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Empirical Evidence of Tunisian Business Cyclical Asymmetries

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Abstract

The aim of this paper is to treat the asymmetry behavior of the Tunisian business cycle. Thirty time series concerning a variety of macroeconomic and financial fields used in order to check the stylized facts in Tunisian business cycle. By referring to the *Skewness and* Triples tests and using Markov chain models, we show an evidence asymmetry in that many time series exhibiting this behavior. The economic indicators exhibit an evidence deepth, steepness and Sharpness asymmetry. The financial time series analysis shown that some variables are exhibits a stypness asymmetry and some others are characterised by the depth asymmetry. In terms of economic policies we recommend reviewing any policies based on a linear modelling with Gaussian innovations.

Key words: Business cycle, asymmetry, skewness, triples, Markov switching

1. Introduction

In their pioneering work, Burns and Mitchell (1946) identified two main characteristics of business cycles: the asymmetry and the co-movement. The asymmetry of the difference resulting from characteristics of the phases of expansion and recession, while the co-moving series resulting by the fact that they may change direction or even differently than other series. The asymmetry is considered by Mitchell (1927) and Keynes (1936) since recessions are brief and more violent than expansions. Thus, the succession of high and low growth is not periodic. Recently, it is explained by the integration notion and the dependance between the economic system (see Frankel and Rose (1998).

In the case of persistence of shocks, these results are substantially important for the decision maker especially when their policy proposals are based on linear models. Indeed, the presence of the stylized fact in the business cycle requires appropriate policy measures in each phase of the cycle.

In the literature, three asymmetry types are considered: (*i*) the *sharpness* asymmetry concern the difference of the curvature between the peaks and troughs. In most cases, this asymmetry indicates that the cycle peak is supposed to be sufficiently 'rounded', (*ii*) the *deepness asymmetry*, checked if the troughs are deeper and more severe than the peaks, (*iii*) *steepness asymmetry*, defined as the growth rate is higher (in absolute terms) in a recession than expansion.[1]

Empirically, applied work has been multiplied by referring to the Neftçi (1984) pioneer work on asymmetry in the U.S unemployment rate. Thus, DeLong and Summers (1986) have found that the production and unemployement data in six OECD countries for the post-war period have a shorter and sharper contractions than expansions. McQueen and Thorley (1993) found that many NBER time series are characterized by a relatively sudden transition between the peaks, and progressive transition between the peaks of the business cycle. They advocated that the asymmetry incentives to develop theoretical models that generate it. Sichel (1993) has found an evidence deepth for U.S. post-war unemployment and industrial production. Razzak (2001) has found that the international business cycle distributions are different. Franses and Contreras (2003) have argued the Razzak's results and have shown a stronger evidence of international business cycle asymmetries.

Note that all those applied works treat the characteristics of business cycles in developed economies and provide an evident asymmetry in most cyclical fluctuations. However, about the emerging economies, specifically the Tunisian business cycle, studies are not abundant. Among the few applications, we mention Medhioub's (2007) who has identified a deepness and steepness asymmetries in Tunisian industrial production over the period 1994-2004.

Many different methods have been proposed in the literature to detect asymmetry. In this paper, we are interested to Triples test (Randles et al. (1980)), the skewness known test and the Switching Markov model (Clements and Krolzig (2003)) to check the presence of the asymmetry stylised fact in a variety of Tunisian time series. The paper is organized as follows. In the second and third section, we present the Skewness and Triples tests methodology. In the fourth section we discuss the MS-AR model and the Clement-Krolzig test. The last section presents the results and interpretations of our empirical investigations.

[1] Djk and Franses (1997) shows the steepness cycle if the slope of the expansion phase differs from the slope of the contraction phase, the steepness occurs when the distance of the middle cycle at the peak is not equal to the average distance to the bowl and the sharpness focuses on the curve 'round' when compared to samples.

2. The skewness test

The *Skewness* test is firstly used by Delong and Summer (1986) in a business cycle asymmetry study. Later, the test has been widely used in several studies on business cycles (Sichel (1993), Lupi and Ordine (2001), Bai and Ng (2005) and Lisi (2005)). Sichel (1993) considered as reference in empirical studies, distinguishs the *Deepness* and *Steepness* asymmetry in the several USA macroeconomic time series. In fact, Sichel (1993) notes that the series exhibits deepness asymmetries while it's negatively skewed relative to its mean, or trend. The steepness asymmetry is verified if the first-differences are negatively skewed. Furthermore, Sichel notes that using the expression for the asympthotic standard error of the coefficient of skewness of an *i.i.d* random variable is inapplicable since the observation of time series to be studied are sure to be serially correlated. His procedure is explained as follows:

The Skewness coefficient is calculated as:

$$\hat{\gamma} = \frac{\mu_3}{\mu_2^{3/2}} \quad (1)$$

μ_k is the sample moments $\mu_k = 1/n\sum_{t=1}^{n}(y_t - \bar{y})^k$, where n is the sample size and $\bar{y}$ is the sample mean. The Skewness test is based in following statistics:

$$u = \left(6n^{-1}\sum_{\tau=-k}^{k}\hat{\rho}_\tau^3\right)^{-1}\tilde{\gamma}_1^2 \quad (2)$$

