

8<sup>th</sup> July, 2016

## **Aurum Small Cap Opportunities & Aurum Growth Portfolio 14th Quarterly Update – QE June 2016**

Dear Investor,

The quarter gone by will perhaps be remembered as a quarter of 'exits' with words like Rexit & Brexit being discussed in the media and boardrooms alike. Most of the world was unaware of BREXIT till it happened. For those of us who were aware of BREXIT the exit vote actually caught us by surprise. On the announcement of the same, the market gyrated wildly, though we doubt the participants understood the implications of BREXIT.

Simply put, if Great Britain were to follow through with the exit, its citizens and trade will not have seamless access to the rest of EU and vice versa. Correspondingly, Britain will not have to share the financial and other responsibilities that its EU membership entailed.

Many companies, who opened office in Britain to access the EU market, will have to rethink the 'access to EU market' strategy. We believe, barring some financial cost and logistical disruption, it will be business as usual for the rest of the world. However, Britain as we know it today, will be a much diminished entity in the emerging world order. The implications of that are long term and still very unclear.

That apart, the only observation that we wish to humbly convey in respect of Brexit is that India is better placed than most of the world to deal with any adverse consequences of Brexit. That is not to say that there will not be sharp, short term swings in the capital and currency markets in the near term.



## Disruption, the new normal

Continuing with our theme of disruption being the new normal for 3<sup>rd</sup> quarter in row, we wish to throw some light on the disruptive prowess of driverless and electric vehicles

Globally, auto industry at USD 9.7 t, accounts for 13.4 % of global GDP. It is the bellwether sector of an economy & a country. However, we believe, there is a power shift about to happen in the auto industry in the next 5-10 year time frame. Our hypothesis is based on emergence & confluence of two primary technology developments, namely:

- I. **Autonomous driving technology:** Driver independent operating system to autonomously drive passenger and commercial vehicles, currently being developed by Google, Tesla, Navya, etc
- II. **Electric Vehicles:** Tesla seems to have cracked the holy grail of EV technology; speed, mileage per charge and ownership cost

Over the next 5-10 years, the confluence of these 2 technology platforms will disrupt and transform the auto industry ecosystem as we know it today. Both these are likely to mature and gain critical mass in the next 5-10 years. It will also give rise to a host of new technology companies and platforms, by their own rights.

- I. **Autonomous driving technology:** Coming androidisation of automobile industry

Google acquired Android in 2003 for ~USD 50 m and in Oct 2008, the first Android based phone was launched by HTC, christened HTC Dream. Till then most OEM had their own operating systems. Launch of android operating system triggered the proliferation and consequent fragmentation of the smartphone market with over 100 handset OEMs joining the fray (Samsung, Nokia, ASUS, LAVA, Apple, Xiommi, Gionee, Micromax, Karbonn, OnePlus, etc). The OS market, however, has remained oligopolistic and continues to be dominated by iOS (Apple, 10-15% market share), Android (Google, ~80% market share) and Windows (Nokia / Microsoft).

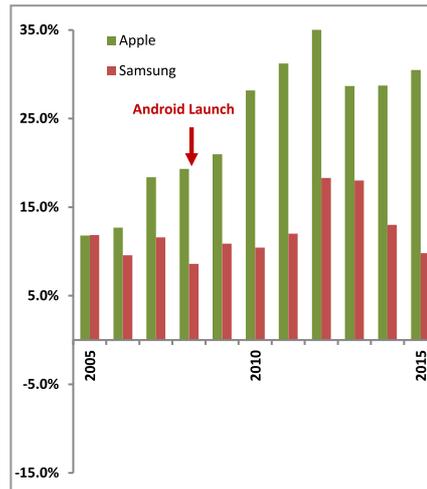
Since the launch of Android OS, anecdotal evidence suggests and as is evident from chart 3 below that smart phone OEMs have had a chequered past. Launch of Android OS has led to a proliferation of hand set manufacturers and eventual marginalization of marquee names like Nokia and Motorola. Apple remains an exception to this phenomenon by virtue of having its own OS and positioning itself as an object of desire.

