Proceedings of the International Conference on Global Business, Economics, Finance and Social Sciences (GB15_Thai Conference) ISBN: 978-1-941505-22-9
Bangkok, Thailand, 20-22 February 2015 Paper ID: T548

Can Consumer Economic Sentiment Indicator Predict Consumption Expenditure in the Eurozone?

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Abstract

This paper investigates the relationship between consumers' expectations and consumption expenditure in Eurozone countries. While some studies have examined the impact of consumers' expectations on consumption expenditure, none concludes a clear positive relationship between these variables. It has been argued that consumers' expectations about the economy's future state should have an impact on consumers' decisions about how much to consume and how much to save. While consumers' expectations seem to be a strong predictor for future consumption expenditure, there are potential statistical problems with the use of current available estimates of consumers' expectations. In this paper, we hypothesize that due to these statistical problems, consumers' expectations in Eurozone countries measured by current available estimates such as Consumer Economic Sentiment Indicator (CESI) do not have explanatory power to predict future levels of consumption expenditure. We present empirical evidence that while disposable income is a good predictor for consumption expenditure, CESI is not a reliable predictor for future levels of consumption in Eurozone countries. Our empirical analysis is based on a multiple regression model and the Granger causality test. In our multiple regression model, the dependent variable is consumption expenditure, and the independent variables include disposable income and the level CESI. Monthly data for consumption expenditure, disposable income, and CESI in Eurozone countries are obtained from the European Commission Eurostat at http://epp.eurostat.ec.europa.eu. Our statistical analysis covers January 1995 through September 2014.

Keywords: *Eurozone, Consumers' Expectations, Consumption Expenditure*

1. Introduction

The main challenge currently faced by the euro-zone economy is a lack of aggregate demand and declining consumption expenditure. For example, at the end of 2013, private consumption in the Eurozone was 2% below its 2007 level while in the US, it was 7% above where it was in 2007.

In light of declines in aggregate demand and private consumption in the Eurozone in the past seven years, and given the fact that consumption expenditure counts for more than 60% of aggregate demand, it seems imperative to take a new look at factors that have influence on consumption expenditure. Correct identification of such factors can help predict future slowdowns in consumption and aggregate demand. For many years the impacts of variables such as current disposable income, past peak income, interest rates, and consumers' expectations on consumption expenditure have been debated and empirically examined in the macroeconomic literature. Although scholars have studied the subject extensively, prediction of levels of consumption expenditure remains an unresolved issue.

The focus of this paper is on the explanatory power of current available measures of consumers' expectations to predict future levels of consumption in Eurozone countries. Our hypothesis is that due to statistical bias, current estimates such as the Consumer Economic Sentiment Indicator (CESI) are not reliable tools for prediction of consumption expenditure in the Eurozone. We present empirical evidence that while disposable income is a good predictor for consumption, CESI does not have explanatory power to predict future levels of consumption expenditure in the Eurozone.

According to Keynes (1936), current consumption expenditure is very closely related to current disposable income, both for an individual and for an economy. Empirical evidence both in cross sectional and time series data has been widely used to explore Keynes' theory. The results were mixed and led to a variety of innovations in consumption theory. Friedman (1957) introduced permanent income hypothesis (PIH). According to the PIH, consumption by households is the outcome of an intertemporal decision-making process. Friedman argued that consumption had two components, a permanent planned component based on habits, budget planning, and current needs, and a transitory capricious component based on whim, chance occurrence, and random phenomena.

While the PIH alludes to a flexible concept of permanent income, including possibly lifetime income, it makes no explicit allowance for demographic factors. The structure of population, number of new couples, percentage of retired couples, and so on, is not static. These kinds of factors may change and induce changes in consumption which would be unanticipated by the PIH. Duesenberry (1967) introduced the relative income hypothesis. He postulated that consumption depends on current income and past peak income. If income

exceeds the previous peak level of income, no downward adjustment in living standards are necessary and consumption will adjust to income according to one set of relations. If, however, income falls below previous peak income, then consumption will react more gradually to changes in income. A different approach to consumption was undertaken by Modigliani and Ando (1963). Their theory of consumption titled "Life Cycle Hypothesis" distinguishes between two types of wealth, net worth of one's stock of assets, and the present value of one's expected labor income stream. According to this theory, consumption at any time depends both on the flow of expected labor income and on the stock of net worth or wealth.

