Homo Economicus: Rare earth profiling

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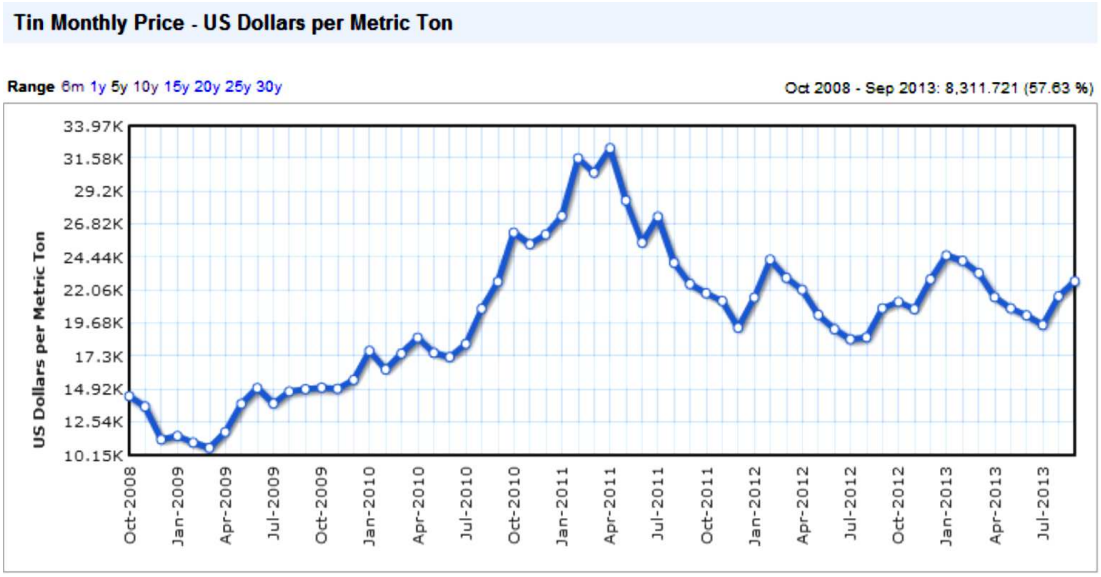
This paper discourses the IMF graph on monthly tin prices between May 2008 and May 2013, indicative of a high volatility on price, typical of rare earth metals. The sharp increases and steep decline on monthly prices, state the absence of equilibrium or stability between the supply side and the demand side. For that reason, price fluctuation is correlated to the oligopolistic market behaviour

characterised of the World metals industry, dominated by a handful of suppliers having apparent control on pricing movements (Griffiths & Wall 2011, Gillespie 2011, Institute of Asian Economic Affairs 1962, Lipsey & Chrystal 2011)

Volatility is explained as the drastic change in price over a short period of time (Investopedia). Further discussion on price volatility has to stem from an approving of the price theory, which states that a commodity derives its price from the intensity of economic activities performed in the creation and transfer of value, from its primary mode into trade. Value is attributed to utility, or otherwise, value is attributed to the power of purchasing specific goods. Rare earth metals derive value out of relative scarcity and the exhaustive use of labour in its extraction (Smith 1776). Subsequently, the price of tin as a rare earth metal derives value from the fact that it can only be found in very specific geographical regions. The principal producers of tin are China, Indonesia, Peru, Bolivia, Brazil, Democratic Republic of Congo, Viet Nam, Malaysia, Australia and the Russian Federation (Metal Rare Earth Limited, US Geological Survey 2009).

At the same time, the price of tin derives value from a categorical measure as a primary commodity. Menger (1871) emphasised that the value of a commodity is intrinsically linked to its "utility at the margin." Like most primary products typically sourced from developing countries, the extraction of tin is directly affected by the speed of industrialisation and political stability in the producing country (Fraser 2013, Jansson et al 2009, US Geological Survey 2011). By economic principle, the price of tin, as a primary commodity, is influenced on the demand side. Tin demand is correlated with increased industrial use in packaging material, tin plating 16 percent chemicals, brass and bronze five percent, float glass and extensive application in consumer electronics 52 percent, which is a general fabrication material for countries with more advanced economies (Adams 2013, Alphamin 2013, World Bureau of Metal Statistics).



