METALS & MINING

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All figures in US$, unless otherwise noted.

Company Attendees

	Rating	Target
Avanco Copper Ltd.	N/R	N/R
Cornerstone Capital Resources Inc.	Spec. Buy	C$0.60
Filo Mining Corp.	Spec. Buy	C$4.00
Highland Copper Co.	N/R	N/R
Los Andes Copper Ltd.	N/R	N/R
NGEx Resources Ltd.	Spec. Buy	$2.70
Regulus Resources Inc.	N/R	N/R

Paradigm Junior Copper Symposium Preview

Event

On October 19, we will be hosting a small-cap copper conference to showcase names of interest in the junior copper developer universe. Given the significant cuts in global exploration spending over the past five years, the projects owned by these juniors are key prospects to follow as they become a focus for investment, acquisition or eventual production by the juniors that own them.

Highlights

- **Fundamentals |** After the extended downturn from 2012 to 2016, there has been an extended period of strong fundamentals which have subsequently provided price support throughout 2017. On the supply side, disruptions at major copper mines throughout H1/17 quickly changed sentiment around a perceived oversupplied market. Suspensions at Escondida (45-day labour strike), Grasberg and Cerro Verde impacted global supply and profits of the companies that own them. It is expected that supply disruptions will return to historical norms of 5–6% in 2017, a modest improvement from historical lows of 3.8% in 2016. On the demand side, China remains at the forefront. GDP growth in the first nine months of the year was in line with expectations in the 6.8–7.0% range. Although IMF forecasts China's GDP growth to decline to 6.4% in 2018, this still represents modest growth in base metal demand. These factors will provide short medium-term price support for copper but we believe it is the sustainable energy market, including electric vehicles, renewable energy and associated infrastructure, which will propel copper demand growth over the next decade.
- **Forecast Deficit | According to ICSG, t**he copper market is expected to be in a deficit position by 147Kt in 2017 and 169Kt in 2018. In contrast, SNL forecasts a copper surplus of 91Kt for the year, an 89Kt deficit in 2018 and a 417Kt deficit in 2019. Although short-term forecasts may differ, industry-wide perception is of a structural deficit forming heading into the next decade, providing substantial price support.
- **Exploration Rebounding |** Exploration spending in the copper sector has naturally followed along the same downward trend over the past five years but has experienced a slight resurgence in 2017 with the copper price. This movement is anticipated to carry through to 2018 as copper prices remain above $3.00/lb and corporate boards set budgets with more optimistic outlooks.
- **Minimal Large-scale Projects in Pipeline I** Development studies on large-scale copper projects are scarce and major companies lack substantial project pipelines. Other than First Quantum's (FM-T, C$23.50 TP, Buy) Cobre Panama and Teck's (TECK.B-T, C$42.00 TP, Buy) brownfield QB2, there are minimal large-scale projects in asset portfolios of major base metal companies, adding to the appeal of larger projects held by juniors.

Conclusion

The junior copper companies featured in this report appear to be in opportunistic positions to capitalize on a rebounding copper market that seems to be holding or improving in terms of demand and price growth. Consequently, the projects these companies own should captivate market attention as they become targets for investment, acquisition, or are developed to production by junior or intermediate base metal companies.

Our disclosure statements are located at the end of this report.

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Company Reports

Copper Fundamentals

Over the course of 2017, copper fundamentals have continued to improve. Supply disruptions at the beginning of the year have had a material impact on global supply and sustained Chinese economic growth has given the market optimism that demand for the red metal will continue to grow. These factors, as well as global infrastructure growth, have led market speculators to forecast a growing wedge between supply and demand starting next year.

