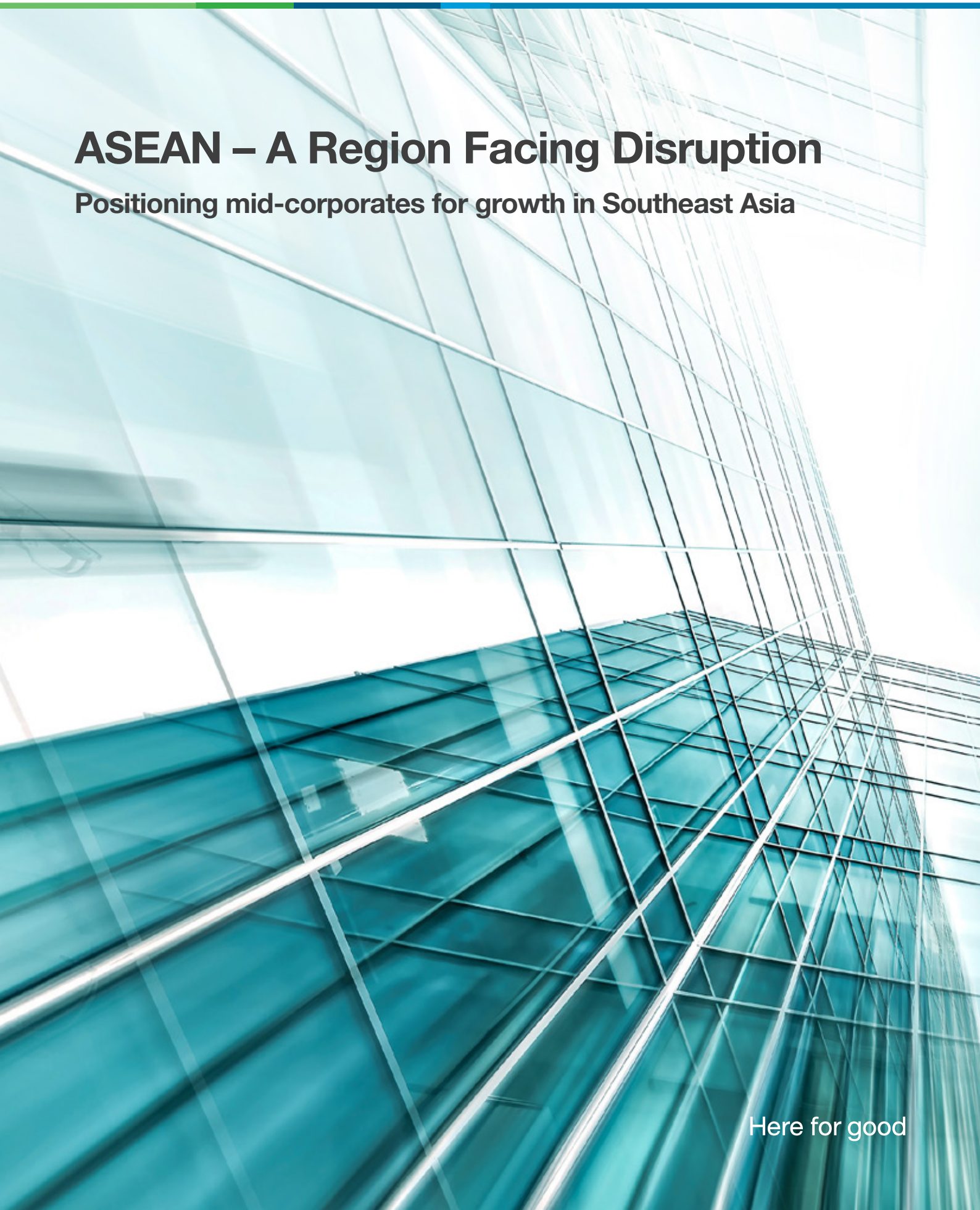
Standard Chartered

ASEAN – A Region Facing Disruption

Positioning mid-corporates for growth in Southeast Asia



Here for good

Contents

Executive Summary 2

Chapter 1 5
Shifting paradigms in ASEAN

Chapter 2 13
Strategies for the Future - Manufacturing

Chapter 3 31
Strategies for the Future - Retail and Consumer

Chapter 4 53
Strategies for the Future - Infrastructure

Chapter 5 75
Building capabilities for success

"Mid-corporates across ASEAN have played a critical role in the region's growth trajectory, however disruptions from both within and external to the region will force organisations to review how they best prepare themselves for continued profitability. Embracing and adopting digital solutions across the value chain and regional expansion are two key growth themes which mid-corporates can focus upon in order to ensure they are a part of ASEAN's future growth. Standard Chartered appreciates the complex transformation that companies face in the region and is committed to supporting them through this era of disruption to realise their growth ambitions."

Jiten Arora
Global Head, Commercial Banking
Standard Chartered Bank

“ASEAN is a hotbed of opportunities. Despite the volatile international economic environment, the region’s resilience and capacity to grow cannot be underestimated. From its rising middle class and young workforce to forward-thinking governments and digitally-inclined businesses, ASEAN is well-placed to seize new opportunities arising from any global shift. Being the only global bank present in all 10 ASEAN markets, Standard Chartered is well-positioned to support our clients’ regionalisation and expansion aspirations. We provide financial services to a third of our ASEAN mid-corporate clients outside of their home-market across the region and we continue to transform and innovate with them as their businesses evolve and grow.”

Judy Hsu
Regional CEO, ASEAN & South Asia
Standard Chartered Bank

Executive Summary

Background

In its sixth decade of existence, ASEAN stands today at an inflection point in its growth journey. The region celebrated 50 years of peace and prosperity in 2017, having achieved strong economic growth coupled with notable improvements in the standards of living of its people. The private sector has played a major role in ASEAN’s growth story so far – especially the mid-corporate segment – which occupies a crucial market space between large-scale multinationals and numerous small-scale suppliers spread across the region. Over the past few decades, ASEAN has established itself as a major manufacturing centre, with multiple mid-corporates supplying products as part of global value chains. The industrial sector has attracted steady flows of foreign investments, leading to productive employment for its people and consequently to sharp improvement in the region’s per capita income. These trends have further fuelled growth in consumer demand, especially for more aspirational and premium product categories. However, this rise in regional prosperity has placed significant strain on ASEAN’s infrastructure, creating the need for additional investments to sustain growth.

Going forward, the mid-corporate segment will continue to play a critical role in strengthening the region’s growth pace, which will become a more challenging task in the coming years. Previously successful value-propositions and business models will increasingly lose relevance in a world marked with fast changing political, economic and social dynamics. Emerging external and internal disruptions will necessitate new growth strategies to be adopted by ASEAN’s mid-corporates. The mid-corporate segment is also well placed to drive transformational change, with a stronger capacity to fund innovation than small-scale firms, while also being more agile and ‘closer to market’ than large-scale enterprises. This paper focuses on strategies mid-corporates can adopt to remain competitive within three chosen sectors. Together, these sectors (Manufacturing, Retail and Consumer and Infrastructure) are among leading contributors to ASEAN’s economy (representing 44% of regional GDP), and are expected to maintain strong growth in the near future (7% to 9% annually by 2021).

ASEAN’s continuing growth story

ASEAN’s growth story has registered much success in the past and remains promising in the near term, despite growing uncertainties in global markets. Regional GDP rose to USD 2.89 trillion in 2018, making ASEAN the fifth-largest economy worldwide. Near-term projections also remain encouraging, with regional GDP expected to surpass the USD 4 trillion mark by 2023, with further growth in the medium term to potentially become the fourth largest economy by 2030 – driven by a burgeoning middle class (65% of population by 2030) along with a formidable workforce (third-largest worldwide by 2030), that continues to support foreign investments into the region. In fact, FDI flows to ASEAN rose to an all-time high of USD 137 billion in 2017. These encouraging growth expectations can be realised through specific opportunities across the three chosen sectors, as mentioned below.

- Manufacturing: Companies in more established production centres are moving away from resource-heavy low-tech manufacturing into more value-adding segments. This will lead to new opportunities for mid-corporates – as industry suppliers and providers of supporting services – in the automotive, chemicals, pharmaceuticals, electronics, medical devices, machinery and the aerospace components industry.
- Retail and Consumer: Digital commerce is projected to grow exponentially. Representing only 4% of overall retail sales in ASEAN at present, digital commerce shows significant room for growth in the coming years. This will provide mid-corporates with new opportunities to tap into digital channels to expand market reach, and to improve loyalty by connecting with and selling directly to consumers.
- Infrastructure: ASEAN currently has a pipeline of over 800 infrastructure projects across sectors such as transport, energy, utilities, and social infrastructure. Limited public sector capital will create new opportunities for private sector involvement, in both domestic projects as well as in multi-territory infrastructure programmes such as China’s Belt & Road and other intra-ASEAN connectivity initiatives.

Potential disruption and challenges

However, the viability of these short-term growth expectations and the region's long-term prospects will also depend on whether ASEAN is able to suitably tackle certain internal and external challenges that loom over its economy. Internal challenges such as low labour productivity (65% lower than global average) continue to slow down the region's growth pace, while high dependence on external trade (represents 77% of ASEAN exports of goods) further exacerbates growth risks in the face of rising trade tensions and volatile exchange rates in global markets. Harnessing the region's consumption opportunity will also be an arduous task, requiring companies to anticipate market needs with greater agility – satisfying growing consumer demand for quality, personalisation and quicker order fulfilment. Moreover, an expanding workforce will need more productive jobs to be created, requiring training in new skills relevant to new business strategies and operational models being deployed by both domestic and global competitors.

Strategies for ASEAN's mid-corporates

To increase the probability of success in these dynamic times, mid-corporates in ASEAN will need to adopt new growth strategies aligned to major shifts expected in their respective sectors of operation. In particular, these strategies will focus on the ability to improve productivity within all functions impacting a mid-corporate business – from sourcing, to production, to distribution and delivery. They will also allow mid-corporate firms to profitably adapt business models as per changing consumer needs, by enabling a more digitalised consumer journey. In addition, through these strategies, more mature mid-corporate firms that have established a strong domestic presence will be able to expand to new regional markets to trigger their next phase of growth.

These strategies are also well-suited to the mid-corporate environment, typically marked with elements such as smaller production batch sizes, faster product development cycles, delayed payment schedules and greater capital constraints, as compared to large-sized enterprises. Together, they will impact not only the top-line of businesses by increasing access to new markets and by strengthening product quality, but will also help improve their bottom-line by optimising processes and reducing operational costs.

- Smart operations: Productivity improvement at the factory floor, supply chain optimisation and efficient project execution, will need to be prioritised to improve margins and meet changing market expectations. New technologies such as Industrial IoT, Collaborative Robots, 3D Printing, Blockchain-enabled Contracts and Building Information Modelling solutions show strong potential for adoption.
- Digital go-to-market: Customer engagement will need to be more targeted and personalised at touchpoints across the customer journey, through new solutions such as Micro-segmentation, Geo-targeting and Augmented Reality. Distribution functions (inventory management, warehousing and delivery) will need to be optimised through digitalisation, to improve process efficiency and drive flexibility.
- Cross-border expansion: ASEAN's mid-corporates will need to look beyond domestic borders and enter new markets to strengthen growth. This expansion will involve exploration of new sourcing avenues, delivery of products to new market segments, and partnerships with new players to target multi-territory infrastructure programmes across ASEAN, and even beyond in the longer term.

Many of these strategies will also require changes in existing operational models to be impactful. For example, while digitalisation within manufacturing could be initiated by deploying solutions at the shop floor, companies will also need to restructure linear supply chains and build connected digital networks managed by a centralised analytics hub – in order to maximise the impact on margins. Similarly, an effective internationalisation strategy will require companies to develop a regional capability framework to identify existing capability gaps, while entering into partnerships with those having complementary capabilities.

Business conditions in ASEAN also bring forth a wide range of other growth themes such as strengthening local innovation and R&D, developing cross-sector alliances and integration models, improving supplier management, and optimising the production footprint among others. However, we see the three strategies previously mentioned as the most relevant and timely for ASEAN's mid-corporates to achieve profitable growth.

Starting the transformation journey

Going forward, ASEAN governments will need to adopt new measures to support intra-regional trade and investments, and foster digital adoption, in order to counter emerging external and internal growth risks. In addition to these required regulatory shifts, it will also be essential for mid-corporate companies to develop the right capabilities to effectively regionalise and digitalise their operations. Successful deployment of the growth strategies mentioned earlier, will depend heavily on a strong capability foundation within the firm, one that is supported by four key elements:

- Talent development: Build data and partnership management skills, establishing stronger governance standards through formalised processes. Hire or train cyber professionals to mitigate new security risks.
- Organisational culture: Establish cross-functional teams to drive implementation, supported by a committed company leadership. The transformation function must focus on enhancing the 'people' experience.
- Technology infrastructure: Adopt off-the-shelf solutions for select pilot projects. Develop technology solutions based on a hybrid cloud model, in partnership with the ecosystem in the longer term.
- Capital management: Strengthen management of working capital, especially on the receivables front to meet gaps in growth financing. Explore alternatives to traditional bank loans such as capital markets.

Mid-corporates in ASEAN are on a growth journey that will need them to be better prepared to effectively manage disruptions – maximising the opportunities while minimising the risks associated with rapidly changing market conditions. As next steps, these firms will need to identify existing gaps and focus on undertaking internal transformation initiatives towards strengthening their capability foundation. While making large-scale transformational changes will be difficult for mid-corporates, incremental shifts will be required to sustain momentum. Assistance from specialised external partners such as technology incubators, government-run digitalisation and financing agencies, and professional growth advisors (financial, regulatory and tax), will be crucial in this regard, enabling mid-corporates to achieve stronger returns on their strategic investments.

Chapter 1:
Shifting paradigms in ASEAN

A. ASEAN's journey and the role of mid-corporates

Having greater agility than large-scale enterprises and stronger investment capacity than small-scale firms, mid-corporates will play a pivotal role in ASEAN's future growth story.

ASEAN's growth story so far

The Association of Southeast Asian Nations, or ASEAN, was established in August 1967 with the signing of the ASEAN Declaration (or the Bangkok Declaration) by its founding members, Indonesia, Malaysia, the Philippines, Singapore, and Thailand — collectively known as the ASEAN-5. Brunei Darussalam, Vietnam, Lao PDR, Myanmar and Cambodia joined over the 1980s and the 1990s, making up the ASEAN-10, with the membership status remaining unchanged since then. More recently, ASEAN celebrated its 50th anniversary in 2017, having achieved strong and steady economic and social progress for its member nations. The region has emerged as a formidable economic entity over these past five decades, establishing robust fundamentals that have enabled it to hold ground against imposing global challenges such as the Asian financial crisis of 1997 and the economic downturn during 2008-09. The region's GDP has more than quadrupled from USD 577 billion in 1999 to USD 2.89 trillion in 2018, making it the fifth-largest economy worldwide. Over these years, ASEAN's per capita GDP has also risen to USD 4,444 (2018, in current prices), 35 times the level in 1967. Consequently, only 14% of ASEAN's population was estimated to be living below the poverty line (USD 1.25 per day in Purchasing Power Parity, PPP terms) in 2015, as compared to almost 50% of the population in 1990. Contrary to common knowledge, this reduction was not restricted to the major economies, but also included the less developed CLMV markets (Cambodia, Lao PDR, Myanmar and Vietnam), where poverty rates fell from 66% in 1990 to less than 20% by 2015.[1]

Need for cohesive growth

However, despite these overall achievements, the region continues to face significant variations in economic and social well-being. For example, ASEAN's economy remains highly concentrated among its five founding members, which collectively accounted for almost 90% of regional GDP in 2017. Major variations also exist in the per capita income status. While Singapore leads the group with GDP per capita above USD 55,000, the CLMV markets record figures at USD 2,500 and below. The same CLMV markets, however, are expected to record among the highest GDP growth rates in the region, 6% to 7%, between 2017-2023. Demographic patterns are also in a state of flux, with populations in markets such as Brunei, Malaysia, Singapore, Thailand and Vietnam growing older at a faster pace than their 'younger' counterparts Indonesia, the Philippines, Cambodia, Lao PDR and Myanmar. In view of these factors, while ASEAN's leadership has initiated the 'ASEAN Community Agenda' to achieve more cohesive growth, these measures constitute only the beginning of what is required in the face of highly dynamic global conditions.[2]

Role of mid-corporates

Going forward, smaller local businesses will need to be strengthened to achieve more equitable and sustainable development across ASEAN. Acting as a value-adding link between multinationals targeting entry or expansion in the region, numerous small-scale suppliers and a fast growing consumer base, mid-corporate businesses (defined as those with annual revenues between USD 10-500 million) will be key to strengthening ASEAN's presence in a rapidly changing global economy. Mid-corporates are also suitably placed to drive change. A larger size than small-scale firms provides them with a stronger capacity to fund innovation, and invest in talent and infrastructure. On the other hand, a smaller size than large-scale multinationals make mid-corporate firms more agile, with familiarity to local market conditions improving their ability to adopt new strategies that can allow them to explore emerging opportunities or to counter emerging threats.[3]

Understanding variations between individual countries will be essential for both governments and the corporate sector in ASEAN to identify growth priorities and design suitable strategies to achieve impact. Less penetrated segments will offer new opportunities for market expansion or product diversification, but will also require new business models and stronger capabilities to enable profitable growth. These aspects are discussed in detail in the sector-focused chapters that follow.

B. Key disruptive forces influencing ASEAN

Business conditions in ASEAN are being influenced by multiple global and regional macroeconomic forces, creating the need for mid-corporate firms to devise new growth strategies. These forces are creating new opportunities to meet growing consumer demand and to strengthen the local production landscape, but are also bringing forth new challenges that need resolution to sustain ASEAN's growth trajectory.

1. Growth drivers

1.1 Expanding workforce and consumer base to generate new opportunities

Short-term projections for ASEAN remain encouraging for global investors, with rising affluence and supply of labour expected to make ASEAN a USD 4 trillion economy by 2023

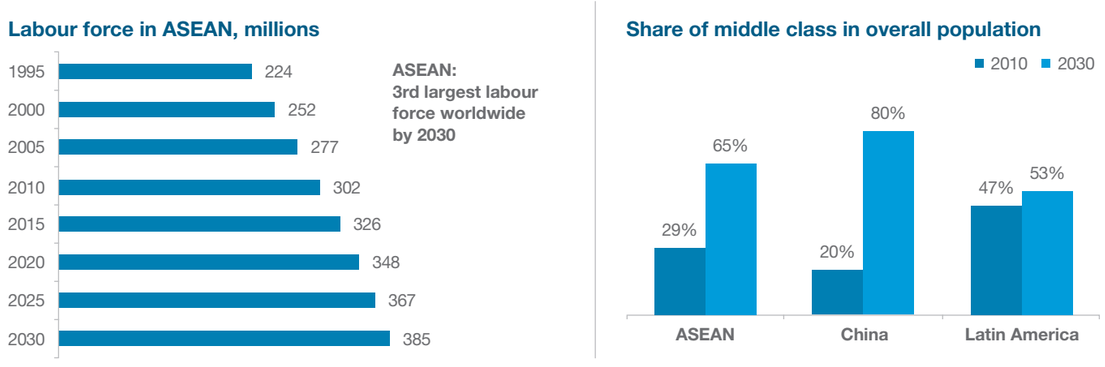
Short-term growth prospects

Strong economic fundamentals continue to support ASEAN's growth prospects in the near future, with regional GDP expected to surpass the USD 4 trillion mark by 2023. In fact, these growth projections denote the onset of a new phase in ASEAN's growth journey, achieving much greater economic impact in a shorter period of time. As per estimates by the International Monetary Fund, ASEAN's annual GDP is projected to rise by USD 1.35 trillion from 2017-2023, as against growth of only USD 460 billion recorded over the past six years (2011-2017). The scale of this growth can also be adjudged by the fact that it took nearly 40 years for ASEAN to first cross the USD 1 trillion GDP mark since inception. This sharp rise in the scale of economic activity will further translate into new opportunities across sectors, as detailed in chapters two, three, and four of this report.[4] ASEAN's robust projections are underpinned by both supply- and demand-side factors impacting economic growth.

