Instead of basic multiple-regression model, the Fixed Effect Least-Squares Dummy Variable (LSDV) Model (Hill, 2012) will be used because the individual heterogeneity can be captured by the intercept. The regression equation is:

\[
\text{LN(CONS)}_{jt} = \alpha + \beta_1 \text{LN(YM)}_{jt} + \beta_2 \text{RN}_{jt} \\
+ \gamma_3 P_j + \gamma_4 P_j + \ldots + \gamma_{31} P_j + \varepsilon_{tj}
\]

where \( M = 1, \text{or } 5; N = 0, 025, 05, 1, 2, 3, \text{or } 5; t = 2001, 2002, \ldots, 2010; \)
\( P_j = 1 \) for the \( j \)th province, otherwise \( DC_j = 0, j = 2, 3, \ldots, 31; \)

(P\( j \) is the dummy variable denoting different provinces).

Before running regression in EViews 7, the data series are needed to be tested for stationarity (Hill, 2012) by using 4 panel unit root test: (A) Levin, Lin and Chu, (B) Im, Pesaran and Shin, (C) Fisher-type test using ADF test, and (D) Fisher-type test using PP test. Null hypothesis of all 4 tests is assuming there is a unit root. The rejection rule is: the lower probability a series has, the stronger rejection on null hypothesis. Detailed report of test results is in Appendix B.

According to the panel unit root test results, the level statistics of series of \( \text{LN(CONS)}, \text{LN(Y1)} \text{ and } \text{LN(Y5)} \) was computed with high probability in at least one of the 4 tests. The high probability suggests that null hypothesis of existence of unit root cannot be rejected. So, these series are concluded as
nonstationary. However, after taking the tests again in 1st difference, null hypothesis can be rejected such that LN(CONS), LN(Y1) and LN(Y5) are now stationary.

For all 7 interest rate series, the test results showed a low probability when unit root tests were conducted on level and 1st difference of the series. This implies that null of unit root can be rejected and the interest rate series are stationary.

Therefore, referring to the unit root test results, the empirical model will be modified in the way that LN(CONS), LN(Y1) and LN(Y5) will take 1st difference when running regression:

\[
D(\ln(\text{CONS})_{ij}) = \alpha + \beta_1 D(\ln(\text{YM})_{ij}) + \beta_2 \text{RN}_{ij}
\]

\[
+ \gamma_2 p_j + \gamma_3 p_j + \ldots + \gamma_{31} p_j + \epsilon_{ij}
\]

where \( M = 1, \text{ or } 5; \ N = 0, 0.25, 0.5, 1, 2, 3, \text{ or } 5; \ t = 2001, 2002, \ldots, 2010; \ p_j = 1 \text{ for the } j\text{th province, otherwise } p_j = 0, j = 2, 3, \ldots, 31; \)

(P\(_j\) is the dummy variable denoting different provinces).

Using the above equation, there are 16 models in total that each type of income, LN(Y1) and LN(Y5), has 8 models. Each model will take 1 type of incomes and 1 type of interest rates. The aim of such separating estimation is to discover and compare the significance of different types of incomes and interest rates on private consumption. Table 3a and 3b show a summary of the models.
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Table 3a Regression model summary for current disposable income

<table>
<thead>
<tr>
<th>Model 9</th>
<th>Model 10</th>
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<th>Model 13</th>
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<td></td>
</tr>
<tr>
<td>D(LN(Y5))</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>R0</td>
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</tr>
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<td></td>
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</tr>
<tr>
<td>R3</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>R5</td>
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</table>

Table 3b Regression model summary for permanent income
4. Results and Interpretations

<table>
<thead>
<tr>
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<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
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</tr>
</thead>
<tbody>
<tr>
<td>D(LN(CONS))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(LN(Y1))</td>
<td>0.4513** (3.4901)</td>
<td>0.4499*** (3.4571)</td>
<td>0.4503*** (3.4409)</td>
<td>0.4496*** (3.4217)</td>
</tr>
<tr>
<td>R0</td>
<td>0.000419 (0.2846)</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R025</td>
<td>/</td>
<td>0.000500 (0.2998)</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R05</td>
<td>/</td>
<td>/</td>
<td>0.000477 (0.2774)</td>
<td>/</td>
</tr>
<tr>
<td>R1</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>0.000499 (0.2818)</td>
</tr>
<tr>
<td>R2</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R3</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R5</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>C</td>
<td>0.0398*** (3.1947)</td>
<td>0.0394*** (3.3393)</td>
<td>0.0392*** (3.3553)</td>
<td>0.0392*** (3.3737)</td>
</tr>
<tr>
<td>R²</td>
<td>0.1820</td>
<td>0.1821</td>
<td>0.1820</td>
<td>0.1820</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.0756</td>
<td>0.0757</td>
<td>0.0756</td>
<td>0.0756</td>
</tr>
<tr>
<td>DW stat</td>
<td>1.9751</td>
<td>1.9756</td>
<td>1.9753</td>
<td>1.9753</td>
</tr>
<tr>
<td>Total pool (balanced) Obs</td>
<td></td>
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<td></td>
<td>279</td>
</tr>
</tbody>
</table>

Table 4a Empirical results

Note: for full regression output by EViews 7, please refer to Appendix C.

Numbers in parentheses are the t-statistics; *** indicates significant at the 1% level; ** indicates significant at the 5% level; * indicates significant at the 10% level.
### Table 4b Empirical results (cont')

<table>
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<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
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<tbody>
<tr>
<td>D(LN(CONS))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(LN(Y1))</td>
<td>0.4476*** (3.4015)</td>
<td>0.4477*** (3.3854)</td>
<td>0.4479*** (3.3707)</td>
<td>0.4626*** (3.7657)</td>
</tr>
<tr>
<td>R0</td>
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<td>/</td>
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<td>/</td>
</tr>
<tr>
<td>R025</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
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<tr>
<td>R05</td>
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<tr>
<td>R1</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R2</td>
<td>0.000587 (0.3209)</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R3</td>
<td>/</td>
<td>0.000585 (0.3080)</td>
<td>/</td>
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</tr>
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<td>R5</td>
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<td>/</td>
<td>0.000571 (0.2936)</td>
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</tr>
<tr>
<td>C</td>
<td>0.0390*** (3.4283)</td>
<td>0.0388*** (3.4543)</td>
<td>0.0386*** (3.4618)</td>
<td>0.0382*** (3.4574)</td>
</tr>
<tr>
<td>R²</td>
<td>0.1821</td>
<td>0.1821</td>
<td>0.1821</td>
<td>0.1818</td>
</tr>
<tr>
<td>Adjusted R²</td>
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<td>0.0757</td>
<td>0.0757</td>
<td>0.0791</td>
</tr>
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<tr>
<td>Total pool (balanced) Obs</td>
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</tr>
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</table>

Note: for full regression output by EViews 7, please refer to Appendix C.