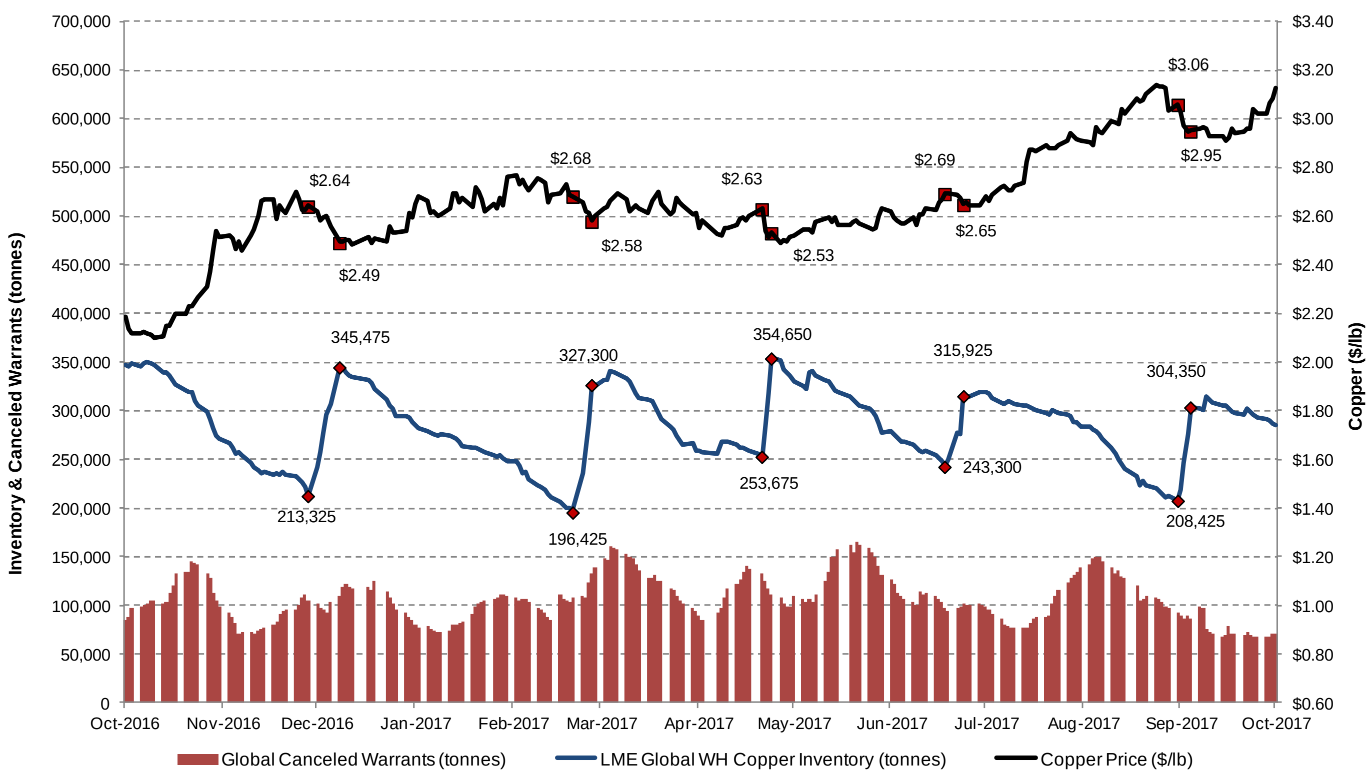
So far in 2017, copper supply disruptions have trended in line with historical norms of 5–6%. Large copper mines (i.e., Escondida, Grasberg and Cerro Verde) experienced prolonged suspensions owing to labour strikes and other worker-related issues in H1/17, which has had a material impact on large-cap mining profits and global copper supply.

Chinese copper demand can be measured in SHFE inventory draws and copper imports. Over the month of Sept. 2017, ~80Kt of copper was drawn from the SHFE, representing ~44% of inventories. This, along with sustained levels of copper imports (~1.5Mt of concentrate, 250Kt of refined metal and 250kt of scrap), gives us confidence that Chinese buyers remain very active in commodity markets. SHFE inventories reaching multi-year lows and the threat of the Chinese government halting copper scrap imports will support price through 2018.

LME Inventory Cycle

The LME inventory cycle continues to play out every ~2–3 months. Each cycle follows a similar pattern: inventories draw to ~200Kt and ~100–120Kt of copper is added in a matter of 4–5 days. Over the past five cycles, price has reacted negatively in a range of $0.04–$0.15/lb. These swings have become somewhat predictable, which suggests that evaluating demand based on inventory draws is not very reliable. Despite these cycles, market spectators continue to forecast a structural deficit starting as early as this year.

