Sentiment in Foreign Exchange Market

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Outline

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- Sentiment in FX Market
- Data Description & Sample Characteristics
- Methodology & Results
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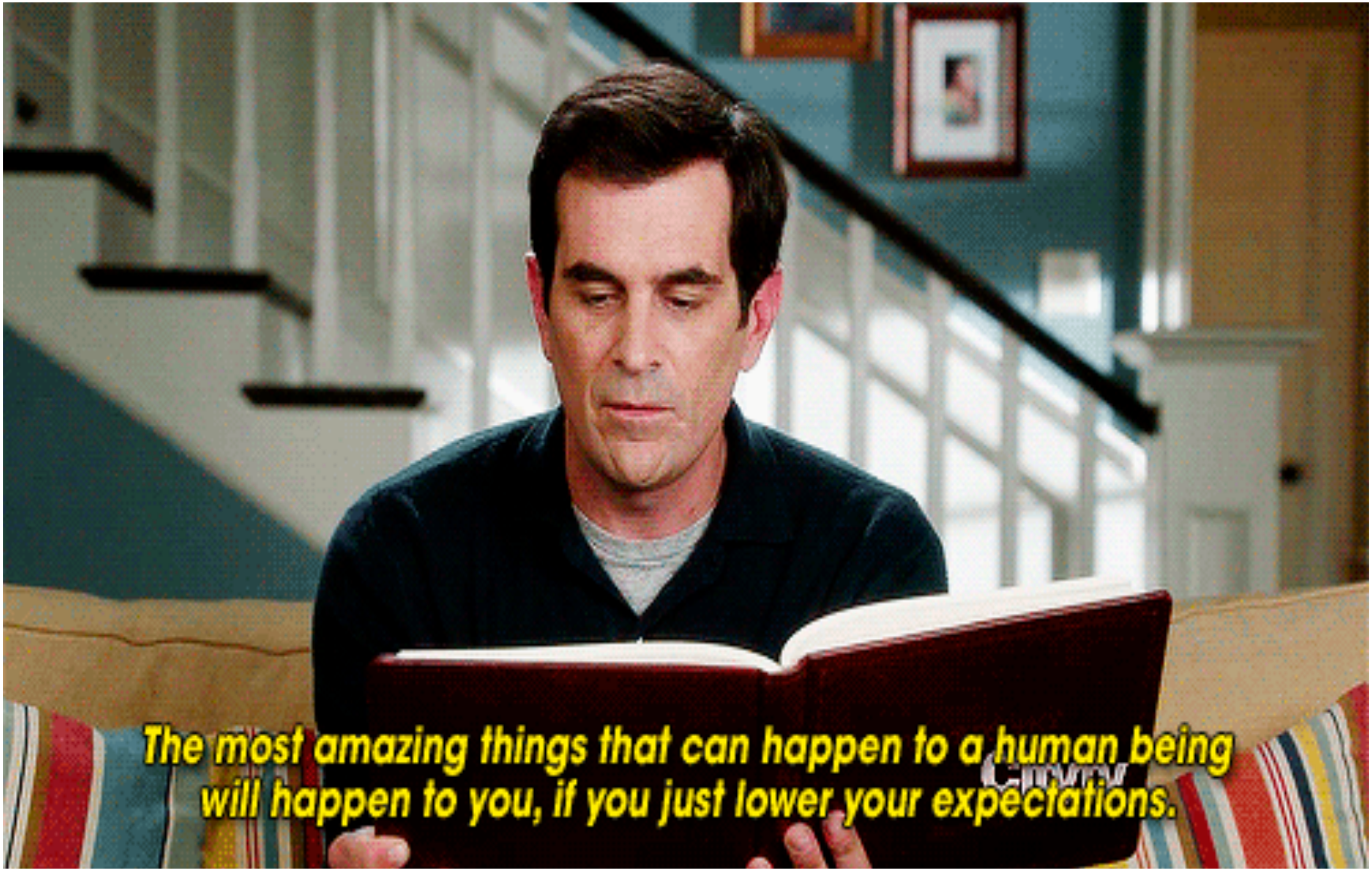
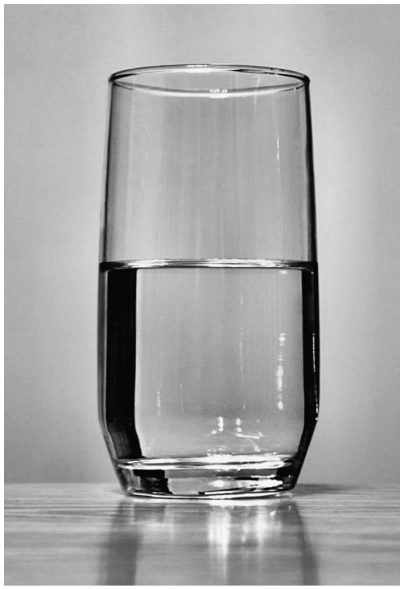

The most amazing things that can happen to a human being
will happen to you, if you just lower your expectations.

Market Sentiment: Why It Matters?

Keynes(1932) “the market will be subject to waves of optimistic and pessimistic sentiment.”

Winter (1986) “Perceptions of phenomena in the external world, interpreted by the perceiver as perceptions of “facts”, are actually fundamentally (but unconsciously) shaped by the perceiver’s own beliefs and expectations.”

