FINAL TERM PROJECT

QUANTITATIVE METHODS I

Prof Lin Shih-Mo

**PREDICTABILITY OF CONSUMPTION GROWTH**



By:

**Augustine sanyang - 11204606**

**CHUNG YUAN CHRISTIAN UNIVERSITY**

**2024**

**Content**

[I. Introduction 2](#_Toc155898275)

[a. Background 2](#_Toc155898276)

[b. Purpose 2](#_Toc155898277)

[II. Data Description and Methodology 3](#_Toc155898279)

[III. Results Estimation 3](#_Toc155898280)

III[. Discussion 12](#_Toc155898283)

[IV. Conclusion 12](#_Toc155898284)

# Introduction

## Background

The concept of predictability of consumption growth is a critical area of study in economics, particularly in understanding how various economic indicators can forecast future consumption patterns. This predictability is essential for policymakers, businesses, and investors as it influences economic planning, investment decisions, and fiscal policies. Everaert and Pozzi Everaert & Pozzi (2014) provide a comprehensive analysis of consumption growth predictability across OECD countries, emphasizing the role of various economic factors such as real disposable income, government consumption, and interest rates. Their findings suggest that consumption growth is influenced by both domestic factors and global economic conditions, highlighting the interconnectedness of economies. This aligns with the observations made by Obstfeld, who noted a rising correlation between domestic and world consumption growth among G7 countries during the late 20th century, indicating that external economic shocks can significantly impact national consumption patterns (Everaert & Pozzi, 2014).

Furthermore, the predictability of consumption growth can be understood through different channels, such as the cash flow and risk avenues discussed by McMillan (McMillan, 2015). Improved economic performance typically leads to higher expected future consumption, which can create a positive predictive relationship between consumption growth and other financial metrics, such as dividend yields. This relationship underscores the complexity of consumption dynamics, where various economic indicators interact to shape consumer behavior. Bansal et al. Bansal et al. (2012) contribute to this understanding by illustrating how past consumption patterns can forecast future economic conditions, thereby influencing asset pricing and investment strategies.

Moreover, the Bayesian mixed-frequency approach employed by Schorfheide et al. Schorfheide et al. (2013) reveals that there exists a small but significant predictable component in consumption growth, which can be identified through high-frequency data analysis. This method enhances the understanding of consumption dynamics by capturing different volatility processes that affect consumption over various time frames. The ability to predict consumption growth accurately is crucial, especially in the context of economic uncertainty and fluctuating market conditions.

## Purpose

The main purpose of the paper by Everaert and Pozzi is to investigate the predictability of consumption growth across 15 OECD countries, with a specific focus on the interplay between various economic indicators such as real per capita private consumption, government consumption, hours worked, real disposable labor income, and real interest rates. By employing a dynamic panel data model, the authors aim to uncover the extent to which these variables can forecast future consumption trends, thereby providing valuable insights for policymakers and economists regarding consumption behavior in response to economic conditions. This research is particularly relevant in the context of Japan, where unique demographic and economic factors may influence consumption patterns differently compared to other OECD nations. However, for the purpose of this assignment, we shall be obliged to compare the predictability consumption growth of Japan and Germany using the economic indicators provided.

# Data Description and Methodology

This paper develops a model to examine the predictability of consumption growth in 15 OECD

countries. The variables used are growth in real per capita private consumption (CSUMPTN), growth in real per capita government consumption (GOV), growth in per capita hours worked (HOURS), growth in per capita real disposable labor income (INC), and the real interest rate (R)Based on the data.

The equation below is provided:

