May 22, 2013

Metal Detector

Copper curve ball – Chinese financing deals likely to end

Goldman Sachs

Commodities Research

Short-term fundamental bullish thesis meets downside risk

The combination of Chinese capital controls and a significant positive domestic (CNY) to foreign (USD) interest rate differential has, in recent years, resulted in the development and implementation of large scale 'financing deals' which legally arbitrage the interest rate differential via China's current account. These 'financing deals' typically use commodities with high value-to-density ratios such as gold, copper, nickel and 'high-tech' goods, as a tool to enable interest rate arbitrage. With the notional value of 'financing deals' far exceeding the export/import value of the commodities used, and likely significantly contributing to the recent run-up in China's short-term FX lending (and related upward pressure on the CNY), China's State Administration of Foreign Exchange (SAFE) announced new regulations to address these issues (May 5), to be implemented in June.

While some uncertainty remains, the new policies are in our view likely to bring to an end to these financing deals. As such, in this note we provide a full example of a typical deal and discuss the impact of an unwind in Chinese Copper Financing Deals (CCFDs) on the copper market. A complete unwind of CCFDs would likely be bearish for copper prices as the copper used to unlock the interest rate differential shifts from being a positive return/carry asset to a negative carry asset. Indeed, the ex-China (LME) market may need to carry at least 200-250kt of additional physical copper over the next 1-3 months, or 4%-5% of quarterly global supply, via a widening contango and likely downward pressure on cash prices.

The emergence of this bearish risk – we had assumed that deals would continue indefinitely – complicates our near-term bullish copper view. On the one hand, our fundamental short-term thesis is playing out – copper inventories are drawing, copper's main end-use markets in China are growing solidly, seasonal factors are currently supportive, Chinese scrap availability is tight, and positioning also remains short. Set against this is the likely near-term unwind in CCFDs and, critically, our view that copper is headed into surplus in 2014 (the window for higher prices is shortening). On net, we now see the risks to our 6-month forecast of $8,000/t as skewed to the downside. In this context, we unwind our September long copper recommendation at $7,482/t, a 3% loss.

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Forecasts	3mth	6mth	12mth
Copper ($/mt)	7500	8000	7000
Aluminium ($/mt)	2000	2000	2100
Zinc ($/mt)	1950	2000	2100
Nickel ($/mt)	16500	16500	17000
Lead ($/mt)	2150	2150	2300

LME Metals Prices	22-May	%Chg wow
Copper ($/t)	7475	3.8%
Aluminium ($/t)	1883	2.4%
Zinc ($/t)	1880	3.1%
Nickel ($/t)	15175	1.8%
Lead ($/t)	2057	4.5%
Platinum (US$/oz)	1474	-1.5%
Palladium (US$/oz)	750	3.2%
Gold (US$/oz)	1409	-0.1%

Source: Reuters, Goldman Sachs Global ECS Research estimates.

Trading and hedging recommendations

Closing: Long LME copper September 2013 contract at $7,482/t, a $236/t (3.1%) loss

Following the initial sell-off in copper prices in the second half of February 2013, we established a long copper position at $7,718/t in the September contract (on March 1, 2013). We believed that the fall in copper prices, reflecting in part concerns about Chinese activity, was overdone. We reiterated this view on April 22, post further substantial price declines. Since then, prices have rebounded strongly, with the September contract closing at $7,482/t on May 22, up by 10% from the May 1 low of $6,808/t.

The emergence of the risk that CCFDs unwind over the next 3 months – we had assumed that deals would continue indefinitely – has complicated our near-term bullish copper view (from current prices). On the one hand, our fundamental short-term thesis is playing out – copper inventories are drawing, copper's main end-use markets in China are growing solidly (property sales +39% yoy, completions +7% yoy, auto's output +14% yoy Jan-April 2013), seasonal factors are currently supportive, Chinese scrap availability is tight, positioning also remains short, and policy risks are, arguably, mildly skewed to the upside.

Set against this is the likely near-term unwind in CCFDs and, critically, our view that copper is headed into surplus in 2014 (the window for higher copper prices is shortening). On net, we now see the risks to our 6-mo forecast of $8,000/t as skewed to the downside, and, in this context, we unwind our September long copper position at $7,482/t, a $236/t (3.1%) loss, given the recent strong rally in LME prices to near our 3-mo target of $7,500/t. Additionally, we believe that a further rally in copper prices in the near term would be a good selling opportunity taking a 12-month view.

Consumers: We believe that consumers will have a better opportunity to enter the copper market to buy taking a 12-month view. Following the recent sharp sell-off in zinc we are increasingly bullish on the outlook from current prices and as such believe consumers should take advantage of current low levels.

Producers: Our base case of a sharp slowdown in growth of Chinese construction completions in 2014, in the context of above-trend supply growth, presents significant longer-term downside risks to global copper demand growth and prices. Therefore we continue to believe that any further rallies in the copper price in 2013 represent a good opportunity to hedge, and in our view other non-producer market participants should continue to monitor any copper positions in light of the 2014 downside risks.

Current trading recommendations

Current trades	First recommended	Initial value	Current Value	Current profit/(loss)[1]
Closing: Long Copper				
Buy LME September 2013 copper future, with stop on close below $6,800/t	March 1, 2013 - *Metal Detector*	$7,718/mt	$7,482/mt	**($236/mt)**
Short soybean crush margin				
Sell Jul-13 CBOT soybean crush future	April 10, 2013 - *Agriculture Update*	$0.47/bu	$0.31/bu	**$0.16/bu**
Long Sep-13 NYMEX WTI crude vs. short Sep-13 ICE Brent crude				
Buy 1 Sep-13 NYMEX WTI crude, sell 1 Sep-13 ICE Brent	August 21, 2012 - *Energy Weekly*	($10.33/bbl)	($7.57/bbl)	**$3.95/bbl**
Rolled from a Long Jun-13 NYMEX WTI crude vs. short Jun-13 ICE Brent crude position on 7 April 2013 with a potential gain of $1.19/bbl				
Long NYMEX natural gas call options				
Buy $4.20 Nov-13 NYMEX natural gas call option	April 4, 2013 - Natural Gas Watch	$0.31/mmBtu	$0.42/mmBtu	**$0.11/mmBtu**

[1]Copper as of close on May 22nd. Other prices as of close on May 21, 2013. Inclusive of all previous rolling profits/losses.

Source: Goldman Sachs Global ECS Research.

