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Silver, long considered the poor man's gold has flown under the radar for quite some time and has only recently started to emerge from the pattern of sideways consolidation that dominated 2015.

After a slow start to the year the silver rally started to gain some serious momentum, adding almost 18% in April alone as spot prices approached \$18/oz. Prices have since consolidated some of these gains but the recent activity has renewed our interest in the metal and here we assess its relative merits.

Spot Gold/Silver Ratio: *After extending towards historical peaks the ratio has begun to mean revert and is on track to hit the long run average.*



Source: Bloomberg

At first glance charting the gold/silver ratio presents some interesting talking points. Looking back over the years we can clearly see that as the ratio pushed towards and above 80 (that is approximately 80 ounces of silver to one ounce of gold) it wasn't long before we experienced a sharp reversal.

This apparent correction where the spot price of gold dropped to bring the ratio back towards a more comfortable level for the market has happened on three distinct occasions over the past 20 years, in March 1995, June 2003 and October 2008. Each time the mean reversion has been driven by a sharp decline in gold prices and a comparatively modest appreciation in silver.

The lower bound of these whipsaw moves is less obvious but momentum seems to fade as the ratio extends below 50. The spike towards 30 in 2011

is particularly prominent as silver prices hit a fresh record high towards \$50/oz, largely driven by sentiment at the time.

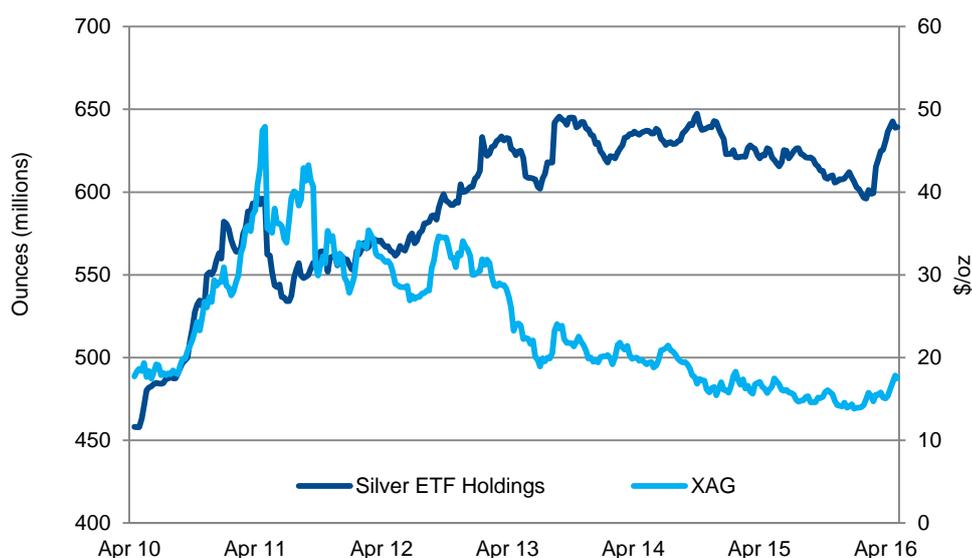
Earlier this year we saw the gold/silver ratio creep back above 80 before swiftly correcting throughout April as the market decided that current valuations were unsustainable. But one thing sticks out, while previous reversals have been triggered by a correction in gold prices, this time it looks different.

The reining in of the gold/silver ratio from just below 82 to 72 within a few short weeks wasn't driven by a sharp decline in gold prices; in fact gold prices have been relatively well supported in recent weeks finding their feet back above \$1,250/oz towards the end of last month and early this month (Bloomberg 2016). The move was triggered by a solid rally in spot silver prices and it is down to this changing dynamic that we believe silver will likely outperform gold over the coming months. Accordingly we expect the ratio to fall back towards the long term average of 60.

So the question is; "What will drive this relative outperformance of silver compared to gold?"

Silver has had a strong start to the year up 30%, to the end of April, outperforming its counterpart by nearly 8% (Bloomberg 2016). At the beginning of the year, volatile markets and struggling corporate profits went some way to explain the demand for precious metals. However in April, silver surged nearly 18% as investor concerns were compounded not only by the high valuations in equity and bond markets, but by encouraging fundamentals.

Silver ETF Holdings vs Spot Price: *Total ETF holdings have added over 40m ounces since the start of the year as the demand outlook steadily improves.*



Source: Bloomberg

Slow global economic growth coupled with the introduction of negative rates by some central banks has seen uncertainty dominate market sentiment and in this low yield environment the search for excess returns has pushed many investors to look beyond traditional asset classes. The loss of confidence in major central banks largely due to ineffective policy measures has boosted demand for precious metals once again. However, this time not as a hedge against inflation but as an avenue for outsized returns. The Federal Reserve's cautious approach to another rate hike off the back of sluggish figures in the US has seen the attractiveness of non-yielding assets increase as investors bet on price appreciation.

