

Macro
Forum
insights and
perspectives

October 2018



Welcome

Welcome to a bumper issue of our Macro Forum insights and perspectives, timed to coincide with our semi-annual investor updates, but also published in a period of significant geopolitical volatility in which confidence in emerging and growth markets has taken a significant hit. The reasons behind this are widely debated, but in our view from the streets in our markets, it's not the fundamentals. Instead a combination of the unexpectedly rapid pace of tightening by the Federal Reserve, the weakening of international institutions following greater US unilateralism, and contagion from idiosyncratic issues impacting Turkey and Argentina all combine to prompt fear and a flight to safety. We continue to prefer the flight to growth, and when others shy away, we believe this presents opportunities for investment at improved pricing in secular growth opportunities across our world.

We start this issue with a focus on the impact of a potential global trade war triggered by the tension between the US and China. Then we turn to Korea, where we have recently welcomed our new Actis Asia real estate team to the business, and in his article, Julian Jung-Wook Kim sheds light on some of the unique characteristics of the Seoul real estate market which has permitted the successful evolution of our "build to core" strategy. Ali Mazanderani and Anil Amin then share their perspectives on the big data opportunity in our markets before Liam Smith from our Energy Operations group explores the opportunities and threats arising from the rapid development of battery storage.



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The Great Trade War

Ewen Cameron-Watt

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Trade matters. The long period of declining tariffs since the 1990 Uruguay Round has seen huge investment led growth in the developing world, the growth of integrated supply chains have played a major role in the development of emerging markets as an asset class. Arguably more than any single factor, the reduction in barriers to free trade has lifted billions out of poverty across the world.

But the mood music has definitely changed. World trade growth has been in decline since 2010, and with the election of President Trump in November 2016, appetite for further reductions in tariffs seemed to evaporate. Financial markets were slow to react to this change with EM equities and bonds soaring in 2017 as investors sought out the higher yields on offer.

2018 has brought a colder climate as rhetoric turns to action. Whilst it is too early to say exactly what the impact of the Sino American face off and a new NAFTA will be, the tide does seem to be on the turn. As always FX has led the way, with most EM currencies declining against the dollar this year.

Our view from the street remains balanced, and from the experience of our own portfolio companies and investment



teams across our markets, the current negativity around EM feels perhaps as unjustified as the unbridled enthusiasm felt in 2017. We feel that our economies can and will broaden with increasing emphasis on quality of growth and productivity over simple increases in inputs. The urgency of investing in competitive infrastructure including power generation and distribution has risen. Logistics including warehousing and efficient commercial property investments are in greater demand. Payments systems are evolving and growing along with the demand for better healthcare and education.

In this issue we have sought out expert opinion to help further our understanding of the complex forces at play. We include, for the first-time input from a non Actis

source. Dr Simon Ogus, CEO of DSG Asia (www.dsgasia.com) who is a highly experienced and respected economic commentator and who writes here about trade wars and Asia. The views are his own but we would broadly agree with the perspective he offers. We back this up with inputs from our various colleagues on the ground.

Nor do we ignore currencies, a key component of our risk management and investment decision making. The charts we include on where currencies stand today relative to long run fair value provide a clear picture of opportunity rather than over valued risk as was the case at the start of the year.



Asia may not be interested in trade wars, but trade wars are interested in Asia

Simon Ogus

Guest author, Hong Kong



Asia has been the prime beneficiary of the trend towards openness in international trade in goods and services and cross-border investments over the past half-century. So, is it consequently correct to argue that it will also be the biggest potential victim of this trend reversing? The at least partial counter is that the region is increasingly trading and investing amongst itself which might suggest that over the longer-term there is potential for economic decoupling should America really seek a permanent and fundamental change in the nature of its trade relationships.

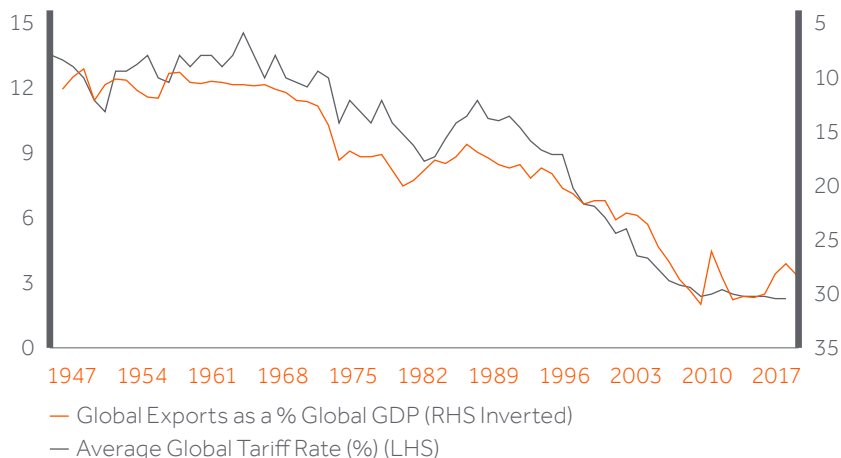
So independently of the long run outcome, nearer-term, Asia will certainly feel the pain should trade and investment volumes start to slow or even contract. Moreover, this pain is likely to be shared, not least by US consumers who in a higher tariff and re-localised production world, will find themselves paying significantly more for goods and services of potentially lower quality. This has implications too for inflation more broadly and hence the cost of servicing elevated debt burdens.

Over the last fifty years, the global economy has become increasingly open to international trade in goods and services and cross-border investments. Successive rounds of trade negotiations and agreements have resulted in progressive tariff reductions. Accordingly, the export share of global output and the global stock of foreign direct investment have surged.

During this half century, the real rate of global trade growth has generally outpaced that of real global GDP, except during periods of synchronised global downturns.

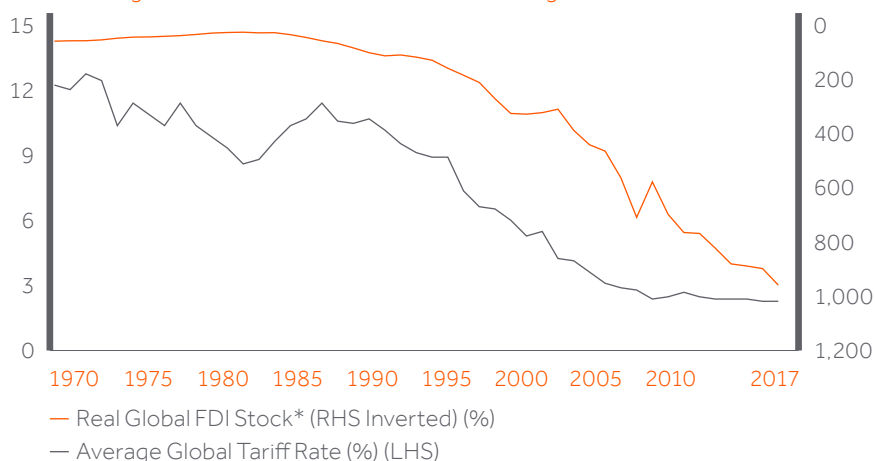
In the post-2008 environment, worries about secular stagnation and weak productivity growth have been accompanied by an extended period of tepid global trade growth. Correlation does not imply causation, but the GFC's legacy has been one of unresolved bad assets, and international financial institutions constrained by regulation, which have both suppressed aggregate demand and restricted funding for real

Exhibit 1: Average Global Tariff Rate and Global Exports as a Share of Global GDP



Source: Tariffs WTO, World Bank, Exports IMF

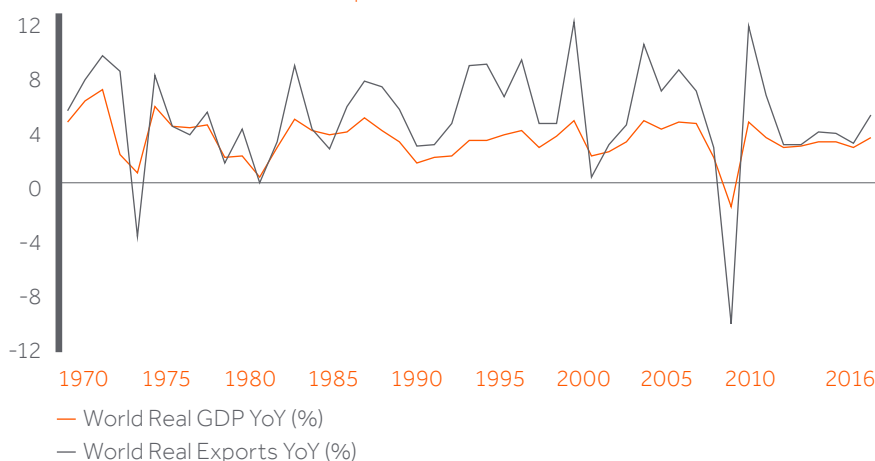
Exhibit 2: Average Global Tariff Rate and Real Global Foreign Direct Investment 1970=100



Source: Tariffs WTO, World Bank FDI UNCTAD

*2017 Global FDI Stock USD32 trillion

Exhibit 3: World Real GDP and Real Export Growth



Source: IMF

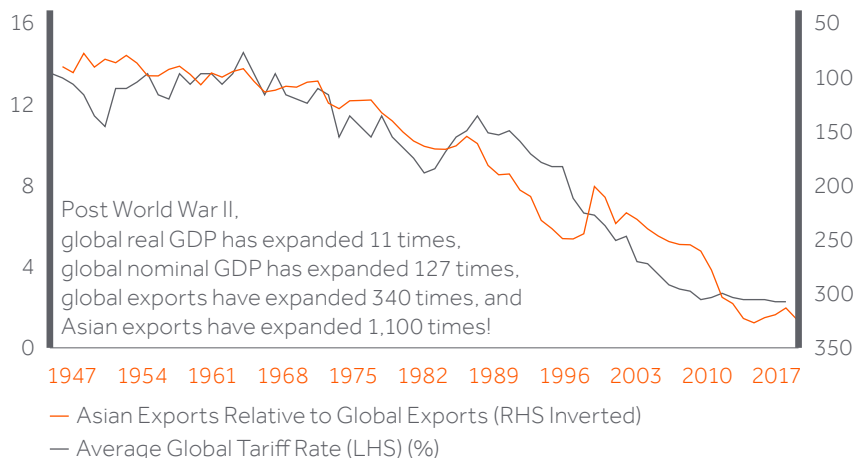
economic activity. The same constraints have also disproportionately impacted small and medium sized companies which are crucial and integral components of global supply chains.

And the longer-term returns from trade liberalisation have been far from evenly distributed. Asian economies,¹ the focus of this article, have been the principal beneficiary of the freer movement of goods and capital having placed themselves at the epicentre of the emergence of increasingly specialised global supply chains and winning huge market shares in the process. Other major non-Asian economies such as Mexico and Turkey have also successfully plugged themselves into such networks, but for the vast majority of countries still hoping to emerge, such trends have largely passed them by. A cursory explanation for this divergence might revolve around variables such as openness to foreign investment, the ease and consistency of doing business, and the availability of skilled and flexible labour.