Supply-side growth drivers

On the supply side, expansion of the region's labour force has been a major contributor to ASEAN's growth story, with more than 100 million people estimated to have joined its workforce over the past 20 years. This trend is also expected to continue in the near term, though at a slower pace than before. Going forward, ASEAN will record the second-largest growth in labour force worldwide (behind only India), adding around 60 million people to its workforce by 2030, accounting for a total of 10% of the global labour force. However, this large labour force will also need new and more productive jobs to be created, to contribute effectively to the regional economy. Regional integration will need to be enhanced, allowing easier movement of labour and capital to address talent gaps between individual ASEAN countries. Changing market conditions will also require new skill sets from employees, requiring ASEAN to focus on suitably training this growing workforce to foster a shift towards higher value-adding jobs. This challenge of suitably exploiting the demographic dividend, will be even more relevant for the relatively younger economies of the region (especially Indonesia and the Philippines) expected to witness stronger growth in their working-age populations over the coming decades.[5]

Figure 1.1: Growth in the labour force and the middle class in ASEAN



Source: International Labour Organisation, 2017; International Enterprise Singapore, 2017

Demand-side growth drivers

On the demand side, ASEAN's middle class (defined as households with daily expenditure between USD 10 to 100) is projected to grow significantly in the coming years, representing almost two-thirds of the overall population by 2030, compared to only 29% in 2010. This emerging class has a higher willingness to pay for quality and choice, and will drive demand for more aspirational product segments such as consumer durables, personal care, fashion and apparel, health and wellness, and leisure and entertainment. Consequently, this will also lead to more intense competition, with consumers showing high willingness to try new products. For example, a study on the food and beverage sector by Nielsen indicated a much higher proportion of consumers purchasing 'new' products in their last grocery shopping visit in Vietnam (88%) and Indonesia (72%), as compared to more mature consumer markets such as Malaysia (68%) and Taiwan (58%). Achieving market success in ASEAN, will therefore require differentiation strategies to become more customer-focused (e.g. by offering an omni-channel experience, or making frequent product launches), while suitably managing higher costs and operational complexities associated with meeting such expectations.[6]

> ASEAN has been a remarkable success over the last decades, with millions of people lifted out of poverty and the emergence of a significant middle class. However, there are important risks on the horizon - escalating trade tensions, demographic headwinds, and technological transformation leading to labour market dislocation – all of which need to be carefully managed by corporates and governments to limit the impact on the region.
>
> **Jochen Schmittmann**
> Resident Representative in Singapore,
> International Monetary Fund (IMF)

2. Growth challenges

2.1 Internal: Gaps in labour productivity require new measures to remain competitive

Large deficits in labour productivity over global counterparts threaten growth prospects in emerging ASEAN markets, while declining productivity growth engulfs developed ASEAN

Productivity growth is recognised as a major driver of economic output and competitiveness, making it a crucial tool for nations to achieve faster economic growth. Accordingly, policy-makers worldwide aim to adopt a number of interventions to achieve a boost in labour productivity (or output per worker). These include investing in human capital, building new infrastructure, making policy improvements or encouraging the adoption of new technologies among businesses and government institutions.[7]

Productivity gap over global markets

Despite the significance of improving labour productivity, industry figures indicate a major gap between ASEAN and global markets, as shown in Figure 1.2, highlighting major scope for improvement in the coming years. As a regional entity, labour productivity in ASEAN remains much below the world average, being ahead of only Africa and Southern Asia in 2017. While ASEAN's productivity has more than doubled from USD 4,115 per worker in 1991 to USD 8,854 per worker in 2017, it still stands at less than 10% of figures recorded for advanced regions such as North America and Western Europe. Patterns differ among ASEAN markets as well. Declining productivity growth has been a concern for many high-income or developed nations worldwide, including those in ASEAN (Singapore, Brunei), with a fast ageing population making it even more challenging to revive growth in the longer term. The situation in emerging ASEAN nations also remains challenging, recording much lower productivity levels than emerging markets worldwide. Rising wage levels in emerging ASEAN are further diluting the low-cost proposition enjoyed by many of these markets, necessitating a greater productivity focus to maintain competitiveness in the longer term.[8]

Levers for productivity improvement

Developed ASEAN markets such as Singapore and Brunei have more advanced institutions and infrastructure, and therefore will need to focus more on increasing technology adoption to counter declining productivity growth and to meet expected labour shortages. On the other hand, emerging economies, with less mature institutions and social development, have even more levers that can be influenced to improve productivity. Adoption of digital solutions in particular is expected to have a significant impact across both types of markets – for example, as per one study, a single point improvement in a country's digital connectivity score could lead to more than a 2% rise in productivity and national competitiveness.[9]

2.2. External: Uncertainties in global trade necessitate intra-regional cooperation

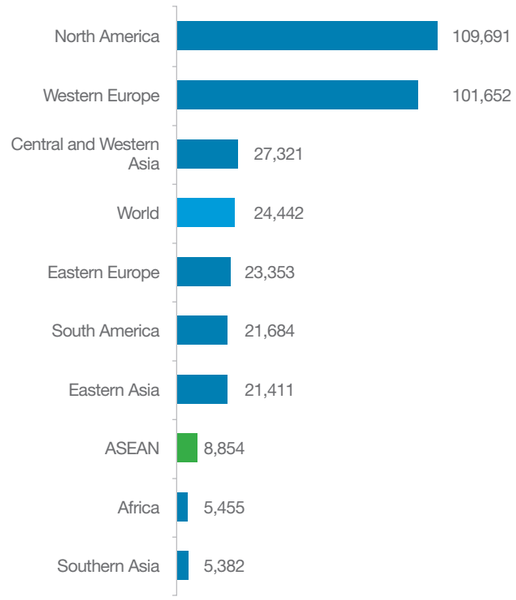
Rising global trade tensions increase growth risks for ASEAN due to its high dependence on participation in global value chains to generate employment and fuel economic growth

Trade-related growth risks

The contribution of trade to ASEAN's economy has grown significantly since inception, with trade-to-GDP ratio rising from 43% in 1967 to a high of 131% in 2005, before falling to 87% in 2016 – though still being much higher than the global average of 56% in 2016. Aligned to this sharp rise in trade dependence, ASEAN's share of global exports has also grown from only 2% in 1967 to 7% by 2016. However, factors such as increasing trade tensions and protectionist sentiments among many global economies, coupled with rising volatility in emerging market currencies, now pose growth risks to markets that remain heavily dependent on trade. According to the World Trade Organisation's (WTO) annual monitoring report, its member nations had applied 137 additional trade-restrictive measures over the period spanning October 2017 to October 2018. A notable shift is also visible in the nature of global trade, with the value of trade covered by restrictive measures being on the rise, while the value covered by trade facilitating measures is witnessing a decline. Considering such conditions, the WTO has recently downgraded its outlook for growth in global trade for 2019, citing significant downside risks to its growth projections.[10]

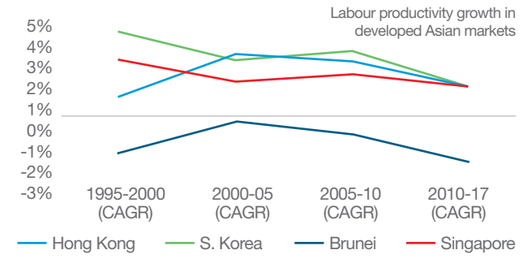
Figure 1.2: Labour productivity in ASEAN and global markets

Labour productivity in ASEAN remains much below the global average

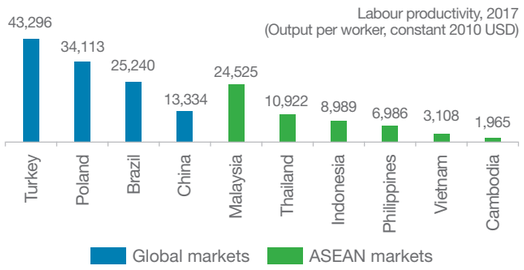


Source: International Labour Organisation, 2018

Slowdown in productivity growth could challenge prospects in developed ASEAN



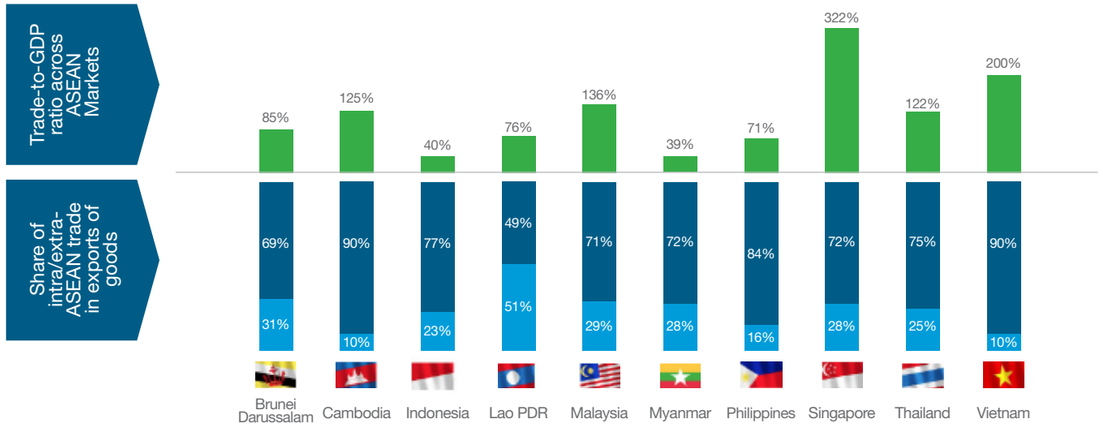
Emerging ASEAN continues to lag global counterparts in labour productivity



ASEAN's dependence on external trade

With ASEAN's trade flows being heavily skewed towards external partners, these growth risks become even more relevant to the region. Extra-ASEAN trade represented 76.5% of exports of goods in 2017, with figures for select markets such as Cambodia, Vietnam and the Philippines being significantly higher than the ASEAN average, as shown in Figure 1.3. Besides these markets, Thailand, Malaysia and Singapore also show high trade dependence (trade-to-GDP ratio > 100%), with a dominant share (>70%) of exports destined for regions outside ASEAN. This external dependence is quite in contrast to other leading economic blocs, such as the North American Free Trade Agreement (NAFTA) and the European Union (EU). Intra-NAFTA trade surpassed extra-NAFTA trade within five years of NAFTA's implementation, while intra-EU trade represented 64% of EU exports in 2017. Going forward, ASEAN will also need to focus more on increasing intra-ASEAN trade and investments, to counter growing external risks. Besides regulatory shifts such as reduction in non-tariff trade measures, this will also require the corporate sector to build stronger regional value-chains. To do so, companies will need to build new capabilities, while restructuring themselves into 'connected' regional supply chain networks, discussed in detail in chapter two of this report.[11]

Figure 1.3: ASEAN's dependence on trade and external trade partners



Source: World Bank, 2018; ASEAN Secretariat, 2018

Key takeaways

1. Fifth-largest economy: ASEAN, the world's fifth-largest economy, will remain a high opportunity market for global firms. Recording unprecedented growth in annual output, regional GDP is estimated to reach USD 4 trillion by 2023.
2. Fast rising demand: Demand for new products and services is bound to rise, driven by the increasing affluence of its people (65% in the middle class by 2030) and robust expansion of the labour force (additional 60 million over 2015-30).
3. Internal and external challenges: However, challenges such as labour productivity gaps over global competitors and the weakening of external trade conditions will require new interventions from ASEAN governments and the private sector.
4. Role of mid-corporates: Acting as key suppliers to established global brands and as fast-growing businesses competing for access to the end consumer, mid-corporates will play a major role in realising ASEAN's future growth ambition.

> We are actively pursuing regional opportunities as a risk mitigating approach. Ours is a cyclic business, with periods of growth followed by downturns. Being present in various regional markets allows us to compensate for a downturn in one country with growth in others.
>
> **CFO**
> Malaysian mid-corporate, construction

Focus of this report:

While a wide number of sectors will continue to push the regional economy forward, this report focuses on those expected to have the most far-reaching impact on ASEAN's growth prospects, while also showing higher potential for mid-corporate businesses to operate in.

Three sectors stand out in this regard, namely:

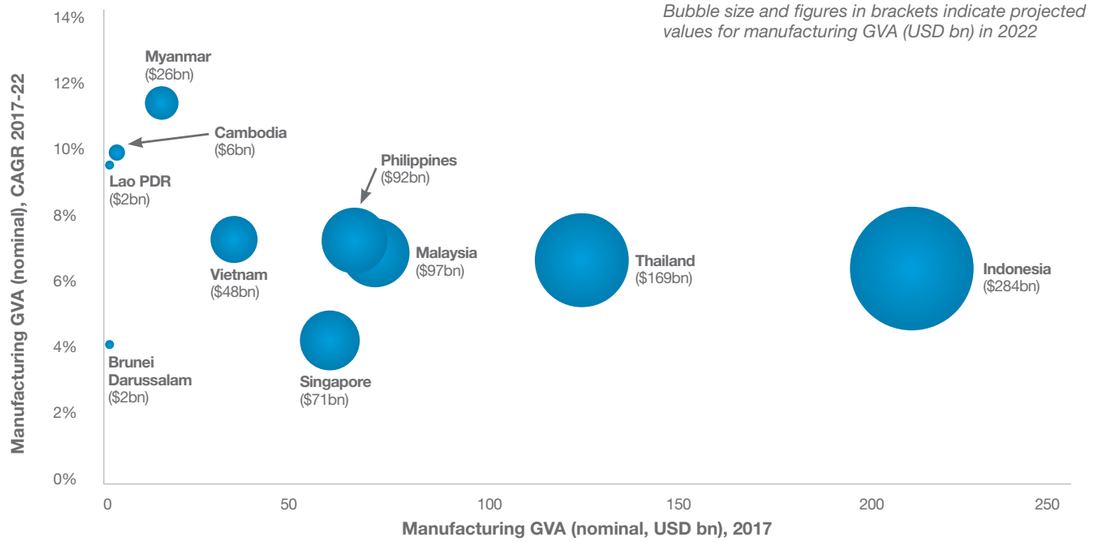
- Manufacturing
- Retail and Consumer
- Infrastructure

Together, these three sectors represent 44% of regional GDP, and are expected to maintain strong growth in the near future (7% to 9% annual growth by 2021). Sectors such as manufacturing and retail and consumer will be essential in generating greater economic value through new products that meet customer demand, and thereafter in capturing economic value by supplying these through the right channels. On the other hand, the Infrastructure sector will act as a foundation for other sectors to flourish, reducing market inefficiencies that slow down an economy's pace of development.

Chapter 2: Strategies for the Future - Manufacturing

Being the leading contributor to regional output (more than 20% of GDP in 2017), the manufacturing sector has played a major role in shaping ASEAN's growth story so far – attracting steady flows of foreign investments and generating productive employment that has been instrumental in boosting the region's per capita income. Supported by multiple factors such as the region's demographic dividend, lower labour costs, a supportive policy climate and ASEAN's favourable geographic location along major maritime trade routes – the manufacturing sector has emerged as a major growth driver for the region – with its share in ASEAN exports of goods rising from only 9% at the time of ASEAN's founding to a significant 66% at present.[12]

Figure 2.1: Manufacturing Gross Value-Add (GVA) for ASEAN nations (2017-22)



Source: BMI Database, 2018

Opportunities and challenges

Aligned to the overall economy, ASEAN's manufacturing sector remains concentrated among its six leading markets (Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam), collectively representing more than 90% of the region's manufacturing output by value in 2017. Although the sector remains dominated by more labour-intensive production segments at present, multiple new opportunities are expected to arise from the region's growing focus towards capital and technology intensive areas – boosting manufacturing value-add (nominal) from USD 581 billion in 2017 to USD 797 billion by 2022. However, productivity gaps and rising costs of doing business remain major challenges. These issues could dampen ASEAN's global competitiveness going forward, unless manufacturers adopt new growth strategies to prepare for emerging industry disruptions.[13]

Growth strategies for manufacturing mid-corporates

Mid-corporate manufacturers in ASEAN will need to devise more competitive value-propositions to strengthen their market position or risk losing business to global competitors. These trends will drive the adoption of digital technologies within their production lines and supply chain functions – to achieve improvements in production capacity, operational costs, process efficiency and product quality. Solutions such as IoT-enabled analytics and collaborative robots are already being embraced by many, offering greater visibility into production and supply chain processes, combined with improved operational flexibility. Ongoing advancements in other areas such as 3D printing and blockchain-enabled digital contracts are also expected to gain adoption in the longer term, resolving constraints that limit the possibilities of 'on-demand' production today – while significantly improving the availability of trade finance for mid-corporates in the coming years.

A. Key industry shifts impacting growth

We see three major shifts impacting ASEAN's manufacturing competitiveness in the coming years, giving rise to new opportunities and challenges for mid-corporate firms. These transformational shifts involve a progression towards more value-added production segments, amidst a growing need to improve labour productivity and enhance supply chain performance in the region.

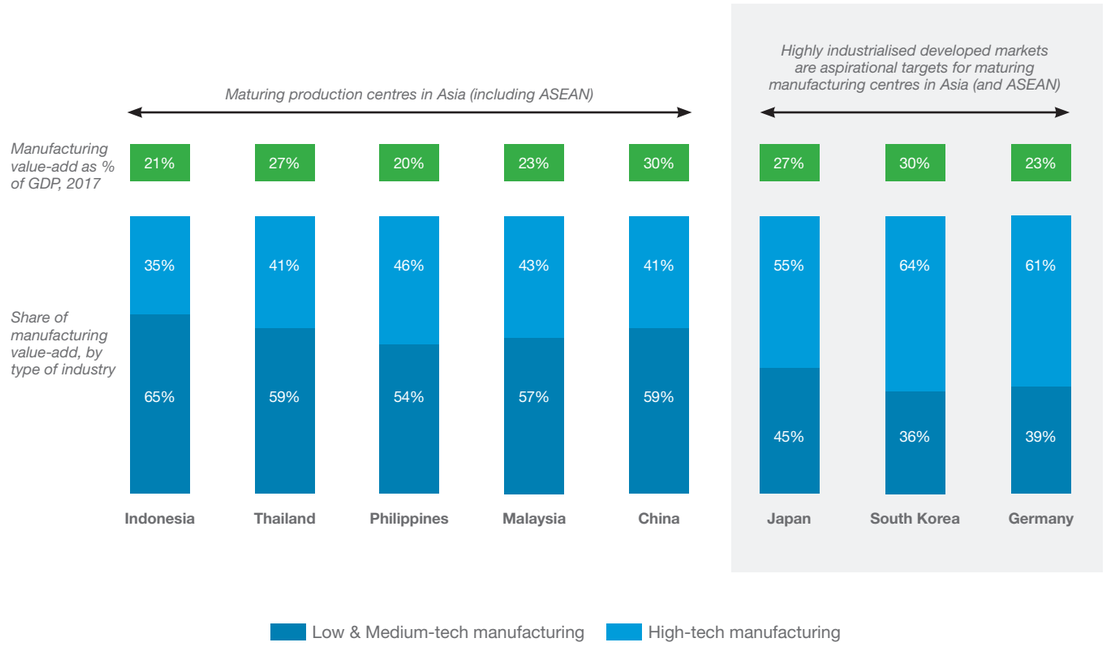
1. High-tech manufacturing to generate new opportunities

More mature production centres will witness growth in higher value-adding sectors such as automotive, chemicals, pharma, electronics, medical devices, industrial machinery and aerospace

Growing trade tensions, rising wages and tougher emissions regulations are fast eroding the value proposition of a cheap labour force in the Chinese industry – opening the opportunity for other countries to pick the (lower cost) manufacturing mantle from China. The last few years have accordingly seen many manufacturing firms, especially in labour-intensive sectors such as clothing and footwear, shift base to lower cost ASEAN locations such as Vietnam, Cambodia and Myanmar. Besides cost considerations, many multinational companies (MNCs) are also keen on reducing their dependence on China, in view of the rising trade tensions being faced by its industry – and are therefore building more distributed supply chains by investing into Southeast Asia. For example, Pou Chen Corporation, one of the world's largest contract manufacturers for footwear, has reduced its annual production in China from a share of 29% in 2014 to only 17% in 2017, with 46% of the production now being undertaken in Vietnam.[14]

While relatively less mature production centres in ASEAN (e.g. Vietnam, Cambodia) will continue to benefit from the relocation of low-tech manufacturing away from China, more advanced manufacturing centres in the region (e.g. Indonesia, Malaysia) are switching attention towards technology intensive production. Historically, a structural shift in manufacturing – from low to high-tech industries – has been a driver of per capita income in developed Asian nations such as South Korea and Japan. This growth model is now being widely considered as a way forward for emerging ASEAN economies looking to escape the middle-income trap. With manufacturing competitiveness on the rise globally, new value propositions (besides low labour costs) will also be required to continue to attract production – therefore, driving these select ASEAN nations to move away from resource-heavy low-tech manufacturing into more value-adding high-tech production.[15]

Figure 2.2: Share of manufacturing output by type of industry



Source: United Nations Industrial Development Organisation, 2018; BMI Database, 2018

As shown in Figure 2.2, leading ASEAN manufacturers such as Indonesia, Thailand, the Philippines and Malaysia are today at a similar stage in their manufacturing evolution journey as China – having a similar technological structure of overall production (mix of low-medium-high tech manufacturing).[16]

Driven by these factors, national governments and industry bodies in ASEAN have also announced plans of prioritising high-tech manufacturing in the coming years. For example, Thailand and Indonesia have announced initiatives to develop their electric vehicle industry. Thailand extends incentives such as exemptions on corporate income tax for companies manufacturing powertrain components within the country. Similarly, the construction of a major project to manufacture lithium batteries is expected to start in Sulawesi, Indonesia in 2019, aiming to initiate production by 2021. The project will need an overall investment of USD 4 billion and already has investors on-board from South Korea, Japan and China.[17]

Malaysia, on the other hand, plans on strengthening its position as a global medical device manufacturing hub. The sector is being prioritised as per the government's ongoing five-year development plan, creating growth opportunities for the production of components for X-ray machines, computed tomography (CT) scanners, ultrasound and nuclear imaging systems and magnetic resonance imaging (MRI) systems. Similarly, the Philippines' Manufacturing Industry Roadmap prioritises high-tech segments such as automotive, aerospace, chemicals and transport equipment among others to achieve the nation's aim of increasing the contribution of manufacturing to 30% of overall output and 15% of employment by 2025. Lastly, while Singapore already represents a more advanced manufacturing centre within ASEAN (80% of manufacturing being high-tech at present), it has also announced Industry Transformation Maps (ITMs) for multiple areas including electronics, chemicals and precision engineering, to maintain its competitiveness in the coming years.[18]

Overall, these growth plans are creating new opportunities for mid-corporate businesses in ASEAN – as industry suppliers and providers of supporting services – integrating themselves as part of global value-chains in industries such as automotive, chemicals, pharmaceuticals, electronics, medical devices, machinery and equipment, and aerospace components. Accounting for more than 60% share in global exports by value in 2017, these high-tech segments continue to dominate manufacturing worldwide, and therefore offer much greater scope for ASEAN's mid-corporates to play and compete in than low-tech production. Besides product diversification, many mid-corporates are also looking to expand into new geographies within ASEAN to benefit from favourable policy incentives, lower production costs or to move closer to their major customers. As per the Business Times-Standard Chartered Leaders' Survey conducted in 2018, a majority 80% of businesses in ASEAN (including many mid-corporates) plan to expand regionally over the next three to five years.[19]

> Low-cost manufacturing is not a sustainable proposition for mid-corporates as costs continue to grow. Manufacturers in Vietnam have to abide with new environmental standards, which requires additional investments. Labour costs are also rising. These costs, in a low-tech offering, cannot be passed on to clients, thereby reducing already low margins.
>
> **IT Director**
> Vietnamese mid-corporate,
> pharmaceuticals manufacturing

2. Margin pressures necessitate productivity improvement

Low labour productivity combined with fast rising wages and changing customer requirements are resulting in tighter margins for mid-corporate suppliers in ASEAN

As discussed in chapter one, low labour productivity continues to represent a major challenge for emerging ASEAN markets, while developed ASEAN has witnessed stagnant productivity growth in recent years. This has led to growing profitability pressures on local manufacturers in the midst of rising wage rates, while a fast ageing population is expected to further exacerbate labour shortages in select markets such as Thailand, Singapore and Vietnam in the longer term (beyond 2030).[20]

The manufacturing sector is also fast evolving in reaction to changing consumer needs, with growing demand for customisation and quicker order fulfilment placing additional pressure on companies down the supply chain. MNCs are increasingly looking at technology adoption to address the market's growing need for 'mass customisation' – differentiating through greater product variety and lower time to market, while keeping production costs under control. With MNCs showing limited propensity to push rising costs to the end consumer, pricing pressure on suppliers (many of these being mid-corporates) is on the rise. In view of this, mid-corporate businesses will need to focus on improving productivity levels or face possible margin cuts to remain competitive. Aiming to maximise operational performance, MNCs are also expected to prioritise suppliers that are higher up on the technology adoption curve, to minimise time and cost investments required to upgrade their supply networks – thus necessitating timely action from mid-corporate firms.[21]

3. Market dynamics push for supply chain optimisation

Globalisation of supply chains amidst rising pressure from consumers and governments to ensure product quality and safety, is increasing supply chain management costs for firms

The past few decades have witnessed global manufacturing being spread across multiple locations to benefit from cheaper labour, regulatory incentives and proximity to large consumer markets. The fragmentation of supply chain networks has risen substantially over these years, with global value-chains (GVCs) managed by MNCs already accounting for almost 80% of global trade. In line with this trend, ASEAN has also emerged as a major production and logistics centre. Almost two-thirds of ASEAN exports today are accounted for by participation in GVCs, making it the second-largest regional grouping worldwide in terms of GVC presence, behind only the European Union (70% share).[22]

Consequently, supply chains in ASEAN have also become more fragmented, complex and difficult to manage – making it challenging for network participants (including many mid-corporates) to understand how disparate parts interact and where problem areas could be located. On the other hand, a more affluent consumer is expecting higher quality and greater product choice, while national governments are prescribing stricter safety, traceability and corporate accountability standards. Changes in the international trade climate (such as imposition of protectionist non-tariff barriers, security concerns) are also causing tighter border controls, further driving up compliance time and costs. Together, all these factors are increasing supply chain management costs for mid-corporates, and are thus pushing the need for improvements in operational performance to remain competitive.[23]

B. Strategies for growth

Mid-corporate companies will need to explore new strategies to maximise opportunities while minimising the risks arising out of disruptive shifts being witnessed across ASEAN's manufacturing landscape. As discussed in the following sections, productivity improvement at the factory floor and supply chain optimisation will need to be focussed on, to strengthen growth while improving company margins.

