



Increasing trends in the excess comovement of commodity prices



Kazuhiko Ohashi ^{a,1}, Tatsuyoshi Okimoto ^{b,*}

^a Graduate School of International Corporate Strategy (ICS), Hitotsubashi University, 2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo 101-8439, Japan

^b Crawford School of Public Policy, Australian National University, 132 Lennox Crossing, ANU, Acton, ACT 2601, Australia

ARTICLE INFO

Article history:

Received 20 August 2015

Received in revised form

3 February 2016

Accepted 6 February 2016

Available online 12 March 2016

JEL classification:

C32

C51

G15

Keywords:

Excess comovement

Commodity return

Time-varying correlation

DCC

Smooth transition

Regime change

Financialization

ABSTRACT

We investigate how the excess comovement of commodity prices, that is, the correlation in commodity returns after filtering out common fundamental shocks, has changed over the past three decades by developing the smooth-transition dynamic conditional correlation model that can capture long-run trends and short-run dynamics of correlation simultaneously. Using data from 1983 to 2011, we find that significant increasing long-run trends in excess comovement have appeared since around 2000. We confirm that these increasing trends are neither an artifact of the financial crisis after the bankruptcy of Lehman Brothers in September 2008 nor the time-varying sensitivities of commodity returns to common fundamental shocks. Moreover, we find that no significant increasing trends exist in the excess comovement among off-index commodities and that the surge of global demand alone cannot explain the increasing trends. These findings provide additional evidence for the timing and scope of the recent increasing commodity–return correlations that suggest the influence of the financialization of commodity markets starting around 2000.

© 2016 Elsevier Ltd All rights reserved.

1. Introduction

Since the early 2000s, commodities have emerged as an additional asset class alongside traditional ones such as stocks and bonds. Many researchers, using data from before the 2000s, have found slightly negative return correlations between commodity and stock returns [15,16]. Return correlations among commodities in different sectors have also been found to be small [13]. Moreover, several papers have reported decreasing or non-increasing trends of return correlations between commodities and stocks at least before the financial crisis after the bankruptcy of Lehman Brothers in September 2008 [9,5].

These characteristics of commodity returns implied an opportunity for diversification and thus have attracted investors worldwide. Institutional investors and hedge funds have started intensively trading commodity indices such as Standard & Poor's Goldman Sachs Commodity Index (S&P-GSCI) and the Dow–Jones UBS Commodity Index (DJUBS). Such commodity index investment, however, has changed the environments. In particular, with a massive inflow of funds into commodity markets by financial institutions starting around 2000, which is referred to as financialization,² the commodity markets seem to have

* Corresponding author. Tel.: +61 2 6125 4763; fax: +61 2 6125 8448.

E-mail addresses: kohashi@ics.hit-u.ac.jp (K. Ohashi), tatsuyoshi.okimoto@anu.edu.au (T. Okimoto).

¹ Tel.: +81 3 4212 3102; fax: +81 3 4212 3020.

² For a survey regarding the financialization of commodity markets, see Cheng and Xiong [8].

become more integrated into traditional markets and among themselves. For instance, Silvennoinen and Thorp [26] show that return correlations between commodities and stocks (or bonds) have increased well before the 2008 financial crisis, while Tang and Xiong [28] find significant increasing trends in the return correlations between crude oil and other commodities since 2004. As a result, analyzing time-varying correlations in commodity markets has become an important issue.

In this paper, we investigate whether and how correlations among commodity returns have changed over the last three decades possibly due to the financialization of commodity markets starting around 2000. We address these questions, however, from a slightly different viewpoint. We focus on excess comovement in commodity returns, initially raised by Pindyck and Rotemberg [23] and extended by Deb, Trivedi, and Varangis [10]. The excess comovement of commodities is defined as the correlation among commodity returns after filtering out the contemporaneous common macroeconomic factors and hence is interpreted as comovement unrelated to market fundamentals. We investigate how such excess comovement has changed over time.