It’s all about perceptions……



Definition

Previous Definition: Noise Traders' Beliefs

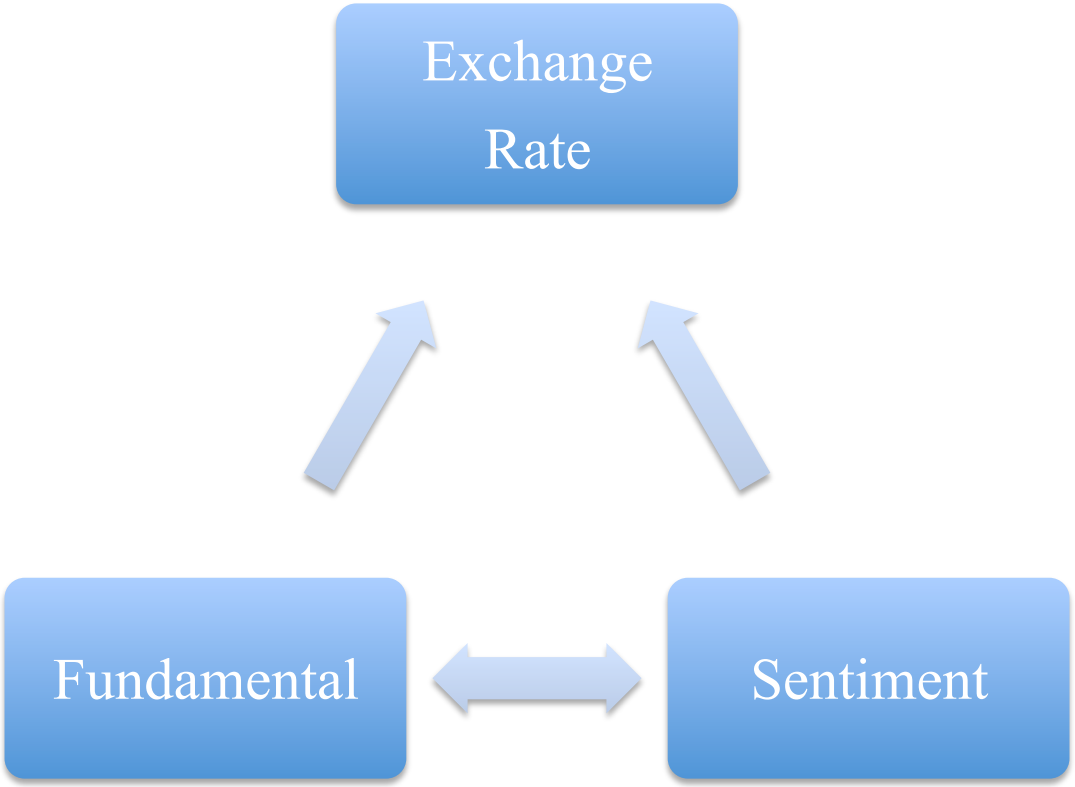
According to Delong, Shleifer, Summers, and Waldmann(DSSW) (1990), the investor sentiment, refers noise traders' beliefs based on non-fundamentals and was originally attributed to the psychological theories.

Definition of Market Sentiment:

Economy sentiment is an aggregate level of individual beliefs about future economy performance.

Exchange rate sentiment is an aggregate level of investors' beliefs about the future risk and return of exchange rate.

Sentiment in FX Market



Background

- Frankel and Froot (1986) have applied survey data in the Foreign Exchange Market to explain the US dollar bubble. The interest differential between Europe and US fell suggesting an increase of risk perception, if anything shifted to US.

- Cheung and Chinn (1999). Taylor and Allen (1992) focus on the use of technical analysis. This approach simply summarize the responses of the subjects and get the proportions of respondents and it leaves no space for other econometric analysis to test the causality and the marginal effects.

Sentiment Proxies

Survey-Based Proxies
US Consumer Confidence Index
AAII
UBS/GAllup
ZEW
SNX

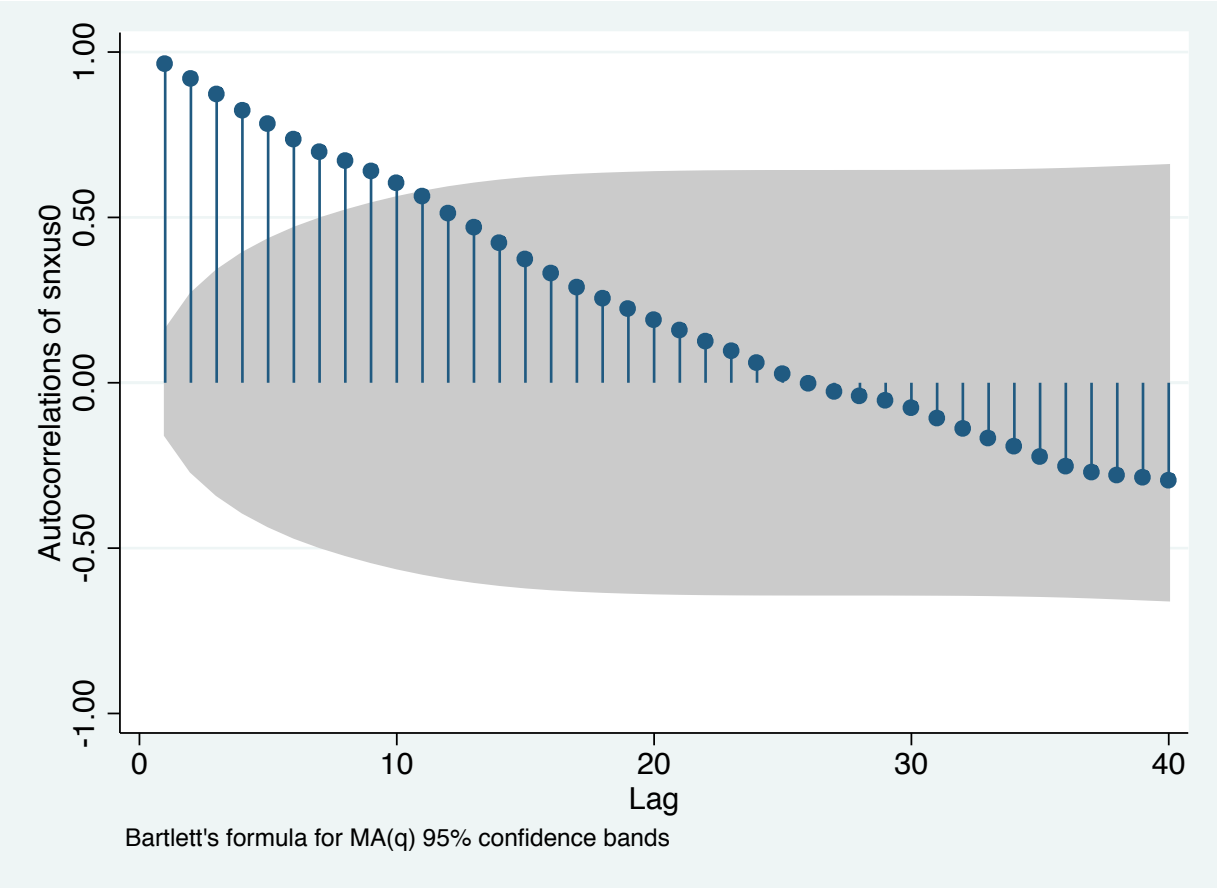
Survey-Based Proxies in FX Market
Bloomberg Survey
FX Expectation
ZEW FX Sentiment
SNX FX Sentiment