Strategy 1: Adopt new technologies at the factory floor

Initiate digitalisation by prioritising deployment of the Industrial Internet, collaborative robots and 3D printing solutions – to improve floor productivity and company profitability

Global manufacturing is presently in a state of flux, witnessing rising pressure on companies to improve operational effectiveness. Mid-corporate firms will accordingly need to deploy new technologies along their production lines to meet MNC expectations of achieving higher productivity at lower costs. The impact of technology adoption could be significant. As per PwC's Global Industry 4.0 Survey, manufacturers worldwide expect to reduce operational costs by 3.6% while increasing efficiency by 4.1% annually, by adopting next-generation industrial technologies. Considering ASEAN's inherent need to address a large productivity gap over global markets and its fast rising production costs, uptake of digital solutions could yield a stronger impact for the region than these global averages.[24] Based on regional conditions and how peer firms globally are reacting to similar challenges, three types of solutions show strong applicability for mid-corporates in ASEAN, as explained in sections that follow.

1.1 Industrial Internet of Things (IIoT)

Implementation of IIoT-based monitoring solutions can reduce machine downtime, lower maintenance costs, eliminate non-value adding processes and improve product quality

The Industrial Internet of Things involves expanding the internet to connect machines, computers and the workforce to enable improvements in information monitoring, collection, visualisation and analysis. By attaching intelligent devices (different types of sensors) to plant assets, manufacturers can collect data from resources that have remained untapped thus far, and analyse information through software algorithms to make more optimal production decisions in real-time. Interest in IoT solutions is already high in ASEAN. As part of a regional survey conducted in 2017, 70% of ASEAN businesses indicated they were exploring IoT adoption, while 14% indicated that they had already completed IoT implementation within their businesses. Thailand, Malaysia and Indonesia led the region in terms of interest levels in IoT in 2017.[25]

Key impact areas for ASEAN mid-corporates: Companies can target operational improvements along three key areas, leading to an enhancement in productivity and quality whilst simultaneously reducing operational costs. These areas include:

a. On-demand maintenance: IIoT enables manufacturers to move away from scheduled preventive maintenance that could lead to unnecessary downtime, and also involves additional labour and part costs. Through continuous monitoring of machine usage, production patterns and operating conditions, IIoT allows manufacturers to pick signals that caution against a possible malfunction (such as unexpected vibrations) and initiate timely interventions, as and when required. This helps minimise unscheduled downtime and prevents more expensive repairs or industrial accidents at a later stage. As per industry estimates, IIoT-enabled predictive maintenance can improve plant productivity by 50% and production capacity by 65%, by enabling shorter maintenance cycles and by allowing production lines to function for longer than before.[26]

b. Process optimisation: Process data (such as lead time, material and energy consumption or operator efficiency) can be collected and translated into real-time dashboards, allowing for timely monitoring and generation of insights to enable plant optimisation. This helps remove non-value adding processes, optimise in-process inventory, improve inter-department coordination and enable dynamic scheduling to meet any sudden changes in demand. Location tracking enabled by IIoT allows less time to be spent in locating tools, equipment and finished goods inventory, leading to improvements in worker productivity. Estimates indicate reduction in process validation time from two weeks to a few hours by adopting IIoT.[27]

c. Quality control: Quality concerns have gained prominence among customers and regulators in recent years. Stronger quality control will also be imperative for mid-corporate companies in ASEAN planning to compete with global firms by moving up the value-chain into high-tech production segments. IIoT-enabled systems help in this aspect through various means. Real-time monitoring of environmental changes or inconsistencies in source materials helps prevent quality defects. IIoT-enabled production lines can be shut down in time should any quality issues be detected, thus minimising the production of faulty products. Adoption of IIoT across multiple facilities also helps benchmark performance and share best practices between high-performing plants and underperforming facilities.[28]

Case study: Lido Stone Works implements an IoT-enabled 'intelligent manufacturing system'

US-based Lido Stone Works, a manufacturer of architectural stone products (such as stone fireplaces, fountains and floors), has been able to increase productivity by 30%, reduce travel costs by USD 524,000 per year and increase revenues by 70%, by implementing an IoT-enabled 'intelligent manufacturing system'. The system links Lido Stone Works, its machinery suppliers and its client's architects through an IoT-based cloud platform, to help monitor production in real-time and detect and resolve potential issues at the earliest time possible. Contrary to expectations, digital adoption has also enabled the company to increase employment rather than cut jobs. Since adopting an IoT system, the company has been able to invest its savings and revenue gains into further expanding business presence, increasing employment by 66%.[29]

Case study: IoT-enabled analytics helps Kaeser Kompressoren reduce downtime and costs

Similarly, Germany's Kaeser Kompressoren, a manufacturer of compressed air systems, has achieved 60% reduction in unscheduled equipment downtime, while saving USD 10 million annually in maintenance and inventory management costs, by implementing an IoT-enabled predictive analytics solution. The company has added IoT sensors to its equipment to capture key environmental and performance metrics such as humidity, temperature and vibration levels. It then applies predictive analytics to determine which parts are more prone to failure, in order to replace these before a major outage can occur.[30]

1.2 Collaborative robots (Cobots)

Cobots are better suited for mid-corporate businesses, offering higher operational flexibility, faster payback and greater worker safety over industrial robots employed by large plants

Automation of the production line is on the rise worldwide, with robots being deployed across a wide range of industrial operations. However, the adoption of industrial robots is expensive and complex for smaller businesses that are looking more for solutions to augment the performance of their human workforce, rather than to replace them. In this regard, collaborative robots (or cobots) that are able to work with humans have emerged as a new path. Besides being technically less complicated to program and operate, the adoption of cobots is also gaining pace due to apprehensions over a possible decline in innovation and ideation with less human intervention on the factory floor. As per estimates, while cobots account for less than 5% of the global robotics market at present, their share is expected to reach a high 34% by 2025.[31]

Key impact areas for ASEAN mid-corporates: In terms of applications, cobots are increasingly being adopted by mid-corporates in industries such as electronics, semiconductors, metal and machining, food processing and pharmaceuticals, for a range of operations including packaging, quality testing, material handling, machine tending, assembly and welding.[32] Cobots offer three major value-propositions for mid-corporate firms looking to boost productivity through automation:

a. Operational adaptability: The level of flexibility required from production inputs (labour and equipment) within smaller manufacturing units is typically greater than in large-scale plants that are based more on the principles of process standardisation and are dominated by repetitive tasks. Mid-corporate firms typically need to run production in smaller batch sizes, catering to varying customer requirements. Therefore, cobots are a more attractive proposition for such a production environment, as they are lighter in weight and easier to re-program than industrial robots, allowing quicker changeovers with minimal set-up time and effort.[33]

b. Investment affordability: Cobots are cheaper to own and operate than industrial robots making them more suitable for mid-corporate companies looking to kick-start their automation journey. The average cobot price is estimated to be about 40% lower than the average price of an industrial robot. Without the need for a large workspace equipped with protective barriers, or for specialised user trainings, cobots can also be deployed with lower time and cost investments than industrial robots. The benefits of automation further help in reducing production costs and material wastages, while improving operational efficiency. This allows cobot investments to have a shorter payback period than industrial robots, increasing their applicability for smaller firms that face greater pressure on working capital than large-scale enterprises.[34]

c. Worker safety: Cobots are designed to benefit from the insights and value-adding capabilities of human workers, in addition to the productivity advantage of conventional robots. Unlike heavy industrial robots which need to be caged and are considered unsafe for direct human interaction while in operation, cobots are ergonomically designed to work with people and are equipped with safety sensors programmed to cease activity if any obstacle is encountered. This helps ensure worker safety while in operation.[35]

> China's high wage is mitigated by higher productivity compared with countries in ASEAN that we operate in. A key challenge for ASEAN will be to improve productivity - it is no longer an option, but a must to remain competitive. The emergence of digital solutions such as Industrial IoT or robotics is very timely on this front.
>
> **Kenneth Tan**
> Executive Director, Sunright Limited, Singapore

Case study: Mid-corporates in ASEAN adopt cobots to improve productivity and performance

PLC Industries, a precision machining company in Singapore, was facing challenges around shortage of skilled labour, in addition to diminishing margins due to rising material and real estate costs. It therefore decided to automate its production lines by adopting robotics systems to help improve productivity while achieving consistent quality. However, the company also needed a solution that allowed employees to work in close proximity with the robots due to space constraints at the production floor. It therefore decided to adopt two cobot units, instead of industrial robots. Since adoption, the company has achieved a 40% increase in annual output within a modest payback period of 12 months on its investment. The ease of programming enabled each cobot to serve two Computer Numerical Control (CNC) machines, and therefore allowed the company to address labour shortages.

Similarly, PT JVC Electronics Indonesia has been able to reduce annual operational costs by more than USD 80,000, while improving productivity and quality, by deploying seven cobot units. The cobots execute tasks such as soldering, screwing and pick and place operations, and required only four days for the staff to be trained to start operation.[36]

Case study: Cobots gain acceptance among mid-corporates globally, from Europe to South Asia

Examples of cobot adoption can be seen among mid-corporates outside ASEAN as well. Multi-Wing CZ, a Czech manufacturer of ventilation systems, has been able to reduce production costs by 10-20% while increasing production capacity by 336 hours per year by deploying cobots. Similarly, Aurolab, an ophthalmic equipment manufacturer in India, has been able to increase annual output of high precision lenses by 15%, by deploying eight cobots at its production site in Madurai. The lenses are currently exported to over 130 countries worldwide due to their higher quality.[37]

1.3 Additive manufacturing (3D Printing)

Faster development of prototypes, high product variety and on-demand production enabled through 3D printing will allow mid-corporates to stay competitive in the evolving landscape

Additive manufacturing or 3D printing technology produces solid objects from digital designs by building up multiple layers of plastic, resin, metals or other materials, under computer control. While additive manufacturing has typically been favoured for products requiring higher precision, it is now increasingly being adopted for low-volume production of other products as well. The last few years have seen the emergence of new government-sponsored programmes, research institutes, and smaller printing businesses in ASEAN markets such as Singapore, Malaysia and Thailand. Global 3D printing firms have also entered the region. Materialise NV, a global provider of 3D printing services, has established a base in Malaysia to serve as a hub for additive manufacturing services for medical sector clients across Asia.[38]

Key impact areas for ASEAN mid-corporates: While the technology is in the early stages of adoption, the last few years have witnessed significant expansion in the scope for additive manufacturing – in terms of both the materials available for use and the supplier ecosystem. These developments have made it possible for 3D printers to more affordably produce a wider range of products, in higher volumes than ever before.[39] Going forward, 3D printing offers improvements along three key areas for mid-corporate firms:

a. Product development: 3D printing allows for less expensive and faster ways of developing prototypes. Multiple designs can be developed and tested repeatedly at lower costs than conventional methods – therefore reducing time to market, and making it possible for smaller enterprises to compete with established firms. Besides this, 3D printing is also being used to create customised tooling for the production phase, much faster and at lower costs than conventional techniques. This application is highly relevant for specialised sectors such as aerospace, where 3D printing could lower tooling time from a few weeks to only a few days, while also reducing tool production costs by up to 40%.[40]

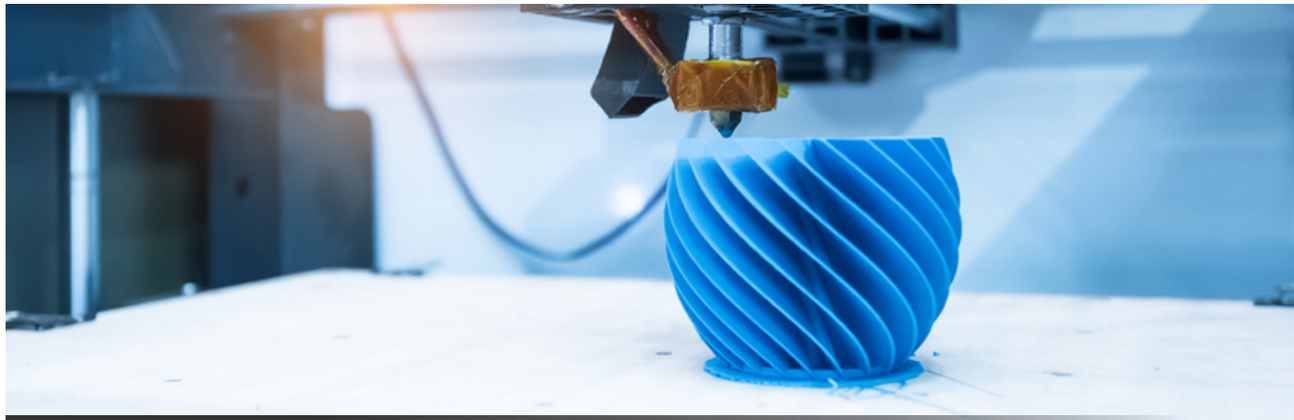
b. Product range and quality: 3D printing enables greater product customisation at lower costs than is possible through traditional manufacturing. This is highly relevant for sectors such as footwear, fashion, jewellery and furniture, where customers are less satisfied with standardised offerings and the pace of change in customer requirements is also high. With the use of 3D printing, electronic circuitry and components such as antennae and sensors can now be printed directly onto objects, which improves electronic integration of the product, reduces manufacturing waste and enhances quality. OLED screens made through 3D printing are estimated to have two to three times the product life than those made by conventional manufacturing.[41]

c. On-demand production: With 3D printing, factories can quickly adjust production (change the number of units or switch between product types) rather than having to shut down operations to retool conventional assembly lines. It therefore allows companies to reduce costs associated with maintaining large inventories, and address any sudden fluctuations in demand. Production of machine spare parts denotes a key application area. 3D printing enables part suppliers to shift from a 'make-to-stock' to a 'make-to-order' approach – printing spare parts on an on-demand basis, while shifting production in the proximity of key clients. This helps lower inventory and logistics costs for the supplier, and reduces machine downtime for the customer.[42]

Case study: Singapore's 3D Metalforge creates value for customers through 3D-printed parts

Founded in 2016, Singapore-based 3D Metalforge specialises in using 3D printers to print metal parts. Since inception, it has established a high-tech production facility in the city-state, equipped with 12 printers, and also offers services such as design, engineering, material advisory, diagnostics and testing to customers. Over the years, the company has evolved from manufacturing small components to making large metal parts (up to 1.5 metres) for heavy industries including marine, oil and gas and transportation.

The company's sister-firm 3D Matters (founded in 2012) focuses on using 3D printing to develop prototypes, and together the two companies have already serviced more than 1,300 clients including MNCs such as Unilever, GE Healthcare, Samsung and Tetra Pak. As examples of value delivered to its clients, 3D Metalforge was able to save USD 30,000-40,000 for an auto fleet operator in Singapore, by replacing failing parts with 3D printed components, without having to replace the entire hydraulic brake system. In another instance, the company was able to design and deliver an impeller to a marine fleet operator in less than three weeks, as against a period of six to 10 weeks taken through traditional manufacturing.[43]



"Singapore has an absolute necessity to move to a less labour-intensive mode of production, as our costs are too high. We have therefore introduced IoT to support proactive operations management and have cobots moving semi-finished products. We are also using 3D printing, but only for proof of concepts for now."

CIO
Singaporean mid-corporate, manufacturing

Strategy 2: Build integrated supply chain networks

Develop smarter supply chains connected in real-time with all network participants through new technology solutions such as IoT-enabled analytics and blockchain-enabled contracts

In the face of growing supply chain complexities described earlier, effectively managing their supply networks remains a challenge for ASEAN businesses. Under the prevailing conditions, optimising the supply chain will require changes along two key elements, namely network restructuring and network connectivity.

An effective supply chain will require a shift away from the prevalent linear structure towards a regionally integrated model, which in turn will need the deployment of new digital solutions to enable real-time information sharing and collaboration. Interest levels in the area are already high. A vast majority of respondents (80%) to a global survey of industry leaders (published by the Material Handling Institute, US), agreed to digital supply chains becoming predominant over the next five years. This is relevant not only to large multinationals but also to smaller mid-corporate firms, with almost two-thirds of the companies surveyed earning less than USD 500 million in annual revenues. In terms of network connectivity, among the many technologies being developed, two solution areas seem to have stronger applicability for mid-corporates. While IoT-enabled analytics represents a more immediate solution, complementing the digitalised factory floor, blockchain-enabled digital contracts show strong potential in the longer term. All these aspects are detailed in the following sections.[44]

2.1 Network restructuring: Regionally integrated model

Shift from the existing linear supply chain structure to an integrated network model, monitored and managed in real-time by a centralised digital nerve centre

As supply chains become more fragmented, the ability to extract data from multiple sources, generate insights and suggest a timely response, has become a major competitive differentiator. To achieve this, the supply chain needs to strengthen connectivity between participants giving them end-to-end visibility. This would require linear supply chain networks, operating in silos, to evolve into a regionally integrated model, controlled by a centralised hub to monitor and manage regional networks. This restructuring has already been initiated by many MNCs in ASEAN, aiming to digitalise interactions with their major suppliers, many of whom are mid-corporate businesses. However, faced with similar requirements (need for greater visibility, faster delivery etc.), mid-corporate businesses will also need to adopt a similar restructuring of their own supply networks to remain relevant to MNC customers.[45]

Key impact areas for ASEAN mid-corporates:
Mid-corporate firms could target improvements along two key aspects impacting their business performance:

a. Real-time operations: Control hubs in a digitally integrated supply chain connect to different elements (procurement, production, warehousing, logistics) through tracking technologies (e.g. IoT devices), and manage interactions between them in real-time through a centralised analytics engine. Such a structure enables a high level of awareness and collaboration along the supply chain, exchanging real-time information on operational elements such as demand patterns, inventory levels, capacity restrictions or delivery status, among all participants. It allows companies to quickly evaluate any changes against a set of decision-making criteria (e.g. financial performance metrics or the impact on delivery of other orders), and identify an optimal solution to be communicated seamlessly along the network. Overall, this results in stronger supply chain performance marked with improved visibility, higher operational efficiency and greater resilience to disruptions.[46]

b. Risk mitigation: As discussed in chapter one of this report, ASEAN faces a growing need to reduce its dependence on external trade for growth. Strengthening intra-ASEAN trade is therefore becoming a focal point for many regional collaboration initiatives, and such efforts will also push the corporate sector (including MNCs and their mid-corporate suppliers) to adopt a more regionalised supply chain structure. Going forward, ASEAN's economic integration initiatives and efforts to reduce non-tariff trade barriers are expected to allow easier movement of goods, capital and people across national borders, and this will further ease efforts to regionalise sourcing and production functions for manufacturers. Driven by the growing affluence of its consumer base and improvements in connectivity infrastructure, ASEAN will also evolve into a much larger end-user market in the coming years, creating even greater incentives for manufacturing firms to establish regional chains to better serve (greater choice, affordable cost, quicker delivery) this high value target market.[47]

Lastly, the performance of a digital supply chain hinges majorly on the strength of its digital nerve centre. Acting as the supply chain's 'single source of truth', the hub is responsible for multiple aspects, including collating and analysing data (from tracking devices, social listening, traffic feeds), making decisions, alerting stakeholders of disruptions and advising them on remedial actions. More advanced logistics centres in ASEAN, such as Singapore, show strong potential to evolve into a digital hub for companies looking to manage their regional supply chains (in ASEAN or the larger APAC region). Being the region's largest trading port, Singapore is well equipped with the infrastructure required to manage high volumes of trade flows. The city-state also scores better than regional counterparts in terms of the quality of digital infrastructure, institutions and other logistics support services, which are needed to maximise the impact of such a sophisticated digital supply chain model.[48]

> We have selectively started looking at new technology solutions to improve operational efficiency and transparency. Tracking solutions such as barcodes are being deployed to help monitor our assets while moving around globally. Going forward, it will be important to train our staff as per our growth priorities, especially the next generation of leaders who will drive our growth agenda for the future.
>
> **Kum Wan Pan**
> Director, Ecoscience Manufacturing & Engineering, Malaysia

Case study: MNCs establish digital control hubs in Singapore for regional supply networks

Many global manufacturing firms have already started restructuring their regional supply chains in ASEAN, being managed by centralised control towers based in Singapore. Henkel, a global manufacturer of industrial and consumer products, has set up its digital supply chain hub in Singapore, to better manage the company's procurement, production and logistics processes across the region. It is currently working with its suppliers, start-ups and universities to speed-up digitalisation efforts across its regional supply chain networks.

Similarly, global semiconductor manufacturer Infineon Technologies plans to invest USD 80 million over five years, starting in 2017, to adopt new digital technologies within its production and supply chain operations in Singapore – making it the company's control node to monitor and manage other manufacturing plants and logistics networks within ASEAN. More recently, the company also launched its first global 'co-innovation' centre in Singapore in 2018, to develop new commercially viable solutions in collaboration with regional start-ups, supply chain partners and key customers.[49]

2.2 Network connectivity: IoT-enabled supply chain analytics

Analytics solutions driven by IoT devices deployed across the network, can improve procurement efficiency and asset traceability, while reducing transportation costs

Most analytics solutions deployed so far by companies have been informative in nature – focused mainly on analysing historical data to create benchmarks that help diagnose the current state of operations. However, the next generation of analytics solutions available today are focused on analysing the 'predictive' element of supply chain performance, using data generated from IoT devices embedded across the network and the broader environment. Global survey results for 2018, published by the Material Handling Institute, US, indicate growing acceptance of the solution. A majority 62% of corporate leaders worldwide (including many mid-corporates), considered predictive analytics as a source of competitive advantage that is disrupting the supply chain industry, rising from a low 38% who said so in 2015. While only 19% of companies agreed to have already deployed predictive analytics, adoption is expected to surpass 80% by 2022.[50]

Key impact areas for ASEAN mid-corporates: Companies can target improvements along three key supply chain functions by adopting IoT-enabled analytics:

a. Procurement planning: The procurement function within ASEAN's mid-corporates will undergo a major transformation with digitalisation, enabling companies to better manage the supply of raw materials and replacement parts. Effectively coordinating multiple suppliers with changing customer requirements remains a challenge for many mid-corporate businesses in the region. Moreover, delays in receiving replacement parts could translate into longer-than-planned machine downtime, leading to delays in order fulfilment. IoT-enabled predictive analytics can recognise data signals from the market, to anticipate changes in demand patterns – translating these into changes required along all other supply chain components, including procurement. These solutions can also better predict machine failure, and help order spare parts in time for disruptions to be minimised.[51]

b. Freight monitoring: Tracking technologies such as IoT devices serve as a building block of a digitally integrated supply chain, seamlessly capturing and exchanging operational data. With supply chains spreading across multiple geographies and regulatory standards getting stricter, asset traceability has become highly significant for ASEAN's mid-corporates. Product safety, quality and social responsibility in particular have become key concerns. With growing internationalisation among ASEAN firms, cargo thefts, spoilage and counterfeiting risks are also on the rise, as sourcing units, production plants and end user markets are spread across previously untapped regions. IoT-enabled monitoring and analytics allows companies to constantly supervise quality and other operational metrics in real-time and in locations that were earlier beyond supervision and could be prone to misconduct.[52]

c. Fleet management: Facing the need to improve traceability and reduce supply chain management costs, the analysis of real-time data on how company assets (people, equipment) move through the supply chain has become essential for ASEAN's mid-corporates – helping identify problem areas, anticipate bottlenecks and initiate a timely response. With the implementation of IoT-enabled systems, data on supply chain breakdowns (due to vehicle accidents or natural disasters) can be shared in time for remedial actions to be initiated. Moreover, manufacturers maintaining their own fleet of vehicles are able to better plan for transportation needs as per dynamic market requirements, while improving vehicle utilisation and saving costs through route optimisation.[53]

2.3 Network connectivity: Blockchain-enabled digital contracts

Currently in the development phase, digital contracts show high potential to improve access to trade finance for mid-corporates, while reducing inefficiencies associated with manual processes