Figure 1: LME Inventory and 3-month Price Movement



Source: Bloomberg, Paradigm Capital Inc.

Deficit Forecast

Expectations for copper supply/demand balance in 2017 are split. Earlier in the year, Cochilco forecast a refined production deficit of 67Kt on the basis of Q1 supply disruptions. Furthermore, the International Copper Study Group (ICSG) forecasts for 2017 and 2018 suggest notable deficits in each year of 147Kt and 169Kt, respectively. This is a significant adjustment from ICSG's prior estimate of a 163Kt surplus in 2017. In contrast to Cochilco and ICSG, SNL forecasts a 2017 surplus of 91Kt in 2017, holding off on deficit forecasts until the 90Kt deficit predicted for 2018 (Figure 2). The justification for the 2017 surplus places an emphasis on the quick management of the yearly disruptions, which helped mitigate production losses on key Latin American projects. We expect the market to be balanced in 2017 and a large deficit to form heading into the next decade, similar to other market observers. These mutli-year deficits should support price and, in association, junior copper project valuations into 2020 and beyond.

Figure 2: SNL Copper Industry Annual Exploration Budget and Copper Price

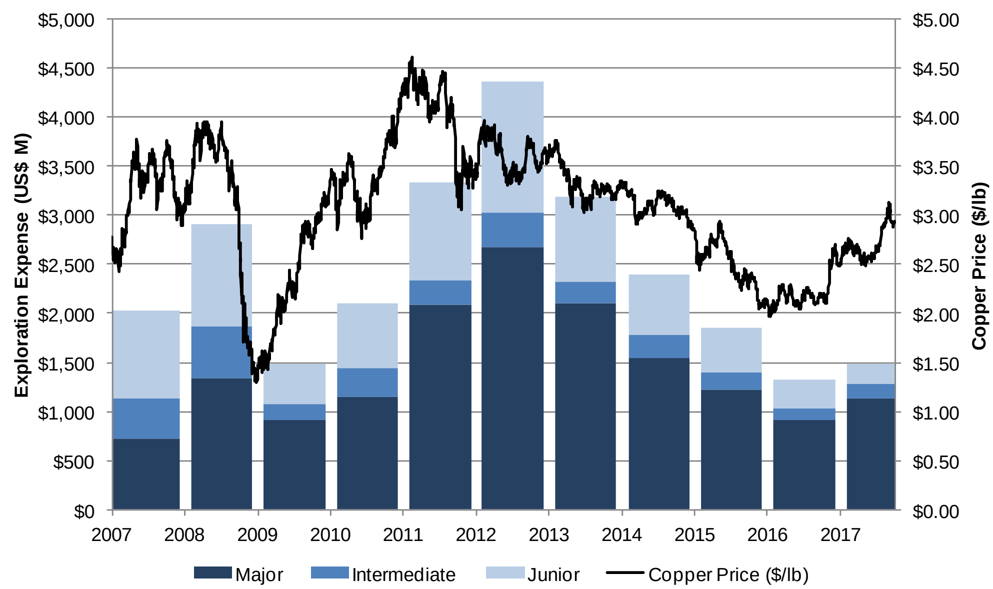
	Mine Production (kt)				Refined Output (kt)				Refined Usage (kt)			
	2016A	**2017E**	**2018E**	**2019E**	**2016A**	**2017E**	**2018E**	**2019E**	**2016A**	**2017E**	**2018E**	**2019E**
Africa	1,892	1,903	2,193	2,240	1,301	1,362	1,487	1,464	301	311	333	343
North America	2,873	2,714	2,849	2,857	2,030	2,034	2,290	2,344	2,290	2,329	2,431	2,506
Latin America	8,353	8,650	9,016	9,225	3,242	3,239	3,290	3,230	585	576	637	651
Asia & Oceania	4,504	4,440	4,549	4,676	12,236	12,554	12,684	13,078	15,749	16,216	16,743	17,353
Europe	2,294	2,442	2,498	2,495	4,083	4,162	4,228	4,352	3,847	3,830	3,925	4,034
Total	**19,916**	**20,149**	**21,105**	**21,493**	**22,892**	**23,351**	**23,979**	**24,468**	**22,772**	**23,262**	**24,069**	**24,887**
% change	-	*1.17%*	*4.74%*	*1.84%*	-	*2.01%*	*2.69%*	*2.04%*	-	*2.15%*	*3.47%*	*3.40%*
World Refined Balance									**120**	**89**	**-90**	**-419**

Source: SNL, Paradigm Capital Inc.