Where, k is a suitably chosen non-negative, $\tilde{\gamma}_1$ represents the *Skewness* estimated empirical coefficient and $\hat{\rho}_\tau$ is the empirical estimation of the autocorrelation function between the series y_t and $y_{t+\tau}$. The later coefficient is defined by the follwing expression:

$$\hat{\rho}_\tau = \left\{n^{-1}\sum_{t=1}^{n}(y_t - \bar{y})^2\right\}^{-1}\left\{n^{-1}\sum_{t=1}^{n-|\tau|}(y_{t+|\tau|} - \bar{y})(y_t - \bar{y})\right\}, \quad |\tau| \le n-1 \quad (3)$$

3. Triples test

The triples test is a nonparametric method proposed by Randles et *al.* (1980) to test the asymmetry of the depth and slope (*Steepness* and *Deepness* asymmetry). As the Skewness, *Steepness* asymmetry is verified by analysis of the first difference of the time series considered, while the *Deepness* asymmetry is verified by analysing of the original series.

The Triples test counts all possible combinations of three values selected from a sample of size N (C_N^3 combinations) of a univariate time series. The distribution is skewed if most Triples are bent towards the right or the left. We present in what follows, the main steps of evaluation of this test.

Consider three integers i, j and k such that $0 \le i, j, k \le N$. The three observations (x_i, x_j, x_k) skewed to the right (a right triple) if the middle observation is closer to the smallest observation. The left triple is formed if the middle observation tends to be closer to the largest observation. Randles et al. (1980) have diagrammed this test as follows:

Right Triple	x x______x____________
Left Triple	x ______xx______________

To assess the test Triples, the null hypothesis of symmetric distribution against the alternative of asymmetry are verified by the statistical normal distribution. These assumptions are:

$$\begin{cases} H_0 : \hat{u} = 0 \\ H_1 : \hat{u} \neq 0 \end{cases}$$

Where

$$\hat{u} = \left(C_N^3\right)^{-1} \sum_{i \prec j \prec k} f\left(x_i, x_j, x_k\right) \qquad (4)$$

Notes that :

$$\hat{u} = \frac{\text{the number of right triple - the number of left triple}}{3C_N^3}$$

$$f\left(x_i, x_j, x_k\right) = \frac{\left[sign\left(x_i + x_j - 2x_k\right) + sign\left(x_i + x_k - 2x_j\right) + sign\left(x_j + x_k - 2x_i\right)\right]}{3}$$

And,

$$sign(u) = \begin{cases} -1 & \text{if } u < 0 \\ 0 & \text{if } u = 0 \\ 1 & \text{if } u > 0 \end{cases}$$

Thus, the function $f(.)$ can take only the following three values: $\left\{\frac{-1}{3}, 0, \frac{1}{3}\right\}$. If $f(.) = -\frac{1}{3}$, (x_i, x_j, x_k) form left triple. The time series is symmetric if $f(.) = 0$. (x_i, x_j, x_k) form right triple if $f(.) = \frac{1}{3}$.

The Triples test statistic is noted by U which is defined as follows[2] :

$$U = \sqrt{N}\,\frac{\hat{u} - u}{\hat{\sigma}_N} \to N(0,1)$$

Where,

$$u = E(\hat{u}) = \Pr\{x_1 + x_2 - 2x_3 > 0\} - \Pr\{x_1 + x_2 - 2x_3 < 0\}$$

$$\hat{\sigma}_N^2 = Var(\hat{u}) = \left(C_N^3\right)^{-1} \sum_{t=1}^{3} \left(C_N^t\right) \begin{pmatrix} N & -3 \\ 3 & -t \end{pmatrix} \xi_t$$

$$\xi_1 = \frac{1}{N} \sum_{i=1}^{N} \left(f_1(x_i) - \hat{u}\right)^2 \qquad \text{with} \qquad f_1(x_i) = \left(C_{N-1}^2\right) \sum \sum_{\substack{J<K \\ i \neq j,\, j \neq k}} f\left(x_i, x_j, x_k\right)$$

$$\xi_2 = \left(C_N^2\right)^{-1} \sum \sum_{j<k} \left(f_2(x_i, x_k) - \hat{u}\right)^2 \qquad \text{with} \qquad f_2(x_i, x_k) = \frac{1}{N-2} \sum \sum_{\substack{i=1 \\ i \neq j \neq k}} f\left(x_i, x_j, x_k\right)$$

And,

$$\xi_3 = \frac{1}{9} - \hat{u}^2$$

The advantage of the Triples test against the Skewness one is the ability to distinguish between the positive and negative steepness asymmetric. A positive Triples statistic involves that the time series is characterized by recovery phases longer than the recession ones. Thus, an economy with such asymmetry adapts more quickly to crises than other economies.[3]

4. A Markov switching model

A stationary time series y_t is assumed to have been generated by a Markov-Switching Autoregressive (*MS-AR*) model with p are the lags and m is the state governed by an unobserved stationary ergodic Markov chain with transition probabilities,

$$p_{ij} = \Pr(S_t = j / S_{t-1} = i), \tag{5}$$

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[2] Hoeffiding (1948) shows the normality distribution of the statistic.
[3] See Verbrugge (1997) and Razzak (2001) for more explanation.