Effectively managing cross-border trade has become a major challenge for mid-corporate businesses worldwide, including within ASEAN. Supply chain transactions such as trade finance or custom clearances involve several parties (including regulatory bodies, trading partners, banks, clearinghouses, and insurance firms), multiple procedures and onerous paper-based documentation, completed mostly on a manual basis – making it susceptible to operational delays and human error. With paper-intensive processes being inefficient and less secure, the complexities of maintaining multiple ledgers for businesses have only worsened with fragmentation of supply networks. As per estimates by the UN, such paper-heavy processes increase trade costs by 9-13%, across countries in the Asia-Pacific region. Stricter trade conditions being adopted across many global markets (trade barriers, security concerns) have also increased compliance time and costs. Besides these operational issues, limited availability of trade finance also remains a key challenge for smaller companies. All these issues are particularly relevant for ASEAN manufacturers, considering their strong focus on supplying intermediate goods as part of global value chains for MNCs.[54]

Digital contracts based on blockchain technology are emerging as a potential solution. While these are still in the nascent phase, with pilot projects being tested by market players, and common standards being developed by industry consortiums – digital contracts are expected to gain significant adoption over the next few years – giving a boost to regional trade and manufacturing profits. According to UN estimates, digitalising trade processes by converting paper-based documentation into electronic formats and adopting new tools such as digital contracts could increase exports from the Asia-Pacific region by USD 257 billion per year, while reducing time to export by a significant 44%.[55]

Key impact areas for ASEAN mid-corporates: There are two major ways in which digital contracts could improve business conditions for a mid-corporate manufacturer:

a. Effective transaction management: Digital contracts trigger transactions automatically (such as fund remittance), only when certain pre-defined conditions are met (such as ships entering a port or goods arriving at a warehouse), monitored in real-time through asset tracking technologies. This streamlines payments for companies, strengthening much required working capital for smaller firms. Data is automatically captured and is stored securely on the blockchain, which once implemented is transparent to all and is unalterable unless all parties are in consensus. A shared ledger enables easier multi-party verification, while features such as permission-based access and an unalterable program code (containing terms for contract execution) ensures a greater degree of trust.[56]

b. Access to trade finance: As per a white paper published by the World Economic Forum in September 2018, small and medium-sized enterprises (SME) and mid-cap companies represent 75% of the global trade financing gap at present. Globally, a majority of trade finance proposals made by these firms are rejected by banks due to strict compliance requirements – leading many companies to explore more expensive informal alternatives. Promising a higher degree of inter-party visibility and trust, a digital contract with banks (or other lending agencies) as one of the participants could significantly reduce the compliance burden on smaller manufacturers and enable faster credit approvals.[57]

Case study: Standard Chartered pioneers blockchain-based trade finance in ASEAN and beyond

Standard Chartered is developing strong capabilities in the domain of blockchain based financing solutions, looking in particular at facilitating trade flows for clients in ASEAN and other markets in Asia, Africa and the Middle East. Most recently, the bank completed its first blockchain-enabled cross-border trade finance transaction in Singapore in January 2019, for Agrocorp International and its supply chain network. The transaction was completed within 24 hours, significantly reducing the time it would otherwise have taken (five to seven days). The platform also provided information related to the origin of commodities purchased and farming practices used, to improve traceability along the supply chain. Standard Chartered had earlier also piloted the industry's first end-to-end blockchain-based smart guarantees solution for trade finance in the UAE, in 2018.[58]

Besides Singapore, activity levels are also on the rise in emerging ASEAN markets. 14 banks in Thailand, including Standard Chartered (Thai), have joined forces and are currently working with select state enterprises and private businesses to develop the country's first blockchain-based trade finance platform, mainly to make the process for issuance of letters of guarantee more efficient. The solution could significantly impact ease of trade in an economy that depends heavily on exports (exports represent 68% of Thai GDP). Joint efforts by banks will help share technology development costs while ensuring the industry develops common standards for ease of adoption.[59]

"Companies in Indonesia face high logistics costs due to inadequate infrastructure. This has created the need for technology adoption. Our approach has been to begin by mastering data acquisition, management and analysis along the production line and the supply chain. We have deployed sensors that send data to the ERP systems for analysis, indicating where processes could be optimised."

Group CFO
Indonesian mid-corporate, manufacturing

Key takeaways

1. Need for new value-propositions: Manufacturing in ASEAN is undergoing a transition towards technology-intensive production in its more established markets, as relying mainly on labour arbitrage has become a less sustainable proposition.
2. Opportunities in high-tech segments: This is creating new growth opportunities for mid-corporates, as part of regional or global value chains in industries including automotive, chemicals, pharmaceuticals, electronics, medical devices, industrial machinery and aerospace components.
3. Productivity and cost challenges: Low productivity and rising costs of doing business continue to challenge growth prospects. To remain competitive, mid-corporates will need to push digitalisation of their factory floors and supply chains.
4. Adoption of new technologies: Deployment of technologies such as Industrial IoT and Cobots will need to be prioritised in the short term, while advancements in 3D Printing and Digital Contracts offer long-term solutions to mid-corporate issues.
5. Re-structuring of supply chains: Beyond the production plant, mid-corporates will also need to build integrated supply chain networks to improve operational efficiency and asset traceability – giving a boost to margins and capital performance.

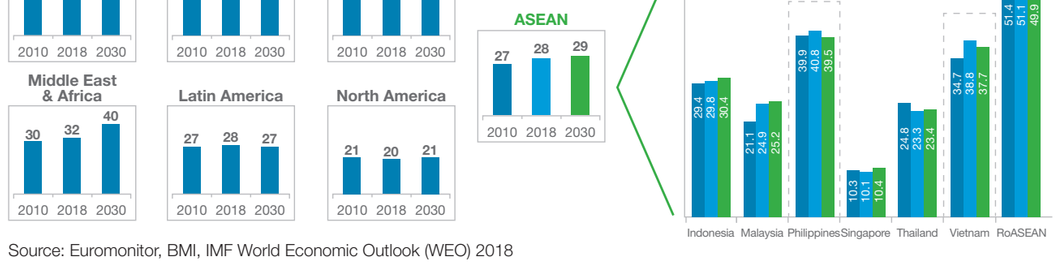
We are looking to diversify into more environmentally sustainable product lines and enter new ASEAN markets for growth. Standard Chartered has been an important partner in this journey, mainly due to its wide international network. Besides financing assistance, the bank is also helping us in vetting local partner firms whom we plan to engage with in markets outside Malaysia.

Kum Wan Pan
Director, Ecoscience Manufacturing & Engineering, Malaysia

Chapter 3: Strategies for the Future – Retail and Consumer

The retail and consumer sector has been one of the first major industries to reap the benefits of ASEAN's growth trajectory. Improving economic conditions driven by the expansion of ASEAN's labour force, rising wages and a growing middle class with higher disposable income, led to a significant increase in spending on consumer products. The rate of expenditure on consumer goods in ASEAN is now the third largest in the world, at 28% of GDP, only behind growth regions such as the Middle East, Africa and Eastern Europe. And, despite recent headwinds, this situation is expected to continue in the coming years, with sector growth in ASEAN's six leading economies projected at 7.7% CAGR in 2016-2021, to reach an astounding USD 511 billion by 2021.[60]

Figure 3.1: Consumer Expenditure as % of GDP in ASEAN vs Rest of World (RoW)



Source: Euromonitor, BMI, IMF World Economic Outlook (WEO) 2018

Opportunities and challenges

Against this backdrop, a number of opportunities arise for consumer goods companies to capitalise on this growing local demand. With ASEAN's current digital transformation, a further dimension is added to how consumers shop and how companies can create value, providing even more opportunities to engage with consumers and capture their loyalty. However, this digital transformation will also bring significant disruption to consumers' spending behaviours and patterns, making them a lot more complex and demanding. The challenge for consumer goods players will lie on adapting their mindset and capabilities to be able to fulfil consumers' new demands whilst navigating the region's inherent complexities around infrastructure, logistics, labour productivity and increasing competition.

Growth strategies for retail and consumer mid-corporates

As such, mid-corporate consumer goods players seeking to grow their share of the ASEAN market will need to adapt and enhance their operating models through leveraging the use of digital technology within their distribution and front-end processes. Digital solutions will help companies to optimise operational efficiencies and maximise their speed and flexibility in order to provide a better service and experience to customers. Technologies such as predictive analytics, warehousing solutions like automated picking, storage and retrieval systems, and Radio Frequency Identification (RFID) for inventory tracking can be easily adopted in the short-term without major

investments. Other solutions should be considered for the medium-term, such as Internet of Things (IoT) for smart warehousing. Technologies such as drones for product delivery can be considered for the longer-term, once there is a legal framework established and their commercial viability is improved. On the front-end, innovative touchpoint technologies brought about by Augmented Reality, Artificial Intelligence and Virtual Reality are gaining significant traction in the industry as a way of enhancing companies' engagement with consumers to enable a personalised customer experience, essential for securing their loyalty.

A. Key industry shifts impacting growth

A new scenario in ASEAN's retail and consumer industry is being created by three major industry shifts, around consumers' growing use of digital channels, the creation of a crowded and highly competitive environment, and the increasingly complex demands of ASEAN's shoppers. These transformational shifts will give rise to new opportunities and challenges for mid-corporate firms, and disrupt the way they pursue growth in the region.

1. The rapid rise of digital channels for consumption

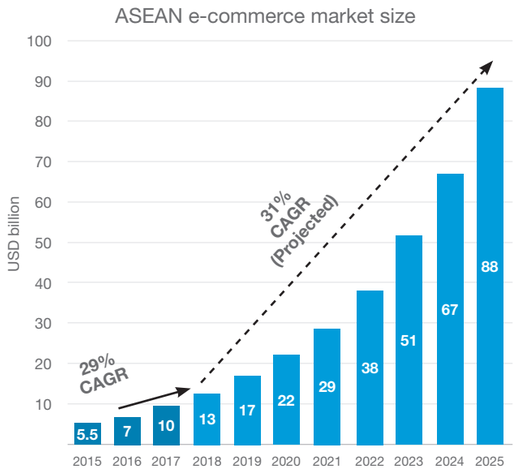
Exponential growth in demand for consumer goods in ASEAN will come from the adoption of digital technologies for consumption and strong rise in e-commerce

Despite the fundamental growth drivers for the consumer sector in ASEAN being the increasing levels of urbanisation, a younger and wealthier consumer base, and higher levels of consumer spending, the sector's expected exponential growth will be driven by the adoption of digital technologies for consumption. The use of technology is fundamentally changing the way ASEAN consumers shop, with their decision-making journey becoming more complex and less predictable.

This is already having a significant effect, as ASEAN now has 200 million digital consumers (those who have purchased products or services online), up 50% in a year, and 230 million online-engaged consumers (those who have only researched products or services online).[61] As illustrated by Figure 3.2, this trend is predicted to continue as e-commerce sales in the region are expected to grow significantly by 31% CAGR to 2025, to USD 88 billion or 6.4% of all retail sales.[62] Nevertheless, ASEAN still trails behind other e-commerce markets such as China, the US, the UK, Japan, and Germany by a significant amount, with e-commerce accounting for a very small percentage of overall retail sales (only around 4%, whilst in China it already accounts for 16%).[63] However, this indicates that there is still room for further development. With the e-commerce environment primed for exponential growth, it is essential that mid-corporates act now, whilst growth in digital channels is still at a relatively nascent stage, to avoid missing out on the next generation of digital shoppers.

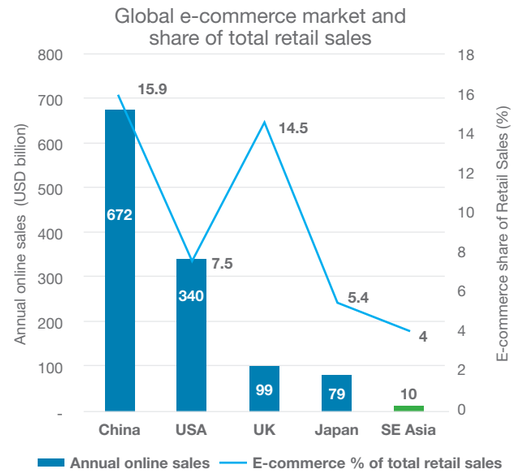
Figure 3.2: E-commerce growth in ASEAN and share of total retail sales

E-commerce growth in ASEAN is expected to continue to accelerate up to 2025



Source: Google-Temasek Holdings, Nielsen, e-Marketer

ASEAN e-commerce share of retail still small, with further room for growth



Source: eMarketer, Research and Markets

2. Mounting pressure to compete for consumers' attention

An increasingly competitive environment adds pressure on consumer goods mid-corporate players to differentiate themselves in order to gain consumers' attention and loyalty

A rapid increase in the number of connected consumers is creating an ever increasing ecosystem of consumer goods companies, e-commerce players, pure plays and brick-and-mortar retailers, as well as digital natives and innovative start-ups, which is intensifying competition across the region. In addition, foreign e-commerce players such as Amazon and Alibaba are looking to capitalise on this unique opportunity and will continue to increase their presence in the region, while regional players such as Tokopedia and RedMart, will seek to further strengthen their foothold. M&A activity is also expected to increase as sector players attempt to expand their market share. Competition is even coming from outside the region, as is the case of Japanese player Rakuten, as cross-border e-commerce experiences rapid growth amidst consumers' eagerness to access unique brands not physically present in their own country.

In this scenario, whilst consumer goods MNCs may have a head start due to consumers' familiarity with global brands which are generally top-of-mind, local mid-corporate players must consider ways to make themselves more widely known and focus on rapidly developing unique propositions extending beyond product offerings, to service and the customer experience, in order to stand out from competition. This is particularly important as ASEAN consumers are still experimenting with brands, products and experiences recently made available to them.

3. Fickle and demanding consumers requiring close engagement and personalised solutions

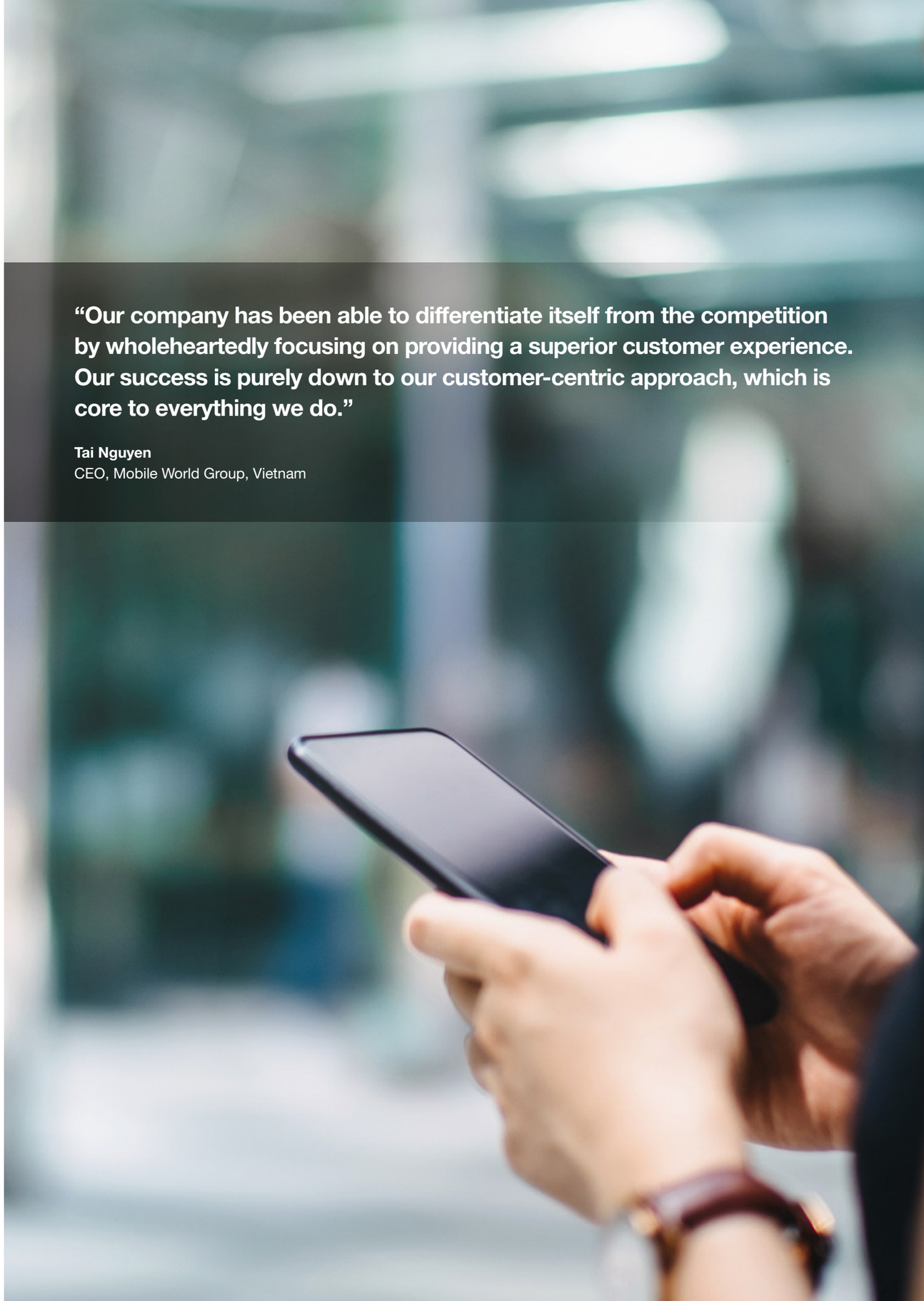
To gain share-of-mind mid-corporates must strengthen their engagement with consumers, both online and in-store, and offer products and solutions that closely match their needs

ASEAN consumers are constantly being steered towards an increasingly wider range of influences and options. Their perceptions, preferences and behaviours are being disrupted; they are becoming ever more demanding for customised products or solutions which closely match their personal needs. This marks a fundamental change in consumer behaviour which will require companies to adapt the way they cater for their customers.

Retail and consumer players are under significant pressure to enhance their engagement with consumers, to better understand their demands and tailor their offering accordingly. The ASEAN consumer journey is becoming increasingly complex and needs to be looked at in the context of differing needs and occasions. Since in this scenario it is no longer sufficient to compete on product quality and price alone, mid-corporates have a unique opportunity to differentiate themselves by providing customised solutions and exceptional customer experience to gain consumer mindshare and win over consumers, especially as they are better able to leverage their smaller size and greater flexibility compared to larger players.

The pressure to enhance consumer engagement applies both to the digital and the physical world. Despite the rise of digital channels for consumption, bricks-and-mortar retailers continue to be important. A PwC Global Consumer Insights study showed that the percentage of shoppers who visit a physical store at least weekly fell from 42% in 2013 to 36% in 2015, but since then has bounced back to 44% in 2018.[64] In addition, wider availability of data through digital channels has empowered companies to explore new horizons in customer segmentation and engagement. The challenge now lies in converting that data into valuable consumer insights and a unified, single view of the customer, to personalise products and solutions.

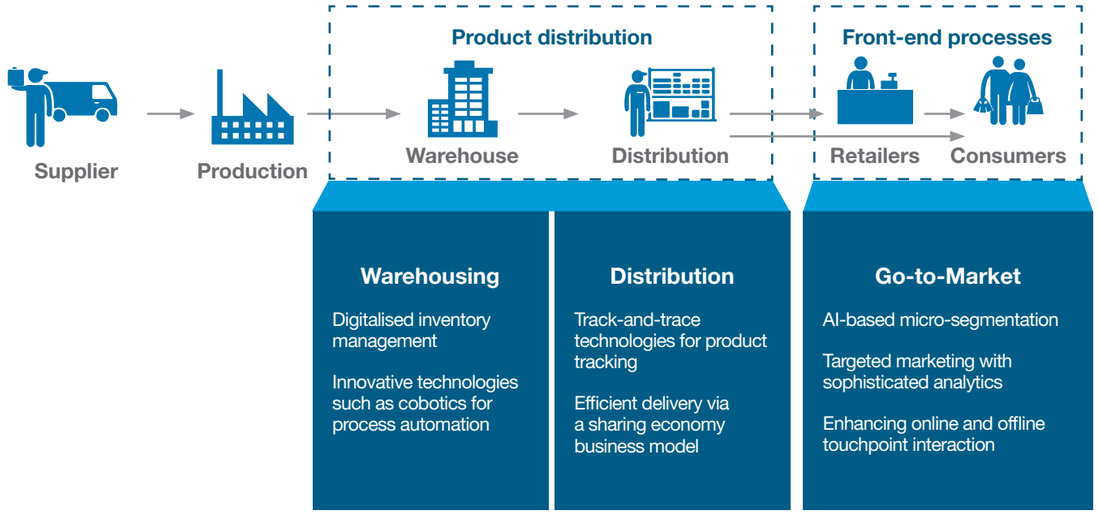
This scenario creates substantial opportunities for manufacturers and retailers of consumer products to grow their share with ASEAN's consumers. At the same time, it poses a threat for companies which do not adapt their business models in the wake of the digital revolution. With so many more options to choose from, the customer will prefer to engage only with players that offer 'always-on' service and a personalised and seamless omni-channel experience, from promotional offers through to purchase and payment options. Achieving this objective will require innovation on a substantial scale, with better adoption and integration of digital technology into every aspect of the customer journey, as we explore in the next section.



B. Strategies for growth

In order for consumer goods companies to capitalise on the opportunities whilst minimising the impact brought about by ASEAN's digital disruption, they ought to adapt their mindset and capabilities and pursue strategies that will enable them to thrive in this new scenario. The following section highlights growth strategies companies should consider adopting, around digitalising key distribution and front-end processes, to gain valuable efficiencies and cost savings, which will allow them to better engage with and serve their existing and potential new customers.

Figure 3.3: Digitalisation of distribution and front-end components of the value chain



Source: PwC analysis

Strategy 1: Digitalise key distribution processes

Leveraging digital technologies within key distribution functions will allow mid-corporates to improve operational efficiency, speed and flexibility to better serve their customers

For companies of all sizes including SMEs and mid-corporates, the key to success is being competitive by providing ASEAN new-age customers with a differentiated experience. Core to achieving this is making business processes as efficient as possible to save time and reduce the cost to serve, thereby improving their bottom line. Process efficiency and agility are especially important in a connected world where customers increasingly decide who they are going to buy products from based on considerations beyond brand and product quality, around accessibility, immediacy and convenience. Companies which do not recognise the changing habits and preferences of customers and accordingly do not digitalise their processes quickly enough, will find it hard to succeed.

Having said that, although the concept of a full digital transformation can be daunting, companies must focus on building and implementing digital capabilities that they can then scale as they grow. Next we explore how leveraging key innovative technologies across three key parts of the distribution value chain will allow mid-corporates to maximise operational efficiency, speed and flexibility in order to succeed in this environment.

1.1 Inventory Management

Digitalising inventory management will be crucial to satisfy customers with the right products, at their preferred time and location

Providing the right product, at the right place and time, and at the right price, safely and conveniently can be a real challenge for most traditional small or mid-sized consumer and packaged goods (CPG) companies operating in ASEAN. In addition, further customisation is driving constant changes in companies' stock-keeping unit (SKU) portfolios, making category management and inventory management more complex. For CPG companies operating in emerging ASEAN countries, especially in tier two or three cities, the dominance of independent traditional retailers added to infrastructure and logistical difficulties in reaching them makes inventory management a challenge. Stock-outs are commonplace. In addition, the rise of digital commerce and the wide variety of retail formats in ASEAN countries, added to the demand for individualisation, means category management is considerably more intricate and requires a lot more consideration and planning compared to more established consumer markets.

With consumer experience also becoming increasingly important, issues such as out-of-stocks or lost deliveries can result in a lack of repeat business and have a detrimental effect on the brand and overall company image. Inefficient inventory management can exacerbate that risk – a risk which SMEs and mid-corporates especially, cannot afford to be exposed to given ASEAN's unforgiving consumer environment.

