



On the links between stock and commodity markets' volatility

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ABSTRACT

This paper investigates the links between price returns for 25 commodities and stocks over the period from January 2001 to November 2011, by paying a particular attention to energy raw materials. Relying on the dynamic conditional correlation (DCC) GARCH methodology, we show that the correlations between commodity and stock markets evolve through time and are highly volatile, particularly since the 2007–2008 financial crisis. The latter has played a key role, emphasizing the links between commodity and stock markets, and underlining the financialization of commodity markets. At the idiosyncratic level, a speculation phenomenon is highlighted for oil, coffee and cocoa, while the safe-haven role of gold is evidenced.

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1. Introduction

Throughout the last decade, commodity prices experienced an exceptional volatility, with simultaneous and alternating phases of rising and falling trends. This evolution can be compared to that of financial markets, as illustrated by Figs. 1 and 2 representing the Standard and Poor's 500 (S&P 500) and Commodity Research Bureau (CRB) price returns' volatility. As shown in Fig. 3—which displays the dynamics of the S&P 500 and CRB price indexes—commodity prices have experienced a drop during the 2007–2008 financial crisis, and their link to stock prices seems to have strengthened since that turmoil. At the same time, commodities increasingly become part of portfolio allocation, together with stock classes.

At a macroeconomic level, policymakers pay particular attention to commodity prices and their volatility given their potential to feed inflation pressures. Volatility of commodity prices is thus a central issue for the world economy, as notably illustrated by the G20 which

addressed the question of excessive fluctuations and volatility of commodity prices in its September 2009 Pittsburgh summit. Moreover, analyzing the links between commodity and stock markets is of particular interest for financial players as raw materials enter many investment portfolios, together with stock classes (Dwyer et al., 2011; Silvennoinen and Thorp, 2010; Vivian and Wohar, 2012). Furthermore, as documented by Choi and Hammoudeh (2010), commodity traders concurrently look at both stock and commodity market fluctuations to infer the trend of each market. Comparing the dynamic volatility of raw materials and equity prices provides useful information about possible substitution strategies between commodity and stock classes. In particular, volatility plays a key role regarding hedging possibilities, and impacts asset allocation across raw materials and their risk–return trade-off. Building on the observed links between commodity and stock markets, a recent literature has emerged regarding the impact of investors' behavior in explaining the increase in both the level and volatility of commodity prices.¹ However, as underlined by Vivian and Wohar (2012), no clear-cut conclusion has been reached so far.

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¹ Recent references include Büyüksahin and Harris (2011), Büyüksahin et al. (2008), Capelle-Blancard and Coulibaly (2011), Du et al. (2011), Eckaus (2008), Irwin and Sanders (2012), Khan (2009), Manera et al. (2012), Masters and White (2009), Stout (2011), Valiante (2011), and Vivian and Wohar (2012).

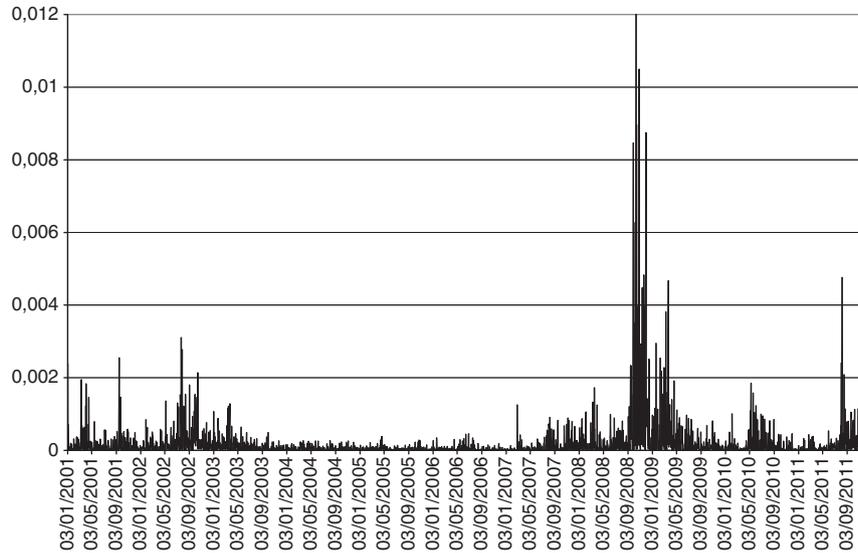


Fig. 1. S&P 500 stock returns volatility (01/03/2001–11/28/2011).