And whilst consumers in the developed world have, in aggregate, reaped the benefits of lower prices for internationally traded consumer goods, less-skilled and less-educated workers whose jobs have moved to other locations have also experienced an extended period of stagnant real income growth and a marked reduction in job security. The period of rising protectionist sentiment which has contributed to the electoral success of President Trump and others, stems at least in part from this sense that there have been "losers" from globalisation.

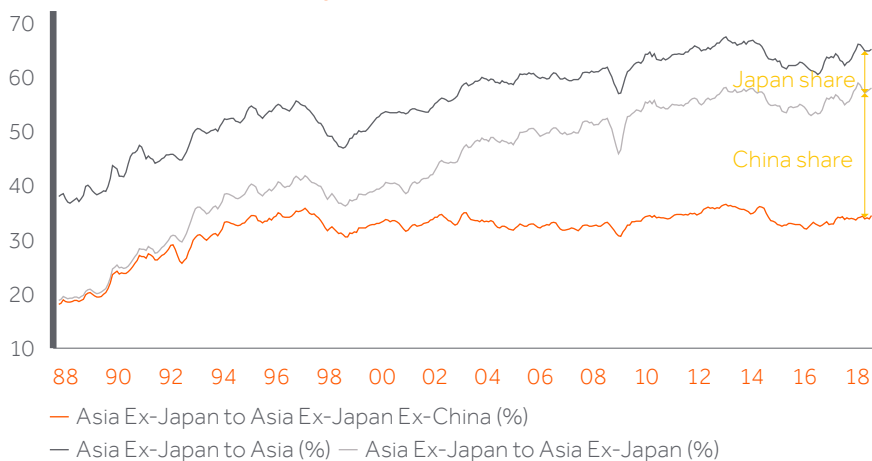
Since Asia has been the prime beneficiary of the trend towards openness of the past half-century, it is in consequence the biggest potential victim of this trend reversing. Positively, major economic risks such as out-of-control inflation, significant currency misalignments and major balance of payments and foreign debt strains are largely absent at this point, but the short-term pain will still be felt. To counter this threat, the region is increasingly trading and investing amongst itself which might suggest that there is potential for economic decoupling should

Exhibit 4: Average Global Tariff Rate and Asian Exports Relative to the World



Source: Tariffs WTO, World Bank, Exports IMF

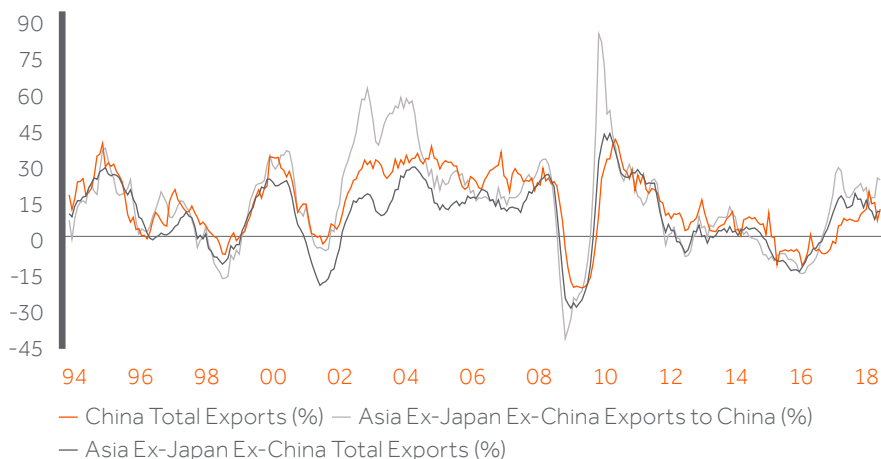
Exhibit 5: Asian-7* Share of Intraregional Trade



Source: DSG calculations from CEIC database

* Korea, Taiwan, Singapore (non-oil domestic), Malaysia, Thailand, Philippines, Indonesia

Exhibit 6: China versus Asia Ex-Japan Ex-China Exports (USD %YoY 3MMA)



Source: DSG calculations from CEIC database

1 For the purposes of this report Asia includes: Japan, South Korea, Taiwan, China, Hong Kong, Singapore, Malaysia, Thailand, Indonesia, the Philippines, Vietnam and India.

America really seek a permanent and fundamental change in the nature of the trading relationship.

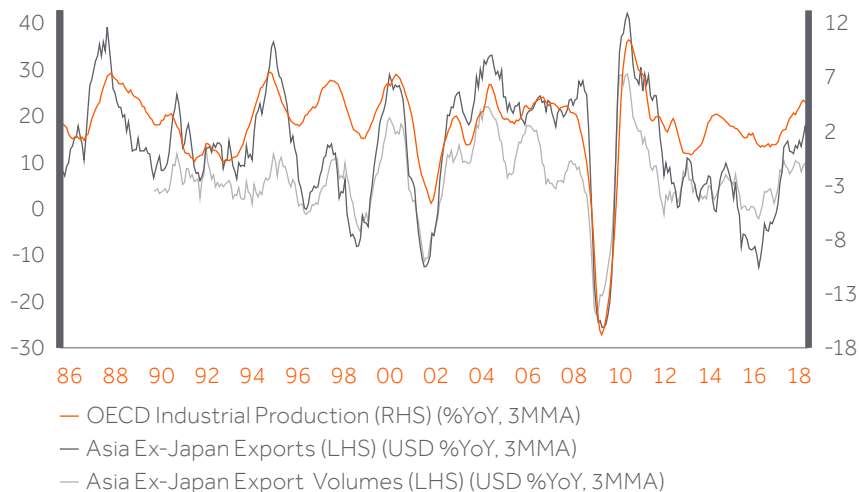
To declare that Asia will emerge largely unscathed would be a step too far. The charts on the right suggest that intraregional trade has been on a steady rise over the past three decades, and the importance of trade with China has grown especially fast. However, the reality remains, for now at least, that the majority of this growth in intraregional trade has been associated with the increasing disaggregation of the global supply chain. Were true decoupling being witnessed, one might expect to see a marked divergence between Asia ex-China export growth to China and that to the rest of the world. But as the charts suggest, traditional linkages would appear to hold firm for now.

Indeed, Asian exports continue to live or die by the vacillations of the global production cycle and should this be interrupted by either a cyclical downturn in developed world demand and/or regulatory and tariff interventions that deliver the same, the region will again feel the heat.

To be fair, the region has been trying to wean itself of its dependence on developed world demand. Notably China has been attempting to rebalance its economy away from an over-reliance on investment and exports. Although China's fixed capital formation-to-GDP rate remains historically elevated in excess of 40%, exports as a share of annual output have fallen from a third to around a fifth over the past decade.

Many of the accusations being levelled at China concerning its mercantilist trade practices, its theft of intellectual property, and its policies to force technology transfers are not wholly without merit. Nevertheless, manipulation of an undervalued exchange rate is a story whose time has come and gone. Partly in response to international pressure, and partly in an attempt to force Chinese producers to move up the value-added chain, the Chinese Yuan or RMB has been allowed to appreciate significantly to the extent that it is probably more overvalued than undervalued these days. And while the bilateral US-China trade deficit

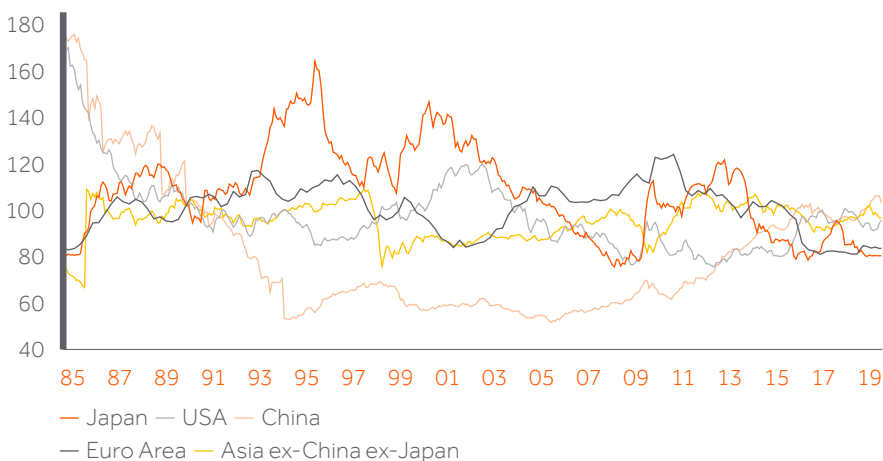
Exhibit 7: Asia Exports and OECD Industrial Production



Source: DSG calculations from CEIC database, OECD

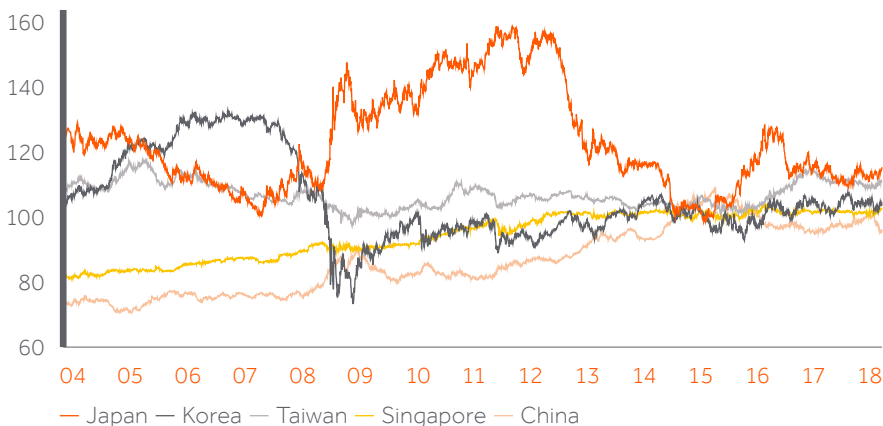
Exhibit 8: Real Unit Labour Cost-Based Trade-Weighted Exchange Rates (January 1990 = 100)

USA, Japan and Euroland IMF/Official Calculations; Asia and China DSGAsia Calculations



Source: IMF as per chart citation, DSG calculations from CEIC database

Exhibit 9: Nominal Trade Weighted Exchange Rate Indexes - December 2014 = 100*



Source: DSG calculations from CEIC database

* 31st December 2014 is assumed to be China's TWI anchor date

continues to yawn,² the PRC's overall current account surplus has all but disappeared.

The rather more freely-floating RMB may still be far from fully convertible, but China's heft in global trade flows means more of its neighbours are having to take greater account of its movements in calibrating their own exchange rate policies. Since the middle of the decade, Beijing has increasingly managed its currency against a nominal trade-weighted basket as opposed to the bilateral CNY/USD. Traditionally, this was a form of exchange rate management pursued (in a somewhat different manner) by only Singapore, but increasingly Japan, Korea and Taiwan are giving additional weight to currency movements within north Asia. In short, the RMB is assuming increasing importance relative to the USD in terms of economic and financial risks in Asia.