The state can be detected in mean, in the intercept or the volatility. The expression of the three main models are summarised as follows:

$$MSM-AR(p):\ \mathrm{y_t}-\mu(s_t)=\sum_{j=1}^{p}\phi_j(y_{t-j}-\mu(s_{t-j}))+\varepsilon_t \tag{6}$$

$$MSI-AR(p):\ \mathrm{y_t}=\mu(s_t)+\sum_{j=1}^{p}\phi_j y_{t-j}+\varepsilon_t \tag{7}$$

$$MSMH-AR(p):\ \mathrm{y_t}-\mu(s_t)=\sum_{j=1}^{p}\phi_j(y_{t-j}-\mu(s_{t-j}))+\varepsilon_t(s_t) \tag{8}$$

$$MSIH-AR(p):\ \mathrm{y_t}=\mu(s_t)+\sum_{j=1}^{p}\phi_j y_{t-j}+\varepsilon_t(s_t) \tag{9}$$

According to McQueen and Thorley (1993), the non-sharpness implies that the transition probabilities to and from the two outer regimes are identical. Clements and Krolzig (2003) formulate this as follows:

$$p_{im}=p_{im}\ \ and\ \ p_{1i}=p_{mi}\ \ for\ all\ i\neq 1,m \text{ and } p_{1m}=p_{m1} \tag{10}$$

Clements and Krolzig (2003) consider that the null hypothesis of non-sharpness can be expressed as

$$\phi_{TP}(\lambda)=\Phi\pi \tag{11}$$

Where the matrix Φ is defined such that the alternative hypothesis is accepted. Let π the transition probabilities matrix,

$\pi=(p_{12},p_{13},p_{21},p_{23},p_{31},p_{32})'$

In the case of a three-state Markov chain, Clement and Krolzig note that:

$$\Phi=\begin{bmatrix}1&0&0&0&0&-1\\0&1&0&0&-1&0\\0&0&1&-1&0&0\end{bmatrix} \tag{12}$$

Under the null of symmetric transition probabilities the Wald statistic has the form:

$$W_{TP}=\tilde{\pi}'\Phi'\left[\Phi(\frac{1}{T}\tilde{\Sigma}_{\tilde{\pi}})\Phi'\right]^{-1}\Phi\tilde{\pi} \tag{13}$$

5. Empirical investigation

The asymmetry behaviour is computed for thirty Tunisian monthly time series from 1980:1 to 2010:5; economic indicators (industrial production, producer prices and consummer prices), financial indicators (international liquidity, fund position, monetary authorities, moneatry survey, interest rates), banking variables (deposit money banks, banking survey) and exchange rates. We select our database form the CD-ROM of the International Monetary Fund (2011).

In our application we will focus on Sichel's (1993) study. It notes that the Deepness asymmetry is checked in the cyclical component of the times series and the steepness one is attached to the first difference of the cyclical components.[4]

At this end, we consider a time series:

$$y_t = \tau_t + c_t \quad (14)$$

Where, τ_t is the trend component of the series and c_t is its cyclical component (supposed stationary). We refer to the Hodrick and Prescott (1980) filter (HP), in order to detrend the time series. In this respect, the Deepness and steepness tests of asymmetric cyclical components considered are applied respectively to the filtered series and the first difference of the cyclical components. These tests verify the null hypothesis of symmetry of the series.

As Belaire-Franch and Contreras (2003), we fit a wide range of MS-AR models, allowing for either changes in the mean or changes in the intercept, with either regime-dependent heteroscedasticity or homoscedasticity. The number of states, m, has been as usual kept fixed to two: a recession and expansion period. The lag length is selected using the Schwarz criterion. In all cases, the time series to be analysed are detrended using the HP filter.

The first two table s report the deepness and steepness tests according to corresponding expressions above. The sharpness test and the identified model are summarised in the table 3.

From the table 1, the results show that the economic indicators such as PI and GDP time series exhibit an evidence deepness and steepness asymmetry. The negative value of the Triples statistics concerning the steepness test indicates that the PI and GDP tends to fall speedily, but rises very slowly over the sample. This are confirmed with Razzak's (2001) results on the New Zealand GDP. This implies that the Tunisian economy requires some (much) time to come out of the crisis. The test of for asymmetries in MSI-AR model shows that the non-sharpness is accepted for the IP time series. Indeed, price variability describes the environment short term, while economic growth relates to the structure of the economy.

In the moneatry variables, several indicators such as the SDR holdings, Reserves, Quotas, Foreign liabilities, and Capital accounts are characterized by the *Steepness* asymmetry and not the *Deepness* one. Moreover, there is clear evidence of asymmetric turning points (sharpness).

[4] Sichel has used the HP and BP filter in order to detrend the time series.

Some of the banks variables, as liquid liabilities and long-term foreign liabilities, are characterised by Deepness asymmetry and others by a steepness one. The sharpness asymmetry is rejected for the Long-Term Foreign Liabilities time series. The deepness and steepness asymmetries are the caracteristics of the exchange rates but the probability of moving from a recession state to an expansion one (p_{12}) is equally as likely as the probability of moving from an expansion state to a recession one (p_{21}).

The interest rate behavior is also characterised by steepness and sharpness asymmetries.

6. Conclusion

In this paper we are interrested to check an important stylised fact of the business cycle theory such as the asymmetry. We have analysed 30 Tunisian time series defining a variety of filds, economic, monetary, banking, and interest rate indicators.

