Global Emerging Markets and Artificial Intelligence

RWC Emerging & Frontier Markets

Investor letter Q2 2017
In this edition we give an overview of emerging and frontier markets in 2017 so far before examining Artificial Intelligence as a theme.

We believe Artificial Intelligence will continue to have a profound impact on all markets globally. The challenge for investors is to find the most interesting companies that are taking advantage of the growth opportunities this sector now offers.

The Team

John Malloy and James Johnstone co-manage the RWC emerging and frontier markets strategies. Anil Tewari heads up research for the team, focusing on Asian technology opportunities himself. They are supported by a team of 12 analysts, economists and strategists based in Miami and Singapore, many of whom have worked together for over twenty years. The team joined RWC Partners in 2015 and now manages c. $2.5bn for its clients.

Emerging and frontier markets represent the fastest growing countries in the world. The RWC team believes the continued growth in these markets represents opportunities across a range of industries.

The team takes an index-agnostic, opportunistic approach which, when combined with its depth of experience, allows the RWC emerging and frontier market strategies to participate in different opportunities that are usually off the beaten track.
Review of Q1 2017

As many skeptics and pundits worried about the Trump victory, Fed hikes, a strong dollar, trade wars and geopolitical risk, emerging and frontier markets continued to outperform developed markets into the first quarter of 2017.

The MSCI Emerging Market Index was up +11.44% for the quarter, and the MSCI Frontier Market Index returned +8.89%, compared to the MSCI World (ex-EM) Index which generated +6.53%.

Our funds continued to produce good performance in Q1 2017, with the RWC Emerging Markets Equity Fund up +11.82% and the RWC Frontier Markets Equity Fund +8.75%.

We believe that emerging and frontier markets will continue to do well given the global backdrop of improving growth, low interest rates and increased global trade. In addition, these markets offer high growth opportunities at very reasonable valuations that are cheaper than developed equities.

After underperforming last year, the Chinese market rebounded sharply as the government continued to focus on SOE reform and infrastructure. During the quarter our China team, along with John Malloy, spent a week visiting companies in the Shanghai area which reinforced our conviction that 2017 would be a year of stability in China with the economy potentially surprising on the upside. We came away positive on the SOE reform theme which includes the government reducing non-productive overcapacity in steel and coal, which has already led to strong performance from Angang Steel and China Shenhua Energy. As China reduces overcapacity, we are seeing a strengthening of domestic commodity prices as well as a pickup in fixed asset investment. This has led to a rebound in PPI from being negative 6% to almost positive 6%.

In addition, Brazil and Argentina were strong contributors to performance in the quarter as both governments focused on fiscal reforms. Negative impacts on performance were mainly driven by companies or countries that have oil exposure, such as Russia and Saudi Arabia.

Within the frontier market complex, Bangladesh continued to be a key country exposure for our strategies, with continued gains across the sectors. BRAC Bank continued to rally on increased investor interest in the BKash mobile payments subsidiary. Its frontier Asia companion, Vietnam, also extended its year-to-date gains, rallying over 10% in Q1. Our holdings in cement and brokerage stocks outperformed the market and remain attractively valued. Banks in Kenya recovered sharply as profits showed less of an impact than expected from the credit limitation laws enacted in late 2016. Although Kenya’s macro situation remains slightly cloudy, the long term attractiveness in the banking sector remains underpinned by low levels of valuation.

The frontier market detractors were led by Pakistan as the market continues to underperform after its massive rally over the last three years. With its upcoming reclassification to emerging market status in May, we expect to see volatility as passive buyers contend with profit takers to set the market direction. Additionally, our underweight positions in Kuwait and Bahrain detracted from performance.

One of the themes that we are very excited about is Artificial Intelligence, which we believe will continue to have a profound impact on developed as well as emerging and frontier markets.

In the following research note we explain how we take broad technology themes to identify interesting companies that are taking advantage of the growth opportunities.
Artificial Intelligence

Artificial Intelligence or “AI” simplistically conceptualizes a device or machine mimicking “cognitive” functions that humans associate with other human minds, such as “learning” and “problem solving.” Driven by the massive increase in computing power available today (which continues to advance exponentially), AI is becoming much less “concept” and much more an everyday reality. **Machines routinely perform tasks that have traditionally required human intelligence such as visual perception, speech recognition, translation between languages and even decision making.**

An often-cited AI scholar, Professor Yutaka Matsuo of Tokyo University, offers four simplified levels to understanding Artificial Intelligence:

- **Level 1 – Simple control programs – basic automation**
  *Controlling air conditioners, washing machines*