Silver Shines Brightest in Solar Power

Silver, most commonly used in electronics, jewellery and industrial applications has recently seen its prestige increase in value as the adoption of renewables gathers pace. The Silver Institute reported that as much as 77.6 million ounces of silver was used in the production of solar panels last year. We expect this number to rise sharply in the coming years as green energy adoption rates increase and the world's physical demand for silver continues to grow.

Data from the Energy Information Administration (EIA) shows that over the past five years growth in solar power has been relatively steady, around 30-40% year-on-year. With 2.8 million ounces of silver required to produce one gigawatt of electrical capacity the growth prospects for the precious metal are looking good. According to the EIA, solar power in the US is expected to grow by 16% y/y in 2016 and by 28% y/y in 2017. Looking at the chart below we can see that, apart from 2016, which has been impacted by lower oil prices, growth in US solar energy is roughly 30% per year.

Selected US Renewables Growth Rates: *Growth in solar power, specifically via photovoltaic means has picked up considerably in recent years.*

	Solar		Wind power		Hydropower		Liquid biofuels	
2017f	0.8172467	28%	2.2240141	7%	2.588851	-1%	1.2439537	0%
2016f	0.6394948	16%	2.0838295	15%	2.6045337	9%	1.2422467	2%
2015	0.5499219	31%	1.8151575	5%	2.388612	-3%	1.2204771	3%
2014	0.4200696	38%	1.727115	8%	2.4665766	-4%	1.1806212	8%
2013	0.3051897	34%	1.5962301	19%	2.5623823	-3%	1.0965447	1%
2012	0.2273497	33%	1.3393647	15%	2.628702	-15%	1.0906491	-5%
2011	0.1710857	36%	1.1670944	26%	3.1028522	22%	1.1495521	5%
2010	0.1259009	29%	0.9232705	28%	2.5385411	-5%	1.0975467	22%
2009	0.0977656	10%	0.7211266	32%	2.6688241	6%	0.902318	15%
2008	0.088767	17%	0.545548	60%	2.5111085	3%	0.7843729	43%
2007	0.0756571	11%	0.3405031	29%	2.4463886	-15%	0.549475	34%

Quadrillion British thermal units, year on year growth rates

Source: EIA

*A British thermal unit is the quantity of heat required to raise the temperature of one pound of liquid water by one degree Fahrenheit. This metric is used to compare different fuels on an equal basis.

All That Glitters Isn't Gold



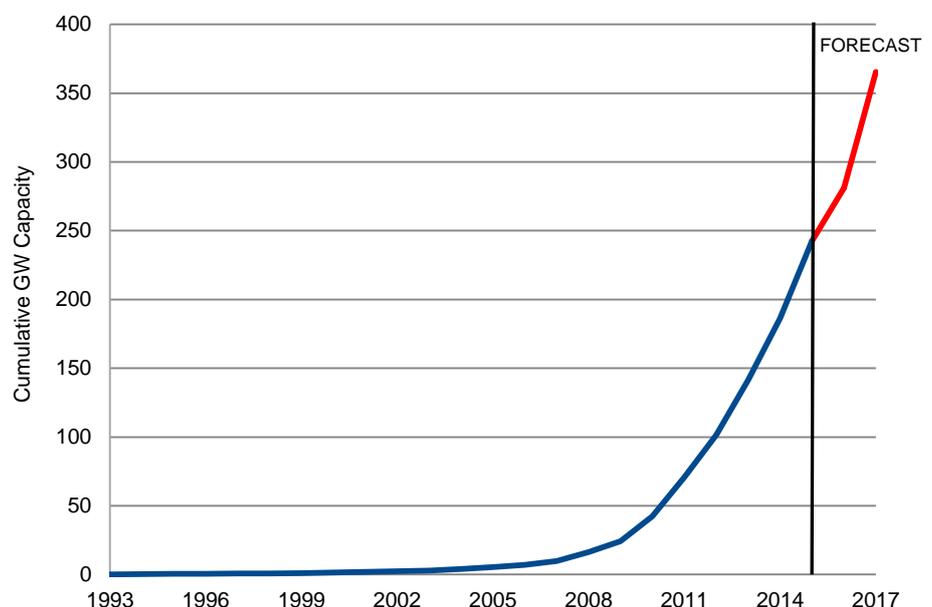
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Given the US was an early adopter of solar power we could infer that global solar uptake will follow a similar path. Applying this growth factor for 2016 and 2017 globally, we could see global solar capacity increase from 240 GW in 2015 to approximately 280 GW in 2016 and 365 GW in 2017.