Market-Based Proxies in Stock Market
Trading Volume
Dividend Premium
Closed-End Fund Discount
Option Implied Volatility VIX
IPO first day returns/ IPO trading volume
Market P/E Ratios or Put/Call Ratios

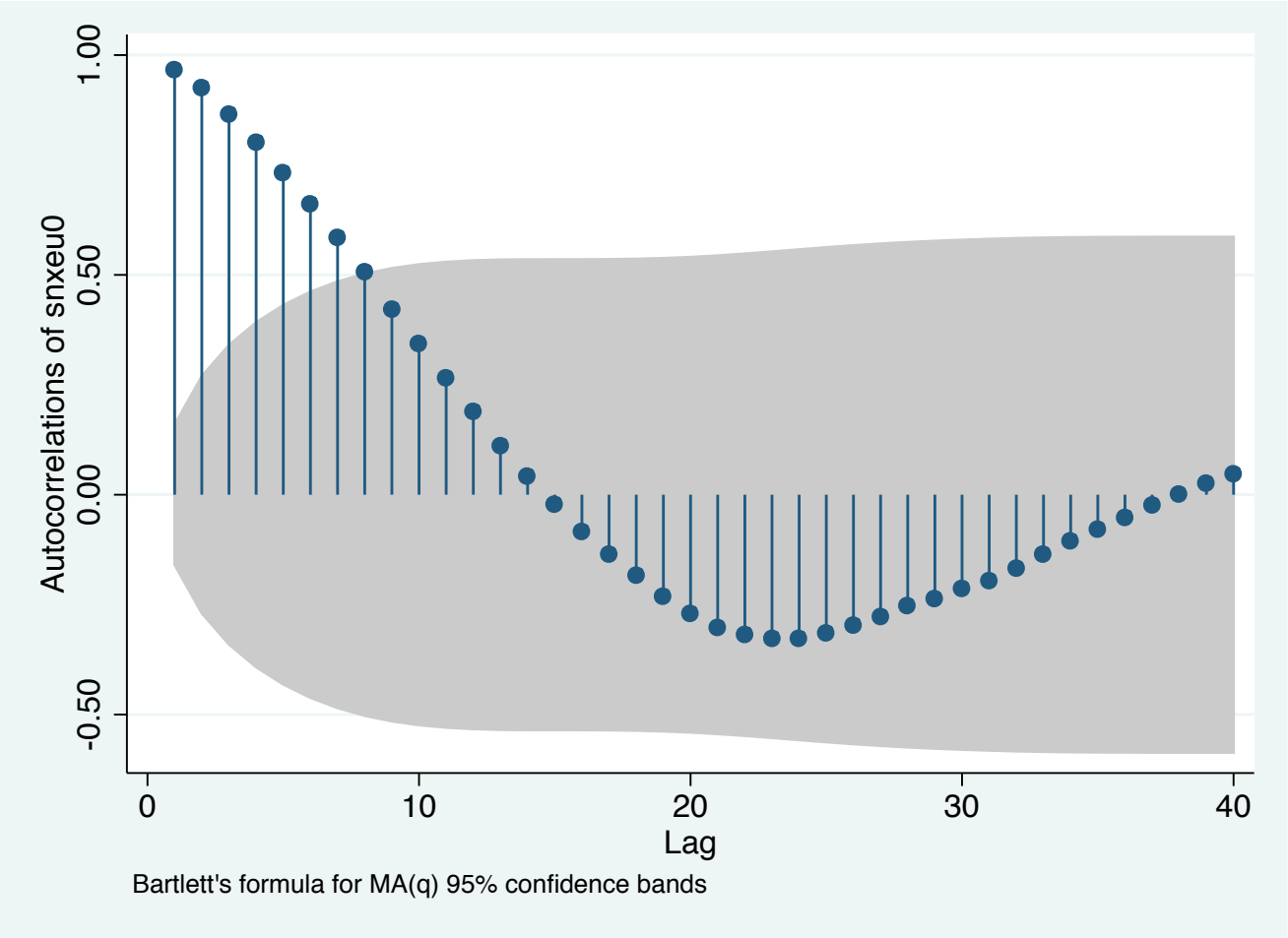
Market-Based Proxies in FX Market
Risk Reversal
Forward Exchange Option Volatility
Commitment of Traders Reports
Futures Open Interest