---

3 Numbers in parentheses are the t-statistics; *** indicates significant at the 1% level; ** indicates significant at the 5% level; * indicates significant at the 10% level.
<table>
<thead>
<tr>
<th></th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D(LN(CONS))</td>
<td>D(LN(Y5))</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.9788*** (2.9896)</td>
<td>1.9781*** (2.9852)</td>
<td>1.9755*** (2.9789)</td>
<td>1.9724*** (2.9725)</td>
</tr>
<tr>
<td>R0</td>
<td>0.000911 (0.4261)</td>
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<td>/</td>
</tr>
<tr>
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<td>/</td>
<td>0.001004 (0.4152)</td>
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<td>/</td>
</tr>
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<td>R05</td>
<td>/</td>
<td>/</td>
<td>0.001048 (0.4266)</td>
<td>/</td>
</tr>
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<td>R1</td>
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<td>/</td>
<td>0.001109 (0.4437)</td>
</tr>
<tr>
<td>R2</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R3</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R5</td>
<td>/</td>
<td>/</td>
<td>/</td>
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</tr>
<tr>
<td>C</td>
<td>-0.0930 (-1.5728)</td>
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<td>-0.0944 (-1.6144)</td>
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Table 4c Empirical results (cont')

Note: for full regression output by EViews 7, please refer to Appendix C.

---

Numbers in parentheses are the t-statistics; *** indicates significant at the 1% level; ** indicates significant at the 5% level; * indicates significant at the 10% level.
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</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(LN(Y5))</td>
<td>1.9675*** (2.9665)</td>
<td>1.9651*** (2.9614)</td>
<td>1.9611*** (2.9538)</td>
<td>2.0226*** (3.1037)</td>
</tr>
<tr>
<td>R0</td>
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</tr>
<tr>
<td>R025</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R05</td>
<td>/</td>
<td>/</td>
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</tr>
<tr>
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<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R2</td>
<td>0.001240 (0.4915)</td>
<td>/</td>
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</tr>
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<td>R3</td>
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<td>0.001298 (0.5043)</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>R5</td>
<td>/</td>
<td>/</td>
<td>0.001384 (0.5282)</td>
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</tr>
<tr>
<td>C</td>
<td>-0.0947 (-1.6294)</td>
<td>-0.0952 (-1.6452)</td>
<td>-0.0955 (-1.6527)</td>
<td>-0.0991* (-1.7313)</td>
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<td>0.1728</td>
<td>0.1730</td>
<td>0.1779</td>
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<td>2.6076</td>
<td>2.6067</td>
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<tr>
<td>(balanced) Obs</td>
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<td></td>
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<td>155</td>
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</tbody>
</table>

Table 4d Empirical results (cont’)

Note: for full regression output by EViews 7, please refer to Appendix C.

---

5 Numbers in parentheses are the t-statistics; *** indicates significant at the 1% level; ** indicates significant at the 5% level; * indicates significant at the 10% level.
Referring to the result summary in Table 4a, 4b, 4c and 4d, coefficients of all types of income regressors which are current disposable income and permanent income do have the expected positive sign. It means that there was a positive relationship between changes of disposable income and changes of private consumption. More importantly, it is obvious that, according to data of Chinese urban residents in 2001 to 2010, changes in all types of per capita disposable income of Chinese urban residents were highly significant, at the 1% level, to changes in their per capita private consumption level. The results are consistent with the strong link between income and consumption in both Keynesian’s absolute income hypothesis and Friedman’s permanent income hypothesis.

On the other hand, empirical result of interest rate of deposit is another story. The coefficients of all 7 types of interest rate of deposit had the positive sign which a positive relationship between change of consumption and interest rate of deposits was suggested. But it is surprising that, no matter saving deposit, short term or long term time deposits, impact of real interest rate of deposit was highly insignificant on Chinese urban residents’ private consumption level from 2001 to 2010. According to the empirical result, none of interest rates of deposits was significant at the 1%, 5% or 10% level.

Another piece of evidence on insignificance of interest rate of deposit is the slight variation in magnitudes of coefficients. Coefficients of change of current disposable income, D(LN(Y1)), only differed slightly in Model 1 to Model 8. A similar case also occurred for coefficients of change of permanent
income, D(LN(Y5)), in Model 9 to Model 16. Moreover, the relatively stable $R^2$ and adjusted $R^2$ before and after including the interest rate regressors in regression also provide as a piece of evidence of insignificance of interest rate of deposit to change of private consumption level (Table 5a and 5b).

<table>
<thead>
<tr>
<th>Before removal of interest rate regressors</th>
<th>After removal of interest rate regressors</th>
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<tr>
<td>Model 1 – Model 7</td>
<td>Model 8</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.1820 – 0.1821</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.0756 – 0.0757</td>
</tr>
</tbody>
</table>

Table 5a $R^2$ and adjusted $R^2$ comparison for current disposable income models

<table>
<thead>
<tr>
<th>Before removal of interest rate regressors</th>
<th>After removal of interest rate regressors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 9 – Model 15</td>
<td>Model 16</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.3443 – 0.3448</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.1723 – 0.1730</td>
</tr>
</tbody>
</table>

Table 5b $R^2$ and adjusted $R^2$ comparison for permanent income models

Therefore, all of these observations serve as evidences of insignificance of interest rate of deposit on affecting changes of per capita private consumption level of Chinese urban residents. And since interest rate of deposit was insignificant to changes of per capita private consumption. The following comparison among current disposable income and permanent income will base
on empirical results of Model 8 and Model 16 which all interest rate of deposit regressors are removed.

