Arab Journal of Administrative Sciences

2015, Vol. 22, No. 1, 49 - 72

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THE DETERMINANTS OF INFLATION IN KUWAIT: AN EMPIRICAL INVESTIGATION

Key Words

Econometric Model Construction and Estimation; Price Level and Inflation; Monetary Policy; JEL Classification: C51, E31, E52

Abstract

We conduct empirical analysis of the main factors influencing inflation in Kuwait. The State of Kuwait is representative of small open economy facing capital mobility. Due to the lack of well-developed domestic financial market and domestic investment opportunities a model of price determination is developed and tested based on supply-side constraints, demand pressures, and spillovers from external factors, as well as the role of second-round effects and entrenched expectations on price adjustments. The main finding useful for the conduct of monetary policy in Kuwait is that money supply, domestic and foreign interest rates, the exchange rate, and world prices are the main determinants of consumer prices in Kuwait. Exchange rate pass-through and money supply shocks come up as the foremost factor and predominates in the inflationary process.

Introduction

There is a consensus among economic researchers that inflation is economically costly. It inhibits growth, makes management of national economy a very difficult task, leads to random distribution of income, undermines the coordinative properties of the price system, diverts resources away from direct want-satisfaction.

Several empirical studies have analyzed the relationship between inflation and long-run economic growth. In a cross-sectional analysis, Barro, 1996 found a negative relationship between inflation and economic growth. Fischer, 1996 reached the same conclusion. According to Chari *et al.* 1996, a 10 percent increase in the inflation rate causes a decrease of the growth rate of real GDP between 0.3

Submitted October 2013, accepted January 2014.

and 0.7 percent. To explain how inflation hinders economic growth, (Choi *et al.*, 1996) argue that inflation tends to reduce real return received by savers and investors, which in turn reduces capital formation and long-run real activity.

The detrimental impact of inflation on purchasing power and aggregate economic performance has made inflation targeting the paramount policy objective of almost all central banks. Thus knowledge of the causes of inflation is a prerequisite for accomplishing that objective. This knowledge is particularly important for developing countries, which strive to achieve sustainable long-run economic growth.

The aim of this study is to investigate the dominant factors influencing inflation in an open developing country like Kuwait where the lack of well developed financial markets makes domestic money holdings vulnerable to changes in international opportunity costs in the same way as domestic opportunity costs do. This type of analysis, which has not been done before, would be extremely useful to monetary policy in this country for limiting the causes of inflation. The only study on the determinants of inflation in Kuwait was a descriptive analysis by Elsamman, 1989, who argues that external factors (such as import prices), and internal factors (such as government expenditures, consumption and investment expenditures, money supply, and market structure) are the main causes of inflation in Kuwait.

Based on the market equilibrium conditions, we develop and test a dynamic error-correction model of inflation and subject it to a battery of tests in order to prove its statistical adequacy and examine its structural stability. The empirical model is found to generate good forecasts of inflation and tracks the data reasonably well. The main finding useful for the conduct of monetary policy in Kuwait is that money supply, oil revenues, domestic and foreign interest rates, the exchange rate, and world prices are the main determinants of consumer prices in Kuwait.

The remainder of the study is organized as follows. Section II provides briefing of various schools of economic thought contribution to inflation analysis. Section III describes the proposed model and examines the underlying theoretical foundations. Section IV outlines the empirical methodology and describes the data used in the study. Section V reports the empirical results and discusses the policy implications of the study. Section VI conclusions.

Literature Review

Literature on inflation is huge and its survey is beyond the scope of this paper. Indeed, we cannot add more than many Journal of Economic Literature surveys of detailed debates on inflation issues (Kilian, 2008; Stock and *et al.*, 2003; Fischer and *et al.*, 2002; Williamson, 2000; Clarida *et al.*, 1999; cf. Frisch 1983)

Inflation econometric modeling distinguishes between supply-side constraints, demand pressures, and spillovers from external factors, as well as the role of second-round effects and entrenched expectations on price adjustments as main determinants of inflation. This paper draws largely on Kibritcioglu, 2002 to present briefing of various contributions of competing schools of economic thought. The main goal of this briefing is to highlight inflation dynamics determinants in order to derive inflation equation and empirical implementation using State of Kuwait data.

Inflation Definition

Kibritcioglu, 2002, page 45, states that "Inflation is defined as sustained increases in the general price level for goods and services in an economy". Inflation is called demand-pull if equilibrium price level in a domestic market for goods and services rises continuously as a result of continued excess demand conditions in successive time periods. Aggregate demand grows faster than the level of aggregate supply and "pulls" prices higher. Inflation is called cost-push inflation if production costs increase continuously as in the cases of rising imported input prices, wages, taxes, interest rates, or exchange rates".

Decomposition of observed inflation into its demand-pull and cost-push components is not easy because price movement is a dynamic process, and supply and demand shocks to prices are mixed and simultaneous. Also, past inflation may cause present inflation. Most economic theories bring together demand-pull and cost-push inflation channels in explaining inflation. Other criteria, besides demand-pull and cost-push, are needed to classify inflation theories.

Alternative possibilities to distinguish various types of inflation theories include:

1- Distinction between short-run and long-run inflation theories.

2- Distinction between closed and open economy models of inflation.

3- Theories of low-, high- or hyper-inflation.

4- Distinction between perfect competition and monopolistic competition models.

5- Theories with assumptions of perfect or imperfect information.
6- Distinction between fiscal and monetary theories of inflation.

For the purposes of the present study, it seems more appropriate to classify and compare theories of inflation according to major debates between competing schools of economics.