The question arises as to whether the RMB's recent fall against the USD and against its own TWI basket is an attempt to re-weaponise the currency and act at least as a partial offset to higher American tariffs. The near-term evidence suggests that the downward move in the RMB has been more market driven and like many other moves across Asia, more a reflection of generalised dollar strength. Nevertheless, if Beijing were to put the currency properly into play, it would be a dangerous game which could invite further US retaliation and destabilise markets more generally. As noted above, China no longer runs significant surpluses on the current account balance of payments, nor indeed on the direct investment account albeit, Chinese outward investment has again become more constrained in recent times. In the absence of a significant robust balance of payments cushion, a country needs to both rely on shorter-term international capital flows and on its own population keeping its funds onshore.

² In 2017 the US-China trade deficit was around USD375 billion but this headline number incorporates significant amounts of exports of from American companies operating in China. University of Groningen's World Import-Output Database <http://www.wiod.org/home> accounts for the value added in trade flows and in 2014 (the latest data available), pinned the US-China deficit at USD200 billion compared to the headline USD315 billion gap reported.

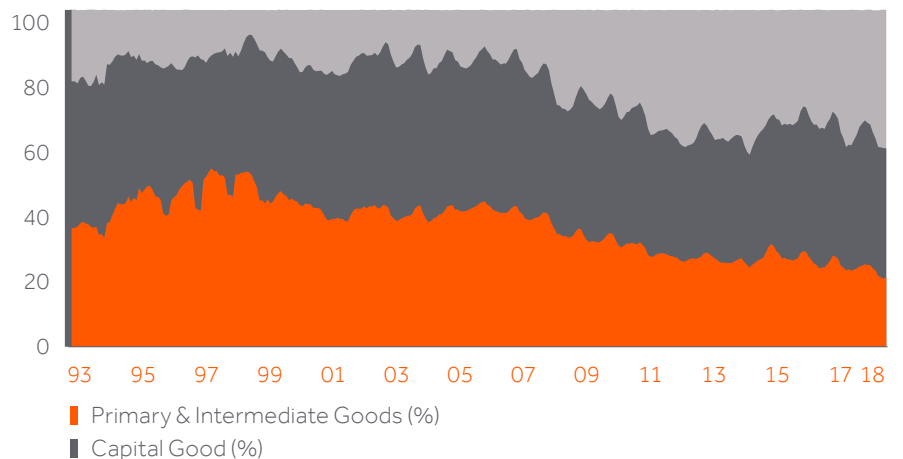
Exhibit 10: Bilateral Chinese Yuan Exchange Rate Indexes - December 2014 = 100*



Source: DSG calculations from CEIC database

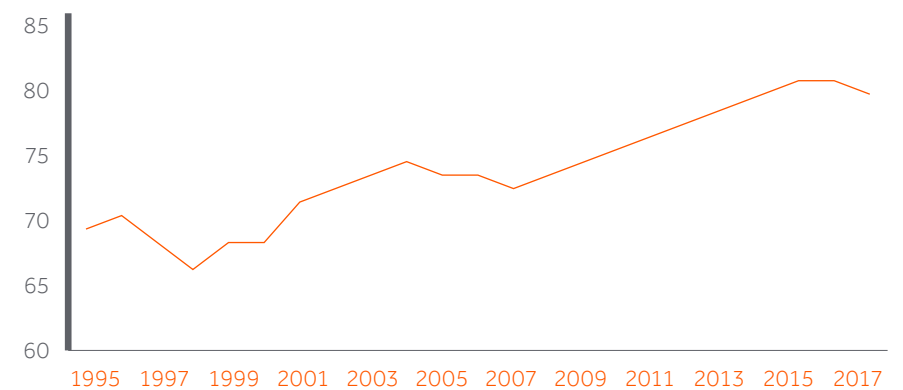
* 31st December 2014 is assumed to be China's TWI anchor date

Exhibit 11: China Import Shares By Type



Source: DSG calculations from CEIC database

Exhibit 12: Asia ex-China share of tourist arrivals from Asia



Source: DSG calculations from CEIC database

A weaker RMB could potentially feed on itself if locals players seek to hedge against further expected depreciation.

Currency matters aside, as the PRC's productive capacity has moved up the value-added chain, so its import share of production inputs have fallen and that of final consumption goods have risen accordingly. This shift has not as yet been sufficient to meaningfully impact overall final intraregional demand patterns, but the direction is encouraging.

A similar story emerges on the intraregional services side. Local Asian banks are increasingly funding local trade finance and cross border investment deals, while intraregional tourism is also steadily on the rise as Exhibit 12 suggests. Furthermore, as Asian consumers become wealthier and more sophisticated, so they will increasingly seek to travel as higher-spending individuals rather than on lower-yielding group tours.

Finally, although the Trump administration seems minded to withdraw from international trade agreements and aggressively employ tariffs in an attempt

to divert trade flows, much of the rest of the world, and Asia in particular, continues to seek broader trade and investment integration. The region continues to push for the consummation of Transpacific-Pacific Partnership (TPP), now rebranded after America's withdrawal as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Meanwhile China continues to champion its own Regional Comprehensive Economic Partnership (RCEP) grouping. The quality and substance of these various initiatives may fall short of the lofty declarations of their protagonists, but their continued pursuance is arguably rather better than the alternative of trade re-atomisation.

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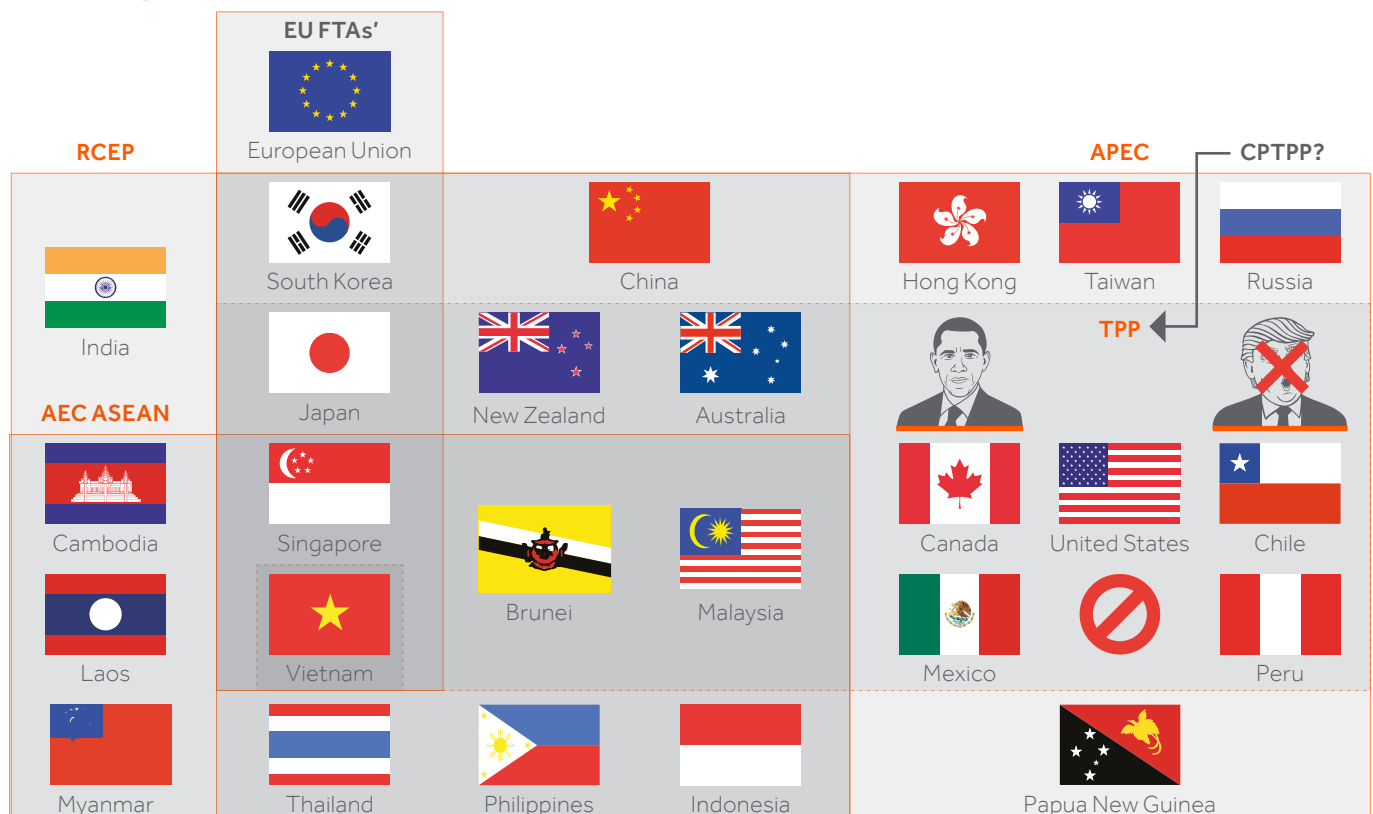
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The Trade Agreement Matrix



Original Source: Dezan Shira & Associates; updates by DSG Asia

Street view on trade conflict: China



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Street view

Trade wars - China

Max Lin

Although dominating media headlines across the world, the most visible signs of the ongoing trade dispute so far in China have been the impact on a few selected imports. In the auto sector, following the imposition of higher tariffs on imported vehicles, we have seen significant price increases of US made vehicles, including Tesla and German branded SUVs (Mercedes and BMW) that are made in the US. Costs are also expected to increase for some basic foods as soy bean import prices are hit.

However, fears that the Chinese government would use non-tariff administrative measures to make life difficult for US companies have so far proven largely unfounded. On the contrary, China continues to relax its restrictions on foreign investments in China, in multiple sectors including automotive and financial services.

Tesla announced its plans to open a Gigafactory in Shanghai recently, and BMW is rumoured to be increasing its ownership stake in its China JV from 50% to 70%, both taking advantage of the relaxation of restrictions and perhaps wary that the import tariffs are here to stay, at least for a while.

In the payment space, PBOC's Shanghai branch announced in late July that WorldFirst had applied for online and mobile payment licenses

in China. The publication is typically the first step in the formal approval process, suggesting that WorldFirst is likely to be the first foreign recipient of a payment licence in China, with more applicants in the queue.

We continue to watch carefully how domestic support for the Chinese agenda of overseas investment in support of the One Belt One Road initiative evolves. The Government has at the same time recognised the importance of improving income inequality in China and continuing the process to lift more of the population out of poverty, and this will require significant investment. Balancing these policy priorities, particularly in light of private sector liquidity constraints that exist currently, will be an important challenge for the Xi administration.