In order to optimise the flow of goods across the supply chain and guarantee customer satisfaction and retention, mid-corporates can leverage technologies to make their inventory management process far more efficient, accurate and transparent. Here we will explore two examples of such technologies, predictive analytics for demand forecasting and planning; and cloud-based inventory management for tracking stock.

Predictive analytics uses historical data, machine learning, and artificial intelligence to predict future events. Historical data on consumers' past purchases is input into a model that factors in major trends and patterns in the data, and applies these to current data to predict future demand. This data is gathered from all the company's platforms and external sources which influence demand, allowing companies to uncover deeper and more meaningful insights. CPG companies are therefore less reliant on transactional point-of-sale data, allowing them to more accurately predict future demand and optimise inventory accordingly.[65] Large retailers in developed consumer markets are already incorporating predictive analytics to their advantage. For example, in the UK, grocery retailer Tesco uses predictive analytics to reduce the chance of product stock-outs. By feeding weather data into its predictive analytics tool it can forecast demand of weather-dependent products such as ice cream, and adjust inventory and supplier orders in advance on a store-by-

store basis to minimise missed revenue. Mid-corporates are in an even better position to benefit from predictive analytics given their greater flexibility compared to bigger players, especially those which have a regional presence in ASEAN and need to cater for highly diverse consumer preferences.

Cloud-based inventory management to track stock in real time can further optimise inventory management processes for retail and consumer mid-corporate players. This technology tracks inventory throughout the supply chain and allows it to be managed from multiple locations. Staff can access real-time inventory information from all platforms and sales channels at all times. Despite being a fairly new development, this technology is consistently proving to be ideal for companies mainly due to its scalability as well as functionalities such as automated scheduling and real-time tracking.[66] In a region as logistically-complex as ASEAN, real-time stock tracking would bring significant advantage to mid-corporates. In addition, with the increasing emphasis on speed of product delivery to ASEAN customers, having full visibility of stock would be highly valuable for mid-corporates. However, ASEAN's retail and consumer market is still dominated by many small, family-run 'mom and pop' stores operating inefficient payment methods involving cash and cheques, which can slow down the cash cycle and, by consequence, the flow of inventory. The introduction of more efficient, convenient and prompter payment methods such as mobile wallets will accelerate the cash cycle and help ensure a more seamless flow of inventory.[67] Other solutions such as Vendor Prepay Programme (VPP), provided by Standard Charted, help players reduce the risk of collections and further improve their working capital cycle.

Key impact areas for mid-corporates: Accurate demand planning, optimal stock levels, and full visibility over the movement of inventory across the supply chain can significantly improve companies' operational efficiency and ultimately their bottom line.

a. SKU optimisation: Knowing more about customer preferences through the use of data and predictive analytics greatly helps companies to optimise demand forecasting, and in this way minimise inventory and wastage. It also allows them to more closely align their product offering with what consumers want. Data insights are used to tailor SKU portfolios with a view of increasing the rate of sales, based on the fact that products more closely match the needs, preferences and purchasing behaviour of their target audience.

b. Improved efficiency, decision-making and coordination: In ASEAN, most small and mid-sized CPG companies still rely on paper-based or legacy systems for managing their inventory, which greatly limits their productivity. Digitalising inventory management will allow mid-corporates to gain significant operational efficiencies around things like order fulfilment and optimisation of stock levels, highly necessary to serve ASEAN consumers' demands. Monitoring inventory in real time allows a more accurate view of the flow of goods in the system, making it easier to manage and make quick decisions. A cloud-based inventory management solution provides wide and easy access to inventory information as it can be accessed from anywhere and from most digital devices. This further improves efficiency as well as co-ordination, by allowing departments within a company to work together more effectively.

c. Cost savings: Improved inventory management will result in an overall decrease in operational expenses and the amount of capital tied up in stock as inventory will move more quickly through the supply chain. Cloud-based solutions can also be very cost-effective for mid-corporates as they do not require onsite servers - one software can support multiple users at the same time, even if they are off-site. Deployment is also manageable and does not require large upfront investment or significant running expenses. In addition, by reducing errors, providing accurate information throughout the product lifecycle and preventing shortage and overstock, inventory management systems allow significant cost cuts. It is estimated that 46% of SMEs either do not track inventory or use a manual method.[69] However, by adopting an inventory management system, companies can increase their profitability by 20-50% or more.[70] In fact, according to a Getapp survey conducted in the US, 55% of small and medium-sized company owners claim that inventory management software saves them more than 5 hours each week with 16% of all respondents saying they save more than a day.[71]

d. Increased visibility and transparency: Accuracy and transparency around inventory information can have a huge impact on mid-corporates' bottom line. Having full visibility of inventory in real time, currently a challenge for most retail and consumer players in ASEAN, would allow them to quickly identify bottlenecks and any workflow issues, as well as to optimise inventory location and track order fulfilment, hence minimising the financial impact of potential complications in the flow of goods. This could provide both manufacturers and retailers in ASEAN with significant competitive advantage, as they would be better able to serve customers and manage their expectations around product availability and order fulfilment.

Case study: Goodvine Group adopts advanced analytics and digital inventory management

Singapore-based leather goods specialist Goodvine Group used to rely on qualitative feedback from its frontline staff to develop new products; its inventory management system was unable to capture and store granular product information such as design styles and colours. It soon realised that it needed to gather deeper and more insightful data on customer preferences to maintain its competitive edge, so it decided to develop a new inventory system with built-in analytics capabilities to uncover insights from product information and sales data to understand which product features most resonated with customers. As a result, product and marketing managers were able to make quicker SKU decisions and quantitatively forecast their re-orders, based on more specific historical sales data, captured and uploaded in real time.[68]

Case study: Castlery adopts technology across supply chain to drive efficiency

Another example is Singaporean online furniture retailer Castlery, which differentiates itself from competitors with its strong e-commerce site, technology and ownership of the entire supply chain. Being an online retailer, Castlery had to develop efficient logistics. It set up a robust inventory and warehouse management system (WMS) in its warehouse and achieved an almost 100% inventory accuracy. The company is now able to collect real-time data of available inventory for its online sales. Customers can access lead-times based on the information provided by this extensive system. In addition, the company has achieved significant efficiencies through automating their packaging and loading processes, and by building and optimising their WMS.[72]

1.2 Warehouse Automation

Mid-corporates should consider automating manual and labour-intensive warehousing activities to increase efficiency, accuracy and worker safety

Within ASEAN, one of the biggest challenges is around warehouse location, operation, and logistics. The physical location of inventory is often too far removed from customers' delivery points to enable agile handling. Warehouses tend to operate via highly labour-intensive, often paper-based processes which are subject to human error, resulting in lower productivity and time delays. Warehouse automation would help to solve this as ordinary warehousing activities, from inbound logistics to internal warehouse operations including, manual processes such as picking goods, and outbound shipping, would be replaced or aided by the use of technology.

Warehousing activities can be automated to varying degrees – from small technological improvements all the way to a fully 'smart warehouse', which incorporates most or all innovative digital technologies such as IoT, Augmented Reality (AR), wearables, smart sensors, automated guided vehicles (AGVs), and robotics. Large MNCs such as Alibaba are developing fully automated 'smart warehouses', however local players can focus on only automating key parts of the warehousing activity.

When considering warehouse automation, companies ought to be aware that some solutions may require high capital investments and may be difficult to implement. Hence, partially automating tasks and using technologies that support workers rather than replace them, such as automated picking, storage and retrieval systems (ASRS) may be a better solution for mid-corporates in the short term. ASRS involve rail-guided cranes that can travel along storage aisles to store and retrieve items, or battery-powered shuttles that can move along aisles for picking and storing goods. Goods-to-person (GTP) systems bring the goods to the worker, rather than the worker having to pick the items manually. This is a common technology used in warehouses and distribution centres (DCs). Pick-to-light systems use lights above racks or bins to show workers an item's location and the required quantity to pick-up. More advanced technologies include Augmented Reality solutions such as 'Vision Picking' smart glasses, which provide visual displays of order picking instructions along with information on the items' location and where they need to be placed. Recently, technologies such as collaborative robots or 'cobots' and even drones are being introduced into the warehouse to make picking and storage processes more accurate and efficient.

IoT could also help automate key warehouse operations. IoT compiles data collected from sensors installed in objects to store and interconnect them in an intelligent Internet-based network. Typical challenges faced by warehouses in ASEAN include lack of space, improper space utilisations, lack of visibility into partially used locations, as well as offloading delays. IoT offers great potential for use in warehouse management as sensors and RFID tags aggregate operational data and give warehouse managers instant visibility over the real-time locations of every product.

Key impact areas for mid-corporates: Automation would allow mid-corporates to maximise the use of labour, space, capacity and assets whilst minimising down time, stock levels and delays, hence improving the efficiency and reducing the overall cost of the warehousing and distribution element of the value chain. This is especially beneficial given rising wages and low productivity issues in ASEAN.

a. Maximised efficiency, accuracy and visibility: Reducing the use of manual labour will increase shipping speed, crucial to fulfilling customer demands. Technologies such as IoT will also optimise location utilisation planning, further improving the efficiency of warehouse management processes. Furthermore, automating routine manual tasks can also improve accuracy and reduce the propensity for and impact of human error. Incorporating technologies such as IoT/sensors ensures companies obtain full visibility of inventory not only within the warehouse, but also in the overall supply chain, allowing goods to be more easily tracked, which in turn helps with inventory planning and management, and ultimately customer satisfaction. According to The Essentials of Supply Chain Management by Hokey Min, most companies observe around a 25% gain in overall productivity, a 10–20% improvement in space utilisation, and a 15–30% reduction in safety stock simply by moving from a paper-based system to a warehouse management system (WMS).[73]

b. Reduction in operation and fulfilment costs: Automating manual processes through the use of say, GTP systems, compared to traditional manual operations, ensures higher throughput rates and allows companies to bring down their overall operating and order fulfilment costs given the increased efficiency and reduction in headcount requirement. For example, in one of Alibaba's smart warehouses, the deployment of 60 robots to help move goods has reduced human labour by 70% and raised productivity threefold.[74]

c. Safer work environment: Automation of ordinary and repetitive tasks such as picking goods would also mean that warehouse workers would be less involved in executing tasks manually, therefore significantly improving the health and minimising risk and expenses for employers. This is especially relevant for mid-corporates operating in Asia, where more than 1.1 million people die from occupational accidents or work-related diseases every year.[75] Safe and decent work is deemed a priority for the ASEAN Secretariat, whose members are working on implementing the ASEAN- Occupational Safety and Health Network (ASEAN-OSHNET) Plan of Actions 2016-2020.[76]

> Our focus continues to be on meeting the rapidly changing needs of the shopper by providing high quality, fresh products in a convenient manner. This is supported by extensive technology infrastructure, including a well-established ERP system in the back-end as well as new-age innovation such as our recently launched un-manned store in Jakarta.
>
> **Meshvara Kanjaya,** President Director
> **Harman Siswanto**, Director
> PT Supra Boga Lestari Tbk, Indonesia

1.3 Enhanced Product Delivery

With 'last-mile' delivery being a big challenge for retail and consumer players, track-and-trace technologies or a sharing economy business model can bring significant efficiencies

For retail and consumer players, the biggest challenge by far lies in the 'last-mile' delivery from the warehouse to the final customer, especially in a geographically complex region like ASEAN. In general, this portion of the supply chain represents 53% of the delivery cost compared to 37% for the line haul (transportation between cities), 6% for sorting and 4% for collection.[77] For players operating across ASEAN, its poor connectivity has significant implications on delivery costs; in fact, the World Bank has stated that it is cheaper to ship essential goods from China to Singapore than to send goods from Jakarta to Papua, in Indonesia.[78] In addition, a significant portion of incidents (e.g. lost parcels) occur in the last mile, which accounts for a significant expense. With empowered consumers' increased expectations for the delivery experience, mid-corporates are under tremendous pressure to satisfy this demand and at the same time avoid being crippled by shipping expenses.

While the importance of the last mile in ensuring success is unquestionable, the challenges in making it optimally efficient are still significant. Many MNCs in the sector globally have tried to come up with different strategies however as yet there does not seem to be an obvious and simple solution to the challenge. Currently at the forefront of 'last-mile' delivery innovation is drone delivery. Large players such as Amazon in the US and JD.com in China have already started adopting this technology. However, it is less likely that smaller companies will be able to adopt drones in the short term as the technology is still being developed and can be costly. In addition, the legal framework around drone deployment is still being established. Having said that, drone delivery is already being experimented with in countries like Singapore, where SingPost is looking to deliver packages via drones; and in Malaysia, where e-commerce players like Lazada are testing drones for speedy product delivery. In the meantime, mid-corporates can consider adopting simpler and cheaper technologies and/or business models to enhance their product distribution. Examples include:

Track-and-trace technologies: These allow companies to identify inventory past and current locations. Barcoding is the easiest track-and-trace technology to implement. However, it is less accurate and more labour intensive than RFID. RFID technology uses radio frequency waves to transfer information from the chipped product to a reader able to convert it into data relayed to computer systems. RFID can be used throughout the supply chain and products are tracked by a chip throughout the entire delivery route.

Sharing economy business model: Along with new technologies, new business models are arising, allowing for faster and more cost-effective deliveries. Widely found in the transportation, hospitality and food delivery industries, the 'Uberisation' model is also starting to become prevalent in the logistics industry, allowing manufacturers, retailers, logistics partners and consumers to connect with local, professional or non-professional couriers who deliver products independently. This goes a long way to solving challenges associated with last-mile delivery, especially in complex territories such as ASEAN.

Case study: Pos Indonesia automates warehouses to fulfil e-commerce demand

Indonesia's national postal company, Pos Indonesia, has recently brought technology into its warehouses to be able to cope with increasing demand for fulfilment and last mile delivery following the rapid growth of e-commerce, which demanded efficiency, accuracy and traceability. Only by automating manual processes like sorting, was it able to get more parcels to the right destinations – a real challenge in a country where locations are spread over 17,000 islands and the costs of reverse logistics for parcel returns are very high.[79]

Key impact areas for mid-corporates: It is important that mid-corporates consider adopting solutions which will bring the necessary speed and flexibility to fulfil the consumers' demands whilst being cost-effective.

a. Increased visibility, efficiency and cost savings: Track-and-trace technologies allow companies to improve visibility on the delivery process and readily identify issues in order to improve performance. Added to that, being able to track products' location would allow companies to better manage consumers' delivery expectations. The 'Uberisation' of delivery would mean companies are able to deliver products to consumers much faster and to a location and time of their preference, without having to commission their own delivery fleet. This business model could be appealing to mid-corporates as it requires very little investment and resources, especially compared to other 'last mile' delivery solutions.

b. Risk reduction: Being able to identify a product's location throughout the delivery stage is particularly useful in highly fragmented territories like ASEAN. Reducing loss, damage and theft or pilferage can be significantly beneficial in regions like Asia, which has the highest number of cargo theft incidents recorded at warehouse locations, according to Asia Insurance Review.[80] Product traceability along the supply chain is also critical, especially when it comes to food products. With the growing importance of food safety in ASEAN, a potential product recall could be detrimental to the brand and cause irreparable damage to a company's reputation, especially for small and mid-sized companies. Therefore it is essential that companies are able to track products as they travel through the supply chain.

c. Improved customer satisfaction: Track-and-trace technologies allow companies to more easily supply real-time information regarding the location of the customer's orders, allowing them to carefully manage their expectations. ASEAN consumers are ever more demanding, requesting not only fast and convenient delivery but also the ability to return products they are not satisfied with, in a seamless manner. For companies to be able to address this requirement, they must ensure they have the appropriate technology that can provide live updates to their customers. Faster delivery to a customer's preferred location and flexibility around returns is a good way to exceed customers' expectations. For mid-corporates, this will be crucial to ensure repeat business and secure customers' loyalty.

Case study: ASEAN's Ezyhaul, Giztix and Logivan at the forefront of product delivery innovation

Consumer goods companies in ASEAN have already started adopting a sharing economy business model for optimising last mile delivery. For example, Ezyhaul, a company present in Singapore, Malaysia, Thailand and India, matches shippers with domestic carriers through an online freight exchange platform. The company addresses inefficiencies that have emerged in the freight industry in Southeast Asia and allows easier shipping and real time tracking for shippers, and capability maximisation for transportation companies. Since the company was launched in 2016, delivery volume has increased by 8% month by month.[81]

Another example is Giztix, an online Thailand-based marketplace for logistics and shipping, which addresses the issue of empty backhauls by connecting shippers with transporters through an online platform. Recently, Giztix has managed to average 30% month-on-month growth, demonstrating a clear demand for its services.[82] Logivan in Vietnam is another new entrant focused on load optimisation, matching shippers of freight with independent truckers who have space availability. In a country where logistics costs are estimated at over 20% of GDP, and 70% of trucks come back empty after completing a run, this type of solution is filling a significant gap.[83] Solutions provided by innovative companies like these can be ideal for mid-corporate players in circumventing last-mile delivery challenges in the region.

Strategy 2: Enhance front-end processes to drive customer experience

Adopting digital solutions to enhance front-end processes will allow stronger engagement with consumers and help increase sales by providing an enhanced customer experience

By 2020, customer experience will overtake price and product as the key brand differentiator, according to Frost & Sullivan.[84] As the ASEAN region evolves, consumer preferences evolve with it. Today's ASEAN consumers are looking for, above all, value, convenience, and a unique experience. Traditionally, customer experience focused on providing a smooth and seamless experience across channels. Despite this still being important, companies are now moving away from an operational mindset and realising that to stay ahead of competition they must provide innovative experiences that are genuinely unique and memorable. This will require personalisation.

In order to offer advanced personalisation, companies must leverage consumer data collected across online and offline marketing resources and systems. According to Experian, 86% of customers find it acceptable for brands to use their data to personalise communications as long as it is relevant to them.[85] This will allow them to move from a model of mass targeting to micro-segmentation and targeting, explored below.

To personalise customer experience effectively, companies must work across devices, touchpoints and sales channels. At the same time, they must not lose sight of the end-to-end customer journey if they are to truly maximise customer satisfaction and improve performance. Mid-corporates can leverage advanced technology to gather data at every touchpoint in the journey and continuously look into personalising that interaction in order to optimise the overall customer experience.

2.1 Micro-segmentation and next-level geo-targeting

It is important that mid-corporates approach customers with relevant and timely content, and this can be achieved by using digital tools to refine segmentation and targeting

ASEAN's digital consumers are demanding authentic brand experiences delivered at the right time and in their channel of preference, or they will very easily disengage. Despite being bombarded with marketing messages on every channel, what they are really seeking is content which is relevant to them on a personal level. Executives surveyed in a PwC Strategy& global study conducted with 161 executives in 2016 rated "segment and know your customers" as the second most important principle of developing a great customer strategy.[86] For this to happen, companies must make their marketing and segmentation efforts a lot more granular - they can no longer rely solely on basic demographic data to segment customers into mass clusters.

Micro-segmentation, a technique for dividing customers into specific groups based on common characteristics, is an effective way of enabling highly targeted connections and engagements. This is especially useful for players operating in ASEAN, where the sheer diversity means that consumer preferences will vary significantly from market to market. Leading companies in the sector are developing much more sophisticated customer analysis tools that gather inputs from a variety of sources, including customer behaviour and psychographic data gathered online and offline, real-time information collected from sensors, and geographic/mapping data. Using that data to deliver personalised content will create real consumer value. Gartner predicts that organisations that excel in personalisation will outsell companies that do not by 20%.[87]

In this digital era, consumer goods companies and retailers have the ability to reach new horizons in customer segmentation empowered by the increased availability of customer data gathered from numerous platforms such as customer relationship management (CRM) systems, web navigation, e-commerce history, point of sale, social media and others. Artificial Intelligence (AI) is one of the key technologies enabling micro-segmentation, or the 'segment-of-one', to happen a lot more effectively. AI algorithms allow companies to analyse one individual user—the habits, likes and dislikes, and previous activity of existing customers and leads—and draw conclusions quickly to engage with them on a personal level. Advanced AI-based data analytics uses data from these various sources and combines, consolidates, and sorts it to identify micro-segments and analyse which actions will have the greatest impact on each segment as well as predict the most likely customer response to any engagement. This will allow companies to have more targeted communication and provide personalised offerings.[88]

Targeting customers with relevant content at the right place and the right time can be made possible by combining micro-segmentation with geo-targeting. Geo-targeting refers to delivering content to customers based on their geographic location. Although this technique is already well established, it is highly effective and should be included in companies' marketing strategies, especially by the smaller and mid-sized corporates. Related and more innovative practices include geo-fencing, which allows firms to track people's IP address in real time to locate their devices (mobile phones, tablets and computers) and deliver marketing content to customers within a predefined perimeter, and geo-conquesting, where companies target shoppers who are close to a competitor's location and steer them away from them.[89]

Key impact areas for mid-corporates: prior to tailoring their offering, it is important for mid-corporates in ASEAN to incorporate micro-segmentation and geo-targeting in their marketing strategies in order to better understand their customer base, maximise the outcome of their marketing efforts and personalise the customer experience. Winning customers in ASEAN requires companies to effectively understand data and maintain brand relevance with such diverse target groups.

a. Personalised segmentation and targeting: Micro-segmentation allows firms to determine the appropriate marketing mix, tailor messages and identify gaps in customer needs and sales opportunities to develop relevant products and services that appeal to specific segments. This is especially useful for territories as diverse as ASEAN, where consumer preferences are far from uniform. In addition, once micro-segments have been defined, techniques such as geo-targeting would help mid-corporates approach consumers at the ideal time, further increasing the relevance of the interaction.

b. Maximised conversion rates and marketing ROI: Targeted communication at critical touchpoints will further optimise conversions and purchases, increasing ROI on marketing efforts. By using geo-targeting in ad or social media campaigns, the average cost-per-click (CPC) can be reduced and higher traffic will be generated within a defined budget. Lower CPCs also mean a lower cost-per-acquisition for customers.[90] Anticipating and meeting customers' needs before the customers themselves realise what they are, and addressing the right customers at the right time, with personalised content, will translate into a higher response rate, maximise the chances of a sale and, eventually the conversion of visitors into long-term, high-value and loyal customers.

c. Improved customer experience: Understanding consumers' tastes, preferences and shopping habits, and tracking the customer journey, helps ensure customers are positively surprised and impressed by a tailored, seamless experience. According to Forrester, 94% of marketers are focusing on data and analytics, personalisation technologies and customer profile data management capabilities to deliver personalised customer experiences.[91] If mid-corporates can be in a position where they truly understand consumers in each of the ASEAN markets, they can tailor their offerings and services accordingly and ensure that a positive experience drives consumer loyalty.

> We need to understand our customers by leveraging and analysing all the information we have on them. We also need to strive to offer a seamless customer experience across all channels.
>
> **Senior Director**
> Vietnamese mid-corporate, retail

2.2 Enhance touchpoint interaction for driving customer experience

Digital touchpoint technologies, both online and offline, can help mid-corporates to enhance interaction with customers to improve their overall experience

The customer journey involves a variety of touchpoints, defined as a specific interaction between a customer and an organisation. In fact, customer journeys are collections of touchpoints, be it for inspiration or transactions. They are the building blocks of customer experience, and need to be carefully considered given the growing importance of providing a positive, personalised experience to consumers.

Many of these touchpoints involve standard channels—in-store, online via a company's website, or viewing a TV or radio ad. However, ASEAN consumers are fast adopting new channels – for example, they are now amongst the world's strongest adopters of social media for complementing their shopping. Increasingly new media touchpoints are appearing such as social networking, blogs, communities, mobile applications, video, Twitter, and location-based services, which ASEAN consumers will be quick to adopt. These new touchpoints mark a shift from communicating products and brand attributes through channels that retailers and manufacturers can control, to ones which are completely independent of them. They are becoming an integral part of the customer journey and making it a lot more dynamic, interconnected and complex than ever before.

