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Consumer Confidence and the Japanese Economy -Comparison of Pre- and Post-Bubble Period-

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Abstract

This paper investigates the effect of confidence on the Japanese economy by using vector autoregressions. Especially, I divide the total estimation period into two parts, pre- and post-bubble periods, and analyze the transition of that effect through the ages. It is shown that consumer confidence has a significant effect on GDP. Moreover, that effect becomes larger in a post-bubble period than in a pre-bubble period, which implies that the low level of confidence has worsened the economic condition in the lost (two) decade(s) after the bubble period.

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1. Introduction

Since the collapse of the bubble economy, the Japanese economy has been in a long-standing depression. In the short term, there were some periods of prosperity such as during the IT bubble around 2000. However, the Japanese economy has not been able to find chance to genuinely recover.[1] (The Japanese long recession is often called 'the lost decade' (or two decades).[2]) Huge amounts of outstanding government bond and anxiety about the future benefits of the social security system have led to greater uncertainty over the Japanese economy. Lingering economic stagnation has aggravated anxiety about future livelihoods. To resolve the vicious cycle between the poor economic condition and general anxiety, understanding the relationship between economic confidence and the real economic condition is of great importance.

It is said that there is a significant relation between real economic fluctuations and changes in confidence.[3] Matsusaka and Sbordone (1995) empirically proved that in the US economy, consumer sentiment affects GDP fluctuations. Utaka (2003) analyzed the Japanese case and proved that consumer confidence has a significant effect on GDP in the cases of quarterly and monthly data.[4] Li (2011) showed that consumer expectation can influence output growth in Chinese economy.[5]

In this paper, I investigate the effect of confidence on the Japanese economy by using vector autoregressions. In the same way as Matsusaka and Sbordone (1995) and Utaka (2003), this paper also uses vector autoregressions including a control variable useful for predicting future economic conditions, in addition to GDP and a variable that represents consumer confidence. This is to exclude the possibility that consumer confidence precedes GDP fluctuations, simply because consumers accurately forecast

[1] Although Japanese economy has recently turned upward somewhat by so-called "Abenomics", whether it leads to a real economic recovery is unpredictable.

[2] Motonishi and Yoshikawa (1999) examined the effect of financing constraints on Japanese firms during the 1990s. Hayashi and Prescott (2002) showed that a low productivity growth rate caused a decade of economic stagnation. Nishimura and Saito (2003) argued that scarcity of profitable private investment is a major cause of the prolonged stagnation. Horioka (2006) found that demand side factors are more important than supply side factors as causes of the long economic stagnation. Hamada and Okada (2009) emphasized the role of the overvalued real exchange rate of the yen in the stagnation.

[3] In economic theory, if dynamic indeterminacy of equilibria exists, confidence itself can affect economic fluctuations. See Azariadis (1993) and Benhabib and Farmer (1999) for instance.

[4] Chapter 1 of Akerlof and Shiller (2009) makes a concise explanation of the relation between confidence and the real economy.

[5] Gelper et al. (2007) and Malgarini and Margani (2007) analyzed the effects of consumer sentiment on consumer spending, and Caleiro (2006) analyzed the relation between consumer confidence and unemployment. Chua and Tsiaplias (2009), using Australian data, showed that consumer sentiment data is significantly useful for GDP forecast.

future economic conditions.

Moreover, I analyze the transition of that effect through the ages. Specifically, I divide the total estimation period into two parts, pre- and post-bubble periods, and compare their effects in each period. That is, I examine how the effect of confidence on the real economy changes before and after the bubble. I found that in both before and after the bubble period, consumer confidence has a significant effect on fluctuations in Japanese GDP. Importantly, the effect of confidence increases in a post-bubble period than before one.

2. Empirical Analysis

Here, I empirically investigate the effect of consumer confidence on Japanese economic fluctuation. In this paper, the quarterly data is used. The consumer confidence index (CCI), which is announced by Cabinet Office, is supposed to represent consumer confidence.