Copper curve ball – Chinese financing deals likely to end

The combination of Chinese capital controls and a significant positive domestic (CNY) to foreign (USD) interest rate differential has, in recent years, resulted in the development and implementation of large scale 'financing deals' which legally arbitrage the interest rate differential via China's current account. These Chinese 'financing deals' typically use commodities with high value-to-density ratios such as gold, copper, nickel and 'high-tech' goods, as a tool to *enable* interest rate arbitrage. With the notional value of the deals far exceeding the export/import value of the commodities used, and likely significantly contributing to the recent run-up in China's short-term FX lending (and related upward pressure on the CNY), China's State Administration of Foreign Exchange (SAFE) announced new regulations to address these issues (May 5), to be implemented in June.

SAFE's new policies are, in our view, likely to bring these Chinese 'financing deals' to an end over the next 1-3 months. Having said this, some uncertainty remains around the implementation of the new policies by SAFE and Chinese banks, the speed at which the policies impact the market, and the possibility that new financing deals are "invented". Owing to these uncertainties, a complete unwind of CCFDs is still at this point considered a risk.

In this note we provide a full example of a typical deal and discuss our understanding of the impact of an unwind in Chinese Copper Financing Deals (CCFDs)[1] on the copper market. Our view is that the bulk of copper stored in bonded warehouses in China – at least 510,000t at present, as well as some inbound copper shipments into China – is being used to unlock the CNY-USD interest rate differential. This material has not been entirely unavailable to the market (deals can be broken if costs rise, such as a tightening of LME spreads), but the inventory has been effectively financed by factors exogenous to the copper market for some time.

We find that a complete unwind of CCFDs would be bearish for copper prices as the copper used to unlock the differential would shift from being a positive return/carry asset to a negative carry asset for those who currently hold it. As such this inventory will likely become more 'available' to the global market. Initially stocks would likely move into the Chinese domestic market to ease the current tightness, until the current SHFE price premium to LME closes.

After the SHFE-LME price arbitrage closes sufficiently, the remaining bonded stock (over and above day-to-day working flows) would likely shift from bonded warehouses to the LME. We expect that the ex-China (LME) market would likely see inventory increases as a result, as China draws on bonded stocks instead of importing and as excess bonded stocks are shifted back on to the LME. We estimate that the ex-China market will need to 'carry' a minimum of 200-250kt of additional physical copper over the coming months, equivalent to 4%-5% of quarterly global supply. The latter would most likely result in a widening contango, including downward pressure on cash prices (please see page 12 for details).[2]

[1] CCFDs are driven by factors exogenous to the copper market – the interest rate differential, in contrast to aluminium financing deals which are endogenous to the aluminium market and reflect in large part sustained surplus and resulting contango.

[2] N.B. The net change in global inventories owing to a financing deal unwind is zero, as falls in bonded inventories offset increases in stocks in China and on the LME. However, metal that was previously used to earn a profit (owing to the *exogenous* interest rate arbitrage) would shift to being a negative carry asset (owing to financing and warehousing costs not being offset by the current contango). As such this copper would likely be sold into the market, and would need to be carried by the LME copper market itself (*endogenous*).

Specifically, the current LME 3-15 month contango is 1.1%, compared to full carry of c.3%-3.5%.

The emergence of this bearish risk – we had assumed that deals would continue indefinitely – complicates our near-term bullish copper view. Indeed, our fundamental short-term thesis is unfolding – copper inventories are drawing, copper's main end-use markets in China are growing solidly (property sales +39% yoy, completions +7% yoy, auto's output +14% yoy over the Jan-April 2013 period), seasonal factors are currently supportive, and scrap availability in China is reportedly tight. Positioning also remains short, and policy risks may be mildly skewed to the upside (ECB meeting June 6 and FOMC meeting June 18-19).

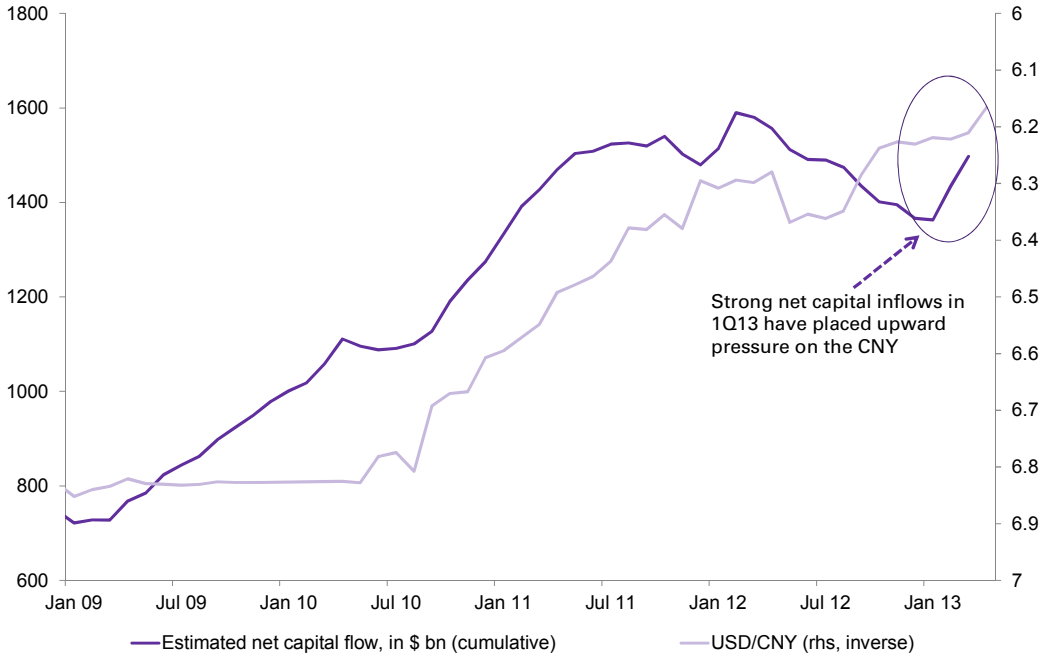
The other factors that have recently supported a rebound in copper prices have been mine supply disruptions at Grasberg in Indonesia (c.480kt for 2013E), and the threat of further strikes in Chile ahead of the Chilean elections and at Grasberg ahead of contract negotiations (the current labour contract ends in September). Our forecast 2013 disruption allowance of 5.8%, or c.900kt is designed to account for these kinds of developments, and so far this year our allowance looks reasonable, meaning that these disruptions are not set to impact our overall balance forecast.