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## EBIT margins (%) of phone-set manufacturers

Industry Survivors



Industry Casualties

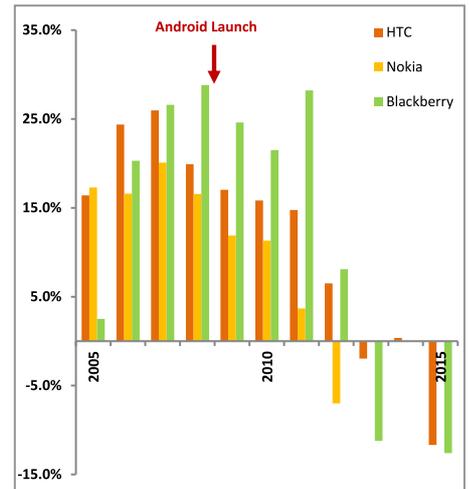


Chart 3: Company Annual Reports

The point we are trying to drive home is that, a situation of one or few 'enabling technology provider(s)' and many 'me too producers' leads to a skew in favour of the 'enabling technology provider(s)' and hyper competition amongst 'me too producers'. This leaves no space for mass producers, unless backed by exceptional quality and phenomenal manufacturing & marketing scale, as in case of Samsung. This is what we chose to call 'androidisation' of the cell phone industry and earlier the PC industry as well. In the PC industry, Intel and Microsoft continue to thrive, whereas marquee companies like Dell and HP have continued to struggle. Companies like IBM and Sony, and Wipro & HCL in India have either vacated the space or are preparing to vacate the space for more adventurous players.

### The coming power shift in Auto industry

We expect the auto industry to be 'androidised' over the next 5-10 year time frame. Currently, Google, Tesla, EasyMile, Navaa and a few others are conducting driverless (autonomous) car trials. So are some auto OEM consortiums. Our premise is that, eventually, autonomous driving as a technology will get approved, as specified by National Highway Traffic Safety Authority, USA. Post approval, we believe, there will be progressive adoption of autonomous driving technology by consumers.

This space, once it achieves critical mass, is likely to be dominated 2-3 players like Google, Tesla, Navaa, etc, providing the OS for car and commercial vehicles. The likes of Mercedes, Honda or Suzuki may well lose their customer pull or pricing power or both as they become more dependent on one of the autonomous operating systems. This dependence on 3<sup>rd</sup> party OS is going to be hugely disruptive for the traditional auto industry.

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With this power shift, auto OEMs may experience a sudden pressure on their profitability. As a corollary, the beneficiaries will be the OS, communication & safety solution providers, enabling autonomous mobility.

### What does Autonomous driving OS entail?

To begin with, a driverless vehicle entails a robust technology frame work of:

- Sensors & safety features (optical, infra red, radar, ultrasonic, laser)
- Wireless network for vehicle to vehicle and vehicle to signal communication
- Navigation, GPS systems and maps
- Automatic transmission& control (steering, brakes, signals)
- Server, software and power supply
- **Operating System (OS)**, to analyse inputs and manage response to ensure security & safety

### Implications for auto industry

- **Androidisation:** We believe, most auto OEMs will be dependent on few OS (Google, Tesla) for autonomous driving technology.
- **Auto ancillary profile to undergo change:** Next, OEM and tier I suppliers will have to invest heavily in developing technology sub systems for communication, control & safety, as mentioned above. This is likely to see emergence of new auto technology companies to cater to these requirements. On the flip side, investment in traditional features and equipment in a PV / CV would reduce disproportionately putting pressure on the current auto ancillary ecosystem.
- **Deteriorating financial health of auto industry:** With this power shift, auto OEMs may experience a sudden pressure on their profitability. As a corollary, the beneficiaries will be the OS, *communication & safety solution providers*, enabling autonomous mobility.

## II. Electric Vehicle (EV)

The other emerging trend is main streaming of electric passenger car (PV) and commercial vehicle (CV). Currently, they are less than 1% of new vehicle sales (FY15) at ~ 4,62,000 nos, which however is a 60% growth over FY14.