Adding to the price complexity is the fact that tin is a natural resource, little else a national wealth. Therefore its depletion and use are within the authority and

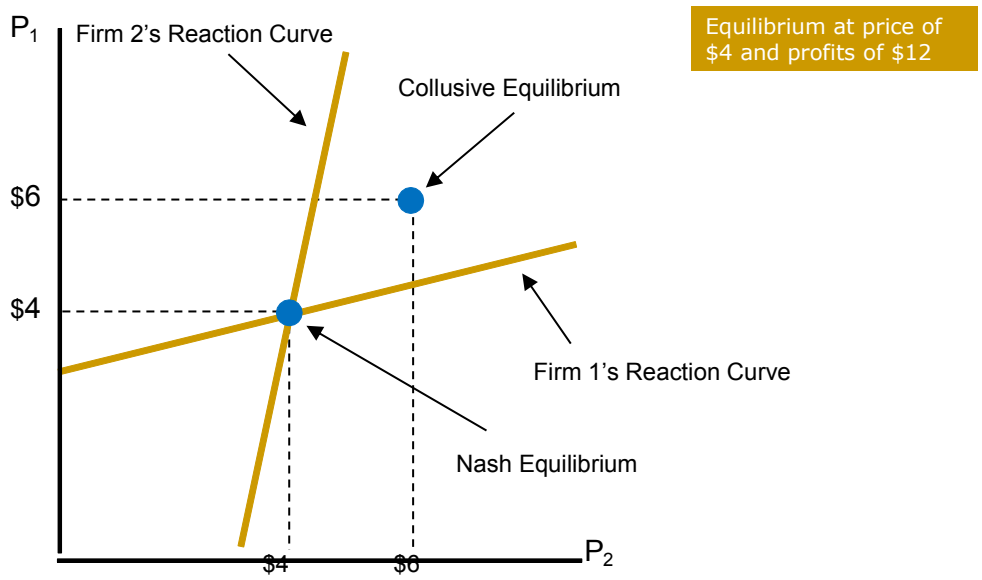
control of these country Governments. Price volatility is highly influenced on the supply side, which can be correlated to the socioeconomic and political circumstances at any given time (Fraser 2013, Jansson et al 2009). This explains why the World metals industry falls on the oligopolistic market behaviour, whereas export volumes can be slashed down in any instance where tin prices fall below marginal costs of production. Given the extreme price control on the supply side, consumers tend to restock and destock into price swings (Griffiths & Wall 2011, Gillespie 2011, Institute of Asian Economic Affairs 1962, Lipsey & Chrystal 2011).

The nature of tin in respect with price volatility can be reasoned further with the theory of storage which states that as inventory increases, the marginal expediency yield on inventory falls at a decreasing rate. Reversely, the theory predicts positive demand shocks just about peaks, generate large expediency yields and price, and in effect reduce metal inventories (Fama & Kenneth 2012).

The Bertrand Model points out that in an oligopolistic industry, competition may occur with price instead of output. Thus it can be assumed that Governments compete with price, not quantity. Having that tin as a commodity is homogeneous, other buying Governments are forecast to purchase from the seller with the lowest price. In which case, tin producing countries have the incentive of reducing prices below rivals. More importantly, is that these Governments of tin producing countries can conspire or collude, and decide to charge a uniformly towering price that optimises profits: P=P1=P2, rather than competition on commodity (Bertrand 1883).

Nash Equilibrium in Prices

(Nash, 1950)



The Nash equilibrium equation supports the Bertrand Model as a solution impression of a non-cooperative game involving players, in which each player is said

to recognise the equilibrium strategies of the other players. Therefore no player has anything to gain but by altering own strategy unilaterally.

Following this equation, the high volatility on tin prices is further expressed in the literature of Wittman and Weingast (2009), wherein the theory of political economy is put forward. Political economy is perceived as a grand amalgamation of political behaviour and institutions that influence social choice, pressure groups, policy, and international conflict (Wittman & Weingast 2009). As an example, the slippage in Global tin production in 2011 is reasoned with the stringent Government pollution controls and drought conditions in China (Fraser 2013). Indonesia on the other hand, which accounts for 40 percent of global tin trade for country exports, has changing mining regulations that are already in place for enforcement. Although China ranks first as an active trader in tin, country consumption outpaces production between 148,107 tonnes production and 176,000 tonnes consumed (World Bureau of Metal Statistics).