CSUMPTN = β1 +β2HOURS+β3GOV +β4R+β5INC + e

A) **Table 1. GERMANY**

|  |  |
| --- | --- |
| Dependent Variable: CSUMPTN |  |
| Method: Panel Least Squares |  |
| Date: 12/22/24 Time: 23:02 |  |
| Sample: 1971 2007 IF CXID=7 |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |
| Total panel (balanced) observations: 37 |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.015617 | 0.003135 | 4.980807 | 0.0000 |
| HOURS | 0.246245 | 0.040096 | 6.141324 | 0.0000 |
| GOV | 0.030508 | 0.072151 | 0.422829 | 0.6752 |
| R | -0.235569 | 0.097584 | -2.414015 | 0.0217 |
| INC | 0.686408 | 0.121538 | 5.647686 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.922236 |     Mean dependent var | 0.022073 |
| Adjusted R-squared | 0.912516 |     S.D. dependent var | 0.031310 |
| S.E. of regression | 0.009261 |     Akaike info criterion | -6.400955 |
| Sum squared resid | 0.002744 |     Schwarz criterion | -6.183263 |
| Log likelihood | 123.4177 |     Hannan-Quinn criter. | -6.324209 |
| F-statistic | 94.87544 |     Durbin-Watson stat | 1.458826 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**Table 2. JAPAN**

|  |  |
| --- | --- |
| Dependent Variable: CSUMPTN |  |
| Method: Panel Least Squares |  |
| Date: 12/22/24 Time: 23:05 |  |
| Sample: 1971 2007 IF CXID=9 |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |
| Total panel (balanced) observations: 37 |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.003980 | 0.003221 | 1.235388 | 0.2257 |
| HOURS | 0.424608 | 0.184279 | 2.304153 | 0.0279 |
| GOV | 0.164079 | 0.141829 | 1.156879 | 0.2559 |
| R | 0.243435 | 0.074703 | 3.258690 | 0.0027 |
| INC | 0.608275 | 0.138554 | 4.390149 | 0.0001 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.822630 |     Mean dependent var | 0.020929 |
| Adjusted R-squared | 0.800459 |     S.D. dependent var | 0.023128 |
| S.E. of regression | 0.010331 |     Akaike info criterion | -6.182232 |
| Sum squared resid | 0.003415 |     Schwarz criterion | -5.964541 |
| Log likelihood | 119.3713 |     Hannan-Quinn criter. | -6.105486 |
| F-statistic | 37.10348 |     Durbin-Watson stat | 2.182288 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**GERMANY:**

Intercept (C): Coefficient: 0.015617, P-value: 0.0000 (Significant at 5% level)

 HOURS: Coefficient: 0.246245, P-value: 0.0000 (Significant at 5% level)

GOV: Coefficient: 0.030508, P-value: 0.6752 (Not significant at 5% level)

 R: Coefficient: -0.235569, P-value: 0.0217 (Significant at 5% level)

 INC: Coefficient: 0.686408, P-value: 0.0000 (Significant at 5% level)

 R-squared: 0.922236 (High explanatory power)

 **JAPAN:**

 Intercept (C): Coefficient: 0.003980, P-value: 0.2257 (Not significant at 5% level)

 HOURS: Coefficient: 0.424608, P-value: 0.0279 (Significant at 5% level)

 GOV: Coefficient: 0.164079, P-value: 0.2559 (Not significant at 5% level)

 R: Coefficient: 0.243435, P-value: 0.0027 (Significant at 5% level)

 INC: Coefficient: 0.608275, P-value: 0.0001 (Significant at 5% level)

 R-squared: 0.822630 (High explanatory power, but lower than Germany)

 Key Observations:

1**. Significant Variables:**

 For Germany, the significant variables at the 5% level are C, HOURS, R, and INC.

 For Japan, the significant variables at the 5% level are HOURS, R, and INC.

2. **Non-Significant Variables**:

 GOV is not significant for both Germany and Japan. The intercept C is not significant for Japan.

3**. R-squared Comparison:**

Germany has a higher R-squared value (0.922236) compared to Japan (0.822630), indicating a better fit for the model in Germany.

4. **Coefficient Differences:**

The coefficient for HOURS is higher in Japan (0.424608) than in Germany (0.246245).

- The coefficient for R is positive in Japan (0.243435) and negative in Germany (-0.235569).

 The regression analysis reveals distinct differences in the factors influencing consumption growth in Germany and Japan. For Germany, the significant predictors at the 5% level include the intercept, growth in per capita hours worked (HOURS), the real interest rate (R), and growth in per capita real disposable labor income (INC). Notably, the real interest rate has a negative impact on consumption growth, suggesting that higher interest rates may deter consumption in Germany. In contrast, Japan's significant predictors are HOURS, R, and INC, with the real interest rate showing a positive relationship with consumption growth, indicating a different economic dynamic compared to Germany. The government consumption growth (GOV) is not a significant predictor in either country, highlighting its limited role in driving private consumption growth. Additionally, Germany's model exhibits a higher R-squared value, suggesting a better overall fit compared to Japan. These findings underscore the varying economic environments and policy implications for consumption growth in these two countries.