The main finding is that the economy variables show a deepness and neagative-steepness asymmetries. Monetary variables may exhibit a positive-steepness. The sharpness asymmetry caracterises the international liquidity, the banking and the interest rate indicators.

Our general implicatication is to two sides. First, the user of these variables must be taken into account the asymmetry data in her models and analysis. Second, the politicians must take account of this stylised fact when studying or forecasting macroeconomic fluctuations. Indeed, the settlement taken during expansion periods must be different in recession one.

Table 1. The Deepness Asymmetry in Tunisian Business cycle.

Variable	*Skewness Test*		*Triples Test*	
	Statistic	**P-value**	**Statistic**	**P-value**
Production Indices				
PI	2.430	[0.119]	-2.7106	[0.003]
GDP	3.613	[0.057]	-3.301	[0.000]
Prices (Consumer, Producer Prices)				
PPPI	4.155	[0.042]	-0.5029	[0.307]
PCP	0.256	[0.203]	-0.8303	[0.230]
International Liquidity				
ILSDR	0.0045	[0.946]	-0.4284	[0.334]
ILRPF	1.332	[0.248]	-0.6474	[0.258]
ILFEX	32.56	[0.000]	-0.2335	[0.408]
Fund Position				
FPQUO	0.000	[0.997]	-0.1289	[0.448]
FPSDRH	1.197	[0.274]	-0.4225	[0.336]

FPPPF	0.000	[0.999]	-0.016	[0.494]
Monetary Authorities				
MAFAS	3.288	[0.069]	0.4621	[0.322]
MAREM	0.727	[0.394]	1.0303	[0.151]
MAFOL	5.623	[0.017]	0.7761	[0.219]
MACAP	0.068	[0.794]	0.9597	[0.168]
Monetary Survey				
MSFOA	7.213	[0.007]	0.4731	[0.318]
MSDOC	13.67	[0.000]	4.04	[0.000]
MSMON	2.58	[0.107]	1.3597	[0.087]
MSLTFL	8.80	[0.003]	-1.5429	[0.061]
Deposit Money Banks				
DMRES	3.18	[0.074]	2.1687	[0.015]
DMFOA	3.24	[0.072]	-0.2025	[0.419]
DMFOL	2.50	[0.113]	0.2624	[0.396]
DMCAC	2.65	[0.103]	-0.4023	[0.343]
Banking Survey				
BSFAS	1.37	[0.241]	-0.255	[0.399]
BSDOC	1.37	[0.489]	1.207	[0.114]
BSLLI	11.99	[0.000]	1.92	[0.027]
BSLTF	8.8	[0.003]	-1.54	[0.060]
Exchange Rates				
ERMREPS	0.109	[0.740]	-1.4546	[0.073]
ERNEER	285.27	[0.000]	-2.7106	[0.003]
ERREER	273.60	[0.000]	-0.8403	[0.200]
Interest Rates				
IRMMR	0.0852	[0.770]	0.1759	[0.430]

Table 2. The Seepness Asymmetry in Tunisian Business cycle.

Variable	***Skewness Test***		***Triples Test***	
	Statistic	**P-value**	**Statistic**	**P-value**
Production Indices				
PI	10.90	[0.001]	-4.177	[0.000]
GDP	9.14	[0.002]	-3.725	[0.000]
Prices (Consumer, Producer Prices)				

PPPI	35.23	[0.000]	2.942	[0.001]
PCP	1.389	[0.238]	-1.509	[0.065]
International Liquidity				
ILSDR	4199.79	[0.000]	-1.939	[0.026]
ILRPF	6129.17 3	[0.000]	-1.888	[0.029]
ILFEX	405.661	[0.000]	0.862	[0.194]
Fund Position				
FPQUO	6689.72	[0.000]	-11.29	[0.000]
FPSDRH	3899.53 4	[0.000]	-1.583	[0.056]
FPPPF	6689.62 7	[0.000]	-11.29	[0.000]
Monetary Authorities				
MAFAS	981.766	[0.000]	1.652	[0.049]
MAREM	0.427	[0.513]	0.125	[0.449]
MAFOL	586.081	[0.000]	-0.29	[0.384]
MACAP	943.121	[0.000]	4.63	[0.000]
Monetary Survey				
MSFOA	67.080	[0.000]	1.92	[0.027]
MSDOC	30.586	[0.000]	0.84	[0.199]
MSMON	1.5776	[0.209]	1.55	[0.059]
MSLTFL	476.41	[0.000]	0.52	[0.300]
Deposit Money Banks				
DMRES	1.404	[0.236]	0.37	[0.353]
DMFOA	4.813	[0.028]	-0.16	[0.435

				]
DMFOL	694.743	[0.000]	-0.09	[0.462]
DMCAC	90.828	[0.000]	3.608	[0.000]
Banking Survey				
BSFAS	857.836	[0.000]	1.87	[0.310]
BSDOC	1.44	[0.229]	-0.022	[0.491]
BSLLI	6.49	[0.011]	2.45	[0.070]
BSLTF	476.49	[0.000]	0.523	[0.300]
Exchange Rates				
ERMREPS	80.138	[0.000]	0.926	[0.177]
ERNEER	1.651	[0.198]	-0.443	[0.329]
ERREER	1.268	[0.260]	-0.067	[0.473]
Interest Rates				
IRMMR	1251.874	[0.000]	-2.808	[0.002]

Table 3. The Sharpness test in the MS-AR model.