Economy Sentiment is Systematic

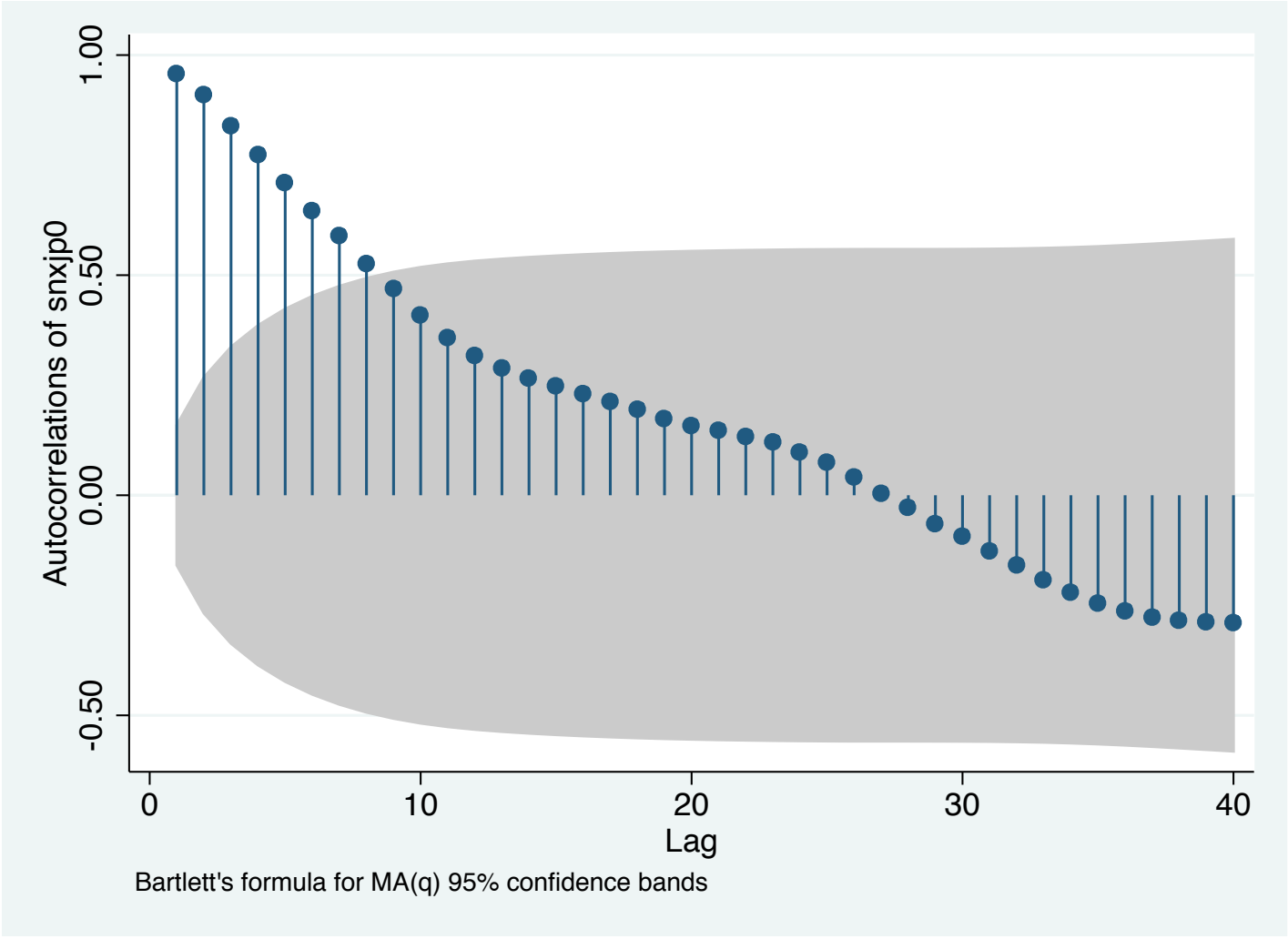
- Short-term Momentum & Long-term Reversal