Previously, it has been reported that both current disposable income and permanent income showed their significances to changes of private consumption level of Chinese urban residents from 2001 to 2010. However, the 2 types of incomes differ in the degree of explaining the whole picture of change of private consumption of Chinese urban residents.

For current disposable income, in Model 8, the $R^2$ and adjusted $R^2$ of regressions concerning regressors of current disposable income were 0.1818 and 0.0791 respectively. It means that variations in change of per capita current disposable income and different types of interest rate of deposit could only explain about 18.18% of variation in change of per capita private consumption level.

Similarly, for permanent income, in Model 16, the $R^2$ and adjusted $R^2$ of regressions concerning regressors of permanent income were 0.3434 and 0.1779 respectively. It means that variations in change of per capita current disposable income and different types of interest rate of deposit could only explain about 34.34% of variation in change of per capita private consumption level.

From these statistics, it may be concluded that, in 2001 to 2010, Friedman’s permanent income hypothesis explained private consumption of
Chinese urban residents better than Keynesian’s absolute income hypothesis. But, both current disposable income and permanent income did show that they were highly significant to private consumption.

What’s more, a worth noting point about the $R^2$ and adjusted $R^2$ of regressions is the relatively low values suggest that income, no matter current or permanent income, may poorly explain the majority of changes of private consumption although they were highly significant. The rest of changes of private consumption may be explained by other factors, or indeed unexplainable.

To recap as a sub-conclusion, with reference to the empirical results for Chinese data from 2001 to 2010, it is once again showed that disposable income of urban residents, no matter current or permanent income, was significantly closely related to the changes of their private consumption level. In particularly, Friedman’s permanent income hypothesis might explain the whole picture better than Keynesian’s absolute income hypothesis. Yet, income factor can only explain a small part of changes of private consumption. On the other hand, in Chinese case, interest rate of deposit was surprisingly insignificant in changes of private consumption level.
5. Discussion

In this section, discussion will focus on the significance of disposable income and insignificance of interest rate of deposit.

5.1 Disposable Income

As discussed in consumption theories and literature review previously, it is proved that disposable income would affect the level of private consumption due to Keynesian’s absolute income hypothesis and Friedman’s permanent income hypothesis. As a result, ultimately, any factors affecting the level of disposable income would also affect the level of private consumption. With this belief, one important insight from the empirical results is that, in order to stimulate private consumption of Chinese urban residents, the per capita disposable income should be increased. Without borrowing, people have budget constraint that they can only spend, at most, as much as they earn or the real wealth they have. So, disposable income as the amount of money a person earns after tax is a key limitation in increasing his level of consumption.

Nowadays, in China, although the disposable income of urban residents has increased continuously and steadily, its growth rate has still been slower than the growth rates of inflation, GDP and national government revenue. For example, according to China Statistical Yearbook 2011, the growth rate of disposable income of urban residents in 2010 was 7.8%. Yet, growth rates of GDP, national government revenue and inflation in the same year were 10.3%,
21.3% and 5.7% respectively. In addition to the relatively low income level, private consumption has not increased much correspondingly, and its growth rate has even been slowed down. It is believed that such special phenomenon in fact is caused by 4 major factors: (1) region-biased and sector-biased government policies, (2) imperfect tax policies in individual income tax, (3) imperfect social security system, and (4) a lack of investment channels.

(1) Region-biased and Sector-biased Government Policies

Since the Chinese government adopted the sequential and gradualism development strategy, some regions were selected to be the experimental zones to try out new government policies such as policies on trade and manufacturing. Take Guangdong Province as an example. In early 1980s, Shenzhen, Zhuhai and Shantou in Guangdong Province became 3 of the 4 earliest Special Economic Zones (SEZs) under the Open Door policy and Economic Reform in China. These SEZs were given a series of economic privileges and a relatively greater independence in determining and setting up their own development policies, particularly in international trade industry. The regions then developed rapidly by attracting a large amount of foreign direct investment and doing a great job in manufacturing and exporting. Consequently, their substantial economic growth pushed up the economy of the whole Guangdong Province and helped it to grow. The special identity led the Guangdong urban residents receiving one of the highest disposable income levels in the entire country. However, in other provinces like Gansu, Sichuan and Qinghai, they were not given the opportunities to enjoy the SEZ privileges. And thus, it was difficult
for them to attract foreign direct investment and shift their pillar industries to sectors which could generate high profits. Therefore, urban residents there received a relatively lower disposable income level than urban residents in SEZs. So, regional income disparity was resulted and affected the private consumption of urban residents in non-SEZ regions.

Then, in terms of sectors, it was a similar situation to region-biased government policies. Some sectors were highly or fully supported by the Central and/or local governments. So, firms in these sectors would then have been given various resources and incentives for investment and development. With more resources, supposing rent-seeking activities were minor and firms were working with efficient technologies, firms usually could earn higher profits which enabled them to invest and expand to further generate higher profits in next period. So, a virtuous circle was formed. And workers of these being-supported firms generally earned a higher disposable income than others. Therefore, income disparity also occurred.