I use vector autoregressions including GDP, CCI, and the control variable that is useful for forecasting future economic conditions. As this control variable, I choose Index of Business conditions: Composite Index of Leading Index (IBCL) in the same way as Utaka (2003). This index is also announced by Cabinet Office. IBCL is a control variable useful for forecasting future economic conditions, so this vector auto regression system makes it possible to investigate the effect of pure confidence on GDP. GDP and IBCL are expressed in terms of log difference, and CCI is expressed in levels. The sample period covers the fourth quarter of 1982 to the second quarter of 2011. The lag length is chosen by considering Akaike Information Criterion (AIC).

The equations estimated in this paper are

$$\begin{pmatrix} GDP_t \\ IBCL_t \\ CCI_t \end{pmatrix} = \begin{pmatrix} a_{11}(L) & a_{12}(L) & a_{13}(L) \\ a_{21}(L) & a_{22}(L) & a_{23}(L) \\ a_{31}(L) & a_{32}(L) & a_{33}(L) \end{pmatrix} \begin{pmatrix} GDP_t \\ IBCL_t \\ CCI_t \end{pmatrix} + \begin{pmatrix} u_{GDP_t} \\ u_{IBCL_t} \\ u_{CCI_t} \end{pmatrix},$$

where $a(L)$ denotes polynominal in the lag operator L, and u is an error term.

First, let us analyze the case of the total period. The results of this estimation are presented in Table 1.

In this case, the number of observation is 114. Each column is a regression and the

dependent variable is at the top of each column. This table reports F-statistics for the hypothesis that the block of coefficients is jointly equal to zero. In addition, the sum of the block of coefficients is presented.[6] ** denotes significant rejection of the hypothesis that the block of coefficients is jointly equal to zero at 1% level.

The most important result is concerning the effect of CCI on GDP. It is shown that in the GDP equation, the sum of CCI coefficients is positive and the hypothesis that the block of CCI coefficients is jointly equal to zero is rejected at almost zero percent level. In other words, there exists Granger Causality from consumer confidence to GDP.[7] These results are the same as those in Utaka (2003).[8]

Table 1 Vector autoregressions with GDP, IBCL, and CCI (Total period)

Lag=2		Dependent Variables		
		GDP	IBCL	CCI
GDP	F-statistics	1.883	0.081	0.977
	Sum of coefficients	-0.269	-0.36E-02	38.030
IBCL	F-statistics	6.079	20.142	1.187
	Sum of coefficients	0.149**	0.500**	-9.50
CCI	F-statistics	11.651	1.673	222.732
	Sum of coefficients	0.13E-02**	-0.85E-03	0.857**

This table first indicates F-statistics for the hypothesis that the block of coefficients is jointly equal to zero. Next, the sum of their coefficients is presented. ** denote significant rejection of the above hypothesis at 1%.

From now on, let us analyze the transition of the effects of confidence on real economy. I compare the effect in the pre-bubble period with that in the post-bubble period. Considering the results of Chow test, I divide the estimation period into two parts, the first period from the second quarter of 1982 to the fourth quarter of 1990 (pre-bubble period) and the latter period from the first quarter of 1991 to the second quarter of 2011 (post-bubble period). Concerning their respective cases, I estimate vector autoregression

[6] All equations in this paper include a constant term.
[7] From the GDP equation, IBCL also precedes GDP, which implies that IBCL is useful for predicting future trend of GDP.
[8] The sample period in Utaka (2003) covers the fourth quarter of 1982 to the third quarter of 2000.

model with GDP, IBCL, and CCI.

The results of their estimations are presented in table 2 and 3.

The number of observation is 30 in the pre-bubble case and 81 in the post-bubble case. * and ** denote significant rejection of the hypothesis that the block of coefficients is jointly equal to zero at 5% and 1% level, respectively.