Set against this is the likely near-term unwind in CCFDs and, critically, our view that copper is headed into significant surplus in 2014 (the window for higher prices is shortening). On net, we now see the risks to our 6-mo forecast of $8,000/t as skewed to the downside. In this context, we unwind our September long copper recommendation at $7,482/t, a 3% loss.

SAFE's new regulations

China's foreign currency reserves have risen significantly since the start of the year, placing upward pressure on the CNY (Exhibit 1).[3] This development prompted SAFE, China's regulator of cross-border transactions, to announce a new set of regulations on May 5, to be implemented in June.

Exhibit 1: Rapid capital inflow in 1Q2013 placed upward pressure on the CNY
$bn; currency (inversed)



Source: CEIC, Bloomberg, Goldman Sachs Global ECS Research.

The new regulations can be split into two parts, and broadly summarised as follows:

a) **The first measure targets Chinese bank balance sheets.** This measure aims to:

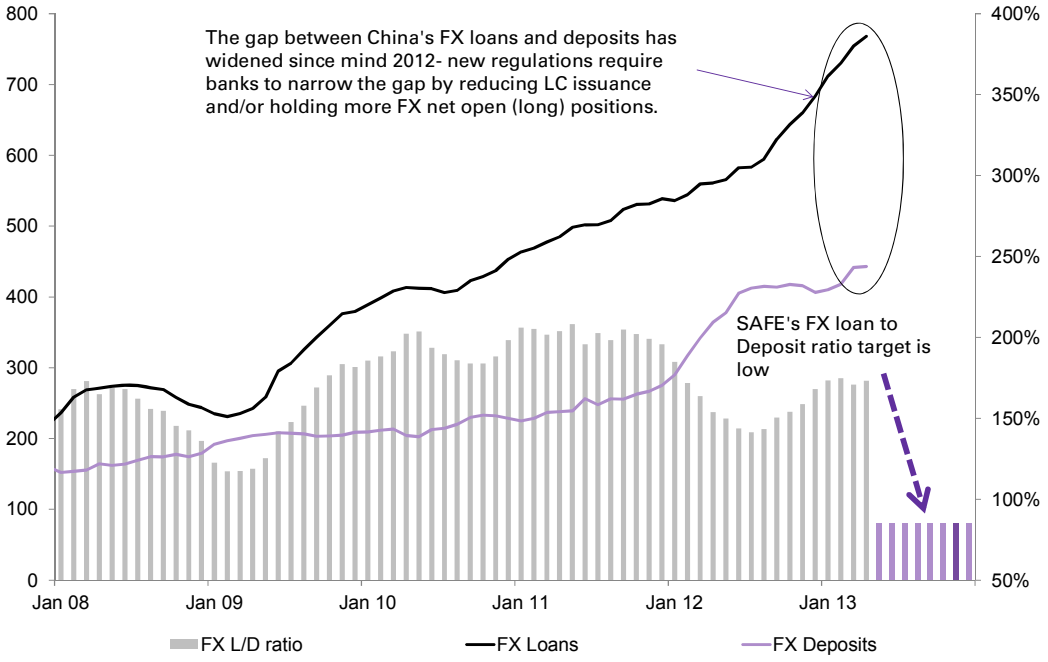
i) Directly reduce the scale of China's FX loans, thus reducing the scale of letter of credit (LC) financing (bank loans), thereby reducing the volume of funding available for CCFDs (though not specifically targeting CCFDs); and/or

ii) Raise banks' FX net open positions (banks are required to hold a minimum net long FX position at the expense of CNY liabilities), thus raising LC financing costs, thereby increasing the cost of funding CCFDs.

Specifically, Exhibit 2 shows that SAFE aims to implement a bank loan to bank deposit ratio of 75%-100% going forward, compared to an existing ratio of >150%. For further explanation of how the new regulations impact Chinese banks' balance sheet, please refer to Appendix A.

[3] For details of the broader drivers of China's capital inflows, which are placing pressure on Chinese exporters, please see *Emerging Markets Macro Daily: China: Recent capital inflows and SAFE's new regulations,* published on May 7, 2013, by our China economist Cui Li.

Exhibit 2: China's banks are expected to reduce LC issuance and/or increase FX net long positions to meet the new regulations
$bn; %



Source: CEIC, SAFE, Goldman Sachs Global ECS Research.

b) The second measure targets exporters and/or importers ('trade firms') by identifying any activities that mainly result in FX inflows above normal export/import backed activities (i.e. trades for the purpose of interest rate arbitrage, amongst others). This measure would force entities to curb their balance sheets if they are found to be involved in such activities.

Since May10 SAFE has been requesting 'trade firms' provide detailed information of their balance sheets and trading records, in order to categorize them as either A-list or B-list firms by June 1, 2013. B-list firms will be required to reduce their balance sheet significantly by cutting any capital inflow related trade activities.

To avoid being categorized as a B-list firm by SAFE, 'trade firms' may reduce their USD LC liabilities in the near term, with CCFDs likely impacted. It is not yet clear what happens to the B-list firms once they are categorized as such. However, if B-list firms were prohibited from rolling their LC liabilities this could increase the pace of the CCFD unwind, since these trade firms would likely need to sell their liquid assets (copper included) to fund their LC liabilities accumulated through previous CCFDs.

These new regulations are likely to impact a number of markets and market participants. In this note we focus on the impact on CCFDs and the copper market. **Should a) and b) be enforced, copper financing deals are highly likely to be impacted.**