From above, both region-biased and sector-biased government policies contributed to the uneven primary income distribution which indeed would affect the level of disposable income and so as the level of consumption. In Cheng Raohua’s research paper (Cheng, 2010), she clearly stated that, according to Keynes, the change of propensity to consume would be affected by the uneven income distribution. The more the wealth a person had, the smaller value the propensity to consume he had. The propensity to consume of lower income people usually was larger than that of higher income people (Cheng,
This could be observed from the higher ratio of private consumption on disposable income in a lower income household which normally was greater than the ratio in a higher income household. The philosophy is, for a higher income urban resident, he will have a higher propensity to save but lower propensity to consume since his relatively higher standard of living will have already satisfied his demand on consumption. On the other hand, for a lower income urban resident, he will have a lower propensity to save but higher propensity to consume since he probably will have to spend the majority of his disposable income in order to maintain subsistence level. (Guo, 2011 Jun; Xie, 2011) Therefore, although lower income people wish to consume, their consumption level at last will be limited since they do not have more disposable income to spend. Eventually, the average propensity to consume (APC) of the society will decrease if wealth gap continues to increase. Then, the aggregate consumption demand of the whole society will be reduced. (Cheng, 2010)

(2) Imperfect Tax Policies in Individual Income Tax

Individual income tax is a direct factor affecting an urban resident’s disposable income due to the income effect theory. The higher the individual income tax, the lower the disposable income a person has; therefore, his private consumption level will then be reduced (Ma & He, 2011).

Currently, China adopts the progressive tax rate on income ranging from 5% to 45%, if in excess of specific amount after deducting 2,000 Yuan of
expenses (Table 6).

<table>
<thead>
<tr>
<th>Taxable income of the month, (Y^i) in excess of (Yuan)</th>
<th>Tax rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Y^i &lt; 500)</td>
<td>5</td>
</tr>
<tr>
<td>(500 \leq Y^i &lt; 2,000)</td>
<td>10</td>
</tr>
<tr>
<td>(2,000 \leq Y^i &lt; 5,000)</td>
<td>15</td>
</tr>
<tr>
<td>(5,000 \leq Y^i &lt; 20,000)</td>
<td>20</td>
</tr>
<tr>
<td>(20,000 \leq Y^i &lt; 40,000)</td>
<td>25</td>
</tr>
<tr>
<td>(40,000 \leq Y^i &lt; 60,000)</td>
<td>30</td>
</tr>
<tr>
<td>(60,000 \leq Y^i &lt; 80,000)</td>
<td>35</td>
</tr>
<tr>
<td>(80,000 \leq Y^i &lt; 100,000)</td>
<td>40</td>
</tr>
<tr>
<td>(Y^i \geq 100,000)</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 6 Individual income tax rate, State Administration of Taxation

Ma Haitao and He Lidao argued that the low and lower-middle income people has taken a heavier tax burden than the upper-middle and high income people because their margin tax rate of individual income tax is still higher than that of upper-middle and high income people. So, the 2 scholars believed that this is one of the reasons causing a larger drop in disposable income of low and lower-middle people. (Ma & He, 2011) The income disparity is then, once again, resulted among different income levels. And thus, similarly, it may lead to a decrease in private consumption level in the country.
(3) Imperfect Social Security System

The social security system in China has long been complained as imperfect. All urban residents have to spare a portion of disposable income for their spending on residence, healthcare and medical services, and education. In 2010, for all types of households, the total percentage of expenditures in these 3 categories nearly reached 30% of their total consumption expenditure (Table 7).

<table>
<thead>
<tr>
<th>Household</th>
<th>Residence (a) (%)</th>
<th>Healthcare (b) (%)</th>
<th>Education (c) (%)</th>
<th>Sum (a)+(b)+(c) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest Income (10%)</td>
<td>11.99</td>
<td>7.41</td>
<td>9.19</td>
<td>28.59</td>
</tr>
<tr>
<td>Low Income (10%)</td>
<td>10.53</td>
<td>6.50</td>
<td>10.14</td>
<td>27.17</td>
</tr>
<tr>
<td>Lower-middle Income (20%)</td>
<td>10.47</td>
<td>6.61</td>
<td>10.76</td>
<td>27.84</td>
</tr>
<tr>
<td>Middle Income (20%)</td>
<td>9.99</td>
<td>6.86</td>
<td>11.27</td>
<td>28.12</td>
</tr>
<tr>
<td>Upper-middle (20%)</td>
<td>9.32</td>
<td>6.57</td>
<td>12.40</td>
<td>28.29</td>
</tr>
<tr>
<td>High Income (10%)</td>
<td>9.52</td>
<td>6.26</td>
<td>13.05</td>
<td>28.83</td>
</tr>
<tr>
<td>Highest Income (10%)</td>
<td>9.49</td>
<td>5.80</td>
<td>14.22</td>
<td>29.51</td>
</tr>
<tr>
<td>Average</td>
<td>9.89</td>
<td>6.47</td>
<td>12.08</td>
<td>28.44</td>
</tr>
</tbody>
</table>

Table 7 Per capita annual expenditure of urban households on residence, healthcare and education, by income percentile, in 2010 (% of total consumption expenditure), *China Statistical Yearbook 2011*
With such high expenditure, the existing imperfect social security has brought uncertainty which limits current and future private consumption. The degree of reducing consumption level will be more obvious in low and lower-middle households since they will prefer saving up more of their disposable income as the precautionary saving to reduce the risks of having insufficient funds for securing their life. As a result, the disposable income for consumption and the consumption level would be reduced. (Lin, 2011)

(4) A Lack of Investment Channels

Nowadays, urban residents mainly save up their income as bank deposits (Yang, 2011). This is because urban residents are limited to invest in real estates and few types of financial products have been offered for urban residents to divert risks in financial market (Shen & Lei, 2011). Undoubtedly, most urban residents aim to gain some investment profit within their risk tolerance level. This means that they will prefer investment channels which have a lower risk level rather than those generate greater revenue. Under this situation, bank deposits have become the most popular choice among residents because of the lower risk level. Though there are many opportunities to invest in securities, mutual funds, bonds and futures at the financial market, these investments require a certain level of investment knowledge and experience. The level of risk of these products is relatively higher than that of bank deposits. Therefore, a number of urban residents are not willing and do not dare to invest in these products. Then, the less active financial market would result a slower reform in the market in which investors have less confidence and become cautious to
invest. So, a vicious circle is formed to hinder development of the financial market in China. Since urban residents prefer bank deposits, such investment decision will reduce the possibility of earning more future income by different investment channels. Additionally, they forecast that they cannot make big money through bank deposits. Therefore, they become more conservative in private consumption. (Shen & Lei, 2011)

5.2 Interest Rates of Deposits

From the empirical results, in 2001 to 2010, interest rates of deposit were insignificant in imposing impact on changes of private consumption of Chinese urban residents. It is believed that the insignificance was induced by the inelasticity of interest rates of deposits. There are 4 reasons suggested to explain the inelasticity: (1) strict control on interest rates, (2) immature financial system, (3) high inflation, and (4) depositor’s purpose of saving.