B)

The coefficient β2 could be positive or negative depending on whether hours worked and private

consumption are complements or substitutes. Similarly, β3 could be positive or negative depending

on whether government consumption and private consumption are complements or substitutes.

What have you discovered? What does a test of the hypothesis H0∶β2 = 0, β3 = 0 reveal?

 H0: β2=0 and β3=0
 H1: β2 ≠ 0 and β3≠ 0

|  |  |  |
| --- | --- | --- |
| Wald Test: |  |  |
| Equation: Untitled |  |
|  |  |  |  |
|  |  |  |  |
| Test Statistic | Value | df | Probability |
|  |  |  |  |
|  |  |  |  |
| F-statistic |  2.662182 | (2, 32) |  0.0852 |
| Chi-square |  5.324363 |  2 |  0.0698 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Null Hypothesis: C(2)=0, C(3)=0 |  |
| Null Hypothesis Summary: |  |
|  |  |  |  |
|  |  |  |  |
| Normalized Restriction (= 0) | Value | Std. Err. |
|  |  |  |  |
|  |  |  |  |
| C(2) |  0.424608 |  0.184279 |
| C(3) |  0.164079 |  0.141829 |
|  |  |  |  |
|  |  |  |  |
| Restrictions are linear in coefficients. |

|  |  |  |
| --- | --- | --- |
| Wald Test: |  |  |
| Equation: Untitled |  |
|  |  |  |  |
|  |  |  |  |
| Test Statistic | Value | df | Probability |
|  |  |  |  |
|  |  |  |  |
| F-statistic |  19.09623 | (2, 32) |  0.0000 |
| Chi-square |  38.19246 |  2 |  0.0000 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Null Hypothesis: C(2)=0, C(3)=0 |  |
| Null Hypothesis Summary: |  |
|  |  |  |  |
|  |  |  |  |
| Normalized Restriction (= 0) | Value | Std. Err. |
|  |  |  |  |
|  |  |  |  |
| C(2) |  0.246245 |  0.040096 |
| C(3) |  0.030508 |  0.072151 |
|  |  |  |  |
|  |  |  |  |
| Restrictions are linear in coefficients. |

 F-statistic: 2.662182, P-value (F-statistic): 0.0852 for Japan are greater than 0.05, indicating that we fail to reject the null hypothesis. This suggests that, jointly, the coefficients for HOURS and GOV are not significantly different from zero at the 5% level for Japan.

.

 F-statistic: 19.09623, P-value (F-statistic): 0.0000 for Germany re less than 0.05, indicating that we reject the null hypothesis. his suggests that, jointly, the coefficients for HOURS and GOV are significantly different from zero at the 5% level for Germany.

C)

 JAPAN

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/23/24 Time: 11:57 |  |  |
| Sample: 1971 2007 IF CXID=9 |  |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 37 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.006141 | 0.002638 | 2.327820 | 0.0262 |
| HOURS | 0.308006 | 0.155062 | 1.986338 | 0.0554 |
| R | 0.259905 | 0.073709 | 3.526097 | 0.0013 |
| INC | 0.746998 | 0.069770 | 10.70651 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.815212 |     Mean dependent var | 0.020929 |
| Adjusted R-squared | 0.798413 |     S.D. dependent var | 0.023128 |
| S.E. of regression | 0.010384 |     Akaike info criterion | -6.195313 |
| Sum squared resid | 0.003558 |     Schwarz criterion | -6.021160 |
| Log likelihood | 118.6133 |     Hannan-Quinn criter. | -6.133916 |
| F-statistic | 48.52759 |     Durbin-Watson stat | 2.202635 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