Classical and Neoclassical (Monetary) Inflation Theories

Classical economists (e.g., David Hume, Adam Smith, David Ricardo and John Stuart Mill) and neoclassical economists (e.g., Leon Walras, Alfred Marshall and Arthur C. Pigou) used the quantity theory of money (QTM) to explain inflation. According to The QTM, the value of all sales of goods must necessarily balance the value of all purchases:

$$M.v = p.T \qquad (1)$$

Where: M is money supply, v is the velocity of money, p is the general price level, and T represents the real volume of transactions. If one assumes, following the classical economists, that v and T are constant in the short run, equation (1) can be rewritten to yield a price equation for the economy as follows:

$$p = \frac{v}{T}.M \qquad (2)$$

Equation (2) states simply that doubling the money supply doubles the price level, everything being equal. That is, the general price level is solely an increasing function of money supply, or in other words, an excess supply in the money market causes, other things being equal, an excess demand in the goods market. In its extreme interpretation, this simple classical or neoclassical relationship states that inflation is only a monetary phenomenon if one ignores the possible changes in v and T. Therefore, in a classical or neoclassical economy, the money supply should be reduced to fight against inflation. OBrien (1975) argues that there are some differences between inflation transmission channels in classical and neoclassical versions of the QTM. The neoclassical model supports less transmission mechanisms than the classical model because it is based on the assumption of full employment, and it is characterized by a dichotomy between the real and monetary spheres. Real wages will be determined in the real sector (labor market) while nominal prices are a function of the money supply[1]. Therefore, increases in the money supply increase the general price level by leaving the volumes of goods demanded and supplied, and hence, activity level unchanged. Some

(1) According to the neoclassical paradigm, there's no cost-push inflation.

classical economists like David Hume do not assume full employment and there is no room for a dichotomy. According to Hume, an increase in the money supply does increase the general price level through a different transmission mechanism. The increase in nominal cash balances of economic units initially results in higher expenditures for goods, and hence, in higher production. Then, under the assumption of underemployment, prices start to adjust to risen money supply. As a result, money is not neutral as in the neoclassical model; it has also some real effects in the short run. In other words, Humes monetary approach differs in describing the process of inflation in the short and long run by allowing some price rigidities in the short run.

Keynesian Inflation Theory analysis

Keynes (1940)[(2)] developed a different demand side model of inflation with price rigidities mainly in the labor market. In his model of "inflation gap", Keynes describes a redistribution process in which "inflation acts like a pump that transfers income from wage earners who have a low propensity to save and a low marginal tax rate to the entrepreneurial sector with a higher propensity to save and a higher marginal tax rate" (Frisch, 1983: 230). An unexpected increase in aggregate demand (inflationary gap), as in the case of a war, leads to a price increase under full employment conditions, and this, in turn, creates unanticipated profits for firms while nominal wages remain temporarily constant. Rising profits create an additional excess demand in the goods market. However, the lagged attempt of firms to satisfy the initial excess demand in the goods market creates an excess demand in the labor market. Resulting competition among entrepreneurs for fully employed labor pushes nominal wages higher until restoring real wages to their initial level. The increase in real wages induces a new demand pressure in the goods market. Prices increase again. If the wage-lag mechanism still continues to work, an inflation spiral occurs which can be defeated only by reducing aggregate demand (e.g., tax increases and/or cuts in government spending) and/or reducing rigidities by, for example, implementing an appropriate income policy.

(2) John Maynard Keynes' (1936) book, The General Theory of Employment, Interest and Money, was based mainly on the assumption of underemployment equilibrium with a fixed general price level. That is, it was not designed to analyze the dynamics of inflation.

Neo-Keynesian Approach to Inflation: The Philips Curve Debate.

Inflationary gap model developed in Keynes (1940) is a demand-pull model including wage rigidities in the short-run and excluding details on the money market developments (as in the quantity theory of money). Furthermore, as mentioned by Humphrey (1981), Keynesian (nonmonetary) demand-pull inflation model was influenced by some cost-push inflation. Most Keynesian economists treated demand-side shocks as the primary cause of inflation but accepted the possibility of inflationary effects originating from supply-side shocks. Arthur Smithies (1942) and the others introduced formal presentation of Keynes verbal analysis of inflationary gap model and their explanations prevailed until the mid-1970s[3]. The Neo-Keynesian macroeconomics, or Keynesian neoclassical synthesis, is based primarily on:

1- The IS-LM closed-economy model developed mainly by Hicks, 1937 and Modigliani in the late 1930s and 1940s.

2- The Phillips curve (developed,1958, by Phillips and Richard Lipsey 1950s, and extended by Samuelson and Robert Solow)

3- The Fleming-Mundell (F-M) small-open-economy model and popularized by the IMF in the 1960s.

Keynes-Smithies investigated income redistribution causes of inflation. This channel was not included in the standard IS-LM model. That is, there was no room for continuous price increases, or inflation, in the neo-Keynesian IS-LM world. On the other hand, the difference between Keynesian and classical theories of income determination was reduced to differences in interest-rate sensitivity of money demand, and hence, to the shape of the curve for money market equilibrium (LM).Accordingly, the Keynesian and neoclassical synthesis incorporated labor market dynamics into the IS-LM model by taking into account the Phillips curve (PC) to remove the missing wage-price loop enabling inflation equation integration in the equilibrium system:

$$\pi = \alpha.u \qquad (3)$$

where π represents the inflation rate and μ is the unemployment rate. The trade-off, or negative correlation, be-

(3) In Section 2.4, we go back to the Keynes-Smithies theories in order to stress the role of income distributional effects in inflation dynamics when summarizing the cost-push theories of inflation developed by structuralists, neoMarxian economists post-Keynesians, disequilibrium economists.

tween inflation and unemployment was stated by $\alpha < 0$. A decrease in μ (i.e.: an increase in the inverse of μ), was interpreted as an indication for excess demand in labor factor and hence in goods markets, according to the demand-pull explanation for inflation. Regarding observed evidence, the demand-side determination of inflation within the IS-LM-PC framework failed to explain economic crises (stagflation in the late 1960s and 1970s). First and second oil-price shocks in 1973-74 and 1978-79 created worldwide recessionary and cost-push inflationary effects at the same time. The observed evidence on incompatibility between the PC relationship and the co-existence of stagnation and inflation was actually predicted by monetarist economists. Friedman and Phelps proposed an expectations-augmented PC in the late 1960s:

$$\pi = \alpha U + \beta \pi^e \qquad (4)$$

where π^e is inflation expectations while β represents the expectation adjustment parameter. In the short-run, there is still a negative relationship between inflation and unemployment for a given π^e. That is, inflation expectations act as a shift variable in the model. However, assuming that $\beta = 1$ and $\pi^e = \pi$ in the long-run, the PC must be vertical according to the monetarist critique of the standard PC. In other words, there is no trade off between π and U in the long run, and the vertical long-run PC represents a kind of "natural rate of unemployment".