Historically, battery cost, mileage per charge (*distance covered per charge*) and cost per km, were the primary challenges in mainstreaming electric vehicles. Without going into the technicalities, model Tesla S & Tesla M give us reason to believe that Tesla may have cracked the holy grail of EV. Similarly, other EV platforms are also being developed by Volkswagon, Nissan, Chevrolet, Toyota and BMW amongst others. As things stand today the main drivers towards emergence of EV are:

**Cost of lithium-ion battery packs (\$ per kWhr)**

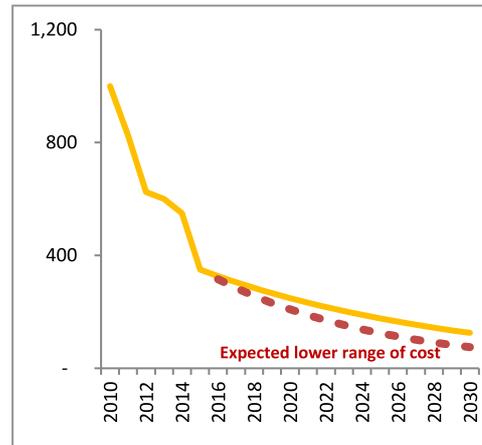


Chart 4: Bloomberg Research

**1. Fall in lithium ion battery pack price:** As would be evident from Chart 4, Lithium ion battery packs have seen a ~35% drop in cost (\$ per kWhr), over last year. This downward trend is likely to continue, given the enormous amount of effort and money being committed in this area. Any, technology or material breakthrough in battery or material technology would further accelerate this process.

**2. Higher 'Well to Wheel' Efficiency:** EV has a 'well to wheel' energy efficiency of ~2.4x and ~1.8x vis a vis diesel ICE and petrol ICE, respectively. Significant part of the efficiency delta of an EV over ICE can be attributed to the higher 'battery to wheel' efficiency vis a vis 'IC engine to wheel' efficiency.

**Well-to-wheel efficiency (km/J)**

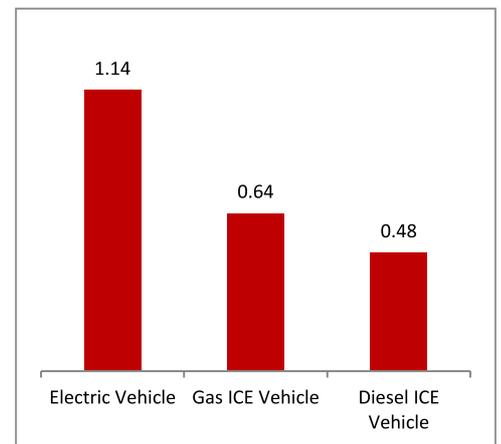


Chart 5: Tesla Research

**Cost per 100 km (USD)**

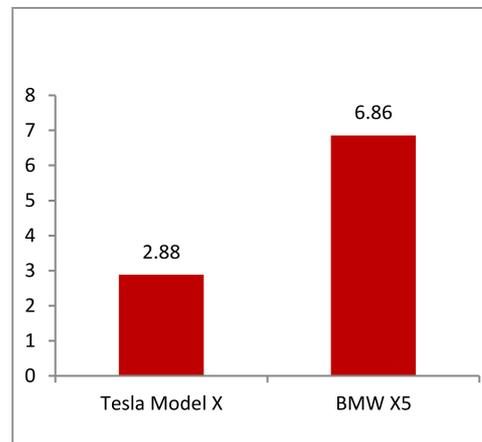


Chart 6: Tesla and BMW websites, NRC Research

**3. Lower Operating cost per km:** Confluence of lower / declining lithium ion battery price and higher energy efficiency ratio, effectively translate into lower per km cost vis a vis conventional fuel.



#### 4. EV - Fewer moving parts, less wear & tear

##### Electric vehicles vs Internal Combustion Engine (ICE) Vehicles

ICE Vehicle - Many moving parts	EV - Few moving parts
Engine, gear set, clutch, coupler, drive shaft, alternator, oil pump, water pump, pistons, rotor, valves, motor generator, etc	Battery, controller and electric motor

Table 3: NRC Research

As would be evident from the Table 3 above, ICE vehicles have many moving parts in the power transmission system, which in turn leads to higher wear & tear and consequently higher maintenance. The transmission system of an EV, on the other hand has battery, controller and electric motor at the wheels. The lower number of moving parts translates into lower wear & tear and lower ownership cost vis a vis an ICE engine. The other significant impact is that the IC engine based auto ancillary ecosystem, as we know it today would face investment destruction.