Eurozone Sentiment



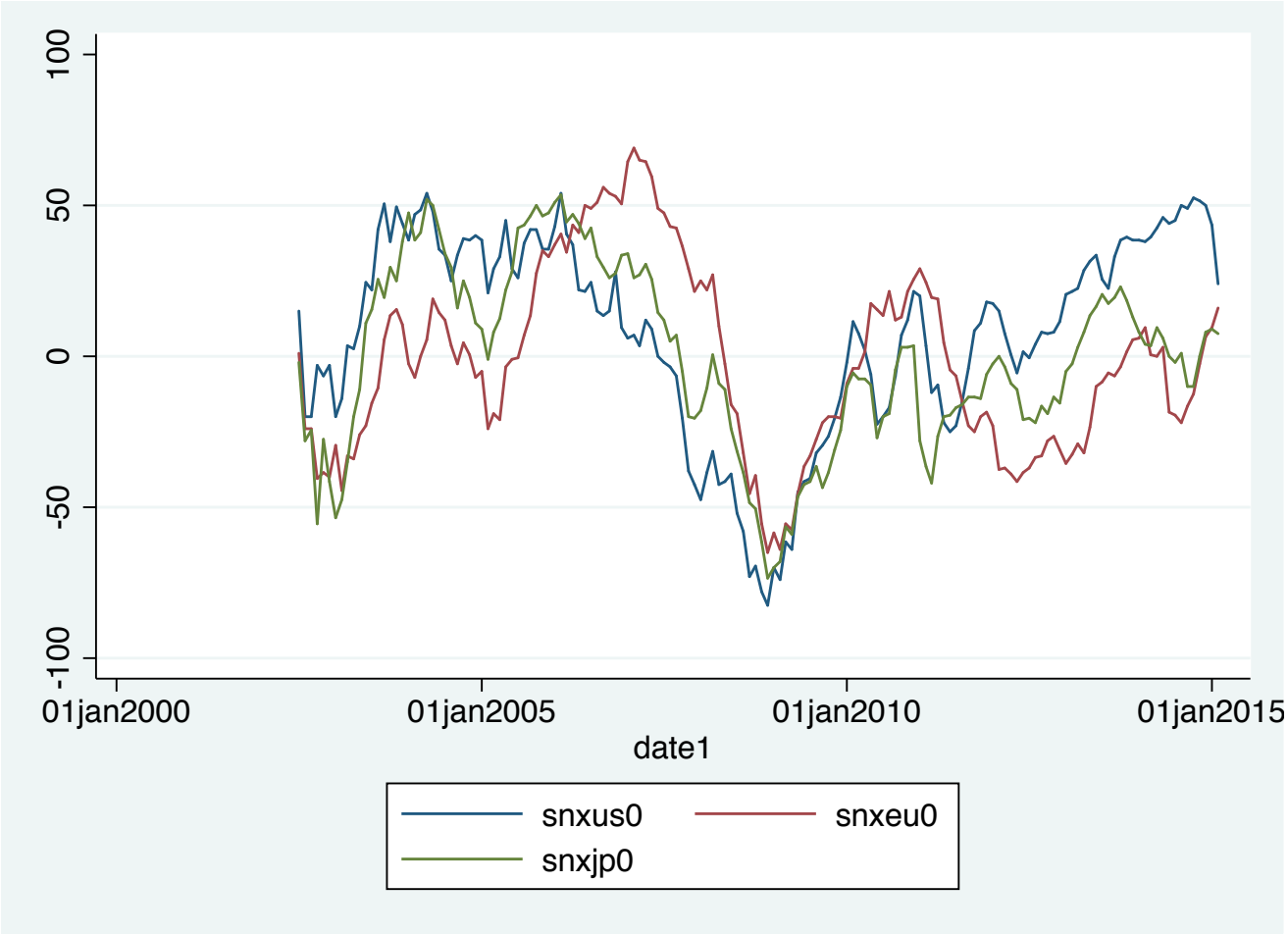
Japanese Sentiment



Data

- The investor sentiment indices dataset SENTIX, which surveyed more than 4,400 investors including over 1,000 institutional investors from 2001. As a very unique dataset first, distinguishes the institutional investors and private investors. Second, it's an online survey which allows different international investors take surveys in different locations.
- It has both economy sentiments for US, Europe and Japan, as well as the exchange rate sentiments for EUR/USD and USD/JPY. SNX, ZEW and US consumer confidence index are correlated significantly. Survey-Based Data is also correlated with Market-Based Proxy such as VIX.