According to the monetarist economists, the formation of inflation expectations is backward-looking, or adaptive, in the sense that not all information is available to economic agents during their formation of price expectations (the expected rate of inflation at time t is only a weighted average of the actual inflation rate and the expected inflation rate in the previous period).

Monetarist-Structuralist Debate: Demand-Pull vs. Cost-Push Inflation

From 1960 up to oil price shock in 1973-74 the discussions on inflation causes were dominated by the debate as to whether inflation is a demand-pull or cost-push issue. Cost-push theories attribute inflation (and disinflation) to non-monetary, supply-side effects that change the unit-cost and profit markup components of the prices of individual products (cf. Humphrey, 1998). The structuralist approach to inflation is one of the major contributions to the cost-push inflation theories (cf. Streeten, 1962 and Baumol, 1967).

The first implementation of structuralist inflation models to Latin America, in the 1960s, focused on

productivity differences between the industrial and agricultural sectors. The second implementation of structuralist inflation models, in the 1970s, to the Scandinavian countries stressed the role of collective bargaining and wage setting mechanism.

Rational Expectations Revolution

After oil - price shocks in late 1970s, rational expectations economists dominated inflation debate: Economic agents form their macroeconomic expectations "rationally" based on all past and current relevant information available, and not only on past information, or adaptive, price expectations. Accordingly, the errors in price expectations are totally random (independent of each other). The rational expectations approach to the business cycle and prices generated a vertical Phillips curve both for the short- and the long-run. For example, if the Central bank announces a monetary stimulus in advance (fully anticipated monetary policy), economic agents expect that prices rise. In this case, monetary policy cannot have any real effects even in the short-run.

New classical: the real business cycle approach to inflation dynamics.

New classical macroeconomists, real business cycle theorists argued that economic activity fluctuations originate from real (aggregate supply) shocks rather than monetary (aggregate demand) shocks. New classical economists under-estimate the effect of price rigidities because they assume that all markets clear continuously.

New Keynesian: Microeconomic foundations of inflation dynamics

The new Keynesian economists developed microeconomic causes of price rigidities in order to remove the Keynesian ad-hoc assumption of fixed wages and prices in the short run and attack the new classical assumption of "continuous market-clearing. According to the new Keynesians, wage and price stickiness in the short run can be explained by factors like "small menu costs" or "staggered (or non-synchronized) wage and price changes (cf. Mankiw, 1985, Taylor, 1998).

New Neoclassical Synthesis.

Since the early 1990s, the sharp difference between the emphasis of new Keynesian and new classical economists on the major origins of business cycles and price movements has been increasingly softening, and a new neoclassical synthesis (NNS) is now on the agenda of macroeconomics. According to Goodfriend *et al.*, 1997, the new generation of quantitative models of economic fluctuations has two central elements:

1- Systematic application of intertemporal optimization behavior of firms and households, and rational expectations.

2- Incorporation of imperfect competition and costly short-run price adjustments into dynamic macroeconomics.

Model Specification

The overall price level (P) is a weighted average of the price of tradable goods (P^T) and the price of the non-tradable goods (P^{NT}). After appealing to the law large numbers and log-linearizing the price index around a zero inflation steady state, we obtain the following expression for the evolution of the price level as function in log-linear formas:

$$\log P = \alpha(\log P^T) + (1-\alpha)(\log P^{NT}), \quad (1)$$

where $0 < \alpha < 1$ represents the share of tradable goods in total expenditure. The structural parameter α is a function of the technology curvature parameter and the elasticity of demand.

The price of tradable goods (P^T) is determined exogenously in the world market and, in domestic currency terms, depends on foreign prices (P^f) and the exchange rate (e)[4]:

$$\log P_t^T = \log e_t + \log P_t^f, \quad (2)$$

Therefore, the depreciation of domestic currency and the increase in world prices will lead to an increase in the overall price level. This is the exchange rate pass-through. Since Kuwait is an open economy, a greater part of inflation is expected to be imported. With Kuwaiti Dinar practically being pegged to the US dollar, prices tend to rise at times when the dollar is weak against the Yen and European currencies, which are the currencies of the major sources of Kuwait imports. Hence, we will use the trade weighted average exchange value of the US dollar as a proxy for the exchange rate variable in equation (2). According to Kandil and Morsy, 2009: 3 "GCC countries have traditionally pegged domestic currencies to the U.S. dollar... U.S. dollar depreciation may have contributed to inflationary pressures, raising questions about the sustainability of the peg in GCC. The downward trend in the U.S. dollar implied a depreciation of GCC national currencies relative to other trading partners currencies, particularly the Euro. As a result, import prices soared in many GCC countries. It is estimated that at least 20 percent of inflation is attributed to the surge in import prices. This led Kuwait to abandon the peg of the dinar

(4) Exchange rate e is defined as amount of domestic currency for one unit of foreign currency. An increase (decrease) in e indicates domestic currency depreciation (appreciation).

to the U.S. dollar in May 2007 and establish a (weighted) peg to a composite of currencies for major trading partners".

The price of non-tradable goods (P^{NT}) is determined in the domestic money market, where demand for non-tradable goods is assumed, for simplicity, to move in line with the aggregate demand in the economy. Thus, the price of non tradable goods is determined by the money market equilibrium condition where real money supply (M^s/P) equals real money demand (m^d), which yields the following equation for non-tradable goods prices:

$$\log P_t^{NT} = \beta(\log M_t^s - \log m_t^d) \quad (3)$$

where M_T^s represents the nominal stock of money, m_t^d is the demand for real money balances, and β is a scale factor representing the relationship between aggregate demand and the demand for non-tradable goods. The demand for real money balances (m^d) is assumed to depend positively on real income and negatively on inflationary expectations and foreign interest rates:

$$m_t^d = \underset{+}{f}(\underset{+}{y_t}, \underset{-}{E(\pi_t)}, \underset{-}{r_{t+1}}) \quad (4)$$

where y_t represents real income, $E(\pi_t)$ are expectations made in period $t-1$ about inflation in period t, and r_{t+1} is the expected nominal foreign interest rate in period $t+1$ adjusted by the expected change in the exchange rate in period $t+1$.

Theoretically, an increase in real income will stimulate money demand, whereas an increase in the domestic opportunity cost variable (expected inflation) will lead to a decline in the demand for money.