#### Going Forward

##### Expected sale of EV per year (Mn)

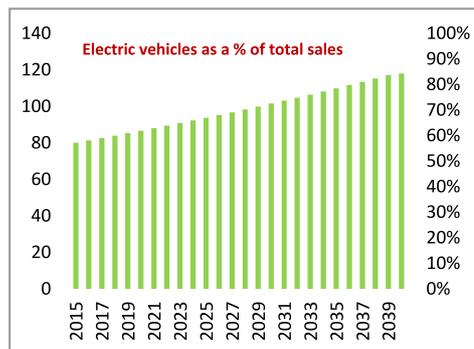


Chart 7: Bloomberg Research

As EV as a technology platform gathers steam, it is assumed that from less than 1% today, they are likely to account for 10-15% of all new vehicles sold by 2025-30! Such a growth would have a cascading impact on oil & gas sector, automobiles and allied industry, as we know it today.

In conclusion, the confluence of autonomous driving technology and EV is gaining momentum. The impact of the same will be very significant and change the auto industry as we know it today. To summarise:

- ✓ **Auto OEM:** Dependence of automobile OEM on 3<sup>rd</sup> party autonomous OS, in the longer run, will translate into lower profitability.
- ✓ **Oil & gas:** EV will reduce the dependence on and usage of fossil fuel. Similarly, autonomous driving is likely to enhance the fuel efficiency of the economy as a whole.

IC engine based auto ancillary ecosystem, as we know it today would face investment destruction.



'Internet of Things' (IoT) is a network of physical objects embedded with sensors and software, which interact via internet with a platform, exchanging data without human intervention. This data, when collected and analysed can trigger specific action(s).

- ✓ **Auto Ancillary:** On the back of the above two events, auto ancillary industry will have to reinvent itself. That may lead to the decline of many large and prominent auto ancillary players of today and emergence of new platforms.
- ✓ **Ownership of Vehicles:** Vehicle ownership pattern may shift significantly from individual to corporates (OEM or aggregators) as vehicles become available on beck and call.
- ✓ **Employment:** Driver, as a profession may be at risk. On the flip side, we will see large scale generation of automobile engineering jobs & re skilling there of.
- ✓ **Infrastructure:** Infrastructure Development to support of autonomous driving and EV vehicle ecosystem will throw up many interesting new investment opportunities.
- ✓ **Traffic safety & Insurance:** The most apparent benefit of autonomous driving would be a more organised traffic flow, lower incidents of accidents and lower fuel consumption. Correspondingly, insurance prima and revenue accruing to insurance companies would also decline. Given the lower incidence of accidents, insurance pay outs are also expected to reduce. It may or may not adversely impact the financial health of insurance companies.

## Internet of things

**What is Internet of Things?** Simply put, 'Internet of Things' (IoT) is a network of physical objects embedded with sensors and software, which interact via internet with a platform, exchanging data without human intervention. This data, when collected and analysed can trigger specific action(s). Though M2M (Machine to Machine communication), an early harbinger of IoT, has been in usage for 10-15 years, IoT took off in the true sense only in 2013. The key catalysts were:

- a. **Launch of new internet protocol (IPV6):** it removed the constraint of IP addresses with its address space of 128 bits (IPV4's 32 bits yielded ~4.3bn unique addresses ( $2^{32}$ ) that got exhausted by 2010) which provides a huge supply of unique IP addresses that can last for centuries.
- b. **Launch of 4G:** It enabled higher band width for digital traffic.
- c. **Declining cost of data storage:** Cost of storing data has fallen substantially with the arrival of storage-on-demand services via cloud, offered by the likes of Amazon and Microsoft (Azure) etc.

**How IoT works?** Sensors and chips are embedded in the everyday things that surround us, like household items (meters, fridge, etc.), traffic signals, trains, mining equipment's, automotive components etc., securely transmitting data such as location, humidity, temperature, motion, activity, velocity, vibration and sound etc. to an IoT platform. This platform integrates the data, applies filters or analytics (predictive, descriptive or prescriptive) to initiate immediate action or build a pattern for further reference.

