

## Business Cycle Features in the Iranian Economy

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### Abstract

This paper studies the business cycle characteristics of the Iranian economy and the co-movements of macroeconomic variables with oil prices. As is common in most developing and emerging countries, volatility of business cycles in Iran is high. Except for monetary aggregates, co-movements of business cycles are similar to those of developed countries. The theoretical impacts of monetary policy cannot be supported since results show that they have small negative effects on real output. Findings suggest that supply shocks play prominent roles in the macroeconomic fluctuations of the Iranian economy. Moreover, nominal money and price level are procyclical with oil prices. And different price indexes are procyclical with oil prices.

**Keywords:** Business Cycles, Monetary policy, Oil prices.

### 1- Introduction

The study of the stylized features of business cycles is the first step towards using the dynamic stochastic general equilibrium models (DSGE) in explaining business cycles. In the last decade, most of the research in this area has been focused on developed countries. Recently, a few attempts have been undertaken to examine the main characteristics of macroeconomic fluctuations in Asian and developing countries<sup>1</sup>. This paper can be considered

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1- For more information see Kim and et al (2003) and the references in it.

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as a contribution to this stream, by casting the light on the stylized features of business cycles in the Iranian economy.

The empirical results of this paper are a set of benchmark statistics for evaluating the performance of business cycle models for the Iranian economy. In an oil exporting country such as Iran, oil price shocks influence fiscal and monetary policies. Therefore, this paper attempts to point out the cyclical co-movement of oil prices with macroeconomic variables. In addition, vector error correction (VAR) and co-integration approaches are used to study the role of monetary policy shocks on the macroeconomic fluctuations.

Recent attempts of research on DSGE for developing countries can be found in studies such as Medina and Soto (2005) for Chilean economy, Benes and et al (2005) for Czech economy, Hamann and et al (2006) for Colombian economy, Neumeyer and Perri (2006) and Garc'ia-Cicco and et al (2007) for Argentina economy, and Aguiar and Gopinath (2007) for Mexican economy.

The rest of the paper is organized as follows: section 2 describes the data and section 3 provides a brief summary of the structure of the Iranian economy. Cyclical co-movements of real output and components of national expenditures with monetary aggregates and oil prices are studied in section 4. Section 5 concludes the paper.

### **2- Data**

Except for interest rate and unemployment rate data, the data sets used in this paper are natural logarithm of the quarterly data for the period of 1988:2 to 2004:2 (total of 72 observations). The data are from the Central Bank of Iran database.

### **3- The Structural Characteristics of the Iranian Economy**

Investigation of structural characteristics of the Iranian economy is the best way for understanding the stylized features of business cycles and potential importance of the various shocks affecting this economy. For this purpose, this paper examines the national expenditure components and the composition of Iranian aggregate output.

### **3-1- The Composition of Aggregate Output**

Panel A of Table 1 presents the minimum, the maximum, and the mean of expenditure shares of GDP components for the sample. On average, private consumption, government consumption, and total consumption constitute 52%, 14%, and 65% of aggregate output, respectively. The most volatile components of aggregate expenditures are the total investment, exports, imports, with shares around 30%, 19%, and 22%, respectively. Moreover, the average ratio of exports plus imports to output, which is used as a measure of openness, is around 41%.

Panel B of Table 1 reports the sectoral composition of aggregate output. For the sample period, on average, industry and service sectors account for 20% and 52%, respectively. As Kouparitsas (2001) shows, the growing shares of industry and service sectors toward the amount of these shares in industrial countries, are the characteristics of developing countries. In Iran, the oil and agricultural sectors account for 14% and 15%, respectively.

The last row of panel A in Table 1 shows the averages of annual growth rates for output components. For instance, the average annual growth rates of private consumption, government consumption and total consumption are 5%, 2%, and 6%, respectively. Aggregate investment has the highest annual growth rate second to total consumption in the sample period. For exports and imports, the growth rates are around 5% and 4% respectively. In the same period, the annual growth rate of output is around 4%. Finally, the last row of panel B in Table 1 reports the annual growth rates for the sectoral composition of aggregate output. Industry and services sectors account for roughly 6% and 4%, while agriculture and oil sectors represent 4% and 3%, respectively.

### **4- Stylized Features of Iranian Business Cycles**

This section presents the stylized facts on business cycles of the Iranian economy. We use the Hodrick and Prescott (1980) and the Baxter and King (1999) filters to construct the stationary cyclical deviations for all macroeconomic variables. These figures are then used to calculate the volatility and persistence of the cyclical component of the variables. In fact, the more persistent the fluctuations are, the greater the economic hardship during downturns and longer expansion.

### **4-1- Volatility and Persistence of National Expenditure Components**

Table 2-1 reports the volatility and the persistence of the cyclical components of macroeconomic variables based on the Hodrick and Prescott filter (HP) and the Baxter and King filter (BK). Volatility is measured by the standard deviation of the filtered series, while persistence is calculated by the autocorrelation coefficient of the filtered series. Results show that the HP filter produces more volatile cycles than the BK filter. The volatility of output is around 3.6% and 2.7% in terms of HP and BK filters, respectively. Both HP and BK filters show that imports, exports and investment have high volatility among components of national expenditures. As Kim and et al (2003) argue, these may be due to some external factors – highly volatile world prices, world interest rates shocks, and the cyclical dynamic in developed countries. In fact, the results show that the volatility of oil prices is around 18.5% which supports their arguments. may be evidence of confirming the above sentences. These results show that Iranian export and import components are more volatile than those of G7 countries, as presented in Kim and et al (2003). Volatility of total consumption is around 3% and 2% in terms of HP and KP, respectively which shows that total consumption is the least volatile component of Iranian national expenditures. This finding is supported by economic theories which suggest that people prefer to sustain their consumption expenditures despite positive or negative shocks in the economy. In addition, government consumption is about two times more volatile than private consumption. . Our findings are very similar to that of Kim and et al (2003) for G7 countries. However, as Neumeyer and Perri (2005) and Aguiar and Gopinath (2007) show, on average, the volatility of income, consumption, investment and net exports are larger in developing countries than developed countries. The latter study considers these features of business cycles in developing counties as a sign of extreme shocks to stochastic trend.

In addition, Table 2 shows the persistent properties of macroeconomic components. According to this table, the BK filter suggests that the aggregate output and all its components are very persistent. Except for imports, the HP filter shows fairly persistent macroeconomic aggregates as well. These results are similar to what has been reported in the literature.

