On the Real Final Consumption of Households in HCMC

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The final consumption of households, or individuals, is an important part of the aggregate demand. In HCMC, the final consumption of household represents 48.3% of it gross output (2004). This figure at the national level in 2003 was 64.8%. Researches on the final consumption are important to policy making process, and they serve as a basis for companies' strategies to develop their market shares. This article aim at developing a model of factors affecting the real consumption of households (FCHR) in HCMC and providing predictions of its changes until 2015.

1. Data and theoretical basis for the model

From data gathered in HCMC in the years 1990-2004, I work out the following model of factors affecting the FCHR:

FCHR = f (GDPR, Interest Rate, Financial Wealth, Television, Video, Refrigerator, Motorcycle, Unemployment Rate)

In this model, data of the FCHR are calculated by adjusting data on final consumption of nominal household (supplied by the HCMC Statistics Bureau) to the gross price index; data about television, video, refrigerator and motorcycle are gathered from annual statistics yearbooks (there are no sufficient data about other tangible assets, such as real estate) and from the *Số liệu dân số – lao động văn xã và đời sống dân cư TP. HCM* ("Data about population, labor, cultural and social life in HCMC") published by the HCMC Statistics Bureau.

Data for GDPR are gathered from annual statistics yearbooks, *Số liệu 25 năm TP.HCM* ("Numerical data about 25 years of HCMC") published by the HCMC Statistics Bureau. Researches on national consumption usually use disposable income to measure the personal income in the model. At provincial level, data about the disposable income are not available. In my research, I use the GDPR because its data are available in statistics yearbooks, which will make it easier for everybody to update the model and prediction of the coming years.

The variable "Interest rate" is based on the real interest rate in a year on 3-month deposits in banks. These data are available in Dr. Lê Quốc Lý's book (2005). The real interest rate in Vietnam in 1990-91 is worked out by the author, based on the assumption that decrease in the real interest rate in 1990-91 is equal to the decrease in the average real interest rate in the years 1989-1992.

Data for the variable "Financial wealth" are ones on resident deposits suggested by Bimal Singh's book (2004) and based on HCMC annual statistics yearbooks and adjusted to the price index.

Data about unemployment rate are calculated by dividing the unemployed by the working population based on statistics supplied annually by the HCMC Statistics Bureau. Data about urban unemployment rate or working hour in rural areas are not used because there are only such data for the years 1996-2004.

Table 3: Results of estimate of limited model

Dependent variable: FCHR
Method: Least squares
Date: July 17, 2005
Sample: 1990 2004
Included observation: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPR	0.3979	0.0112	35.3	0.0000
C	5,829.7062	525.8232	11.0	0.0000
R-squared	0.9896	Mean dependent var		22,879.76
Adjusted R-squared	0.9889	S.D. dependent var		7,690.20
S.E. of regression	809.9	Akaike info criterion		16.35
Sum squared resid	8,528,896.6	Schwarz criterion		16.44
Log likelihood	-120.6	F-statistic		1,248.98
Durbin-Watson stat	1.88	Prob(F-statistic)		0.0000

Source: Author's calculation with Eviews 4.1

Table 1: Variables of the model

Variable	Meaning	Expectation signs
FCHR	Real final consumption of households (VND billion)	(dependent variable)
GDPR	GDP at 1994 fixed price (VND billion)	+
Interest Rate	Real interest rate (%)	-
Financial Wealth	Real financial wealth (VND billion)	+
Television	Proportion of household with TV sets (%)	+
Video	Proportion of household with VCR (%)	+
Refrigerator	Proportion of household with refrigerator (%)	+
Motorcycle	Proportion of household with motorcycle (%)	+
Unemployment Rate	Proportion the unemployed (%)	-

2. Model estimate and test

a. Finding factors that really affect the FCHR

The limited model shows that the GDPR certainly has effects on the FCHR because the Prob of t-Statistic corresponding to the GDPR is below 0.05. The coefficient of the limited model has a statistical meaning at reliability of 95% because the Prob(F-statistic) is below 0.05. To affirm that the independent variable in the limited model is reasonable, I develop an expanded model that includes the same variables as the theoretical model does, and then