Variable	***Mode l***	***NonSharpness***	
		Statistic	**P-value**
Production Indices			
PI	MSI- AR(1)	0.0009	[0.976]
GDP			
Prices (Consumer, Producer Prices)			
PPPI	MSI- AR(3)	14.3557	[0.0002] ***
PCP	MSM- AR(2)	5.3939	[0.0202] **
International Liquidity			
ILSDR	MSIH-AR(2)	17.3064	[0.0000] ***
ILRPF	MSIH-AR(1)	14.3076	[0.0002] ***
ILFEX	MSIH-AR(6)	1.0519	[0.3051]
Fund Position			
FPQUO	MSIH-AR(1)	4.4179	[0.0356] **
FPSDRH	MSIH-AR(1)	17.2107	[0.0000] ***

FPPPF	MSM- AR(1)	0.2528	[0.6151]
Monetary Authorities			
MAFAS	MSM- AR(2)	2.3238	[0.1274]
MAREM	MSMH-AR(2)	0.3029	[0.5821]
MAFOL	MSIH-AR(2)	0.8962	[0.3438]
MACAP	MSIH-AR(2)	34.1831	[0.0000] ***
Monetary Survey			
MSFOA	MSIH-AR(1)	4.0500	[0.0442] **
MSDOC	MSIH-AR(1)	0.0374	[0.8466]
MSMON	MSIH-AR(1)	0.0128	[0.9100]
MSLTFL	MSIH-AR(2)	0.1496	[0.6989]
Deposit Money Banks			
DMRES	MSIH-AR(2)	0.0693	[0.7924]
DMFOA	MSIH-AR(2)	0.0718	[0.7887]
DMFOL	MSIH-AR(2)	3.2231	[0.0726]*
DMCAC	MSIH-AR(2)	5.285	[0.0215] **
Banking Survey			
BSFAS	MSMH-AR(1)	10.8972	[0.0010] ***
BSDOC	MSIH-AR(2)	4.7010	[0.0301] **
BSLLI	MSIH-AR(1)	2.8971	[0.0887]*
BSLTF	MSI-AR(1)	0.0031	[0.9558]
Exchange Rates			
ERMREPS	MSM-AR(1)	6.0543	[0.9488]
ERNEER	MSMH-AR(3)	1.7264	[0.1889]
ERREER	MSMH-AR(3)	3.0725	[0.0796]*
Interest Rates			
IRMMR	MSIH-AR(1)	14.7179	[0.0001] ***
*: significance at 10% **: significance at 5% *** significance at 1%			

The test statistics compute the null hypothesis of symmetry ($p_{12} = p_{21}$) against the alternative of sharpness tests and it is asymptotically distributed as χ_1^2.

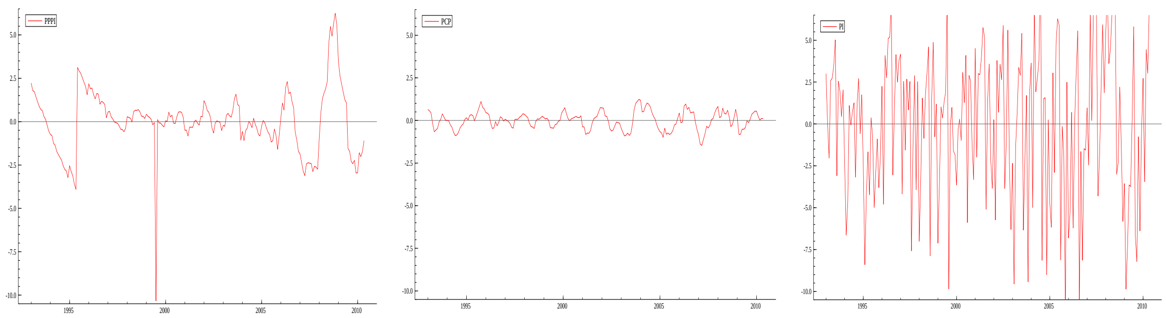


Figure 1. The Cycical components of the Economic Indicators (PPPI, PCP,PI).