#### **4-2- Volatility and Persistence of Price and Monetary Aggregate**

Table 2-2 reports volatility and persistence of price levels, inflation, monetary aggregates, real monetary stocks and monetary growth rates. Except for money growth and inflation rates, the calculated volatilities by HP and BK for other variables are the same.

The volatility of the consumer price index, wholesale price index and GDP deflator, are around 4% to 6%, with high persistency. We use two measures, CPI and GDP deflator, to calculate inflation. In terms of the HP filter, the volatilities of both inflation measures are half of the CPI and GDP deflator, with no persistency. However, when we use the BK filter, the volatilities are smaller but highly persistent.

Using the HP filter, the nominal money aggregate (M1) and the liquidity (M2) are around 5% and 3% respectively. The BK filter gives slightly different results with 3% and 2%, respectively. The results show that the cyclical component of M1 is more volatile than M2 but both of them are persistent. These results are in line with Kim et al (2003) and show that monetary aggregates and price levels are more volatile in the Iranian economy than in G7 countries.

#### **4-3- Co-movement of Real Output with Macroeconomic Variables**

Table 3 presents the degree of real output co-movement with GDP components, monetary aggregates, and price levels. It reports the autocorrelation and dynamic cross-correlation coefficients between the cyclical component of real output and the cyclical component of other macroeconomic variables. Panel A presents the results for the HP filter and panel B depicts the BK results.

As Serletis and Shahmoradi (2005) argue, the degree of co-movement of real output with each of the cycles can be measured by the magnitude of the correlation coefficient  $\rho(j)$ ,  $j \in \{0, \pm 1, \pm 2, \dots\}$ , where  $j$  is the number of lags. The contemporaneous correlation coefficient —  $\rho(0)$  — gives information on the degree of contemporaneous co-movement. In particular, if  $\rho(0)$  is positive, zero, or negative, we say that the series is procyclical, acyclical, or countercyclical, respectively. In fact, following Fiorito and Kollintzas (1994), for  $0.23 \leq |\rho(0)| < 1$ ,  $0.10 \leq |\rho(0)| < 0.23$ , and  $0 \leq |\rho(0)| < 0.10$ , we say that the series is strongly contemporaneously correlated, weakly

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contemporaneously correlated, and contemporaneously uncorrelated with the cycle, respectively<sup>1</sup>. The cross-correlation coefficient,  $\rho(j)$ ,  $j \in \{\pm 1, \pm 2, \dots\}$ , gives inside information on the phase shift of output, relative to the cycle. If  $|\rho(j)|$  is maximum for a positive, zero, or negative  $j$ , we say that the cycle of the variable is leading the cycle of output by  $j$  periods, is synchronous, or is lagging the cycle by  $j$  periods, respectively.

According to Table 3, real private consumption and total consumption are strongly contemporaneously procyclical with real output. The real government consumption, however, is weakly procyclical with real output and leads the real output using the HP filter. The BK filter, on the other hand, suggests that government consumption is strongly contemporaneously countercyclical with output. Moreover, irrespective of the filter used, real investment, real exports, and real imports are strongly contemporaneously procyclical with real output.

Table 3 also depicts that CPI, WPI, and GDP deflator are countercyclical with real output and lead the real output, in general.

Our results, especially for HP filter, are consistent with results reported by Kim and et al (2003) for APEC and G7 countries and Cooley (1995) for U.S. Backus and Kehoe (1992), Chadha and Prasad (1994), and Fiorito and Kollintzas (1994) provide evidences for countercyclical movements of prices in the developed economies. Kim (1996) finds that there is a negative correlation between the price level and output fluctuations in Korea and Taiwan. These findings support the importance of supply shocks in driving economic fluctuations.

Using HP filter, the nominal aggregate money stocks (M1 and M2) are negatively, but weakly, correlated with real output and are leading the real output. The BK filter, on the other hand, shows that is contemporaneously uncorrelated with real output but M2 seems quite counter cyclical with real output. The results are similar to findings of Afxention and Serletis (2002) for Canadian economy.

We also calculate the correlation coefficients between real money stocks and real output. Irrespective of the choice of the filter used, the real money

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1- The cut-off point of 0.1 is close to the value of 0.097 that is required to reject the null hypothesis  $H_0: \rho(0) = 0$  at the 5% level. Also, the cut-off point of 0.23 is close to the value of 0.229 that is required to reject the null  $H_0: |\rho(0)| \leq 0.5$  at the five per cent level.

stocks are positively correlated with real output, in which real money stocks lead real output.

Table 3 also depicts that for both filters, the inflation rates are weakly countercyclical correlations with output, where the interest rate is procyclical. However, our results are not in the same line with the findings of Cooley (1995) for United States and Chadha and Prasad (1994) where the inflation rate is procyclical with output in G7 countries. Finally, the unemployment rate and market exchange rate are strongly contemporaneously countercyclical with output.

#### **4-4- Co-movements of Monetary Aggregates with Macroeconomic Variables**

This section discusses the co-movement of monetary aggregates with output and its components. The nominal, the growth rate of nominal, and real monetary stock are used to investigate the correlation coefficients with output and national expenditure components.

##### **4-4-1- Nominal Aggregate Money Stocks**

Table 4 and 5 show the co-movements and cross-correlations of nominal aggregate money, M1 and M2, with all macroeconomic variables, respectively. For M1, for both filters, CPI, WPI, and GDP deflator are positively and strongly contemporaneously correlated with nominal M1. The nominal interest rate is contemporaneously uncorrelated with nominal M1 when the HP filter is used, though when using the BK filter, a weak procyclical pattern emerges.

According to Table 5, the nominal M2 shows the same kind of behaviours towards nominal interest rates and price indexes as nominal M1. In fact, it seems that the expectations are quickly adjusted so the expansionary monetary policies lead to increases in the price levels and nominal interest rate, which is consistent with the Fisher equation.

Moreover, except for government expenditure which has, in general, the same fluctuations with two nominal M1 and M2, the other components of national expenditures fluctuate inversely with the nominal stock of M1 and M2.

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Finally, using both filters, the open market exchange rate has the same fluctuations with nominal M1 and M2, suggesting that any change in M1 and M2 might be a good predictor of the future market exchange rate.

### **4-4-2- Nominal Money Growth Rates and Macroeconomic Variables**

As we show in Table 6, nominal growth rates of M1 and M2 are contemporaneously correlated with other macro variables. The price indexes have the same fluctuations with both of the money growth rates. Using the HP filter, the inflation rates are contemporaneously uncorrelated with money growth rates. However, they have the same fluctuations with growth rates of money using the BK filter.

