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FAR EAST CAPITAL
The Mining Investment Experts

Weekly Commentary

5 March 2022 *On Friday's Close* Analyst : Warwick Grigor

Metal Powder Works could transform additive manufacturing (3D printing) costs

The Ukraine invasion continues to be the greatest variable in markets today, shadowing every investment decision. Business and markets are continuing to operate with deals being done and capital being raised notwithstanding the heightened global geopolitical risk. Does that mean we are not taking the threat sufficiently seriously, or are we just focusing on what is tangible rather than being paralysed by fears. Specially, the resource sector is showing itself to be a bright spot in these troubled times, being led by stocks such as BHP and RIO. Oil and gold prices continue to rise and investors are buying the underlying stocks.

While we can take heart that the Ukrainians are doing a good job in resisting Putin's aggression, and there is solidarity in condemnation of his actions not only around the world but throughout the Russian civilian population itself, Ukraine is still in a very volatile position. Seeing Putin introduce the spectre of nuclear weapons shows us just how mentally unstable he is, and therefore unpredictable. That increases the risk profile to a new level.

What happened to 3D printing?

Going back 5-10 years, 3D printing was the next big thing in manufacturing. It promised to revolutionise the way many components were made, taking advantage of just-in-time inventory management through the ability to make items on demand.

We hear little of the benefits of 3D printing today. Is this because it hasn't been ubiquitously adopted and is therefore no longer sensational, or is it because it hasn't delivered as much as was hoped? If so, is this just a function of the time that it takes to fully commercialise new technologies?

Brilliant, then dismal performance of companies

After the initial interest in 3D printing we began to see a number of companies on the ASX that sought to capture the interest of speculators with technologies that built on the 3D printing story. Two companies come to mind; Aurora 3D (A3D) and Titomic (TTT). Both companies saw their share prices soar to great heights, only to crash and burn when the wax on their wings melted.

Nothing enlightening about Aurora 3D

Aurora IPO'd in August 2016, raising $2.8m at 20¢ a share. It described itself as an industrial technology and innovation company that specialised in the development of 3D metal printers and the supply of associated consumable materials for 3D metal printing. Further, it was in the early stages of developing secondary business units including 3D printing related software and the manufacture of consumable materials used in 3D metal printing, which are intended to complement its printer manufacturing business.

Aurora's share price peaked at $3.52 a share in November 2016, at which point it sported a market capitalisation of $193m. Today, with a share price of 7.5¢, the market capitalisation is a paltry $13.8m.

Is Titomic doing a Titanic?

Titomic was incorporated in 2014, to research and develop a new solid-state additive manufacturing process using Cold Spray to produce bulk 3D forms and coatings from powder feed stock that is both metallic and non-metallic. Its metal additive manufacturing process, Titomic Kinetic Fusion, focused on industrial scale manufacturing of large size metal parts as well as high volume production of complex shaped parts.

Armed with a CSIRO Patent Application, the manufacturing of near net shape titanium parts, the repair of metal components and structures, ballistic protection coating for defence and space application and specialised coatings for marine application were just some of the future opportunities being promoted by Titomic.

The Company IPO'd in September 2017, raising $6.5m at 20¢ a share. In May 2018, it raised $12m at $1.25 a share, and launched the world's fastest metal 3D printer. The Company seemed to be on a roll with bullish ASX releases coming thick and fast, taking the share price to a high of $2.85 by the end of May. However, the shares have been in a downtrend ever since, trading recently at 22¢. Whatever the merits of the Company, both short and long term, the stock market has moved on to other stories. The Company is now capitalised at $50m, a long way short of the $239m in November 2018.

A common story with tech companies

It is not unusual for stock market punters to get over-excited by new technology and take share prices to ridiculous levels. It happens all the time. As far as 3D additive printing is concerned, those who got in early on in the above mentioned companies and were smart enough to sell would have had a wonderful experience, but anyone who bought at higher prices would have been crucified if they held on for any length of time.

Share market performance is often not a good measure of whether the company or the technology has any future. Aggressive investors rarely have the patience to see new technology through, while unlucky investors can frequently get the timing wrong. Making money on the stock market is all about timing and taking advantage of euphoric speculative activity - at least in the short term. Reality can be a distraction.