(1) Strict Control on Interest Rates

Currently, all nominal interest rates in China are not market-oriented. They are indeed set by the People’s Bank of China and have been strictly enforced by any legal and administrative means. The level of nominal interest rates normally is set with reference to past data from the Chinese government. So, the rates actually cannot reflect the real relationship with money supply in reality. (Shen & Lei, 2011) Consequently, in 2001 to 2010, changes in interest rates could not significantly affect residents’ deposits. Then, of course, the private
consumption level would not be significantly affected as well.

(2) Immature Financial System

Firstly, banks have not been fully commercialized. Since interest rate of deposits has not yet been liberalized but under strict control by the People’s Bank of China, banks actually do not have their own decision-making power in determining interest rates themselves. After years, banks may have insufficient professional knowledge and skills in investment and capital management. So, they would prefer investments which were highly secured and safe. Then, this made interest rates ineffective and insignificant for urban residents to determine their level of savings. (Shen & Lei, 2011)

Another consideration about immature financial system is the lack of investment channels. Similar to explanation in disposable income previously, the lack of investment channels offered no other better choices to urban residents. Therefore, in 2001 to 2010, no matter how interest rates changed, especially when the interest rates were decreasing, urban residents were not sensitive to the changes and thus would not vary the level of bank deposits so much.

(3) High Inflation

High inflation rate induces more uncertainty in the market. To prevent future suffering, urban residents normally will increase saving at current period
as a precautionary measure. Therefore, even though interest rates of deposits were low in 2001 to 2010, urban residents still keep saving up money which resulted the insignificant impact on interest rates.

In addition, the low or even negative real interest rates of deposits were unfavorable to consumption. Originally, the Chinese government wanted to keep the interest rate of deposit low in order to tackle the high inflation problem. Unfortunately, the outcome was unfavorable and the low nominal interest rates even turned the real interest rate to be negative since inflation rate had a larger value. The interest earned in bank deposits greatly determined the level of urban residents’ savings. Yet, for most years in 2001 to 2010, inflation rate was higher than real interest rate of deposit which means the actual revenue of bank deposits kept decreasing. Therefore, urban residents tended to save up more money in order to reduce future risk. (Jiang, Ma & Yin, 2010)

(4) Depositor’s Purpose of Savings

The main purpose of deposit is saving up for family expenditure such as housing, wedding, children’s education, funerals, medical and health care and retirement in case future income declines (Ding, 2011; Jiang, Ma & Yin, 2011). Since demand of these goods is relatively inelastic, in addition to Chinese existing imperfect social security system, Chinese urban residents will prefer saving up as much as possible. So, the low interest rate of deposit indeed will not affect the amount of bank deposit. In other words, depositors are not sensitive to changes in interest rates.

33
6. Suggestions

There are some current suggestions provided by some scholars and professionals to stimulate private consumption of Chinese urban residents by increasing their disposable income as well as improving their sensitivity on interest rates of deposit.

6.1 Increasing Employment Rate

It is believed that if urban residents are employed, they may at least earn a portion of income regularly such that they can secure themselves and thus be able to enlarge their private consumption. Otherwise, higher unemployment rate will reduce aggregate demand of urban residents, lower their consumption in general. In other words, employment and consumption are interdependent. Therefore, more specifically, government should take initiatives to help development of small and medium enterprises, private enterprises and enterprises in tertiary sector since these companies provide large amount of employment opportunities. (Cheng, 2010; Wang, 2006) Furthermore, unemployed residents should be encouraged to find job and be re-employed. One benefit of this suggestion is, by increasing the employment rate, labour in China could be fully utilized. What’s more important, according to the typical production function,

\[
\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + \alpha \frac{\Delta K}{K} + \beta \frac{\Delta L}{L}
\]
an increase in labour, $\Delta L/L$, may lead to an increase in output, $\Delta Y/Y$. So, economic growth may be induced. Usually, with economic growth, people will tend to have a positive expectation for the market and they may be confident to consume more.

6.2 Establishing Regular Wage Increase and Payroll Security Mechanism

Currently, the growth rate of wage of urban residents (indeed even for all Chinese residents) seldom increases as quick and much as that of GDP; and payrolls of some urban residents have not been fully protected since their employers always find excuses to delay paying full or part of their payrolls. This may imply that the unprotected and unstable disposable income may lower urban residents’ private consumption. Therefore, the establishment of mechanism of reviewing growth rate of wage and payroll security is strongly suggested. (Cheng, 2010; Jin, 2010) Supporters of this solution hope that the wage increase can reduce the income gap, transfer a larger portion of company profits to labour who are normally from low and lower-middle income families.

Jin Sanlin further suggested that the minimum wage rate should be increased, timely (Jin, 2010). Yet, this suggestion may create more unemployment. It is believed that an increase in minimum wage rate at anytime will increase operational cost of companies, reduce companies’ competitiveness; companies which could not afford the increasing cost will choose to lay off labour. As a result, unemployment rate might be increased.
6.3 Reforming Social Security System

Reforming and perfecting the current social security system is a common view from general public and scholars (Cheng, 2010; Jin, 2010; Wang, 2010; Lin, 2011; Xie, 2011). With reference to data from *China Statistical Yearbook 2011*, in 2010, the national government expenditure, which including both Central and local governments, on social items such as education, social safety net and employment effort, medical and health care, and affairs of housing security counted about 32.11% in total (Table 8). Especially expenditure on social safety net and employment effort only counted about 10% of all national government expenditure. It was relatively much lower than that in other countries such as 39% in Canada and 37% in Japan (Cheng, 2010).

