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DO STOCK MARKET RETURNS AFFECT CONSUMER SENTIMENT? AN IRISH STUDY

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ABSTRACT

This paper studies the relationship between changes in consumer sentiment and stock market returns in Ireland from January 1996 to June 2006. We argue that Irish consumers were highly influenced by movements in the stock market during this period because of their concerns for their stock-based compensation, their job security and their earnings. We find that the change in consumer sentiment and stock returns were related during this time, and that movements in the stock market impacted on consumer sentiment.

INTRODUCTION

This study investigates whether equity market returns affect consumer sentiment in Ireland. Consumer sentiment is measured by the IIB Bank/Economic and Social Research Institute (ESRI) Consumer Sentiment Index of Ireland. Otoo (1999) examined the relationship between movements in stock prices and consumer sentiment in the United States. She identified two possible explanations for this relationship.

First, an increase in the stock market may indicate higher than anticipated current wealth to consumers. This increases consumer sentiment directly. This argument only applies to consumers who have direct investments in the stock exchange. This direct effect is likely to be less important in continental Europe than in the US, because in Europe fewer households invest in stocks, and when they do it is a smaller share of their wealth. Short-term movements in the stock market would be unlikely to lead to changes in consumer sentiment because of indirect investments in the stock exchange, such as pensions. This is because these short-term fluctuations would be unlikely to significantly change the pension benefits. In general, there is not a culture of share ownership amongst Irish consumers. However, during this time period the Irish economy was experiencing the 'Celtic Tiger.' This period of sustained rapid economic growth may have implications for this study in that employees of large US multinationals such as Microsoft, Intel, Hewlett-Packard and Dell had been granted discounted stock and stock options.

These shares and options became increasingly valuable in the rising stock market and came to represent a significant percentage of the earnings of these employees.

Secondly, Otoo (1999) follows Poterba and Samwick (1995) and Morck, Shleifer and Vishny (1990) who have developed models that predict that a rising stock market improves consumer sentiment by acting as a leading indicator of higher than expected labour income. This second argument is that higher stock prices may be interpreted by economic agents as a sign of favourable economic conditions in the future. The stock market as a leading indicator, provides a channel through which equity prices may influence the behaviour of all consumers, regardless of whether they have a direct stake in the stock market or not. This argument may also be relevant to Ireland during this time period as many employees of US multinationals believed that poor stock market returns would lead to restructuring, job-cuts and reduced investment. As stock markets fell, consumers would have been less confident about their future earnings and job security.

LITERATURE REVIEW

Jansen and Nahuis (2003) explore several aspects of the link between stock market returns and consumer confidence for 11 European countries in the period 1986–2001. First, they analysed the relationship between the stock market and the aggregate consumer confidence index. Secondly, they disaggregated the confidence index into its components to examine the nature of the relationship between consumer sentiment and stock market returns. They find that stock returns and changes in sentiment are positively correlated for nine countries, with Germany as the main exception. Moreover, stock returns generally cause changes in consumer confidence at very short horizons (2 weeks – 4 weeks), but not vice versa. The relationship between stock market returns and consumer confidence is driven by expectations about economy-wide conditions rather than personal finances. This suggests that the consumer confidence is based on the leading indicator, the stock market, and that it is not a part of the wealth effect. This implies that expenditure effects emanating from the stock market may be larger and more widespread than suggested by the relatively small equity portfolios and the concentrated ownership of stocks in the European economies.

Lemmens, Croux and Dekimpe (2007) find that short-term fluctuations in consumer sentiment are largely country specific. They find that, in the longer run, consumer confidence indicators become more homogeneous. However, this homogeneity is inversely related to the economic and cultural distances between the member states. This suggests that the relationship between consumer confidence and stock market returns could be different in Ireland than in other European countries.

The links between economic variables and financial markets in Ireland have been the subject of a number of past studies. In the main, these studies examine financial markets reaction to economic variables. In contrast, this study examines the financial markets' impact on consumer sentiment.