Exploration Spending Bottom Behind Us

In our May 8th report, *Time to Take a Serious Look the Copper Pipeline*, we forecasted a lift in 2017 exploration spending from 2016 historical lows. Recently, SNL published its estimate for 2017 exploration spending which totaled ~$1.5B. This 12% increase from 2016 was mostly attributable to majors with exploration by juniors declining 28%. The overall improved exploration budget outlook is largely owing to the copper price increase over the year, in conjunction with concerns regarding the impending scarcity of viable copper projects. As junior financings pick up, we expect the trend in junior exploration budgets to accelerate, similar to the 2009–2012 boom (Figure 3).

Figure 3: Copper Industry Annual Exploration Budget and Copper Price



Source: SNL, Paradigm Capital Inc.

In conjunction with exploration spending, acquisitions in the copper space have changed significantly over the past six years. In the past, a large majority of acquisition spending was focused on acquiring new companies. In contrast, the recent trend involves a propensity for late-stage property acquisition, which significantly outweighed company acquisition in 2016. Similar to exploration spending, we should see acquisition activity pick up in 2018 as majors' balance sheets are stronger coming out of the cycle and can afford to invest, enter into joint-venture agreements or acquire junior copper developers to fill their respective copper project pipelines.

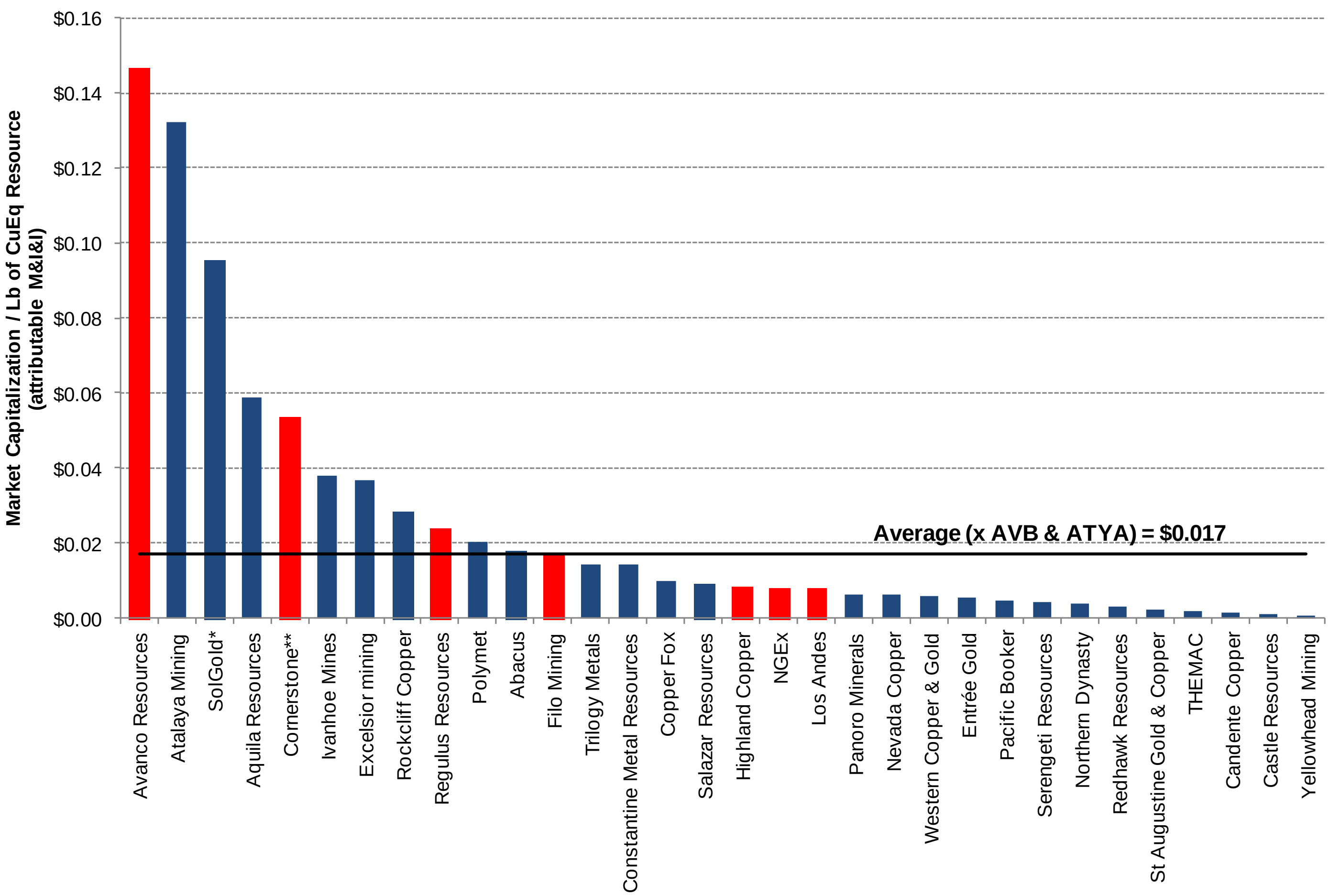
Conclusion & Recommendations

Apart from the inventory cycles, the copper recovery has played out as expected over the past 12 months. Supply disruptions returning to normal, China demand sustaining at heightened levels and exploration spending returning to the industry are all indicative of the beginning of the next cycle. Investors looking to add torque to their portfolios are looking at the list below with a keen eye to judge which projects have the best chance to progress to production and which are poised to be acquired by majors (Figure 4).