The impact of interest rates on consumption expenditure has also been studied extensively in the macroeconomic literature. Almost all empirical studies on the subject have found no significant relationship between interest rates and consumption expenditure (see for example, Lusardi (1990), Wilcox (1990), and Elmendorf (1996)). The absence of a significant relationship between interest rates and consumption may be due to two simultaneous effects that interest rates have on consumption. While an increase in interest rates (an increase in cost of financing) may induce a reduction in consumption of durable goods and services, it could also raise future incomes from each dollar saved in the current period, and thus increase current consumption. Consequently, the direction and magnitude of the effect of interest rate on consumption expenditure remains ambiguous.

Researchers who have examined the impact of consumers' expectations on consumption expenditures include an empirical study by Bram and Ludvigson (1998) that suggests when interest rate and equity price changes are included in forecasting models, the Index of Consumer Sentiment (ICS) is no longer a significant predictor of consumption expenditures. However, according to this study, the Conference Board's Consumer Confidence Index (CCI), significantly improves the explanatory power of the forecasting models. Bram and Ludvigson conclude that the CCI and the ICS do not provide the same forecasting information. Yash and Martin (2003) use empirical analysis controlling for the possible influences of expected changes in income and interest rates on consumer spending. They find that consumer sentiment may predict future household spending because it foreshadows current economic conditions. They conclude that consumer sentiment is useful as a barometer of the near-term outlook for spending. Garrett, Hernandez-Murillo, and Owyang (2003) test the ability of consumer sentiment to predict retail spending at the state level. They conclude that the practical value of sentiment indices to forecast consumer spending at the state level is, at best, limited. In an empirical study for the US and the Eurozone countries, Stéphane Dées and Pedro Soares Brinca (2011) conclude that the consumer confidence index can be in certain circumstances a good predictor of consumption. In particular, based on out-

of-sample evidence they find that the contribution of confidence in explaining consumption expenditures increases when household survey indicators feature large changes so that confidence indicators can have some increasing predictive power during such episodes.

There are other studies in the literature that investigate the impact of consumers' expectations on consumption expenditure; see for example Al-Eyd, Barrell, and Philip (2008), Souleles (2001), and Carroll, Fuhrer, and Wilcox (1994). None of these studies concludes a clear positive relationship between these variables.

It has been argued that consumers' expectations about the economy's future should have an impact on consumers' decisions about how much to consume and how much to save. When consumers have good expectations about the future, they may consume more and save less than when they are pessimistic about it. Therefore, what consumers are thinking about the future state of the economy could be a useful factor in explaining future changes in levels of consumption.

While consumers' expectations seem to be a strong predictor for future consumption expenditure, there are potential statistical problems with the use of estimates for consumers' expectations. In the next section, we present explanations for these problems, and hypothesize that consumers' expectations measured by current available estimates such as the Eurozone Consumer Economic Sentiment Indicator (CESI) do not have explanatory power to predict future levels of consumption expenditure in the Eurozone countries. We present empirical evidence that while disposable income is a good predictor for consumption expenditure, CESI does not have explanatory power to predict future levels of consumption in the Eurozone.

2. Method

While consumers' expectations seem to be a logical predictor for future consumption expenditure, there are potential statistical problems with the use of estimates for consumers' expectations. First, when estimates such as Consumer Economic Sentiment Indicator are used, there is no assurance that the resulting forecast errors average out over a certain time period. Consumers who are surveyed may overestimate or underestimate the level of business activity, future inflation rates, and other key macroeconomic variables in such a way that could lead to bias predictions. Secondly, forecasts may be inefficient, in that people's forecast errors can be correlated with their demographic characteristics and/or the "aggregate shocks do not hit all people uniformly" factor. As a result of these problems, we believe that available estimates for consumers' expectations should not have any strong explanatory power to predict future consumption expenditure. In this paper, we

provide an empirical examination of the impact of disposable income and consumers' expectations on consumption expenditure in the Eurozone. We hypothesize that the relationship between survey-based estimates for consumers' expectations and future consumption expenditure should be insignificant.