Table 2: Data used for the model

Year	Nominal final consumption of household (VND bil.)	Real final consumption of household (VND bil.)	GDPR (VND bil.)	Real interest rate (%)	Real financial wealth (VND bil.)	TV (%)	Video (%)	Refrig-erator (%)	Motor-cycle (%)	Unemploymc nt (%)
1990	5,242.9	13,934.4	17,993.0	21.9	1,256.9	42.0	7.2	16.2	35.0	12.9
1991	8,641.7	13,084.5	19,629.0	19.1	1,067.7	47.0	10.8	16.6	39.0	10.3
1992	11,703.4	13,937.3	21,930.0	16.6	1,468.0	55.2	16.8	22.1	46.0	13.9
1993	14,192.9	15,353.7	24,668.0	15.2	2,550.0	64.7	29.7	23.5	54.3	12.3
1994	17,518.4	17,517.8	28,270.0	2.4	5,607.5	71.3	51.0	36.0	69.1	11.2
1995	21,591.0	19,034.0	32,596.0	4.1	8,665.0	83.5	54.4	37.0	71.2	8.4
1996	26,109.5	21,428.7	37,380.0	5.1	10,483.0	86.8	57.0	38.4	72.1	8.8
1997	27,875.8	22,135.8	41,900.0	6.0	11,111.0	87.5	58.1	39.3	73.7	9.0
1998	30,711.0	22,914.6	45,683.0	1.0	16,159.5	87.6	58.4	39.5	74.1	8.8
1999	35,155.1	24,749.5	48,402.0	5.1	18,024.7	87.7	58.7	40.8	75.2	8.8
2000	40,924.1	28,458.0	52,754.0	5.1	26,352.4	88.5	61.1	43.4	77.0	9.1
2001	42,068.3	28,649.9	57,787.0	4.6	30,470.2	88.8	62.1	44.8	78.3	8.9
2002	46,299.1	30,578.6	63,670.0	2.0	37,097.4	89.2	63.1	46.3	79.6	8.9
2003	53,003.5	33,182.5	70,947.0	3.2	50,543.9	91.4	71.6	49.4	84.7	8.9
2004	65,919.4	38,237.1	79,171.0	-3.3	68,534.7	93.7	775.7	53.9	89.1	8.9

Source: HCMC Statistics Yearbooks and others.

carry out Wald test on independent variables that are not included in the limited model (other variables besides the GDPR).

Expanded model:

FCHR = C(1)*GDPR + C(2)*INTEREST RATE + C(3)*FINANCIAL WEALTH + C(4)*TELEVISION + C(5)*VIDEO + C(6)*REFRIGERATOR + C(7)*MOTORCYCLE + C(8)*UNEMPLOYMENT RATE + C(9)

Hypothesis of the Wald test:

H0: C(2) = C(3) = C(4) = C(5) = C(6) = C(7) = C(8) = 0

H1: Among regressive coefficients C(2), C(3), C(4), C(5), C(6), C(7), C(8), there is at least one that is different from 0.

Results of the Wald test show that F = 1.28; Probability of F-Statistic in the Wald test = 0.38 (0.05), so we accept the hypothesis H0. In other words, there is no need to include any variables other than GDPR in the model. Thus, the limited model is the most suitable one in terms of independent variables.

b. Other tests on the limited model

Breuch-Godfrey test on the serial correlation shows that the Probability of F equals 0.86 (0.05), so the limited model doesn't go against the serial correlation. Other tests, such as White's or Ramsey's, prove that there is no problem with the model.

c. Model explanation

All statistical tests are suitable, and the model of factors affecting the real final consumption of households in HCMC is as follows:

$\widehat{FCHR} = 0.398*GDPR + 5,829.706$ (model 1)

This model can explain 98.9% of changes in the FCHR. GDPR and FCHR change in parallel. When the GDPR increases by one billion, the FCHR increases by 0.398 billion. From that equation, we can work out the coefficient of elasticity of the FCHR according to the GDPR in HCMC in the last three years that is equal to 0.83. In these years when the GDPR increased by 1%, the FCHR in HCMC rose by 0.83%. If the coefficient of elasticity in the years 1990-2004 didn't change in the formula $FCHR = a.GDPR^b$, then it equals 0.7.

