China's "Minsky Moment"?

The Qingdao Fraud and the rise and fall of the Chinese Commodity Collateral Financing Market

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Abstract

The Chinese government's 2008 economic stimulus plan led to a surge of liquidity entering the Chinese financial system and a rapid increase in credit provision to Chinese firms, with much of this channelled through the country's growing shadow banking system. Focusing on one particularly prominent credit channel, this paper uses the methodological device of the paradigmatic case study to explain the emergence and gradual unwinding of the commodity collateral financing (CCF) market. The CCF market evolved over multiple stages, and involved the storage of copper, aluminium and other metals in duty-exempt bonded warehouses, with warehouse receipts operating as collateral for firms seeking to borrow but lacking the political or economic clout to otherwise access capital. Subsequently, this channel was discovered as an effective and opaque mechanism to circumvent capital controls and exploit the interest rate differential between the onshore and offshore yuan, gradually developing into a primarily speculative instrument that allowed for all actors involved to profit through a potentially endless rehypothecation loop. In this process the market grew exponentially, impacting the country's overall balance of payments and moreover creating the opportunity for criminality.

In May 2013 authorities discovered that the Chinese trading firm Dezheng Resources had pledged non-existent metals to large Chinese and international firms, leading to a complete dissipation of trust among market actors and fire-sale dynamics. While at first glance the Qingdao port fraud appears to be solely a case of individual criminality, this paper argues that it highlights the convergence of two larger political and economic trends: firstly, the post-2008 development of a credit bubble in China and the subsequent deleveraging and reform process, and secondly the end of the 2003-12 commodity super-cycle. Drawing on Hyman Minsky's *Financial Instability Hypothesis*, Katharina Pistor's *Legal Theory of Finance*, as well as relational approaches to the understanding of financial markets from economic sociology and geography, this paper treats the Qingdao fraud as an entry point to explore broader changes within the Chinese economy and global commodity markets. More broadly, the case exposed the complexity of ongoing Ponzi-like financial practices in the sector, highlighting not only the opacity in the global metal market, but also the fragility of China's post-2008 growth.

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"*Confidence is the indispensable basis of all sorts of business transactions. Without it, commerce between man and man, as between country and country, would, like a watch, run down and stop.*" (Melville, [1875] 2010: 172)

1. Introduction

As Chinese authorities and creditors descended on the port of Qingdao, the world's seventh largest port, in May 2014, it quickly became clear that the Chinese-owned and Singapore-based Dezheng Resources had pledged the same aluminium housed in one of its warehouses multiple times to several domestic and international trading firms. The discovery of this large-scale warehouse receipt fraud reverberated far beyond the world of metals trading, with accounts in the financial media at the time describing it as China's "Minsky moment" (Bermingham 2014) and the "black swan event of the year" (Home 2014). As Dezheng's pyramid financing scheme began to unravel, it emerged that this was not an isolated incident and that several hundred million dollars of stored metals were unaccounted for and Dezheng's owner, Chen Jihong, was arrested. Chinese investigators in turn sealed off large sections of the port, and multiple other instances of warehousing fraud have been discovered in other Chinese economic free zones. Domestic and international banks and trading firms have gone to court in China, the UK and other jurisdictions to pursue their losses.

While the financial amounts involved in the Qingdao fraud are not systemically significant, its discovery led to the unwinding of the commodity collateral financing (CCF) market that had developed in China in the years following the 2008 global financial crisis. During this time China has been awash with liquidity following the country's $586 billion economic stimulus programme. Moreover, foreign investors were turning away from the low-interest American and Eurozone markets, and increasingly looking to China and other emerging economies for higher yields. The CCF market served two primary purposes. Firstly, it created a means for firms and individuals to access physical collateral in the form of metal for loans in a financial system where credit provision still relied heavily on proximity to state institutions. Secondly, it allowed banks and other financial institutions to circumvent capital controls and take advantage of the differential between offshore yuan- and dollar-denominated loans and interest rates in China.

Despite its extensive coverage in the financial press, the Qingdao fraud and the Chinese CCF market more broadly have so far received scant attention in the academic literature.[2] It is estimated that at its height, in 2012 and 2013, up to 15% of all capital flows into China were coming in the form of collateralized metal stored in loosely regulated bonded warehouses located in the economic free zones of major Chinese ports (Yuan et al. 2013). It is also estimated that more than 10% of the price increase for many non-ferrous metals (including copper, aluminium and zinc) during the years 2010-13 was caused by Chinese imports that were kept in port warehouses and used solely or primarily as rehypothecated loan collateral (Tang and Zhu, 2016).

While at first glance the Qingdao port fraud may appear to be solely a case of individual criminality, this paper argues that it highlights the convergence of two larger political and economic trends: firstly, the

[2] Notable exceptions include econometric treatments by Roache and Rousset (2015), Xiao and Balding (2015), and Tang and Zhu (2016). Roache and Rousset (2015) examine how credit shocks – for example associated with a rebalancing of Chinese demand towards consumption and away from production– would impact commodity prices, particularly for metals. Xiao and Balding (2015) focus on the carry trade strategy that draws on the interest rate arbitrage integral to this channel, tracking copper stock holdings in response to onshore-offshore interest rate margins and find a long run relationship exists between copper financing and the covered carry trade return during the period January 2003 and March 2015. Tang and Zhu (2016) develop a model that formalizes the causes and effects of financing using commodities as collateral in situations where capital flows are heavily restricted, but the trade in productive assets such as commodities is not.

post-2008 development of a credit bubble in China and the deleveraging process that started in 2014, and secondly the end of the 2003-12 commodity super-cycle. To elucidate these dynamics the paper examines the causes of the emergence of the CCF market and, subsequently, what led to its unravelling. In addressing this primarily empirical research question, the paper provides an entry point to understand much larger systemic dynamics in the rapid accumulation of corporate debt since 2008 and the country's current economic stagnation. The CCF market was integral to a boom in corporate lending following the 2008 stimulus, fuelling an enormous increase in corporate debt within a stagnating post-crisis global economy (Nolan, 2015; Pettis, 2016). While there has been, in the context of the recent economic crisis, a proliferation of analyses of the US and European shadow banking system, concern about the potential systemic risks inherent in China's shadow banking system have received more attention in academia and policy circles in recent years (Zhang, 2013; Elliott et al., 2015). However, there are thus far few in-depth analyses of the growth of specific credit channels operating outside the regulated banking system and no detailed analyses of the CCF market.

Secondly, in linking individual deviant behaviour at the micro-level, the evolution of a market itself (the meso-level), and the broader macroeconomic dynamics and legal institutions both are embedded in, this paper develops a theoretical framework that integrates three approaches: i) Minsky's "financial instability hypothesis" and particularly its stylised cycle of income-debt relations that culminate in crises (Minsky 1986, 1992; Kindleberger, 2000), ii) the "legal theory of finance" developed by Katherina Pistor and colleagues (Pistor, 2013; Hodgson, 2013; Awrey, 2015), and iii) emerging work in economic geography and sociology focused particularly on the relevance of relational dynamics in financial markets (Bathelt and Glückler, 2003; Knight and Sharma, 2015; Wigan and Seabrooke, 2016). This is intended to provide a means for addressing the complex logic underpinning the CCF market, its broader economic context, as well as the criminality its opacity and lax oversight invited.

Rather than explicitly critiquing any one of these theoretical approaches, I instead argue that viewing these collectively at a multi-scalar level enriches our understanding of the specific political economy dynamics underlying the case study itself, as well as the broader dynamics contributing to asset bubbles. This analysis therefore allies itself with the methodological tradition of the 'paradigmatic case study' (Flyvberg, 2006; Gerring, 2006). Such case studies function as exemplars to "establish a metaphor … for the domain that the case concerns" (Flyvberg, 2006: 232). Methodologically this paper draws on secondary accounts in the popular and specialized press,[3] semi-structured interviews with eight CCF market participants and observers based in London, Singapore and China, as well as a study of the legal documents that have since been made available, most notably from the Mercuria v. Citibank trial.

