Chapter 2
Dynamics of the Relation Between Producer and Consumer Price Indices:
A Comparative Analysis in the U.S. Market

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ABSTRACT

The relation between the Producer Prices Index (PPI) and the Consumer Price Index (CPI) in the U.S. is analyzed for two sub-periods: one spanning from 1947 to 1982, the post-war period marked by demand-side economic policies, and the other one starting by 1983 when supply-side policies pioneered by the Reagan government came into effect. As the series in question are found to be cointegrated, a Vector Error Correction Model is employed for the analysis. Regarding the long-run equilibrium relationships, it is found that the loading for the PPI series are statistically significant for both periods, while the loading for the CPI is barely significant for the first period, and it is insignificant at any acceptable level for the second. Thus, the CPI represents the common trend in the system in both periods, but it does more clearly so in the second period.

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INTRODUCTION

The relationship between the Producer Prices Index (PPI) and the Consumer Price Index (CPI) has long been an essential question for academic and policy-making purposes. Numerous empirical studies have investigated this relationship and identified unidirectional or bidirectional causal relations for different samples.

In early studies for the U.S. market, Colclough and Lange (1982) found a unidirectional causality from CPI to PPI (called Wholesale Price Index at the time) by using Sims and Granger causality tests, while Jones (1986) found a bidirectional causal relationship. Bloomberg and Harris (1995) and Clark (1995) reveal that the PPI does not help to predict the CPI. These empirical results casted doubt on the conventional wisdom according to which there is unidirectional causality running from producer to consumer prices.

The supply-side approach claims that there is a causal relationship from PPI to CPI. This conventional explanation is based on the well-known cost-push mechanism: through the production chain, increases in prices of raw materials and intermediary goods are reflected in the prices of finished goods. The causality from CPI to PPI is explained through a less intuitive mechanism: the demand-side approach refers to the demand-pull effect according to which increased demand for final goods leads to an increase in demand for inputs (Cushing & McGarvey, 1990; Caporale, Katsimi, & Pittis, 2002).

More recent empirical evidence is mixed as the results depend on both the method and the data used. Using Toda and Yamamoto's (1995) causality approach, Caporale, Katsimi and Pittis (2002) found that there is a unidirectional causality from PPI to CPI for the G7 countries for the period of 1976 to 1999. Unidirectional causality from PPI to CPI is also found by Ghazali, Yee, and Muhammed (2008) in their study on the Malaysian economy and by Sidaoui, Capistrán, Chiquiar and Ramos-Francia (2010) for Mexico. Moreover, Liping, Gang, and Jiani (2008) showed that there is a unidirectional causality from CPI to PPI in China.

Vector Autoregressive (VAR) models or Vector Error Correction (VEC) models are employed for these types of analyses where the variables in question are potentially interrelated. For VAR models to be reliable, the series should all be stationary. However, many empirical time-series tend to exhibit time-varying moments. Through differencing, non-stationary series may be transformed into stationary series that are suitable for VAR analysis at the expense of valuable information about long-term dynamics. Instead, cointegration analysis may be conducted to identify long-term stable relationships between variables. Identified cointegration relationships may then be integrated into the VAR model with differenced series to form a VEC model. Through a VEC model, it is possible to analyze not only how the variables react to