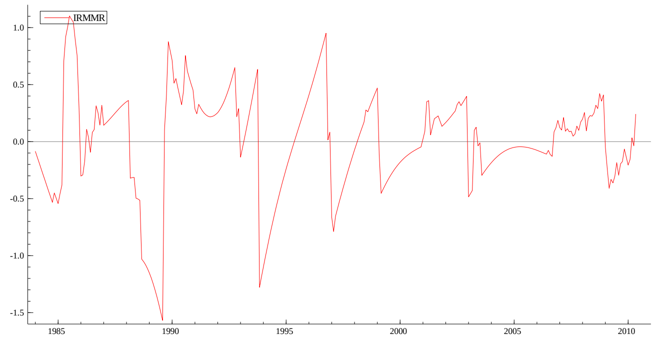


Figure 2. The Cycical components of the Interest Rate

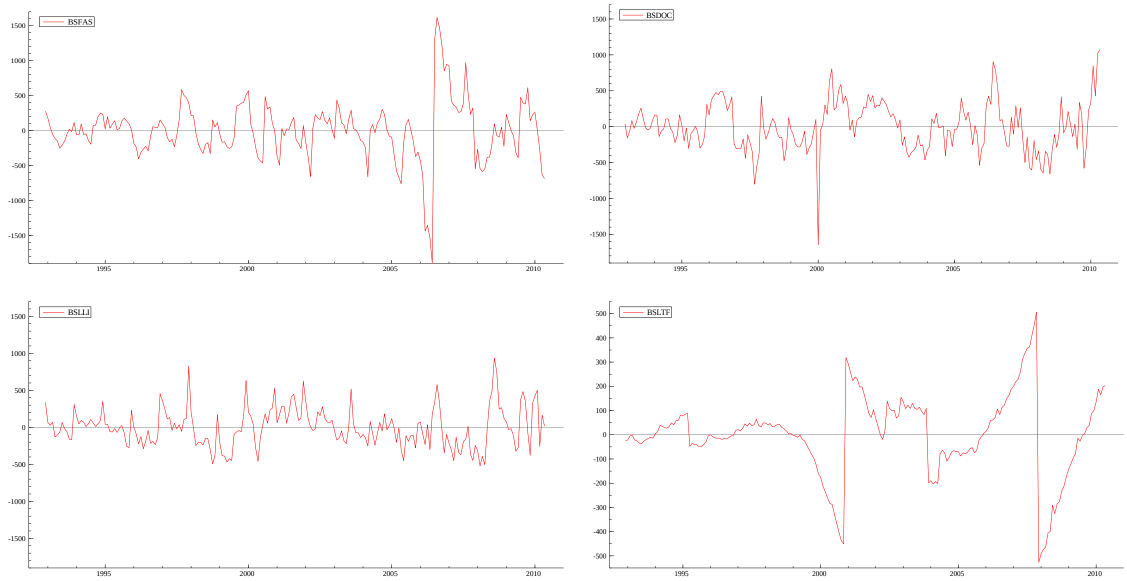


Figure 3. The Cycical components of the Banking Survey

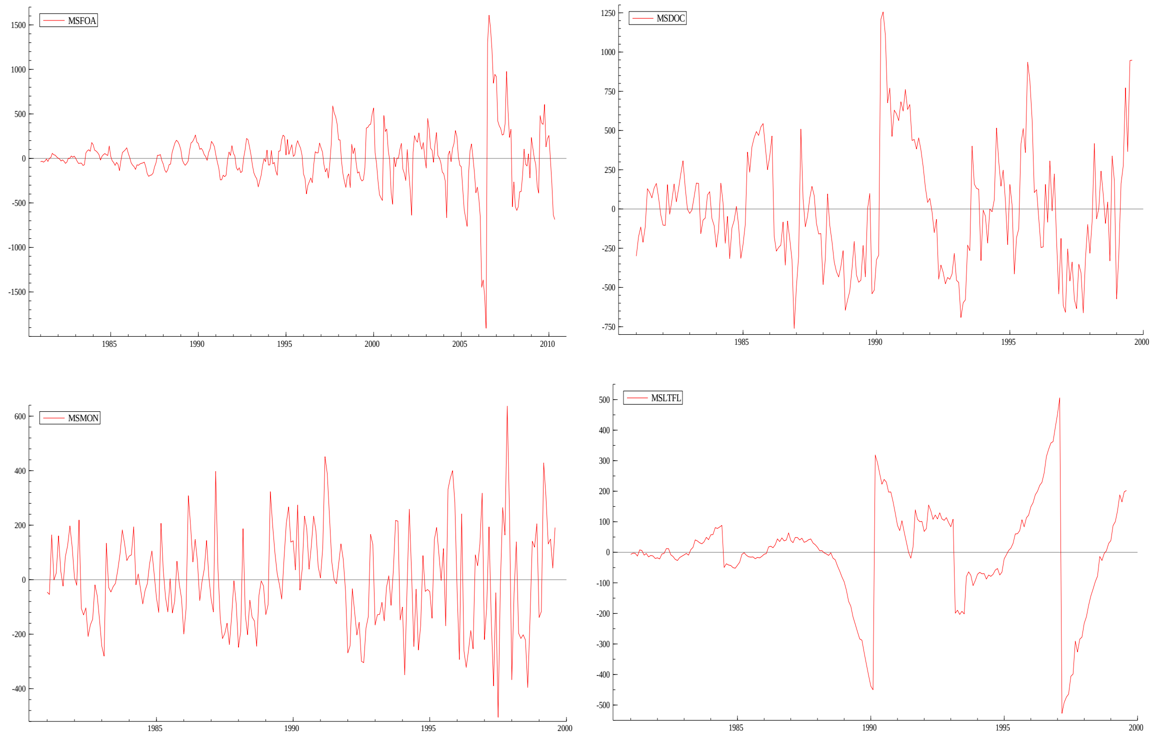
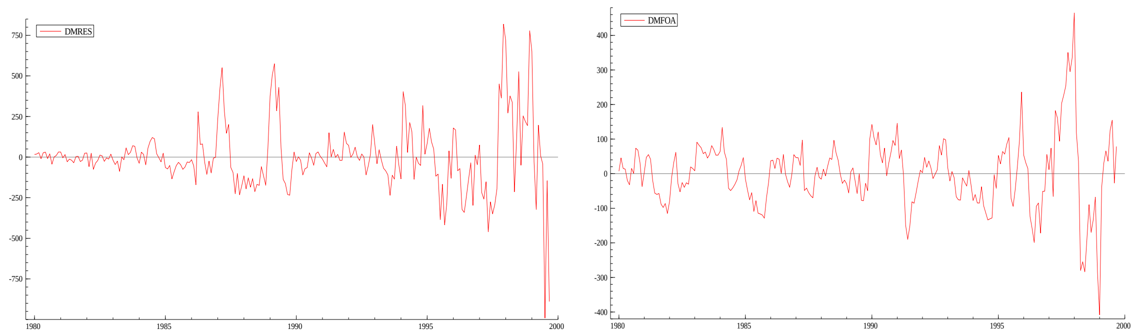