An example of a typical, simplified, CCFD

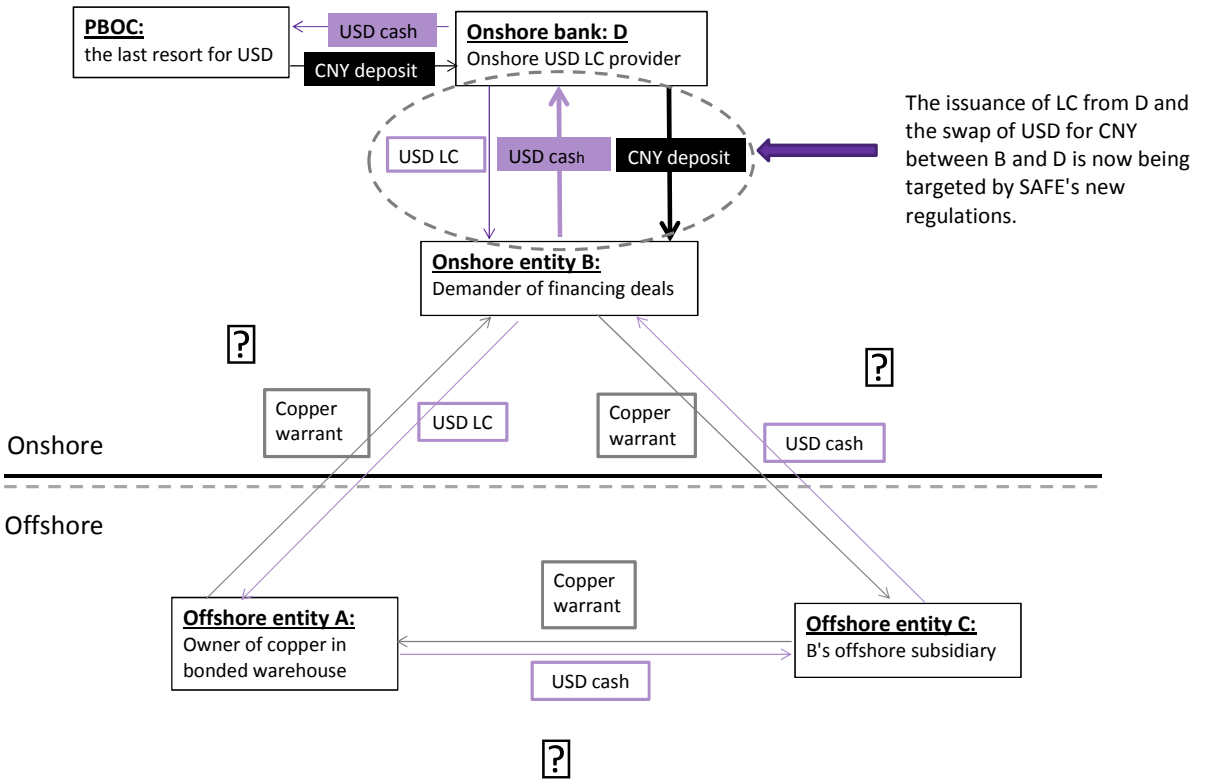
In this section we present an example of how a typical Chinese Copper Financing Deal (CCFD) works, and then discuss how the various parties involved are affected if the deals are forced to unwind. Exhibit 3 is a 'simplified' example of a CCFD, including specific reference to how the process places upward pressure on the RMB/USD. We believe this is the predominant structure of CCFDs, with other forms of Chinese copper financing deals much less profitable and likely only a small proportion of total deal volumes.

A typical CCFD involves 4 parties and 4 steps:

- **Party A** – Typically an offshore trading house
- **Party B** – Typically an onshore trading house, consumers
- **Party C** – Typically offshore subsidiary of B
- **Party D** – Onshore or offshore banks registered onshore serving B as a client

Step 1) offshore trader A sells warrant of bonded copper (copper in China's bonded warehouse that is exempted from VAT payment before customs declaration) or inbound copper (i.e. copper on ship in transit to bonded) to onshore party B at price X (i.e. B imports copper from A), and A is paid USD LC, issued by onshore bank D. **The LC issuance is a key step that SAFE's new policies target.**

Exhibit 3: Flow chart of a typical, simplified, Chinese Copper Financing Deal (CCFD)



Note: **Step-4** is a circulation of step 1-3.

Source: Goldman Sachs Global ECS Research estimates.

Step 2) onshore entity B sells and re-exports the copper by sending the warrant documentation (not the physical copper which stays in bonded warehouse 'offshore') to the offshore subsidiary C (N.B. B owns C), and C pays B USD or CNH cash (CNH = offshore CNY). Using the cash from C, B gets bank D to convert the USD or CNH into onshore CNY, and trader B can then use CNY as it sees fit.[4]

The conversion of the USD or CNH into onshore CNY is another key step that SAFE's new policies target. This conversion was previously allowed by SAFE because it was expected that the re-export process was a trade-related activity through China's current account. Now that it has become apparent that CCFDs and other similar deals do not involve actual shipments of physical material, SAFE appears to be moving to halt them.

Step 3) Offshore subsidiary C sells the warrant back to A (again, no move in physical copper which stays in bonded warehouse 'offshore'), and A pays C USD or CNH cash with a price of X minus $10-20/t, i.e. a discount to the price sold by A to B in Step 1.

Step 4) Repeat Step 1-Step 3 as many times as possible, during the period of LC (usually 6 months, with range of 3-12 months). This could be 10-30 times over the course of the 6 month LC, with the limitation being the amount of time it takes to clear the paperwork. In this way, the total notional LCs issued over a particular tonne of bonded or inbound copper over the course of a year would be 10-30 times the value of the physical copper involved, depending on the LC duration.

Please see Appendix B for details of Step 4 of the process.

Copper ownership and hedging: Through the whole process each tonne of copper involved in CCFDs is hedged by selling futures on LME futures curve (deals typically involve a long physical position and short futures position over the life of the CCFDs, unless the owner of the copper wants to speculate on the price). Though typically owned and hedged by Party A, the hedger can be Party A, B, C and D, depending on the ownership of the copper warrant.

Please see Appendix C for details of risk exposures of parties to CCFDs.

[4] Risk free CNY asset such as discounted bills or 3m wealth management products attract annual returns of c.5%, while for some products with longer durations (i.e. trust products and property projects), the annual return is >5%).

How important are CCFDs? They are not trivial!

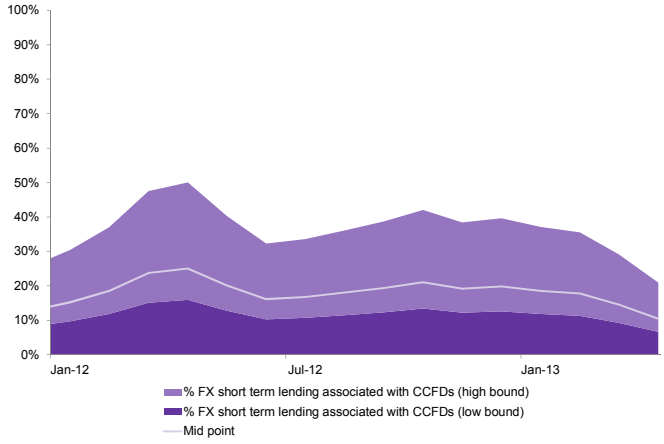
Chinese 'financing deals', including CCFDs, are likely to contribute to China's FX inflows since they involve direct FX inflows through China's current account. Specifically, for CCFDs, the immediate cross-border conversion of FX to onshore CNY after Party C pays Party B for the copper warrant (Step 2) directly contributes to China's FX inflows.