But wait, is there a saviour? Metal Powder Works, Inc?

We have recently been reviewing an unlisted company that could have a material impact on the outlook for 3D printing companies - Metal Powder Works (MPW). It has a new process that could significantly reduce the costs of raw materials.

MPW, based in Austin, Texas, is controlled by John Barnes, an engineer who previously spent time working with the CSIRO in Australia. He has spent more than two decades thinking about the problems, then three years ago he built a prototype that is starting to look like it could be a game changer.

A bit of atomisation history first

Metal powders of the type used in additive manufacturing are currently made through an atomisation process, which has its roots in shot towers that were originally built to make lead shot for musket style weapons. Take the molten metal up to the top of the tower, pour it out from a great height, and by the time it hits the ground you have your shot. Of course, that is a simplification. The process for the modern powdering of metal has become more sophisticated with gas, plasma and water atomisation methods, but it is still atomisation.

New technology is set to take over

The MPW DirectPowder™ technique involves a patent pending, software driven mechanical process that takes metals in the form of bars or rods. It reduces the metal to a particle size that is required by customers, using conventional tooling machinery. Yields to powder are much more efficient at 95-100% when compared to the common yield of 40% for atomisation. There is much greater size control. Atomisation generates particles in the range of 0 to 300 μm but the MPW process is particularly efficient at precisely controlling the size range to 20-60 μm. It is also much more efficient in electricity consumption.

Through the range of improvements MPW believes it can reduce the cost of powders to customer by at least 50%, and possibly 90% in some cases, with greater reliability of product. It expects do this while achieving profit margins of at least 50%. Thus the lower costs will be of material benefit to 3D printing companies.

Still considering the optimum business model

MPW has three business models that it is considering, with these not being mutually exclusive. It could set up a centralised production facility and sell from that point. It could lease the machinery to customers who want to produce powders on demand, on location. It could sell the machinery outright to larger customers. It will probably focus on making the powders itself in a dedicated production facility for the first few years. Further out it may install dedicated facilities in the workshops of high volume customers.

Long term shareholder opportunities

Having successfully commissioned its prototype machine the Company is now seeking to scale it up further (even though the existing size can produce at similar scale to existing atomising facilities). It is undertaking another round of funding to achieve this step. The pre-funding valuation of the company is around US$60m. We can provide more information on the company and the funding terms if readers wish to know more.

We can't say what form the company will take in subsequent years though. It is currently an unlisted company with a limited number of shareholders. We don't know whether it will remain unlisted or whether it will seek a listing on a stock exchange. Much will depend upon the preferences of John Barnes, the inventor and the largest shareholder. Maybe he just wants to sell the technology in a trade sale for hundreds of millions of dollars … if he can get it. Any investors coming into this round of funding needs to appreciate that it will be an illiquid investment for the time being at least.

What it means for the additive manufacturing industry

This technology could be a shot in the arm for additive manufacturers that are currently struggling. Maybe the share prices of companies like Aurora and Titomic could break their downtrends on the back of expectations of improved profit margins courtesy of significant cost reductions. Time will tell.

Disclosure: FEC is not being paid for research comments, but it may be entitled to capital raising fees in the event that it assists in the fund raising

Where to for the uranium sector?

We should all know that nuclear power is the only assured solution to reducing carbon emissions. That is the logic behind the revival of interest in uranium companies over the past 12 months, though it is very difficult to see real contenders for new uranium mines. There is too much shut-in capacity just now, with operating mines being able to boost production quite readily in order to satisfy any increase in demand.

Back in the noughties there were more than 100 wannabe uranium companies on the ASX, but only two companies actually progressed to becoming producers; Paladin and Peninsula. Neither have covered themselves in commercial glory but at least they were serious operators as opposed to excessively optimistic promoters.

All of the old, previously unsuccessful junior uranium companies are wheeling out their wares again and raising money. However, there is nothing to suggest they will be any more successful in this cycle. It is difficult for an analyst like myself to go back to many of these knowing what I have learnt from the previous cycle, and learning what I did about the sector as a director of Peninsula.