These studies focus on Ireland position as a small open economy. Researchers have found that returns and volatility on the Irish stock exchange are related to exchange rate volatility (Kearney, 1998), spillovers from the London stock exchange (Alles and Murray, 2001), US, UK and German stock returns (Bredin and Hyde, 2007; Gallagher, 1995). Lucey (2005) finds that volume does not appear to be important in explaining the volatility of the Irish stock market. While Lucey and Whelan (2004) find a strong and persistent monthly effect with a January peak for Irish stock returns.

Lettau and Ludvigson (2001) argue that macroeconomic variables linked to the business cycle are predictors of stock returns. Lemmon and Portiaguina (2002) use consumer sentiment to explain the cross section of returns. These papers suggest that economic variables like consumer sentiment can predict stock returns. In this paper, the nature of this relationship is explored in the Irish context.

DATA

The data used is the ISEQ® Index of Irish Shares (ISEQ) and the IIB Bank/ESRI Consumer Sentiment Index of Ireland (CSI). The ISEQ® is the Irish Stock Exchange's official equity index. This index is comprised of the ISEQ® overall and four sub-indices, the ISEQ® Financial, the ISEQ® General, Small Cap Index and the ITEQ® (Technology Index). These show the overall performance of various shares quoted on the Irish Stock Exchange. This study will use monthly values of the indices. The data frame covers a period from 1996-2006.

In general, the consumer sentiment indices are produced in a similar manner across different countries. These indices are usually derived by combining responses to a number of questions, rather than relying on a single question. The University of Michigan, Survey of Consumers, is a long-established indicator in the US. The IIB Bank/ESRI indices are constructed using the methodology of the University of Michigan, using similar questions. As a contributor to the EU-wide Consumer Survey, the ESRI carries out a nationally representative survey of a minimum of 1,100 completed questionnaires on a monthly basis. A fresh national sample is used each month. This sample is representative of the totality of persons living in private households in Ireland. Thus, the survey represents the views of all persons aged 18 and over across all regions of the country. The principal objective of the survey is to record details on consumers' attitudes towards trends in the economy.

The IIB Bank/ESRI indices are an average of scores from five survey questions that ask respondents about their current financial situation; the expected changes in their financial situation over the next year; their views on expected business conditions in the next year and the next five years; and whether they think this is a good time or a bad time to make large household purchases. The actual survey questions are as follows:

Q.1. How do you think the economic situation will develop over the next 12 months? (get better/stay the same/get worse)

Q.2. Do you think the number of people out of work in the country in the next 12 months will (increase/remain the same/decrease)?

Q.3. How does the financial situation of your household compare now with what it was 12 months ago? (got better/stayed the same/got worse)

Q.4. How do you think the financial position of your household will change over the next 12 months? (get better/stay the same/get worse)

Q.5. In view of the general economic situation at the present time, what do you think about people buying large items such as furniture, washing machines, TV sets etc. Do you think that for people in general the present time is (good/neither good nor bad/bad)?

The IIB Bank/ESRI Consumer Sentiment Index is produced on a monthly basis from 1996 (see Appendix). The Permanent TSB / ESRI House Price index, the Irish Central Statistics Office Consumer Price Index and the ECB refinancing rate were collected and used as control variables.

RESEARCH METHODS AND FINDINGS

The objective of this paper is to establish a link between consumer sentiment and stock market returns in Ireland. Table 1 presents the variables used in this study and Table 2 presents descriptive statistics for the variables used. Figure 1 shows consumer sentiment and the ISEQ index from January 1996 to June 2006.

The results of Dickie-Fuller tests for a unit root are shown in Table 3. These tests show that while the levels of consumer sentiment (CSI) and the ISEQ index (ISEQ) are not stationary, the first-difference of the logs of these variables is stationary. Panel B of Table 3 gives the result of a Dickie-Fuller test on the residuals of a regression of the log of ISEQ on the log of CSI. The results of this test imply that the residuals are non-stationary and that the variables are not cointegrated. Given these results, the first difference of the logs of the variables are used in the regression tests and in the vector autoregression tests.