Street view on trade conflict: Brazil



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Street view

Trade wars – Brazil

Bruno Moraes

The upcoming presidential election taking place in October is dominating the conversation in boardrooms and cafes here in Sao Paulo and across Brazil, with the contagion risk emerging from Turkey and Argentina relegated to a secondary issue. On the political front, the run for president remains uncertain; Luiz Ignacio “Lula” da Silva registered his official candidature and stated his intention to run, but he is currently serving a 12-year jail sentence for corruption and money laundering and has been banned from standing as a candidate or running campaign advertisements, most recently in a court ruling in early September. However, an appeal has been lodged with the Supreme Court and no one is ruling out the possibility of further twists and turns as this political Houdini attempts to secure immunity through election. In the interim, in an echo of events elsewhere, another PT stalwart, Fernando Haddad, has been lined up to stand in Lula’s place if his appeal fails, and the party will be hoping that much of Lula’s support transfers to him. Jair Bolsonaro remains a strong contender, followed by Marina Silva and Geraldo Alckmin, who after forming a coalition with centre parties may start gaining momentum. Given the fragmented scenario, candidates that poll as little as 15% of the vote may well qualify for the run-off.

So Lula remains the spectre casting a shadow across the economy, but regardless of who wins, the failure of President Temer and his administration to tackle the fiscal deficit through social security reform simply underlines the political challenges the incoming Government will face. Early confidence in this outcome has faded somewhat, but a period of stability post-October will be key to helping local capital markets to normalise, and until then we expect a period of heightened volatility and continued BRL weakness.



Street view on trade conflict:

Korea



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Street view

Trade wars - Korea

Julian Jung-Wook Kim

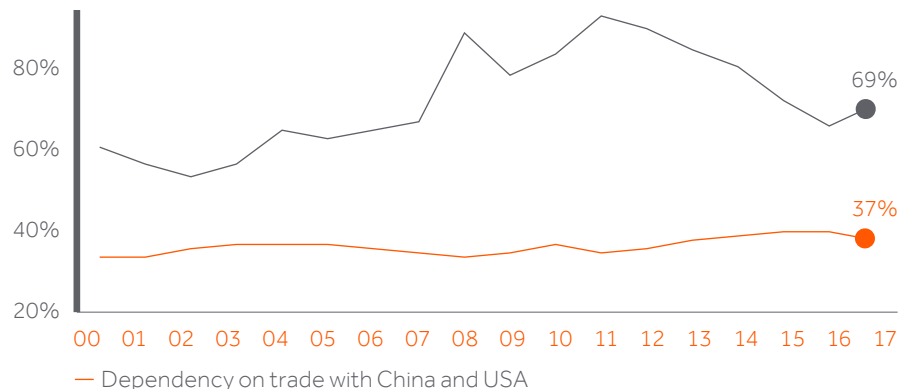
As a major Asian trading nation with important supply chains into and out of China, Korea appears particularly vulnerable to trade war frictions. China is Korea's largest trading partner representing 25% of total Korean exports. Clearly negotiations and eventual outcomes between the US and China could matter a lot for Korean companies.

That said, we expect the short term impact on Korea's economy to be limited. According to an estimate of the Ministry of Trade, Industry, and Energy (MTIE), intermediate goods to China that ultimately become Chinese exports to the US account for only 5% of total Korean exports to China. Korea may even benefit from the current circumstances, as the imposition of high tariffs on US-China trade could allow Korean competitors to step in and substitute Chinese exports to the US and imports from the US in sectors including vehicles, high tech and agricultural products. An appreciating US Dollar could also provide Korean companies with a competitive advantage in the US market.

However, if the conflict is prolonged, it could have a significant impact on Korea. Over the long term, retaliatory tariffs are likely to reduce the rate of economic growth of Korea's top two trading partners and finding alternative markets for

Exhibit 1: Appendix: graphical representations

Dependency on foreign trade (Korea)

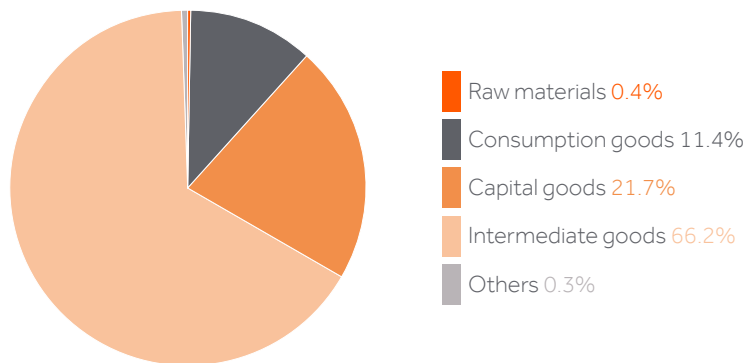


Note: Calculated by sum of total exports and imports divided by nominal GDP ((exports + imports) / nominal GDP)

Source: Korea Statistics, Korea International Trade Association (KITA)

Exhibit 2: Export composition (Korea, 2017)

Total export : KRW574bn

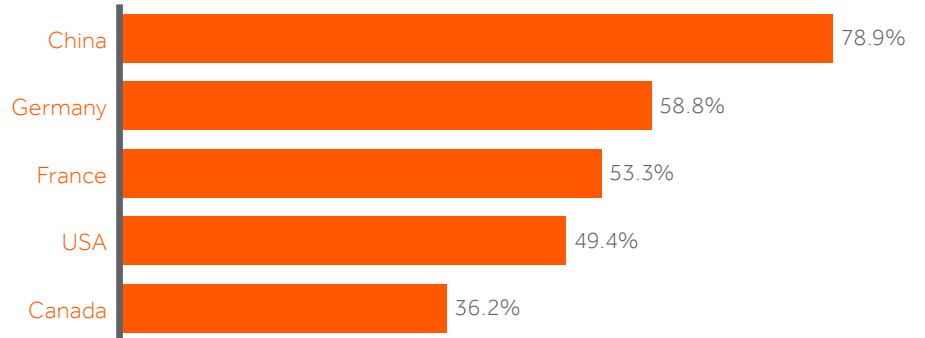


Source: Korea International Trade Association (KITA)

displaced Korean exports could be challenging. A prolonged conflict could also develop into a full-blown worldwide conflict that could directly impose tariffs on Korean exports. In Seoul, we expect that the path of trade conflict will become clearer post the November US midterm elections, which are critical for the Trump administration. In the meantime, the Korean Government is fully aware of potential consequences of the trade conflict and has been focused on limiting any additional tariffs imposed by the US such as on autos. We expect that the Government will also actively encourage Korean enterprises to seek new export markets, and take steps to boost domestic consumption growth to make the economy more resilient to external threats.

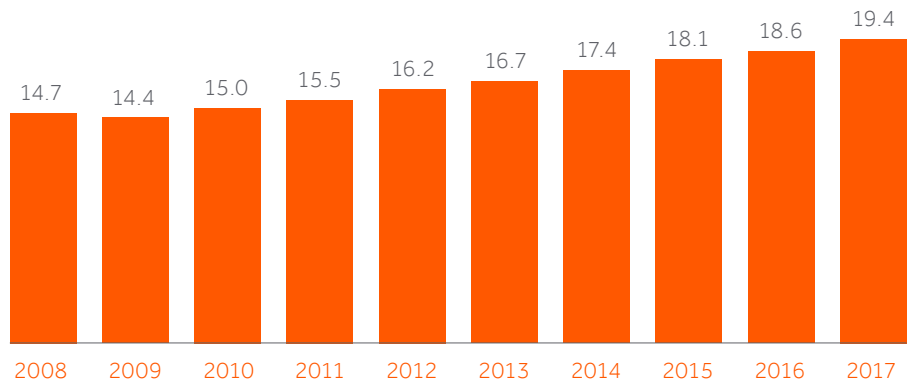


Exhibit 3: Proportion of intermediate goods to total export by country



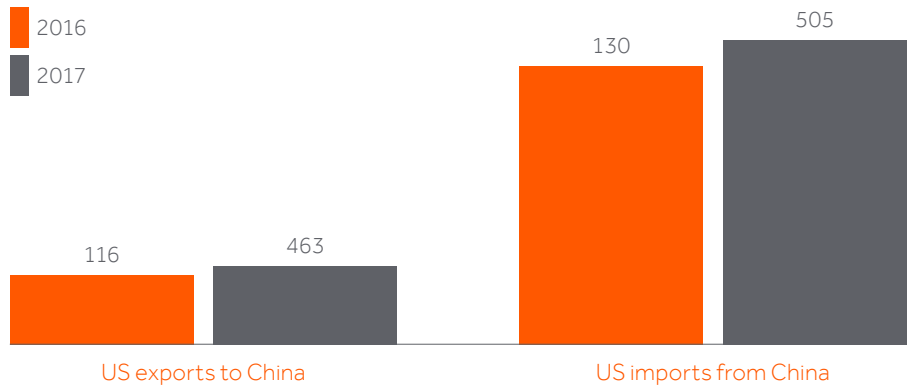
Source: Korea International Trade Association (KITA), research materials

Exhibit 4: United States GDP (2008–2017, USD Trn)



Source: World Bank

Exhibit 5: Trade between the US and China (2016–2017, USD Bn)



Source: United States Census Bureau

Street view on trade conflict: India



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Street view

Trade wars – India

Pratik Jain

The mood in India has been cautious with respect to the escalating trade conflict between the US and the rest of the world, China in particular. Although India is taking comfort in the fact that the direct impact will probably be low, given its low share of world trade (2%), there is a growing realization that the country may not be as insulated as first thought if the conflict escalates into a full blown trade war.

The direct impact on India has so far been minimal – US tariffs on steel and aluminum imports from India are estimated to have cost around \$240m to date and India has retaliated by imposing higher import tariffs on 30 US goods - including motorcycles and heavy machinery as well as a large number of agricultural products such as almonds, shrimps and chocolates - which is expected to bring in an additional US\$240m from import duties. This is small in the context of a \$2.6trn GDP.

India's largest exports to the US are in the services sectors where the US has been increasingly raising non-trade barriers that restrict the free movement of professionals, especially India's skilled IT professionals. Indian IT companies have responded over the last 2 years by diversifying their workforce through increased recruitment

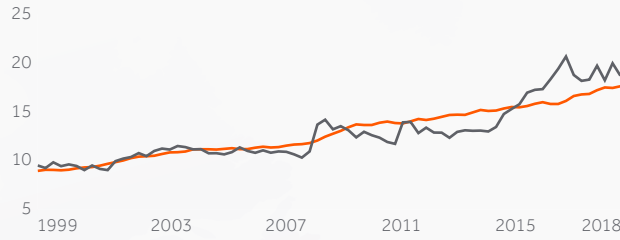
of locals in their US operations to address American concerns.

The worry in India stems primarily from the fear of contagion. The biggest impact could be on the rupee which is already battling historic lows against the US dollar. The rising price of oil will increase India's current account deficit, weakening the rupee further, as India imports 80% of its oil requirements.