Source: Data are extracted from Datastream. Volatility is proxied by the daily squared returns of prices.

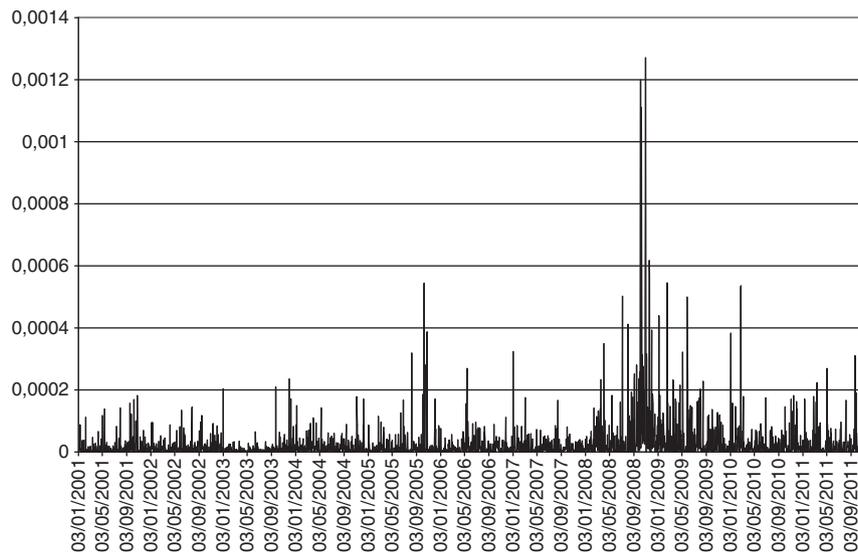


Fig. 2. Commodity price returns volatility (01/03/2001–11/28/2011).

Source: Data are extracted from Datastream. Volatility is proxied by the daily squared returns of prices.

In this paper, we contribute to the emerging empirical literature dealing with the relationships between commodity and stock markets. More specifically, we focus on the dynamics of the correlations between both markets, and analyze whether those correlations evolve according to the situation—bullish or bearish—in the stock market. We pay particular attention to the recent 2007–2008 financial crisis by investigating whether it has strengthened or disrupted the links between stock and commodity markets. From a methodological viewpoint, we follow the dynamic conditional correlation (DCC) GARCH approach introduced by Engle (2002) which allows the assessment of the changes in correlations between commodity and stock returns over time. The DCC-GARCH approach has been followed by Choi and Hammoudeh (2010) in a quite similar context, but our study considerably extends the analysis.² Our

² Only five commodities were considered in Choi and Hammoudeh (2010), instead of 25 in our case.

sample consists of 25 commodities covering various sectors over the period from January 3, 2001 to November 28, 2011. Relying on a large panel of raw materials (energy, metals, agricultural, food...) allows us to study whether commodities constitute a homogeneous asset class with regard to their links with stock markets, and whether the crisis has engendered a financialization of commodity markets.³ This kind of relationship has typically been investigated in the case of oil (Doyle et al., 2007; Mouawad, 2009), though the cross-effect on oil and stock market volatility remains globally unclear.

Our results show that correlations between commodity and stock markets are time-varying and highly volatile. The impact of the 2007–2008 financial crisis is noticeable, emphasizing the links between

³ The financialization process refers to a situation in which the price of an individual commodity is not only determined by its primary supply and demand, but also by several financial factors and investors' behavior in derivative markets.

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