The test of excess comovement among commodity returns is originally conducted by Pindyck and Rotemberg [23]. For monthly data from 1960 to 1985, they find that the excess comovements among several commodity returns are significant. Deb et al. [10] extend the model by introducing conditional heteroskedasticity and a time-varying conditional correlation with multivariate GARCH processes. The time-varying conditional correlation model allows them to analyze the short-run time-varying fluctuation in excess comovement, but the long-run mean of the correlation is set to be constant. Using monthly data from 1974 to 1992, they find that evidence of excess comovement becomes weaker especially when the multivariate GARCH is applied.

In this paper, we develop the smooth-transition dynamic conditional correlation (STDCC) model based on the smooth-transition correlation (STC) model by Berben and Jansen [4] and Kumar and Okimoto [19], and the dynamic conditional correlation (DCC) model by Engle [11] to generalize the aforementioned models. In the STDCC model with time as a transition variable, the STC part describes long-run trends in correlation and the DCC part captures short-run fluctuation. Thus, combining them enables us to investigate changes in long-run trends and short-run dynamics of excess comovement simultaneously. Moreover, the STC part allows us to detect solely from the data when and how a regime change, if any, in excess comovement occurs. To best of our knowledge, this paper is the first to develop the STDCC model and apply it to examine the timing of the regime change in the excess comovement of commodity returns.

The main contribution of this paper is that using this STDCC model for monthly data from 1983 to 2011, we find several new empirical facts regarding the behavior of excess comovement among commodities. First, the STDCC model detects significant long-run increasing trends in commodity excess comovement. Moreover, in contrast with the time-varying conditional correlation model by Deb et al. [10] that cannot detect long-run trends, this paper finds the importance of long-run increasing trends in the excess comovement of commodity prices relative to short-run conditional correlation dynamics. Indeed, our results indicate that the STC model that captures long-run trends is sufficient for characterizing the dynamics of excess comovement among commodities from 1983 to 2011.

Second, both STC and STDCC models find that such long-run increasing trends in excess comovement among commodities have appeared since around 2000. Until 2000, the excess comovement of commodity prices was almost constant and remained at low levels, which is fairly consistent with Deb et al. [10]. However, it has increased gradually since 2000 and reached much higher levels toward 2011. This result is generally consistent with the theoretical prediction of Basak and Pavlova [3] that the presence of index investment in commodities, which became popular around 2000, increases correlation among commodity returns. This result also complements Tang and Xiong [28], who find increasing trends in correlations between crude oil and non-energy commodities since (exogenously chosen) 2004, and Silvennoinen and Thorp [26], who detect a regime change in the increasing correlations between commodities and stocks (or bonds) since around 2000, although both sets of researchers analyze return correlations, not excess comovement.³ Furthermore, this result is closely related to Le Pen and Sévi [20], who find a small increase of excess comovement among commodities between 2000 and 2004 and a large increase after 2008, based on the rolling window analysis.

Third, we examine the possibility that the excess comovement among commodities might decrease after the 2008 financial crisis and find that the financial crisis after the bankruptcy of Lehman Brothers in September 2008 alone cannot explain the increasing trends in excess comovement among commodities. For this test, we extend the two-state STC model to the three-state model and investigate whether and when, if any, there are decreasing trends in excess comovement. The results indicate that the increasing trends in excess comovement after 2000 are the dominant feature of the dynamics in commodity excess comovement. This is consistent with Adams and Glück [1] who show that the 2008 financial crisis alone cannot explain the size and persistence of comovement. This also complements the findings of increasing trends in correlations by Tang and Xiong [28], who investigate only monotonic trends, and Silvennoinen and Thorp [26], who examine possible non-monotonic trends, but use the data up to 2009.

Fourth, we show that the increasing long-run trends of excess comovement are robust regarding changes in the sensitivities of commodity returns to common macroeconomic factors. Since the STC model assumes that the sensitivities of commodity returns to common macroeconomic factors are constant, there remains a possibility that the increasing trends in

³ Silvennoinen and Thorp [26] apply the double smooth transition conditional correlation GARCH (DSTCC-GARCH) model, which is closely related to the STDCC model in this paper.

Download English Version:

<https://daneshyari.com/en/article/999046>

Download Persian Version:

<https://daneshyari.com/article/999046>

[Daneshyari.com](https://daneshyari.com)