In terms of outflows, the issuance of LC (FX short-term lending) by Party D to Party A (Step 1) is not associated FX outflow by definition, and when the LCs expire they tend to be rolled forward. Step 3 occurs offshore, so there is no inflow/outflow related to this transaction.

In this way, the net Chinese FX inflows/outflows associated with CCFDs are equivalent to the change in the value of the notional LCs. We make some broad estimates of how much of China's short-term FX lending could be accounted for by CCFDs.

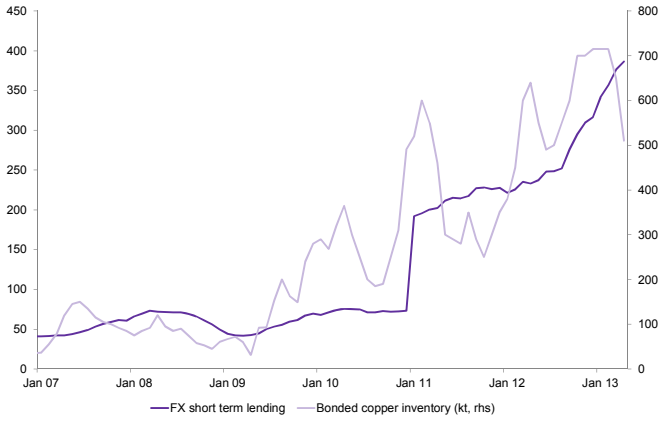
Specifically, our best estimate suggests that roughly 10% of China's short-term FX lending could have been associated with CCFDs since the beginning of 2012 (Exhibit 4). In April 2013, we estimate that CCFDs accounted for $35-40 bn (stock) of China's total short-term FX lending of $384 bn (stock), making various assumptions. More broadly, Chinese bonded inventories and short-term FX lending has been positively correlated in recent years (Exhibit 5).

Exhibit 4: CCFDs may have accounted for an average of c.10% of China's short term FX lending in recent years
%



Source: CEIC, Goldman Sachs Global ECS Research estimates, CRU, NBS.

Exhibit 5: China's short-term FX lending and copper bonded stocks have increased five-fold since 2009
$ bn; '000t



Source: CEIC, Goldman Sachs Global ECS Research estimates, CRU, NBS.

What are the margins of each Party, per tonne of copper?

In this section we detail an example of the margins of each Party involved in CCFDs using a working example (see Exhibit 6).

Exhibit 6: The margins for each participant of the CCFD

Margin calculations:
1 - Party A margin = (t1 * c1) ~ (t2 * c2) = $100 ~ $600 per 6 months, or $200 ~ $1200 p.a.

2 - Party B, C margin = 2a-2b = $1675 ~$4425 p.a.

2a - Revenue range = rf * cu * c1 ~ rf * cu * c2 = $3750 ~ $11250 p.a.
2b - Cost range = 1+3a = $2075 ~ $6825 p.a.

3 - Party D margin = 3a-3b = $750 ~ 2250 p.a.

3a - Revenue range = idiff * cu * c1 ~ idiff * cu * c2 = $1875 ~ $5625 p.a.
3b -Cost range = fc * cu * c1 ~ fc * cu * c2 = $1125 ~ $3375 p.a.

Total margin range from CCFDs by Party A, B, C and D = 1+2+3 = $2625 ~ $7825 p.a.

Assumptions:
6-month LC
rf: CNY 6m risk free interest rate = 5%p.a.
idiff: 6m LC interest rate D charge B = 2.5%p.a.
fc: D's FX funding cost for 6m LC = 1.5%p.a.
t1: minimum take A receives = $10 per circuit
t2: maximum take A receives = $20 per circuit
c1: minimum circuits per 6 months = 10 circuits
c2: maximum circuits per 6 months = 30 circuits
cu: Copper price @ $7500/t

Source: Goldman Sachs Global ECS Research estimates.

Party A – typically an offshore trading house, uses USD funding, receives a USD LC, and may have revenues of c.$10-20 per completed CCFD Step 1-3 circuit.

*Assuming revenues per circuit of $10-20, and 10-30 circuits are completed over the course of a 6-mo LC, Party A revenues are $100-600 per 6-mo LC (i.e. rev. per circuit * no. circuits). Annualised this is $200-1,200 of revenue for Party A.*

Party B – typically an onshore trading house, consumers, adds CNY as its asset and USD LC as its liabilities, making a profit from the interest rate arbitrage. Based on Step 1 and Step 2, and Footnote 4, without leverage, B would make an annualized return of c.2%-3% by purchasing risk free CNY assets, and >2%-3% by purchasing riskier products.

Assuming the CNY 6m risk free interest rate is 5%p.a., that the value of copper is $7,500/t and that the no. of circuits completed is 10-30 per 6-mo LC, the total revenue made over the 6-months by Party B would be $1,875-$5,625 (i.e. CNY risk free rate copper price per tonne * no. circuits), or $3,750-11,250 per year. Of this amount, $200-$1200 p.a. is paid to Party A and $1,875-$5,625 p.a. is paid to Party D for LC interests, assuming 6m LC interest rate at 2.5% p.a. On net, Part B's margin range is between $1,675~$4,425 p.a.*

Party C – Offshore subsidiary of B, functions as a bridge, buying the copper warrant from B in USD, and selling the copper warrant to A in USD (no physical copper movement).

Party D – Onshore banks or offshore banks registered onshore, serving B as a client, adds USD LC as their FX lending (asset) and is paid a fee for doing so. The bank is usually paid the differential between the LC interest rate they charge B and the financing cost they receive from the interbank market to fund the LC issuance. Party D also enables the swapping of CNY for B's USD in Step 2, which is eventually added to PBOC's balance sheet.

In the example above, Party B pays Party D 2.5% p.a., and Part D's funding cost could be 1.5% p.a., resulting in a 1% p.a margin per notional value of LCs issued. So, Party D, assuming a 1% p.a. margin, $7,500/t copper price, and 10-30 completed circuits over the course of a 6-mo LC, results in profit of $375 and $1,125, or $750-2,250 annualised.

Total interest rate arbitrage in this example is 5% less 1.5%, or 3.5%. Assuming $7,500/t copper price, and 10-30 completed circuits over the course of a 6-mo LC, results in total profits to be shared of $1,313 and $3,938, or $2,625 and $7,875 annualised. For reference and completeness, we provide details on the sensitivity of CCFDs profits to changes in the various variables (exchange rates, premia, no. of circuits completed, spreads, etc) for each market participant in Appendix D.