Our Copper Symposium will showcase Avanco Resources, Cornerstone Capital Resources, Filo Mining, Highland Copper, Los Andes Copper, NGEx Resources and Regulus Resources (see 1-page summaries this section). Assets like NGEx Resources' Project Constellation are more likely to be taken out, whereas Cornerstone Capital's 15% interest in the Cascabel project represents an intriguing value proposition to gain exposure to an early-stage, world-renowned asset. These assets, along with others held by these companies, represent the future of global copper mining.

We look forward to hearing from these companies at the symposium and watching them develop their respective assets in the coming years.

Figure 4: EV / CuEq Pounds-in-the-Ground Valuation Analysis



*SolGold has yet to publish a resource estimate for the Cascabel asset. Lbs-in-the-ground estimated from PCI's model assumptions
*SolGold Market Captialziation less Cornerstone Interest (5.5%).
** Cornerstone Market Capitalization less SolGold interest (11.22%).

Source: Company filings, FactSet, Paradigm Capital Inc.

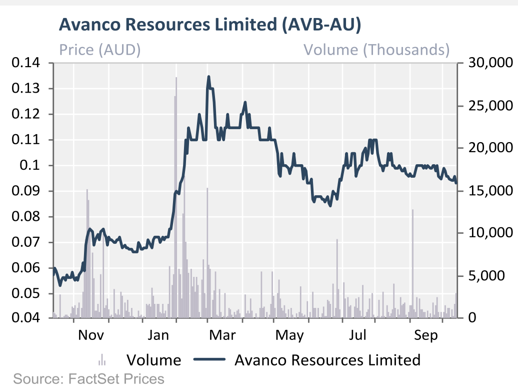
All figures in C$, unless otherwise noted.
Prices as of October 12, 2017

Rating: N/A

12-Month Target: N/A

Price (C$)		$0.09
Ticker		AVB
FYE		31-Dec
	Basic (M)	FD (M)
Shares O/S	2,457	2,457
Market Cap ($M)	$176.9	$176.9
Net Debt ($M)		-$16.5
Enterprise Value FD ($M)		$160.4

Antas North	P&P	MI&I
Resource Size (Mt)	3.04	5.46
Copper (%)	2.64%	2.43%
Au (g/t)	0.58	0.48
Copper (Mlbs)	176.93	292.50
Gold (Moz)	5.6685	8.4257
Pedra Branca		**MI&I**
Resource Size (Mt)		10.48
Copper (%)		2.80%
Au (g/t)		0.7
Copper (Mlbs)		646.92
Gold (Moz)		23.5846
CentroGold		**MI&I**
Resource Size (Mt)		20.2
Au (g/t)		2
Gold (Moz)		1.286



Source: FactSet, Company filings, Paradigm Capital Inc.