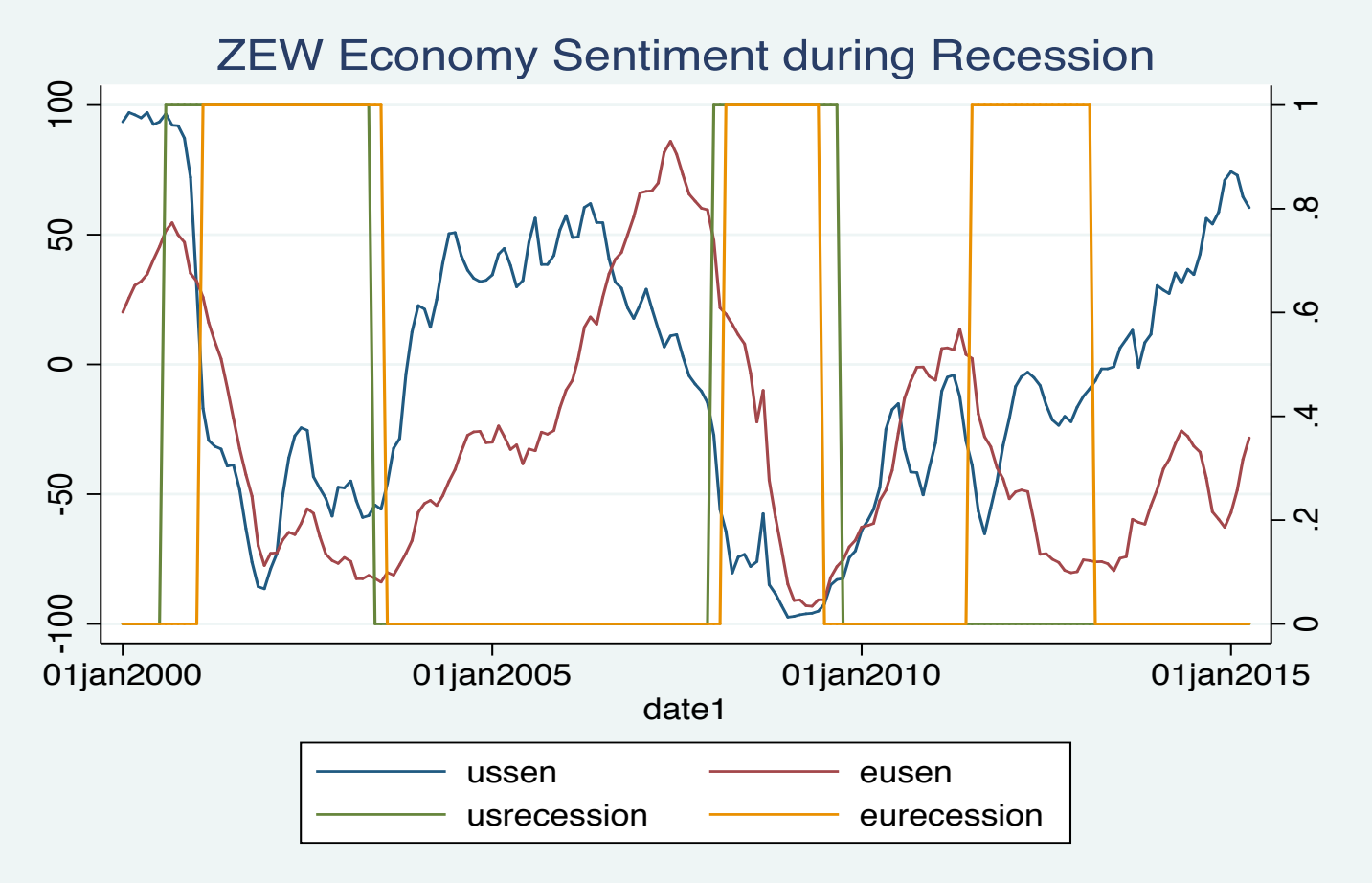
Global Sentiment



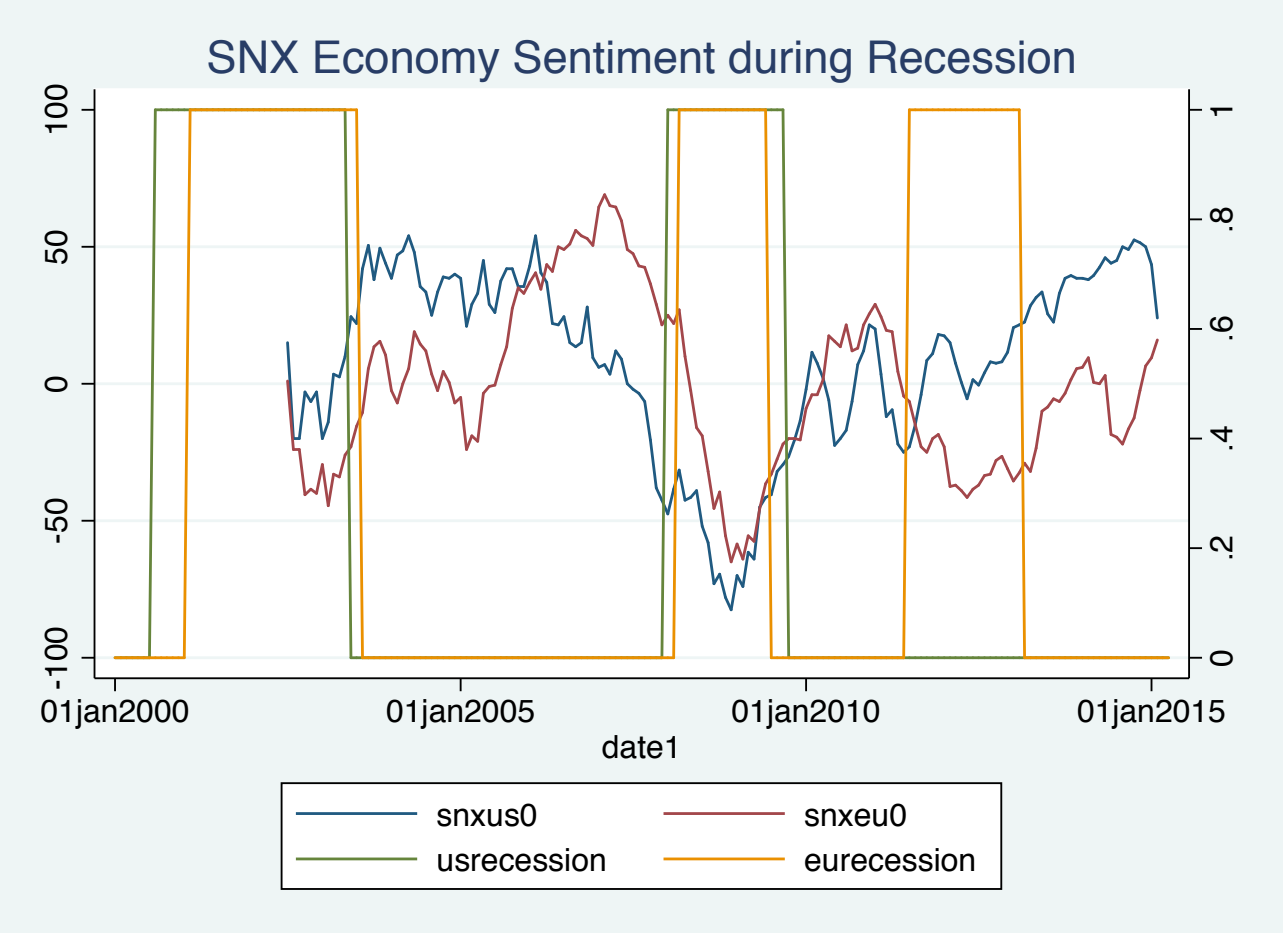
"Contagion" during Low Sentiment Episodes

	US	Europe	Japan
Panel A: Overall Correlations			
US	1.0000		
Europe	0.3437	1.0000	
Japan	0.7875	0.6618	1.0000
Panel B: Correlations during Low Sentiment Episodes			
US	1.0000		
Europe	0.3240	1.0000	
Japan	0.5563	0.8739	1.0000
Panel C: Correlations during Normal Episodes			
US	1.0000		
Europe	-0.0421	1.0000	
Japan	0.6482	0.4716	1.0000

Sentiments during Recessions



Sentiments during Recessions



Sample Statistics for Sentiment Indices during Recessions

	Mean	Median	25%-quant	75%-quant	Stand. Dev
Panel A: All Periods					
US Sentiment	-6.04	-7.85	-47.65	34.55	51.97
Europe Sentiment	-27.89	-36.65	-67.85	5.85	46.71
Japan Sentiment	-41.93	-40.85	-78.15	-10.8	40.16
Panel B: Recessions					
US Sentiment	-34.80	-48.3	-77.9	-17	54.92
Europe Sentiment	-48.3	-76.3	-65.15	-31.7	33.56
Japan Sentiment	-43.33	-34.6	-72.75	-20.25	33.22

Episodes of High Sentiments (Top 10%)
Episodes of Low Sentiments (Top 10%)

	Europe Low Sentiment		US High Sentiment		US Low Sentiment		Japan High Sentiment		Japan Low Sentiment
May-09	-93.2	Apr-15	60.4	Jan-09	-97.4	May-07	16.1	Sep-01	-99.3
Apr-09	-93	Apr-06	60.5	Feb-09	-97.1	Aug-07	16.5	Feb-02	-98.7
Feb-09	-91	May-06	62	Mar-09	-96.5	Dec-06	17.3	Dec-01	-98.7
Jun-09	-90.7	Mar-15	64.6	Apr-09	-96.1	Jan-06	17.4	Nov-01	-98.4
Jul-09	-90.7	Dec-14	71	May-09	-95.9	Dec-05	17.5	Oct-01	-98.1
Mar-09	-90.7	Dec-00	72.1	Jun-09	-95.1	Feb-06	18.3	Jan-02	-98.1
Jan-09	-84.7	Feb-15	72.9	Dec-08	-92.9	Jul-07	19.8	Mar-02	-98.1
Jul-03	-83.9	Jan-15	74.3	Jul-09	-92.3	Jun-07	20.5	Apr-02	-98
Apr-03	-82.6	Nov-00	87.2	Nov-08	-88.4	Apr-07	22.1	Jun-03	-97.2
Mar-03	-82.6	Oct-00	92	Dec-01	-86.5	Nov-06	23.8	Aug-01	-97.2
Jun-03	-82.5	Sep-00	92.2	Nov-01	-85.7	Mar-07	24	May-03	-97
Aug-09	-82.1	Jun-00	92.5	Aug-09	-85	Sep-06	26.6	Apr-09	-97
May-03	-81.3	Jan-00	93.5	Oct-08	-84.9	Mar-06	28.4	May-02	-96.5
Sep-03	-81.2	Jul-00	93.5	Sep-09	-82.9	Oct-06	29.9	Jul-01	-96.5
Nov-12	-80.3	Apr-00	95	Oct-09	-82.5	Apr-06	33.3	May-09	-96.4
Aug-03	-80.2	Mar-00	96.2	Apr-08	-80.4	Jun-06	33.8	Dec-02	-96.3
Dec-12	-79.9	Aug-00	96.6	Jan-02	-78.8	Aug-06	35.7	Oct-02	-96.1
Jun-13	-79.5	Feb-00	97.1	Jul-08	-77.9	May-06	36.9	Apr-01	-96.1
Oct-12	-79.4	May-00	97.1			Jul-06	37.4	Nov-02	-96
								Mar-01	-96