How an unwind may impact each CCFD participant

As we discussed on pages 4 and 5, SAFE's new regulations target both banks' LC issuance (first measure) and 'trade firms' trade activities (second measure). Here we discuss how the different entities (A, B, C, D) would likely adjust their portfolios to meet the new regulations (i.e. what happens in a complete unwind scenario).

Party A: Party A, without the prospect of $10-20/t profit per Step 1-3 iteration, is likely to find it hard to justify having bonded copper sitting on its balance sheet (the current LME contango is not sufficient to offset the rent and interest costs). As a result, Party A's physical bonded copper would likely become 'available', and Party A would likely unwind its LME short futures hedge.

Party B, C: To avoid being categorized as a B-list firm by SAFE, Party B and C may reduce their USD LC liabilities by: 1) selling liquid assets to fund the USD LC liabilities, and/or 2) borrowing USD offshore and rolling LC liabilities to offshore USD liabilities. The broad impact of this is to reduce outstanding LCs, and CCFDs will likely be affected by this. It is not yet clear what happens to the B-list firms in detail once they are categorized as such. However, if B-list firms were prohibited from rolling their LC liabilities this would increase the pace of the CCFDs unwind. In this scenario, these trade firms would have to sell their liquid assets (copper included) to fund their LC liabilities accumulated through previous CCFDs.

Party D: To meet SAFE's regulations, Party D will likely adjust their portfolios by reducing LC issuance and/or increasing FX (mainly USD) net long positions, which would directly reduce the total scale of CCFDs and/or raise the LC financing cost, respectively.

Implications for copper - bonded copper moves from a positive carry asset to negative carry asset

We expect that a complete unwind of CCFDs, everything else equal, is likely to be bearish for copper prices, LME spreads, and bonded premiums.

CCFDs involve a long copper physical positions and a short futures position on the LME. The physical position would be sold if CCFDs unwound and the short futures positions bought back. The newly available physical copper would not be financed by the China and ex-China interest rate differential anymore (not a positive carry asset anymore), and would instead need to be financed by a natural contango (in the interim copper becomes a negative carry asset), everything else equal.

Theoretically then, the physical market, over a short period (say, one quarter), may need to absorb as much as c.400kt of copper, equivalent to 8% of quarterly global copper supply. By contrast, the LME futures market would need to absorb buying of c.0.2%-0.3% of quarterly traded LME volumes and c.6% of daily average 2012 open interest. The impact on the physical market is therefore likely to be relatively large, in spite the fact that an unwind of CCFDs does not result in the creation of new copper (i.e. aggregate global copper inventory impact is 0/our inventory chart does not change).

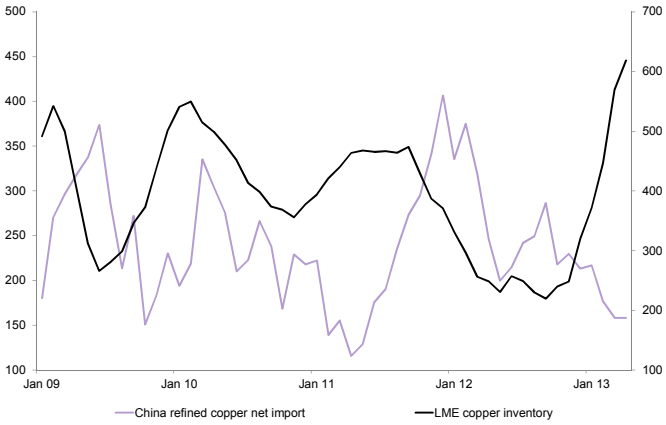
What about in practice?
Since there are no comparable historical examples to make reference to, what happens when CCFDs unwind in practice is open for debate. We believe that since the downward pressure on the physical market is large, both in absolute terms and relative to the upward pressure on the futures market, near-term prices are likely to come under relatively significant pressure. Further, if the market fears the unwind of CCFDs, physical buyers may hold off on purchases, and futures sellers may bet on lower prices (offsetting either in part or more than offsetting the financing deal related unwind buying). In this way it is likely that in practice the whole copper price curve would be under pressure in the case of a complete CCFD unwind, at least until the contango widens sufficiently to compensate for the cost of carry.

We see the following as a likely chain of events in a complete unwind scenario:

- **China would draw on bonded until it is 'full'.** In the current market bonded copper stocks will likely initially flow into the domestic Chinese market, since SHFE prices are above LME prices, with the SHFE curve in backwardation and LME in contango.
- **Chinese imports fall/remain low, placing upward pressure on LME stocks.** Since China is drawing bonded inventories to meet its demand, Chinese copper imports are likely to be under downward pressure beyond May, resulting in any excess material ex-China turning up on the LME as well (Exhibit 7). **Remaining bonded stocks (ex-stocks in transit), would shift to LME.** Once China is 'full' (i.e. the import arbitrage closes, bonded physical premia decline, SHFE price and curve softens), the remaining excess bonded inventory will likely make its way on to the LME. Since China is in deficit at present (drawing bonded and SHFE inventories, SHFE in backwardation), due in part to seasonal factors, the inventory numbers noted above, in practice, will likely be smaller but still very large. **Our best estimate would be a minimum of 200,000-250,000t of stock could shift/build on the LME over the next 2-3 months, or 4%-5% of quarterly global consumption.**
- **LME contango to widen.** Higher LME stocks suggest higher LME copper spreads, including downward pressure on the front end. Exhibit 8 illustrates that over the last 6 years, the buildup of LME inventory has been consistently associated with widening LME spreads into contango, and the scale of contango is mostly driven

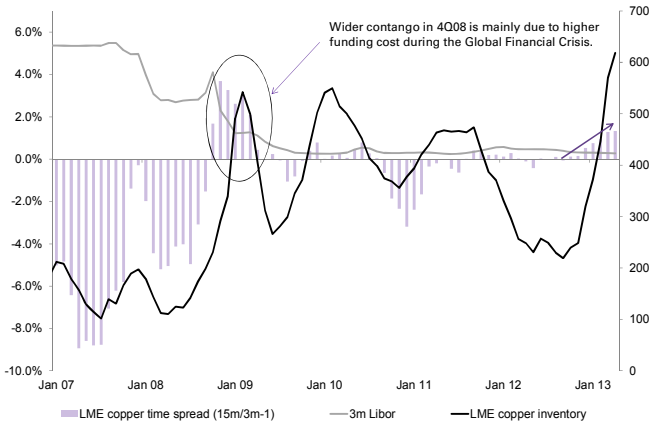
by financing cost and inventory levels. With excess copper flowing into LME warehouses, the spread needs to widen further to finance the carry trade effectively. For reference, LME annual rents are c.$150/t or 2% of copper prices. Assuming an annualized financing cost of 1%-1.5%, full carry is c.3%-3.5%, compared to current LME 3-15 month contango of 1.1%.