As wonderful as nuclear power is, the sector will always be vulnerable to the risk of catastrophic events, even if they are only in the minds of the public, and the actual risk is much lower in reality. We saw the value of uranium companies fall by 90% when the Fukushima accident happened in 2011, and the sector has largely been on the back foot since then. Just last week we saw panic in the markets at the suggestion that Putin may employ tactical nuclear weapons, and then that was compounded by news that the Russians had bombed the Zaporizhzhia reactor. We don't know the full extend of the damage, but we do know it caused panic in the markets that can be highly destructive to share prices.

Nova's scoping study fails to impress

Last Monday, Nova Minerals (NVA) released a starter pit scoping study for the Korbel Gold Project in Alaska. On the day the share price fell from $1.00 to a low of 56¢, on turnover of $5m. It was a public hanging with the market capitalisation being cut to a tad over $100m. Where to from here?

The study (+/- 35%) assumes a 6 Mtpa plant at a capital cost of US$483m to treat the low grade 8.1 Moz deposits. While the Company tends to take umbrage at the suggestion that it is low grade, I don't know anyone else who says that 0.3 gpt is anything but low grade.

The real question to ask is whether or not it is is too low grade. Given the low waste to ore ratio of 0.76:1 and AISC in the first three years of US$879/oz, the 200,000 oz p.a. production target could generate cash flow in excess of US$200m p.a. at today's gold price. However, this is based on the assumption that ore sorting can deliver 1 gpt head grade in these three years.

The purpose of doing a scoping study at this juncture is to decide on whether or not there is a project worth pursuing. There is a great deal of subsequent work required to take the project further down the track through the PFS and DFS levels of certainty and these steps will take a number of years, but at this point we can say it is a promising project.

Canadian's are more familiar with super large, low grade projects like this one, especially in Alaska, so it is not surprising to see our market being cautious. Nevertheless, there will be plenty of trading opportunities in the stock in the months and years ahead. Maybe the smart contrarian view is to begin accumulating shares at these depressed levels.

There is one very important point to remember. Low grade gold projects like this offer the best leverage to the gold price. A $100-$200 boost to the gold price could do marvellous things to the share price.

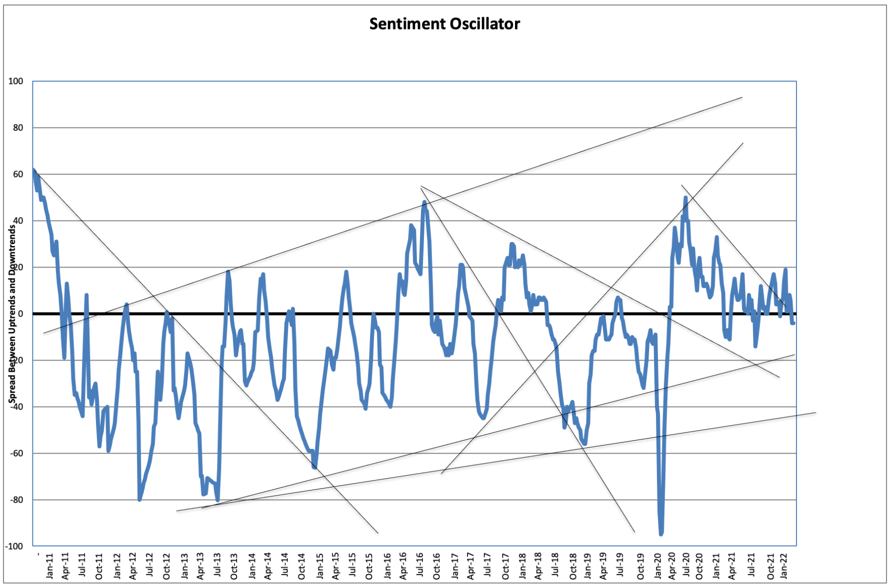
Why isn't the ASX addressing the (alleged) share price manipulation

We all want efficient and reliable markets but in order to have these the regulators needs to be objective and conscientious in the discharging of duties. Unfortunately there is always going to be a problem with the ASX due to it being a listed entity driven by the profit motive. Its operations are riddled with conflicts of interest and this is demonstrated by the capriciousness with which we see in its discharging of its duties. At least this had been recognised with ASIC taking over much of the burden, but the day to day business is still the mandate of the ASX.