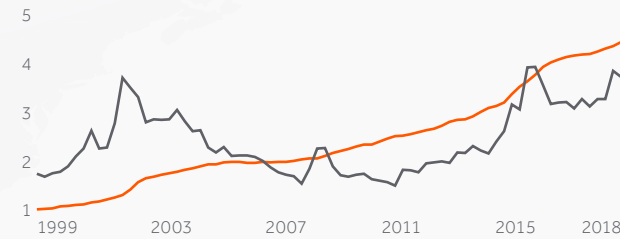


Currency review

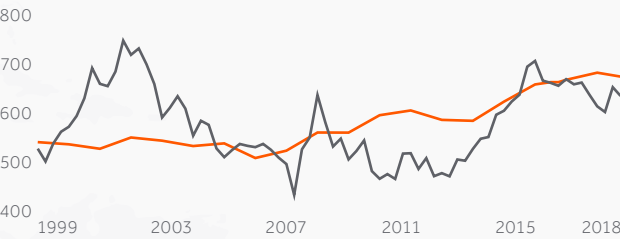
Mexico



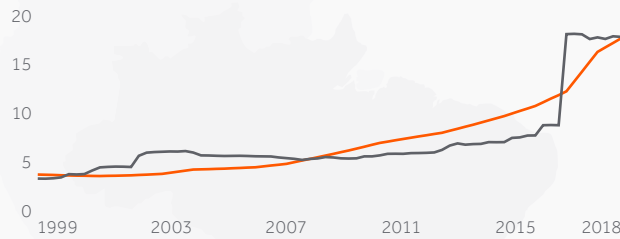
Brazil



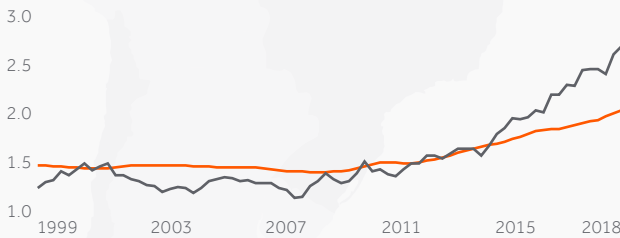
Chile



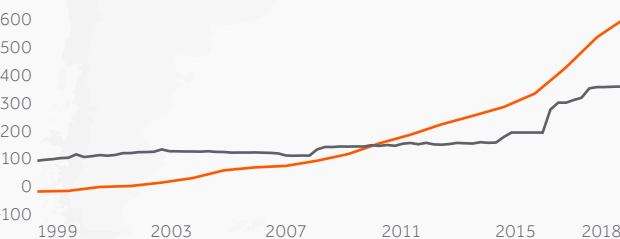
Egypt



Tunisia

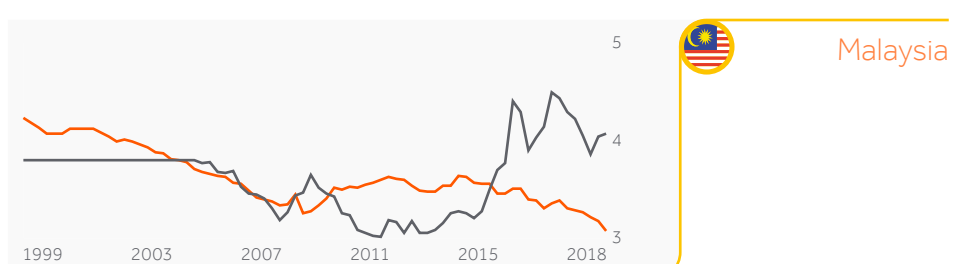
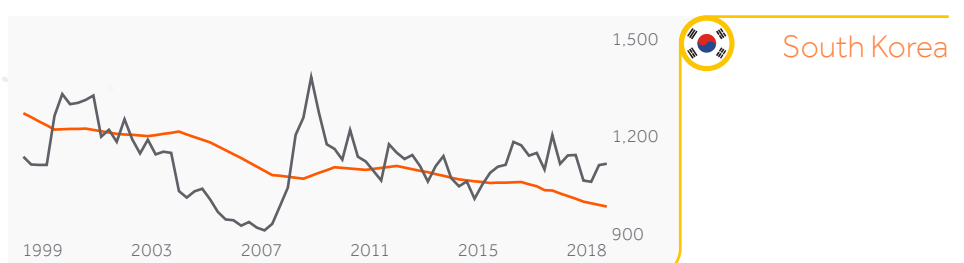
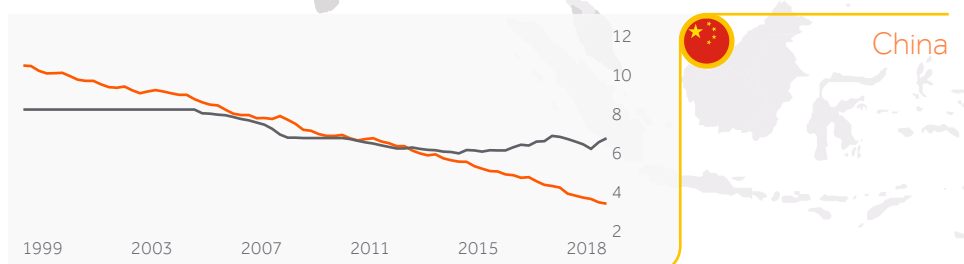
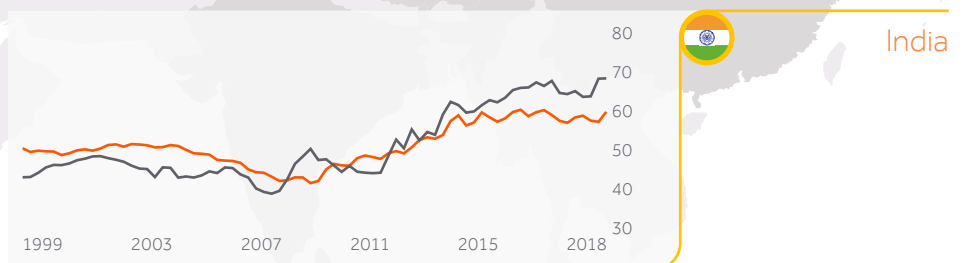
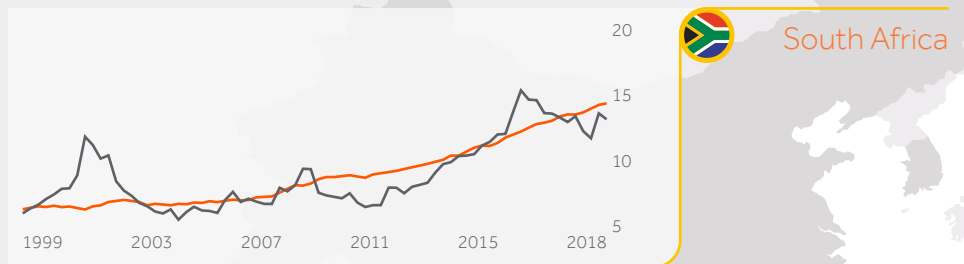
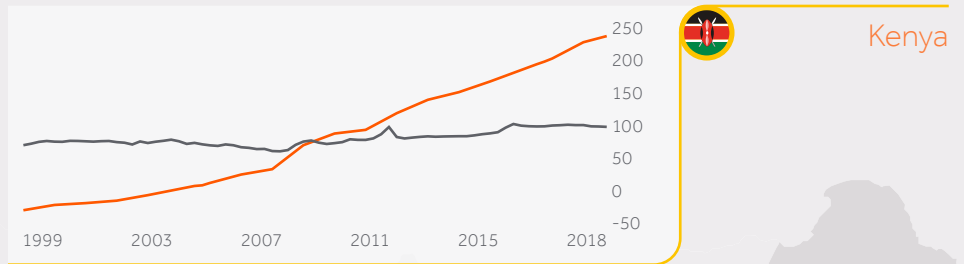


Nigeria



— FV — FX

Source: Bloomberg & Actis methodology for Fundamental Value



— FV — FX

Korea:

Opportunities in shifting paradigm

Julian Jung-Wook Kim

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From being one of the poorest nations with GDP of less than USD5bn¹ in 1967, Korea has grown rapidly to become the 11th largest economy in the world with 2017 GDP of over USD1.5tn. But the successful model of export and investment led growth that has driven this progress faces new challenges, and the rapid growth of the Chinese economy has threatened Korean pre-eminence in its key manufacturing industries including electronic displays, shipbuilding, mobile phones, steel, and even semi-conductors and automotive. Hence, there is now a need for a new growth model to foster not only export-led but also domestic growth to continue to improve quality of life for Koreans and to make the economy more robust against the volatility of a world pushing back on globalisation.

President Moon's administration has been focusing on a wide ranging agenda aimed at improving growth potential through deepening social and industrial reform. Measures taken include boosting youth employment, supporting productivity through introducing a 52-hour, 5-day work week system, relaxing regulations and rules in various industries, encouragement of the birth rate by creating a more comfortable environment for younger generations to get married and raise children, increased public housing supplies and tighter regulations on multi-housing owners to cool down the over-heating housing market. The new regime has also expanded its spending on welfare of the retirees and the poor under its slogan of income redistribution.

However, this ambitious agenda faces challenges. One of the main challenges is associated with the rapid increase in the minimum wage as a part of the regime's income led growth program. This is having a significant impact on individual proprietors and small companies that

depend on minimum wage earners because these employers cannot easily pass the cost of the higher wage onto their customers.

In parallel with these changes, there is an ongoing shift in household priorities from saving to spending. Unlike older generations whose top priorities were thrift and saving, younger households focus on investments for their future including education and housing. An expensive and inefficient mortgage market consequently contributes to the lower savings rates we observe.

From our perspective as long term investors in the Korean real estate market, the lack of supply of high quality property provides us with investment opportunities at least attractive as those we see in other Actis markets. In the past, when supply was the priority, the model was to provide properties as cheaply and as quickly as possible. However, this has had its inevitable consequences, meaning many properties located even in the most

1 Source: Statistics Korea

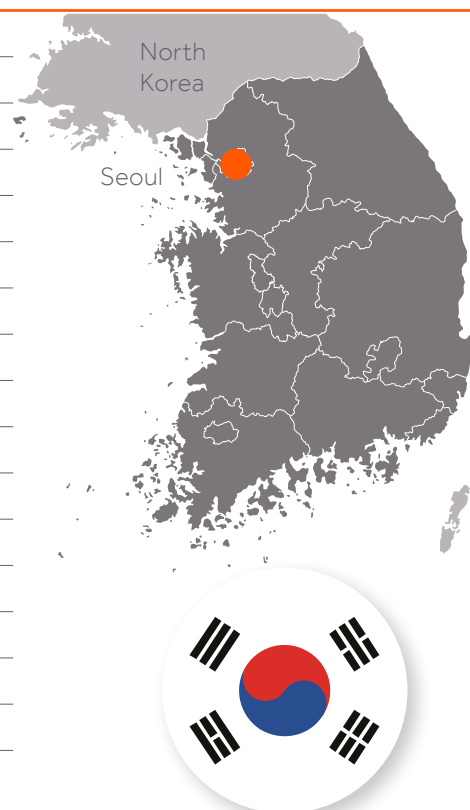
Korea country profile: quick facts

Area	99,720 km ²
Capital	Seoul (605.2 km ²)
Population	51.8 Million (27th, as of Jul. 2018)
Growth (%)	0.4% (2018E)
Median age	42.6 years (2018E)
Unemployment rate	3.7% (as of Jun. 2018)
Youth unemployment rate ¹	9.0% (as of Jun. 2018)
Birth rate	1.17 (2017)
HDI ²	0.901 (very high, 18th, 2015)
GDPA	USD 1.53 Trillion (28th, 2017)
Growth (%)	2.9% (2018E)
GNI per capita	USD 28,380 (28th, 2017)
GNI per capita (PPP)	USD 38,260 (29th, 2017)
Industry as % of GDP	39.2%
Service as % of GDP	58.7%
Exports as % of GDP	44.2%

1. Economically active population who is 15 to 29 years old

2. Human Development Index

Source: World Bank, Central Intelligence Agency, United Nations, Statistics Korea, Bank of Korea, Wikitravel (map)



prime areas are now deteriorating and are unfit for purpose. Apgujeong-dong, which is now one of the most prestigious residential zones in Seoul, was developed from farmland in the 1970s and is now hitting a major refurbishment cycle. This mismatch between demand and the quality of existing supply is largely mirrored across all types of property - retail, offices, hotels and industrial, as the sophistication of end user demand has evolved faster than quality of the existing assets. As a result, needs for redevelopment or renovation of such unsatisfying properties have continued to grow. This trend is most evident in Seoul, and the focus of our business has always been and is likely to remain Seoul for the foreseeable future.