The proliferation of new touchpoints is ever increasing as a consequence of ASEAN's digital transformation and the fast development of omni-channel retailing. In addition, the development of new and engaging touchpoint opportunities is being accelerated by technologies such as Augmented Reality (AR). These new interaction technologies are evolving rapidly, making it a challenge for CPG companies and retailers to sort through, understand, and respond to the touchpoint opportunities they represent. To keep up, companies need to quickly leverage these opportunities and also align the role of all the different touchpoints to create a uniform customer journey and ultimately ensure a positive consumer experience. The ability to understand and leverage touchpoints is what will distinguish successful businesses from the rest.[92]

In addition, companies should consider that while the rise of online channels does not diminish the relevance of brick-and-mortar retailers, it does mean that these retailers cannot continue to compete on price and quality alone and must provide a compelling reason to drive consumers into their stores. Physical space and overall experience have become increasingly significant factors to distinguish brick-and-mortar retailers, and the concept of 'destination retail' will only continue to gain traction going forward. However, in order to remain competitive, brick-and-mortar retailers must focus on matching e-tailers' convenience, especially with payments. With consumers expecting a seamless experience regardless of the channel they choose to engage with, consumer goods companies should ensure omni-channel consistency in terms of convenience and service levels. In ASEAN, where over 70% of the population remains unbanked, digital payment solutions such as mobile wallets are rapidly gaining ground.[94] Real-time updates on payments and faster refunds help to further enhance the customer experience. Therefore brick-and-mortar retailers should equip themselves accordingly.

With this, it is essential that mid-corporates look at enhancing their customer engagement at every touchpoint in the customer journey, both online and offline (in-store). They can do this by leveraging innovative touchpoint technologies which will allow them to really drive customer engagement and experience to remain competitive. We have highlighted some of these in this report.

> We have 10-12 million consumers coming to our stores every year. One of the key things for us is to really maximise the potential from these customers. The challenge lies in how we can convert them, engage with them at a deeper level and offer them newer products and better deals. That is why we are investing in omni-channel platforms and CRM - to try and better understand our consumers and improve the customer journey.
>
> **CEO**
> Malaysian mid-corporate, sports retailer

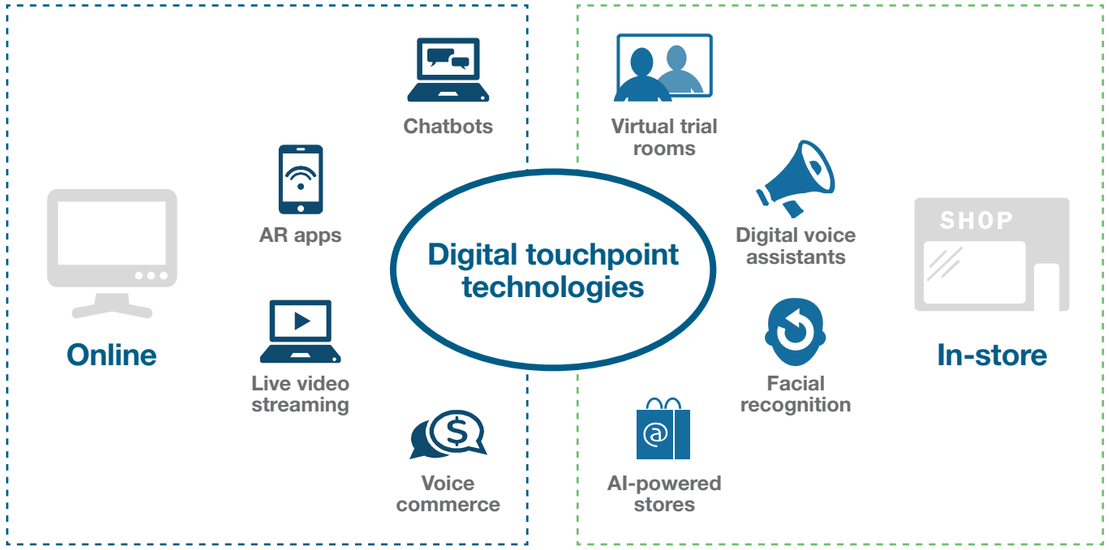
Case study: Zalora adopts customised segmentation to acquire new customers

Mid-corporates operating across ASEAN are increasingly adopting advanced segmentation and targeting techniques to grow their presence in the region, an example of which is fashion e-commerce player Zalora. Zalora was looking to increase its share in the region, a real challenge given the diversity of its target markets (Singapore, Indonesia, Malaysia, Brunei, the Philippines, Thailand and Vietnam) in terms of income levels, internet adoption rates as well as language and cultural differences. It used custom segmentation and individually tailored dynamic display ads to reach qualified new users with personalised product recommendations according to each individual user profile, across desktop, mobile and social media. This was done through combining first-party CRM data with real-time user data. In this way the company managed to achieve a 17% increase in new customer acquisition across all markets and a 12% increase in revenue contribution from campaigns over the three-month test period.[93]

Case study: Bangkok's Siam Discovery Mall embraces the 'Destination Retail' concept

Offline, or in-store, different technologies are already being adopted in Southeast Asia. An example is Siam Discovery Mall in Bangkok creating "Siam Discovery – The Exploratorium", where 5,000 international and local brands are organised and displayed in such a way that it becomes a 'lifestyle lab' for customers. In this "hybrid-retail destination and lifestyle specialty store" customers can conveniently choose, mix, match, try, and retry until they find a match for their tastes and needs.[95] Retailers, especially small and mid-sized, must constantly be mindful of the relevance of stores and invest in features which will draw in customers.

Figure 3.4: Digital touchpoint technologies in the retail and consumer sector



Source: PwC analysis

Online touchpoint technologies: With the advent of digital disruption, consumers are becoming hyperconnected. And with Southeast Asia being one of the fastest growing regions in terms of mobile penetration, this opens up significant opportunities for mid-corporates to boost their social commerce potential.

The introduction of next-generation technologies that are disrupting consumer goods and retail such as AI and the Internet of Things (IoT), means that customers are becoming hyperconnected across multiple devices ranging from desktop to laptops, mobiles and smart devices such as wearables like Fitbit or Apple Watch, car navigation and entertainment, and home appliances.

Understanding and being present in all these touchpoints is essential for companies to develop a closer and more effective engagement with consumers. Below we explore a few examples of online touchpoint technologies:

- Chatbots: a chatbot is an online technology that can hold a real time natural sounding conversation with consumers aiming to support them, give them advice and encourage product purchases. Chatbots are generally integrated into a company's website or social media pages. Basic chatbots spot keywords in a customer's inquiry and give pre-defined answers, while more sophisticated chatbots powered by artificial intelligence and machine learning can form responses and have conversations. Artificial intelligence chatbots actively learn from consecutive conversations to give accurate answers. If questions are too complex for the chatbot, a real customer service representative can take over the conversation.
- Live streaming on social media: Social media has changed the way brands can interact with customers. New functionalities such as live video streaming and stories allow for interactive and highly personal experiences. Live videos or Q&A provide instant communication with no possibility of editing. Brands can share exclusive content with customers (behind the scenes, questions with key executives, make announcements etc.), and companies are increasingly using this channel. A study conducted by Hall & Partners polled agencies and brands in key markets in Southeast Asia and revealed that around 75% of respondents currently involved with video ads were expanding their video budget.[96]

- Augmented Reality applications: Apps are a new touchpoint for brands and can add value to customer experience by acting as digital shopping assistants. AR can be incorporated within apps to help the customer become familiar with the product. Multinational beauty brands, such as L'Oréal, have been using AR apps to allow customers to experiment with products virtually. Having said that, AR apps are also accessible to smaller players as their technology is not too advanced and the investment required to develop them is not particularly significant.
- Voice Commerce: Digital voice assistants like Amazon Alexa, Apple's Siri or Google Home are innovative touchpoints that are gaining popularity and are set to change the way consumers shop. Voice commerce is in its infancy - according to PwC's Global Consumer Insights study, among consumers who own an AI device, nearly half (48%) said that they spend around the same amount on shopping as they did without one, while only 18% said they spend more. However, its adoption is expected to grow as more capabilities are built in. This is especially true amongst Asian consumers in China, where 21% already own an AI device and more than half (52%) plan to buy one, Vietnam (19% own, 45% plan to), Indonesia (18% own, 49% plan to), and Thailand (15% own, 44% plan to).[97]

Offline (in-store) touchpoint technologies: The store is the traditional touchpoint with the client and despite the rise of digital channels, still remains so for most retail and consumer players. Hence, the in-store experience must be convenient and optimised to help customers easily navigate the store. Retailers, regardless of their size, can leverage digital technology to significantly enhance the in-store experience. Examples of technologies which can help achieve this are:

- Virtual trial rooms: Augmented reality technology is changing the retail scene, whether by allowing customers to have a 360 degree view of what the product looks like on them (clothes, beauty products etc.), recommending products or providing additional product information (promotions tailored to client, existing sizes and colours, sourcing location, nutritional content etc.). This technology is not only applicable to large retailers. For example, La Belle Couture in Singapore implemented AR virtual mirrors in its stores and chatbots online, managing to increase appointment rates by 30%.[98]
- Digital shopping assistants: Voice assistants like Amazon Alexa or Google Home can be installed in kiosks throughout shops to assist customers by helping them navigate around the shop and answer questions about products. Furthermore, by connecting the virtual personal assistant to an order management system, it will track a customer's shopping history and data to suggest articles and sizes based on their past orders. Similarly, retailers may choose to invest in AI robots to act as customer service or sales representatives. For example, customers at The North Face receive interactive support through natural conversations with AI-powered tools, which help them narrow down their choice of jackets based on the preferences they specify.[99]
- Facial recognition: Facial recognition technologies and biometric data are being used by retailers to analyse patterns of buying behaviour. They can track individual customers walking into a store, show them ads and promotions related to their profile, past purchases and journey throughout the store. Heat maps can highlight hot spots and even identify loyal customers. Facial recognition could be used to improve customer service—for example, a customer who appears to be struggling to choose among various brands could receive a text or voice message offering assistance. Retailers could also use the technology to gauge the effectiveness of displays and store layouts, and optimise sales and marketing campaigns accordingly.
- Autonomous 'Grab and Go' AI-powered stores: Cashless, staffless shops will change the retail landscape, and this has already started in markets such as the US with Amazon Go, China with Alibaba, and Hong Kong with Alibaba-Guess. The trend is starting to reach Southeast Asia, with JD.com opening an AI-powered store in Indonesia, and Honestbee in Singapore. RFID is the main technology behind AI-powered stores. RFID tags are attached to each product to track and record items shoppers put in their basket. When a consumer exits the shop, all tags are scanned automatically and the balance is

deducted from the customer's bank account that is pre-registered in the store's system, resolving another pain point: paying at checkout. The price of RFID technology has decreased allowing for the technology to be cost-effective even when attached to low-priced goods. Added to the growing importance of convenience, the expectation is for these store formats to grow in popularity.

Key impact areas for mid-corporates: Although SMEs and mid-corporates may not be able to adopt technologies in all their online and offline touchpoints, they should consider investing in innovative technologies as soon as they become normalised and more accessible.

a. Source of unfiltered consumer data: According to Salesforce's recent 'State of the Connected Consumer' report, 51% of consumers expect companies to anticipate their needs and make relevant, proactive suggestions across every touchpoint.[100] These technologies have applications in the home and in store and are providing companies with full visibility of consumer preferences and behaviour as well as a valuable trove of unfiltered consumer information. This data can then be used to anticipate and respond to customer needs, therefore personalising and increasing the value and relevance of an experience.

b. Increased exposure and stronger consumer engagement: Leveraging online channels such as social media helps mid-corporates widen exposure of their brand and curate their brand image, which in turn allows them to create a bond between their brands and customers. In addition, interactive technologies such as AR apps provide customers with a more immersive experience and allow mid-corporates to develop a closer and more personal engagement with consumers, and a deeper relationship at every touchpoint, which will ultimately help capture and strengthen their loyalty. With a low investment requirement, these technologies are very effective for mid-corporates to reach, gain and maintain the attention of new and existing consumers.

c. Maximised efficiencies and cost savings: Adopting such technologies can also help reduce operational costs. For example, using voice commerce or digital assistants which connect directly to an order management system, will generate significant efficiency in order and inventory management, whilst simultaneously reducing the need for dedicated customer service functions or employees. Efficiencies are also realised as companies can access a much wider audience with comparatively less investment in marketing activities. If managed well, this strategy allows mid-corporates to reduce the overall cost of acquiring, serving, and maintaining customers.

d. Enhanced customer experience and brand loyalty: Carefully leveraging technology to enhance touchpoint interaction in an aligned and curated manner throughout the customer journey will have an overall positive effect on the customer experience and in turn will shape consumers' future behaviour, as they turn their loyalty to brands that provide them with not only a good product, but with a positive shopping experience.

Case study: Unilever Thailand's Auntie Reply chatbot drives sales of Knorr

A success case for the use of chatbots was Unilever in Thailand. The company launched a chatbot called Auntie Reply. Sales of one of its brands, Knorr, were shrinking mainly due to Thai mothers' fast-paced lifestyle which did not allow for frequent home cooking. They tried to inspire mothers and help them with home cooking, and given mothers' extensive use of mobile phones and social messaging app Line, it became Knorr's official account as a mothers' trusted food engine. The result was a 50% increase in consumption per household and a 7.6% sales increase after months of stagnant sales performance.[101]

Key takeaways

1. Shifting retail and consumer landscape: Demographic and economic shifts, as well as the digital revolution, are transforming the profile of consumption in ASEAN and creating a very different consumer goods landscape across the region.
2. Opportunities in digital channels: With a rapidly growing number of digital customers, this new scenario offers a unique opportunity for consumer goods mid-corporate companies to more closely engage with them and win their loyalty for the long-term.
3. Competitive challenges: ASEAN's digital transformation will disrupt traditional consumer behaviours and patterns. It will become more challenging to serve consumers given their stringent demands and the intensifying competition for their attention.
4. Technology adoption for operational efficiency: To succeed in an increasingly competitive environment, it is important that mid-corporates leverage new technologies to optimise operational efficiencies and maximise their speed and flexibility in order to free up capital from back-end processes and better serve the demands of their customers.
5. Innovative touchpoint technology to drive consumer engagement: On the front-end, innovative technologies brought about by Augmented Reality, Artificial Intelligence and Virtual Reality can also be highly transformative tools to enhance consumer engagement and provide a personalised customer experience, thereby guaranteeing the loyalty of consumers.

Chapter 4: Strategies for the Future – Infrastructure

ASEAN's fast pace of growth has led to rising demand for infrastructure development. Urbanisation, demographic and social change including ageing populations, increase in population mobility and communication needs, as well as geopolitical and environmental factors around trade and sustainability, have significantly driven the pipeline of infrastructure projects in the region.

However, there is a major need for infrastructure investment – a so-called 'infrastructure gap', or the difference between required infrastructure spending and actual investment spending. Over the period from 2016 to 2030, the Asian Development Bank (ADB) estimates that the total infrastructure investment needed in ASEAN will be USD 2.8 trillion, or around USD 184 billion per year.[102] Infrastructure plays a critical role in promoting and improving connectivity among the ASEAN economies, and both public and private investment in this sector is essential to bridge the infrastructure gap and secure ASEAN's overall economic prosperity.

Figure 4.1: ASEAN infrastructure quality and investment need

Source: Global Competitiveness Index, World Economic Forum, Global Infrastructure Hub; Asian Development Bank (ADB) Institute (ADBI) PwC 'Seizing greenfield infrastructre opportunities in ASEAN'

Opportunities and challenges

This scenario presents a number of major opportunities for mid-corporate infrastructure players. There is strong demand for infrastructure investment and expertise across the region, especially in countries with lower infrastructure quality, such as Myanmar, Lao PDR, the Philippines, Vietnam and Indonesia, as shown in Figure 4.1 above. These large-scale projects will create opportunities for mid-corporates across the infrastructure value chain to participate both domestically and regionally. However, the lack of familiarity with overseas markets and finding suitable local partners poses an obstacle for many mid-corporates seeking to access regional opportunities.[103] Furthermore, challenges around capability maturity, skills and capacity impact project performance and can make it more difficult for mid-corporates to succeed in large-scale projects both domestically and overseas.

Growth strategies for infrastructure mid-corporates

In order to be able to take full advantage of the numerous opportunities in ASEAN and increase their chances of success, mid-corporate players must focus first on upgrading their capabilities to a standard that will allow them to win and appropriately execute projects across the region. Once a regional capability model is established and adapted to the intricacies of a target market, mid-corporates must categorically seek to build synergistic partnerships that will create the right medium for success and provide further opportunities for mutual growth in the long term. Many players in the region are already using or planning to adopt technologies such as Building Information Modelling (BIM) to drive their efficiency and performance. Other more advanced technologies such as Digital Fabrication techniques including 3D printing, which are expected to gain traction in the longer term, show significant potential to revolutionise areas such as housing construction. These digital solutions will help improve project planning, enhance performance levels, and reduce cost and time overruns.

> There has been a steep increase in participation in large-scale projects. In fact, Indonesia is following China's lead and doing something similar. For the past four years, there has been a very significant, fast increase in infrastructure building across the country.
>
> **President Director**
> Indonesian mid-corporate, infrastructure

A. Key industry shifts impacting growth

We see three major shifts significantly impacting ASEAN's infrastructure landscape and giving rise to new opportunities and challenges for mid-corporate firms. These range from the increasing number of infrastructure projects, their cross-border nature and the capability gap of existing mid-corporates to address the infrastructure needs of the region.

1. Rapid proliferation of infrastructure projects to narrow ASEAN's wide infrastructure gap

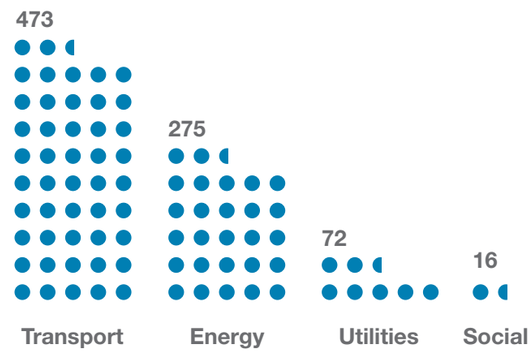
ASEAN's significant pipeline of infrastructure projects will provide major opportunities for mid-corporates to partner with government via PPPs or with larger players for delivery

Currently, ASEAN has a pipeline of over 800 projects to address the significant infrastructure gap, in sectors such as transport, energy, utilities, and social infrastructure. The transport sector alone has 473 projects in the pipeline, including 219 road and bridge projects. In the energy sector there are about 275 projects, including 77 renewable energy projects across hydro, solar, wind, geothermal and biomass.[104]

Typically, much of the responsibility for infrastructure spending falls on the shoulders of the respective governments. However, countries in ASEAN do not have sufficient public sector capital to finance all the required projects; according to ADB they are currently only able to cover about 50% of the total investment, even with the implementation of planned reforms in public finances. This means that many of the projects in this pipeline remain unattainable, and ASEAN must look beyond the public sector to finance them. In itself, this represents an opportunity for private sector investors.

To implement such projects, many ASEAN governments are planning to leverage Public Private Partnerships (PPPs) to complement their fiscal resources and leverage private sector expertise and efficiencies. Backed by the ASEAN Secretariat and the Organisation for Economic Co-operation and Development (OECD) that jointly developed a framework for PPP development, many ASEAN countries have established a PPP ecosystem. Private sector companies will therefore be increasingly crucial in bridging the region's infrastructure gap.

Figure 4.2: ASEAN project pipeline by infrastructure segment



Source: BMI

In addition to PPPs, many ambitious infrastructure programmes are sprouting across the region. In the Philippines, President Duterte's "Build! Build! Build!" infrastructure plan is under way with 75 projects estimated to be worth USD 180 billion. Similarly, the Jokowi administration in Indonesia set up a 5-year plan (2015-2019) increasing investment in infrastructure by USD 10 billion annually compared to the previous period.[105]

This opens up significant opportunities not only for the large local infrastructure players equipped with stronger financial capability, but also for mid-corporates - as part of the wider project supply chain - who will be able to leverage their specific areas of expertise and partner with larger contractors to participate in such projects.

2. Increasing number of large-scale cross-border infrastructure initiatives

Large-scale, cross-border initiatives, such as China's Belt & Road Initiative (BRI), are providing a push for mid-corporates to participate in projects and grow beyond their home territories

On top of infrastructure megaprojects and PPPs, other large-scale, multi-territory infrastructure programmes, such as BRI, are providing an additional platform for ASEAN players to be involved in important infrastructure projects, and to further enhance their growth via cross-border investments.

First proposed in 2013 by Chinese President Xi Jinping, the BRI is an ambitious megaproject with a network consisting of more than 65 countries and regions with a population of about 4.4 billion and contributing to one-third of the world's GDP and 40% of global trade. In 2017, President Xi pledged an additional USD 124 billion to the BRI, building upon an estimated USD 900 billion worth of proposed projects. Asian companies are expected to be the main beneficiaries of the BRI as the Chinese government, banks, and enterprises invest in BRI countries. ASEAN players have the opportunity to leverage their expertise and local knowledge to win such projects.[106]

In addition, the ASEAN Secretariat's 'Master Plan on ASEAN Connectivity 2025' aims to expand intra-ASEAN connectivity by deploying multimodal initiatives covering air (ASEAN Open Skies agreement), rail (Singapore-Kunming Rail Link), sea (ASEAN Roll-On/Roll-Off Shipping Network and Short Sea Shipping) and land (ASEAN Highway Network). This will provide further opportunities for infrastructure players, both large and mid-sized, to be involved in large-scale cross-border projects.

ASEAN nations rely on each other for finances and expertise to fill the region's urgent infrastructure gap. Infrastructure players, especially the small and mid-sized ones that, until today, have focused on strengthening their presence in their home markets, now have a unique opportunity to participate in projects in other countries in the region and further enhance their growth. However, they must act now and start understanding how they can best leverage their expertise and capabilities to take full advantage of these large-scale initiatives.

3. Capability maturity of local infrastructure players limiting project success rates

Productivity, skills and capability challenges, as well as slow adoption of automation, often cause cost and time overruns which affect overall project performance levels

Performance challenges in the infrastructure sector in ASEAN significantly slow down progress in infrastructure development and further exacerbate the infrastructure limitations of the region. As such this remains a key area of concern, and addressing these limitations will require a major shift in current ways of operating in the sector.

Typically, the main challenges lie in the design and execution phases of a project. Poorly designed and structured projects lead to delays and cost overruns, and are largely a result of poor preparation. In addition to this, ASEAN infrastructure companies of all sizes often lack the appropriate capabilities around skills, capacity and productivity levels required to perform well on projects.

In parallel, the infrastructure industry has been relatively slower in the adoption of new technologies as compared to other sectors such as manufacturing and retail and consumer, as we have explored in the preceding chapters. These sectors have transformed themselves and their productivity performance, and the infrastructure sector's slow adoption of automation further aggravates its productivity challenges.

For mid-corporates to be able to participate and succeed in large-scale projects, especially in other ASEAN markets, it is important that they have a strong track record of successful project delivery, ideally domestically and also overseas. Often these are formal requirements when participating in bids for PPP or other types of infrastructure projects. This represents an opportunity for mid-corporates to take advantage of their smaller size and comparatively simpler operations, to focus on developing and enhancing their capability maturity in order to increase their chances of winning and executing successful projects, especially across borders.