ASIC has sought leverage in the prosecution of its duties, aiming for high profile cases that provide media coverage. There is logic in this approach but it nevertheless leaves a breeding ground for lesser companies to pursue unsavoury practices that could easily be nipped in the bud before they become entrenched in corporate behaviour. You know the maxim; a stitch in time saves nine.

We frequently hear companies and shareholders complaining that someone is manipulating their share price, adversely. They say that when they take their grievances to the ASX, they are met with a brick wall.

An example of what we are talking about is a company that often has tiny trades at the end of the day that seem to be designed to affect the closing price. Between 3.34pm and 4.15 pm on one day in question there were eight trades at an average of six shares each for a total value of $8.88. You may comment that this is just the "bots" doing algorithmic trading, but someone is programming those bots. When you see repeated examples of this sort of behaviour on many separate days, there is a prima facie case for alleging share price manipulation. It would be very easy for the ASX to identify which brokers are engaging in this sort of activity and issue them with a "please explain" query, but the ASX has shown a reluctance to do this. They won't even disclose who the offending brokers are to the aggrieved companies. Why not? Surely the companies have a right to know who is messing around with their share prices. Companies see their share prices being manipulated but when they try to get to the bottom of it, the authorities don't seem to care. What does that say about the integrity of the regulators and the market itself?



Sentiment Oscillator: Sentiment was steady over the week. There were 34% (34%) of the charts in uptrend and 38% (38%) in downtrend on Friday's close.

Detailed Chart Comments

NB. Only the bold comments have been updated. Comments in grey type are from previous weeks and will be less relevant. Please note that this list is a cross section of the market. It IS NOT a list of recommendations.

Indices	Code		Trend Comment	
All Ordinaries	XAO		still in downtrend	
Metals and Mining	XMM		testing downtrend	
Energy	XEJ		punched higher, above uptrend channel	
Information Technology	XIJ		rallying	
Stocks	**Code**		**Trend Comment (updated comments in bold)**	**Main Interest**
Alpha HPA	A4N		pullback	HPA
Adriatic Resources	ADT		continuing down	zinc, polymetallic
Alkane Resources	ALK		stronger	gold
Alicanto Minerals	AQI		downtrend	base metals, silver, gold
Altech Chemical	ATC		down	HPA, anodes
Alto Metals	AME		sideways	gold exploration
American Borates	ABR		recapturing uptrend	borate
American Rare Earths (was BPL)	ARR		off its highs	rare earths
Antilles Gold	AAU		testing downtrend	gold
Arafura Resources	ARU		rising	rare earths
Ardea Resources	ARL		pullback	nickel
Aurelia Metals	AMI		new uptrend	gold + base metals
Australian Potash	APC		heavy fall	potash
Australian Rare Earths	AR3		down	rare earths
Auteco Minerals	AUT		rallying	gold exploration
Azure Minerals	AZS		on support line	nickel exploration
BHP	BHP		breeched uptrend	diversified, iron ore
Beach Energy	BPT		new uptrend confirmed	oil and gas
Bellevue Gold	BGL		down	gold exploration
Benz Mining	BNZ		new low	gold
Blue Star Helium	BNL		down	gas, helium
BMG Resources	BMG		new low	gold exploration
Boab Metals	BML		in a secondary downtrend	silver/lead
Breaker Resources	BRB		heavy fall from highs	gold exploration
Buru Energy	BRU		testing uptrend	oil
Calidus Resources	CAI		on support line	gold
Capricorn Metals	CMM		surge to new high	gold
Caravel Minerals	CVV		slump	copper
Celsius Resources	CLA		testing short-term uptrend	copper
Chalice Mining	CHN		down	nickel, copper, PGMs, gold exploration
Chesser Resources	CHZ		rallied off lows	gold exploration
Cobalt Blue	COB		surge to new high	cobalt
Cyprium Metals	CYM		rallied to meet resistance line	copper
Danakali	DNK		downtrend accelerating	potash