Figure 4. The Cycical components of the Monetary Survey



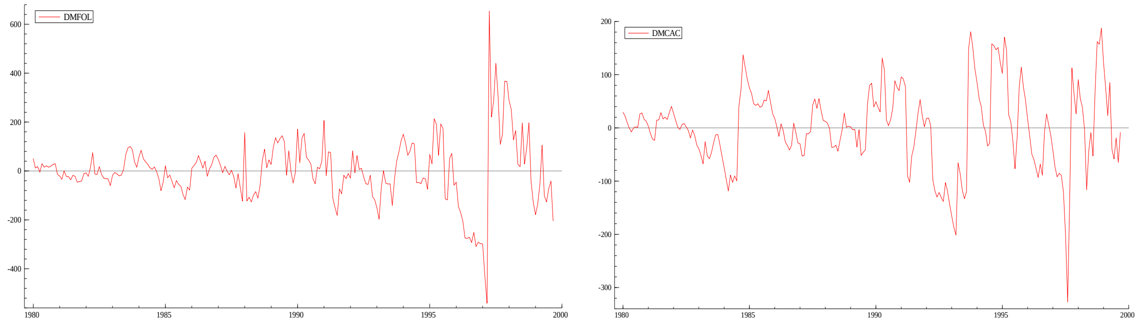


Figure 5. The Cycical components of the Deposit Money Banks

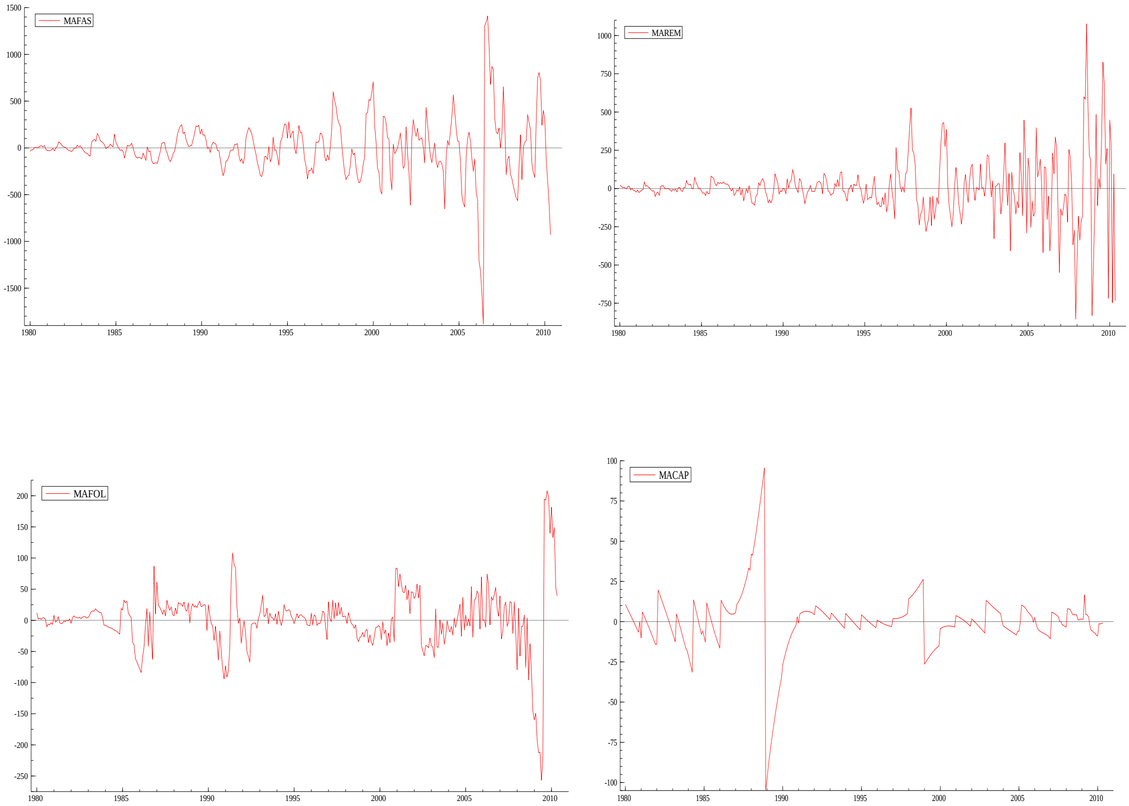


Figure 6. The Cycical components of the Monetary Authorities

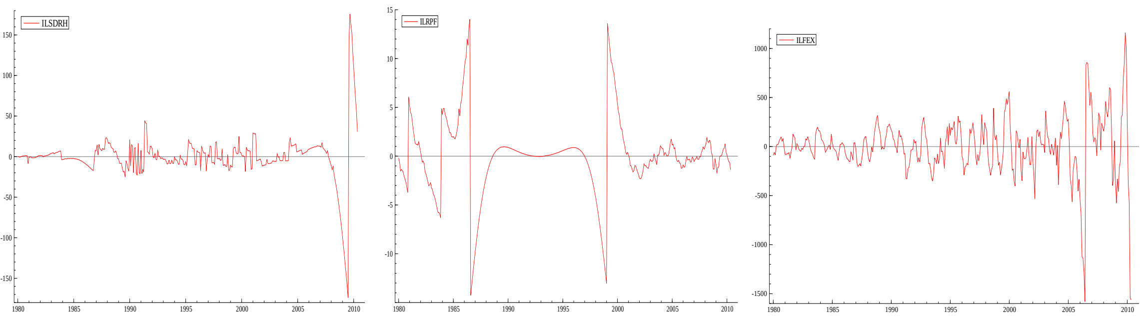


Figure 7. The Cycical components of the International Liquidity

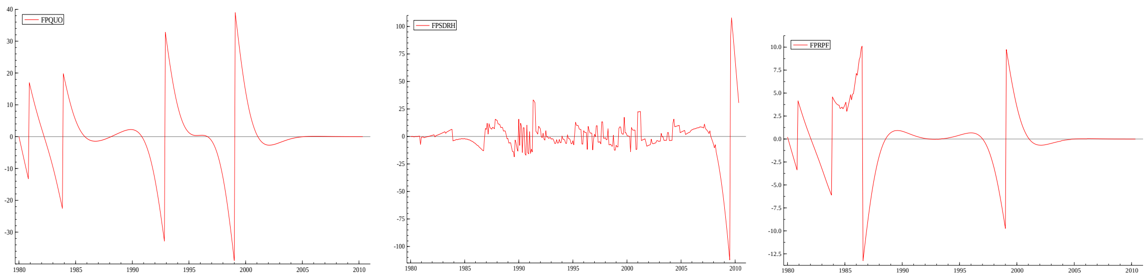


Figure 8. The Cycical components of the Fund Position

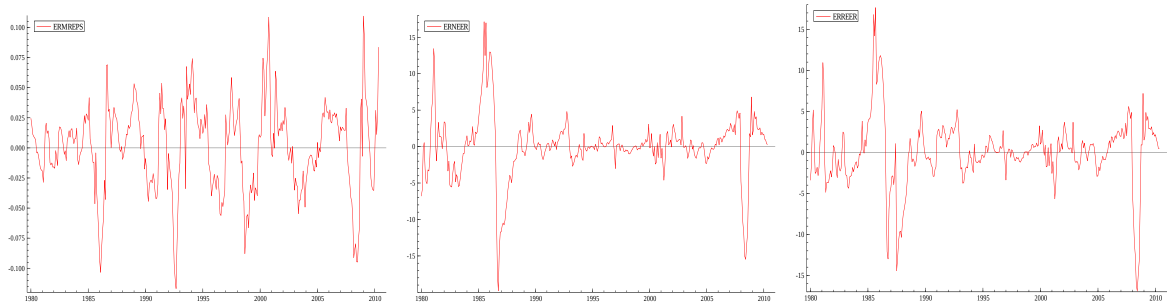


Figure 9. The Cycical components of the Exchange Rates

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Appendix

Table 4. Description of analysed time series

Variable	Description	Study Period
Production Index		
PI	Industrial Production	1993:1-2010:5
GDP	Gross Domestic Product	
Prices (Consumer, Producer Prices)		
PPPI	Producer Prices	1993:1-2010:5
PCP	Consumer Prices	1993:1-2010:5
International Liquidity		