TABLE 1: LIST OF VARIABLES

Variable	Description
CSI_t	The Irish Consumer Sentiment Index for month t
$ICEC_t$	Index of current economic conditions for month t
IEC_t	Index of expected economic conditions for month t
$ISEQ_t$	The ISEQ Index for month t
$S\&P_t$	The S&P500 Index for month t
$NASDAQ_t$	The NASDAQ Index for month t
HP_t	The Irish House Price Index for month t
$ECBr_t$	The ECB base rate for month t (equivalent Irish rates used prior to 1998)
CPI_t	The Irish Consumer Priced Index for month t

TABLE 2: DESCRIPTIVE STATISTICS FOR THE CONSUMER SENTIMENT INDEX AND THE ISEQ INDEX FOR THE MONTHS JANUARY 1996 – JUNE 2006[A].

Variable[a]	N	Mean	Standard Deviation	Lower Quartile	Median	Upper quartile
CSI_t	126	101.790	19.420	89.400	103.000	119.500
$\Delta\ln(CSI)_t$		0.000	0.050	-0.030	0.010	0.030
$ICEC_t$		107.850	11.610	101.000	110.600	116.500
$\Delta\ln(ICEC)_t$		0.000	0.040	-0.030	0.000	0.030
ICE_t		97.710	25.440	78.900	97.850	121.300
$\Delta\ln(ICE)_t$		0.000	0.070	-0.040	0.010	0.040
$ISEQ_t$		4,929.980	1,325.250	4,217.080	5,010.160	5,702.210
$\Delta\ln(ISEQ)_t$		0.010	0.050	-0.020	0.020	0.040
$S\&P_t$		1,094.330	222.220	950.800	1,128.210	1,252.650
$\Delta\ln(S\&P)_t$		0.010	0.040	-0.020	0.010	0.040
$NASDAQ_t$		2,027.870	747.490	1,534.800	1,926.120	2,188.760
$\Delta\ln(NASDAQ)_t$		0.010	0.080	-0.040	0.000	0.060
HP_t		78.230	29.520	52.250	81.000	104.300
$\Delta\ln(HP)_t$		0.010	0.010	0.010	0.010	0.010
$ECBr_t$		2.980	0.800	2.250	3.000	3.500
$\Delta\ln(ECBr)_t$		0.000	0.070	0.000	0.000	0.000
CPI_t		104.090	11.150	93.470	103.830	113.980
$\Delta\ln(CPI)_t$		0.000	0.000	0.000	0.000	0.010

[a] Variable definitions are given in Table 1

Pearson correlation coefficients for the variables in the study are given in Table 4. These coefficients show significant correlation between consumer sentiment and house prices, interest rates and inflation. These variables are incorporated as controls in the regression tests in order to acknowledge these effects.

Table 5 shows the results of an OLS regression of consumer sentiment on current stock returns, lagged stock returns and lagged variables. Model 1 shows the results of regressing consumer sentiment on current and lagged returns on the ISEQ index. The coefficient on lagged ISEQ returns is positive and significant. Model 2 adds a number of control variables to the regression. These variables are an Irish house price index, ECB base interest rates and the Irish Consumer Price Index (CPI). The coefficients on current and lagged ISEQ returns are unchanged and none of the control variables is significant. In a related study, Bredin, Gavin and O'Reilly (2003) find that unanticipated changes in interest rates appear to have little significant influence on the Irish stock market. Models 3 and 4 look at the relationship between Irish consumer sentiment and the returns on the S&P 500 index and the NASDAQ index. In general, Irish consumer sentiment is related to these indices. This is not surprising given the high correlation between different stock exchange indices.