De Grey	DEG		on support line	gold
E2 Metals	E2M		down	gold exploration
Ecograf	EGR		down	graphite
Element 25	E25		down	manganese
Emerald Resources	EMR		rising again	gold
Empire Energy	EEG		holding uptrend	gas
Euro Manganese	EMN		down	manganese
Evolution Mining	EVN		breached uptrend	gold
Firefinch	FFX		breached uptrend	gold
First Graphene	FGR		testing uptrend	graphene
Fortescue Metals	FMG		testing uptrend	iron ore
FYI Resources	FYI		down	HPA
Galena Mining	G1A		still down	lead
Galilee Energy	GLL		down	oil and gas, CBM
Genesis Minerals	GMD		surged higher after consolidation	gold
Genmin	GEN		new uptrend	iron ore
Global Energy Ventures	GEV		testing downtrend	hydrogen
Gold Road	GOR		testing downtrend	gold
Great Boulder Resources	GBR		rising	gold exploration
Hastings Technology Metals	HAS		testing uptrend	rare earths
Hazer Group	HZR		bounce back to resistance line	hydrogen
Highfield Resources	HFR		back to resistance line	potash
Hillgrove Resources	HGO		long term uptrend	copper
Iluka Resources	ILU		breached downtrend, back to highs	mineral sands
Image Resources	IMA		new uptrend	mineral sands
Independence Group	IGO		new high	gold
ioneer (was Global Geoscience)	INR		slump	lithium
Ionic Rare Earths (Oro Verde)	IXR		recovering long term uptrend	rare earths
Jervois Mining	JVR		shallower uptrend	nickel/cobalt
Jindalee Resources	JRL		strong rally	lithium
Kingston Resources	KSN		rallying	gold
Kingwest Resources	KWR		breached uptrend sideways	gold
Legend Mining	LEG		down	nickel exploration
Lepidico	LPD		testing steepest uptrend	lithium
Lindian Resources	LIN		surge higher	bauxite
Lion One Metals	LLO		spike higher	gold
Los Cerros	LCL		rallied to hit resistance line	gold exploration
Lotus Resources	LOT		holding long term uptrend	uranium
Lucapa Diamond	LOM		shallow downtrend	diamonds
Lynas Corp.	LYC		sharp pullback	rare earths
Magnetic Resources	MAU		shallow downtrend	gold exploration
Mako Gold	MKG		breaching support	gold exploration
Marmota	MEU		sideways	gold exploration
Marvel Gold	MVL		breached uptrend	gold exploration

Matador Mining	MZZ		rallied to hit resistance line	gold exploration
Mayur Resources	MRL		slump to new low	renewables, cement
Meeka Gold	MEK		strong rise but still LT downtrend	gold
Megado Gold	MEG		new low	gold exploration
Meteoric Resources	MEI		still falling	gold exploration
MetalsX	MLX		new high	tin, nickel
Metro Mining	MMI		new uptrend confirmed	bauxite
Mincor Resources	MCR		new high	gold/nickel
Mithril Resources	MTH		down	gold/silver
Musgrave Minerals	MGV		testing downtrend	gold exploration
Neometals	NMT		testing uptrend	lithium
Northern Minerals	NTU		rising	REE
Northern Star Res.	NST		breached downtrend	gold
Nova Minerals	NVA		heavy slump	gold exploration
Oceana Gold	OGC		breaching downtrend	gold
Oklo Resources	OKU		down	gold expl.
Orecorp	ORR		down	gold development
Oz Minerals	OZL		back to support line	copper
Pacific American	PAK		back to lows	coking coal
Pantoro	PNR		surge higher	gold
Panoramic Res	PAN		on support line	nickel
Peak Minerals	PUA		new low	copper exploration
Peak Resources	PEK		broken down through support line, but rebound	rare earths
Peel Mining	PEX		down	copper
Peninsula Energy	PEN		on support line	uranium
Poseidon Nickel	POS		sideways	nickel
Perseus Mining	PRU		good bounce	gold
PVW Resources	PVW		steep rise	rare earths
Queensland Pacific Metals	QPM		down	nickel/cobalt/HPA
Red River Resources	RVR		still down	zinc
Regis Resources	RRL		out of downtrend	gold
Renergen	RLT		on support line	gas, helium
RIO	RIO		new uptrend	diversified, iron ore
Rumble Resources	RTR		breached downtrend	gold exploration
S2 Resources	S2R		consolidating after steep rise	gold exploration
St Barbara	SBM		testing downtrend	gold
Sandfire Resources	SFR		breached uptrend	copper
Santos	STO		breached downtrend	oil/gas
Saturn Metals	STN		breached ST downtrend, but still in LT one	gold exploration
Silex Systems	SLX		sideways through downtrend	uranium enrichment technology
Silver Mines	SVL		sideways	silver
South Harz Potash	SHP		slump	potash
Stanmore Coal	SMR		hitting resistance line	coal
Strandline Resources	STA		slump	mineral sands