- **Level 2 – Classic Artificial Intelligence**
  *Chess programs, cleaning robots, games AI, and AI capable of responding to questions*

- **Level 3 – Artificial Intelligence embodying Machine Learning**
  *Embedded in search engines; can automatically make decisions based on big data*

- **Level 4 – Artificial Intelligence Capable of Independent Program Generation**
  *Using neural networks; outcome oriented; no human programming required*

Source: Tokyo University

**FIGURE 1:**
Traditional Programming versus Machine Learning

Automation is a related and more prevalent term, used primarily within manufacturing circles, which simply involves the use of control systems and/or robotics to perform some or all tasks previously performed by humans. We believe that today we are at the very nascent stages of how AI will impact automation. **As automation converges with AI, we believe we will see significant disruption across a multitude of industries in all aspects of the global economy, perhaps led by changes we are already witnessing in some of the manufacturing-heavy emerging markets.**

The US, Germany, Japan and South Korea are all at the forefront of these innovations. But it is impossible to overlook or underestimate the **sheer scale, growth momentum and money that China embodies in the quest to automate.** In 2013 China overtook Japan in domestic robot unit sales.

**Guangdong province offered 943 billion yuan ($137 billion) in subsidies to about 2,000 local companies, including both robot makers and those making autos, home appliances, and construction materials, that are looking to automate their plants. President Xi Jinping’s government wants local industrial robotics makers like E-Deodar Robot, Anhui Efort, and Siasun Robot & Automation to take on foreign players including Japan’s Fanuc or California-based Adept Technology for leadership in the $11 billion market.**

*(Bloomberg News, 24 April 2017)*
So it’s early days: how do we invest in this theme in emerging markets?

First, as with any new trend or theme, look for enablers or companies that empower the infrastructure of AI and Automation.

Enabling machines to teach themselves and other machines to think has taken us to new frontiers in AI and automation. Indeed teaching machines to pursue desired outcomes, to even out-think the world’s greatest chess-players (IBM’s ‘DeepBlue’ beats world grand master in 1996, a game with $10^{44}$ possibilities), to out-strategize the keenest human “Go” minds (Google’s ‘DeepMind’ beats top human player in this ancient Chinese game with an almost infinite $10^{170}$ possible outcomes), and even out-bluff the most prodigious poker players (Carnegie Mellon’s ‘Liberatus’ victorious after 20 day poker tournament, 30 January 2017), requires massive amounts of data-processing and incredible levels of computing.

Data centers, high-speed connectivity, high-power chip fabrication, high-speed memory, visual and sensory analog to digital data conversion (which includes everything from touch sensors to surveillance camera data processing) are just some facets of AI and Automation where we have found companies with thriving business models in China, Taiwan and South Korea.

At RWC we have been closely researching aspects of AI and Automation for the last few years.

Presenting on themes such as robotic manufacturing and automated manufacturing of everything from mobile phones to garments; to the enabling of electric vehicles and driver-less cars. In one of our more recent (January 2017) updates, we discussed the significant and pervasive nature of trends as we hit interesting milestones in several key areas as these technologies both evolve and converge.

While still in their infancy, we have no doubt that AI and Automation will become a commonly accepted dimension of all industries in the future... reminiscent to many of us of the impact of the internet in the mid-to-late 1990s, when web browsing and Netscape was just being introduced to the world.

Below we discuss key portfolio holdings from the end-application level makers of surveillance systems such as Hangzhou Hikvision, and factory automation enablers such as Delta Electronics. From the better known upstream chip manufacturers like Taiwan Semiconductor, and Hynix that are deriving new growth opportunities from high-performance computing, and high-bandwidth memory to less known up Win Semi which provide gallium-arsenide chip fabrication services. We also discuss large-data moats and cloud infrastructure giants such as Alibaba, and the smaller but innovative watch-list stocks such as Shenzhen Innovance.
**Chip manufacturing.** The first area of AI-enabling we focus on is the manufacturing of chips, which are at the heart of creating the deep neural networks and high performance computing required for AI. The use of graphics processing units (GPU) – accelerators pioneered by companies such as **nVidia**, and used by **Google** in its ‘Brain’ image recognition project – reduced the need for over 1,000 servers and over 2,000 CPUs (central processing units) down to just three servers and 12 GPUs to achieve speeds 10-20x faster than previously possible, while more accurately recognizing images than humans. nVidia and other high-end chip design houses (referred to as “fabless” given they outsource the actual chip fabrication) have just one main go-to source for advanced node chip-fabrication: **Taiwan Semiconductor**.