Exhibit 7: Low Chinese imports are typically associated with rising LME stocks
'000t; % China copper import profit (inversed)



Source: Bloomberg, Goldman Sachs Global ECS Research estimates.

Exhibit 8: Historically when LME stocks rise, the LME contango increases
'000t; % China copper import profit (inversed)



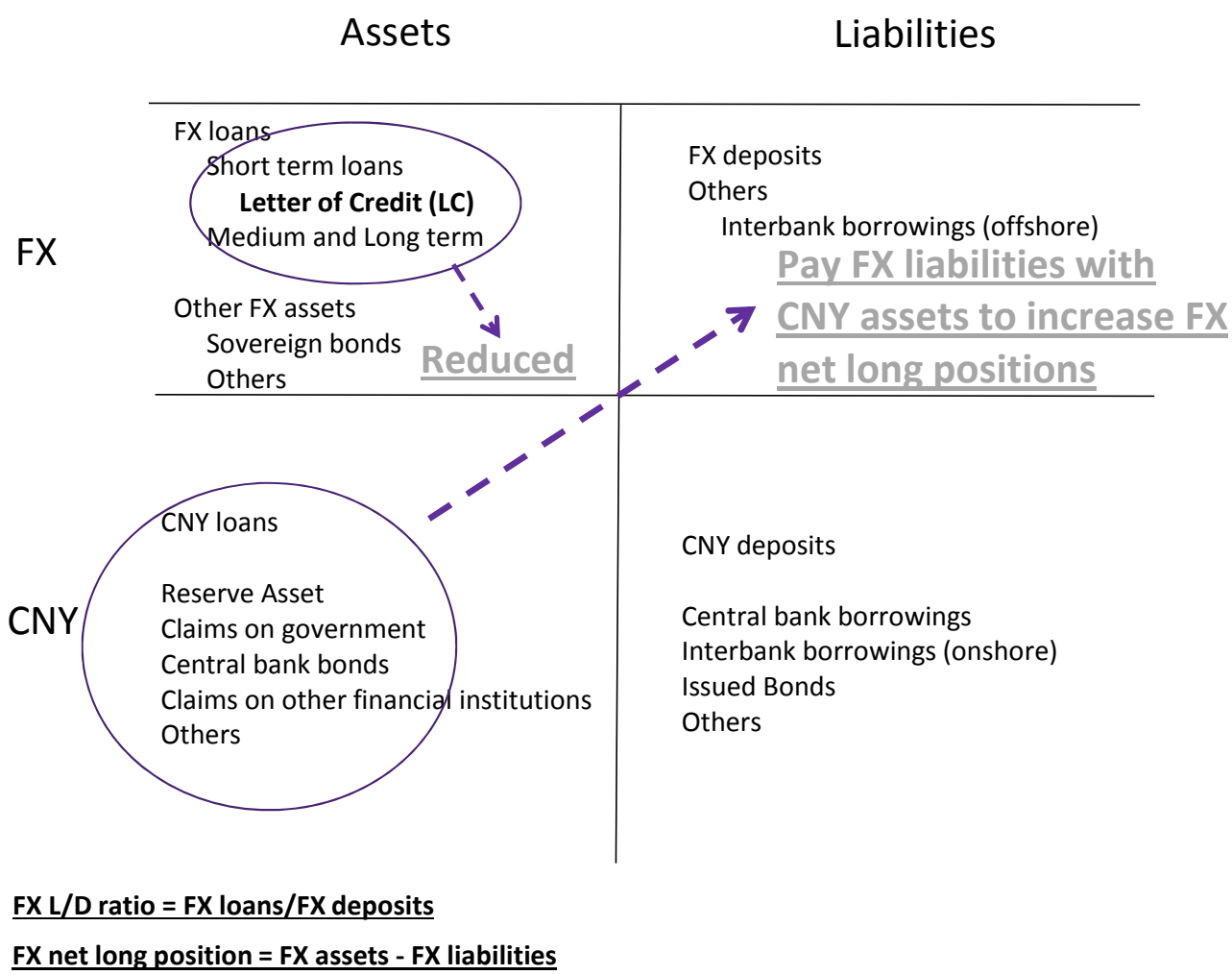
Source: Bloomberg, CEIC, Goldman Sachs Global ECS Research estimates.

The main caveat to the above is that a complete unwind in CCFDs is still subject to the implementation of the policy by SAFE, Chinese banks and 'trade firms', and the possibility that new financing deals are "invented". As a result, we will continue to closely monitor implementation of the policy by banks via monitoring bonded physical premiums, SHFE spreads and bonded stock flows.

Appendix A: the impact of SAFE's new regulations on banks' portfolio

To evaluate the impact of new regulations on Chinese banks' FX portfolio, we need to first understand the portfolio itself. Exhibit 9 is a simplified version of Chinese banks' balance sheet. Banks' assets are split into FX assets, including FX loans, foreign sovereign bonds and claims on other offshore financial institutions, and CNY assets, including CNY loans and other claims. Banks' liabilities are also split into FX liabilities, including FX deposits and other offshore interbank borrowings, and CNY liabilities, including CNY deposits, borrowings from different onshore entities and issued bonds.

Exhibit 9: An example of the impact of SAFE's new regulations on a Chinese banks' balance sheet



FX L/D ratio = FX loans/FX deposits

FX net long position = FX assets - FX liabilities

Source: Goldman Sachs Global ECS Research.

Given the consistent interest rate differential between CNY and USD and also the structural CNY appreciation against USD since 2005, banks are unwilling to hold a FX net long position. (i.e., banks' FX assets are not likely much bigger than FX liabilities).

But from June 2013, SAFE's new regulations will require banks to:

1) Increase their FX net long position. i.e., banks will be asked to hold more FX assets by swapping CNY assets for FX liabilities, as long as their FX loan-to-deposit ratio is above the threshold (75% for domestic banks and 100% for foreign banks' onshore entity), and/or,

2) Reduce their FX loans by swapping them for other FX assets such as foreign sovereign bonds.

To increase FX net long position, banks will have to take the cost of CNY/USD interest rate differential and be exposed to the risk of CNY/USD exchange rate.

