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Minor metals and organized markets: News highlights about the consequences of establishing a futures market in a thin market with a dual trading price system

Florian Fizaine

Laboratoire, Réseaux Innovation Territoires et Mondialisation (RITM), Université Paris-Sud, EA 3546, France

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ABSTRACT

The introduction of molybdenum and cobalt, two minor metals, in the London Metal Exchange provides us with the opportunity to assess the effect of futures markets on price behavior. Simple tests show that metal markets without futures are more volatile that metal markets with futures, although we cannot say whether or not this difference stems from the presence of futures markets or from distinct market fundamentals. This paper also demonstrates via the Vector Error Correction Model and causality tests, a cointegration relationship between molybdenum price and nickel price due to similar sectorial outlets. The introduction of futures markets for molybdenum seems to have reinforced this relationship. The double trading price system (market prices and reported prices) characterizing cobalt and molybdenum markets appears to be dominated by LME market prices. This assumption is supported by the weak exogeneity of market prices in VECM, different causality tests, and Cholesky impulse responses. On the contrary, the price discovery mechanism of future prices seems not to work, most likely because of the lack of liquidity on these markets. A strong and permanent increase in transaction volumes on minor metal futures markets is necessary in order to ensure the continuity of their existence.

1. Introduction

Since February 22, 2010, two minor metals (molybdenum and cobalt) have had access to futures markets through trading on the London Metal Exchange (LME). This structuring of their markets is not without its importance and confirms the success experienced in the development of the uses of these metals. By way of comparison, since the beginning of the 20th century, global copper and iron productions have grown by a factor of 35 and 20 respectively, while during the same period, global cobalt and molybdenum productions were multiplied by 600 and 25,000 respectively. The widespread use of these metals in cutting edge-technologies (including clean technologies) and the important volumes generated by their exchanges motivated the creation of their futures markets in order to hedge a growing risk. Indeed, before February 2010, these markets were subject to over-the-counter transactions. In this context, the molybdenum and cobalt markets experiencing a dual trading price system where reported prices (published by reporting agencies) and market prices (settled on LME) co-exist. Now, the related issue consists in determining who leads the price discovery mechanism when these two prices co-exist.

In the past, there have been many attempts to corner[1] metal markets, but most of them have failed because of insufficient control of producing industries and a lack of discretion which would have ensured an undetectable manipulation. Nonetheless, contrary to huge commodity markets like gold or copper, minor metal markets incorporate fewer players and the exchanges take place with extremely little transparency, which prevents the reading of market fundamentals. In addition, minor metals have experienced several type of opaque pricing ranging from transfer prices to producer prices and secretive prices (see Maxwell (2015) for the pricing history of lithium). Thus the conditions are fulfilled for one player to manipulate prices with few resources and with the strong probability that the other players cannot determine whether the new evolution of prices derives from a change in inaccessible market fundamentals (little information on prices, on productions, on players…). The recent suspicion of manipulation of Platts pricing on the oil market perfectly illustrates this issue.

Against this backdrop, the recent emergence of Exchange Traded Products (Exchange Traded Commodities, Exchange Traded Funds) and their increasingly important roles could raise some

[1] Especially, corner attempts by Hunt brothers on the silver market, by Hamanaka of the Sumitomo Corporation on copper, and by the international Tin Council (Sixth International Tin Agreement).

E-mail address: florian.fizaine@gmail.com

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Table 1
Sizes of different ETF focused on metals (Million US dollars).

Abbreviation	ETF	Outstanding M$
GLD	SPDR Gold Trust	40,444
DBC	DB Commodity Index Tracking Fund	5723
DBB	PowerShares DB Base Metals Fund	276
DBP	PowerShares DB Precious Metals Fund	231
NYSE REMX	Market Vectors Rare Earth/Str Metals ETF	122.6
SLV	iShares Silver Trust	7.8
NYSE LIT	Global X Lithium Etf	40
SMGI	SMGI	3

Table 2
Sizes of different physical metal markets in 2013 (Million US dollars).

Metal	Size of physical market M$
Gold	142,000
Copper	121,500
Silver	22,400
Molybdenum	7300
Cobalt	3400
Neodymium	1800
Lithium	762
Indium	250
Gallium	110

issues about these micro-markets. For instance, considering the opacity of most of minor metal markets due to over the counter transactions, the replication of the real price can be very problematic for the ETF. In addition, the size of these funds could be sufficiently large to destabilize the physical and financial markets of minor metals when funds accumulate stocks as collateral (Tables 1 and 2).