In addition, according to the HP filter, real output has no contemporaneous correlation with growth rates of money stocks, while, using the BK filter, output is contemporaneously countercyclical with money growth rates. Real private consumption is contemporaneously uncorrelated with the money growth rates, whereas real investment and real imports fluctuate inversely with it.

In sum, prices, inflation rates, and interest rates move positively with growth rates of money stocks.

### **4-4-3- Real Money Balances**

It is time to finalize this section with the study of the correlation between real money balances and other macroeconomic variables.

For both real money stocks, M1 and M2, the nominal interest rate is contemporaneously uncorrelated with real money when using the HP filter, while it is procyclical based on the BK filter. Also, the unemployment rate is contemporaneously uncorrelated with real money balances using the HP filter, while using the BK filter it is weakly countercyclical and real money balances lead it.

Table7 shows that using both filters, real money is strongly contemporaneously procyclical with private consumption, government consumption, total consumption, and investment expenditure. Moreover, the real money balance leads investment.



Finally, the open market exchange rate, regardless of the filter used, is strongly contemporaneously countercyclical with real money balances and lags them.

In conclusion, although nominal aggregate money stocks and their growth rates are, in general, countercyclical with real output and its components, but the real stock of money, generally, is procyclical with output and its components.

#### **4-5- Oil Prices**

As is mentioned earlier in section 3, the oil sector plays an important role in the Iranian economy. Roughly, it accounts for 15% of total real output with an annual growth rate of 3%. In addition, oil revenue is the most important source of revenue for the Iranian government. Table 9 provides some information on the composition of government income for the period of 1998 to 2005. On average, 57% of government expenditure has been financed by oil revenue. In comparison to oil revenue, the average tax income is 32% in this period. This indicates the dependency of government finances on oil revenue. When considering the fact that the government sector represents about 85% of the national economy of Iran (including government agencies and companies), the importance of oil revenue becomes much more evident.

We report the cyclical co-movements and cross-correlations of oil prices with some macroeconomic variables. First, using both filters, WPI and GDP deflator are strongly contemporaneously procyclical with oil prices. Furthermore, using the BK filter, the CPI is also procyclical with oil prices. More interestingly, the oil prices lead all price indexes. This means that it is possible to use oil prices as a predictor of future price levels. Second, the nominal interest rate is contemporaneously uncorrelated with oil prices where the inflation rate is countercyclical with it. Third, the nominal money M1 is weakly procyclical with oil prices, whereas nominal money M2 is contemporaneously uncorrelated with oil prices.

Table 10 shows that real output and real government expenditure, in general, are contemporaneously uncorrelated with oil prices, while real private and total consumption are contemporaneously countercyclical with it.

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On the other hand, exports and imports are countercyclical and procyclical with oil prices, respectively. Finally, the open market exchange rate is contemporaneously uncorrelated with oil prices, using both filters.

### **5- Conclusion**

The stylized facts of the business cycle features on the Iranian economy are studied in this paper. In addition to the usual cyclical co-movement of macroeconomic variables, especial attention is paid to study the cyclical co-movement of oil prices with macroeconomic variables.

The results, using both HP and BK filters, demonstrate that imports, exports and investment are the most volatile components of the Iranian economy. Although government consumption is about two folds more volatile than private consumption, total consumption is the least volatile component. Even though monetary aggregates and price levels are more volatile in the Iranian economy than in G7 countries, the high volatility of oil prices can uniquely explain part of the volatility of Iranian business cycles.

Except for monetary aggregates, the co-movements of the Iranian business cycles are similar to those of developed countries. The market exchange rate is procyclical with the monetary aggregate. Nominal monetary aggregates are negatively and weakly correlated with the real output. Moreover, CPI, WPI, and GDP deflator are positively and strongly contemporaneously correlated with monetary aggregates. These show that monetary policies alone account for the most part of the price level increases. Therefore, it seems that supply shocks play prominent roles in the business cycle of the Iranian economy.

Based on the HP filter, real output does not have contemporaneous correlation with growth rates of money. On the other hand, the correlation between price levels, inflation rates, and interest rates with the growth rate of money are positive.

WPI and GDP deflator are strongly contemporaneously procyclical with oil prices. Furthermore, using the BK filter, CPI is procyclical with oil prices, too. The nominal money M1 is weakly procyclical with oil prices, whereas nominal money M2 is contemporaneously uncorrelated with them. Real output, on the whole, is contemporaneously uncorrelated with oil prices.

## References

- 1- Afxention, P.C. and A. Serletis, 2002. "Macroeconomic Policy in the Canadian Economy," Kluwer Academic Publishers.
- 2- Aguiar, M., and G. Gopinath, 2007. "Emerging Market Business Cycles: The Cycle is the Trend," *Journal of Political Economy* 115, P69-102.
- 3- Backus, D. K., and P. J. Kehoe, 1992. "International evidence on the historical properties of business cycles," *American Economic Review* 82, 864-888.
- 4- Baxter, M. and King, R. (1999), "Measuring Business Cycles: Approximate Band-Pass filters for economic time series", *The Review of Economics and Statistics*, 81(4), 575-593.
- 5- Beneš, J., T. Hlédik, M. Kumhof, and D. Vávra, 2005. "An Economy in Transition and DSGE: What the Czech National Bank's New Projection Model Needs," *Czech National Bank, Working Paper No.12*.
- 6- Chadha, B., and E. Prasad, 1994. "Are prices countercyclical? Evidence from the G7," *Journal of Monetary Economic* 34, 239-257.
- 7- Cooley, T.F., 1995. "Frontiers of Business Cycle Research", Princeton: Princeton University Press.
- 8- Fiorito, R. and T. Kollintzas, 1994. "Stylized Facts of Business Cycles in the G7 from a Real Business Cycle Perspective," *European Economic Review* 38, 235-269.
- 9- García-Cicco, J., R. Pancrazi, and M. Uribe, 2007. "Real Business Cycles in Emerging Countries?", Manuscript.
- 10- Hamann, F., J. Pérez, and D. Rodríguez, 2006. "Bringing a DSGE Model into Policy Environment in Colombia", Banco de la República.
- 11- Hodrick, R. and Prescott E. (1997), "post-war U.S business cycles; An Empirical Investigation" *Journal of money, Credit and Banking*; 79 (1), PP.1-6.
- 12- Kim, Y. W., 1996. "Are Prices Countercyclical? Evidence from East Asian countries," *Federal Reserve Bank of St. Louis Review*, 69-82, September/October.
- 13- Kim, H., A. Kose, and P. Plummer, 2003. "Dynamics of Business Cycles in Asia: Differences and Similarities," *Review of Development Economics* 7 (3), 462-477.
- 14- Kouparitsas, A., 2001. "Evidence of the North South Business Cycle," *Economic Perspectives* 25(1), 46-60.