ILSDR	SDR Holdings	1980:1-2010:5
ILRPF	Reserve Position in the Fund	
ILFEX	Foreign Exchange	
Fund Position		
FPQUO	Quota	
FPSDRH	SDR Holdings	
FPRPF	Reserve Position in the Fund	
Monetary Authorities		
MAFAS	Foreign Assets	1980:1-2010:5
MAREM	Reserve Money	
MAFOL	Foreign Liabilities	
MACAP	Capital Accounts	
Deposit Money Banks		
DMRES	Reserves	
DMFOA	Foreign Assets	
DMFOL	Foreign Liabilities	
DMCAC	Capital Accounts	
Monetary Survey		
MSFOA	Foreign Assets (Net)	1981:1-2010:5
MSDOC	Domestic Credit	1981:1-1998:8
MSMON	Money	
MSLTFL	Long-Term Foreign Liabilities	
Banking Survey		
BSFAS	Foreign Assets (Net)	
BSDOC	Domestic Credit	
BSLLI	Liquid Liabilities	
BSLTF	Long-Term Foreign Liabilities	
Exchange Rates		
ERMREPS	Market Rate	1980:1-2010:5

ERNEER	Nominal Effective Exchange rate	1980:1-2010:5
ERREER	CPI-Based Real Effect. EX. Rate	1980:1-2010:5
Interest Rates		
IRMMR	Money Market Rate	1981:1-2010:5