The paper proceeds as follows. Section two provides an overview of the relevant literature in financial economics and political economy, critical legal studies as well as economic sociology and geography. Section three in turn explains the case study at the core of this paper, focusing on the economic context of post-2008 China, as well as the functioning of the commodity collateral financing market, explaining how this market led to a speculative bubble that proved ideal for criminal activity. Section four links an analysis of the case study back to the theoretical in section two, and elucidates the contribution of this case study to our understanding of credit bubbles and globalised financial markets. Section five summarises the findings and concludes.

[3] Inevitably, this reliance on – in large part – secondary sources, carries with it some weaknesses, including its inflexibility and the need to trust those who initially compiled it. Given the legal and political sensitivity of the subject matter, and the difficulty of obtaining a large volume of detailed primary information it does however provide a best-available alternative to elucidate the dynamics underpinning the case (Clark 2004 [2013]: 57).

2. Literature review and theoretical foundation

This section elucidates the paper's three main theoretical building-blocks, and particularly their relationship to neo-classical economic theory about the evolution and functioning of markets, moving from Minsky's "financial instability hypothesis", to the "legal theory of finance", and thirdly the relevance of relational approaches in economic geography and sociology to the understanding of financial markets. The paper aims to demonstrate that jointly they provide a foundation for understanding the macro- and micro-economic, as well as the societal and individual behavioural dynamics involved in the emergence of a credit bubble, the appearance of large-scale criminality within this bubble, as well as the subsequent crisis dynamics characterised by a rapid loss of trust among participants and a collapse in asset prices. As such, this review serves to theoretically situate the empirics of the case study.

Minsky's "Financial Instability Hypothesis" and the global financial crisis

In recent years, and particularly in the context of the 2008 Global Financial Crisis, there has been a proliferation of scholarship on the causes and consequences of financial crises (Shiller, 2000; Reinhart and Rogoff, 2009). One central theoretical approach that has experienced a particular resurgence is the work of the American economist Hyman Minsky (1919-1996).[4] Minsky drew on the work of Irving Fisher and John Maynard Keynes, and focused on the role of uncertainty and the cyclical nature of capitalism in the development of financial crises, issues that he felt were generally neglected in popular Keynesian interpretations (Minsky, 1986). However, during his lifetime, Minsky's analysis of financial crises had primarily been influential in more heterodox economic circles (Keen, 1995; Wray, 2016). Though Kindleberger (2000: 13-22), among others, found it widely applicable for his economic history of financial crises in *Manias, Panics, and Crashes*, Minsky's model was primarily theoretical in nature. His work became more widely known outside post-Keynesian circles when the financial analyst Paul McCulley of the bond trading house PIMCO noted its relevance in explaining the Russian financial crisis of 1998 (Vercelli, 2011). However, with the recognition that the housing bubble in the US and the UK followed – in broad terms –Minsky's cyclical framework, interest in his work increased substantially and he gained renewed recognition among mainstream economists and is in turn being integrated into existing mathematical models (see, for example, Mian and Sufi, 2011; Eggertsson and Krugman, 2012).

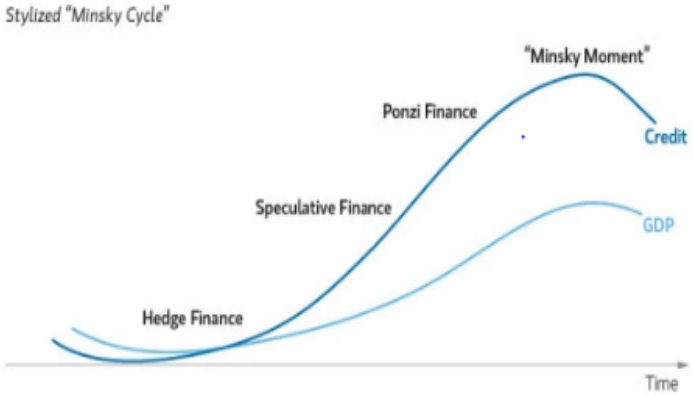
Minsky's central argument in the "Financial Instability Hypothesis" (Minsky, 1986; 1992) – that i) instability was integral to economic and particularly financial systems and ii) that long periods of stability almost inevitably foment crises – remains of great relevance for the analysis of credit bubbles. Minsky classified borrowers in credit markets into three categories: hedge borrowers, who can make payments from current cash flows from investments; speculative borrowers who can service debt from investments but must continually roll-over the principal; and Ponzi borrowers who rely on the appreciation of the asset's value to refinance their debt. Minsky's central argument, as depicted in a stylized model in Figure 1, is that over time and in the absence of any kind of government intervention, there is a shift in the relative preponderance of these three types of borrowers from hedge to speculative and eventually Ponzi. This argument – that 'stability is destabilising' – is grounded in the observation that during expansions, borrowers and lenders become increasingly confident that cash commitments can be met. In turn, lending standards and safety margins are reduced and riskier projects are approved (cf. Papadimitriou and Wray, 1999).[5]

[4] One particularly noteworthy example of this is the inclusion of Minsky's Financial Instability Hypothesis as the second theory in the Economist magazine's six-part series on "seminal economic ideas" (Economist, 2016)

[5] While not engaging directly with Minsky's work at the time, this mirrors Schiller's more expansive analysis during the late 1990s of the US equity market bubble that became highly influential in the field of behavioural finance (Schiller, 2000).

In this process, Minsky (1992: 8) argues, "the economy transits from financial relations that make for a stable system to financial relations that make for an unstable system." Eventually, the financial system seizes up and asset prices collapse – what has since been called the "Minsky Moment"– as trust dissipates from the financial system and even hedge borrowers struggle to find loans (Magnus, 2007; Whalen, 2008).[6] This paper situates the discussion of a Minskian financial cycle within the context of the Chinese financial system, an economy characterised by weak market institutions and the dominance of state-related companies within the financial sector (and in turn a very small institutional barrier between state and private sector financial systems). There is only limited analysis of Minskyian cycles within state-dominated economies (Vymyatnina and Pakhnin 2014 constitute a notable exception, examining the Soviet Union and contemporary Russia). However, such countries provide an additional layer of complexity to the analysis of Minskyian crisis dynamics, which are generally viewed as primarily relevant for developed Western economies. Thus, while there has been some discussion of the relevance of Minsky in contemporary analyses of the Chinese economy (cf. Nolan, 2015:11; Qi et al., 2015), none of these authors focus on the development and unravelling of specific asset bubble dynamics in contemporary China. It is further worth noting that the current era of global capital mobility and a "global financial cycle" (Borio, 2012; Rey, 2013) add an additional accelerating dynamic to the framework Minsky had envisioned, which implicitly assumes a largely closed economy. Both dynamics – relevant to this specific case – will be explored further in Section 4.

Figure 1: Stylised Minsky Cycle



Source: Komlik (2015)

Legal institutionalism and the Legal Theory of Finance

Legal intuitionalist thought (cf. Samuels, 1989; Deakin et al., 2015) and more specifically Pistor's Legal Theory of Finance (henceforth LTF, 2013) provides a second theoretical foundation for the analysis of the CCF market and the Qingdao fraud. The foundations of the LTF lie in early 20th century institutional economics and particularly the work of John Commons, who argued for a "unity of law and economics" (Commons 1924a). In perhaps his most notable work, *The Legal Foundations of Capitalism* (1924b), Commons emphasised the critical tensions in the legal make-up of modern-day financial markets and their governance, as well as the significance of the role of the state behind all property rights and

[6] Vercelli (2011) provides an important theoretical and semantic contribution to the discussion of the financial instability hypothesis, and the 'Minsky Moment,' placing the tripartite taxonomy Minsky developed on a continuum, comprising a 'Minsky process' where units are classified on two axes into six categories based on their liquidity and solvency ratios as either (hyper-)hedge, (hyper-)speculative and (highly) distressed.

market transactions. The legal system as such is thus not seen as a traditional, customary dimension of socio-economic orders, as argued in the Hayekian tradition, but as a an intentional construct by the state enabling and constraining the development of markets (Deakin et al., 2015, Hodgson 2016).[7]

The LTF focuses on the critical tensions in the legal make-up of modern-day domestic and global financial markets and their governance, arguing that the legal structure of finance is of central importance for explaining and predicting the behaviour of market participants and of market-wide outcomes. This builds on Minsky's understanding of crisis dynamics and the inherent instability of the financial system in an attempt to more strongly integrate the role of law and – to a lesser extent – politics in the financial system. Pistor (2013) moves from a series of stylised facts about contemporary finance to assert that financial systems are i) legal constructions that have evolved over time in light of financial and technological innovations and a political contestation over regulations between private actors and states, ii) essentially hybrid with the state providing enforcement and backstopping institutions for markets in which primarily private actors engage, iii) inherently hierarchical in that existing legal constructions apply differently to actors relative to their systemic significance and their proximity to the apex of the system, and iv) that these legal constructs, while intended to be stabilising, can be sources of substantial instability. This stands in stark contrast to the neo-classical perspective (cf. La Porta et al., 1998) on law and finance, by viewing financial systems as not self-stabilising, rejecting many of its central assumptions with respect to information cost and liquidity, broadening the scope beyond equity and private debt markets, and – perhaps most importantly – arguing that law is endogenous to finance (Awrey 2015; see Figure 2).