In order to reach a degree of economic price equilibrium, international or bilateral commodity agreements are oftentimes forged. Nonetheless these understandings are viewed with mistrust, given its limitations and effectiveness (Jansson et al 2009). For instance, in October 1985 the International Tin Council disclosed a lack of capacity to recompense debts to banks and metal brokers after defaulting on nearly £900 million, which proves that commodity agreements need to price realistically and are in fact more difficult to carry out (Prest 2009).

In the second quarter of 2008, the Chinese government through the Export-Import Bank of China concluded its USD9 billion deal which combines investment in infrastructure and an aid component, in exchange for the recapitalisation of Gécamines captivated in a long term agreement for crucial rare earth metal commodities. It is to note that both China and the Democratic Republic of Congo are state run economies, commonly described as an economic system in which economic activity is undertaken by the state. The coalition of these two tin producing countries is often dubbed as the Sino-Congolese Agreement, which implies the changing world order in the World metals industry that places China in authority of price (Centre for Chinese Studies 2008, Daly 2009).

In the same year the prices of tin fell steeply by fifty percent.

Notwithstanding, the Democratic Republic of the Congo is perceived as a failed nation weighed down in regional conflict and human suffering. Consequently international pressure casts substantial challenge on all countries in the trade of conflict minerals. In the trade of rare earth metals, there are four basic minerals extracted in eastern Congo: cassiterite which is the ore for tin, coltan the ore for tantalum, wolframite the ore for tungsten, and gold. Mineral trade provides sums of millions of dollars to rebel groups and particular units of the national army, for the ammunition and machinery to shore up rival campaigns (Global Witness 2013). This international pressure somewhat serves in favour of the demand side of the equation, and is represented through political movements that inhibit activities of tin producing countries, such as initiatives of the Extractive Industries Transparency Initiative, EITI (Jansson et al 2009).

In 2010, the US Congress passed into law the Dodd-Frank Wall Street reform act, which is a significant regulation revamp since the 1930s. The Dodd Frank conflict minerals provision instates corporate accountability Under Section 1502, requiring published information on the purchase of these four minerals: tin, tantalum, tungsten and gold, to verify any indirect funding to the armed groups in eastern DRC. The arguments put forward by the National Association of Manufacturers, Chamber of Commerce, and Business Roundtable concomitantly failed in American courts (Financial Times Lexicon 2013, Global Witness 2013).

In that same year the price of tin rose 16 percent.

Many institutions and scholars undertake to analyse price fluctuations of storable commodities traded in open markets, and which are frequently disrupted by random shocks. Mathematical simulations are devised to rationalise expectations of equilibrium, each one of these models analyse and test implications of derivatives. As a matter of fact these initiatives trace decades back, some other forecasting equations are calculated away the common assumption that these price shocks are independently distributed (Hooker 1967).

Jansson J, Burke C and Jiang W

Whatever else, this discourse is incomplete without the theory ‘homo economicus’, which surfaces in all rational economic models, and is defined as behavioural anomalies (Simon 1956). Suboptimal decisions are drawn to satisfy certain aspiration levels by human beings. Inevitably, the behavioural anomalies that are encountered in economic practice in the real world are often too significant to be ignored because this increasingly influence and shape the evolution of economic theory (Camerer 2006, Kahneman & Tversky 2000, Rubinstein 1998, Thaler 1994).

A point to ponder is whether the IMF graph on monthly tin prices between May 2008 and May 2013, is a statement in itself of the changing world order in respect to economic theory, and in the practice of China's cooptive conquest of the Congolese conflict cassiterite. The pressure particularly put on the Democratic Republic of Congo as a laboratory for economic advancement, is for the rest of the world to appreciate whether the Chinese framework for development can rationalise and reconfigure the global landscape, by contrast of democracy.

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