And whilst the rapid policy-driven additions to supply seen in earlier cycles have contributed to this issue, barriers to institutional investment in the asset class have also had an impact. Up until the mid-1990s, there was no concept of an indirect real estate investment vehicle. The only practical way to make an investment was direct asset purchase by companies or individuals, which resulted in heavy tax consequences. Hence, properties were mostly owner occupied during this era. However, this was changed after the Asian crisis in 1997, when the government introduced an indirect investment mechanism that offered unprecedented tax benefits. This new model was a part of the government's effort to increase foreign currency reserves by attracting foreign capital and to boost the rapidly shrinking domestic economy by encouraging growth of the real estate market. Creating instruments such as Project Financing Vehicle ("PFV"), Real Estate Fund ("REF"), and Real Estate Investment Trust ("REIT") made real estate a major investment asset, as it opened up the market to foreign institutional investors that were quickly followed by newly emerging domestic institutional investors.

The Asian crisis also contributed to the advent of the current development model. Prior to 1997, most development had been led by construction companies using their own equity. However, most construction companies faced severe liquidity problems during the crisis, and were forced to stop making long term equity commitments and instead focus on cash flows generated by construction activities.² Their role in the market has since been filled by small local developers.

This model has been in place for the past twenty years and has contributed to the evolution of a number of characteristics unique to the Korean market. First, most development properties are strata-titled because local developers have insufficient equity capital to complete a full site development and must rely on interim cash inflows generated by presales.³ Second, most of these strata titled buildings were poorly built and managed by separate owners leading to accelerated dilapidation. And finally, the control of development projects in essence remains with construction companies because local developers cannot raise debt capital without credit enhancement and a payment guarantee from the construction companies. So you have a market where investment capital is fragmented and local developers struggle to extend their role beyond title aggregation and securing permits and approvals. Last but not least, institutional investors cannot find sufficient projects to meet their investment appetite because there are simply not enough quality assets, and yet demand for institutional quality cashflows keeps growing.

The Actis Asia Real Estate team developed an institutional development model to try to take advantage of these characteristics, which we refer to as "build to core". In essence this involves working with high quality operating partners locally to create core assets that will appeal to institutional investors both domestically

and internationally. Two recent hotel development projects, in which we invited a top local operator (Shilla – a subsidiary of Samsung Group⁴) to partner with us as the master lessee, providing both a minimum rent guarantee and an assurance of quality for the market, evidence this success, with both attracting strong demand from domestic institutional investors, leading to an exit by selling the assets to the two largest domestic institutional investors, National Pension Service ("NPS") and Korea Investment Corporation ("KIC"), respectively. We are currently engaging in the development of a mixed-use hotel and retail facility in a core location through a JV partnership with a major local retail operator (GS Retail)⁵ that will also operate the facility backed by its minimum rent guarantee. This is a strategy that local developers cannot imitate given both liquidity constraints, but also the lack of relationships with key corporate partners in the market.

And one other feature of the Korean market is worthy of note, particularly to those more familiar with our African and other Asian markets. When we commit to a construction contract with a delivery date and a budget, standard Korean practice is for the contractor's commitments to be met to the letter, to the nearest Won and to the hour. Not something our colleagues elsewhere in the real estate business often enjoy.

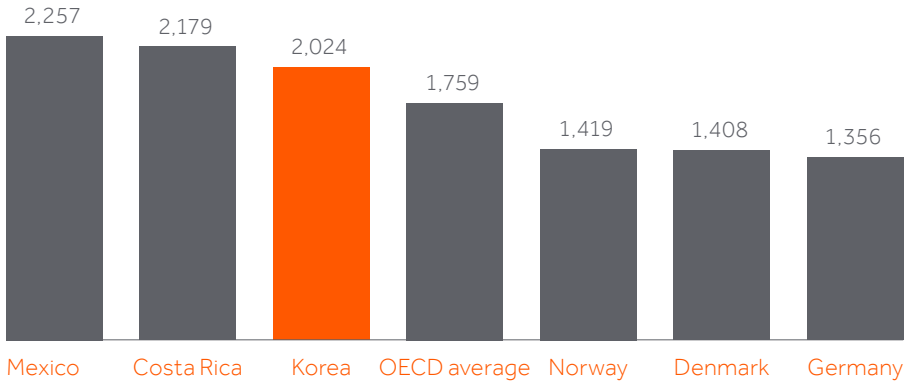
2 This is largely the same even nowadays except a few cases where such development projects are deemed to be extremely profitable with no land title aggregation issue or supported by the government.

3 Developers are allowed to initiate strata sales in parallel with construction commencement. However, the ownership title can be transferred to the buyer post construction completion. Hence, once the buyer signs a purchase contract, he/she is required to place an initial deposit simultaneously (typically equivalent to 10% of total purchase price), after which the buyer periodically makes interim payments (typically up to 50% of total purchase price). Post completion of the construction, the buyer makes a final payment for the title transfer (typically within 1-2 months post completion).

4 Hotel Shilla Co., Ltd ("Hotel Shilla") is the top local hotel brand, which is a subsidiary of Samsung Group. Previously known for a five star hotel brand, the company has actively expanded into the business hotel segment and is currently operating 13 hotels across Korea.

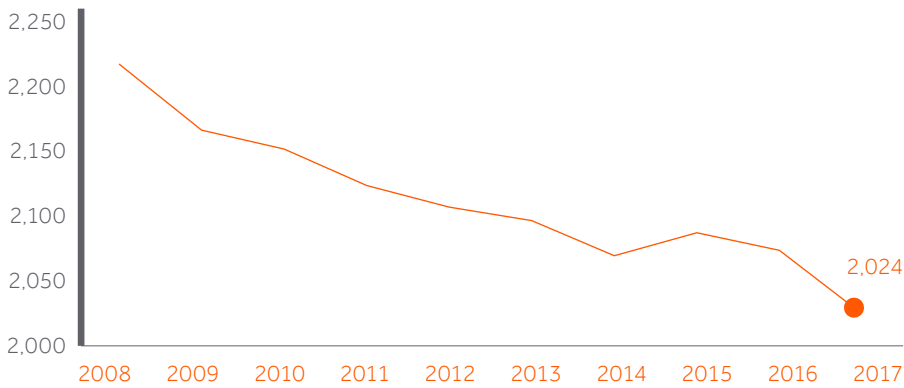
5 GS Retail Co., Ltd ("GS Retail") is a major local retailer and a subsidiary of GS Group, which is another major Korean conglomerate focusing on energy, construction, and retail businesses.

Exhibit 1: Average annual hours actually worked per worker in 2017



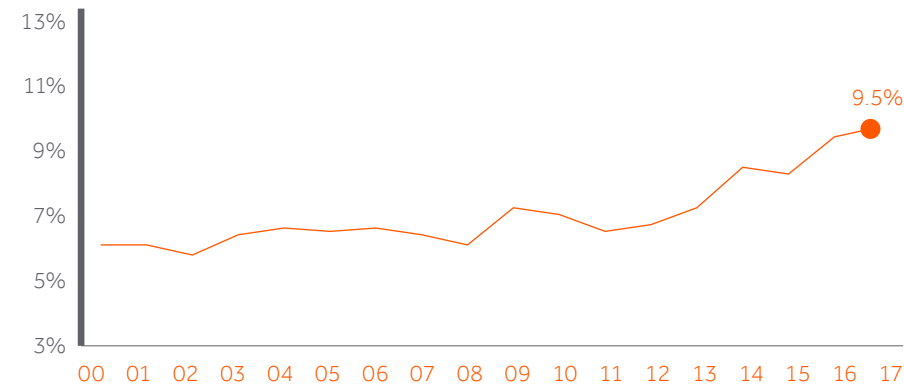
Note: Korea, OCED average, and the top and bottom three nations are presented.
 Source: Organisation for Economic Co-operation and Development ("OECD")

Exhibit 2: Historical trend of average annual hours actually worked per worker in Korea



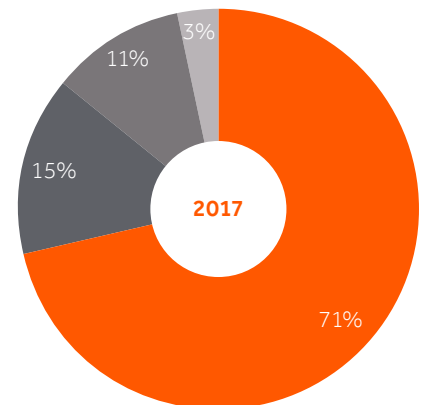
Source: OECD

Exhibit 3: Historical trend of unemployment rate (workforce in 25-29)

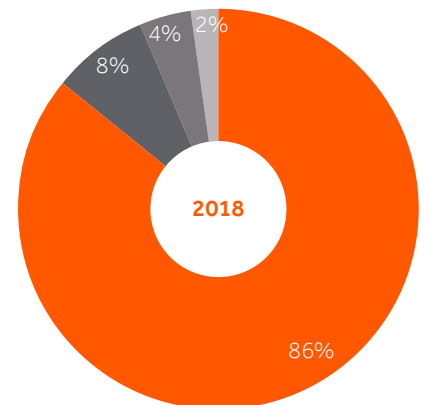


Source: OECD

Exhibit 4: Commercial real estate market size
 KRW 7.0 Trn (USD 6.2 Bn)



KRW 6.7 Trn (USD 6.0 Bn)



Office Retail Logistics Hotel

Note: Includes commercial property transactions exceeding US 10.0 Mn in value. Applied FX rate: 1,130.