An important note arises in this connection. In oil-producing countries in general, Kuwait in particular, oil revenues flow to the government. A substantial part of it is used for public sector imports and reserve accumulation, and only a small part is allocated to the private sector. Therefore it would be more realistic to use non-oil real GDP as a determinant of money demand instead of total real income. Second, while domestic financial assets are an important substitute for domestic money holdings, two other financial assets should be considered particularly in open economies. In open economies with relative capital mobility, international opportunity costs of holding money, such as foreign interest rates and exchange rates, may also influence domestic money holdings much in the same way as domestic opportunity costs do. This is particularly important in developing countries like Kuwait where there is a lack of adequate

financial assets in which to hold wealth. Higher foreign interest rates may induce domestic residents to increase their holdings of foreign financial assets, which in turn could be financed by drawing down domestic money holdings. A change in the exchange rate could also affect portfolio decisions assuming a high degree of substitution between domestic money holdings and foreign financial assets. Thus, in the absence of a well-developed financial market, and given that Kuwait currency was pegged to the U.S. dollar, we hypothesize that interest rates in Kuwait are strongly influenced by interest rates in the U.S. For this we use U.S. short-term interest rates as a proxy for interest rates in Kuwait.

Based on adaptive expectations, the expected rate of inflation in period t is assumed to be equal to:

$$E(\pi_t) = d(\Delta \log P_{t-1}) + (1-d)E(\pi_{t-1}) \quad (5)$$

where $(\Delta \log P_{t-1})$ is the actual inflation rate in period $t-1$ and $E(\pi_{t-1})$ is the expected rate of inflation in period $t-1$. If, for simplicity, we assume that $d=1$ then we have the following reduced-form equation for inflation:

$$E(\pi_t) = \Delta(\log P_{t-1}) \quad (6)$$

Moreover, based on similar assumptions regarding the formulation of expectations, we assume that the expected foreign interest rate (r_{t+1}), corrected for the expected change in the exchange rate, is equal to the observed rate in period t:

$$E(r_{t+1}) = r_t \quad (7)$$

which means that an increase in expected future foreign interest rates (r_{t+1}) is assumed to lead to a decrease in current real money demand as a result of substitution effects. Substituting equations (6) and (7) into equation (4) yields the following log-linear money demand equation:

$$\log M_t^d = c_2 \log y_t - c_3 \Delta \log P_{t-1} - c_4 r_t \quad (8)$$

Substituting equation (8) into equation (3) yields:

$$\log P_t^{NT} = \beta(\log M_t - c_2 \log y_t + c_3 \Delta \log P_{t-1} + c_4 r_t) \quad (9)$$

Now equations (2) and (9) can be substituted into equation (1) to yield the following price equation

$$\log P_t = \alpha\beta(\log Mt - c_2 \log y_t + c_3 \Delta \log P_{t-1} + c_4 r_t) + (1-\alpha)(\log e_t + \log P_t^f) \quad (10)$$ (5)

(5) In the steady state, $M_t^d = M_t^s$ and $P_t = P_i^f$, so $\log P_t = [(1-\alpha)/\alpha] \log e_t$ that is the exchange rate pass-through is the unique inflation determinant of inflation.

Based on the discussion above, some a priori assumptions can be made regarding the signs of the explanatory variables. In particular, an increase in money supply (M_t), expected inflation ($\Delta \log p_{t-1}$), the exchange rate (e_t), foreign prices (P_t^f), and the interest rate (r_t) will cause prices to increase, whereas an increase in real income (y_t) will cause prices to fall.

The Econometric Methodology

Testing for unit root

The intuition behind unit root test is as follows. If a variableyisstationary(ortrend stationary), then it has a tendency to return to a constant (or deterministically trending) mean. Therefore large values will tend to be followed by smaller values (negative changes), and small values by larger values (positive changes). Accordingly, the level of the variable will be a significant predictor of next period's change, and will have a negative coefficient. If, on the other hand, the series is non- stationary, then positive changes and negative changes will occur with probabilities that do not depend on the current level of the series. Accordingly, actual level does not affect its future value and variables past values cannot help predict its future value.

As a first step, the standard unit root test is carried out using the Augmented Dickey and Fuller statistic (ADF) and Phillips-Perron (PP) tests. (cf. Dickey *et al.*, 1979 and Phillips *et al.*, 1988). Next, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) is applied in order to test unit root and stationary hypothesis (cf. Kwiatowski *et al.*, 1992). We allow in turn for a constant and for a constant plus deterministic time trend in the test regressions.

Perron, 1997(6) developed unit roots test under the structural break hypothesis. Since the form of the break is unknown, we follow the recommendation of Sen, 2003 and use the mixed model IO2 as the alternative. In this model the unit root test is performed using the t-statistic for the null hypothesis that $\alpha = 1$ in the following regression

$$y_t = \mu + \theta DU_t + \beta t + \gamma DT_t + \delta D(T_b) + \alpha y_{t-1} + \sum_{i=1}^{k} c_i \Delta y_{t-i} + e_t \quad (11)$$

Where $DT_t = 1(t > T_b)t$

This is the "Mixed Model" in Perron, 1997. This model allows for a break to occur simultaneously in both the intercept and the slope at

(6) Cf. Glynn et al., 2007 for a survey of unit root tests under structural breaks.

time T_b. It is also an innovational outlier model where the change occurs gradually in both the intercept and the slope.

The choice of the appropriate break date (T_b) and order of the lag-truncation parameter (k) are determined endogenously following Perron, 1997, with k-max = 12. In particular, the break-date T_b is selected as the value which minimizes the t-statistic for testing $\alpha = 1$. The truncation lag parameter k is selected using a general-to-specific recursive procedure based on the t-statistic on the coefficient associated with the last lag in the estimated autoregression. That is, the procedure selects the value of k such that the coefficient on the last lag in an autoregression is significant, up to a maximum order k-max. For each one of the variables, table 1 reports the estimated truncation lag k, the estimated break date (T_b), and the t-statistics of the parameters in equation (14). The last two columns report the unit root test statistics and critical values.