Some Striking Facts

- Sentiments during recessions are significantly lower than the normal periods. However, the standard deviation of the sentiment doesn't change a lot during recessions, since sentiment can be consistent over long periods. As you can see from the figure and table. Sentiment is usually very high right before the recessions, which is consistent with over-optimism.

- Low sentiments always happen during the recessions, but high sentiments are relatively random.

Methodology

- Oaxaca Decomposition
- Vector Error Correction (VEC) Model
- Variance Decomposition with Time Series

Oxaca Decomposition

$$EX_t^{recession} = \alpha_1 + \beta_1 Z_t^{recession}$$

$$EX_t^{non-recession} = \alpha_2 + \beta_2 Z_t^{non-recession}$$

$$EX_t^{recession} - EX_t^{non-recession} = (\alpha_1 - \alpha_2) + \beta_1 Z_t^{recession} - \beta_2 Z_t^{non-recession}$$

Adding and subtracting $\beta_1 Z_t^{non-recession}$ and rearranging, one obtains the first Oxaca decomposition[1]:

$$EX_t^{recession} - EX_t^{non-recession} = (\alpha_1 - \alpha_2) + \beta_1 \left(Z_t^{recession} - Z_t^{non-recession}\right) + Z_t^{non-recession}(\beta_1 - \beta_2)$$

Zt

Zt: Determinants based on Standard Exchange Rate Model: Interest Differential, Purchasing Power Parity

The second term is the contribution of the change in coefficients (β1-β2). This can be thought of as the unexplained variables between different environments (recession and non-recession).

Results

- Market Sentiment will affect the predicting power of the fundamentals.

- 84.6% difference between the change in exchange rate during the normal period and high sentiment period is explained by the unexplained factor, the latent difference between high sentiment and low sentiment.

- Only 15.4% difference can be explained by the explained variable(the difference of the fundamental during different period)

Vector Error Correction(VEC) Model

Cointegration Equation

Sentiment (-1)	=	Inflation (-1)	+	EUR/USD (-1)	+	Bonds (-1)	+	Constant
Coefficient 1	=	-0.002	+	0.097	+	0.643	-	0.467