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15- Medina, P., and C. Soto, 2005. "Oil Shocks and Monetary Policy in an Estimated DSGE Model for a Small Open Economy," Central Bank of Chile in its series, Working Paper No.353.

16- Neumeyer, A., and F. Perri, 2005. "Business Cycles in Emerging Economies: The Role of Interest Rates," *Journal of Monetary Economics* 52 (March), 345–80.

17- Serletis, A. and A. Shahmoradi, 2005. " Business Cycles and Natural Gas Prices," *OPEC Review* 29(1), 75-84.

**Table 1: Expenditures and Output**  
**Panel A: Components of National Expenditure (%)**

	Real Private Consumption	Real Government Consumption	Real Total Consumption	Real Investment	Real Export	Real Import
<b>Min</b>	45.10	9.69	57.51	21.10	14.38	10.47
<b>Max</b>	60.23	20.48	80.56	39.36	27.53	45.93
<b>Mean</b>	51.70	13.68	65.38	29.57	19.11	21.42
<b>Std.Dev.</b>	3.39	2.10	4.02	4.58	2.96	8.20
<b>Growth</b>	4.49	1.96	6.45	5.34	5.28	3.44

**Panel B: Decomposition of Output (%)**

	Real Agricultural Value Added	Real Oil Value Added	Real Industrial Value Added	Real Service Value Added
<b>Min</b>	11.33	9.74	14.94	46.63
<b>Max</b>	17.70	22.03	25.21	55.51
<b>Mean</b>	14.77	14.38	19.96	51.80
<b>Std.Dev.</b>	1.13	2.78	2.79	1.67
<b>Growth</b>	3.91	3.02	6.35	4.09

**Table 2-1: Volatility and Persistence**

Variable	Volatility	Persistence
	Panel A: HP Filter	
CPI	4.91	0.82
WPI	5.94	0.85
GDP Deflator	5.84	0.81
Real M2 (CPI)	4.47	0.50
Real M2 (GDP Deflator)	5.80	0.67
Nominal M1	3.34	0.53
Nominal M2	5.36	0.17
Growth of Nominal M1	3.17	-0.60
Growth of Nominal M2	6.74	-0.66
Inflation (CPI)	2.98	0.11
Inflation (GDP Deflator)	3.40	0.02
Panel B: BK Filter		
CPI	4.08	0.94
WPI	5.59	0.94
GDP Deflator	4.99	0.91
Real M2 (CPI)	3.60	0.92
Real M2 (GDP Deflator)	4.80	0.90
Nominal M1	2.45	0.94
Nominal M2	3.30	0.94
Growth of Nominal M1	0.77	0.81
Growth of Nominal M2	1.07	0.80
Inflation (CPI)	1.24	0.88
Inflation (GDP Deflator)	2.00	0.81

Table 2-2: Volatility and Persistence

Variable	Volatility	Persistence
<b>Panel A: HP Filter</b>		
Real Private Consumption	3.26	0.17
Real Government Consumption	7.98	-0.03
Real Total Consumption	2.96	0.32
Real Investment	11.41	0.47
Real Export	12.42	0.24
Real Import	22.08	0.05
Unemployment	0.91	0.87
Real GDP	3.62	0.54
Oil Price	18.52	0.65
Market Exchange Rate	10.55	0.63
<b>Panel B: BK Filter</b>		
Real Private Consumption	1.85	0.84
Real Government Consumption	3.06	0.84
Real Total Consumption	1.67	0.85
Real Investment	8.44	0.92
Real Export	7.82	0.80
Real Import	12.89	0.90
Unemployment	0.81	0.93
Real GDP	2.75	0.93
Oil Price	15.23	0.88
Market Exchange Rate	9.09	0.94

**Table 3: Cyclical Correlations of all variables with Real GDP**

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Real GDP}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	-0.40	-0.40	-0.34	-0.28	-0.21	-0.21	-0.17	-0.10	-0.04	-0.02	0.01
WPI	-0.46	-0.42	-0.33	-0.27	-0.20	-0.23	-0.13	-0.02	0.04	0.04	0.06
GDP Deflator	-0.14	-0.23	-0.29	-0.41	-0.52	-0.53	-0.38	-0.29	-0.23	-0.19	-0.13
Interest Rate	0.05	-0.06	0.01	0.06	0.16	0.23	0.15	0.18	0.16	0.05	0.11
Real Private Consumption	0.32	0.26	0.06	0.28	0.10	0.22	0.18	0.17	0.05	-0.05	-0.20
Real Government Consumption	0.21	0.26	0.01	-0.38	-0.12	0.10	-0.02	-0.10	-0.32	-0.17	-0.11
Real Total Consumption	0.42	0.39	0.06	0.01	0.01	0.25	0.14	0.07	-0.17	-0.14	-0.25
Real Investment	0.18	0.34	0.39	0.48	0.57	0.65	0.38	0.43	0.39	0.29	0.05
Real Export	0.12	-0.05	-0.10	0.11	0.17	0.46	-0.03	-0.19	-0.12	-0.09	0.01
Real Import	-0.13	0.11	0.34	0.44	0.31	0.51	0.35	0.47	0.42	0.31	0.16
Unemployment	0.17	0.01	-0.15	-0.26	-0.36	-0.40	-0.40	-0.39	-0.31	-0.18	-0.09
Real M2 (CPI)	0.26	0.24	0.23	0.20	0.15	0.15	0.10	0.10	0.05	0.06	0.03
Real M2 (GDP Deflator)	0.01	0.07	0.18	0.33	0.45	0.47	0.31	0.28	0.24	0.22	0.16
Nominal M2	-0.24	-0.27	-0.20	-0.15	-0.12	-0.11	-0.12	-0.01	0.02	0.04	0.06
Nominal M1	-0.36	-0.37	-0.28	-0.22	-0.17	-0.12	-0.03	0.09	0.13	0.11	0.16
Market Exchange Rate	-0.46	-0.43	-0.34	-0.33	-0.35	-0.41	-0.19	0.01	0.04	0.03	0.12
Inflation (CPI)	0.02	-0.09	-0.10	-0.10	0.01	-0.07	-0.12	-0.10	-0.02	-0.07	-0.07
Inflation (GDP Deflator)	0.13	0.10	0.20	0.16	0.02	-0.28	-0.14	-0.10	-0.09	-0.06	-0.06
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	-0.68	-0.63	-0.53	-0.42	-0.30	-0.19	-0.10	0.00	0.08	0.16	0.20
WPI	-0.67	-0.60	-0.49	-0.38	-0.27	-0.17	-0.07	0.03	0.11	0.17	0.19
GDP Deflator	-0.19	-0.34	-0.49	-0.62	-0.66	-0.62	-0.51	-0.36	-0.21	-0.09	0.00
Interest rate	0.02	0.04	0.07	0.12	0.19	0.24	0.25	0.21	0.12	0.02	-0.05
Real Private Consumption	0.40	0.33	0.30	0.32	0.37	0.40	0.37	0.25	0.09	-0.07	-0.17
Real Government Consumption	0.27	0.14	-0.03	-0.18	-0.26	-0.29	-0.28	-0.28	-0.27	-0.24	-0.18
Real Total Consumption	0.50	0.36	0.25	0.20	0.21	0.22	0.19	0.10	-0.04	-0.17	-0.22
Real Investment	0.29	0.48	0.64	0.76	0.83	0.86	0.82	0.71	0.53	0.33	0.12
Real Export	0.06	0.00	0.07	0.21	0.32	0.31	0.20	0.02	-0.12	-0.17	-0.15
Real Import	0.05	0.28	0.52	0.70	0.83	0.90	0.89	0.80	0.65	0.45	0.25
Unemployment	0.16	-0.01	-0.21	-0.39	-0.52	-0.60	-0.60	-0.54	-0.44	-0.33	-0.22
Real M2 (CPI)	0.51	0.50	0.44	0.36	0.26	0.18	0.10	0.03	-0.03	-0.07	-0.09
Real M2 (GDP Deflator)	0.00	0.19	0.40	0.56	0.63	0.62	0.53	0.40	0.27	0.17	0.10
Nominal M2	-0.38	-0.31	-0.23	-0.16	-0.11	-0.06	-0.01	0.04	0.10	0.16	0.20
Nominal M1	-0.71	-0.68	-0.60	-0.48	-0.33	-0.17	-0.01	0.13	0.24	0.32	0.36
Market Exchange Rate	-0.60	-0.65	-0.65	-0.62	-0.55	-0.46	-0.33	-0.19	-0.04	0.08	0.18
Inflation (CPI)	-0.20	-0.32	-0.39	-0.39	-0.35	-0.26	-0.17	-0.06	0.03	0.11	0.16
Inflation (GDP Deflator)	0.35	0.38	0.30	0.11	-0.10	-0.27	-0.34	-0.32	-0.25	-0.17	-0.12