Table 2 Vector autoregressions with GDP, IBCL, and CCI (Pre-bubble period)

Lag=2		Dependent variables		
		GDP	IBCL	CCI
GDP	F-statistics	5.459	1.101	0.599
	Sum of coefficients	-1.041*	-0.364	-20.218
IBCL	F-statistics	2.199	3.982	1.467
	Sum of coefficients	0.266	0.468*	13.884
CCI	F-statistics	6.393	3.946	71.216
	Sum of coefficients	0.27E-02**	-0.35E-02*	0.866**

This table first indicates F-statistics for the hypothesis that the block of coefficients is jointly equal to zero. Next, the sum of their coefficients is presented. * and ** denote significant rejection of the above hypothesis at 5% and 1%, respectively.

Table 3 Vector autoregressions with GDP, IBCL, and CCI (Post-bubble period)

Lag=2		Dependent variables		
		GDP	IBCL	CCI
GDP	F-statistics	2.222	0.49E-02	0.287
	Sum of coefficients	-0.393	-0.033	31.874
IBCL	F-statistics	4.805	10.854	0.846
	Sum of coefficients	0.166*	0.474**	-11.142
CCI	F-statistics	6.264	1.278	149.716
	Sum of coefficients	0.98E-03**	-0.92E-03	0.839**

This table first indicates F-statistics for the hypothesis that the block of coefficients is jointly equal to zero. Next, the sum of their coefficients is presented. * and ** denote significant rejection of the above hypothesis at 5% and 1%, respectively.

In both cases, it is also shown that in the GDP equation, the sum of CCI coefficients is positive and the hypothesis that the block of CCI coefficients is jointly equal to zero is rejected at the smaller than 1 percent level. That is, consumer confidence has a significant effect on GDP in both periods.

Next, let us investigate forecast variance decompositions of each period. Table 4 presents the percentage of forecast variance of GDP which is explained by GDP, CCI, and IBCL from one to eight quarters ahead. It is known that percentage contributions are affected by the ordering of variables, so I consider the variance decomposition in four ways of ordering of the variables. It is shown that in a pre-bubble period, CCI explains about 13% to 20% of the forecast variance of GDP eight quarters ahead. In a post-bubble period, on the other hand, CCI explains about 7% to 28% of the forecast variance of GDP eight quarters ahead.