<table>
<thead>
<tr>
<th>Expenditure Item</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Education</td>
<td>13.96</td>
</tr>
<tr>
<td>(2) Social Safety Net and Employment Effort</td>
<td>10.16</td>
</tr>
<tr>
<td>(3) Medical and Health Care</td>
<td>5.35</td>
</tr>
<tr>
<td>(4) Affairs of Housing Security</td>
<td>2.64</td>
</tr>
<tr>
<td>Sum = (1)+(2)+(3)+(4)</td>
<td>32.11</td>
</tr>
</tbody>
</table>

Table 8 Calculated percentage of social security service expenditure to national government expenditure, *China Statistical Yearbook 2011*

In general, no specific guidelines and policies have been suggested on how to reform the existing social security system. Yet, it is clear that Chinese government should expand expenditure on social items. More transfers could be made to the needy. But the type of transfer should be productive. This means
that these transfers should be used in enhancing residents’ productivity rather than simply giving out money. Otherwise, problem of moral hazard and rent-seeking activities maybe occur.

6.4 Reforming Individual Income Tax Collection

Since individual income tax is a major direct factor affecting urban residents’ disposable income, so, another suggested reform is about the reform of individual income tax collection. Ma Haitao and He Lidao proposed to lower the individual income tax rate of first 2 categories, individuals whose monthly taxable income is smaller than 2,000 Yuan after deducting 2,000 Yuan of living expenses, from 5% and 10% to 3% and 5%. It is hoped that the decrease in marginal tax rate will increase these residents’ marginal propensity to consume. (Ma & He, 2011)

However, the 2 scholars claimed that the main purpose of collecting individual income tax should be adjusting people’s income distribution and relieving the income disparity. So, it should not be given power to stimulate consumption, directly. So, they did not agree with the view which increasing the minimum income level for tax exemption. They explained that a further increase in the level would induce a big cut in the tax base. (Ma & He, 2011)
6.5 Liberalizing Interest Rates

Since interest rates of deposit are set by the People’s Bank of China, they are inelastic to urban residents. To solve it, Nicholas Lardy, who is an expert on Chinese economic issues in Institute for International Economics, and some Chinese scholars suggested and urged China to liberalize its interest rates (International Business Times, 2012; Jiang, Ma & Yin, 2010; Shen & Lei, 2011). The economists said that when interest rate policy becomes market-oriented, the interest rate level floats according to the demand and supply in the market. Then, people based on the principle of profit-maximization will adjust the amount, type and time bound of their deposits in financial institutions. So, with a more flexible interest rate of deposit, there will be a greater possibility in increasing urban residents’ private consumption (Jiang, Ma & Yin, 2010).

However, Lardy suspected whether the People’s Bank of China would really liberalize interest rates. He pointed out that Wen Jiabao, the Premier of China, in fact did mention liberalizing interest rates in his Report in 2009. But within these 3 years, Lardy said that he did not observe any measures working on the liberalization of interest rate and he was not confident to say that China would soon start the liberalization. He reasoned the lateness of interest rate liberalization was due to resistance from some vested interest enterprises and departments. He further explained that, for example, the Ministry of Finance, banks, construction and real estate industries would receive the greatest benefits from policies of low interest rate. Therefore, they opposed the liberalization. However, depositors usually suffered. (International Business Times, 2012)
6.6 Developing Financial Market

As discussed in Section 5, one factor for the limitation of earning more future income and for the insignificance of interest rates of deposits is the lack of investment channels. Chinese urban residents have very few choices and limited knowledge in investment so that they have to save up money as bank deposits. Therefore, a high saving rate and a low private consumption rate were resulted.

To tackle it, one suggestion is to develop Chinese financial market by providing more financial investment products and regulating the market well (Ding, 2011; Lin, 2011; Yang, 2011). Broadening the financial market means that various financial products will be provided. Then, Chinese urban residents may have more investment choices. And since they may have different investment goals, risk preferences and investment capital, the variety of financial products may satisfy investment demand of each of them.

Moreover, the financial market should be well-regulated, enforced and supervised. It is believed that with the well-regulated system, urban residents will be more confident to invest in financial products other than bank deposits such that they can spread the investment risks, have greater possibility to earn more income, then so as their disposable income.
7. Conclusion

After an empirical analysis on Chinese data from 2001 to 2010, it is found that for Chinese urban residents, changes of per capita current disposable income and changes of per capita permanent income were highly significantly related to changes of their per capita private consumption. However, for all 7 types of deposits which including the savings deposit, the 3-month, 6-month, 1-year, 2-year, 3-year and 5-year time deposits, their interest rate of deposit were found to be highly insignificant to changes of per capita private consumption of Chinese urban residents.

Although disposable income is significant to private consumption, the empirical results showed that variation in changes of disposable income, no matter current or permanent one, could only explain 18% to 34% of variation in changes of private consumption of Chinese urban residents, in 2001 to 2010. This result implies that perhaps the rest of changes of Chinese urban residents’ private consumption could be explained by other factors, or, was unexplainable.

Last but not least, to tackle the low private consumption issue in China, some Chinese and foreign scholars have suggested several ways. For example, governments should guarantee employment to improve employment rate, establish a mechanism for growth of wage rate and payroll security, reform current social security system, reduce individual income tax rate for low income people, liberalize interest rates and develop the financial market.
Appendix A: Data Summary

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit</th>
<th>Description</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN(CONS)</td>
<td>Yuan</td>
<td>Natural log value of real per capita private consumption of urban resident at current year, measured at 2001 constant price, by province</td>
<td>China Statistical Yearbook 2002-2011</td>
</tr>
<tr>
<td>(Dependent variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LN(Y1)</td>
<td>Yuan</td>
<td>Natural log value of real per capita disposable income of urban resident, measured at 2001 constant price, by province</td>
<td>China Statistical Yearbook 2002-2011; China Infobank</td>
</tr>
<tr>
<td>(Independent Variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LN(Y5)</td>
<td>Yuan</td>
<td>Natural log value of average of previous 5 years’ real per capita disposable income of urban resident, measured at 2001 constant price, by province</td>
<td>China Statistical Yearbook 2002-2011; China Infobank</td>
</tr>
<tr>
<td>(Independent Variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R0</td>
<td>%</td>
<td>Average real interest rate of saving deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>(Independent Variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R025</td>
<td>%</td>
<td>Average real interest rate of 3-month time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>(Independent Variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R05</td>
<td>%</td>
<td>Average real interest rate of 6-month time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>(Independent Variable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>%</td>
<td>Average real interest rate of 1-year time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>-------</td>
<td>---</td>
<td>---------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>R2</td>
<td>%</td>
<td>Average real interest rate of 2-year time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>R3</td>
<td>%</td>
<td>Average real interest rate of 3-year time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
<tr>
<td>R5</td>
<td>%</td>
<td>Average real interest rate of 5-year time deposit, by province</td>
<td>China Statistical Yearbook 2002-2011; The People’s Bank of China</td>
</tr>
</tbody>
</table>
### Appendix B: Panel Unit Root Test Results