FIGURE 1: IRISH CONSUMER SENTIMENT INDEX AND ISEQ INDEX FEB 96- JUNE 06

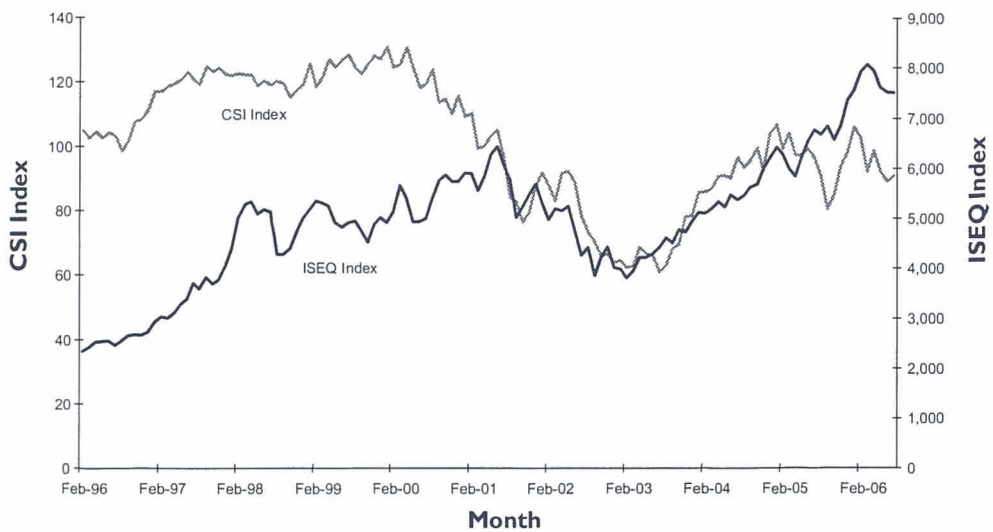


TABLE 3:
PANEL A: UNIT ROOT TESTS OF VARIABLES

Variable	Dickey-Fuller Test [a]
$\ln(CSI)_t$	0.138
$\Delta\ln(CSI)_t$	-104.715
$\ln(ICEQ)_t$	-0.038
$\Delta\ln(ICEQ)_t$	-122.229

[a] Critical value is -2.59 at 0.01 significance level.

PANEL B: UNIT ROOT TEST OF RESIDUAL OF REGRESSION OF LOG OF ISEQ ON LOG OF CSI

$$\ln(ISEQ)_t = \ln(CSI)_t + \varepsilon_t$$

Variable	Dickey-Fuller Test [a]
ε_t	-2.973

[a] Critical value is -4.07 at 0.01 significance level.

Table 6 shows the relationship between the components of the Irish Consumer Sentiment Index and the returns on the ISEQ index. The Index of Current Economic Conditions is related to current returns, while the Index of Expected Economic Conditions has a strong relationship with lagged ISEQ returns.

Table 7 shows the results of a regression of returns on the ISEQ index on Irish Consumer Sentiment. The coefficients on current variables are positive and significant in Model 1 and in Model 2 where a number of controls are introduced. These results are similar to those of Otoo (1999) for the US market.

Table 8 shows the results of an OLS regression of the variables on three lags of the same variable and three lags of the other variable. This test tries to establish causality between the two variables. The results were again similar to those of Otoo (1999) on the US market in that consumer sentiment had a significant statistical relationship with lagged values of stock market returns. Stock market returns did not seem to be effected by lagged consumer sentiment.

TABLE 4: PEARSON CORRELATION COEFFICIENTS [a]

	CSI_t	$\Delta\ln(CSI)_t$	$ISEQ_t$	$\Delta\ln(ISEQ)_t$	HP_t	$\Delta\ln(HP)$	$ECBr_t$	$\Delta\ln(ECBr)_t$	CPI_t
$\Delta\ln(CSI)_t$	0.124	1.000							
$ISEQ_t$	-0.080	-0.045	1.000						
$\Delta\ln(ISEQ)_t$	0.111	0.206 **	0.010	1.000					
HP_t	-0.605 ***	-0.018	0.754 ***	-0.069	1.000				
$\Delta\ln(HP)_t$	0.334	-0.031	-0.050	-0.031	-0.256 ***	1.000			
$ECBr_t$	0.336 ***	-0.231 **	-0.132	-0.065	-0.478 ***	0.146	1.000		
$\Delta\ln(ECBr)_t$	0.210 **	-0.006	0.125	0.124	0.021	0.016	0.119	1.000	
CPI	-0.686 ***	-0.015	0.706 ***	-0.078	0.989 ***	-0.280 ***	-0.488 ***	-0.010	1.000
$\Delta\ln(CPI)_t$	-0.015	-0.204 **	0.153	-0.070	0.081	0.096	0.161	-0.050	0.095

[a] Variable definitions are given in Table 1. Significance of the Pearson correlation coefficients:
* Significant at .05 level, ** Significant at .025 level, *** Significant at .001 level.