One known tool of measuring consumers' expectations in the Eurozone is the Consumer Economic Sentiment Indicator (CESI). CESI consists of consumer surveys collected by the European Commission and measures the level of optimism that consumers have about the economy. The survey is made by phone and covers 23000 households in the Euro Area. The number of households sample varies across the zone. The questions focus on current economic and financial situation, savings intention as well as on expected developments regarding: consumer price indexes, general economic situation and major purchases of durable goods. CESI measures consumer confidence on a scale of -100 to 100, where -100 indicate extreme lack of confidence, 0 neutrality and 100 extreme confidence. In this paper, we use CESI to measure consumers' expectations. We use a multiple regression model as well as the Granger causality test to examine the impact of CESI on consumption expenditure in the Eurozone. Monthly data for consumption expenditure, disposable income, and CESI in Eurozone countries are obtained from the European Commission Eurostat at http://epp.eurostat.ec.europa.eu. Our statistical analysis covers January 1995 through September 2014.

2.1 Multiple Regression

We estimate the following multiple regression model:

$$C_t = a + b_1 DI_t + b_2 CS_{t-1} + U_t \qquad (1)$$

Where

C_t = Level of consumption expenditure at time t

b_1 = Marginal propensity to consume

DI_t = Level of disposable income at time t

a = Intercept

b_2 = Slope of current consumption with respect to lagged consumers' sentiment

CS_{t-1} = Lagged consumers' sentiment (lagged CESI)

U_t = Error term at time t

2.2 Granger Causality Test

In performing the Granger causality tests, the hypothesized dependent variable (consumption expenditure) is regressed on its lagged values. The lag length in the regression

equation must be selected in such a way that the resulting residuals are white noise, and therefore any first order serial correlations are eliminated. Next, the lagged values of the hypothesized independent variable (CESI) are added to the right side of the regression equation and the new regression is executed. Using an F test, the resulting sums of squared residuals from the two regression equations are compared. A relatively large difference between the two sums of squared residuals (a large F) would provide evidence that the hypothesized independent variable Granger causes the dependent variable.

3. Results

Table 1 presents the multiple regression test results; estimates for the slope coefficients b_1 and b_2 over the entire sample period as well as the two sub-periods of 1995-2004 and 2005-2014. Slope coefficients related to disposable income (marginal propensity to consume) are significant at the 5% confidence level for all periods. These results confirm the traditional Keynesian hypothesis that current disposable income is the major factor determinant of current consumption expenditure. However, slope coefficients related to the lagged consumers' sentiment (CESI) are insignificant. These results conform well to our hypothesis that consumers' sentiment measured by CESI has no explanatory power with respect to consumption expenditure in the Eurozone. While less biased measures of consumers' expectations may be powerful tools of predicting future consumptions, it appears that statistical bias related to the use of survey-based index of CESI makes this measure an inefficient tool for consumption forecasts.

The Granger Causality test results are shown in Table 2. The small F statistics of the Granger Causality test (1.08) which is significantly lower than the critical F value at the 5% confidence level (3.94) support the view that there is no causal relation from CESI to consumptuin expenditure in the Eurozone. This result provide additional evidence that consumer sentiment does not have any explanatory power in predicting changes in consumption expenditure.

4. Conclusion

The objective of this study was to examine the relationship between consumers' expectations as measured by Consumer Economic Sentiment Indicator (CESI) and future consumption expenditure in the Eurozone. The major hypothesis of this study was that CESI would not have the explanatory power to predict future consumption in the Eurozone. Our logic for this hypothesis was based on the statistical bias related to the use of this indicator as a proxy for consumers' expectations. We used a multiple regression model in which the dependent variable was consumption expenditure, and the independent variables included disposable income and CESI. We also used the Granger causality test. We found empirical support for our hypothesis. According to our test results, while disposable income is a good

predictor for consumption expenditure, CESI does not have explanatory power to predict future levels of consumption. The major implication of our empirical results is that to obtain more reliable forecasts for consumption, more research on developing other unbiased measures for consumers' expectations is necessary.

Table: 1 Multiple Regression

$$C_t = a + b_1 DI_t + b_2 CS_{t-1+} U_t$$

Period	b_1	b_2	N	DW	R^2
1995.1- 2014.9	.48 (3.36)	1.01 (.24)	237	2.02	.97
1995.1-2004.12	.50 (4.12)	.76 (.24)	120	1.90	.95
2005.1-2014.9	.68 (3.49)	.98 (.41)	117	1.92	.93

Table: 2 Granger Causality Tests

Null Hypothesis: CESI does not cause consumption expenditure	F-Stat	Probability
1995.1- 2014.9	1.19	.32
1995.1-2004.12	1.03	.36
2005.1-2014.9	1.13	.33
Lag: 3		

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