**Taiwan Semiconductor** has been a core portfolio holding since the inception of RWC’s Emerging Markets strategy. It is the world’s largest and only fully-independent foundry. While **Intel** and **Samsung Electronics** are competitors at the leading edge, both have in-house products and technologies that often compete with the chips designed by customers such as **nVidia** and **Apple**. Taiwan Semiconductor is also, for the first time in its history, leap-frogging ahead of Intel in terms of technology leadership, in this case offering the smallest cut die-sizes, by starting to tape-out 7nm projects for production in 2018. A nanometer (nm) is one-millionth of a millimeter: for perspective a human hair is about 75,000nm! We model Taiwan Semiconductor continuing to compound earnings growth at 14%, ascribing some 30% upside to the shares over the next 12-18 months.
The other core area in chip capability and high-performance computing is memory, including high-bandwidth memory. As applications get more advanced they get hungry and require voracious amounts of faster and faster dynamic random-access memory (DRAM, including mobile DRAM and server-DRAM). In emerging markets, both Samsung Electronics and SK Hynix based in South Korea are two of the world’s largest memory producers. Samsung has the largest share with about half the market, while Hynix and Micron, based in the United States, share the other half.

**FIGURE 4:**
Dram content growth per box by application

**FIGURE 5:**
Dram demand by application

**FIGURE 6:**
Dram bit supply growth to hit all-time low in 17CL

Source for figures 4–6: CLSA, DRMeXchange, 04 April 2017
Hynix, with its pure-play memory focus is our chosen portfolio holding for this theme, and is on track to achieve record levels of profits this year. Given the prohibitive costs of advance-node memory production, the industry has undergone a massive shakeout culminating in just three players from as many as 10 just a decade ago. As such, we are seeing unprecedented supply discipline (expressed in the strong contract and spot prices of DRAM) as well as shallower peak-to-trough cyclical volatility, which should help Hynix’s trading multiples re-rate back to the upper end of its historical range. While we continue to monitor the often intense ongoing debate on whether memory supply discipline can be sustainable, we view this memory super-cycle as one that will last into 2018. We see an additional upside of over 30% for the shares.

Another ‘enabler’ and potential winner in the upstream chip manufacturing arena is Win Semi in Taiwan. Win Semi is the largest independent gallium-arsenide (GaAs) foundry, with 60% global market share. GaAs is interesting as it offers less interference than typical silicon-based components in increasingly complex mobile phones which pack growing numbers of power amplifiers and radio frequency (RF) components into each unit. Win Semi stands to benefit as 4G phones proliferate, and as we go further into 5G technologies. With the ongoing trend in increased GaAs foundry outsourcing, we believe Win Semi can generate industry leading growth. The company has strong relationships with key customers such as Murata, Broadcom and Skyworks.

FIGURE 7:
Win Semi’s opportunity expanding with increasingly advanced wireless communications

Source: Win Semi, May 2017
In addition, we also expect **3D sensing and laser image recognition** as a potential new business (optical sensors – via *Lumentum*, the US based sensor and component manufacturer) to pick up traction starting next year. This is the key AI-related feature that has yet to reach mass-adoption. Despite its nascent stage, there is strong potential for this product to generate meaningful incremental upside for Win Semi’s growth rate in the medium term. We see at least 30% upside to shares with potential for upgrades to our estimates based on adoption of this technology.

**From enabling chips to applications: Servers and manufacturing robotics.** Moving further downstream now, we also see several key areas of opportunity in emerging markets. Within server rooms and the vast manufacturing complex in greater China for example, we see strong scope for upside for companies such as *Delta Electronics*.

Delta, based in Taiwan, has long invested in automation with increasing amounts of AI features and content adding functionality following in the path of larger peers such as *Fanuc* in Japan. Like Fanuc, Delta is also working with equipping assembly line robotic arms with AI GPUs for deep learning and outcome-oriented tasks such as picking up random objects from a bin based on visual or qualitative cues. *And Delta is practicing what it pitches to its customers too.* Internally, the company has ‘automated’ its own manufacturing workforce in China from some 60,000 workers to less than 30,000 today. Management is further targeting 90% internal direct labor automation within five years, going from just under 1,000 robots today to over 10,000 over that time. Selling its products at lucrative discounts to the Japanese, Delta strongly believes its factory automation division can continue to take share and remain a key growth driver over the coming years.