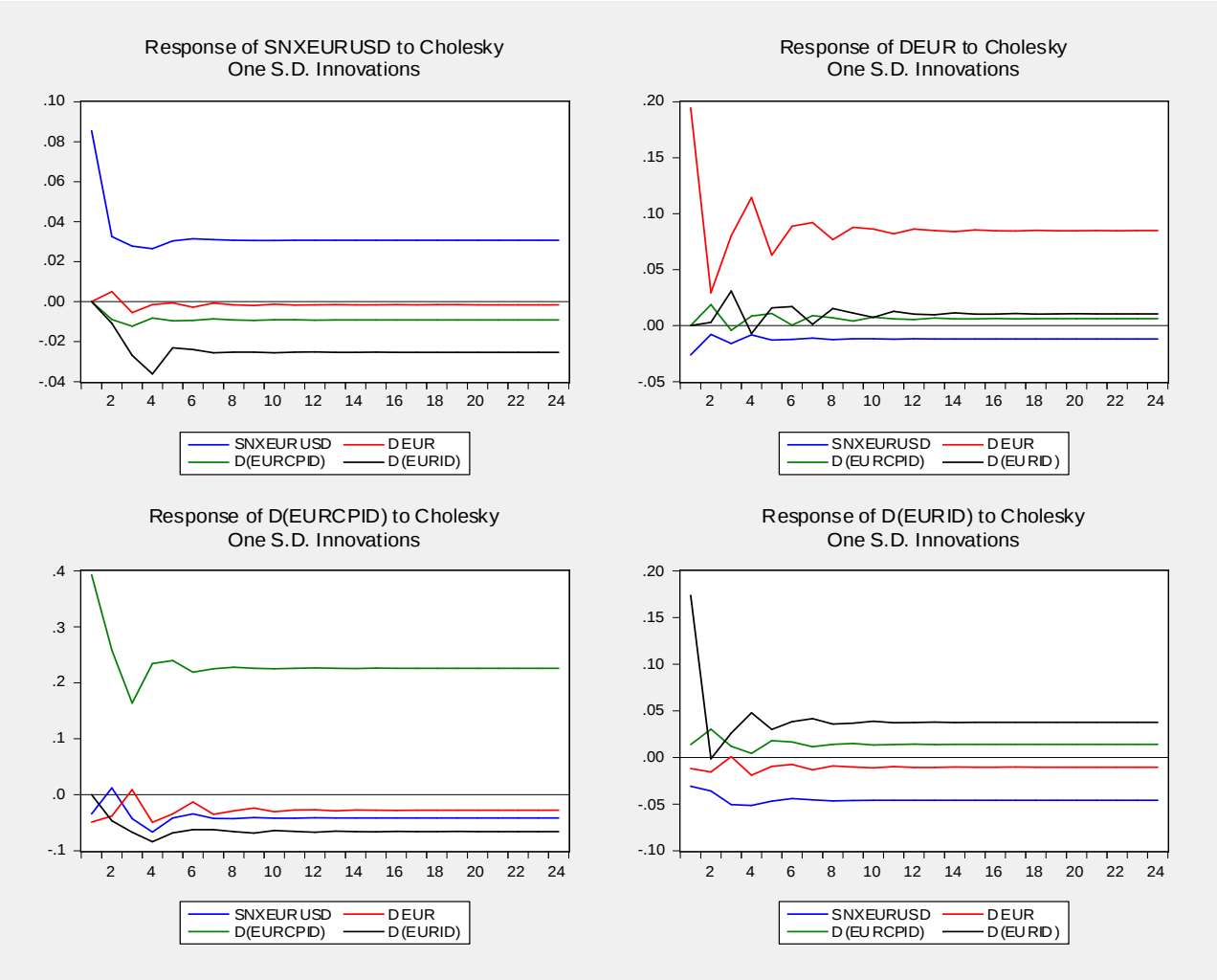
Error-Correction Equations

Error-Correction Equations

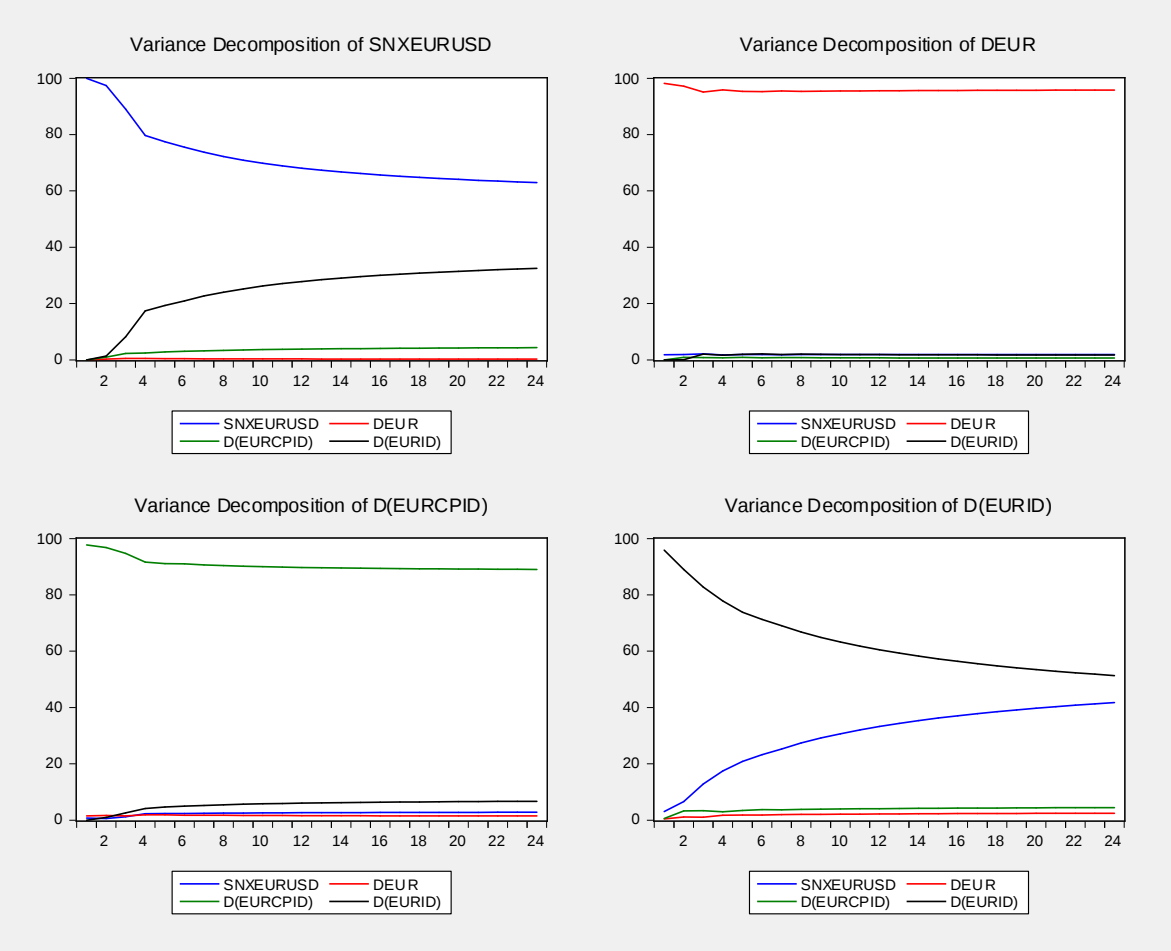
	Sentiment	Inflation	EUR/USD	Bonds
Sentiment (-1)	-0.1	-0.212	1.298***	0.587***
	[-1.02]	[-0.942]	[2.845]	[2.881]
Sentiment (-2)	-0.001	-0.212	0.454***	0.183***
	[-1.02]	[-0.941]	[2.846]	[2.881]
EUR/USD(-1)	0.07***	-0.855***	0.052	0.035
	[2.133]	[-11.416]	[0.341]	[0.523]
EUR/USD(-2)	0.012	-0.46***	0.199	0.0751
	[0.372]	[-6.244]	[1.333]	[1.128]
Inflation(-1)	-0.022	0.048	-0.336***	0.075***
	[-1.277]	[1.226]	[-4.266]	[2.144]
Inflation(-2)	-0.022	-0.01	-0.32***	0.044
	[-1.342]	[-0.262]	[-4.128]	[1.273]
Bonds(-1)	0.288***	-0.109	0.375	-0.367***
	[5.119]	[-0.84652]	[1.437]	[-3.149]
Bonds(-2)	0.149***	0.077	0.185	-0.221***
	[3.72]	[0.843]	[0.996]	[-2.663]
Constant	0.001	0.0011	-0.0006	0.005
	[0.164]	[0.07]	[-0.018]	[0.328]

Log likelihood of the system: 196.204

Combined Impulse Responses



Variance Decomposition



Conclusion

- One possible extension could be researching on sentiment in foreign exchange markets into other currencies, periods or surveys.
- Low sentiment can easily spread out, and it may lead to the instability in asset market. Do we need some financial regulations to offset the shift of market sentiment?
- High sentiment is relatively random, which could be an interesting topic to investigate.

The End……