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Table 4: Cyclical Correlations of all variables with Nominal M1

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Nominal M1}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	0.37	0.35	0.33	0.35	0.55	0.40	0.26	0.24	0.41	0.24	0.12
WPI	0.20	0.17	0.19	0.25	0.40	0.31	0.25	0.33	0.43	0.30	0.24
GDP Deflator	-0.15	-0.11	-0.05	0.05	0.22	0.32	0.34	0.43	0.48	0.47	0.46
Interest Rate	0.18	-0.03	-0.04	-0.07	0.12	0.05	0.08	0.09	0.23	-0.01	-0.04
Real Private Consumption	-0.12	-0.06	-0.10	-0.13	-0.27	0.20	-0.06	-0.21	-0.17	-0.09	-0.03
Real Government Consumption	-0.24	-0.16	-0.19	-0.01	-0.05	0.09	-0.04	0.22	0.08	0.13	0.04
Real Total Consumption	-0.25	-0.15	-0.20	-0.13	-0.27	0.12	-0.08	-0.06	-0.10	0.00	0.00
Real Investment	0.18	-0.04	0.10	0.05	-0.01	0.20	-0.13	-0.23	-0.28	-0.50	-0.36
Real Export	-0.13	-0.17	-0.12	-0.11	-0.16	0.12	-0.04	-0.10	-0.13	-0.20	-0.09
Real Import	0.27	0.03	0.15	-0.02	0.12	0.08	-0.04	-0.27	-0.06	-0.42	-0.21
Real M2 (CPI)	-0.36	0.08	-0.19	-0.01	-0.39	0.18	-0.11	0.06	-0.38	0.10	-0.18
Real M2 (GDP Deflator)	0.19	0.46	0.18	0.24	-0.05	0.15	-0.21	-0.18	-0.44	-0.20	-0.50
Market Exchange Rate	0.08	-0.03	-0.02	-0.06	0.23	0.18	0.11	0.08	0.28	0.15	0.11
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	0.33	0.45	0.54	0.60	0.62	0.60	0.56	0.53	0.51	0.49	0.45
WPI	0.16	0.26	0.35	0.41	0.44	0.47	0.50	0.53	0.55	0.54	0.50
GDP Deflator	-0.29	-0.23	-0.12	0.03	0.22	0.40	0.54	0.64	0.70	0.74	0.76
Interest Rate	0.16	0.09	0.02	0.02	0.08	0.17	0.22	0.20	0.11	0.00	-0.08
Real Private Consumption	0.04	-0.07	-0.25	-0.42	-0.53	0.55	-0.50	-0.43	-0.37	-0.35	-0.38
Real Government Consumption	-0.49	-0.56	-0.53	-0.38	-0.15	0.08	0.24	0.30	0.27	0.23	0.22
Real Total Consumption	-0.17	-0.30	-0.44	-0.54	-0.54	0.46	-0.35	-0.26	-0.22	-0.22	-0.24
Real Investment	0.37	0.28	0.18	0.07	-0.05	0.18	-0.34	-0.51	-0.66	-0.76	-0.81
Real Export	-0.31	-0.39	-0.41	-0.37	-0.31	0.28	-0.28	-0.31	-0.33	-0.31	-0.26
Real Import	0.38	0.35	0.27	0.17	0.06	0.07	-0.24	-0.40	-0.56	-0.68	-0.76
Real M2 (CPI)	-0.09	-0.14	-0.16	-0.14	-0.12	0.10	-0.12	-0.18	-0.26	-0.33	-0.37
Real M2 (GDP Deflator)	0.52	0.51	0.46	0.37	0.21	0.02	-0.17	-0.34	-0.49	-0.60	-0.68
Market Exchange Rate	-0.08	-0.03	0.06	0.17	0.26	0.32	0.34	0.34	0.33	0.33	0.35