To reduce the FX loans scale (mainly cut LC issuance), banks will have to take the cost of the interest rate differential between FX loans and other sovereign bonds.

As a result, banks would need to strike a balance between reducing FX loans scales and holding more FX net long positions. It is apparent that different banks' portfolios now vary so the balances they make to meet the new regulations can't be exactly the same. For example, banks with relatively low FX L/D ratios may be more inclined to hold more FX positions while banks with high FX L/D ratios may be more likely to reduce LC issuance.

On net, against the backdrop that China's FX L/D ratio has been greater than c.150% (way above the threshold), banks may have to both reduce FX loans (cut LC issuance) and hold more FX net long positions. This would likely reduce the total LC notional (and CCFDs) and raise the financing cost for LC funded trade activities (CCFDs included).

Appendix B: Leverage in CCFDs

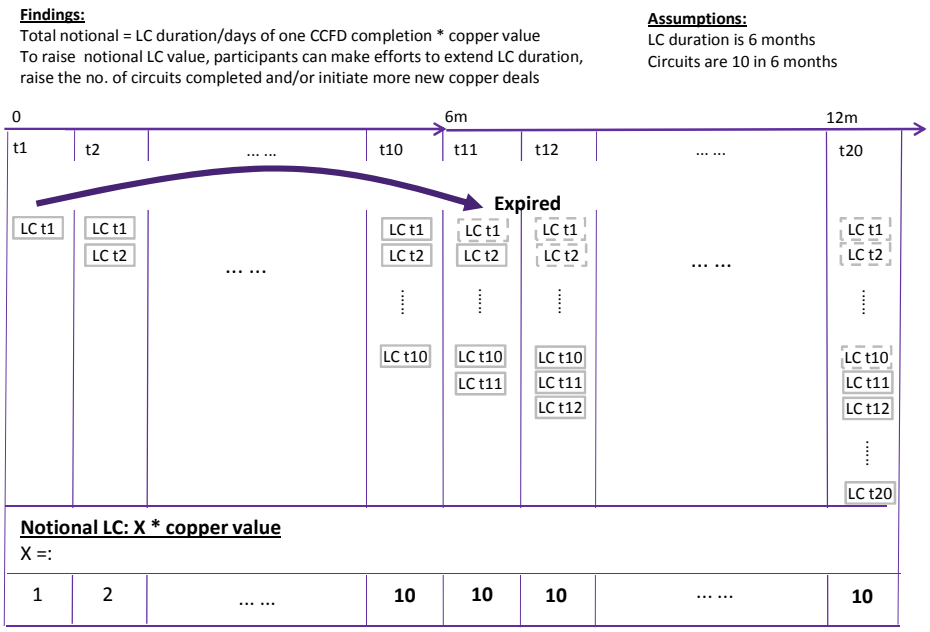
Below is a demonstration of the LC issuance process in a typical CCFD. Assuming an LC with a duration of 6 months, and 10 circuit completions (of Step 1-3) during that time (i.e. one CCFD takes 18 days to complete), Party D is able to issue 10 times the copper value equivalent in the form of LCs during the first 6 month LC (as shown from period t1 to t10 in Exhibit 10). In the proceeding 6 months (and beyond), the total notional value of the LCs remains the same, everything else equal, since each new LC issued is offset by the expiration of an old one (as shown from period t11 to t20).

In this example, total notional amount of LC during the life of the LC = LC duration / days of one CCFD completion* copper value = 10. In this example, the total notional amount of LC issued by Party D, total FX inflow through Party D from party A, and total CNY assets accumulated by party B (and C) are all 10 times the copper value (per tonne).

To raise the total notional value of LCs, participants could:

- Extend the LC duration (for example, if LC duration in our model is 12 months, the notional LC could be 20 times copper value)
- Raise the no. of circuits by reducing the amount of time it takes to clear the paperwork
- Lock in more copper

Exhibit 10: Flow chart of the LC issuance process for a typical CCFD



Notes

LC is Party D's short-term FX lending (asset) and Party B's short-term FX (liability). The greater the notional LC amount, the greater Party D's short-term FX lending is, the greater Party B's short-term FX liabilities are, and finally, the more CNY Party B can swap with Party D in order to leverage the interest rate arbitrage.

Source: Goldman Sachs Global ECS Research estimates.

Appendix C: Risk exposures of parties to CCFDs

Theoretically, Party B risk exposure > Party D risk exposure > Party A risk exposure

- Party B's risks are duration mismatch (LC against CNY assets) and credit default of their CNY assets;
- Party D's risks are the possibility that party B has severe financial difficulties. (they manage this risk by controlling the total CNY and FX credit quota to individual party B based on party B's historical revenue, hard assets, margin and government guarantee) (Party D has the right to claim against party B (onshore entity), because party B owes party D short term FX debt (LC)). If party B were to have financial difficulties, party D can liquidate Party B's assets.
- Party A's risk is mainly that party D (China's banks) have severe financial difficulties (Party A has the right to claim against party D (onshore banks), because Party A (or Party A's offshore banks) holds an LC issued by party D). In the case of financial difficulties for Party B, and even in case Party D has difficulties, Party A can still get theoretically get paid by party D (assuming Party D can borrow money from China's PBoC).

Appendix D: CCFD participant sensitivities

The revenue/cost of each participant in CCFD is sensitive to a list of factors such as CNY/USD interest rate differential, CNY appreciation, time of circulation from Step 1 to 3, copper premia, LME time spread and FX interbank funding cost. Exhibit 11 is a presentation of the impact of each of these factors on different participants' profits. For detailed revenue/cost analysis, please refer to the *Metal Detector: High Chinese copper bonded stocks point to regional imbalance*, published April 19, 2012.

Exhibit 11: Each participant's CCFD related profit sensitivities

	Party A	Party B	Party C	Party D
CNY/USD interest rate differences	N/A	+	+	-
CNY/USD exchange rate	N/A	+	+	-
No.of circuits completed	+	+	+	+
Premia	-	N/A	N/A	N/A
LME time spread	+	N/A	N/A	N/A
FX interbank funding cost	-	-	-	-

Note:
Typically Party C is Party B's subsidiary
Premia is Party A's opportunity cost
LME time spread is defined as cash – 3m
Party D's profit is negatively affected by interest rate differences and CNY/USD exchange rate, because party D needs to hold FX NOP after the new regulations.

Source: Goldman Sachs Global ECS Research.

Disclosure Appendix

Reg AC

We, Roger Yuan, Max Layton and Jeffrey Currie, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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