Figure 2: The Legal Theory of Finance and the Neo-Classical View

	Neo-classical law and finance	**Legal Theory of Finance**
Key assumptions	- Low information costs - No uncertainty - No liquidity constraints	- High information costs - Fundamental uncertainty - Liquidity constraints
Market environment	- Self-stabilising	- Not self-stabilising
Market segment	- Equity, private debt	- Derivatives, structured finance, wholesale funding, public debt
Relationship between law and finance	- Law as *exogenous* to finance - Law as a source of credible commitments	- Law as *endogenous* to finance - Law as a source of credible commitments - Law a source of potential financial instability through contractual rigidity and correlated regulatory arbitrage

Source: Awrey (2015)

Examining the Chinese financial system through the lens of the LTF has of late become as a particularly salient contextual example to demonstrate its explanatory power. Li et al. (2015) see the Chinese financial system's current instability in the context of its development over the past two decades from a state-controlled to a hybrid system, with credit intermediated by state-linked (and in some cases state-owned) entities. Capturing this hybridity, the authors argue, requires a "better understanding of the specific institutional mechanisms that link the allocation of resources to leverage, and leverage to backstopping" (Li et al., 2015: 19). Awrey's (2015) LTF-based analysis of the Chinese shadow banking system, focuses on a rapidly growing segment of this system: the $2 trillion market for wealth management products (WMPs). While financially more significant in terms of size and volume, these

[7] For similar reasons, the legal institutionalist school also takes issue with the understanding of the role of the law in markets in the work on transaction costs and property rights by Coase (1937), Alchian and Demsetz (1973) and Williamson's new institutional economics (1985), where markets operate largely exogenously to the law.

products have some similar characteristics to the CCF market. For one, they are premised on a maturity mismatch, locking in capital for short time periods while reinvesting this into less liquid, longer-term assets. Moreover, WMPs evolved as private contractual responses to restrictive regulatory features and the nature of these contracts remains inherently subject to the behaviour of state actors. It is precisely this dynamic conceptualisation of hybridity in the LTF that becomes of particular relevance in examining the evolution of the CCF market, where the involvement of the Chinese government and of different state agencies played a central role in shaping its evolution.

Relationality in financial markets

The LTF argues that the law is the central vehicle through which modern financial markets are expanded from the developed world to the periphery, and in turn, relational finance is gradually replaced with arms-length market-based finance (Pistor 2013). However, a central component to understanding the operation of the CCF market remains its hybridity, which exists not only between public and private actors, as discussed above, but also between its arms-length and relational characteristic. This relational dimension of financial systems is elucidated in work on the sociology and the geography of finance, where the role of relational ties within the financial system – which remain of more peripheral interest in the LTF – are more prominent. Two aspects of this relational perspective are of particular relevance for the analysis of the case study: the work on different forms of modern financial market structures within the "Global Wealth Chain" framework (Seabrooke and Wigan, 2016) and work on the sociology of fraud (Goffman, 1959; Clark, 1997; Harrington, 2012). This provides a relational perspective on financial markets and the behaviour of actors within financial markets to complement the previous discussion of Minsky's analyses of financial cycles, as well as the Legal Theory of Finance.

Originating primarily in the 'new economic sociology' and its critiques of Williamson's new institutional economics, Granovetter (1985) argued that Williamson's transaction cost approach obscures the fact that interpersonal relations between actors and expectations derived from this constrain opportunistic behaviour (see also Swedberg, 1997; Krippner and Alvarez, 2007). Thus, while not fundamentally questioning the central premise of a rational actor, Granovetter's critique focuses on the role played by social context and trust-based networks in which an actor is embedded that enable interactive and collaborative learning. Similarly work on the sociology of fraud in financial markets, which is inseparable from the relational dimension of trust and confidence in transactions, has in the decades since influenced work on the relational nature of financial markets (Harrington, 2012). Closely related to this, in economic geography, the so-called 'relational turn' has focused on the concepts of context, contingency and path-dependence of economic action, and in turn the localized consequences for economic-geographic analyses (Bathelt and Glückler, 2003: 139). Such a relational approach seeks to "identify the complex relational geometry comprising local and non-local actors, tangible and intangible assets, formal and informal institutional structures, and their interactive power relations" (Yeung, 2005: 38). In the geography of finance, and building on Clark and O'Connor's (1997) typology of informational outcomes for financial products, this relational perspective has found particular adherence (cf. Hall, 2012; Lai, 2012; Dörry, 2016).[8]

In this context, the actual meso-level structure and logic of these financial interactions and transactions is of central concern, and here the recently developed Global Wealth Chain (GWC) heuristic (Seabrooke and Wigan, 2014; 2016 forthcoming) provides helpful guidance. Like the LTF, its theoretical

[8] Knight and Sharma (2016), in their analysis of infrastructure markets, complicate this picture, arguing that financial markets in this asset class remain stuck within a permanent state of 'informational translucency'.

foundation can be found in the early institutional economic analysis of property rights of Commons and Veblen, and particularly the recognition that the value of an entity can be derived through its intangible properties that are in part legally circumscribed (Veblen 1921). As such value is founded both in law and in finance, and wealth chains, they argue, function because capital is composed of property, jurisdiction and underlying value.[9] Here, the rising significance of wealth-based forms of capital (rather than those derived from income), make the economic geography of wealth chains more significant over time than production-based value chains.[10] Building on the framework of global value chain (GVC) governance (Gereffi et al., 2005), Wigan and Seaborooke argue that the mode of wealth chain governance is determined by the complexity of information and knowledge transfer, the regulatory liability involved in transactions, and finally the capabilities of suppliers to create solutions that mitigate uncertainty. These in turn determine which of the five types of governance – market-based, modular, relational, captive or hierarchical – the respective wealth chain falls under (see Figure 3).

Figure 3: Determinants of global wealth chain governance

Governance type	Complexity of product and services	Regulatory liability	Capabilities to mitigate uncertainty	Degree of explicit coordination
Market	Low	Low	High	Low
Modular	Low	High	Low	↑
Relational	High	Low	High	
Captive	High	High	High	↓
Hierarchical	High	Low	High	High

Source: Seabrooke and Wigan (2014)

To summarise, this review of relevant theoretical literature does not intend to provide a new framework *per* se, but rather to create an epistemologically helpful foundation of theoretical building blocks to holistically and inductively analyse the CCF market case study. A central premise of this analysis is firstly, that the CCF market was itself characterised by irrationally exuberant bubble dynamics and secondly, that these were a contributing factor of a much larger speculative bubble in the Chinese post-2008 economy. Thirdly, the utility of presenting such a multi-scalar and inter-disciplinary theoretical foundation is intended to emphasise both structure and agency in the multi-causal emergence and development of the cyclical bubble dynamics that the case study examined in Sections 3 paradigmatically embodies.