In any case, this transformation in the organization of cobalt and molybdenum markets provides us with the opportunity to examine many relevant issues. First, we can ask whether or not metal markets with futures are different from metal markets with no futures in terms of price volatility. Secondly, if we can answer yes to the first question, we must ensure that this difference appears on the cobalt and molybdenum markets after their LME introduction. Thirdly, we can also check if the price behavior of these markets, specifically the cointegration relationship with other prices, changed further to the introduction of their futures. Fourthly, as these two markets benefit from a double trading price system (with market prices and reported prices), an interesting option could consist in identifying which of these two prices leads the price discovery mechanism. Fifthly, as these markets are relatively small compared to other commodity markets, we can verify if their futures markets are operating accurately. To answer these questions, the present discussion will proceed as follows: a second part will propose a review of the main outcomes reported in academic literature about the consequences linked to the introduction of commodity futures markets. Next, a third part will introduce cobalt and molybdenum specificities (especially characteristics of a thin market and minor metals). This part will also try to provide a partial answer to the fundamental difference between markets with and without futures, particularly in regards to price volatility. Moreover, we test whether this change can be observed on the molybdenum and cobalt markets through simple tests. In a fourth part, we explain the methodology (the vector error correction model, impulse response function, and causality tests) used in parts five and six. Part five details the cointegration relationship between molybdenum and nickel markets and its evolution after molybdenum's introduction on the LME. Part six will demonstrate the domination of market prices over reported prices, but also the malfunctioning of their futures markets, most likely because of the lack of liquidity of these markets. Finally, a seventh part will contribute to bring some elements of discussion and in an eighth part we will end by policy recommendations and a conclusion.

2. Consequences linked to the absence or presence of futures commodity markets

Issues linked to the creation of futures commodity markets have generated an important literature since the seventies. Most studies have focused their research efforts on two fields: the price discovery mechanism ensured by futures markets and volatility changes on the commodity cash market further to the introduction of futures markets. According to Hernandez and Torero (2010), a futures market fulfills several roles: the price discovery mechanism and risk transfer, contributions which have been demonstrated empirically, for example, for the oil market (see Moosa (2002)). Other scholars have shown interest in these issues but applied their analysis to agricultural commodities. For instance, Baldi et al. (2011) support the existence of a unidirectional causality normally running from agricultural futures markets to agricultural cash markets, while this relationship would seem to be bicausal in times of crisis due to pressure exerted on the physical commodity market. Zapata et al. (2005) and Hernandez and Torero (2010) obtain similar results for a set of agricultural commodities, strengthening the assumption of price discovery by futures markets. Facilitating the dissemination of information, futures markets facilitate production choices for non-informed producers and guarantee access to information for non-informed traders (Kamara, 1982). This transmission of information in an egalitarian way ensures market transparency and promotes a growing numbers of potential players and in this way an increase in market liquidity.

As information is a component of price modification, some scholars estimate that the creation of futures markets increases volatility because commodity markets integrate more information but are then also more efficient (Cox, 1976). In a similar way, Antoniou and Foster (1992) underline the possibility that futures commodity markets increase opportunities for speculative interventions, which can result in situations where price changes overreact to the modification of fundamentals. In this vein, Yang et al. (2005) demonstrate, for many agricultural commodities, the existence of a relationship of causality from the unexpected volume of futures trading and toward the volatility of commodity cash markets. Sehgal et al. (2012) have also collected results converging toward the destabilization of seven agricultural cash markets by the unexpected volume of trading of their futures markets. Moreover, the authors note that most of these markets are characterized by a high degree of immaturity. On the contrary, other scholars support the assumption of a decreasing volatility on cash commodity markets further to the introduction of futures markets, thanks to a growing visibility of the future which itself feeds phenomena of expectations, hedging, arbitrage, substitution and a more efficient use of storage activities (Peck, 1976; Netz, 1995; Jacks, 2007). All of these behaviors prevent the occurrence of brutal rises or falls in commodity price which may take place in a situation of opacity. In the same way, the appearance of futures markets reduces the need to introduce a risk premium in spot transactions and therefore moderates market volatility and transaction costs (Antoniou and Foster, 1992).

In contrast, opacity prevailing on unorganized markets pushes economic agents to adopt three types of strategy:

1. Reinforce the acquisition of information on the market by buying or controlling structures on the demand and supply