**Table 5: Cyclical Correlations of all variables with Nominal M2**

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Nominal M2}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
<b>CPI</b>	0.27	0.24	0.27	0.34	0.51	0.47	0.45	0.46	0.58	0.45	0.36
<b>WPI</b>	0.07	0.03	0.08	0.16	0.29	0.30	0.36	0.48	0.60	0.52	0.48
<b>GDP Deflator</b>	-0.21	-0.15	-0.05	0.05	0.18	0.30	0.37	0.48	0.56	0.54	0.56
<b>Interest Rate</b>	0.13	-0.02	-0.02	-0.09	-0.01	-0.02	0.10	0.17	0.29	0.09	0.07
<b>Real Private Consumption</b>	-0.11	-0.03	-0.09	-0.15	-0.25	-0.26	-0.16	-0.26	-0.21	-0.07	-0.03
<b>Real Government Consumption</b>	-0.21	-0.18	-0.17	-0.04	-0.12	0.09	0.01	0.21	0.07	0.10	0.07
<b>Real Total Consumption</b>	-0.22	-0.13	-0.17	-0.16	-0.29	-0.18	-0.13	-0.10	-0.14	0.00	0.02
<b>Real Investment</b>	0.09	-0.07	-0.01	-0.01	-0.01	-0.15	-0.14	-0.21	-0.23	-0.36	-0.31
<b>Real Export</b>	-0.09	-0.14	-0.18	-0.19	-0.26	-0.18	-0.10	-0.15	-0.17	-0.21	-0.12
<b>Real Import</b>	0.17	-0.02	0.05	-0.05	0.04	-0.11	-0.08	-0.26	-0.04	-0.29	-0.18
<b>Real M2 (CPI)</b>	-0.20	0.16	-0.05	0.08	-0.17	0.24	-0.10	-0.04	-0.40	-0.07	-0.30
<b>Real M2 (GDP Deflator)</b>	0.28	0.47	0.24	0.30	0.12	0.28	-0.07	-0.12	-0.37	-0.23	-0.50
<b>Market Exchange Rate</b>	0.16	0.01	-0.01	-0.06	0.08	0.04	0.03	0.02	0.16	0.09	0.12
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
<b>CPI</b>	0.24	0.26	0.30	0.36	0.42	0.48	0.51	0.54	0.56	0.58	0.56
<b>WPI</b>	-0.01	0.02	0.06	0.12	0.20	0.30	0.40	0.50	0.59	0.65	0.65
<b>GDP Deflator</b>	-0.31	-0.21	-0.10	0.04	0.18	0.32	0.43	0.53	0.59	0.64	0.68
<b>Interest Rate</b>	0.13	0.06	-0.02	-0.03	0.04	0.17	0.31	0.37	0.34	0.24	0.12
<b>Real PRIVATE CONSUMPTION</b>	0.11	0.06	-0.06	-0.22	-0.38	-0.46	-0.46	-0.40	-0.32	-0.28	-0.30
<b>Real GOVERNMENT CONSUMPTION</b>	-0.41	-0.42	-0.38	-0.27	-0.10	0.10	0.24	0.29	0.24	0.15	0.10
<b>Real TC</b>	-0.07	-0.11	-0.20	-0.30	-0.37	-0.37	-0.31	-0.24	-0.20	-0.20	-0.24
<b>Real I</b>	0.17	0.16	0.14	0.09	0.03	-0.05	-0.12	-0.22	-0.34	-0.47	-0.58
<b>Real EX</b>	-0.03	-0.20	-0.34	-0.40	-0.38	-0.32	-0.30	-0.30	-0.32	-0.32	-0.28
<b>Real IM</b>	0.22	0.19	0.15	0.10	0.03	-0.03	-0.08	-0.14	-0.22	-0.32	-0.40
<b>Real M2 (CPI)</b>	-0.05	0.02	0.09	0.14	0.16	0.13	0.06	-0.06	-0.20	-0.34	-0.42
<b>Real M2 (GDP Deflator)</b>	0.49	0.46	0.42	0.37	0.29	0.18	0.03	-0.13	-0.29	-0.43	-0.54
<b>Market Exchange Rate</b>	0.04	-0.04	-0.07	-0.05	-0.01	0.03	0.05	0.07	0.10	0.15	0.23

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**Table 6: Contemporaneous Correlation of Nominal M1 and M2 Growth Rates**

	Nominal M1 Growth		Nominal M2 Growth	
	HP	BK	HP	BK
CPI	-0.12	-0.07	-0.05	0.12
WPI	-0.08	0.07	0.01	0.27
GDP Deflator	0.07	0.55	0.11	0.42
Interest Rate	-0.07	0.26	-0.02	0.44
Real Private Consumption	0.03	-0.05	-0.04	-0.24
Real Government Consumption	0.12	0.69	0.22	0.62
Real Total Consumption	0.09	0.24	0.10	0.04
Real Investment	-0.17	-0.39	-0.16	-0.16
Real Export	0.04	0.10	0.08	0.13
Real Import	-0.17	-0.38	-0.16	-0.11
Real GDP	-0.08	-0.48	0.00	-0.12
Nominal M2	0.43	-0.03	0.49	0.14
Nominal M1	0.64	0.19	0.63	0.29
Market Exchange Rate	-0.06	0.18	-0.05	0.13
Inflation (CPI)	-0.01	0.20	-0.06	0.10
Inflation (GDP Deflator)	0.08	0.23	0.06	0.12