TABLE 5: REGRESSION OF FIRST DIFFERENCE OF LOG OF THE CONSUMER SENTIMENT INDEX ON CURRENT AND LAGGED FIRST DIFFERENCE LOG OF THE ISEQ INDEX, THE S&P 500 INDEX, THE NASDAQ INDEX AND CONTROL VARIABLES[A].

$$M1: \Delta\ln(CSI)_t = \alpha_0 + \beta_0\Delta\ln(ISEQ)_t + \beta_1\Delta\ln(ISEQ)_{t-1}$$

$$M2: \Delta\ln(CSI)_t = \alpha_0 + \beta_0\Delta\ln(ISEQ)_t + \beta_1\Delta\ln(ISEQ)_{t-1} + \beta_2\Delta\ln(HP)_t + \beta_3\Delta\ln(HP)_{t-1} + \beta_4\Delta\ln(ECBr)_t + \beta_5\Delta\ln(ECBr)_{t-1} + \beta_6\Delta\ln(CPI)_t + \beta_7\Delta\ln(CPUI)_{t-1} + \varepsilon_t$$

$$M3: \Delta\ln(CSI)_t = \alpha_0 + \beta_8\Delta\ln(S\&P)_t + \beta_9\Delta\ln(S\&P)_{t-1}$$

$$M4: \Delta\ln(CSI)_t = \alpha_0 + \beta_{10}\Delta\ln(NASDAQ)_t + \beta_{11}\Delta\ln(NASDAQ)_{t-1}$$

Model	M1			M2			M3			M4		
	Coeff.	t		Coeff.	t		Coeff.	t		Coeff.	t	
α_0	-0.005	-1.231		-0.005	-0.514		-0.005	-1.059		-0.003	-0.606	
β_0	0.163	1.916		0.177	2.040	*						
β_1	0.290	3.418	***	0.281	3.236	**						
β_2				-0.622	-0.900							
β_3				0.787	1.164							
β_4				-0.038	-0.582							
β_5				0.010	0.141							
β_6				-2.021	-1.764							
β_7				1.070	0.975							
β_8							0.258	2.704	**			
β_9							0.347	3.636	***			
β_{10}										0.085	1.621	
β_{11}										0.173	3.314	**
Adj. R^2	0.114			0.115			0.131			0.091		

[a] Variable definitions are given in Table 1. The two-tailed significance of the t-statistics:
* Significant at .05 level, ** Significant at .025 level, *** Significant at .001 level.

TABLE 6: REGRESSION OF FIRST DIFFERENCE OF LOG OF THE INDEX OF CURRENT ECONOMIC CONDITIONS (IEC) AND THE INDEX OF EXPECTED ECONOMIC CONDITIONS (ICE) ON CURRENT AND LAGGED FIRST DIFFERENCE

$$M1: \Delta\ln(IEC)_t = \alpha_0 + \beta_0\Delta\ln(ISEQ)_t + \beta_1\Delta\ln(ISEQ)_{t-1}$$

$$M2: \Delta\ln(ICE)_t = \alpha_0 + \beta_0\Delta\ln(ISEQ)_t + \beta_1\Delta\ln(ISEQ)_{t-1}$$

LOGS OF THE ISEQ INDEX[A].

Model	M1			M2		
	Coeff.	t		Coeff.	t	
α_0	-0.003	-0.709		-0.008	-1.182	
β_0	0.194	2.484	**	0.136	1.080	
β_1	0.081	1.043		0.480	3.816	***
Adj. R^2	0.048			.112		

[a] Variable definitions are given in Table 1. The two-tailed significance of the t-statistics:
* Significant at .05 level, ** Significant at .025 level, *** Significant at .001 level.