3. The Chinese commodity collateral market and the Qingdao port fraud

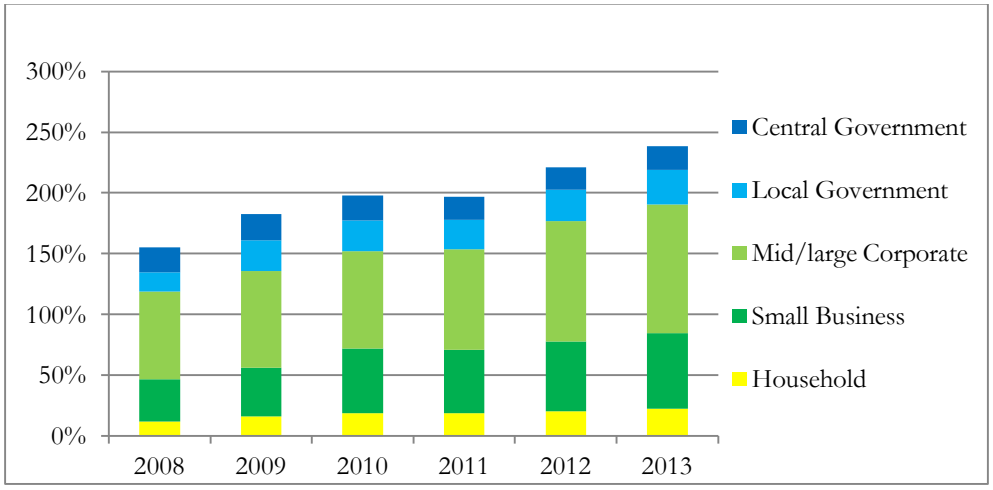
[9] The Global Financial Network framework (developed in Coe, Lai and Wójcik, 2014) in a recent elaboration by Haberly and Wójcik (2015) also recognised the centrality of Veblenian tradition in understanding the bottom-up evolution of economic emergence.

[10] In broad strokes, this mirrors the thrust of Piketty's Second Law of Capitalism, namely that capital's share of income increases over time as population and technology growth stagnate or decline (Piketty, 2014).

The Chinese CCF market and its regulation

Following the onset of the financial crisis in late 2008, the Chinese government launched an unprecedented public investment and stimulus programme (Liu et al., 2016). Together with a low interest rate environment in OECD economies (and in turn a search for yield by asset managers, institutional investors and others), this contributed to a massive increase in debt, with much of this increase due to lending to businesses (BIS, 2015; see Figure 4). As the government gradually attempted to tighten credit from the official banking sector, non-bank onshore and offshore lending increased from less than 20% in late 2007 to more than 30% in 2015, with a substantial part of this provided by the rapidly growing shadow banking system, which increased over six-fold in terms of overall lending between 2007 and 2015 (see Figure 5). The Chinese banking system has historically had very limited experience lending to non-state-owned firms (and especially small and medium-sized enterprises), and thus many borrowers had no substantive credit history to provide as a basis for lending decisions (Elliott et al., 2015). The scope for using collateral for a secured loan was broadened significantly through the 2007 passage of the landmark Property Rights Law which, among other things, included an expansion of the scope of movable collateral that can be used by borrowers to secure a loan and included equipment, inventory, and accounts receivable. This greatly improved the ability of firms to borrow on the basis of existing tangible assets (Roache and Rousset, 2015).

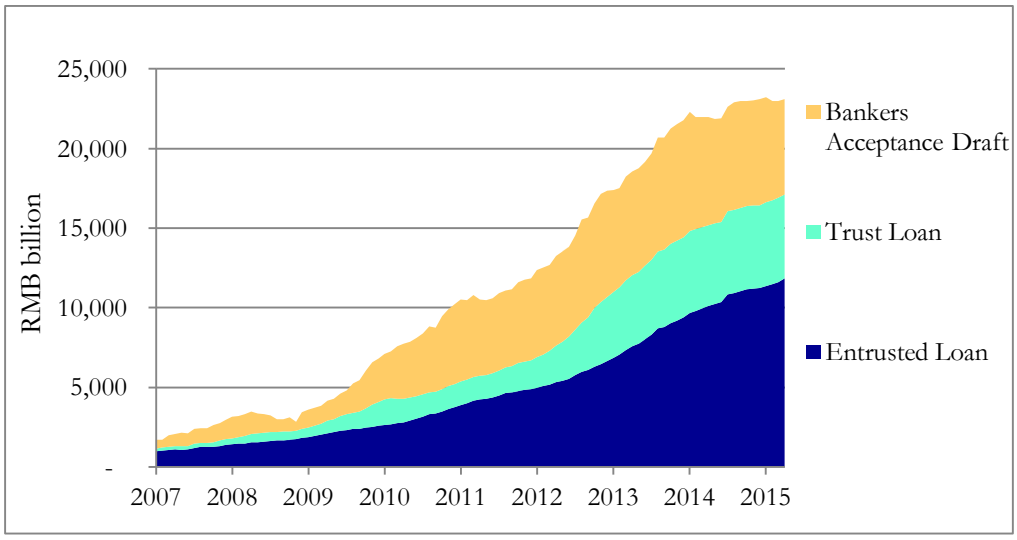
Figure 4: Debt as a share of GDP in China by economic sector



Source: China National Statistics Bureau, Morgan Stanley, Starfort in Zhang (2015)

Figure 5: Growth in lending by "shadow banking" institutions according to different activities[11]

[11] There are multiple types of financial activities that are part of what is considered the shadow banking system in China, including but not limited to trust loans, entrusted loans and acceptance drafts (see Elliott et al., 2015 for an overview). Trust loans are transactions undertaken by trust companies, a type of firm combining elements of banks and fund managers. Entrusted loans are loans made by firms in the non-financial economy run through banks for legal reasons. Bankers' acceptance drafts are certificates issued by banks promising to make a future payment and backed by a deposit from the party desiring the acceptance to be issued.



Source: PBoC, MOF, BIS, CEIC, New America Foundation in Zhang (2015)

The growth of the CCF market was both a symptom of these developments and a cause for its further acceleration, constituting between 10% and 15% of China's short-term foreign exchange inflows (Yuan et al., 2013). The viability and rapid growth of the CCF market as part of the growing shadow banking system relied on two factors related to Chinese financial market governance: the existence of capital controls, which ensured that there were limitations on how much short-term capital could be brought into China from abroad, and the differential between (very low) dollar and offshore yuan interest rates and significantly higher interest rates set by the People's Bank of China (PBOC) in an effort to appreciate and internationalise the renminbi. This created an opportunity to arbitrage this differential via the current account through imports, and thus circumvent capital controls, As such, a substantial part of commodity imports to China were driven by demand for collateral, rather than for raw materials as inputs to further production.

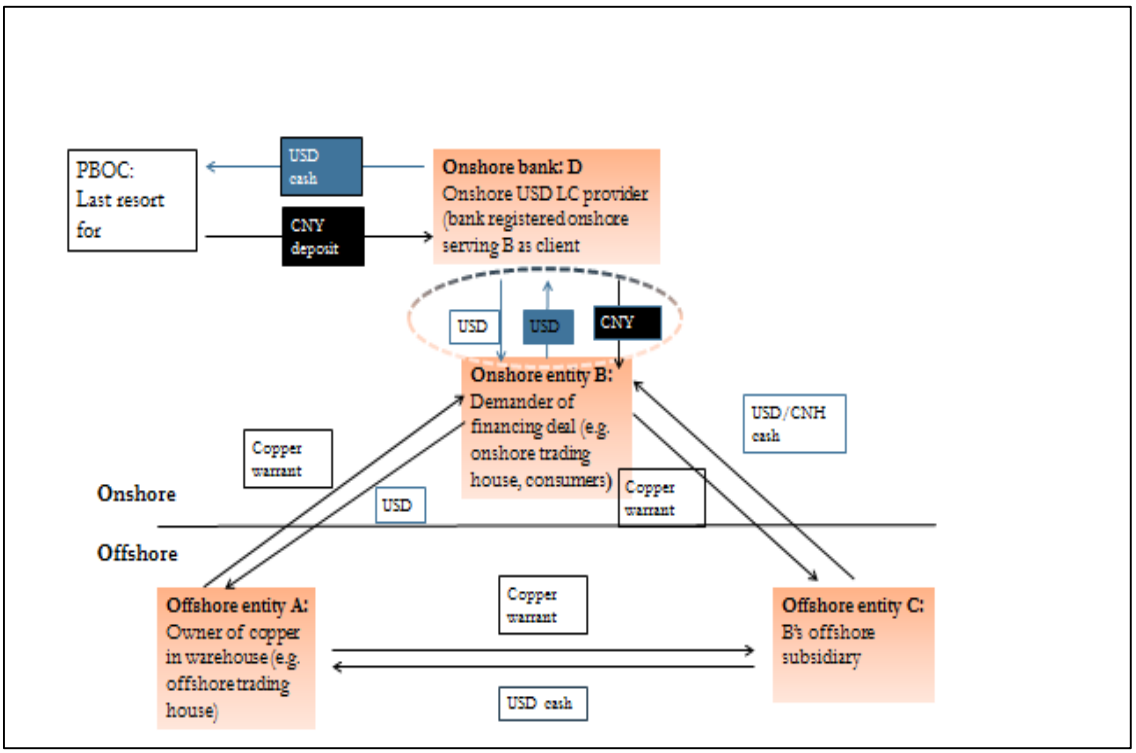
Given the scale of 'genuine' demand for metal as an input into production, the large volumes of metal entering the country for collateral purposes was initially only spotted by metals traders with detailed knowledge of these markets. Chinese demand for commodities had been a central driver of price dynamics over the past two decades, and this accelerated following the start of the financial crisis, when the country became the largest consumer of tin, iron ore, coal, steel, zinc, aluminium, copper, and nickel, as well as the world's second-largest oil consumer (Farooki and Kaplinsy, 2012, Preston et al., 2016). The Chinese CCF market thus functioned as a quasi-shadow banking system. Central to the functioning of the CCF market were two other dynamics. Firstly, between 2008 and 2014 price curves for most metals moved into contango (i.e. forward prices exceeded spot prices) meaning traders who were willing to buy the underlying commodity, store it, and simultaneously sell futures at a premium and then await collection of the premium associated with holding the good once the commodity was delivered, could make a substantial profit (Pirrong, 2014; Tang and Zhu, 2016).