If 2016 and 2017 growth rates are realised, the demand driver for silver from photovoltaics alone would see the fundamental deficit increase substantially from last year's shortfall of 112.5 million ounces. For the sake of simplicity we have not accounted for substitutes, with aluminium touted as a cheaper alternative to silver. However, significant growth is forecast for the sector and with a growing fundamental deficit the market will remain well supported, in our view justifying prices in excess of \$20/oz towards the end of the year.

A slower renewables adoption rate has been factored in for 2016 owing to lower crude oil prices which have in particular delayed the investment in solar power. However, with last year's COP 21 climate change conference in Paris putting particular emphasis on the limiting of fossil fuels, growth in solar is forecast to resume at an accelerated pace the following year. As a result the demand for silver over the coming quarters is anticipated to increase proportionately with the continued adoption of solar power and in our view underpins what will be a bullish phase for the precious metal.

Global Solar Power Capacity: *Significant investment in solar has underpinned a rapid expansion in capacity; double digit growth is expected in both 2016 and 2017.*



Source: Bloomberg

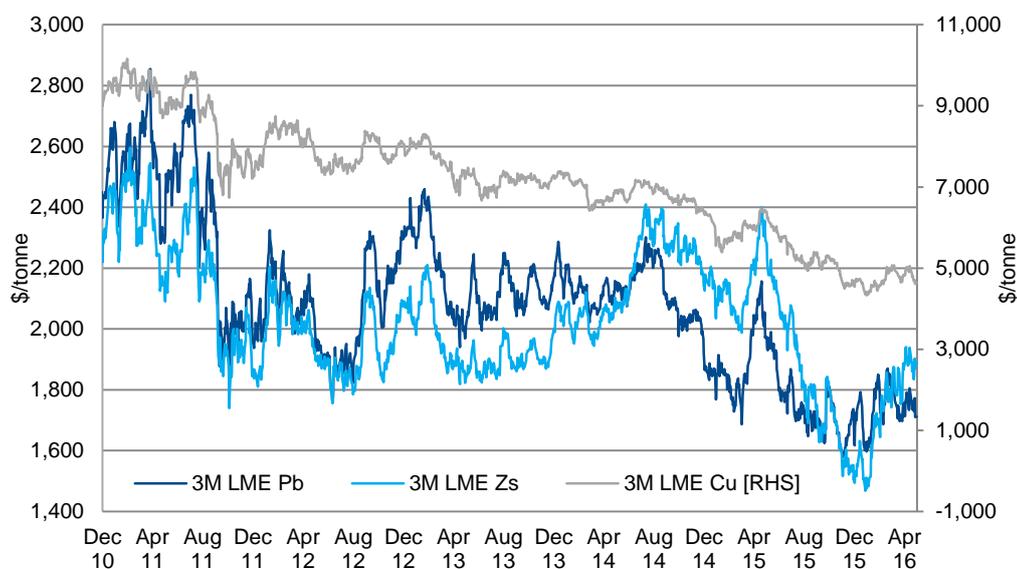
While the demand outlook paints a promising picture for silver, what of the supply side? The influence of non-precious metals in this subject cannot go unnoticed. Only a quarter of silver is produced from dedicated silver mines, with almost half produced as a by-product of mining lead, zinc and copper. Having such a reliance on other metals can be detrimental to the supply of silver and with the substantial glut across base metals; silver production growth may be subdued for some time.

Falling Capital Investment Limits Silver Supply

Low base metals prices have hit margins across the industry and with 47% of silver supply a by-product from base metals in 2015, we believe this will have a disproportionate impact on silver fundamentals as tightness persists (ScotiaMocatta 2015).

Spot prices for zinc, copper and lead have been unwinding for some time now, pushing a significant portion of high marginal cost production into loss making territory. As a result, capital investment has been cut and capacity increases are peppering the coming years with less and less frequency. In time, this is likely to boost prices owing to supply shortages with Glencore's decision to temporarily shutdown some of their zinc output causing a surge in 3 month zinc futures trading on the LME by 12% in one day, a poignant recent reminder of just how tight the market can get. This announced closure, on the 9th October 2015, provided the catalyst for what was ultimately a 10% four day rally in spot silver price, pushing it back above \$16/oz.