TABLE 7: REGRESSION OF FIRST DIFFERENCE OF LOG OF THE CONSUMER SENTIMENT INDEX ON CURRENT AND LAGGED FIRST DIFFERENCE LOG OF THE ISEQ INDEX, THE S&P 500 INDEX, THE NASDAQ INDEX AND CONTROL VARIABLES[A].

$$M1 : \Delta \ln(ISEQ)_t = \alpha_0 + \beta_0 \Delta \ln(CSI)_t + \beta_1 \Delta \ln(CSI)_{t-1}$$

$$M2 : \Delta \ln(ISEQ)_t = \alpha_0 + \beta_0 \Delta \ln(CSI)_t + \beta_1 \Delta \ln(CSI)_{t-1} + \beta_2 \Delta \ln(HP)_t + \beta_3 \Delta$$
$$+ \beta_4 \Delta \ln(ECBr)_t + \beta_5 \Delta \ln(ECBr)_{t-1} + \beta_6 \Delta \ln(CPI)_t + \beta_7 \Delta \ln(CPUI)_{t-1} + \varepsilon_t$$

Model	M1		M2	
	Coeff.	t	Coeff.	t
α_0	0.009	2.022 *	0.017	1.769
β_0	0.209	2.300 **	0.222	2.377 **
β_1	0.089	0.973	0.044	0.462
β_2			0.508	0.690
β_3			-0.819	-1.139
β_4			0.109	1.581
β_5			-0.030	-0.409
β_6			-0.018	-0.015
β_7			-1.674	-1.415
Adj. R^2	0.034		0.029	

[a] Variable definitions are given in Table 1. The two-tailed significance of the t-statistics:
* Significant at .05 level, ** Significant at .025 level, *** Significant at .001 level.

In order to better explore the relationship between consumer sentiment and stock returns, the system was modelled as a Vector Autoregression (VAR)

$$\Delta \ln(CSI)_t = \alpha_1 + \sum_{i=1}^{k} \beta_{1i} \Delta \ln(CSI)_{t-i} + \sum_{j=1}^{k} \delta_{1j} \Delta \ln(ISEQ)_{t-i} + \varepsilon_1$$

$$\Delta \ln(ISEQ)_t = \alpha_1 + \sum_{i=1}^{k} \beta_{2i} \Delta \ln(CSI)_{t-i} + \sum_{j=1}^{k} \delta_{2j} \Delta \ln(ISEQ)_{t-j} + \varepsilon_2$$

where the variable definitions are in Table 1 and (ε_1) and (ε_2) are randomly distributed error terms with zero means. The lag length of the VAR was one lag which was selected using likelihood ratio tests. Figure 2 shows the impulse response to shocks to the variables in the system. The figure shows a substantial change in CSI after a shock to ISEQ over about 4 months. However, shocks to CSI had little or no effect on ISEQ. These results are in line with Otoo's (1999) findings for the US. In this study, the response of CSI to a shock to ISEQ was considerably greater than that found in the US study.

TABLE 8: CAUSALITY TESTS BETWEEN CONSUMER SENTIMENT AND THE ISEQ INDEX[A].

Dependent variable	$\Delta \ln(CSI)_t$	t		$\Delta \ln(ISEQ)_t$	t
Intercept	-0.002	-0.341		0.010	1.938
$\Delta \ln(CSI)_{t-1}$	-0.042	-0.450		0.094	0.949
$\Delta \ln(CSI)_{t-2}$	0.041	0.439		0.071	0.706
$\Delta \ln(CSI)_{t-3}$	0.038	0.422		-0.058	-0.610
$\Delta \ln(ISEQ)_{t-1}$	0.315	3.578	***	0.127	1.352
$\Delta \ln(ISEQ)_{t-2}$	-0.039	-0.425		-0.094	-0.947
$\Delta \ln(ISEQ)_{t-3}$	-0.183	-1.980		-0.081	-0.817
Adj. R^2	0.0929			-0.0045	