**Table 7: Cyclical correlations of all variables with Real M2 (CPI)**

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Real M2 (CPI)}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	0.04	-0.29	-0.37	-0.40	-0.52	-0.75	-0.57	-0.31	-0.13	-0.13	0.11
WPI	-0.09	-0.37	-0.44	-0.51	-0.63	-0.74	-0.53	-0.28	-0.12	-0.02	0.24
GDP Deflator	-0.17	-0.25	-0.25	-0.25	-0.24	-0.24	-0.16	-0.10	-0.09	-0.11	-0.01
Interest Rate	-0.04	-0.15	0.07	0.12	0.12	0.05	0.24	0.26	0.24	0.03	0.06
Real Private Consumption	0.19	0.25	0.12	0.09	0.17	0.25	0.18	0.01	-0.05	0.04	-0.02
Real Government Consumption	-0.06	-0.04	-0.04	0.15	0.04	0.22	0.14	0.15	-0.10	-0.07	-0.08
Real Total Consumption	0.13	0.20	0.09	0.17	0.18	0.36	0.24	0.09	-0.10	0.00	-0.07
Real Investment	-0.03	-0.04	0.10	0.12	0.21	0.24	0.27	0.24	0.26	0.23	0.28
Real Export	0.17	0.23	0.23	0.20	0.10	0.05	0.00	-0.09	-0.11	-0.14	-0.15
Real Import	0.09	-0.02	0.13	0.07	0.13	0.06	0.19	0.08	0.27	0.11	0.19
Unemployment	0.07	0.11	0.06	0.05	0.03	0.00	-0.09	-0.15	-0.15	-0.15	-0.17
Market Exchange Rate	0.10	-0.13	-0.15	-0.21	-0.32	-0.54	-0.42	-0.38	-0.38	-0.45	-0.17
Inflation (CPI)	0.54	0.14	0.05	0.19	0.38	-0.30	-0.41	-0.30	0.00	-0.41	-0.36
Inflation (GDP Deflator)	0.12	0.01	-0.03	-0.03	-0.04	-0.12	-0.11	-0.02	0.04	-0.08	-0.03
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	-0.10	-0.29	-0.49	-0.66	-0.78	-0.80	-0.71	-0.54	-0.31	-0.08	0.13
WPI	-0.17	-0.41	-0.64	-0.81	-0.89	-0.86	-0.70	-0.47	-0.20	0.07	0.29
GDP Deflator	-0.24	-0.35	-0.40	-0.39	-0.33	-0.25	-0.16	-0.07	-0.01	0.02	0.01
Interest Rate	-0.08	-0.09	-0.09	-0.04	0.06	0.20	0.31	0.38	0.37	0.30	0.18
Real Private Consumption	0.40	0.39	0.36	0.33	0.32	0.32	0.32	0.30	0.24	0.14	0.01
Real Government Consumption	-0.21	-0.15	0.01	0.23	0.44	0.56	0.57	0.45	0.25	0.02	-0.20
Real Total Consumption	0.27	0.29	0.32	0.39	0.47	0.52	0.52	0.45	0.31	0.13	-0.09
Real Investment	-0.27	-0.20	-0.08	0.08	0.25	0.39	0.48	0.52	0.54	0.53	0.49
Real Export	0.32	0.35	0.36	0.34	0.28	0.17	0.05	-0.07	-0.19	-0.28	-0.32
Real Import	-0.08	-0.05	-0.01	0.04	0.11	0.20	0.27	0.34	0.40	0.46	0.51
Unemployment	0.14	0.20	0.21	0.16	0.04	-0.10	-0.23	-0.33	-0.39	-0.40	-0.37
Market Exchange Rate	0.14	-0.05	-0.25	-0.45	-0.62	-0.75	-0.82	-0.81	-0.72	-0.54	-0.30
Inflation (CPI)	0.66	0.66	0.58	0.38	0.11	-0.21	-0.51	-0.70	-0.77	-0.69	-0.48
Inflation (GDP Deflator)	0.30	0.15	0.00	-0.13	-0.20	-0.21	-0.19	-0.14	-0.07	0.02	0.11

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**Table 8: Cyclical correlations of all variables with Real M2 (GDP Deflator)**

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Real M2 (GDP Deflator)}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
<b>CPI</b>	-0.24	-0.33	-0.31	-0.22	-0.11	-0.15	-0.09	0.00	0.14	0.13	0.19
<b>WPI</b>	-0.25	-0.31	-0.31	-0.29	-0.28	-0.36	-0.27	-0.12	0.04	0.12	0.25
<b>GDP Deflator</b>	-0.17	-0.27	-0.44	-0.57	-0.71	-0.84	-0.60	-0.33	-0.09	0.13	0.28
<b>Interest Rate</b>	-0.05	-0.16	-0.10	-0.10	-0.01	0.00	0.12	0.21	0.31	0.20	0.19
<b>Real Private Consumption</b>	0.21	0.30	0.23	0.11	0.02	-0.01	-0.02	0.00	-0.07	-0.05	-0.10
<b>Real Government Consumption</b>	-0.08	-0.06	-0.18	-0.16	-0.28	-0.13	-0.09	-0.02	-0.09	-0.03	-0.13
<b>Real Total Consumption</b>	0.16	0.24	0.11	-0.01	-0.17	-0.11	-0.08	-0.02	-0.12	-0.06	-0.16
<b>Real Investment</b>	0.24	0.27	0.31	0.31	0.39	0.34	0.32	0.29	0.25	0.16	0.08
<b>Real Export</b>	0.07	-0.04	-0.11	-0.07	0.03	0.21	0.18	0.06	-0.11	-0.28	-0.28
<b>Real Import</b>	0.10	0.10	0.23	0.23	0.34	0.27	0.28	0.20	0.29	0.12	0.13
<b>Unemployment</b>	0.21	0.17	0.08	0.02	-0.02	-0.07	-0.18	-0.28	-0.32	-0.31	-0.30
<b>Market Exchange Rate</b>	-0.01	-0.12	-0.07	-0.03	-0.06	-0.25	-0.21	-0.20	-0.13	-0.12	-0.01
<b>Inflation (CPI)</b>	0.15	-0.03	-0.14	-0.19	0.07	-0.11	-0.16	-0.23	0.01	-0.11	-0.18
<b>Inflation (GDP Deflator)</b>	0.16	0.28	0.22	0.22	0.20	-0.37	-0.41	-0.39	-0.35	-0.22	-0.13
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
<b>CPI</b>	-0.29	-0.25	-0.23	-0.21	-0.20	-0.18	-0.16	-0.11	-0.02	0.11	0.26
<b>WPI</b>	-0.30	-0.31	-0.32	-0.34	-0.36	-0.36	-0.33	-0.24	-0.10	0.08	0.27
<b>GDP Deflator</b>	-0.12	-0.26	-0.47	-0.70	-0.86	-0.88	-0.73	-0.45	-0.12	0.17	0.38
<b>Interest Rate</b>	-0.23	-0.28	-0.28	-0.20	-0.07	0.11	0.29	0.42	0.46	0.38	0.20
<b>Real Private Consumption</b>	0.48	0.40	0.29	0.20	0.14	0.12	0.13	0.14	0.09	-0.03	-0.20
<b>Real Government Consumption</b>	-0.21	-0.33	-0.41	-0.44	-0.41	-0.30	-0.16	-0.02	0.06	0.07	0.00
<b>Real Total Consumption</b>	0.37	0.25	0.11	-0.01	-0.06	-0.04	0.03	0.09	0.10	0.00	-0.18
<b>Real Investment</b>	0.21	0.32	0.42	0.48	0.51	0.53	0.54	0.52	0.43	0.30	0.14
<b>Real Export</b>	0.09	-0.06	-0.11	-0.04	0.12	0.27	0.32	0.20	-0.05	-0.35	-0.57
<b>Real Import</b>	0.08	0.18	0.29	0.40	0.49	0.54	0.56	0.52	0.43	0.31	0.18
<b>Unemployment</b>	0.28	0.21	0.11	0.00	-0.11	-0.23	-0.33	-0.39	-0.40	-0.37	-0.31
<b>Market Exchange Rate</b>	-0.08	-0.12	-0.15	-0.18	-0.22	-0.27	-0.32	-0.35	-0.33	-0.25	-0.11
<b>Inflation (CPI)</b>	-0.12	-0.06	-0.04	-0.03	-0.05	-0.08	-0.12	-0.18	-0.26	-0.34	-0.37
<b>Inflation (GDP Deflator)</b>	0.38	0.54	0.55	0.37	0.03	-0.37	-0.68	-0.79	-0.70	-0.48	-0.23