Testing for Cointegration

We model the intertemporal interaction between the variables of interest by representing their short-run dynamics by a vector autoregressive (VAR) model where all variables are allowed to be endogenous. Then, the idea that some or all of them share common stochastic trends (i.e cointegrated) can be tested and exploited to model their interaction within a vector error-correction (VEC) model, which captures both the short-run as well as the long-run dynamics of the variables. For the general case, consider a VAR(k) model of the form:

$$X_t = \Phi_1 X_{t-1} + \Phi_2 X_{t-2} + ... + \Phi_k X_{t-k} + \mu + \delta D_t + \eta_t, t = 1, ..., T \quad (12)$$

where X_t is a $p \times 1$ vector containing the p variables of interest. μ is an intercept term and D_t is a matrix containing deterministic variables such as trend and dummies. D_t can also include stochastic variables that are weakly exogenous and excluded from the cointegration space.

Suppose for the time being that some or all the variables in X_t are I(1). If we exploit the idea that there may exist co-movements of these variables and possibilities that they will trend together towards a long-run equilibrium state, then by the Granger representation theorem, we may posit the following testing relationships that constitute a vector error-correction (VEC) model:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + ... + \Gamma_{k-1} \Delta X_{t-k+1} + \prod X_{t-1} + \mu + \delta D_t + \eta_t, \quad t = 1, ..., T \quad (13)$$

where Δ is the first difference operator, Γ's are estimable parameters, η_t is a vector of impulses which represent

the unanticipated movements in X_t, with η_t ~ $niid(0, \sum)$, and $\prod$ is the long-run parameter matrix. With r cointegrating vectors ($1 \leq$ r $\leq$ p-1), $\prod$ has rank r and can be decomposed as $\prod = \alpha\beta'$, with α and β both p x r matrices; β are the parameters in the cointegrating relationships and α are the adjustment coefficients which measure the strength of the cointegrating vectors in the VEC model. With this, the model can be written as:

$$\Delta X_t = \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \alpha\beta' X_{t-1} + \mu + \delta D_t + \eta_t, \quad t = 1, ..., T \tag{14}$$

Hence, the cointegration methodology illustrates well the conflict that exists between the equilibrium framework and the disequilibrium environment from which the data are collected. As formulated in the VEC model in (13), this conflict can be easily resolved by extending the equilibrium framework into one that accounts for disequilibrium and that by including the equilibrium error measured by ($\beta' X_{t-1}$). Once the equilibrium conditions are imposed, the model is now describing how, in each short-term period, the variables are adjusting towards their long-run equilibrium state. In this respect, each cointegrating vector is indicating an independent direction where a stable long-run equilibrium exists and, the adjustment coefficients? measure the speed of adjustment of each variable to the long-run equilibrium state.

Following Toda *et al.*, 1993, 1994 and Clarke *et al.*, 2003, imposing a zero restriction on the adjustment coefficients in (13) can be interpreted as a test of long-run Granger-causality. Johansen and Juselius (1992) term this test as a test of weak exogeneity. A variable is weakly exogenous if its adjustment coefficient is zero, implying that it is not adjusting to the long-run equilibrium relationships. This also means that the long-run movement of the variables in the cointegration space does not have any influence on its short-run behavior.

Johansen, 1988 developed system cointegration test using a maximum likelihood procedure which tests the cointegrating rank *r* and estimates the parameters β and α. The recent literature has demonstrated that the Johansen cointegrating approach performs in general better than a range of other procedures for estimating the cointegrating vectors. For example, Gonzalo (1994) reports, from simulation experiments, that Johansens estimator has superior finite sample performance compared to many other methods for estimating the parameters of the cointegrating vectors. Toda *et al.*, 1995 report that, for samples containing at least one hundred data points, the asymptotic distributions of Johansens

statistics are good approximations to the exact distributions when the null hypothesis is true.

Empirical Results

Data and Variables Definitions

The data cover the period from 1995 to 2012 in monthly frequency (216 observations)[7]. This was the largest data span available at the time this research was started and includes 60 observations since the 2008 financial crisis. Domestic price is measured by the consumer price index (CPI). World price is measured by world (all countries) consumer price index (CPIW). Exchange rate is measured by US nominal effective exchange index (USNEER) and the Kuwaiti Dinar to US Dollar nominal bilateral exchange rate (R). The former captures US Dollar depreciation/appreciation with respect to world major currencies (euro, Yen,...) and the latter captures Kuwaiti Dinar depreciation/appreciation with respect to US Dollar. Oil revenue (OIL) is total government oil income. Money supply is measured by the aggregate M2. Domestic interest rate (I) is measured by Kuwait Central Bank discount rate. Foreign interest rate is approximated by 3-month US Treasury bills rate (T_BILLS).

Data for CPI, CPIW, USNEER are index number base 2005. Data for I and T_BILLS are in percentage point. Data for R are fils[8] per US Dollar and OIL are in million KD. All data are from IMF Database. Data correction for seasonal adjustment for all variables is carried out with Census X12 multiplicative method in EViews 7.

Test Results for Unit Roots

The empirical investigations will be conducted according to the following steps. First, we test for unit roots in the variables. We do this using Dickey and Fuller, Phillips and Perron and Kwiatowski, Phillips, Schmidt and Shin methods. The results of this step will serve to determine the appropriate order of integration of the variables. Knowledge of the order of integration of the variables has implications on the feasibility of conducting the cointegration tests.

The results of table 1 indicate no structural breaks in the variables and that:

(7) Kuwaiti macroeconomic data availability goes back to 1970s in annual frequency. However, consistent (cf. consumer price index year base changes) data at monthly frequency are not available before 1990s. The sample 1995M1 - 2012M12 includes 216 observations and this isn't a small sample according to usual econometric standards. (e.g. Student Test critical value at 200 ddl and 5% is 1.972 as per compared to 1.96 in Normal distribution)

(8) One fils = KD 0.001

Table 1
Unit Root Test results

Variables	Monthly Frequency						Monthly Frequency and Seasonal Adjustment					
	Constant			Constant and Trend			Constant			Constant and Trend		
	ADF*	PP*	KPSS**	ADF*	PP*	KPSS**	ADF*	PP*	KPSS**	ADF*	PP*	KPSS**
CPI	1.0	1.0	1.72	0.98	0.97	0.45	1.0	1.0	1.72	0.98	0.97	0.45
CPIW	0.72	0.79	1.62	0.07	0.17	0.29	0.80	0.84	1.63	0.11	0.20	0.29
USNEER	0.54	0.60	0.65	0.57	0.61	0.35	0.59	0.60	0.64	0.58	0.60	0.35
R	0.71	0.26	1.43	0.44	0.28	0.21	0.72	0.64	1.42	0.46	0.30	0.21
OIL	0.67	0.55	1.64	0.02	0.00	0.29	0.79	0.70	1.65	0.07	0.00	0.29
M2	1.0	1.0	1.72	0.90	0.90	0.45	1.0	1.0	1.72	0.92	0.92	0.46
I	0.92	0.88	1.18	0.86	0.77	0.11	0.92	0.88	1.18	0.86	0.77	0.11
T-BILLS	0.69	0.67	1.18	0.72	0.60	0.08	0.56	0.66	1.18	0.57	0.71	0.08

* p-value: the Null Hypothesis: "the variable has a unit root" is accepted if $p > 0.05$.
** Asymptotic t-ratio, the Null Hypothesis: "the variable is stationary" is rejected if t-ratio > critical value at 5% = 0.46.