B. Strategies for growth

To tap into the significant opportunities in the ASEAN infrastructure sector and contribute to minimising the region's infrastructure gap, mid-corporates will need to explore new strategies for growth which transcend their home territory and which imply new ways of working. This will require a close assessment of their core capabilities, complemented by partnerships and technology adoption, to position themselves for success both in domestic and regional markets.

Strategy 1: Create a strong foundation for regionalisation

Positioning mid-corporates to participate in the large cross-border projects in ASEAN requires a thorough capability assessment and evaluation of partnership opportunities

The ASEAN countries with the lowest infrastructure spending are Indonesia, Vietnam and the Philippines and, as such, are expected to be the focus geographies for large-scale infrastructure projects in the region.

Figure 4.3: Infrastructure spending, quality and global competitiveness

Selected ASEAN Country	Infrastructure spending per capita (USD)	Infrastructure Score (1 to 7)	Global Competitiveness Index (1 to 7)
Singapore	2,049	6.1	5.7
Malaysia	705	5.5	5.2
Thailand	522	4.7	4.7
Indonesia	314	4.5	4.7
Vietnam	284	3.9	4.4
Philippines	115	3.4	4.3

Source: Oxford Economics, Global Competitiveness Report 2017-18, World Economic Forum

Most small and mid-sized infrastructure players in Southeast Asia have, until now, adopted a domestic (country-focused) strategy which has positioned them well for success in their home territory. In order to expand and achieve exponential growth they ought to appreciate the numerous opportunities lying outside their home territories, although this does not mean they should adopt a global strategy at the outset. Especially in territories like ASEAN, it is important to think regionally and apply a regionally-oriented strategy vs. a global one. According to Harvard Business Review, regionally-focused strategies are a mid-way between local and global strategies which, when used in conjunction with a company's overall local and global initiatives, can significantly enhance performance.[107]

Replicating the success that mid-corporate infrastructure players have enjoyed at home in other ASEAN markets and leveraging cross-border opportunities will require a customised approach, as well as the development of a different set of regional capabilities, enhanced via partnerships. The foundation of a mid-corporate's regional strategy must be set around how to exploit, enhance and renew or even transcend their home-based sources of advantage to guarantee the chances of success in external markets.[108]

The two key dimensions involved in building a solid foundation to achieve this goal, include:

1.1 Defining and deploying a regional capability framework

1.2 Positioning for success through partnerships.

1.1 Defining and deploying a regional capability framework

To grow within ASEAN, mid-corporates should identify the capabilities required for success and create a regional capability blueprint which can be adapted and refined as they grow

Mid-corporates in the infrastructure sector typically experience strong success in home markets, but usually lack a structured approach towards cross-border expansion. We believe that the first step towards successfully expanding into external markets is the identification and building of critical 'best-in-region' capabilities which can then be deployed in target countries, and thereafter further strengthened to 'best-in-world' as mid-corporates develop a global expansion plan.

To assess capabilities and position themselves for regional expansion and success, mid-corporates should adopt a step-by-step process to firstly identify key capabilities for regional success and develop a regional capability blueprint. Secondly, there should be a go-to-market phase where companies can refine the model as they grow their presence in the region and beyond. Having a structured tool or mechanism in place will go a long way in guiding companies through their internationalisation journey.

i. Creation of a regional capability framework:

a. Define 'best-in-region' capabilities:

Following the strategy definition to expand regionally, mid-corporates need to understand the most suitable operating model to adopt. This requires conducting a thorough self-assessment of their capabilities. Firstly, companies must identify the key capability groups that are characteristic of a truly regional business. This would include areas such as strategy, proposition development, sales, marketing, reporting, governance and supporting capabilities such as IT and talent management.

Following this, mid-corporates must identify and define the key capabilities that exist within each group, including the processes, technology and people needed to deliver each one.

b. Identify capability gaps:

Having established a comprehensive capability blueprint for regionalisation, mid-corporates should then measure themselves against this model with the purpose of identifying capability gaps in their existing operation.

This will allow them to clearly see where the capability gaps lie and help them understand which capabilities need to be enhanced or developed to transform their current business from a purely domestic one, to one which is fully capable of expanding into one or more countries in the region.

c. Prioritise key capabilities:

After having identified the capability gaps, mid-corporates can then categorise the individual capabilities into those which need to be upgraded for domestic success, and those that need to be developed into 'best-in-region' capabilities for regionalisation. These should then be prioritised according to their level of importance, complexity and urgency, based on the companies' strategic goals.

d. Develop a roadmap to determine the best way to develop necessary capabilities:

Once prioritised, companies must evaluate whether to build, borrow or buy the capabilities required for success.

- **Build:** building capabilities organically would be a suitable strategy for core or differentiated capabilities that distinguish a company from competition, or for those capabilities that require a high level of control. This option can often imply a more significant investment in terms of time and perhaps capital, however the benefits could be longer-lasting compared to partnering or contracting with external parties.
- **Borrow:** where speed to market is a constraint, and where the degree of complexity involved is not substantial, companies should explore gaining capabilities through partnerships or contracts with other infrastructure players or third parties.
- **Buy:** for instances where there is a high degree of complexity and where the capability requires full control but speed to market is not a priority, companies should consider M&A options to acquire the necessary capabilities if they have capital available for investing.

Case study: Singaporean mid-corporate expands into ASEAN via focusing on key capabilities

A Singaporean mid-corporate construction group followed a capability-based approach to cross-border expansion when it ventured into Myanmar in 2012. The company decided to enter Myanmar by focusing on its core competencies: project management and provision of consultancy services to local developers, and tailoring its approach to the specific challenges of the market (lack of skilled workers, lack of a clear regulatory framework, high interest rates). This approach was highly successful in Myanmar and the company is now replicating it in other markets in the region as it grows its footprint further.[109]

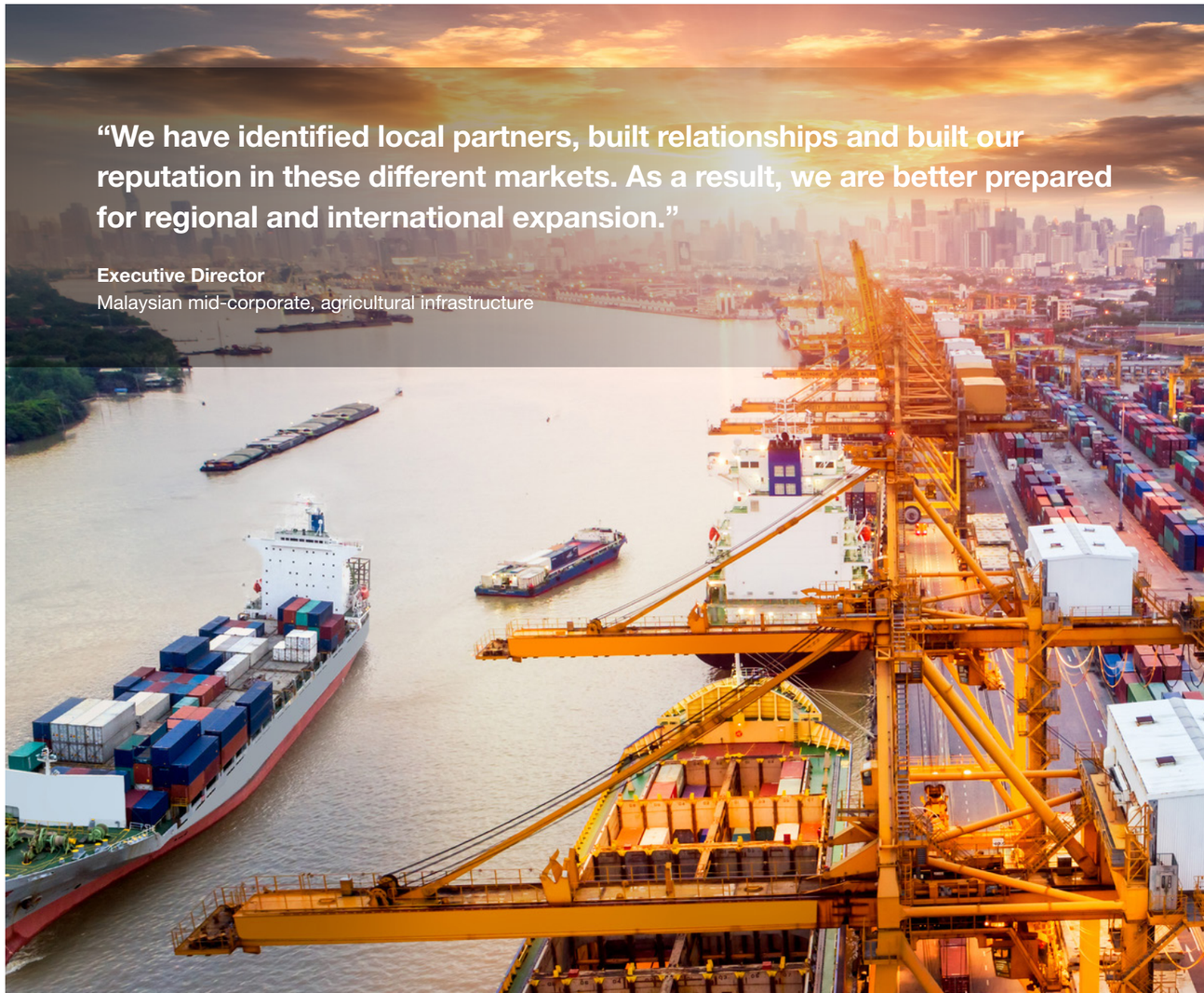
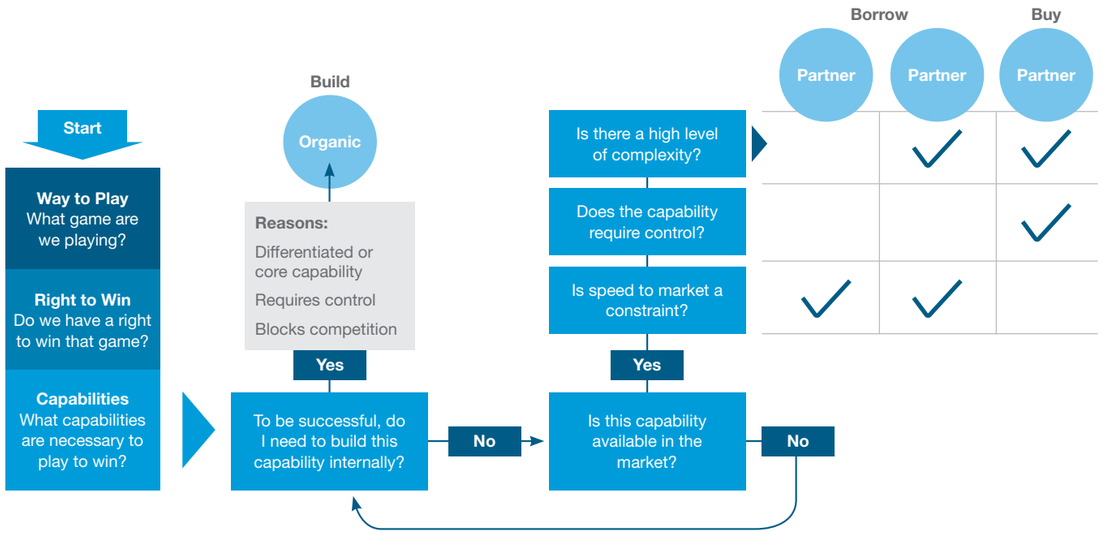


Figure 4.4: Roadmap to determine ideal manner to develop necessary capabilities



Source: PwC analysis

ii. Go-to-market:

a. Adapt:

Once the company has established its regional capability model, it will need to consider country-specific customisations. This is especially true in a region like ASEAN, which has such a high level of diversity amongst it countries in terms of economic development, culture and business environment.

Even nowadays there is a strong tendency for companies to stick to the strategies they have traditionally deployed, which imply a standardised approach to new markets while sometimes experimenting with a few local twists, and as a result they are struggling to become successful in emerging markets. It is imperative that this regional capability blueprint is adapted to target markets within the region, and not considered as 'one size fits all', in order to be effective.

b. Refine:

Mid-corporates ought to critically evaluate their performance in new markets via an iterative process. This means using market feedback to accordingly refine this model and respective processes, before targeting their next market and expanding further within the region. To do this mid-corporates should gather data from their respective market channels, combine and analyse it within their monitoring capability function, before reporting and lastly taking any action.

c. Grow:

This regional blueprint is a key tool in helping mid-corporates through their international growth journey – first regionally and eventually globally. It is therefore essential that these capabilities are well-aligned with the overall growth strategy of the organisation – i.e. the phases of building and enhancing these regional capabilities should be in line with the company's maturity cycle.

1.2 Positioning for success through partnerships

To maximise their chances of success, mid-corporates must acquire complementary capabilities by seeking synergistic and long-term partnerships with other players

Even through developing an effective regional capability blueprint for regional expansion, it will be difficult for some mid-corporates to organically develop 'best-in-region' capabilities across all dimensions, especially in unfamiliar new markets.

In addition, mid-corporates operating in ASEAN must understand that defining and implementing a growth strategy in developing markets is more difficult and complex than in developed markets as they are constantly evolving and therefore harder to navigate, especially if venturing out on their own.

Therefore, a more manageable and effective approach would be to develop partnerships with companies in these target markets with whom a mid-corporate company can partner with whilst it gains confidence and funding to develop a regional business model of its own. Partnering with companies that have synergistic capabilities and are fully familiar with that market's nuances will create a powerful win-win value proposition.

It is often the case that mid-corporate infrastructure players find themselves in a position of advantage through possessing a niche area of expertise, such as waste water treatment, piling works, earthquake engineering, and so on. Many large-scale projects in ASEAN are carried out by large multinational construction firms that hire subcontractors to support their projects, generally because they do not possess certain skills and expertise in a particular area, or knowledge of what works well in ASEAN's unique climate and business environment. As subcontractors generally carry out 85% of construction tasks within a project, it is key for prime contractors to find reliable subcontractors to ensure the success of a project.[110]

Having said that, entering into and sustaining a mutually beneficial partnership requires careful consideration of four key aspects:

Figure 4.5: Key considerations for infrastructure partnerships

1 Identify target market infrastructure needs	2 Define capabilities critical for success	3 Evaluate and select potential partners	4 Enter and maintain partnership
Assess the **infrastructure requirements** of each market to identify major opportunities Understand how best to tap into opportunities in order to **gain share in the target market**	Use **capability assessment framework** to identify capability gaps that must be acquired via partnerships vs. built organically to **increase the chances of success** in the target market.	**Define partner selection criteria:** • Reach • Knowledge gaps • Power balance • Regulatory considerations • Risk and sustainability • Exit strategy Partnerships to be **constantly evaluated, revised or terminated** if required.	Partnership to be approached with a **long-term, collaborative mindset** Invest in **building and maintaining the relationship** vs. working together for short-term mutual gain. Relationship to be based on **trust**

Source: PwC analysis

1. Identifying the inherent needs of the target market: Understanding the individual needs of each market in terms of their infrastructure requirements will help mid-corporates identify where the largest opportunities for them lie, as well as what they need to do in order to gain share in those markets. For example, a mid-corporate player specialising in sustainable pavements would be well-positioned to partner with a larger road developer in a market where there is a severe need for road infrastructure development, such as Myanmar.
2. Defining capabilities development needs critical for success in market: Using the capability assessment framework detailed above, mid-corporates will have a better understanding of where their strengths and weaknesses lie, and would have identified the capability gaps that must be built organically and those that must be complemented via a synergistic partnership in order to increase their chances of success in the target market.

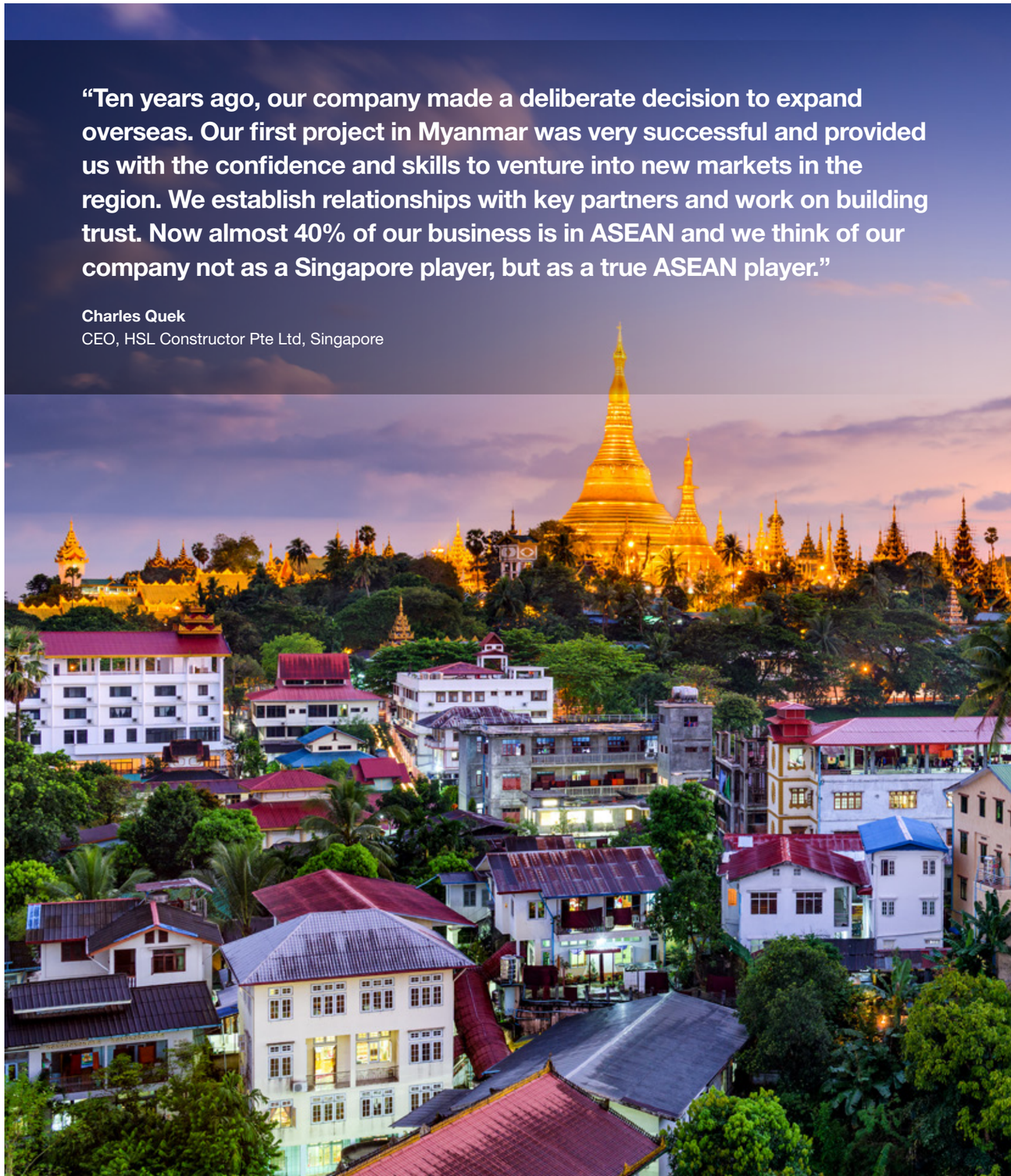
   Once companies have defined the capabilities to be acquired through partnerships, they can move on to searching for partners who possess those key capabilities; either local ones, who will have the added benefit of having knowledge and experience of the target market, or international ones who, albeit new to the market, may possess a unique strength or capability area.
3. Evaluating and selecting potential partners: Selecting a partner in growth markets such as those in ASEAN requires taking into account a broad range of considerations. These begin with the selection criteria, which should assess more than mere reach, and extend to growth market-specific partner management policies which must be embraced by both the company and the local partner to develop trust - a vital ingredient for success. They must consider elements such as the compatibility, relative control and influence of the two parties, synergies in ways of working, local and international compliance as well as brand and reputational risk.

   Many of these aspects will be defined at a local level, and may be beyond the experience of global or even regional management, so a structured approach to assessment is essential for both practical evaluation and senior management buy-in. The assessment must also include an exit strategy, with the recognition that this may include full withdrawal from a particular market if no viable partnership alternative is available. It is important to note that partners targeted for the purpose of accessing a market may differ from those who will help a firm to grow in their areas of interest, and therefore partnerships must be constantly evaluated, and revised or even terminated if required.
4. Entering into and maintaining a partnership: It is important that mid-corporates approach partnerships with a long-term, collaborative mindset and invest in maintaining the relationship with their selected partners instead of simply working together for short-term mutual gain.

   An effective relationship is key to achieving long-term growth and profitability in a new market versus simply having a presence. Therefore, companies must strive to rapidly move from a relationship based on authority or commercial benefit to one that is based on trust. Such partnerships will allow long-term profitability and most likely future opportunities to participate in other projects or enter new markets alongside the partnering firm.

   To allow for a long-term partnership in a new market, companies must be flexible and adaptable to local market nuances in order to build a strong relationship allowing for mutual growth. Foreign players entering a market may have to adapt their expectations to the reality of the new market and define locally achievable goals, responsibilities, timelines and performance measures.

   In addition, it is often the case that parties will have different business priorities, or power in the relationship may lie with the local partner, therefore a clear definition and agreement as to what is expected from each contracting party at the point of contracting, will be crucial to the success of the market entry.[111]



Key impact areas for mid-corporates: A well-structured regional capability model and a systematic approach to complementing these capabilities via partnerships will allow mid-corporates to achieve significant benefits and maximise the chances of success along their growth journey.

a. Successful growth beyond 'home-territory' and ability to replicate in different markets: One of the major challenges impeding mid-corporates' successful growth in overseas markets is the lack of structure and strategy. A regional capability blueprint provides mid-corporates with a foundation to leverage their world-class capabilities and equips them with the right structure, tools and people to grow beyond their home market. It allows mid-corporates to replicate successful strategies in new markets as they develop their portfolio of regional and international projects.

b. Reduced risk of operating in unfamiliar growth markets: Given the risks inherent in operating in international projects, partnerships will go a long way in terms of minimising such risks, as often the large partners will either be local players or have extensive experience of operating in that and similar markets. This is especially true in ASEAN and other developing markets which have complex business environments and significant 'institutional voids' such as the absence of regulatory systems and contract-enforcing mechanisms, making it much more difficult for a foreign company to navigate alone.

c. Improved likelihood of success while ensuring focus on core capabilities: Partnering with prime contractors that have complementary capabilities allows mid-corporates to significantly increase their chances of success in international projects without losing sight of the core capabilities that define them and give them their competitive advantage. Also, developing a deeper understanding of a company's core strengths will better position them for success, both domestically and overseas. In a synergistic partnership both parties' core competencies are combined and in this way operational efficiency is significantly improved when executing infrastructure projects. This in turn will lead to increased profitability and higher project success rates. Ultimately this will generate a long-lasting reputational benefit which will serve mid-corporates well as they progress in their international growth journey.

d. Potential for future collaboration – driving longer term growth into new areas: Larger infrastructure players tend to have wider exposure within the sector and a stronger track-record which allows them to tap into numerous large projects around the world. Therefore a successful partnership with larger players is likely to not only allow for successful entry into a particular market, but also provide the opportunity to access other large-scale projects in ASEAN and potentially globally – something mid-corporates may not otherwise have if operating on their own.