Company description: Avanco Resources Limited is a copper producer with primary operational Ltd. in the Carajás region of Northern Brazil. The Carajás region hosts one of the largest concentrations of large tonnage iron oxide copper gold deposits and well-established infrastructure, making it the ideal operational location for an aspiring mid-tier copper company. Avanco targets 100% ownership of all projects, with Antas North as the sole producing mine and Pedra Branca believed to reach commercial production by 2020.

Avanco Resources Ltd.: Junior Miner with Brazilian Exposure

Company not under coverage.

Investment Thesis. Avanco Resources is an up-and-coming copper developer with a focus on the Carajas region in Brazil. Avanco began production on the Antas North Property in 2016, just two years after a construction decision. The operation has outperformed guidance this past year, producing 24.7Mlb copper and 7.8Koz gold. This ability to efficiently bring projects to the production stage will prove to be an asset as the company's second PFS-level project, Pedra Branca, approaches commercial production in 2020. This proficiency positions Avanco as one of the key players in developing Brazil's copper mining industry.

Event

Avanco's flagship project, Antas North, has exceeded production expectations, providing confidence that the process may be replicated at Pedra Branca.

Highlights

- **Antas Mine |** The Antas mine reached commercial production in H1/16 producing 11.2Kt copper and 7.8Koz gold in the calendar year. H1/17 production of ~7Kt copper and ~5.7Koz gold has positioned the company to once again meet yearly production guidance of ~13.75Kt copper and ~10Koz gold. The successful ramp and consistent performance of the Antas mine gives us confidence management will be able to replicate the process at Pedras Branca.
- **Pedra Branca Development |** The positive results of the May 2017 Pre-feasibility Study (PFS) motivated Avanco to immediately proceed with a Definitive Feasibility Study (DFS). The timing and substance of the DFS will influence the decision of the development plan, but nonetheless commercial production is targeted for 2020. Pedra Branca expected copper and gold production is approximately 24Kt and 16Koz, respectively once ramped to commercial production. In combination with the Antas mine, this would strengthen Avanco's Carajas presence and propel the company to mid-tier status in the copper producer space.
- **CentroGold Development |** CentroGold is a unique Brazilian gold project in contrast to Avanco's otherwise copper-focused portfolio. It is considered one of the largest undeveloped gold projects in the country, with an estimated total resource of 20.2Mt, grading 2.0 g/t gold. The project is progressing quickly, with a scoping study, PFS and DFS all expected before the end of 2018. The PFS will be completed in H1/18, quickly followed by the DFS in H2/18. This projects lends a precious metal pedigree to an already exciting copper asset portfolio.
- **Carajas Region of Brazil |** Brazil ranks as one of the top four countries in the world in terms of gold production, with mining growth expected to continue in the future. The country is set to be a top five global economy by 2050, and no longer requires foreign investment to meet its needs. Avanco's properties position it as the second-largest land owner in Brazil, located in a mining friendly region.
- **Additional Projects |** Avanco acquired two new projects in Q4/16: the Canaa West Project in the Carajas region and the Gurupi gold project in northern Brazil. The Canaa West Project is a possible stan alone property or satellite deposit to Pedra Branca acquired from Codelco, while the Gurupi gold project is an advanced stage gold exploration property owned by Jaguar Mining.. We expect the company to allocate capital to these projects once its other focus projects are up and running.

Conclusion

With a strong geological foundation in the Carajas region, and the potential for the Pedra Branca project to follow in the footsteps of the Antas mine, Avanco continues to draw interest. Avanco will be a company to watch as it advances toward its goal of becoming a mid-tier copper/gold producer.