1- The null hypothesis of unit root cannot be rejected for any one of the variables seasonally adjusted or not according to ADF, PP and KPSS tests when the autoregressive specification includes only constant term.

2- All variables, but Oil revenue are non-stationary according to ADF, PP tests when the autoregressive specification includes constant term and time trend.

3- All variables are stationary according to KPSS test when the autoregressive specification includes constant term and time trend.

4- All variables are stationary upon first differencing, therefore, we conclude that the variables are integrated of order one, I(1).

Cointegration Test Results

Based on the results of the unit root tests above, we herein present the results of testing for cointegration between the variables of interest using Johansen cointegration test. Variables are organized in endogenous variables including all Kuwaiti variables (CPI, R, I, OIL) and exogenous variables (CPIW, USNEER, T_Bills).

The results for testing for the number of cointegrating equations are reported in table 2, which presents both, the maximum eigenvalue and the trace statistics, the 5 percent critical values as well as the corresponding p- values.

The results of table 2 indicate the existence of up to 2 cointegrating relationships between the endogenous

Table 2
Johansen Cointegration Test Results

Trend assumption: Linear deterministic trend (restricted)
Endogenous Series: CPI, M2, Oil Revenues, Discount rate, KD/USD exchange rate.
Exogenous series: World price, US-Nominal Effective Exchange Rate, Treasury. BILLS.
Panel A: Seasonal unadjusted Variables.
Unrestricted Cointegration Rank Test (Trace)

Number of cointegrating equations	Eigenvalue	Trace Statistic	0.05 Critical Value	P-value.
None *	0.266	151.10	88.80	0.0000
At most 1 *	0.186	85.61	63.87	0.0003
At most 2 *	0.140	42.09	42.91	0.0603
At most 3	0.041	10.11	25.87	0.9202
At most 4	0.005	1.19	12.51	0.9972

Panel B: Seasonal adjusted Variables.
Unrestricted Cointegration Rank Test (Trace)

Number of cointegrating equations	Eigenvalue	Trace Statistic	0.05 Critical Value	P-value.
None *	0.239	158.63	88.80	0.0000
At most 1 *	0.204	103.14	63.87	0.0000
At most 2 *	0.148	56.67	42.91	0.0013
At most 3	0.095	24.09	25.87	0.0818
At most 4	0.0180	3.68	12.51	0.7866

variables. Seasonal adjustment makes series ''less volatile'' around their trend, hence Johansen cointegration could predict more cointegrating relationships as per compared to non seasonal adjusted series. Table 2 shows up to 3 relationships at 10% risk level.

Cointegrating equation estimation

Since the scope of this paper is to conduct empirical investigation of inflation dynamics in State of Kuwait we will limit to CPI cointegrating relationship to address long-run features of prices in Kuwait. It can be written as follows(9):

$$Log(CPI) = cte + b_1 log(CPIW) + b_2 log(USNEER) + b_3 log(M2) +$$

(9) Time subscript is omitted.

(10) Since inflation rate is equal to d(Log(CPI)), all equation parameters bi are exactly identified using level specification or first differences specification.

Table 3
Estimation output, Monte Carlo Simulations and Equation Residual Unit Root Tests

Series	Monthly 1995:1 - 2012:12 Including 11 dummy variables				Monthly 1995:1 - 2012:12 Seasonal adjusted	
	2SLS Estimation output (T-Statistics)	Fully Modified Least Squares (FMOLS)	Canonical Cointegrating Regression (CCR)	Monte Carlo Simulations (10,000 replications)	2SLS Estimation output (T-Statistics)	Monte Carlo Simulations (10,000 replications)
Constant	1.558	1.671	1.779	1.533	1.538	1.505
	(7.50)	(4.68)	(4.86)		(7.60)	
World price	0.107	0.104	0.102	0.090	0.108	0.094
	(6.70)	(3.97)	(3.81)		(6.91)	
US - Neer	0.199	0.173	0.178	0.176	0.202	0.186
	(6.61)	(3.37)	(3.50)		(6.86)	
M2	0.193	0.196	0.195	0.215	0.192	0.211
	(12.24)	(7.49)	(7.53)		(12.48)	
Discount Rate	0.077	0.066	0.070	0.061	0.077	0.060
	(6.72)	(3.57)	(3.73)		(6.95)	
U.S. T-bills	-0.043	-0.040	-0.041	-0.037	-0.044	-0.037
	(-12.40)	(-7.22)	(-7.37)		(-12.75)	
KWD/USD exchange rate	0.199	0.188	0.175	0.186	0.197	0.181
	(1.65)	(0.95)	(0.85)		(1.67)	
			Goodness to fit			
R-squared	0.984	0.984			0.984	
Adjusted R-squared	0.982	0.983			0.983	
S.E. of regression	0.022	0.022			0.022	
			Unit root Tests for 2SLS estimated equation residuals (p - value and asymptotic T-ratio)			
ADF*, Constant	0.004				0.004	
PP*, Constant	0.001				0.001	
KPSS**, Constant	0.164				0.179	
ADF*, Constant and Trend	0.022				0.024	
PP*, Constant and Trend	0.009				0.009	
KPSS**, Constant and Trend	0.162				0.175	

* p-value: the Null Hypothesis: "the variable has a unit root" is accepted if p > 0.05.
** Asymptotic t-ratio, the Null Hypothesis: "the variable is stationary" is rejected if t-ratio > critical value at 5% = 0.46.