GERMANY

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/23/24 Time: 11:59 |  |  |
| Sample: 1971 2007 IF CXID=7 |  |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 37 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.015659 | 0.003095 | 5.059956 | 0.0000 |
| HOURS | 0.246982 | 0.039557 | 6.243701 | 0.0000 |
| R | -0.233301 | 0.096216 | -2.424750 | 0.0210 |
| INC | 0.725946 | 0.076668 | 9.468698 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.921802 |     Mean dependent var | 0.022073 |
| Adjusted R-squared | 0.914693 |     S.D. dependent var | 0.031310 |
| S.E. of regression | 0.009145 |     Akaike info criterion | -6.449438 |
| Sum squared resid | 0.002760 |     Schwarz criterion | -6.275284 |
| Log likelihood | 123.3146 |     Hannan-Quinn criter. | -6.388040 |
| F-statistic | 129.6678 |     Durbin-Watson stat | 1.466226 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 Germany:

 Coefficients:

 HOURS: Increased slightly from 0.246245 to 0.246982, R: Changed from -0.235569 to -0.233301, INC: Increased from 0.686408 to 0.725946.

 Significance:

 All coefficients remain significant with P-values less than 0.05.

Japan:

Coefficients:

HOURS: Decreased from 0.424608 to 0.308006. R: Increased from 0.243435 to 0.259905, INC: Increased from 0.608275 to 0.746998.

 Significance:

HOURS: P-value increased to 0.0554, making it marginally insignificant at the 5% level.

 R and INC remain significant with P-values less than 0.05.

Conclusion:

- Germany: Omitting GOV had minimal impact on the significance and explanatory power of the model. The coefficients for HOURS, R, and INC remain significant, and the model still explains a high proportion of the variance.

- Japan: Omitting GOV led to a decrease in the significance of HOURS, making it marginally insignificant. However, R and INC remain significant, and the model still retains substantial explanatory power.

(D)

JAPAN

|  |  |  |
| --- | --- | --- |
| Dependent Variable: GOV |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/23/24 Time: 12:23 |  |  |
| Sample: 1971 2007 IF CXID=9 |  |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 37 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.013171 | 0.003221 | 4.088575 | 0.0003 |
| HOURS | -0.710646 | 0.189352 | -3.753038 | 0.0007 |
| R | 0.100382 | 0.090009 | 1.115249 | 0.2728 |
| INC | 0.845469 | 0.085199 | 9.923439 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.764519 |     Mean dependent var | 0.032551 |
| Adjusted R-squared | 0.743111 |     S.D. dependent var | 0.025018 |
| S.E. of regression | 0.012680 |     Akaike info criterion | -5.795750 |
| Sum squared resid | 0.005306 |     Schwarz criterion | -5.621597 |
| Log likelihood | 111.2214 |     Hannan-Quinn criter. | -5.734353 |
| F-statistic | 35.71282 |     Durbin-Watson stat | 2.083458 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

GERMANY

|  |  |  |
| --- | --- | --- |
| Dependent Variable: GOV |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/23/24 Time: 12:25 |  |  |
| Sample: 1971 2007 IF CXID=7 |  |  |
| Periods included: 37 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 37 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.001369 | 0.007561 | 0.180994 | 0.8575 |
| HOURS | 0.024150 | 0.096648 | 0.249875 | 0.8042 |
| R | 0.074359 | 0.235083 | 0.316308 | 0.7538 |
| INC | 1.295983 | 0.187321 | 6.918526 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.749724 |     Mean dependent var | 0.024708 |
| Adjusted R-squared | 0.726971 |     S.D. dependent var | 0.042761 |
| S.E. of regression | 0.022343 |     Akaike info criterion | -4.662760 |
| Sum squared resid | 0.016475 |     Schwarz criterion | -4.488607 |
| Log likelihood | 90.26107 |     Hannan-Quinn criter. | -4.601363 |
| F-statistic | 32.95143 |     Durbin-Watson stat | 1.102186 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

JAPAN : Comparison with CSUMPTN:

In the CSUMPTN equation, HOURS and INC were significant predictors, similar to their significance in the GOV equation.

- The negative coefficient for HOURS in the GOV equation suggests that as hours worked increase, government consumption decreases, which might explain why omitting GOV affected the significance of HOURS in the CSUMPTN equation.

The significant positive relationship between INC and GOV indicates that as income increases, government consumption also increases, which aligns with the positive impact of INC on CSUMPTN.

- The lack of significance for R in the GOV equation suggests that real interest rates do not have a strong direct impact on government consumption, which might explain why R remained significant in the CSUMPTN equation even after omitting GOV.

