Research in International Business and Finance 25 (2011) 229–237

Contents lists available at ScienceDirect

Research in International Business and Finance

journal homepage: www.elsevier.com/locate/ribaf

Full length article

Commodity prices and inflation: Testing in the frequency domain

Cetin Ciner

Department of Economics and Finance, Cameron School of Business, University of North Carolina Wilmington, Wilmington, NC 28403, United States

ARTICLE INFO

Article history:
Received 2 February 2011
Accepted 2 February 2011
Available online 8 March 2011

Keywords:
Commodities
Inflation
Frequency domain

ABSTRACT

We provide evidence for a long term, positive relation between commodity prices and inflation. However, this is only detected when frequency dependency in the regression is statistically accounted for, suggesting nonlinear dynamics between the variables. We also test whether commodity prices can be used to forecast inflation. Again relying on frequency domain methods, we indeed find support for long term causality from commodities to inflation. Moreover, the information content of commodity futures prices is robust to the effects of several financial and economic variables.

1. Introduction

The commodity price–inflation connection is important for at least two reasons. First, commodities are frequently touted as inflation hedges, which can be used to motivate commodity investments. For example, Gorton and Rouwenhorst (2006) argue that an index of commodity futures is linked with consumer price inflation, implying that commodity investments protect real purchasing power of market participants, while Bloomberg and Harris (1995) and Verheyen (2010) do not support a positive relation.

Secondly, if commodity prices precede general inflation in the economy they can be utilized by monetary authorities in policy decisions. This argument is motivated by the understanding that commodity prices are determined in efficient auction markets and should quickly reflect all available supply and demand shocks in the economy. Furthermore, commodities tend to be important inputs in

E-mail address: cinerc@uncw.edu

0275-5319/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.ribaf.2011.02.001

production and thus, increases in their costs could precede inflationary pressures, see Garner (1989) and Marquis and Cunningham (1990) among others.

Our goal in this article is to conduct an empirical investigation of the link between commodity prices and inflationary dynamics. We provide evidence on both contemporaneous and causal dynamics between the variables. As discussed in greater detail below, our main contribution stems from the fact that we rely on frequency domain methods to characterize the commodity price–inflation connection. The statistical techniques used in this paper permit a decomposition of the connection between the variables into short-term and long-term components, which prove to be critical in our empirical results.

Bloomberg and Harris (1995) note that interest in commodity price–inflation linkage ebbs and flows with investment returns in commodity markets. True to this comment, several recent papers exist in this area, following significant rises in commodity prices. For instance, Cheung (2009) examines the causal link between commodity indexes and inflation in several industrialized economies and argues that commodities tend to signal changes in inflation at long horizons. A similar conclusion is reached by Bhar and Hamori (2008) using the US data and a different statistical method.

Browne and Cronin (2010) also find causality from commodities to inflation; however, these authors suggest that the observed causality is a result of commodities overshooting and moving away from equilibrium, as a response to monetary conditions. Hence, including monetary variables in the modeling is important in their framework. On the other hand, Verheyen (2010) states that while the link between commodities and inflation was strong in the 1970s, it is nonexistent in more recent data, similar to Cecchetti and Moessner (2008).[1] In a noteworthy paper in regard to the methodology used in the present study, Kyrtsou and Labys (2006) show that the relation between commodities and inflation is in fact chaotic and nonlinear. They find comovement between the series once these empirics have been accounted for.

In prior literature that focuses on the 1970s and 1980s, Garner (1989) and Cody and Mills (1991) find support for causality from commodities to inflation, especially in the 1970s. However, studies by Furlong and Ingenito (1996), Bloomberg and Harris (1995) and Garner (1995) focus on the mid-1980s and early 1990s and show that the link between commodities and inflation weakens considerably. These studies suggest that commodity markets started reflecting idiosyncratic shocks, rather than the general, economy-wide shocks and hence, could not be useful in the conduct of monetary policy.

In the empirical analysis of the present study, we investigate the period between 1983 and 2010 and report on both contemporaneous and causal linkages between commodity prices and consumer inflation. The novel contribution of the paper is that we present new findings to the literature using frequency domain statistical methods, relative to conventional time domain analyses used in prior work.

Specifically, we first focus on contemporaneous relations and examine the sensitivity of inflation to commodity price changes. We conduct a nonlinear analysis utilizing the frequency dependent regression approach by Ashley and Verbrugge (2009). As explained in greater detail below, in this framework the relation between the variables is allowed to vary across the frequency components and hence, high frequency (short term) and low frequency (long term) dynamics can be examined separately. Indeed, while a conventional time series regression detects no significant relation between commodity prices and inflation, our frequency decomposition analysis shows that there is actually a positive and significant link between the rate of inflation and long term commodity price shocks.

We proceed to examine Granger causality relations, which can be conducted within the context of vector autoregression models. We decompose the conventional, time domain causality tests to examine both short term and long term causality using the method introduced by Breitung and Candelon (2006).[2] We show that, similar to the regression results, causality from commodities to inflation obtains only in the long term as no causality is detected at high frequencies. Hence, the analysis

[1] In examinations of individual commodities and inflation, Masso and Staeher (2005) show that oil price shocks have short-lived impact on inflation. However, in gold markets, Tully and Lucey (2007) argue that inflation does not figure in the gold volatility equation.

[2] It is noteworthy that researchers have long recognized that summary measures produced by time domain methods are unlikely to capture all aspects of the relation between the variables, see the original article by Granger (1969). However, the