$b_4 log(I) + b_5 log(T\_BILLS) + b_6 log(R) + u$ (10)

Where u is error term.

Table 3 provides detailed output estimation using two stage least squares, Fully modified LS (FMOLS) and canonical cointegrating regression (CCR). Estimates are fairly similar.

Table 3 second and fourth columns provide two stage least squares (2SLS) estimation of the cointegrating relationship between consumer price index and selected explanatory variables using eleven dummy variables to account for seasonal monthly effects or based on seasonally adjusted data(11). Output estimation indicates that, in the long-run, consumer prices are affected by the world price change, the exchange pass-through (US nominal effective exchange rate and Kuwaiti Dinar to Us Dollar nominal exchange rate), money supply, the discount rate and the US Treasury bill rate. Given these results we can conclude that, in the long-run, inflation in Kuwait is caused by movements in the exchange rate, world prices, money supply, domestic and foreign interest rates. Moreover, and as expected, we conclude that the exchange rate, import prices, money supply, all have a positive effect on inflation, while foreign interest rates have a negative effect on inflation in Kuwait.

Since the variables are expressed in logarithmic form, each variables coefficient measures the long-run elasticity of consumer price index with respect to that variable. In this regard, we should notice:

1- All coefficients are correctly signed and significant at 1% risk level except the nominal exchange rate KD/US dollar at 10% independently of the method to account for seasonal effects.
2- The exchange rate pass-through has the highest effect on consumer price inflation.
3- Money supply has the second highest effect on consumer price inflation. The surge in oil revenues has left the country awash in cash. The increased liquidity resulted in massive expansion in credit and aggregate demand, which faced the structural bottlenecks on the supply side. This finding is consistent with Kandil and Morsy, 2009 for Kuwait and other GCC countries and with the demand-pull hypothesis.
4- World prices have significant contribution to explain inflation dy-

(11) Fully modified LS (FMOLS) and canonical cointegrating regression (CCR) output estimation show that there's no significant (quantitative or qualitative) difference as per compared to 2SLS estimation output.

namics but the effect is less important than exchange rate and money supply. This unexpected little spill- over of foreign inflation may be the outcome of various forms of price controls and subsidies to contain inflation.

5- The discount rate and foreign interest rates have less impact on inflation in Kuwait and indicate low influence of the international opportunity costs of holding money.

We conduct Monte Carlo simulations to check for estimation robustness. Table 3 third and fifth columns provide Monte Carlo simulations(12) in order to address estimation robustness issues. We perform random selection of 168 observations among 216 available observations and estimate the cointegrating relationship. We replicate that 10,000 times and average estimated coefficients. Average estimated coefficients converge to their true values (Large number law). Monte Carlo simulations findings are in line with 2SLS estimation output, in particular, regarding main inflation determinants raking.

Table 3 provides unit root tests of cointegrating equation errors. ADF and PP and KPSS tests conclude that estimated errors are stationary, the inflation equation is well specified and it is not necessary to use vector error correction model (VECM)

Conclusion and Policy Recommendations

This paper attempted to empirically investigate the determinants of price dynamics in Kuwait in order to identify the sources of inflation. For this, an econometric model is used to analyze long-run dynamics of prices. The variables used in the analysis are the consumer price index, the discount rate, oil revenues, world prices, money supply, the exchange rate of the KD, and foreign interest rates. Data used are monthly and cover the period 1995:01 to 2012:12.

A careful investigation of the unit root tests under the structural break hypothesis revealed that all variables are integrated of order one I(1).

The results of cointegration indicated the existence of up to two long-

(12) In Monte Carlo simulation, the econometric model is simulated a large number of times. Each simulation is equally likely, referred to as a realization of the model. For each realization, all of the uncertain parameters are sampled. The outcome is a large number of separate and independent results; each representing a possible state for the model or one possible path the model may follow through time. The results of the independent model realizations are assembled into probability distributions of possible outcomes. As a result, the outputs are not single values, but probability distributions.

run equilibrium relationships between the variables. We focus on one relationship including consumer price index as dependent variable. This long-run relationship indicates that, in the long-run, prices are affected by the discount rate, foreign interest rates, world prices, money supply, and the exchange rate of the Kuwaiti dinar. In particular, the exchange rate, world prices, money supply, all have a positive effect on inflation, while foreign interest rates have a negative effect on inflation in Kuwait.

In our analysis seeking to determine the factors influencing inflationary pressures in Kuwait, exchange rate pass-through and money supply shocks come up as the foremost factor and predominates in the inflationary process. International factors such as food and raw material prices (which were rising in the first half of 2008) impact on inflation is biased by government subsidy policy.

From the results above, we recommend that monetary policy authority in Kuwait should be able to control inflation using tools such as the exchange rate, money supply, and the discount rate. Monetary stabilization and control is at the root of the control and stabilization of inflation.

Future extension of this paper could be conducted from the perspective of GCC Central Bank, which will be entrusted with monetary policy responsibilities once the GCC countries form a Monetary Union. Containing inflationary pressures would require putting a lid on domestic demand, addressing the non-tradables inflation and easing supply bottlenecks (e.g. the real estate sector) through a tighter monetary policy and exchange rate management..

References

Banerjee, A., J.J. Dolado, D.F. Hendry and S.W. Smith. 1986. Exploring Equilibrium Relationships in Econometrics Through Static Models. *Oxford Bulletin of Economics and Statistics*, 48: 253-277.

Barro, R. J. 1996. Inflation and Growth. *Federal Reserve Bank of St. Louis Review,* 78: 153-69.

Baumol, W. 1967. Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crises. *American Economic Review,* 57 (3): 415-26.

Bernanke, B. S. and Frederic S. Mishkin 1997. Inflation Targeting: A New Framework For Monetary Policy? *Journal of Economic Perspectives,* 11(2): 97-116.

Choi, S., B. D. Smith, and J. H. Boyd. 1996. Inflation, Financial Markets, and Capital Formation. *Federal Reserve Bank of St. Louis Review,* 78: 9-29.

Clarida, R., J. Gali, and M. Gertler. 1999. "The Science of Monetary Policy: A New Keynesian Perspective." *Journal of Economic Literature,* 37(4): 1661-1707.