The escalation of this system, with its ability to create scope for fraud and criminality, was further enabled by the opacity of Chinese system of privately owned and operated storage sites in tariff-free zones, which operated independently from the already opaque and over-loaded system governed by the London Metals Exchange (LME). Warehouse receipts provided by operators were then used to collateralise loans with proceeds used for investment in higher-yielding endeavours. In this context, firms purchased metal for warehouse storage to use as collateral, with no intent to actually use the commodity. In turn, collateralisation through securitised repurchase (repo) transactions meant that banks could

provide almost limitless financing through their ability to raise funds through other financial products or through capital investments in, for example, infrastructure (Kaminska, 2013).[12]

Figure 6 illustrates the operation of these deals within the CCF market (see Yuan et al., 2013). Offshore traders (entity A; for example, a large international mining company or trading firm) would sell warehouse receipts (or warrants) for copper primarily stored in tax-exempt bonded warehouses in Shanghai and other eastern seaboard port cities to onshore parties (entity B) at a given price, who would in turn import the copper and pay through dollar-denominated letters of credit issued by an onshore bank (entity D). This entity – generally a Chinese trading company or a Chinese subsidiary of a large international trading house[13] - would then sell and re-export the copper by sending the warrant documents (but not the physical commodity) to its own offshore subsidiary (entity C), paying in either dollars or offshore Chinese yuan. The Chinese trading firm (B) then converted these USD or offshore CNY to onshore CNY through a Chinese bank or financial institution and reinvested at a higher interest rate. The offshore subsidiary then would sell the warrant back to the original foreign seller (A) in USD or offshore CNY at a slight discount, and this process could in turn be repeated as often as possible during the duration of the LoC (usually 3-12 months). Thereby, the notional value of the LoCs for a given tonne of stored metal (which remained in the bonded warehouse for the entire duration) could be 10-30 times the value of the actual metal involved, contingent only on the amount of time required to complete each of the administrative steps in the chain.

Figure 6: Stylised diagram of CCF market



[12] A commodity repo involves the sale and repurchase of a commodity with a counterparty, which transfers the title to a financial institution. Institutions may seek funding from the repo market when they are constrained by borrowing limits. Counterparties purchasing the commodity can keep the asset off their balance sheet, but at the same time take on new risks associated with ownership. As such, repo transactions transformed the nature of risk from one of credit risk, into legal, operational, market and management risk (Wynne and Koshy, 2015).

[13] An informant interviewed in Kaminska (2014) argues that it would primarily be domestic entities channelling resources into other activities, with international-linked firms too concerned about government rules and wary of doing anything that might jeopardise their market access. However, it is speculated by some that the Chinese State Reserves Bureau (SRB) also has significant copper holdings in China that may have also been distorting prices.

Source: Based on Yuan et al. (2013)

While the precise scale of this system remains unknown, it is estimated that at least 5 million tons of metals imports were being concealed in what became known as 'dark inventory' (Kaminska, 2015.). In 2012, 90% of copper stored in Shanghai's tariff-free zone was for financing purposes, totalling more than 500,000 tons, equivalent to approximately 2.4% of global consumption in 2012 (Economic Observer, 2012 in Tang and Zhu, 2016). Given the availability of cheap domestic credit the market began to compensate producers for producing commodities that were needed only for collateralisation purposes (Kaminska, 2013). According to one interviewee, a Singapore-based trader working for a Chinese trading firm, "*Everyone was involved at the time [and] many Chinese companies existed only to take advantage of this trade based on the interest rate arbitrage*." For banks, on the other hand, this was a deal with no clear downsides: transactions could be kept off balance sheets and clerks received commission on each transaction.[14]

Despite repeated efforts, Chinese regulators were unable to limit the scope of these transactions and its embedded risk until quite late in the process. This was due to a number of reasons, though at the outset it appears to have primarily been one of prioritisation. At the start of the 2008 financial crisis, Chinese regulatory authorities were focused on a dual goal of ensuring both that Chinese producers would not be detrimentally impacted by the global collapse in aggregate demand (though a large-scale stimulus) and that over-leveraging would not spill over into the domestic financial system (through capital controls). The emergence of this market thus represented an unintended consequence of these actions. Initially, Chinese authorities underestimated the scale of the collateral channel, while worrying that that any drastic action could lead to a fall in metals prices and the large-scale failure of many deals and the institutions involved in them. When first reports of fraudulent receipts started to surface in 2011 and 2012, the Chinese State Administration for Foreign Exchange (SAFE) introduced new regulations to dampen financing activity but investors soon developed ways to work around these activities rendering them ineffective (Kaminska, 2014). In 2013 regulatory authorities finally attempted to clamp down on over-invoicing. However, for at least five years, while prices were steadily increasing and interest rates remained high while the yuan continued to appreciate, the CCF market represented, in the words of one commentator, "an impressive example of banks and corporates teaming together to bypass the government's clampdown on leverage" with the financial sector and traders innovating around government efforts to rein in credit growth and informal lending (Kaminska, 2011).

Thus, even in the lead up to the discovery of the Qingdao fraud the PBOC repeatedly attempted to reign in the unrestrained use of LoCs to make further loans, requiring banks to place part of the original collateral held against LoCs in reserve accounts. However, this was of only limited use in tamping down runaway lending, as much of the trade had shifted to foreign banks in Hong Kong, Malaysia and Singapore (Kaminska, 2014). Furthermore, regulators threatened transgressors bringing foreign capital into asset markets with the revocation of trading licenses, among other things. On the borrower side, China's Ministry of Industry and Information Technology issued orders in 2013 to over 1,400 companies in 19 industries to close facilities and eliminate excess production capacities, targeting particularly major energy-consuming and high-polluting industries (steel, electrolytic aluminium, cement, and plate glass, as well as copper and lead smelting). However, compliance with these orders was patchy and it is possible that this clampdown may have further incentivized firms to seek funding through alternative and even more opaque lending channels.

[14] Some have also argued that for Wall Street banks, commodity financing deals, including through CCF markets, was in part motivated by an effort to evade Dodd-Frank regulations on the standardisation of financial instruments (Kaminska, 2012).

The discovery of the Qingdao fraud and its aftermath

The discovery of the large-scale fraud at the port of Qingdao in May of 2014 can be seen as an almost inevitable consequence of the gradual regulatory clamp-down on "dark storage" in the CCF market. Already in 2012, Chinese banks and companies were unsuccessfully attempting to seize steel pledged as collateral by firms that were defaulting on loans (Lian and Wong, 2012), and concerns about the risks inherent in 'dark storage' were growing. Nonetheless, its discovery represents the high-water mark of this particular channel gradually unwinding, both given the financial scale of the fraud and the number of prominent firms involved.

