Base Inventories—is it demand or rates…

The drawdown in exchange inventories has been a focus talking point for months now, with bulls frustrated that the steep drawdowns hasn't been rewarded with a cyclical breakout in outright prices. So something else is going on… We have written about both Copper & Zinc inventories (and their better relationship with spreads vs outright prices) in the past, here and here, so below explores whether the drawdown in overall base inventories is a simply a function of higher rates (graph 1 correlation is a eye-catching) and its associated financing activities vs actual real demand, and provides rough estimates of off-exchange metal that has been driven underground after the LME warehouse rules took effect in 2014

Takeaways:

- **Base metal inventories* of 1.8m mt are at cyclical lows, mid-2000 levels, and 1/4th of peak base metal holdings (2013)**
- **LME rule changes, higher interest rates (forcing an unwind of financially funded inventories), some real demand growth but also tariff-induced dislocations (demand brought forward in 2H'18, before higher tariffs kick in) , all combined to drive the largest LME inventory outflows on record (~6m mt from 2013-2018).**
- **Global interest rates (fueling carry trade activity) is a much larger driver of listed inventory flows vs actual demand, if monthly correlations are any indication. Since 1998, the Fed Fund rate and aggregate base metal inventories enjoy a strong correlation of –0.76 (vs inventories & manufacturing PMIs of –0.35)**
- **Applying historical correlations of these 2 drivers, *before* interventionist LME policies began skewing the warehouse data, to solve for expected inventories, finds:**
  - ⇒ **A top down estimate using between the PMI demand proxy and base inventories, implies theres 5.2m mt of off-exchange inventory, on top of the current 1.8m mt of on-exchange inventory. A majority of this would be aluminum (the carry trade poster child) and to lesser extent zinc.**
  - ⇒ **A similar regression analysis using Fed interest rates, implies that there is 2.7m mt of of exchange unknown stocks. That's a wide range of estimates…**
- **There continues to be a large reputational issue for exchanges if metal continues to remain outside the jurisdiction of the system; this then risks tainting the integrity of individual markets, with less visibility and high variability around both inventory levels and annual balances. Platinum is 1 case study to learn from — years of annual deficits were implausible (given price action) and estimates of above ground stocks were too wide ranging which ultimately drove interest (and prices) further into structural lows. That same fate could await aluminum**
- **Short-term spreads are still more elastic to exchange flows than outright prices; a known to the market.**
- **During the last sustained Fed pause after a hiking cycle (mid 2006—mid 2007), base inventories increased by 36% (~360K mt); inflows really started to accelerate once the Fed began cutting in 2007. The risk today given the Fed pause is for flows to reappear, especially *if* the LME is successful in attracting metal back to warehouses through some measures that include relaxing queue-based rent capping. Ultimately, price action (in spreads and outrights) is a better indicator of (on and off exchange) inventory flows than the data.**

*Simple Aggregate Base Metals inventories in all LME warehouses for Copper, Ali, Zinc, Nickel, Lead & Tin.

CONTACTS

Nicky Shiels
Commodity Strategist (Metals)
212-225-6724
Commodities Derivatives

nicky.shiels@scotiabank.com

Monthly rolling correlations (1988-2018) between LME inventories and drivers & pricing

	Global Base Stocks vs	Correlation	Page
Drivers	Demand (Manufactoring PMIs)***	-0.35	2
Drivers	Rates (Fed Funds)	-0.76	3
Pricing mechnisms	outright base prices*	0.24	4
Pricing mechnisms	short-term spreads**	-0.34	4