**FIGURE 8:**
A sample of Delta’s factory automation and AI-enabled robot solution

Source: Delta Electronics (http://www.deltaww.com), 2016 Annual Report
In addition to factory automation, Delta has other divisions making in-roads in ‘building-automation’ and ‘server-room’ solutions including power supplies and cooling, all of which are key to enabling cloud-based infrastructure which is growing in lock-step with AI. In addition, its core power solutions business has also penetrated new areas such as electric vehicle (EV) inverter power supplies, further entrenching its positioning in the EV and driverless-car supply chain.

Altogether we feel the company is back on track to deliver earnings growth after a period of investment and incubation. Given its unique positioning and strong management team, we believe Delta can continue to trade at high multiples with good surprise potential coming from earnings. We see some 30% upside from current levels.

**FIGURE 9:**
Hikvision is penetrating into the AI, smart robot and auto-driving market

<table>
<thead>
<tr>
<th>2001-2008</th>
<th>2008-2011</th>
<th>2011-2016</th>
<th>Present</th>
</tr>
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<tbody>
<tr>
<td>Single product</td>
<td>Hardware</td>
<td>Solution &amp; consumer market</td>
<td>Artificial intelligence and automation</td>
</tr>
<tr>
<td>DVR/NVR</td>
<td>Monitor</td>
<td>CMS</td>
<td>Facial recognition &amp; analytics</td>
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<tr>
<td>Camera</td>
<td>Encoder/Decoder</td>
<td>eZViz Cloud</td>
<td>Surveillance drones</td>
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<td>Video codec</td>
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<td>Parking and warehouse robots</td>
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<td></td>
<td>Consumer electronics</td>
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<td>Autonomous driving</td>
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Source: BAML, Hikvision, RWC Partners, as at May 2017

**Other AI-based enablers.** One of the more visible areas (quite literally) within AI is *image processing* used not just in *driverless cars*, but also in *surveillance and AI-based security*, where technology continues to evolve at a rapid rate.

**Hikvision** has been a portfolio holding for some time, and has proven to be a leader in the surveillance theme, as the world’s largest supplier of video surveillance products, commanding over 25% share of the growing Chinese market and 3% globally.
In addition to surveillance cameras of all types, Hikvision is also heavily involved in facial-recognition analytics, surveillance drones and autonomous driving applications including autonomous parking warehouses. Our analysis suggests the company can continue to deliver over 25% earnings growth.

Of course no discussion on AI would be complete without the big daddies of Chinese big data – Alibaba, Baidu and Tencent. Among these, and also because of its other dominant business strengths, we prefer Alibaba.

**FIGURE 10:**
Alibaba increasingly flexing its cloud-infrastructure strength and potential

**ALIBABA.** Leveraging its vast amount of sophisticated, transaction-oriented consumer data, we believe Alibaba will be an ultimate beneficiary of AI development. AI allows the company to provide a more personalized experience for its customers; it can rapidly identify clusters and patterns in the information – such as similarities between customers, past purchasing behavior, credit checks and other common threads. Millions of transactions can be analyzed every day to target offers down to a single customer. With the strongest database, as well as the largest (by far) Cloud in China, Alibaba is gaining an upper hand among peers in the forthcoming AI competitive landscape.

Trading at 23x 2018 earnings, Alibaba’s current valuation recognizes only its core e-commerce business, in our view. We believe Alibaba’s strategic investment in Cloud and AI could add an additional 20% upside (or roughly $60bn) to its current market cap.

We have several more names on our watch list and will continue to review the best opportunities within emerging markets on an ongoing basis to participate in this powerful long term investment theme.
Conclusion

Our opportunistic approach to emerging and frontier markets continues to lead us to investigate and fully research themes such as Artificial Intelligence. The thematic research helps us to prioritize where our 15 person investment team is looking for the best ideas on a global basis.

Over the past year, the stocks within the AI theme have added value to our portfolios, and we continue to believe that these companies still have material upside potential.

Overall, we remain constructive on emerging and frontier markets as economic growth continues to improve globally, and the macro backdrop regarding the US dollar, trade and interest rates remains supportive for the asset class.

On both an absolute and relative basis emerging markets currently appear cheap, trading at 15x trailing earnings compared to developed markets at over 20x. Frontier markets are even more attractive at approximately 13x trailing earnings. In the first quarter of the year, emerging markets experienced the largest inflows in many years and we expect that trend to continue as investors globally are underweight the asset class.

One such name is Shenzen Innovance, which provides manufacturing automation products with compelling selling prices ranging from $9,000 to $18,000 per unit, which significantly brings down the payback period to replace assembly line workers in China to just one to two years!

We expect 24% earnings CAGR thanks to their products roll-out and the company is currently trading at 25x forward earnings.
CONTACT US

Please contact us if you have any questions or would like to discuss any of our strategies.
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