The discovery of Dezheng's malfeasance was part of a broader probe into both the CCF market and into local party leaders. One month before the discovery the country's anti-graft authorities launched investigations into the city's Party secretary, Mao Xiaobing, for "serious discipline violations" (Home, 2014; Stockman, 2014). These led investigators to Dezheng and its owner Chen Jihong, an associate of Mao's, who was at the same time facing litigation by China's Shanxi Coal International Energy Group over missed payments. Chen, who had in 2010 featured in Forbes list of China's 500 richest people with an estimated fortune of $500 million,[15] was a well-known figure in the Chinese commodities trading and warehousing scene, and had made his fortune in mining enterprises in Western China, Mongolia and Cambodia.[16] Chen's inability to pay Shanxi caused other creditors, who had received warehouse receipts from Dezheng-linked companies to fear for their inventory. As the warehouses were raided, only about 100,000 tons of aluminium ingots could be found even though creditors – including 18 domestic banks, international banks and trading houses – held warehouse receipts for 300,000 tons. Chen was in turn detained and put under residential surveillance while creditors and authorities descended on the port. The Qingdao government gathered representatives from banks, regulatory agencies and trading firms to discuss the case, while domestic banks were asked to verify whether any loans related to Dezheng Resources were on their books.

As multinational companies, including Standard Chartered, HSBC, Citigroup, Glencore, Mercuria and Trafigura indicated that they had been exposed, the total scale of fraud became increasingly apparent with losses initially estimated at US$1 billion and Chinese media reports suggesting that Decheng owed Chinese banks upward of $2.5 billion (Bermingham, 2014).[17] In turn lawyers began unwinding complex financing deals to determine liability. For example, the Chinese state-owned commodity house, Citic Resources, announced that over half of its aluminium stock at the port was missing (Bermingham, 2014), while Citic was sued by ABN Amro for having made erroneous claims in financing deals. Citic Resources in turn sued Qingdao court over $108 million (Reuters, 2014).[18]

However, the most prominent case emerging from the Qingdao fraud was that between the prominent Swiss trading house, Mercuria and Citigroup over who would be liable for $270 million of

[15] See http://www.forbes.com/lists/2010/74/china-billionaires-10_Chen-Jihong_16B3.html

[16] Chen's involvement in Cambodia, through a $3 billion investment through the Dezheng subsidiary Erdos Hongjun Investment Co. Ltd that was set up specifically for this investment, remains shrouded in mystery. One legal commentator at the time wrote: "The total proposed investment would equal half of what has been invested in Cambodia from China over the past decade, yet there is not a single news report in China discussing the matter. The announced investment target is in power plant and other heavy infrastructure, but the first actual project is a sleazy real estate deal in Phnom Penh. … Though there is no way to know for certain what is going on, I would not be betting on seeing any new Chinese power plants in Cambodia anytime in the near future." (Harris, 2011)

[17] Other reports have placed total losses due to frauds like those perpetrated in Qingdao Dezheng at $10 billion (Zerohedge, 2014)

[18] Other related lawsuits include the $177 million lawsuit directly against Dezheng by Shanxi Coal International Energy Group (which sparked the entire crackdown), Glencore's lawsuit against the Qingdao Port and related companies ($58 million), as well as by Standard Chartered against Zhong Jun Resources ($36 million) (Wong and Aizhu, 2014).

losses.[19] The complexity of the obligated repo arrangement between Citi and Mercuria is substantial, but in essence Mercuria remained responsible for storage and insurance during the deal, which Mercuria in turn passed on to a Dezheng subsidiary. Specifically, the legal dispute centred on metals-related transactions entered to by both parties, where Citibank purchased metals from Mercuria and the parties agreed to latest sales dates in July 2014.[20] Following the discovery of the fraud in early June, Citigroup served bring-forward event notices to Mercuria as the relevant storage facility was no longer licensed or otherwise able to safely store the metal, requesting that Mercuria re-purchase around US$270m of metals from Citibank. Mercuria disputed the validity of these notices and refused to pay, with Citibank disputing Mercuria's refusal and terminating all outstanding transactions. Mercuria in turn claimed that Citibank was unable to validly perform delivery obligations meaning that it could not perform a valid forward sale by endorsing the warehouse receipt. One month later, Citi claimed to deliver the metal to Mercuria by tendering warehouse receipts issued to Citi. Citi did not issue release instructions to the warehouse operators and the operators likewise issued no release confirmation or any new warehouse receipts made out to Mercuria (Taylor and Hardaker, 2015). According to emails read during the trail, Mercuria initially promised that in case of concern regarding the underlying metal, "Mercuria would make Citi whole." (Wynne and Koshy, 2015).

It is this complexity of storage responsibility that was at the heart of the resultant trial: while known warehouse operators were the named storage facilitates in the deal, they used local bonded warehouse companies to issued warehouse receipts up the chain and eventually to Mercuria and Citi (Hume and Sanderson, 2015). The trial, conducted in London, hinged on whether Mercuria was acting in good faith or had a responsibility to verify final storage responsibility and – returning to the diagram in Figure 6 – whether transfers of warrants for underlying goods actually constitutes a "delivery" of the metal in question. (Kaminska, 2014; Sanderson and Hume, 2015). Citi argued that the master agreement behind the repo censured that storage and supervision responsibility fell with Mercuria, with the warrants rather than the actual physical metal constituting the delivery, while Mercuria argued that the delivery of the physical metals constituted a fulfilment of its terms. Mercuria was in the end given right and cleared of acting in bad faith, leaving Citi with over £270 million in losses.

Beyond the complex legal process stemming from the fraud, it also had substantial implications that are still only playing out and often not fully extricable from broader dynamics in commodity markets. For one, it led to a 'flight for safety' with many banks asking clients to shift metal to more regulated LME warehouses outside China to limit exposure (Burton and Wong, 2014). While the scope of this is unclear, metals export data show a significant spike following the Qingdao port scandal. Chinese regulators sealed off the port for many months and numerous arrests followed the probe. Details of how domestic creditors who bore the bulk of losses were compensated remain unclear, though as Pirrong (2014) argues, it appears that the government stepped in to provide an implicit backstop, especially as many were state-owned.

4. Anatomy of a bubble: three complementary explanations

[19] Mercuria had itself recently risen to notoriety and fame in the commodities world, only ten years after its founding by former Goldman Sachs oil traders, buying up JP Morgan's physical commodity business and announcing a substantial expansion into new markets. Its engagement in high-volume Chinese copper financing deals was a significant factor in making it the third largest commodity trader.

[20] This was based on two "Master Agreements" signed between the two companies in 2013 relating to sales and purchases of metals, providing for the sale of metals by Mercuria to Citibank, subject to a repurchase obligation by Mercuria, with Mercuria's parent company guaranteeing the sale.

Returning to the three theoretical building-blocks outlined in Section 2, the following section integrates the case study of the CCF market and the Qingdao fraud elucidated in Section 3 to analyse the market evolution and the Qingdao fraud according to three theoretical lenses discussed earlier: Minsky's 'Financial Instability Hypothesis', Pistor's 'Legal Theory of Finance' and the role of relational dynamics in financial markets.

A Minsky cycle in globally integrated, state-dominated financial markets

The preceding analysis of the CCF market illustrates the presence of all three aspects of cyclical income-debt relations identified by Minsky in the "financial instability hypothesis". Initially, the import and storage of copper and other metals served primarily as collateral for loans for those firms lacking other fixed and relatively stable assets. Gradually, the re-hypothecation scheme surrounding the commodity imports became central and an industry emerged primarily to facilitate these arbitrage deals, with loans continually rolled over on three- to six-month LoCs. Finally, the opacity of the market fostered the emergence of criminality, with the Qingdao fraud representing the tip of the iceberg in a system gradually veering towards instability. More broadly, many of the investments at the time against which the metals served as collateral went to further fuel a speculative bubble, particularly in the construction sector, driven by the government's post-2008 stimulus and by foreign asset managers looking to invest in China and other emerging markets.