Table 4 Forecast variance decompositions of GDP

Pre-bubble period

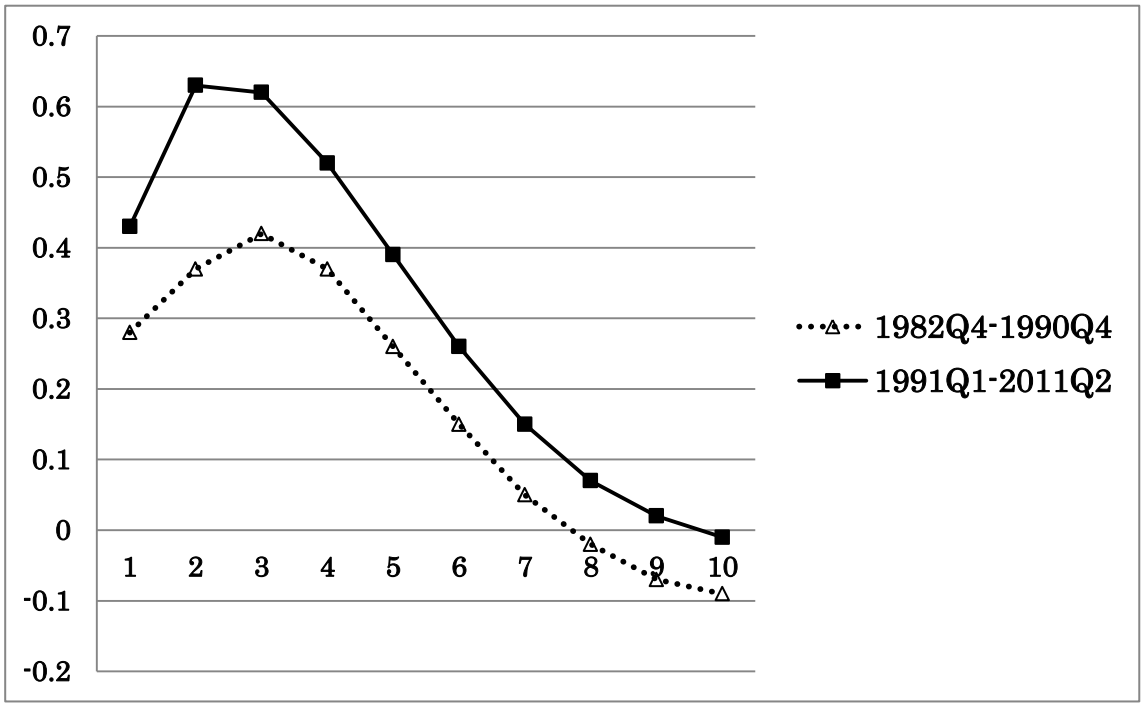
Quarter	GDP	CCI	IBCL
1	100	0	0
4	74.42	18.52	7.06
8	72.66	19.79	7.55
Quarter	GDP	IBCL	CCI
1	100	0	0
4	74.42	13.87	11.71
8	72.66	14.30	13.03
Quarter	CCI	GDP	IBCL
1	14.45	85.55	0
4	14.12	78.82	7.06
8	15.71	76.75	7.55
Quarter	IBCL	CCI	GDP
1	5.25	18.39	76.36
4	23.28	13.20	63.51
8	23.57	14.82	61.61

Post-bubble period

Quarter	GDP	CCI	IBCL
1	100	0	0
4	70.06	21.87	8.07
8	69.58	22.04	8.38
Quarter	GDP	IBCL	CCI
1	100	0	0
4	70.06	23.54	6.40
8	69.58	23.55	6.87
Quarter	CCI	GDP	IBCL
1	7.29	92.71	0
4	28.02	63.91	8.07
8	28.19	63.43	8.38
Quarter	IBCL	CCI	GDP
1	27.25	0.40	72.35
4	39.97	7.05	52.97
8	39.91	7.50	52.59

Finally, let us see the transition of the effect of confidence on GDP by comparing impulse-response functions (generated by Cholesky decomposition) for before and after the bubble. Impulse-response function shows how the shock of one variable affects others. Here, I focus on impulse-response functions that show the responses of GDP to CCI shock. Their functions in each period are shown in the following figure. The function in the pre-bubble period is depicted by a dotted line and that in the post-bubble period is by a solid line. It is shown that the effect of confidence increases in a post-bubble period than before one: real economy depends more on confidence in the period after the bubble. Thus, it can be said that the low level of confidence has worsened the economic condition in the lost (two) decade(s) after the bubble period.

Figure Response of GDP to CCI shock (Cholesky decomposition)



3. Conclusion

I empirically analyzed the effect of consumer confidence on fluctuations in Japanese GDP. I used the quarterly data and adopted vector autoregression approach. First, I analyzed the case of the total period, and showed that Granger causality from CCI to GDP exists, that is, in the Japanese economy consumer confidence has a significant effect on GDP fluctuations. Then, dividing the total period into pre- and post-bubble periods, I examined how the effect of confidence changes before and after the bubble. It is also shown that in both before and after the bubble period, consumer confidence has a significant effect on GDP. Moreover, comparing impulse-response functions in their respective periods, I demonstrated that the effect of confidence on the real economy increases in a post bubble period than before the bubble. In this research, however, I do not consider what causes the change in the effect of consumer confidence on GDP. It is most important to investigate the more exact relation between confidence and economic fluctuations in future research.

After the lost two decades, the Japanese economy is now in the recovery trend by "Abenomics". The success or failure of this attempt rests on how long consumer expectation can be kept high.

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