<table>
<thead>
<tr>
<th></th>
<th>Level Statistic</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Difference Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
</tr>
<tr>
<td>LN (CONS)</td>
<td>1.25</td>
<td>6.33</td>
</tr>
<tr>
<td>LN(Y1)</td>
<td>-4.81</td>
<td>3.53</td>
</tr>
<tr>
<td>LN(Y5)</td>
<td>-4.85</td>
<td>2.91</td>
</tr>
<tr>
<td>R0</td>
<td>-13.38</td>
<td>-5.17</td>
</tr>
<tr>
<td>R025</td>
<td>-14.90</td>
<td>-6.42</td>
</tr>
<tr>
<td>R05</td>
<td>-15.67</td>
<td>-7.06</td>
</tr>
<tr>
<td>R1</td>
<td>-16.72</td>
<td>-7.82</td>
</tr>
<tr>
<td>R2</td>
<td>-17.99</td>
<td>-8.88</td>
</tr>
<tr>
<td>R3</td>
<td>-19.29</td>
<td>-10.04</td>
</tr>
<tr>
<td>R5</td>
<td>-20.57</td>
<td>-10.87</td>
</tr>
</tbody>
</table>

Note: (A) Levin, Lin and Chu  
(B) Im, Pesaran and Shin  
(C) Fisher-type test using ADF test  
(D) Fisher-type test using PP test  
( ) Numbers in parentheses is the probability
### Model 1

**Dependent Variable:** D(LN(CONS))  
**Method:** Pooled Least Squares  
**Sample (adjusted):** 2002 2010  
**Included observations:** 9 after adjustments  
**Cross-sections included:** 31  
**Total pool (balanced) observations:** 279

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.039811</td>
<td>0.012461</td>
<td>3.194687</td>
<td>0.0016</td>
</tr>
<tr>
<td>D(LN(Y1?))</td>
<td>0.451294</td>
<td>0.129307</td>
<td>3.490094</td>
<td>0.0006</td>
</tr>
<tr>
<td>R0?</td>
<td>0.000419</td>
<td>0.001473</td>
<td>0.284590</td>
<td>0.7762</td>
</tr>
</tbody>
</table>

**Fixed Effects (Cross):**

- BEIJING--C: -0.003308
- TIANJIN--C: 0.005114
- HEBEI--C: 0.003469
- SHANXI--C: 0.002751
- INNERMONGOLIA--C: 0.018177
- LIAONING--C: 0.006187
- JILIN--C: -0.003567
- HEILONGJIANG--C: 0.008978
- SHANGHAI--C: 0.012888
- JIANGSU--C: 0.000865
- ZHEJIANG--C: 0.015282
- ANHUI--C: 0.003399
- FUJIAN--C: -0.000950
- JIANGXI--C: -0.075631
- SHANDONG--C: 0.017611
- HENAN--C: -0.005468
- HUBEI--C: 0.005632
- HUNAN--C: 0.001967
- GUANGDONG--C: 0.014504
- GUANGXI--C: 0.023250
- HAINAN--C: -0.008978
- CHONGQING--C: 0.031461
- SICHUAN--C: -0.006866
- GUIZHOU--C: -0.003162
- YUNNAN--C: -0.007093
- TIBET--C: -0.035447
- SHAANXI--C: -0.010800
- GANSU--C: -0.012636
- QINGHAI--C: -0.002062
- NINGXIA--C: 0.007986
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.039411</td>
<td>0.011802</td>
<td>3.339254</td>
<td>0.0010</td>
</tr>
<tr>
<td>D(LN(Y1?))</td>
<td>0.449903</td>
<td>0.130138</td>
<td>3.457121</td>
<td>0.0006</td>
</tr>
<tr>
<td>R025?</td>
<td>0.000500</td>
<td>0.001668</td>
<td>0.299751</td>
<td>0.7646</td>
</tr>
<tr>
<td>Fixed Effects (Cross)</td>
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YUNNAN--C -0.007065  
TIBET--C -0.035483  
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GANSU--C -0.012630  
QINGHAI--C -0.001996  
NINGXIA--C 0.008029  
XINJIANG--C -0.003593  

Effects Specification

Cross-section fixed (dummy variables)

| R-squared | 0.182074 | Mean dependent var | 0.078021 |
| Adjusted R-squared | 0.075677 | S.D. dependent var | 0.055016 |
| S.E. of regression | 0.052894 | Akaike info criterion | -2.930391 |
| Sum squared resid | 0.688241 | Schwarz criterion | -2.500893 |
| Log likelihood | 441.7896 | Hannan-Quinn criter. | -2.758099 |
| F-statistic | 1.711267 | Durbin-Watson stat | 1.975574 |
| Prob(F-statistic) | 0.012994 |  |

Model 3

Dependent Variable: D(LN(CONS?))  
Method: Pooled Least Squares  
Sample (adjusted): 2002 2010  
Included observations: 9 after adjustments  
Cross-sections included: 31  
Total pool (balanced) observations: 279

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**Effects Specification**

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**Model 4**

**Dependent Variable:** D(LN(CONS?))  
**Method:** Pooled Least Squares  
**Sample (adjusted):** 2002 2010  
**Included observations:** 9 after adjustments  
**Cross-sections included:** 31  
**Total pool (balanced) observations:** 279