*BCOM Industrial Metals Index

** Cash - 3m LME Spreads as % of their nominal values, and weighted by market size

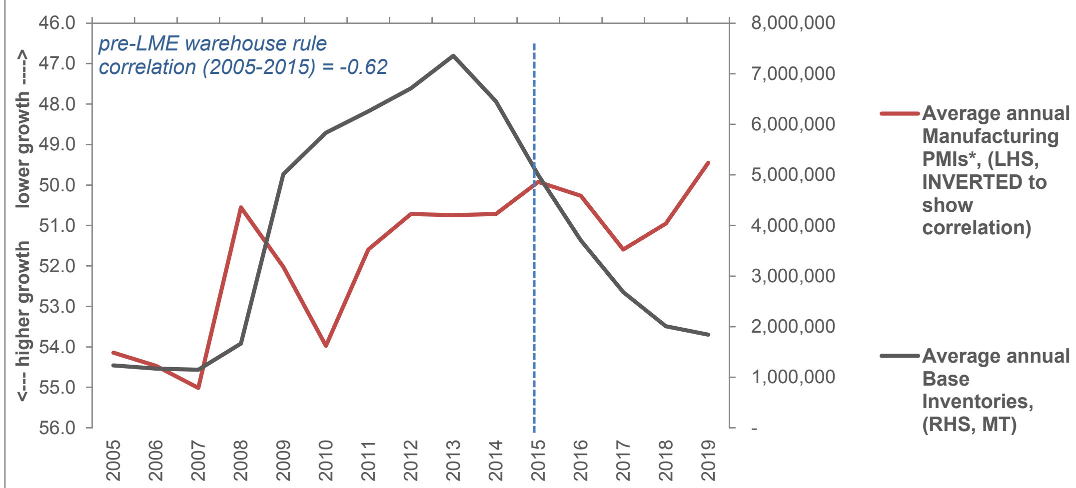
*** annual average Chinese monthly manufactoring PMIs (2005-2018)

Source: LME, Scotiabank Commodities Strategy

Global base metal stocks vs demand

- Base metal inventories are below 2m mt, at levels last seen in 2005-2007 when China had double-digit GDP growth rates and manufacturing PMI was averaging ~54 (vs the sub 50 levels currently). That simply highlights that demand alone isn't drawing warehouse inventories and other factors are at play. Not unknown.
- This recent drawdown in stock has been driven by higher interest rates (see page 3 for further details) and very much compounded by the LME rule changes in 2014 which was intended to reduce queues of metal for end-users but had the unintended consequence of shifting stocks from *known* visible LME warehouses to *unknown* storage in search of better rent-deals / financing / terms.
- Estimates of these off-exchange inventory levels are especially murky and wide ranging, and theres multiple methods in assessing stockpiles. However, if one applies the top-down approach making the assumption that demand growth stats (proxied by Chinese manufacturing PMIs) is correct and utilizing the pretty close correlation from 2005-2015 (*before* interventionist LME policies began skewing the warehouse data), then, using a simple regression:
    - At current demand levels (PMIs sub 50), overall on-exchange base metals inventories, should be ~7m mt (not 1.8m mt). —> there is 5.2m mt of off-exchange unknown stocks, presumably mostly Aluminum and to a lesser extent zinc.

Base Metal Inventories vs Demand* - correlation breaks down post 2015



*Proxied by annual average Chinese monthly manufactoring PMI stats

Source: Scotiabank Commodities Strategy, Bloomberg, LME

Global base metal stocks vs rates

CONTACTS

Nicky Shiels

Commodity Strategist (Metals)