3. Prediction of the real final consumption of households

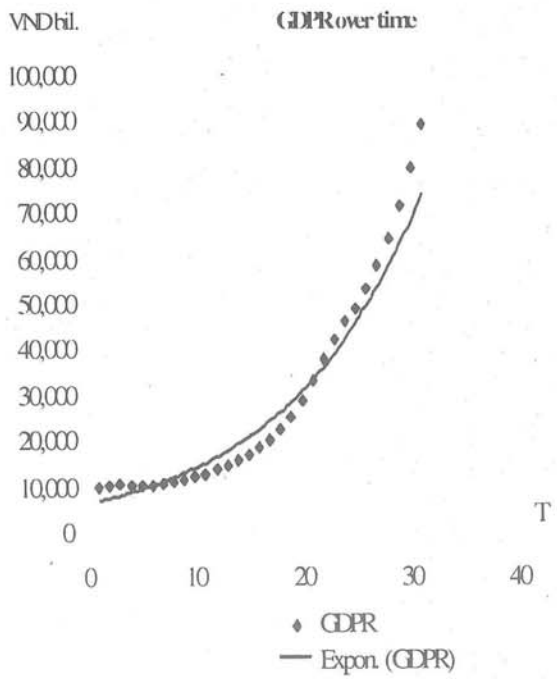

Table 4: Predictions about the GDPR and FCHR

Year	GDPR (VND bil)	FCHR point	Prediction about the FCHR range at reliability of 95%	
			Lowest value	Highest value
2006	79,558	37,484.4	35,469.0	39,499.8
2007	86,192	40,124.0	38,032.1	42,215.8
2008	93,378	42,983.2	40,798.1	45,168.3
2009	101,164	46,081.1	43,784.2	48,378.0
2010	109,599	49,437.2	47,008.3	51,866.1
2011	118,738	53,073.5	50,490.7	55,656.2
2012	128,638	57,012.5	54,252.6	59,772.4
2013	139,364	61,280.2	58,318.2	64,242.2
2014	150,985	65,904.0	62,713.4	69,094.5
2015	163,574	70,912.9	67,465.7	74,360.2

Source: Author's calculation with Eviews 4.1

To predict the FCHR, we could use function FCHR=f(GDPR) or FCHR=f(t). And then we could compare the accuracy of two ways of predicting to determine the suitable method of prediction. The use of FCHR=f(GDPR) allows us to predict changes in the longer term, because we have data of GDPR in the years 1975-2005 and we can predict the GDPR for the years 2006-2015, thereby predicting the FCHR for the years 2006-2015.

a. Prediction about real GDP

The model for predicting the real GDP over time appropriate to existing data is:

$$\widehat{GDPR} = 6{,}133.23 \times e^{0.08t}$$

Where t is the variable of trend, t=1 (1975) to t=31 (2005).

Using an exponential function suitable to a city with high growth rate like HCMC, the prediction model gains high accuracy (Thail U = 0.07, smaller than 0.05). The Table 4 presents results of prediction of GDPR.

b. Prediction of FCHR

From predictions about the GDPR up to 2015, we can use the model 1 to predict the FCHR.

The results of predictions about the FCHR have high accuracy (Thail U = 0.015). Results of predictions about points and range are shown in the Table 4. The predicted FCHR is VND49,437 billion by 2010 and VND70,912 billion by 2015. The FCHR in HCMC will increase steadily, by 7.16% in the years 2006-2010; and 7.51% in 2011-2015. According to predictions by the HCMC Statistic Bureau, the HCMC population will be some 6.41 million people by 2010; and 7.05 million by 2015. These data allow us to calculate that the per capita real consumption is VND7.71 million a year by 2010 and 10.06 million by 2015.

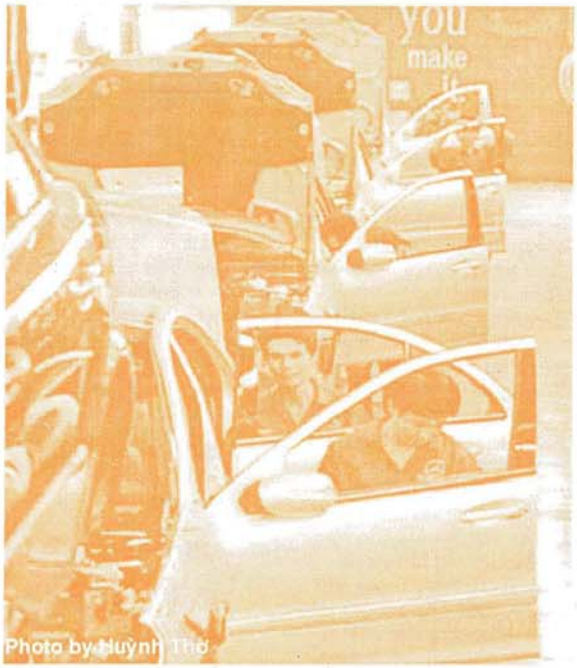

Photo by Huỳnh Thơ

Thus, the FCHR in HCMC depends totally on the GDPR, instead of other factors, such as real interest rate, real financial wealth, tangible assets (TV, VCR, motorcycle, etc.) and the unemployment rate. This means that the policy on the interest rate has no considerable effect on the real consumption of households. In the future, the FCHR in HCMC will rise with some acceleration and this will be a favorable condition for both local and foreign companies in HCMC.

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