However, while Minsky's analysis provides a useful starting point, the specific Chinese context of the past decade provides a unique setting that in some ways diverges from the types of asset bubbles in US equity and bond markets that Minsky primarily analysed. For one, the Chinese financial system remains state-dominated, with a very small, or non-existent institutional barrier between state and private money systems. In adapting Minsky to the USSR in its final years and to Russia from 2008-10, Vymyatnina and Pakhnin (2014) focus on two peculiarities of such state-dominated and transition economies where changes to the money supply are political decisions. Firstly, enterprises are incentivized to bargain for low levels of production while asking for excessive quantities of intermediate goods (such as copper and aluminum), sending false signals about the firm- and industry-level investment. Secondly, these false signals mean that investment decisions are based on miscalculations, inertia and political reasons in the absence of a strict budget constraint or any process of creative destruction, in turn leading to declining returns on investment and endogenous cycles of internal and external credit expansion (Vymyatnina and Pakhnin 2014, 15). As such, the state becomes a central actor in the emergence of bubbles due both to sins of commission and omission – the former, by establishing a rigid planning framework that encouraged pro-cyclical inertia and deceptive behavior among market actors, and the latter by failing to provide sufficient enforcement mechanisms to punish this behaviour.

In the Chinese context, similar dynamics apply: a sudden injection of state liquidity through the government's stimulus programme led to banks being encouraged to lend, with state-owned enterprises (SOEs) benefiting disproportionally relative to non-SOEs. Furthermore, over time bank lending became less responsive to firm profitability in general, and for SOEs, as well as for non-SOEs from favoured industries and regions and those with political connections, while investments became less responsive to the likely return of investment opportunities (Liu et al., 2016, see also Song et al., 2014). In the case of the CCF market, it initially enabled firms (primarily "hedge borrowers") to provide collateral in order to access capital under less rigid lending conditions from both state-owned and state-linked banks and increasingly through the shadow banking system. During the speculative phase, the collateral rehypothecation loop, which involved primarily traders and shadow banks, became a source of concern for regulators, but new restrictions could generally be "innovated" around. Finally, the emergence of

pyramid schemes was only a matter of time given the opacity of the market and the inability of regulators to keep up with these innovations.

A second dynamic that goes beyond Minsky's analysis, though not Kindleberger's,[21] is the existence of global capital mobility, and the cross-border spill-over effect of crises in what Helene Rey (2013) has termed the "global financial cycle" (see also Bruno and Shin, 2013). Driven by loose monetary policy in the US and EU, the search for yield by globally mobile asset managers had restricted the policy space of regulators even further, leading to pro-cyclical credit growth, with independent monetary policies only functioning within a rigidly managed capital account. The capital controls instituted by Chinese policy-makers attempted to address this "impossible dilemma" (Rey 2015), but the CCF market created a back-channel for foreign capital to enter the country through the current account (i.e. as commodity imports). As such, the flipside of the global financial cycle is the persistence of geographically cyclical dynamics in the global financial crisis. Haldane (2015: 11) argues:

> Recent events form the latest leg of what might be called a three-part crisis trilogy. Part One of that trilogy was the "Anglo-Saxon" crisis of 2008/09. Part Two was the "Euro-Area" crisis of 2011/12. And we may now be entering the early stages of Part Three of the trilogy, the "Emerging Market" crisis of 2015 onwards. The three crisis legs have common cause in a large slug of global liquidity. As this has rotated around the international financial system, it has by turns inflated then deflated capital flows, credit, asset prices and growth in different markets and regions.

This accounts for the complexity of addressing the cyclical dynamics at a national level. Recent adaptations of Minsky's "Financial Instability Hypothesis" to take account of the proliferation of global imbalances via stock-flow consistent approaches provide, Dymski argues (2016 forthcoming: 10), a means to analyse the current crisis "as an expression of imbalances at the level of the whole, driven by debt overloads and balance-sheet inconsistency" (see also Keen, 2015). Thus, while the dynamics of the CCF market very closely mirror a Minskyian cycle, providing a self-perpetuating, profitable short-term mechanism to maintain economic stability and continue the provision of liquidity in an economy that was reaching the limits of domestic aggregate demand, the simultaneous glut in *global* aggregate demand, particularly in a developed world mired in 'secular stagnation', further exacerbated the pro-cyclical debt accumulation dynamics that are a central cause of current economic turmoil in China.

The CCF market as a legally constructed financial innovation

The precise impacts of the emergence of this large-scale commodity collateral financing channel remain unknown and there has been limited empirical work carried out, though there is clear evidence that it greatly increased commodity demand and contributed to higher spot prices as well as risk premia for futures. However, the unravelling of the CCF market, with the critical role of the PBOC in backstopping local banks, and of British commercial courts in determining the scale of losses for the multinational traders involved, demonstrates, as Pistor (2013) postulates, the centrality of law in expanding finance from the centre to the periphery. In this context, law and the economy become increasingly "inter -dependent, coevolving sub-systems within the wider, functionally-differentiated orders characteristic of market-based industrialised societies" (Deakin, 2013: 340).

[21] Kindleberger's *Manias, Panics and Crashes* (1978) places the stages of financial crises into an international context, writing about how their propagation both through the arbitraging of divergences in asset prices across countries, and the spread of euphoria.

However, it is important to bear in mind that these dynamics have particular characteristics within the Chinese entity-based financial system (Li et al., 2015). Following Awrey's (2015) analysis of the Chinese market for WMPs, it is useful here to return to the LTF's four characteristics of financial markets to analyse the CCF market, i) their legal construction, ii) their essential hybridity, iii) their inherent hierarchy and finally iv) the financial instability that the law can engender in these markets. Taking these one at a time, the *legal construction* of the CCF market was the product of substantial grey areas existing in the financial system that enabled the growth of the shadow banking system. In the case of the market for WMPs, Awrey (2015: 37) argues that this occurred in "the negative legal space crated by the existence of public regulatory intervention elsewhere within the financial system." This includes both the stipulations provided to banks within the 2008 stimulus on whom to lend to, as well as the ability of banks and other financial institutions to keep certain lending instruments (such as bankers' acceptance drafts) off balance sheets (Elliott et al., 2015: 12). Furthermore, the legal system allowed for commodities to be simultaneously imported and not imported, in the sense that they were physically in China but remained stored in offshore duty-exempt bonded warehouses in the free zones of ports, often not appearing in official customs data. Thus, besides the relatively minor storage costs of the commodity, dozens of LoCs could be issued for the same ton of copper without it being taxed as an import, further increasing the significant profit margins of all participants.

Secondly, despite efforts to liberalise the Chinese financial system (cf. Song et al., 2014), the CCF market was inherently hybrid given the involvement of both private and public actors for all the transactions involved. Firstly, the PBOC provided a backstopping role for any large state-owned bank and many of the creditors involved in legal actions against Dezheng (such as Citic) are state-owned conglomerates. Furthermore, following the emergence of the fraud, courts in China and London have enforced laws and adjudicated responsibility. In the most notable case, Mercuria v Citibank, the rulings of the presiding judge as to what actually constitutes the physical delivery of a good, and when a repo Master Agreement could be terminated, have substantial implications for commodity repo markets and for the trade financing market beyond this specific case. Thirdly, the *hierarchy of law* manifests itself both with respect to the creditors in the CCF market and to the legal jurisdictions involved. In addition to the lender-of-last-resort role that the PBOC implicitly provided for state-owned banks involved, the raid on Dezheng was also the product of a deliberate decision to pursue alleged graft at the provincial level, with Dezheng emerging as a particularly egregious violator (and moreover one with few high-level political ties). However, few other criminal actions have followed against other actors. Secondly, the "flight to safety" for metals storage to other warehouses regulated by the LME or other more trusted entities (especially in Singapore and Korea) following the fraud demonstrated a further geographical hierarchy among jurisdictions.