LME Base Metals Prices: Copper, Zinc and Lead prices have all decreased substantially in the last 5 years.



Source: Bloomberg

Glencore stated at the beginning of May that they have cut production in the first three months of 2016 for zinc and copper. The commodity giant reduced copper output by 4% to 335,000 tonnes in the first quarter. The majority of this reduction has come from mines in Africa.

In the same period the company have also slashed the production of zinc by 28% to 257,100 tonnes. These drawbacks are also driven by desperation as the embattled miner attempts to shrink their debt pile to less than \$20bn by the end of the year.

The cuts will likely limit the supply of silver until higher prices allow for investment. On a global scale, zinc mine production rose 1% last year to 13.4 million tonnes. Forecasts remain constrained in the short term due to closures and organisations increasing unexpended capital (Australia Resources and Energy Quarterly 2016).

Although the price of zinc seems to have improved recently owing to comparatively tighter fundamentals versus copper, the global macro outlook is providing some strong headwinds and capping prices on the upside. This isn't immediately a bad thing, the limited upside potential could see capital investment delayed further which would add additional weight to our bullish outlook for silver.

Lead and copper miners have also attempted to support the market with supply cuts. However, so far this has been unsuccessful as prices continue to flounder, perhaps due to the lack of discipline among producers and recent volatility in commodity markets prompted by increasing speculation activity.

The reported deficit in the supply of copper last year could prove to be bullish for prices and with stock piles low miners may start to ramp up production in an attempt to rebalance the market. In relation to the supply of silver, investment in zinc, copper and lead will only increase when prices reach sufficient levels for mining companies to intensify production. For now though, inventory management and falling stock levels can only support the market so far, a meaningful demand side response would be needed to drastically alter the outlook.

It seems copper production has fallen the furthest with figures out from South Africa in early May highlighting that preliminary copper production was down 28.9% quarter-on-quarter from Q4 2015 compared to Q1 2016 (Statistics South Africa March 2016). Prior to this announcement various miners curtailed production by approximately 660,000 tonnes. The majority of these reductions were across the globe but came from Freeport McMoRan and Glencore.

Copper Production Cuts: *Notable reductions in copper output by companies, caused by a low price and mounting company debt*

Copper Production Cuts by Miners		
Miner	Mine	Decrease in Copper Production (Tonnes)
Freeport McMoRan	Miami, Arizona	26,000
Freeport McMoRan	Tyrone, New Mexico	43,000
Freeport McMoRan	El Abra, Chile	83,000
Freeport McMoRan	Sierrita, Arizona	45,000
Glencore	Mopani, Zambia	400,000
Glencore	Katanga, Congo	
Glencore & Anglo American	Collahuasi, Chile	30,000
Asarco	Ray, Arizona	30,000
Source: Company Reports		657,000

With copper mines contributing 18% of the supply of silver in 2015 the outlook looks set to worsen off the back of these production cuts (ScotiaMocatta 2015). Continued slumps in supply growth are something the silver industry cannot afford with the deficit seemingly growing. However, the spot price will likely gather additional support for due to decreases in production.

The reduction in capital investment is at a time when prices of the involved metals are struggling. However, not all companies are cutting back production and selling off assets to pay back debt or even stay afloat.

BHP Billiton is seeking to expand production in copper in a bid to increase their market share. \$5 billion of capital projects have been outlined to convince investors that they can generate revenue regardless of the low prices. This figure has been allocated to oil and copper exploration as BHP looks to set strong foundations for higher prices.

The investment is Billiton's largest during the commodity downturn and they think the worst is over so perhaps investing now could see them benefit from lower costs of production in the long run. The supply of silver will be bolstered by the investment in copper by BHP however recent output reductions far outweigh this expansion.

Silver Surfing A Rising Wave

To summarise, the supply outlook for silver in 2016 illustrates a tighter market; output is forecast to fall by 5% year-on-year setting the stage for a sustained period of price inflation. All things considered, it's difficult to see a situation where silver narrows last year's deficit which was reported to be 112.5 million ounces.

Accordingly we are optimistic for silver even though sentiment has been the driver for prices recently. Fundamentally, shrinking supply is a significant driver of our bullish outlook and one which underpins silver's relative merits against gold which we believe to be driven largely by sentiment alone.

These factors bring us the conclusion that in the current economic climate we are optimistic about the price of silver, we think it can reach \$20/oz on the upside. Even if a rates rise occurs and the dollar appreciates the bullish fundamental outlook will continue to support silver. Our long silver/short gold play will take time to unfold, especially given the current heightened macro uncertainty supporting spot gold prices.

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