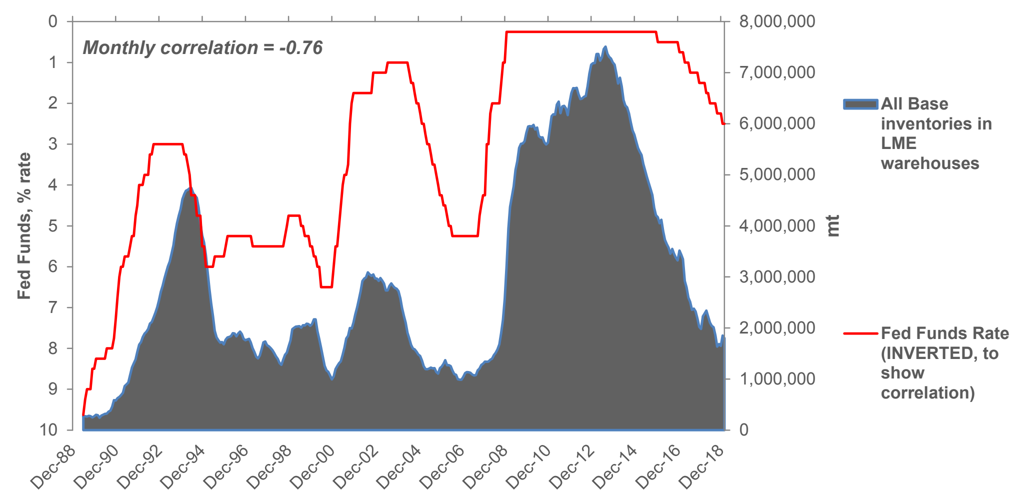
212-225-6724

Commodities Derivatives

nicky.shiels@scotiabank.com

- **Currently, theres is 1.8m mt of base metals sitting in LME warehouses globally, a cyclical (and very close to an historical) low. That size is 1/4th of peak base metal holdings (7.5m mt seen in 2013) and 3/5th the size of the 30year average of holdings (3m mt).**
- **Its clear the drawdown in stocks has occurred alongside a global rise in interest rates*, however, the start of the drawdown in base stocks occurred 2years before the liftoff of Fed funds in Dec 2015*. That is similar to the 2004-2006 hiking cycle where the drawdown in stocks preceded the Fed rate liftoff. Interestingly, back then, when the Fed convincingly paused (mid 2006—mid 2007), base inventories increased by 36% (~360K mt) and inflows really started to accelerate once the Fed began cutting in 2007.**
- ***Yes, this start of the inventory drawdown was compounded (and arguably triggered) by the LME rule changes in 2014**
- **Applying the same approach (demand growth stats to solve for expected inventories in previous page), then given the very strong close correlation from 1998-2015 (before the LME rule change):**
    - **At current Fed rate levels (2.5%), overall on-exchange base metals inventories, using a simple regression, *should be* ~4.5m mt (not 1.8m mt).**
    - **I.E: there is 2.7m mt of above ground unknown stocks.**

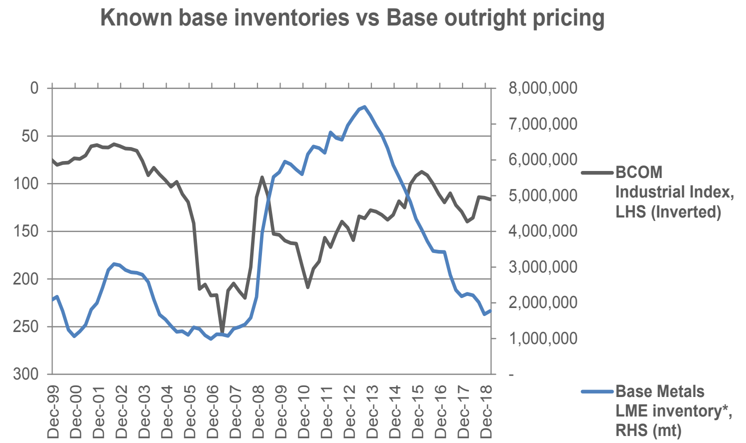
Known base metal inventories vs the Fed



*Simple Aggregate Base Metals inventories in all LME warehouses for Copper, Ali, ZInc, NIckel, Lead & Tin.

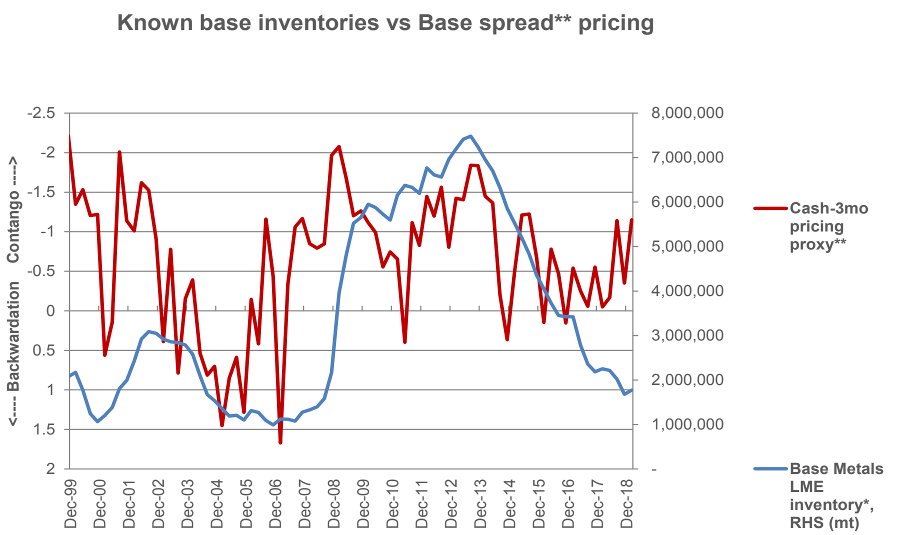
Source: Scotiabank Commodities Strategy, Bloomberg, LME

Base inventories and pricing graphs



*Simple Aggregate Base Metals inventories in all LME warehouses for Copper, Ali, Zinc, Nickel, Lead & Tin.

Source: Scotiabank Commodities Strategy, Bloomberg, LME



** Aggregate of Copper, Ali, Zinc, Nickel, Lead & Tin cash-3mo spread as % of their nominal values, and weighted by market size (annual supply figures)

Source: Scotiabank Commodities Strategy, Bloomberg, LME

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Commodity Strategist (Metals)

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nicky.shiels@scotiabank.com

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