### Schematic representation of IOT at work

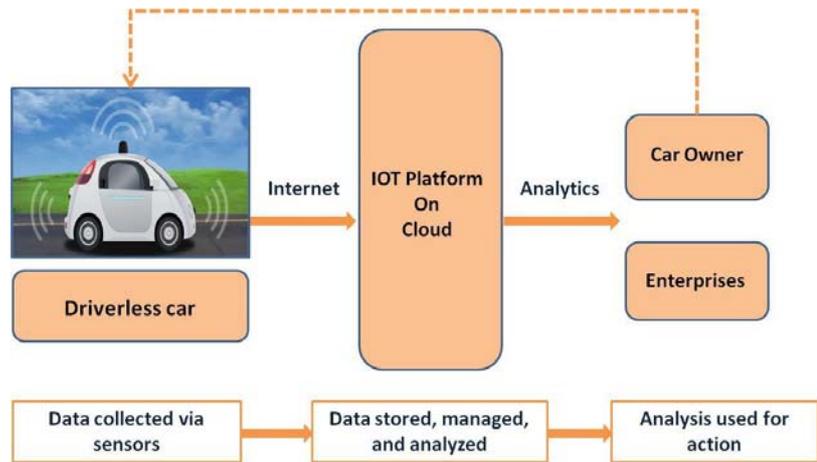


Chart 8: NRC Research

The ecosystem developing around driverless car is one such example of IoT at work

**Impact of IoT in our daily life:** Internet of things (IoT) is already in our daily lives, especially in the developed world. It finds wide application in transportation (traffic management & parking aid), health (Fitbit and vital statistic monitors), energy consumption (Google Nest), etc. The most visible example of IoT is the 'Google driverless car'.

**IoT in manufacturing & asset management:** IoT has significant implications for manufacturing, asset management, household durables, real time financial analysis, business process automation, government decision making, etc. It represents an unparalleled opportunity not only for enterprises but also for governments (human safety, individual health, environment etc.).

#### IoT can:

- Transform companies from products sellers to sellers of products as a service.
- Provide manufacturers with more customer leverage with retailers and owners of technology platforms (such as Google)
- Enhance public safety; manage traffic flow, disaster management, etc.
- Optimize industrial processes and solutions. For example, on an oil rig that has 30,000 sensors, only 1% of the data generated is examined - because information is used mostly to detect and control anomalies—not for optimization and prediction.

**Mapping the business opportunity:** Cisco predicts that the IoT opportunity will be worth ~\$15 trillion worldwide in the next decade, through device installations, product sales as well as savings from efficiency gains. It is likely to spur a new ecosystem wherein the key beneficiaries would be manufacturers (creating new products), system integrators, solutions providers, data service providers etc.

To reach its potential, IoT industry would need to address issues around standardization of protocols, data ownership, privacy, safety, ethics, governance etc.

Government of India's push to clean up banks, usher in more transparency in the business environment, aided by technology; focus on inclusive growth and last but not the least, trying to make the bureaucracy accountable has laid the foundations for a sustainable economic growth in the coming many years.

However, to reach its potential, IoT industry would need to address issues around standardization of protocols, data ownership, privacy, safety, ethics, governance etc.

**IoT landscape in India:** Businesses will need big strategic changes as they scale up their IoT solutions to support billions of things of tomorrow. Indian companies, are lagging their developed market counterparts. Traditional Indian IT services companies also have only a peripheral presence in IoT, covering areas like system integration, middleware (Infosys, TCS, Wipro etc.), software, hardware, network engineering (Cyient, Persistent, KPIT) etc. A few start-ups are leveraging IoT like LifePlot (medical diagnostics), CarlQ (car analytics) etc., but none of a substantial size. This could change however, with govt. thrust on smart cities, Make in India & digital India initiatives.

We believe that the Government of India's push to clean up banks, usher in more transparency in the business environment, aided by technology; focus on inclusive growth and last but not the least, trying to make the bureaucracy accountable has laid the foundations for a sustainable economic growth in the coming many years. Hopefully a good monsoon in the current year will act as a further 'kicker' to the process.

Despite the generally prevalent impression that all good small and mid cap companies are already discovered, we continue to meet new companies with good management teams and sound businesses. Further, our patience helps us in buying such companies at reasonable valuations in these times of market volatility, which we believe is likely to continue.

Please feel free to call or write to me for any further information.

Warm regards,

**Sandeep Daga**

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