Source: CBRE Korea

Major business districts in Seoul



Note: Central Business District ("CBD"), Yeouido Business District ("YBD"), Gangnam Business District ("GBD")

Source: Market Intelligence / Actis

Major retail submarkets in Seoul



Source: Market Intelligence / Actis

Apgujeong-dong (Gangnam area) in 1970s before urban development

Apartments are located in the middle of farmland where a farmer is ploughing a field with a cow.



Apgujeong-dong in recent years

Residents are still living in the previously built apartments in deteriorating condition.



Apgujeong-dong in future (redevelopment rendering image)

The deteriorating buildings are planned to be demolished for complete redevelopment.



Overview of major retail submarkets in Seoul

	Gangnam Station District (GBD)	Myeong-dong (CBD)	Insadong (CBD)	Hongdae	Garosu-gil (GBBD)	Itaewon
Description	Largest retail areas that includes residential, entertainment, healthcare, and educational facilities	Most prime retail area with the highest land price and rent level; No.1 tourist spot	Center of cultural art, which blends traditional and modern Korean culture; No.2 tourist spot	Mecca of youth culture including urban arts, indie music, live club and fashion streets for young generation	Trendy fashion street known as Korean version of SOHO street	Multinational and exotic retail area surrounded by a largest concentration of foreign residents
Avg. daily floating population (est.)	210,000	190,000	140,000	120,000	70,000	50,000
Major age group (%)	20~30s (55%)	30~40s (48%)	30~40s (47%)	20s (36.5%)	20~30s (53%)	20~40s (65%)
Prime times	Day/evening/night	Day/evening	Day/evening	Day/evening/night	Day/evening	Day/evening/night
Major types of retailer	F&B, lifestyle, fashion and apparel, beauty and healthcare, education, entertainment (both daytime and nightlife)	F&B, lifestyle, fashion and apparel, beauty	F&B, lifestyle, fashion and apparel, daytime entertainment	F&B, lifestyle, fashion and apparel, beauty, entertainment (both daytime and nightlife)	F&B, fashion and apparel, beauty	F&B, fashion and apparel, nightlife entertainment
Avg. ticket size of major retail products	Low to medium	Medium to high	Medium to high	Low to medium	Medium to high	Medium to high
Types of major retail facilities	Road shops, flagship stores, multiplex facilities	Department stores, duty free shops, road shops, flagship stores	Multitenant malls consisting of small and medium sized shops	Road shops, flagship stores	Road shops, flagship stores	Road shops

Source: Market Intelligence / Thomas Consultants Asia Pacific, Inc. / Actis



The big data opportunity: harnessing data to bring financial services to the credit “invisible”

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In growth markets, the move from cash to electronic payments is taking place at an unprecedented and accelerating pace. By 2020, mobile phone penetration will reach 90% of all adults in our markets, where the primary mode of internet access is not the computer, but the smartphone. In all corners of the globe – from Africa to Latin America to East Asia – transactions, behaviours, connections, movements and patterns that had previously been unrecorded are recorded, creating a digital data trail that grows exponentially over time. As a point of context, every thirty minutes, the internet and all of the devices connected to it generate more data than all written works in human history. We now live in a world of “Big Data,” which, combined with exponentially increasing processing power, has the potential to meaningfully improve the lives of billions of emerging market consumers through improved access to credit.

The scale of the opportunity is immense: 45% of adults living in emerging markets – or two billion people – are unbanked. The remaining 55% of adults, who do possess bank accounts, often lack access to the broader spectrum of financial services that developed market consumers have become accustomed to: savings accounts, credit cards, loans, mortgages and insurance products. The reason for this disparity lies in the availability of data: according to the World Bank, less than 12% of people in low- and middle-income countries globally are referenced by credit bureaus.

In North America and Europe, a majority of the population have long-had access to formal financial services, and the approach to credit scoring has developed gradually, over decades. Credit bureaus have collected historical data to determine the creditworthiness of individuals based on just a few, highly relevant data points, for example, outstanding credit, salary slips,

repayment patterns, bank balances and asset ownership over time.

Gathering these data points in emerging markets poses significant challenges, particularly for lower-income segments of the population. Since these consumers have not had access to formal financial services, they do not have a repayment history. Complicating matters, debt capacity is difficult to judge, as wages are often distributed in cash and are rarely converted into formalised savings. Finally, a large number of lower-income individuals in emerging markets are self-employed and do not receive fixed wages from month to month, let alone an asset base that can be collateralised.

In a vicious cycle, then, emerging market consumers without a credit history are unable to borrow from the formal financial system to start a business, fund an education, purchase a home or even pay for medical expenses, with serious implications on economic growth and social mobility. Part of the solution to shifting the credit “invisible” populations of these markets into visibility lies in Big Data. The growing electronic footprint of consumers in our market allows traditional data sources to be augmented with alternative data.

Alternative data is information gathered from sources other than banks to determine an individual’s creditworthiness. A growing number of mobile network operators (MNOs), banks, retailers and other credit providers are increasingly harnessing mobile phone usage patterns, bill payment histories, transactional data and even social media data in a bid to extend credit to those outside the formal financial system.

In emerging markets, necessity has spurred the investment and initiative to make sense of large volumes of seemingly irrelevant data from diverse sources to gain insights into the borrower, in a way that is distinctive and transformative and ahead of what is happening elsewhere. The utilisation of alternative data in China has been extensive, and primarily based on transactional data from e-commerce. In other regions, the dominant sources differ. In Africa, mobile phone data provides a particularly instructive source in the absence of alternatives and can prove surprisingly effective.

The average mobile phone produces thousands of data points through text messages and calls per month, and seemingly meaningless data, such as call duration and cell tower location, can be pieced together to create insights into behaviour and credit worthiness. As an example, all else being equal, a consumer who ‘tops-up’ a similar amount of airtime every week is a more reliable borrower than one who does so erratically at random intervals. Another is that a mobile phone user with a larger contact list and consistency in incoming calls is less likely to default, especially if the consequence of default is their phone number being deactivated.

In the first instance, alternative data is being used to facilitate unsecured, short-term, low-value loans to first-time borrowers almost instantly, and at significantly lower cost than the brick-and-mortar approach, which has high fixed costs. At the lower end of the spectrum, borrowing can constitute an advance on mobile top-up from an MNO; at the higher end, a short-term cash loan. But, while alternative data does have the power to open the door for first-time borrowers, in isolation it has limitations and does not guarantee sustainable access to the formal financial system.

The greatest benefits of alternative data to the emerging market consumer can only be unlocked through information sharing between a multiplicity of parties including the government, MNOs, banks and retailers, tying identity to borrowing and repayment history across a number of channels. This will best be facilitated by the further development of emerging market credit bureaus. Like with payments, there are network effects in data and information services. The whole is greater than the sum of its parts. Also like with payments, there is a clear ‘south-south’ axis whereby emerging market bureaus, while developing similar solutions in their respective markets, are developing solutions for problems that don’t exist or for which there is only marginal benefit in addressing in North America and Europe.

Recognizing this, in 2014, Actis acquired a majority interest in Compuscan Holdings (CSH), as the first step in a buy-and-build to create a leading emerging market credit services ‘big data’ business. Today, CSH is the leading independent bureau in Africa with a substantial presence across

several countries. Coming out of South Africa, with its mix of advanced financial ecosystem and a large informal 'thin file' population, CSH pioneered emerging market solutions that enabled it to grow profitably in markets that the large bureaus of Europe and North America had failed to do so.

An example of this is in East Africa, where the Bank of Uganda selected CSH to establish a credit reference bureau in a public tender. In Uganda, the problem was not just that there wasn't existing data on consumers that was shared by lenders, it was that there was no Ugandan national identification system and ability to relate addresses in a standardised way (not all streets are named). CSH solved the problem by developing a biometric financial identification card that would be issued to a borrower when credit was first extended. By 2017, more than 2 million such cards had been issued in Uganda. Since CSH established itself in Uganda, the number of loan accounts has quintupled, the value of loans in the country has tripled, and financial inclusion has increased from 5% to 46%. This has all been done without a similar increase in the risk of non-performance.

While Big Data offers an unprecedented opportunity to improve access to credit in emerging markets, it does not, in itself, guarantee financial inclusion. Without information sharing between all actors in this emerging financial ecosystem, and without the creation of identity-linked borrowing and repayment histories, the broader financial system will remain out of reach to too many for too long. In our portfolio, we have seen the positive impact that credit bureaus have in bringing 'thin file' populations into financial inclusion. As alternative data grows in use and develops in our markets, emerging market credit bureaus like CSH will continue to develop innovative solutions to bridge the gap between the formal financial system and the digital world, and will do so very profitably: a case of Big Data helping values driving value.



The battery tipping point

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The Energy Sector is abuzz with talk of the "Battery Storage Revolution". Recent studies¹ estimate that energy storage in the emerging markets will grow by over 40% per annum in the next decade, producing over 80GW of new storage. Drivers of this growth include; continued rapid uptake in renewables, declines in costs and the development of cost effective micro-grids permitting the first-time electrification of isolated regions. However, much of this rhetoric has been heard before so why is the common battery such a headline grabber now and is it really such a disruptive force?

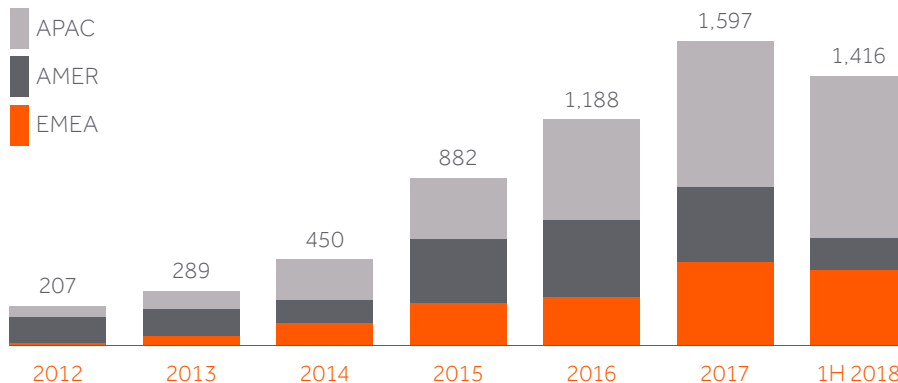
What is undisputed is that widespread availability of energy storage reduces the risks of intermittent supply and the associated challenges to the management of effective transmission grids. Intermittency of supply has been one of the key reasons constraining the growth in the penetration of renewables historically, as wind and solar in particular are impacted by climatic conditions and consequently are ill suited to provide a base load into the system. Storage could usher in the next phase of Energy Darwinism which many refer to as the *age of renewables*.

So why now? In simple terms, cost. As the price point of storage reaches (unsubsidised) grid parity, we enter a virtuous circle leading to more deployment and associated supply side growth. This in turn allows for the further funding of R&D and the entry of new producers, and so the cycle continues. So the key question – are we there yet? Well maybe. Unfortunately, it isn't so straight forward, as regulation can de-link value from price and there is no "one size fits all" in terms of "grid parity".