Sunstone Metals	STM		downtrend	exploration
Talga Resources	TLG		still down	graphite
Technology Metals	TMT		down	vanadium
Tesoro Resources	TSO		new low	gold exploration
Theta Gold Mines	TGM		down	gold
Thor Mining	THR		downtrend breached	gold exploration
Tietto Minerals	TIE		strong rise	gold
Titan Minerals	TTM		breached downtrend	gold
Turaco Gold	TCG		downtrend	gold exploration
Vanadium Resources	VR8		back to highs	vanadium
Vimy Resources	VMY		testing downtrend	uranium
West African Resources	WAF		new high	gold
Westgold Resources	WGX		new uptrend being tested	gold
West Wits Mining	WWI		risen to meet resistance line	gold
Whitehaven Coal	WHC		secondary uptrend	coal
Wiluna Mining	WMC		**breached uptrend**	gold
Yandal Resources	YRL		breached uptrend	gold exploration
Zenith Minerals	ZNC		surge to new high	gold exploration
Zinc Mines of Ireland	ZMI		sideways	zinc
Totals	34%	48	Uptrend	
	38%	53	Downtrend	
		141	Total	

Guides to Chart Interpretations

- Charts usually go pass from one trend (up or down) into the other via a period of indecision and uncertainty during which the trend can either recover or change. This period is signified by the orange colour. The orange represent both the greatest risk and greatest reward possibilities.
- Once a chart is in confirmed up or downtrends it is not uncommon for 10-20% of that trend to have already transpired.
- There are trends within trends. The focus of this chart review is the immediate trend that affects the sentiment i.e. it can be a downtrend within a long-term uptrend.
- Not every chart warrants a new comment every week. The new comments are in bold type. Grey type comments may be dated.
- Individual charts provide a single view. It is valuable to look at charts of other companies in similar commodities, and the overall sentiment is also very valuable. Not many stocks can swim against the tide.
- We periodically add or delete charts, some times for obscure reasons. If a chart consistent gives poor signals or is very erratic, we may delete it. Sometimes we add a chart because we want to see what all the fuss is about. We do have a preference for charting stocks that we cover in our research as well.
- Errors and omissions may occur from time to time, especially in fast moving markets.

Amber Lights in Tables: Just a reminder if when the amber light is used in the table – it is when the charts are ambiguous or when there is a change of trend taking place. If a chart is breaching a downtrend it can either be a positive sign or a trap. Only once it has done more work can it be confirmed as a new uptrend. Maybe it is a new uptrend (or conversely a new downtrend); the risk takers can decide to jump on board early (or sell). They will maximise their profits (or minimise their losses if indeed it is the start of the new uptrend (downtrend). More risk-averse investors should wait a little longer, being prepared to give up some of the gains in return for greater certainty.

Weightings of Sectors Represented in the Company Charts

Sector	No. of Companies	Weighting	
Gold	**31**	**22.0%**	

Gold Exploration	24	17.0%	
Nickel	11	7.8%	
Copper	10	7.1%	
Rare Earths	9	6.4%	
Oil/Gas	7	5.0%	
Iron Ore/Manganese	6	4.3%	
Lithium	4	2.8%	
Potash/Phosphate	5	3.5%	
Graphite/graphene	4	2.8%	
Uranium	4	2.8%	
Zinc/Lead	4	2.8%	
Mineral Sands	3	2.1%	
Silver	3	2.1%	
Coal	3	2.1%	
Bauxite	2	1.4%	
Cobalt	1	0.7%	
Tin	1	0.7%	
Diamonds	1	0.7%	
Other	8		
Total	141		

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