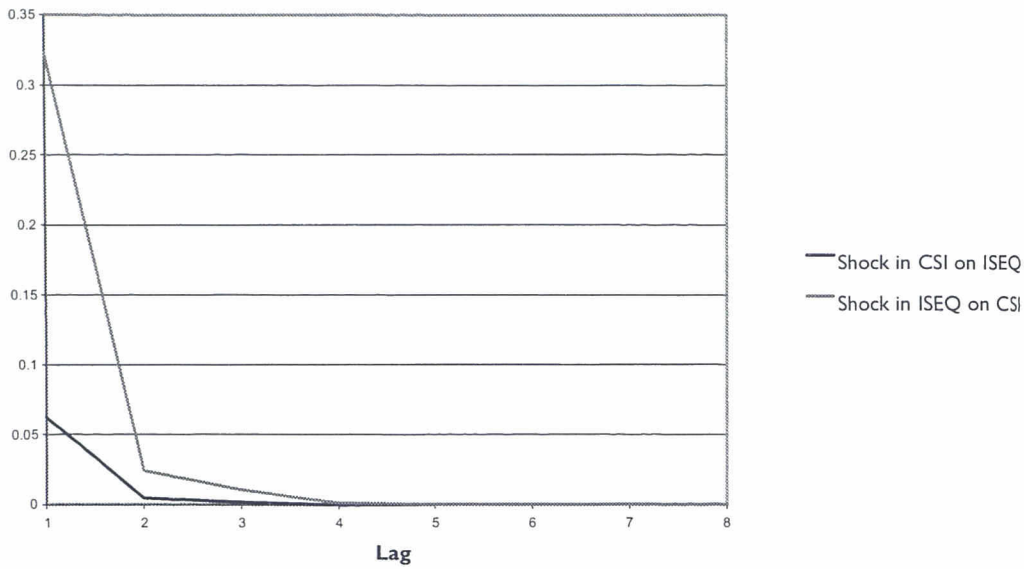
[a] Variable definitions are given in Table 1. The two-tailed significance of the t-statistics:
* Significant at .05 level, ** Significant at .025 level, *** Significant at .001 level.

In summary, we found that stock market returns had a considerable impact on subsequent changes in consumer sentiment, whereas changes in consumer sentiment had little or no impact on subsequent market returns. The magnitude of this relationship was considerably stronger than in the US. The period covered by this study was a period of very fast growth in the Irish Economy. It may have been that the public perception was that adverse stock market conditions would impact on the Irish Economy, employment and labour rates because so many people were employed in multinationals and dot.com companies.

CONCLUSION

This study investigates whether stock market returns affect consumer sentiment in Ireland. We expect that stock market returns will have an impact on consumer sentiment for two reasons. First, consumers in Ireland had direct holdings in listed companies. Secondly, Irish consumers were fearful of the impact of a stock market decline on their earnings and job security. Studies in the US (Otoo, 1999) and in Europe (Jansen and Nahuis, 2003) had also found this relationship. We find that stock market returns do affect consumer sentiment and that the magnitude of this effect was significantly greater in Ireland than in the US.

FIGURE 2: VAR IMPULSE FUNCTIONS



APPENDIX

Calculating the Consumer Sentiment Index

The Consumer Sentiment Index (CSI), is calculated by computing the relative scores [the percent giving favourable replies minus the percent giving unfavourable replies (the balance), plus 100] for each of the five index questions as seen in chapter three. Those who reply "Don't Know" and "Remain the same" are excluded from the index calculations. Each relative score is rounded to the nearest whole number. The sum of the five relative scores is then divided by the base period total. Each of these indices is calculated for the IIB Bank/ESRI monthly release.

$$\text{Consumer Sentiment Index} = \frac{Q_1 + Q_2 + Q_3 + Q_4 + Q_5}{Base(Qtr4, 1995=100)}$$

The Index of Consumer Expectations and the Index of Current Economic Conditions are calculated using the same procedures given above, based on a sub-set of questions. The base value is calculated for the relevant sub-group of questions.

$$\text{Index of Consumer Expectations} = \frac{Q_1 + Q_2 + Q_4}{Base(Qtr4, 1995=100)}$$

$$\text{Index of Current Economic Conditions} = \frac{Q_3 + Q_5}{Base(Qtr4, 1995=100)}$$

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