Clarke J. A. and S. Mirza. 2003. Some finite sample results on testing for granger non-causality, *Econometrics Working Paper* EWP0305

Darrat, A. F. 1985. Monetary Explanation of Inflation: The Experience of Three Major OPEC Economies. *Journal of Economics and Business,* 37: 239-54.

Darrat, A. F. and A. AL-Mutawa. 1996. Modeling Money Demand in the United Arab Emirates". *The Quarterly Review of Economics and Finance,* 36(I): 65-87.

Dickey, D.A. and W.A. Fuller. 1979. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root," *Journal of the American Statistical Association,* 74: 427-431.

Elsamman, A. H. 1989. Dimensions of the inflation Problem in the United Arab Emirates During the Surge in the Petroleum Surplus Funds (1975-1980). *Finance and Industry,* 10: 7-27.

Engle, R.F. and C.W.J. Granger. 1987. Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica,* 55: 251-276.

Fischer, S. R. Sahay, and C. A. Végh. 2002. "Modern Hyper- and High Inflations." *Journal of Economic Literature*, 40(3): 837-880.

Fischer, S. 1996. Why are Central Banks Pursuing Long Run Stability? In Achieving Price Stability proceedings of a symposium sponsored by the Federal Reserve Bank of Kansas City at Jackson Hole, Wyoming, 29-31.

Frisch, H. 1983. *Theories of Inflation, Cambridge: Cambridge University* Press.

Glynn J. P. Nelson and V. Reetu. 2007. Unit Root Tests and Structural Breaks: A Survey with Applications, Revista de Metodos Cuantitativos Para La EconomIa Y La Empresa (3): 63-79.

Gonzalo, J. 1994. "Five alternative methods of estimating long-run equilibrium relationships," *Journal of Econometrics,* 60(1-2): 203-233.

Goodfriend, M. and R. G. King 1977. The New Neoclassical Synthesis and the Role of Monetary Policy. In: Bernanke, B. and J. Rotemberg (eds.), NBER *Macroeconomics Annual 1997*. Cambridge, MA: MIT Press, 1997, 231-282.

Granger, C.W.J. 1986. Developments in the Study of Cointegrated Economic Variables. *Oxford Bulletin of Economics and Statistics*, 48: 213-228.

Hall, S.G. 1986. An Application of the Granger and Engle Two-Step Procedure to the United Kingdom Aggregate Wage Data. *Oxford Bulletin of Economics and Statistics*, 48: 229-239.

Humphrey, T. M. 1981. Keynes on Inflation. *Federal Reserve Bank of Richmond Economic Review*, Jan.-Febr. Reprinted in: Humphrey, T. M., 1986, Essays on Inflation, Richmond, VA: Federal Reserve Bank of Richmond, 38-48.

Humphrey, T. M. 1998. Historical Origins of the Cost-Push Fallacy. *Fed-*

eral Reserve Bank of Richmond Economic Quarterly, 84 (3): 53-74.

Kandil, M. and Hanan M. 2009. "Determinants of Inflation in GCC', IMF Working Paper, WP/09/82.

Keynes, J. M. 1940. *How to Pay for the War*, London: Macmillan.

Keynes, J. M. 1936. *The General Theory of Employment*, Interest and Money, London: Macmillan.

Kibritçioglu, A. 2002. Causes of Inflation in Turkey: A Literature Survey with Special Reference to Theories of Inflation. In: *Inflation and Disinflation in Turkey*, ed. by Kibritçioglu, A., L.Rittenberg, and F. Selçuk, Aldershot: Ashgate, 43-76.

Kilian, L. 2008. The Economic Effects of Energy Price Shocks. *Journal of Economic Literature*, 46(4): 871-909.

Kwiatowski, P. and Schmidt & Shin 1992. Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit Root: How Sure Are We That Economic Time Series Have a Unit Root? *Journal. of Econometrics*, 54: 159-178.

Mankiw, N. G. 1985. Small Menu Costs and Large Business Cycles: A Macroeconomic Model for Monopoly. Quarterly Journal of Economics, 100 (2): 529-38.

Miller, S.M. 1991. Monetary Dynamics: An Application of Cointegration and Error-Correction Modeling. *Journal of Money, Credit and Banking*, 23: 139-154.

Moser, G. G. 1995. The Main Determinants of Inflation in Nigeria. *IMF Staff Papers*, 42(2): 270-289.

O'Brien, D. P. 1975. The Classical Economists, New York: Oxford University Press. Olivera, J. H. G. 1967. Money, Prices and Fiscal Lags: A Note on the Dynamics of Inflation. *Banca Nazionale del Lavaro Quarterly Review*, 20, Sep: 258-267.

Perron, P. 1997, "Further Evidence on Breaking Trend Functions in Macroeconomic Variables, *Journal of Econometrics*, 80 (2): 355-385.

Phillips, P.C.B. and P. Perron. 1988. Testing for a Unit Root in Time Series Regression. *Biometrika*, 75: 335-346.

Sargent, T. J. and N. Wallace. 1981. Some Unpleasant Monetarist Arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review*, 5, Fall: 1-17.

Sen A. 2003. Limiting behaviour of Dickey-Fuller t-tests under the crash model alternative, *Econometrics Journal*, Royal Economic Society, 6(2), December: 421-429.

Smithies, A. 1942. The Behavior of Money National Income under Inflationary Conditions. *Quarterly Journal of Economics*, 57 (4): 113-28.

Stock, J. H., and M. W. Watson. 2003. Forecasting Output and Inflation: The Role of Asset Prices. *Journal of Economic Literature*, 41(3): 788-829.

Streeten, P. 1962. Wages, Prices and Productivity. *Kyklos*, 15 (4): 723-731.

Taylor, J. B. 1998: Staggered Price and Wage Setting in Macroeconomics. *National Bureau of Economic Research, Working Paper*, No. 6754.

Toda, H.Y., P. P.C.B. Phillips. 1994. Vector autoregression and causality:

A theoretical overview and simulation study. *Econometric Reviews*, 13: 259-285.

Toda, H.Y. and Yamamoto, T. 1995. Statistical inferences in vector autoregressions with possibly integrated processes, *Journal of Econometrics*, 66: 225-250.

Williamson, O. E. 2000. The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*, 38(3): 595-613.

Zapata, H. O. and A. N. Rambaldi. 1997. Monte Carlo Evidence on Cointegration and Causation. *Oxford Bulletin of Economics and Statistics*, 59: 285-298.

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