GERMANY

In the CSUMPTN equation, HOURS and INC were significant predictors, but in the GOV equation, only INC is significant.

 The lack of significance for HOURS and R in the GOV equation suggests that these variables do not have a strong direct impact on government consumption.

 The significant positive relationship between INC and GOV indicates that as income increases, government consumption also increases, which aligns with the positive impact of INC on CSUMPTN.

 The non-significance of HOURS and R in the GOV equation suggests that these variables may have indirect effects on private consumption through other channels.

(E)

Re-estimate the models in parts (a) and (c) with the year 2007 omitted and use each of the estimated

models to find point and 95% interval forecasts for consumption growth in 2007.

Regression results for equation (A) re-estimated with 2007 omitted

JAPAN

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/30/24 Time: 11:34 |  |  |
| Sample: 1971 2006 IF CXID=9 |  |  |
| Periods included: 36 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 36 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.004210 | 0.003299 | 1.276270 | 0.2113 |
| HOURS | 0.446854 | 0.192558 | 2.320614 | 0.0271 |
| GOV | 0.174939 | 0.145465 | 1.202621 | 0.2382 |
| R | 0.237276 | 0.076774 | 3.090567 | 0.0042 |
| INC | 0.593240 | 0.143926 | 4.121834 | 0.0003 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.821002 |     Mean dependent var | 0.021410 |
| Adjusted R-squared | 0.797906 |     S.D. dependent var | 0.023267 |
| S.E. of regression | 0.010460 |     Akaike info criterion | -6.154336 |
| Sum squared resid | 0.003392 |     Schwarz criterion | -5.934403 |
| Log likelihood | 115.7780 |     Hannan-Quinn criter. | -6.077573 |
| F-statistic | 35.54659 |     Durbin-Watson stat | 2.212257 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Regression results for equation (C) re-estimated with 2007 omitted

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/30/24 Time: 11:38 |  |  |
| Sample: 1971 2006 IF CXID=9 |  |  |
| Periods included: 36 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 36 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.006360 | 0.002791 | 2.278774 | 0.0295 |
| HOURS | 0.316552 | 0.160290 | 1.974873 | 0.0570 |
| R | 0.256924 | 0.075537 | 3.401289 | 0.0018 |
| INC | 0.743555 | 0.071856 | 10.34786 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.812651 |     Mean dependent var | 0.021410 |
| Adjusted R-squared | 0.795087 |     S.D. dependent var | 0.023267 |
| S.E. of regression | 0.010532 |     Akaike info criterion | -6.164292 |
| Sum squared resid | 0.003550 |     Schwarz criterion | -5.988346 |
| Log likelihood | 114.9573 |     Hannan-Quinn criter. | -6.102882 |
| F-statistic | 46.26807 |     Durbin-Watson stat | 2.217159 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Point and 95% interval forecast for CSUMPTN in 2007 are:

From Model (A)

CSUMPTN2007  = 0.008779; and the 95% interval forecast is

$\tilde{CsuMρtN}$2007 ± t (0.975, 31)  se(f) = (-0.01381, 0.03137)

From Model ( C )

CSUMPTN2007  = 0.006649; and the 95% interval forecast is

$\tilde{CsuMρtN}$2007 ± t (0.975, 32)  se(f) = (-0.01578, 0.02908)

Regression results for equation (A) re-estimated with 2007 omitted

GERMANY

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/30/24 Time: 11:39 |  |  |
| Sample: 1971 2006 IF CXID=7 |  |  |
| Periods included: 36 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 36 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.017240 | 0.003014 | 5.720394 | 0.0000 |
| HOURS | 0.265896 | 0.038436 | 6.917827 | 0.0000 |
| GOV | 0.039461 | 0.067621 | 0.583554 | 0.5637 |
| R | -0.251488 | 0.091563 | -2.746617 | 0.0099 |
| INC | 0.632267 | 0.116028 | 5.449267 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.932286 |     Mean dependent var | 0.022901 |
| Adjusted R-squared | 0.923548 |     S.D. dependent var | 0.031341 |
| S.E. of regression | 0.008666 |     Akaike info criterion | -6.530640 |
| Sum squared resid | 0.002328 |     Schwarz criterion | -6.310707 |
| Log likelihood | 122.5515 |     Hannan-Quinn criter. | -6.453877 |
| F-statistic | 106.7014 |     Durbin-Watson stat | 1.465992 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Regression results for equation (C) re-estimated with 2007 omitted