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Effects Specification

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Model 5

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2002 2010
Included observations: 9 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 279

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Effects Specification

Cross-section fixed (dummy variables)
Model 6

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2002 2010
Included observations: 9 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 279

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<th>Prob.</th>
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**Effects Specification**

Cross-section fixed (dummy variables)

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**Model 8**

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2002 2010
Included observations: 9 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 279

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Effects Specification

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Model 9

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2006 2010
Included observations: 5 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 155
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**Fixed Effects (Cross)**

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<th>Std. Error</th>
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<th>Prob.</th>
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Fixed Effects (Cross)

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Effects Specification

Cross-section fixed (dummy variables)
### Model 11

**Dependent Variable:** D(LN(CONS?))  
**Method:** Pooled Least Squares  
**Sample (adjusted):** 2006 2010  
**Included observations:** 5 after adjustments  
**Cross-sections included:** 31  
**Total pool (balanced) observations:** 155

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<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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<tbody>
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**Fixed Effects (Cross)**  
- **BEIJING--C**  
- **TIANJIN--C**  
- **HEBEI--C**  
- **SHANXI--C**  
- **INNERMONGOLIA--C**  
- **LIAONING--C**  
- **JILIN--C**  
- **HEILONGJIANG--C**  
- **SHANGHAI--C**  
- **JIANGSU--C**  
- **ZHEJIANG--C**  
- **ANHUI--C**  
- **FUJIAN--C**  
- **JIANGXI--C**  
- **SHANDONG--C**  
- **HENAN--C**  
- **HUBEI--C**  
- **HUNAN--C**  
- **GUANGDONG--C**  
- **GUANGXI--C**  
- **HAINAN--C**  
- **CHONGQING--C**  
- **SICHUAN--C**  
- **GUIZHOU--C**

- **Mean dependent var:** 0.077902  
- **S.D. dependent var:** 0.066164  
- **Akaike info criterion:** -2.596043  
- **Schwarz criterion:** -1.948088  
- **Log likelihood:** 234.1933  
- **Hannan-Quinn criter.:** -2.332858  
- **S.E. of regression:** 0.060195  
- **Sum squared resid:** 0.442064  
- **F-statistic:** 2.001703  
- **Durbin-Watson stat:** 2.608325  
- **Prob(F-statistic):** 0.003757
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Effects Specification

Cross-section fixed (dummy variables)

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<td>Hannan-Quinn criter.</td>
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Model 12

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2006 2010
Included observations: 5 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 155

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JIANGXI--C  -0.135787
SHANDONG--C  -0.003448
HENAN--C  -0.010574
HUBEI--C  0.001682
HUNAN--C  0.015953
GUANGDONG--C  0.049410
GUANGXI--C  0.045504
HENAN--C  0.010574
HUBEI--C  0.001682
HUNAN--C  0.015953
GUANGDONG--C  0.049410
GUANGXI--C  0.045504
HAINAN--C  0.018093
CHONGQING--C  0.086151
SICHUAN--C  0.014075
GUIZHOU--C  -0.001662
YUNNAN--C  0.003354
TIBET--C  -0.052035
SHAANXII--C  -0.009106
GANSU--C  0.007022
QINGHAI--C  0.016085
NINGXIA--C  -0.001876
XINJIA--C  0.035855

Effects Specification

Cross-section fixed (dummy variables)

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Model 13

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2006 2010
Included observations: 5 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 155

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<th>Std. Error</th>
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<th>Prob.</th>
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<tr>
<td>D(LN(Y5?))</td>
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<td>0.663250</td>
<td>2.966520</td>
<td>0.0036</td>
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<tr>
<td>R2?</td>
<td>0.001240</td>
<td>0.002524</td>
<td>0.491540</td>
<td>0.6239</td>
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Fixed Effects (Cross)
BEIJING--C  -0.015860
TIANJIN--C  -0.007022
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### Effects Specification

Cross-section fixed (dummy variables)

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Model 14

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2006 2010
Included observations: 5 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 155

<table>
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<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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Effects Specification

Cross-section fixed (dummy variables)
Model 15

Dependent Variable: D(LN(CONS?))
Method: Pooled Least Squares
Sample (adjusted): 2006 2010
Included observations: 5 after adjustments
Cross-sections included: 31
Total pool (balanced) observations: 155

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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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TIANJIN--C         | -0.007002   |            |             |        |
HEBEI--C           | -0.002479   |            |             |        |
SHANXI--C          | -0.029088   |            |             |        |
INNERMONGOLIA--C  | -0.014995   |            |             |        |
LIAONING--C        | -0.000266   |            |             |        |
JILIN--C           | -0.013114   |            |             |        |
HEILONGJIANG--C   | 0.025787    |            |             |        |
SHANGHAI--C       | 0.009306    |            |             |        |
JIANGSU--C        | -0.026415   |            |             |        |
ZHEJIANG--C       | -0.000649   |            |             |        |
ANHUI--C          | -0.001220   |            |             |        |
FUJIAN--C         | -0.002582   |            |             |        |
JIANGXI--C        | -0.135776   |            |             |        |
SHANDONG--C       | -0.003423   |            |             |        |
HENAN--C          | -0.010474   |            |             |        |
HUBEI--C          | 0.001577    |            |             |        |
HUNAN--C          | 0.015893    |            |             |        |
GUANGDONG--C      | 0.049043    |            |             |        |
GUANGXI--C        | 0.045538    |            |             |        |
HAINAN--C         | 0.018044    |            |             |        |
CHONGQING--C      | 0.086083    |            |             |        |
SICHUAN--C        | 0.014077    |            |             |        |
GUIZHOU--C        | -0.001616   |            |             |        |
YUNNAN--C  0.003265
TIBET--C    -0.052300
SHAANXI--C -0.008921
GANSU--C    0.007097
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Effects Specification

Cross-section fixed (dummy variables)

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Fixed Effects (Cross)
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**Effects Specification**

Cross-section fixed (dummy variables)

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Bibliography


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65


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(2001-2010c). “Household final consumption expenditure, etc. (% of GDP)”.