**Table 9: Government Income Components**

	Oil Revenue	Tax Revenue	Others
<b>Min</b>	38.81	17.65	7.03
<b>Max</b>	73.45	47.31	17.22
<b>Mean</b>	57.04	32.62	10.33
<b>Standard Deviation</b>	10.09	8.96	2.95

**Table 10: Cyclical correlations of all variables with oil price**

$\rho(x_t, y_{t+j}), j = -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5; (x_t = \text{Oil Price}, y_t = \text{other macro variables})$											
Panel A: HP Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	-0.18	-0.21	-0.16	-0.08	-0.04	0.02	0.12	0.24	0.28	0.20	0.17
WPI	-0.29	-0.25	-0.10	0.08	0.18	0.25	0.35	0.43	0.39	0.27	0.18
GDP Deflator	-0.35	-0.29	-0.10	0.08	0.16	0.23	0.26	0.15	0.13	0.11	0.02
Interest Rate	0.27	0.38	0.49	0.45	0.29	0.00	-0.15	-0.14	-0.25	-0.41	-0.30
Real Private Consumption	0.10	-0.01	-0.04	0.01	-0.03	-0.15	-0.25	-0.26	-0.09	0.06	0.00
Real Government Consumption	0.04	0.17	0.17	0.01	0.02	0.01	-0.09	-0.18	-0.10	-0.05	-0.03
Real Total Consumption	0.11	0.08	0.06	0.01	-0.02	-0.13	-0.27	-0.34	-0.14	0.03	-0.02
Real Investment	0.20	0.20	0.18	0.20	0.24	0.05	0.00	-0.12	-0.17	-0.21	-0.16
Real Export	0.19	0.10	0.08	-0.21	-0.32	-0.22	-0.13	-0.04	-0.02	0.04	0.06
Real Import	0.12	0.08	0.13	0.13	0.21	0.13	0.09	-0.01	-0.06	-0.17	-0.11
Unemployment	-0.16	-0.20	-0.20	-0.18	-0.11	-0.07	-0.04	-0.02	0.02	0.09	0.17
Real M2 (CPI)	0.34	0.35	0.23	0.12	0.09	0.01	-0.17	-0.32	-0.35	-0.27	-0.32
Real M2 (GDP Deflator)	0.47	0.38	0.15	-0.05	-0.12	-0.20	-0.29	-0.20	-0.17	-0.15	-0.12
Real GDP	0.28	0.30	0.30	0.11	0.06	0.07	-0.02	-0.03	-0.05	-0.12	-0.22
Nominal M2	0.20	0.16	0.08	0.04	0.07	0.05	-0.06	-0.08	-0.06	-0.07	-0.18
Nominal M1	0.13	0.12	0.06	0.09	0.15	0.09	-0.05	-0.06	0.00	-0.01	-0.13
Market Exchange Rate	-0.38	-0.40	-0.33	-0.30	-0.18	0.05	0.25	0.34	0.46	0.47	0.44
Inflation (CPI)	0.06	-0.09	-0.13	-0.08	-0.10	-0.15	-0.19	-0.08	0.12	0.04	-0.12
Inflation (GDP Deflator)	-0.12	-0.33	-0.33	-0.17	-0.13	-0.05	0.18	0.06	0.10	0.17	0.07
Panel B: BK Filter											
	-5	-4	-3	-2	-1	0	1	2	3	4	5
CPI	-0.32	-0.25	-0.14	-0.02	0.10	0.20	0.32	0.39	0.40	0.35	0.25
WPI	-0.42	-0.29	-0.12	0.08	0.27	0.43	0.54	0.57	0.52	0.41	0.25
GDP Deflator	-0.41	-0.29	-0.09	0.13	0.31	0.42	0.44	0.38	0.28	0.17	0.06
Interest Rate	0.41	0.62	0.68	0.58	0.34	0.05	-0.22	-0.40	-0.47	-0.45	-0.37
Real Private Consumption	0.16	0.07	-0.05	-0.18	-0.28	-0.35	-0.34	-0.25	-0.12	0.02	0.11
Real Government Consumption	0.30	0.34	0.34	0.26	0.12	-0.05	-0.19	-0.26	-0.25	-0.21	-0.15
Real Total Consumption	0.24	0.18	0.08	-0.06	-0.21	-0.33	-0.38	-0.33	-0.21	-0.07	0.05
Real Investment	0.24	0.22	0.22	0.23	0.23	0.18	0.07	-0.04	-0.15	-0.24	-0.33
Real Export	0.10	0.06	-0.07	-0.24	-0.37	-0.40	-0.28	-0.09	0.09	0.20	0.23
Real Import	0.13	0.15	0.18	0.22	0.26	0.27	0.20	0.10	-0.02	-0.14	-0.27
Unemployment	-0.22	-0.24	-0.25	-0.25	-0.25	-0.23	-0.19	-0.13	-0.05	0.05	0.18
Real M2 (CPI)	0.59	0.49	0.34	0.16	-0.02	-0.20	-0.36	-0.48	-0.54	-0.53	-0.48
Real M2 (GDP Deflator)	0.59	0.46	0.23	-0.03	-0.26	-0.41	-0.45	-0.42	-0.36	-0.28	-0.21
Real GDP	0.26	0.29	0.29	0.23	0.15	0.08	0.03	0.00	-0.04	-0.12	-0.22
Nominal M2	0.33	0.31	0.27	0.20	0.13	0.05	0.00	-0.06	-0.13	-0.21	-0.28
Nominal M1	0.14	0.16	0.18	0.20	0.20	0.18	0.14	0.10	0.05	-0.01	-0.08
Market Exchange Rate	-0.53	-0.59	-0.58	-0.48	-0.29	-0.04	0.23	0.46	0.63	0.71	0.67
Inflation (CPI)	-0.25	-0.35	-0.39	-0.39	-0.35	-0.29	-0.18	-0.03	0.15	0.32	0.45
Inflation (GDP Deflator)	-0.34	-0.52	-0.57	-0.48	-0.27	-0.02	0.15	0.25	0.27	0.28	0.27