Disruptive enabler in the fuel mix

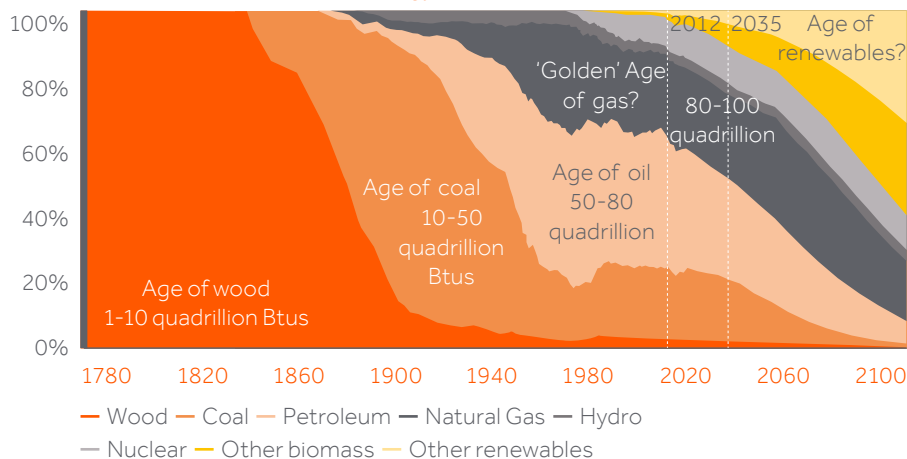
When we pay our energy bills, we are in effect paying for two things, energy and the ability to use it when we want. The ability to use energy when we want to creates a "load shape", i.e. a changing,

Exhibit 1: Global new build utility scale batter projects (MW)



Source: Bloomberg NEF

Exhibit 2: Global historic and future energy consumption



Source: Bloomberg NEF

demand profile, which needs to be filled by the market. This is an important consideration as not all plants are the same in terms of meeting these needs. Base load plants like nuclear and coal are very good at providing energy and somewhat worse at meeting shape requirements (driven by both technical limitations and the need to amortise the high capital cost across higher volumes). Combined Cycle Gas Turbines (CCGTs) are good at both; Open Cycle Gas Turbines (OCGTs) are not good at providing energy (being inefficient and thus expensive) but are an excellent option to meet the needs of the "peaks"² of the load shape. Intermittent supply from renewables can have the effect of exacerbating the peaks, with the cost of meeting this peak demand being a key

factor in determining the overall system fuel mix and cost.

The optimal generation composition has traditionally been a mix of low marginal cost, inflexible "base load" plants, and higher cost, flexible "peaker" plants. Base load plants include Coal and Nuclear (\$60 - \$140/MWh³) or Gas fired CCGT (\$40 - \$80/MWh). The peaks and shaping would be filled by the flexible margins of the base load plants (CCGT can vary load by approximately 50% and Coal / Nuclear by 20%), hydro in combination with Gas / Liquid fuel Open Cycle Gas Turbines (OCGTs) or Reciprocating Engines (\$160 - \$280/MWh). But the rapid decline in the cost of renewable energy introduced a challenge to this model. To date,

1 IFC and Navigant

2 A grid has a daily load shape which changes across the day with an evening "peak" typically corresponding to people using home appliances. There was a time where you could actually see Coronation Street commercials (and the associated tea people would be brewing during this time) within the load shape.

3 Source: Lazard's annual Levelized Cost of Energy Analysis (LCOE 11.0). The Levelized Cost of Energy (LCOE) is the all-in charges needed to pay back both operational cost and capital recovery, depends on a plant's utilisation, fuel, operational and capital costs.

penetration of renewables has largely been facilitated by the significant availability of flexible capacity from existing base load assets, but due to the intermittent nature of the energy they supply, renewables also have the effect of making the load shape more volatile thereby increasing the demand for flexible capacity and so too the cost.

At present the renewables / peaker blend on a standalone basis isn't enough to replace thermal energy, so renewables could only represent a maximum of the margin allowed by the flexibility of the installed base load mix installed (i.e. 20–50% of a grid). This equation could now change as batteries, charged by cheap renewable energy are capable of delivering stabilised supply at a blended cost below that of traditional base load generation.

What Batteries can't do.....yet.

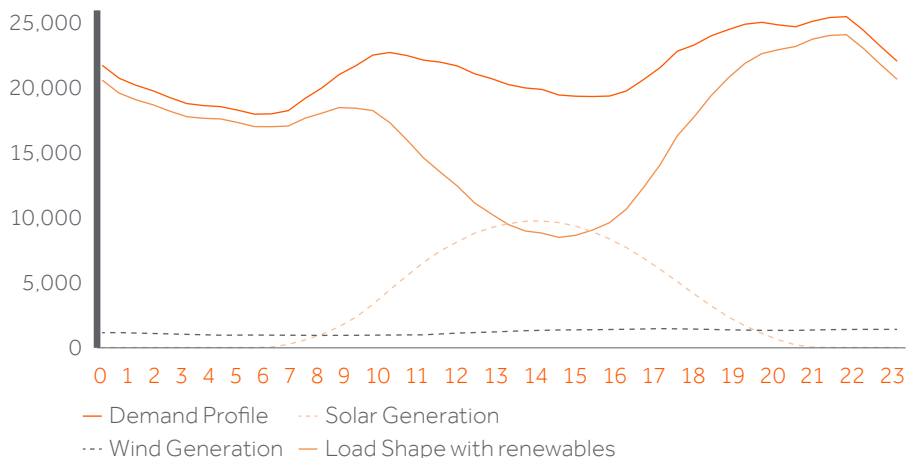
This all works in theory in meeting short term fluctuations in demand, but what about balancing the mix over a week rather than intra-day? That depends on many factors but the short answer is that the cost of batteries is directly related to their storage volume rather than their power capacity⁴ and as a result, storing and shifting volume from day to day rather than small amounts from hour to hour is currently cost prohibitive.

What Batteries can do, which isn't being talked about.

While the primary financial driver for Independent Power Producers is to gain revenue through wholesale pricing arbitrage across the day, ancillary services and/or capacity charges (both of which can be effectively thought of as providing grid stability for a fee) also play a part. While each market is different, battery uptake is somewhat hampered by this economic model, where the ancillary services are undervalued and the other benefits which batteries provide are not paid for through tariffs including:

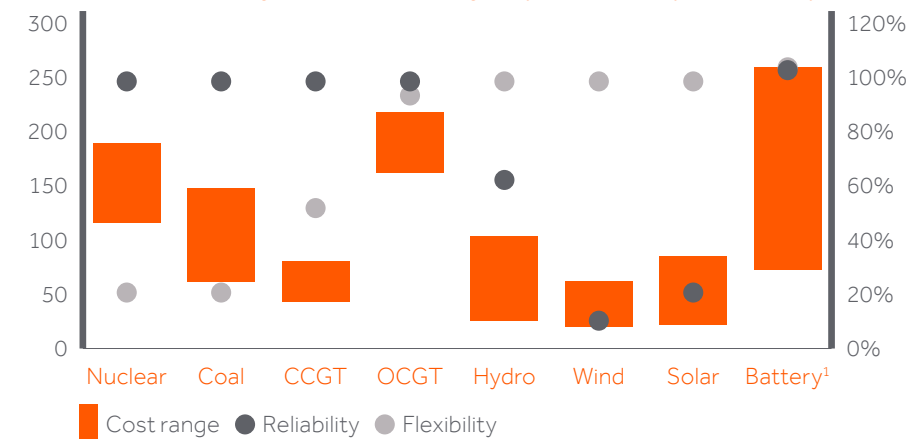
4 Prices for batteries are largely driven by storage capacity measured in MWh, i.e. today's costs for Lithium-ion batteries are in the range of \$250–300k/MWh, i.e. 1MW plant discharging in 1hr would incur a capital cost of \$250–300k. To extend that 1MW discharge to 10hrs (i.e. 10MWhrs) the cost would increase by a factor of 10. A 10MWh batter could be discharge over the span of say 1hr which would imply 10MW of capacity.

Exhibit 3: Example 24hr load shape



Source: Actis

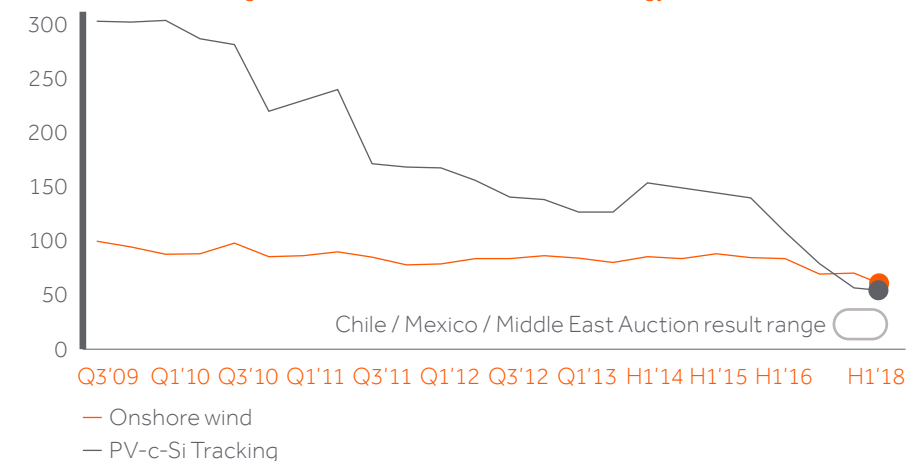
Exhibit 4: Comparison of generation technologies by cost, flexibility and reliability indices



Source: Lazard / Actis

1 Firming cost in addition to supply costs

Exhibit 5: Historic average wind and solar Levelised Cost of Energy (\$/MWh)



Source: Bloomberg New Energy Finance. Note: the global weighted benchmark represents a capacity weighted average of all country level LCOE benchmarks.

- Increased utilisation of transmission assets allowing deferral of expansion requirements and improving profitability of the infrastructure investments (Batteries can be located throughout a grid thus they support load being shifted geographically in a more efficient manner, allowing bottlenecks to be relieved over longer periods of time)
- They are very efficient at providing grid support services which enables grid operators to more effectively manage the grid stability and quality of electricity (i.e. less outages and brownouts)
- By allowing more penetration of renewables, batteries improve geo-politically related security of supply and cost escalation risk by reducing reliance on fuels as well as the decarbonisation of the grid.

What does this mean for investors?

While the headline effect is a continuation in the growth story of renewables there are also a number of opportunities and threats which are less obvious, and these include a shift towards more merchant supply and fewer long term contracts, as well as a more existential threat to the current utility suppliers who run today's baseload plants.

Despite the various issues, the commercialisation of batteries for grid storage is emerging with Australia, India, South Korea, the Middle East and the USA all seeing large scale battery solutions delivered into the market at competitive rates. The green shoots are most evident where regulatory support is available and also in sunnier climates. In our view, the continued cost decline of renewables and batteries at a time when fossil fuel prices are increasing only leads to one conclusion – storage is coming and it will spread to other markets in the near term. As leading investors in renewable energy, we see this as further stimulus for accelerated penetration of these technologies across all markets in due course.





Rivendell

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