Finally, the law (and in many ways the aforementioned negative legal spaces) created a *source of financial instability* on two levels. In the global metals market, the discovery of large-scale fraud in Qingdao caused a temporary decline in prices and a collapse in trust, particularly in the less-regulated sections of the storage sector as well as in the provision of trade credit. Furthermore, the verdict in the Mercuria v. Citibank trial, which resulted in Citibank bearing the costs for the pledged collateral, led to a marked reticence among large banks to engage in these kind of lending operations. Thus, with trust-based relations in the system surrounding the CCF substantially impaired, trade finance became significantly more expensive.[22] The outcome of the Mercuria v. Citi trial further contributed to greater risk aversion

[22] For example, one trade publication writes that prior to the discovery of the fraud, the deposit required to open a LoC was about 10% if you had an existing credit facility with a bank. Following the fraud, having a credit facility was a requirement and a minimum of a 30% deposit was required. Without a facility, this could be as much as 100% the value of the LoC (Singh 2014).

and a general desire to leave the commodities sector among banks in general (Singh, 2014).[23] Secondly, the fraud and – what was seen as an inadequate regulatory and enforcement framework to avert large-scale criminality – contributed to a larger ongoing concern about the robustness and functioning of the Chinese financial system at a moment when numerous other Ponzi-like schemes in other asset classes were being discovered. As such, the legal construction of the CCF market – and particularly the inability of regulators to deter abuse among participants – has become symptomatic in the eyes of many for more significant problems related to overleveraging and excess speculation in the country's financial system (see IMF, 2015; Pettis, 2016).

As such, the utility of complementing the cyclical and macroeconomic analysis derived from Minsky with the LTF provides an important lens that integrates variables frequently neglected in more common legal analyses of financial markets based more in the neo-classical law and economics tradition. These include most notably the centrality of uncertainty, liquidity, and the endogeneity of law in shaping the financial system and contributing to crises, which the LTF places at its centre.

Criminality in an increasingly relational market structure

Finally, as argued in the Section 2, a further useful perspective for the analysis of asset bubbles in financial markets, and criminality in these markets, can be found in the economic geography and sociology literature on relationality in finance. The relational nature of the Chinese financial system (see Töpfer, 2015) has historically provided a puzzle in that a vibrant economic sector coexists with a weak legal system (Allen et al., 2005). The highly personalised nature of deal-making is a central component of this, where relational ties substitute for formal legal institutions,[24] and the functioning of the CCF market, as well as its escalation in the Qingdao fraud, is indicative of this.

As such, despite the enormous financial damage he caused, and without absolving him of his crimes, it would be incorrect to view the behaviour of Chen Jihong as some kind of individual aberration independent of a broader system of institutions and relationships. Like financial fraudsters before him, ranging from Nick Leeson, who brought down Barings Bank in the late 1990s, to Bernie Madoff, Chen was embedded in a network of personal relations and legally ambiguous institutions that not only enabled him to defraud clients, but also may have made this behaviour appear logical in the context of the market in which he was but one medium-sized trader (Clark, 1997). One need only look at the complexity of the CCF market's transactional structure to recognise the significance of personal relationships of the three major players involved in the case. They operated as clients, suppliers, and competitors at different points in time with these business relationships needing to therefore be carefully balanced. This also became clearer in the court proceedings. A central dimension of Citibank's efforts in the immediate aftermath of the discovery of the fraud to ensure Mercuria would refrain from pursuing its losses included the bank reminding Mercuria that it had extensive financial arrangements with Citi beyond the transaction in question.[25] In the court proceedings it further emerged that Citibank's head of metals financing, Georgie Baker, had been doing business with Chen for eight years in her previous role at Standard Bank. In her

[23] In the months following the fraud, queues for use of warehouses, as well as overall premia for aluminium storage have declined though this is most likely to be explained in part through price dynamics (Smart, 2015).
[24] Chen, Liu and Su (2013) demonstrate this empirically in their paper on the relationship between credit allocation and firms' entertainment and travel costs (ETC), a "fudge item in company accounts" used to build relational capital and 'grease the wheels' of bank lending. They find that better-performing firms spend more on ETC, and that expenditure on ETC also is predictive of loan size.
[25] These included $4 billion in credit and borrowing facilities and over $14 billion of bilateral trade facilities, plus potential help in financing the purchase from JP Morgan (Zerohedge, 2014).

testimony she was forced to admit to at one point receiving a £10,000 watch from him at what according the legal transcript "may have been colloquially called a party" (Home, 2014)

It is therefore helpful to return to the governance typology of global wealth chains (see Figure 3). In terms of this taxonomy, the CCF market evolved from a relatively simple, uncoordinated market-based form of governance to one that more aptly fits those of relational governance. The trade in the commodity itself (whether as physical goods or as a hedging tool in futures markets) represents a highly structured, market-based form of governance, while its development into a collateralised repo market relied more on relational ties involving a far greater amount of coordination. Arguably, it is this tension between a market-based formal legal framework and its relational dimensions that enabled its ability to function as a source of liquidity for many years, but also led to its fragility and gradual unwinding as widespread fraud was discovered and the economic conditions underpinning the market changed.

5. Conclusion

This paper has used the methodological device of the paradigmatic case study to explain the emergence and gradual unwinding of the Chinese commodity collateral financing market in the years following the 2008 financial crisis. The market evolved over multiple stages where initially copper, aluminium and other metals were stored in duty-exempt bonded warehouses, with warehouse receipts operating as collateral for firms seeking to borrow but lacking the political or economic clout to otherwise access capital. Subsequently, this channel was discovered as an effective mechanism to circumvent capital controls and exploit the interest rate differential between onshore and offshore yuan (as well as other low-interest currencies) and became primarily a highly opaque speculative instrument that allowed for all actors involved to profit as LoCs were continually rolled over in a potentially endless re-hypothecation loop.

In this process the market grew exponentially, impacting the country's overall balance of payments and moreover creating the opportunity for fraud, which was exploited by Dezheng Resources, among other firms. The discovery of widespread fraud temporarily halted the market's operation and led to fire-sale dynamics through efforts to unload millions of tons of depreciating metals. In the years since, the market has reconstituted itself at a much smaller scale, with foreign traders and banks reluctant to re-engage. In the words of a director at a multinational bank with a large commodity trading operation, "*while the market has changed and margins have narrowed, the situation is still ongoing. A few players have exited on the offshore side and more of the collateral is in transit rather than in warehouses, but new entrants have taken advantage of similar price dynamics for other commodities.*"

In China bankruptcies are currently mounting, trust is dissipating from the financial system, and numerous Ponzi-like schemes are being discovered and unwound,[26] while the Communist Party leadership appears unsure of how to rebalance the economy and return to sustained high levels of growth (Pettis, 2016). Here the role of a global pool of liquidity inflated by years of quantitative easing, chasing yields within highly opaque and insufficiently regulated markets provides a central cause of the currently ongoing process of debt deleveraging and economic hardship in China and other emerging markets. The case of the CCF market is paradigmatic, this paper argues, because it represents far more than just one particularly lucrative arbitrage opportunity that escalated in fraud. Palan and Nesvetailova (2013: 21-22) argue

[26] See also Huang and Timmons (2015).

> The black holes of contemporary financial system do not only pose intellectual and practical challenges to policymakers and regulators, but also to academics analysing the nature of global economy. … One of the most crucial steps towards a better regulation of these financial black holes lies in finding an alternative analytical framework that would allow us to understand the real linkages between, and within, the economy, financial system and its shadow components.

The "dark inventory" at the heart of this case study of the Chinese CCF market is integral to the emergence and rapid growth of precisely one such "black hole". Drawing on an inter-disciplinary and multi-scalar set of theoretical building blocks this paper has aimed to demonstrate the centrality of both structure and agency in the development of crisis dynamics in contemporary financial markets. Mirroring the debates over the causes of the Asian financial crisis of the late 1990s, where explanations were frequently mono-causal,[27] this paper finds salience in explanations specific to the political economy and sociology of financial and commodity markets in China, as well as broader global factors related to the structure of post-crisis global finance, the emergence of shadow banking and the role offshore financial centres, to make sense of the unwinding of the CCF market in the narrow sense, and the current crisis afflicting China and other emerging markets more broadly.

[27] More cultural and institutional explanations include the role of crony capitalism (Krugman, 1997) and the role of *dirigiste* policies in Asian developmental states (Greenspan, 1998), while structural explanations focus more on the impact of global capital mobility and the nature of the globalised financial system (Chang, 1998; Wade, 2000).

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