|  |  |  |
| --- | --- | --- |
| Dependent Variable: CSUMPTN |  |  |
| Method: Panel Least Squares |  |  |
| Date: 12/30/24 Time: 11:41 |  |  |
| Sample: 1971 2006 IF CXID=7 |  |  |
| Periods included: 36 |  |  |
| Cross-sections included: 1 |  |  |
| Total panel (balanced) observations: 36 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 0.017271 | 0.002982 | 5.791644 | 0.0000 |
| HOURS | 0.266572 | 0.038021 | 7.011195 | 0.0000 |
| R | -0.248341 | 0.090457 | -2.745402 | 0.0098 |
| INC | 0.684000 | 0.074080 | 9.233241 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.931542 |     Mean dependent var | 0.022901 |
| Adjusted R-squared | 0.925124 |     S.D. dependent var | 0.031341 |
| S.E. of regression | 0.008576 |     Akaike info criterion | -6.575270 |
| Sum squared resid | 0.002354 |     Schwarz criterion | -6.399324 |
| Log likelihood | 122.3549 |     Hannan-Quinn criter. | -6.513860 |
| F-statistic | 145.1462 |     Durbin-Watson stat | 1.463999 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Point and 95% interval forecast for CSUMPTN in 2007 are:

From Model (A)

CSUMPTN2007  = 0.013725; and the 95% interval forecast is

$\tilde{CsuMρtN}$2007 ± t (0.975, 31)  se(f) = (-0.004885, 0.032335)

From Model ( C )

CSUMPTN2007  = 0.13424; and the 95% interval forecast is

$\tilde{CsuMρtN}$2007 ± t (0.975, 32)  se(f) = (-0.11586, 0.15262)

(F)

Japan Model (A) has a narrower interval compared to Japan Model (C), suggesting more precision.

 Germany Model (A) has a narrower interval compared to Germany Model (C), suggesting more precision.

 Comparing the intervals of Japan Model (A) and Germany Model (A), Germany Model (A) has a slightly narrower interval, indicating more precision.

#

# Discussion

The analysis of consumption growth in Japan and Germany, using the models developed by Everaert and Pozzi, provides valuable insights into the economic dynamics of these countries. The models incorporate key variables such as growth in real per capita private consumption (CSUMPTN), government consumption (GOV), hours worked (HOURS), disposable labor income (INC), and the real interest rate (R).

Japan:

In the case of Japan, the regression results indicate that the variables HOURS, R, and INC are statistically significant predictors of consumption growth at the 5% significance level. This suggests that changes in labor input, interest rates, and disposable income have a meaningful impact on private consumption. However, the variable GOV does not exhibit statistical significance, implying that government consumption may not play a substantial role in influencing private consumption growth in Japan.

The models for Japan demonstrate a strong fit, with adjusted R-squared values around 0.80, indicating that a significant portion of the variability in consumption growth is explained by the model. The forecast for 2007 using Model (A) is more precise, as evidenced by a narrower confidence interval compared to Model (C).

Germany:

For Germany, the regression analysis reveals that HOURS, R, and INC are also significant predictors of consumption growth, while GOV remains insignificant. This consistency with Japan suggests that government consumption is not a primary driver of private consumption growth in both countries.

Germany's models exhibit an even better fit, with adjusted R-squared values around 0.92, highlighting the models' effectiveness in capturing the variability in consumption growth. The forecast for 2007 using Model (A) is more accurate, with a narrower confidence interval than Model (C), indicating higher precision in forecasting.

CONCLUSION

The comparative analysis of Japan and Germany underscores the importance of labor input, interest rates, and disposable income as key determinants of consumption growth. The lack of significance for government consumption suggests that other factors may be more influential in driving private consumption. Germany's models, with their superior fit and forecast precision, provide a more robust framework for understanding consumption dynamics.

These findings offer critical insights for policymakers and economists aiming to enhance economic forecasting models and develop strategies to stimulate consumption growth. By focusing on the significant predictors identified, targeted policies can be formulated to foster economic stability and growth.