Case study: successful partnership between Spain's top infrastructure firm and a mid-corporate

Grupo Puentes, a Spanish mid-corporate specialising in bridge construction, partnered with Spain's largest infrastructure company, ACS, and together they won and successfully executed a large project to expand the Rande de Vigo Bridge in south west Spain. They were selected due to their technical capability offering – ACS held the overall project experience and capital, whilst Grupo Puentes offered highly specialised expertise on bridge construction. In addition, its niche expertise allowed the company to expand beyond its borders and be involved in projects in countries like the US, Poland, Romania, Angola, Ecuador and Qatar. Today, Grupo Puentes, employs more than 500 people and has been involved in over 1,000 projects across 11 countries. This considerable growth allowed the group to diversify from its initial core expertise in bridge construction to cover more project areas such as hydraulic works and larger-scale urban projects.[112]

Collaborations for successful regional expansion

ASEAN's infrastructure sector is highly regulated, complex and potentially challenging for small and mid-corporates to engage in, especially in territories that cross their domestic borders. It is essential, therefore, that they effectively leverage support platforms and mechanisms made available to them, and collaborate with both public and private sector organisations such as:

- **Large MNCs** have more resources to achieve efficiencies and economies of scale in international markets. By working with larger players, a mid-corporate can focus on its area of expertise within the supply chain, and upgrade its distinct capabilities to provide more value-added services.
- **Local players**, especially those from more complex markets in ASEAN, are equipped with in-depth local knowledge of regulatory, legal and political systems, business practices as well as language and culture, and can help mid-corporates achieve success in overseas markets in a quicker and more efficient manner.
- **Public sector entities,** such as Enterprise Singapore, that run initiatives like Partnerships for Capability Transformation, which encourages and facilitates partnerships between SMEs and larger enterprises.
- **Trade associations and chambers of commerce** can also connect enterprises of all sizes through their membership platforms and activities such as overseas business missions.
- **International financial institutions** with deep local knowledge and well-connected networks will help mid-corporates gain insights into foreign regulatory and business environments, and facilitate meetings with potential business partners.

  In addition, financial institutions such as Standard Chartered are able to bank all the players in their clients' supply chain, including domestic and international suppliers, distributors and customers, and as such help mitigate working capital challenges deemed by SMEs as one of the biggest obstacles to internationalisation.[113]

Such types of collaborations and support mechanisms can be particularly useful especially for mid-corporate infrastructure players seeking to participate in large-scale PPP projects in other ASEAN countries, or regional megaprojects such as China's BRI, which are difficult to access alone.

Supporting participation in the Belt & Road Initiative

While the initial stages of China's BRI were exclusively funded or operated by Chinese institutions and companies, the combination of China's domestic debt and the capability gaps of its state-owned enterprises (SOEs) have presented opportunities for both local and multinationals. Whilst strong domestically, China's infrastructure-focused SOEs are relatively new to operating internationally and need partners who can support them in navigating the local environment and develop infrastructure to world class standards.

The BRI will provide the impetus needed for many ASEAN mid-corporates to expand, however players are often unsure of how to be meaningfully involved or have concerns around risk-return trade-offs, and this may result in them missing out on lucrative opportunities. Crucial to addressing such concerns is to establish strategic collaborations and partnerships, based on proving one's unique value-add. According to Roy Teo, MAS's Executive Director of Financial Centre Development, the success of BRI projects is contingent on their bankability. For this to be achieved, the flow of ideas and capital must be facilitated. Project stakeholders including sponsors, investors and operators must be able to easily make cross-border payments and leverage the latest fintech innovations within payments and trade finance, for example.[114] It is important therefore that mid-corporates seeking to access BRI projects partner with financial institutions that possess the right capabilities, including an extensive network and in-depth local insights. For example, Standard Chartered, with its global footprint covering almost 70% of BRI countries and having operated in many of them for over 100 years, has a key role to play in facilitating the BRI development.[115]

Strategy 2: Adopt new digital solutions to improve project planning and performance

Adopting digital solutions such as Building Information Modelling (BIM) and Digital Fabrication techniques will help improve project planning and reduce cost and time overruns

Pressure is mounting for mid-corporates to improve their project performance. The rise of large-scale PPP projects and megaprojects like BRI will force those wishing to leverage such opportunities to scale up their capabilities to a level where they can properly participate and perform well. In addition, given the complexities of operating in different geographies, stronger project planning and management is all the more important now as mid-corporates expand beyond their borders. The longevity of partnerships forged with larger infrastructure players will also be dependent on the performance of mid-corporates in joint projects.

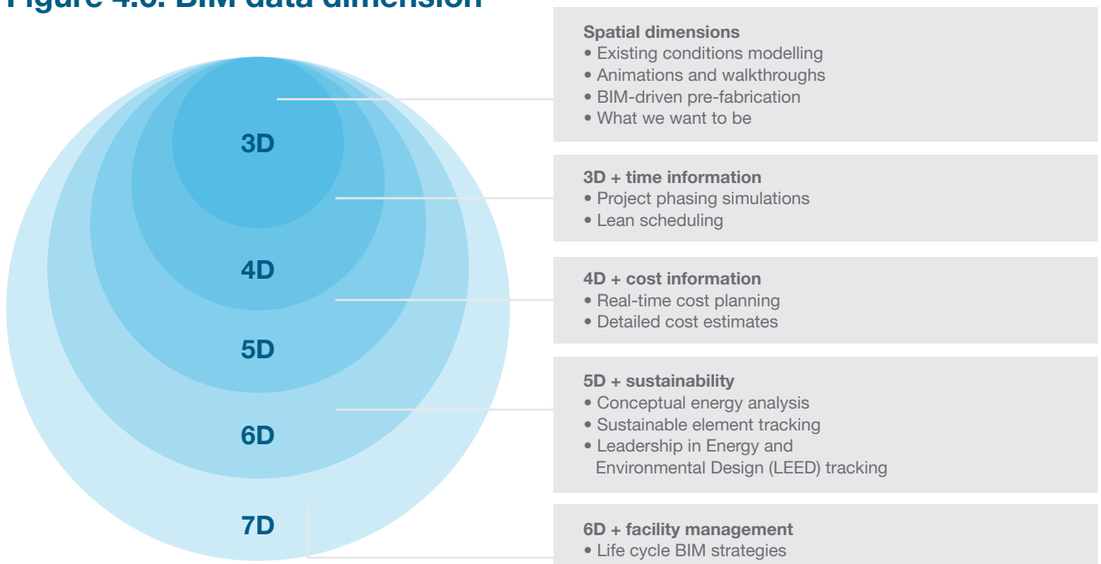
Addressing productivity challenges will be key to driving project performance and ultimately growth for mid-corporates. Digital technologies, such as BIM and digital fabrication techniques, explored next, can go a long way towards helping companies achieve this.

2.1 Building Information Modelling

BIM allows for enhanced digital planning and control of projects, thereby optimising efficiency, minimising risk and improving performance

Traditionally, BIM represented a collaborative technology solution that enables generation and exchange of project information in real time between various project parties in the form of 3D models (spatial dimensions). Advanced BIM now offers new forms of digital planning and control, and can be used to anticipate, resolve and document any clashes and deviations during the different stages of the construction project, while taking into account potential workflow, economic and environmental impacts. Adding multiple dimensions to data shared by users (nD options), such as 4D (3D+time schedules), 5D (4D+cost), 6D (5D+energy usage), and 7D (6D+facility management), enables increased efficiency and early risk identification.[116]

Figure 4.6: BIM data dimension



Source: PwC analysis

The use of BIM by mid-corporate firms is becoming increasingly common, given its usability and cost-effectiveness. In fact, countries like Singapore and the UK have actually made the use of BIM technology compulsory for subcontractor firms participating in government projects.[117]

Asia has been pushing for the adoption of BIM technology through the development of a BIM roadmap. In ASEAN, Singapore has largely implemented BIM and Malaysia is strongly encouraging the implementation to support the Construction Industry Transformation Plan 2020. A minimum of 40% implementation rate of BIM for public projects above RM 100 million is targeted. The construction of major projects such as the building of the Sungai Buloh-Serdang-Putrajaya metro line in Kuala Lumpur mandated the use of BIM Level 2.[118] Similarly, the Ministry of Construction of Vietnam is driving BIM application into the industry; the Institute of Construction Economies developed a BIM Roadmap with the aim of requiring all public projects classified on BIM Level 2 to deliver BIM by 2020.[119]

This new form of digital planning and control will allow mid-corporates to anticipate and mitigate deviations to project execution, hence optimising efficiency, minimising associated risks and improving project performance.

Key impact areas for mid-corporates: BIM offers mid-corporates significant advantages from project planning through to execution.

a. Effective coordination and communication: BIM can be used from the design stage to the construction stage and beyond. All stakeholders have access to a single, integrated source of data, can input additional information using the same standards and conventions, and be alerted when items are modified, therefore equipping them with all the information required to make fully informed decisions. Furthermore, BIM is able to significantly improve communication amongst all project parties, given its effective presentation and documentation process. As project stakeholders are closely aligned, the efficiency and productivity through all stages of the project, from planning and design to execution, is significantly enhanced.

b. Improved visualisation and simulation: BIM technology allows for the compiling of all the information about a project into one complete model and envisioning the building in real life situations. Stakeholders can simulate a wide range of parameters or situations (e.g. resistance to temperature, strength, etc.) very accurately prior to building the physical model and use those to assess options. Hence, issues can be avoided as stakeholders can identify any potential design, construction or operational problems before they occur meaning that costly amendments or modifications, which are commonplace in complex projects, can be avoided.

c. Increased productivity and efficiency: Increased visualisation, closer coordination and communication, improved accuracy and more streamlined planning and design through the use of BIM inevitably translates into greater productivity, especially in the case of large-scale projects. Adopters of 4D BIM, for example, have reported productivity improvement averaging more than 20% compared to the conventional methods of construction.[120] Small and mid-sized players would greatly benefit from productivity improvement, as it would increase their project performance rates and better position them to succeed in partnerships for larger-scale projects in the region. In developing markets of ASEAN, BIM could therefore be a very effective tool to address inherent productivity challenges in the infrastructure industry and help raise productivity towards the level of developed countries in the near future.

In addition, through using BIM, project stakeholders have access to all project information in real time, allowing errors to be detected at early stages, which prevents reworks, delays and the generation of extra costs. A study on the benefits of BIM among users in Asia showed that companies had achieved a 41% reduction in errors and omissions, 31% reduction in re-works, 21% more accurate project estimation, 19% faster project duration, and 23% better waste management.[121]

Case study: Singapore Sports Hub's successful construction using BIM technology

The Singapore Sports Hub was the first project in Singapore to use BIM throughout. BIM technology enabled efficient communication between all stakeholders of the project (design, engineering, construction, and others). Defects in the construction plan were identified early on thereby minimising many potentially costly reworks, which were addressed digitally. BIM played a key role in optimising the roof structure enabling a smoother design with less use of steel, making it lighter and more environmentally friendly. It also helped significantly reduce the time needed to build a structure of such scale.[122]

2.2 Digital Fabrication techniques

As they evolve, Digital Fabrication techniques are likely to disrupt sectors such as residential construction given advantages around greater efficiency, customisation and sustainability

Although still in initial stages of adoption, new technologies such as digital prefabrication systems or 3D printing also show strong potential to revolutionise the infrastructure sector. These technologies combine 3D computer modelling with additive and subtractive manufacturing. Structures are built by overlaying materials or by cutting, carving, shaping materials in ways that would otherwise require complex manual skills or machinery. There is a wide range of Digital Fabrication techniques, but the common underlying aspect is that machines can reliably be programmed to make consistent products from digital designs. Digital Fabrication techniques fall into two broad categories:

Additive technologies such as 3D printing are used to create construction components or entire buildings from the bottom up, layer-by-layer, using an automated and computer-controlled machine. Structures can be made with a variety of materials (polymers, metals, ceramics, concrete, etc.) and designs.

Subtractive technologies such as Computer Numerical Controlled (CNC) and laser cutting are able to cut various solid materials precisely, using sharp rotating tools and cutters or laser beams to remove all unnecessary parts from the surface of the material and create the final product.

Although the potential of certain Digital Fabrication technologies such as 3D printing and related applications is well recognised, as yet there has been no coherent roadmap delineating how these potential and associated benefits should best be pursued, especially in less developed regions of the world such as Southeast Asia.

Despite this, certain applications of Digital Fabrication are already being tested or under way, particularly in areas such as residential construction, where this technology is especially useful. Architects and engineers first design a house using a 3D computer model and then the 3D digital designs are transformed into physical building components. This can potentially revolutionise this sector, especially in developing regions like ASEAN where rising urbanisation levels are pushing demand for housing.[123] The fact that Digital Fabrication technologies permit the construction of identical products makes them highly suitable for government housing or social plans. In fact, Singapore's Housing Development Board is currently investigating the possibility of building public housing for the local population using 3D printing technology.

In addition, universities in Singapore, such as the Institute of Technical Education (ITE), Nanyang Technological University (NTU) and the National University of Singapore (NUS), have invested in centres to explore 3D printing technology. For example, NUS has launched a programme focused on additive manufacturing to accelerate the adoption of 3D printing in construction. Local mid-corporates may be able to participate in such initiatives, for example, local construction player Yosen Advanced Digital Construction and Manufacturing Pte Ltd, signed an MoU with the School of Design and Environment to pursue additive manufacturing in construction.[124]

> Technology is the backbone of our business; our lifeline. We must be able to connect all project officers globally and our technology must work seamlessly for that to happen. BIM is very important for us. For our Singapore clients, that has become a requirement and we expect other ASEAN clients to follow suit.
>
> **Dato' Ir. Dr. Dennis Ganendra**
> CEO, Minconsult Sdn Bhd, Malaysia

Although at present Digital Fabrication is not yet conducive to mass production as such, and weak economies of scale make it a barrier for adoption by smaller and mid-sized players, particularly those in developing regions such as ASEAN, they can still adopt certain elements of Digital Fabrication techniques which are more accessible, like 3D printing for prototyping or small-scale building parts.

Despite the relatively high initial investment requirement, Digital Fabrication techniques bring considerable advantage to construction players of all sizes. Moreover, it is expected that further breakthroughs in equipment, materials, and processes will help ease the technical limitations in the near future. In due course, 3D printing will likely be harnessed to produce greater quantities, build larger-scale structures, and fabricate everyday as well as more specialised and complex objects, and in this way will significantly change the construction industry.

Key impact areas for mid-corporates: Digital Fabrication techniques, once applied by mid-corporates, can bring about significant benefits around project design and execution.

a. Time and cost savings: Digital Fabrication technologies allow firms to operate with lower costs and increased speed. Construction using these technologies require minimal labour and logistics, therefore cutting construction time drastically. This is especially useful in a region like ASEAN, where the rapid rate of urbanisation means there is increased demand for housing and speed of construction is very important. Furthermore, the precision of these technologies allows for an efficient use of production resources, reducing required resources and limiting material waste. WinSun, a Chinese construction company, estimates it saved 80% on construction costs, 60% on labour costs and 60% on waste compared to traditional on-site construction when building the Dubai Future Foundation, one of its main projects, using 3D technology.[125]

b. Reduced effects of skill dependency: Digital Fabrication technologies could help construction firms overcome the issue of skills dependency, especially useful in ASEAN where skilled labour is a barrier to infrastructure project productivity and performance. 3D printers are autonomous or semiautonomous, requiring minimal human surveillance and intervention, and producing higher quality output. These technologies could also allow construction firms to undertake construction in inaccessible or dangerous environments that are not suitable for extensive human labour, ensuring a safer environment for staff. This would help address worker safety concerns present in the region.

c. Customisation: 3D printing allows each product to be tailored to clients' needs and project specifications. Digital tools can be used to create designs that are hard to produce with traditional techniques. Specific parts for fabrication can be produced on demand, quickly and in high quality. In addition, there is no cost increase for producing a one-of-a-kind product, and products can be easily modified. This flexibility can be very useful, especially in complex or non-standard construction projects, and for mid-corporates this can help enhance their technical offering and overall competitive advantage when bidding for projects.

d. Sustainable construction: Digital Fabrication technologies allow products to be designed and printed using sustainable materials other than plastic and concrete. Users are able to try and test different materials for resistance, durability, etc., before printing them in larger quantities. This is especially relevant given the growing importance of green building and sustainable infrastructure, especially in fast-growing regions like ASEAN. Prefabrication is also environmentally sustainable, with more upfront planning meaning less waste, less re-work and less material in the finished product.

Case study: Siam Cement Group builds Asia's first 3D printed home

In Thailand, Thai architect Pitupong Chaowakul (Supermachine Studio) partnered with concrete maker Siam Cement Group to complete Asia's first 3D printed home, using a custom 3D printer from Italian company WASP. The structure exploited the properties of Siam Cement Group's new cement material. The stone-like cement's high compressive strength properties helps overcome the traditional strength limitations of concrete. Its special fibre made it possible to build a tall freestanding structure using a 3D printer and to design the columns in shapes and patterns not achievable in traditional cement construction. It took three months to 3D print the entire construction, and the success of this endeavour has inspired the company to drive the construction industry in Thailand through the use of 3D printing technology.[126]

Sustainable infrastructure and green financing in ASEAN

ASEAN's rapid economic growth and its overarching impact on climate, combined with a corresponding global emphasis on sustainable development, has driven the demand for environmentally sound infrastructure in the region. For ASEAN to put itself on a sustainable trajectory, a substantial amount of green investment will be required. Mid-corporate infrastructure firms planning or executing sustainable projects in areas such as renewable energy, green buildings, sustainable transport, forestry, water treatment or waste management should consider leveraging such initiatives. In addition, they should also be considering accessing alternative sources of finance to fund sustainable projects, including options such as green bonds, in the near future.

ASEAN green bonds

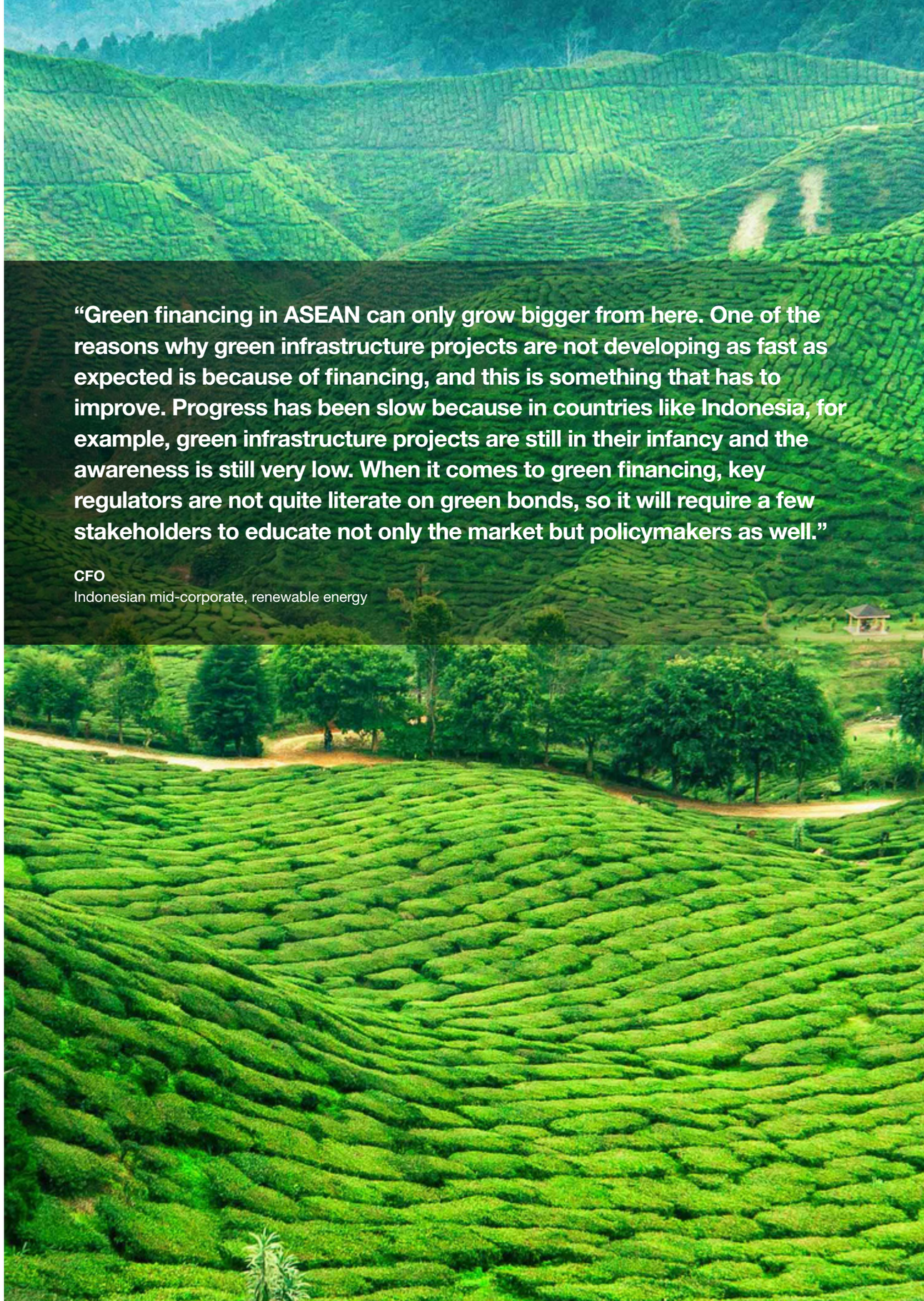
Green bonds, ie. debt sold specifically for sustainable purposes, are at a nascent stage in ASEAN but are gaining traction, with countries such as Indonesia, Malaysia and Singapore introducing green bond standards and incentives to drive growth in this area. The ASEAN Green Bond Standards (ASEAN GBS) aims to enhance the transparency for issuers of green bonds, reduce due diligence costs and help investors make informed decisions. Moreover, it provides market participants with guidance on managing proceeds, processes for project evaluation and selection, and reporting. Total green bond issuances from the region* stands at about USD 4.5 billion. Notably, Indonesia has been the front-running Asian sovereign in the green market, having issued twice in the USD sukuk markets.

Bond issuers in Southeast Asia, both private and public, are increasingly issuing green as well as sustainability and social bonds. For example, in October 2018 Standard Chartered partnered with the International Finance Corporation (IFC) on a landmark issuance in Indonesia. The inaugural Indonesian Rupiah Komodo green bond raised 2 trillion IDR (USD 134 million) to combat climate change. The proceeds will finance infrastructure and climate-related projects, in accordance with Green Bond Principles.

Increasingly, we are seeing a focus on Sustainable Development Goals (SDG) Bonds, which allow for the inclusion of both climate and social themed assets to be eligible for issuance. This will further support infrastructure growth in the region.[127]

Key takeaways

1. Wide infrastructure gap: ASEAN's economic growth rate has outpaced its infrastructure and created a wide 'infrastructure gap', which will require around USD 184 billion in investment to be closed.
2. Opportunities for large-scale projects: This scenario is driving the pipeline for large-scale infrastructure projects such as national PPPs and megaprojects like the BRI, creating major opportunities for mid-corporate infrastructure players, especially in markets with greater infrastructure needs such as Indonesia, the Philippines and Vietnam.
3. Capability upgrade required: Accessing such opportunities requires mid-corporates to develop a mindset of expanding beyond their home market, through upgrading their capabilities to 'best-in-region' and eventually 'world-class', and by establishing long-term partnerships with larger infrastructure players.
4. Digital technology to enhance project performance: Adopting digital technologies such as BIM or Digital Fabrication techniques will enhance mid-corporates' capability maturity in terms of productivity, capacity and skills, to be able to perform well in projects, both domestically and overseas.
5. Improved chances of success: Combined, a regional capability model, synergistic partnerships and innovative technologies, will position mid-corporates in very good stead to maximise their chances of success and to secure future growth in ASEAN and beyond.



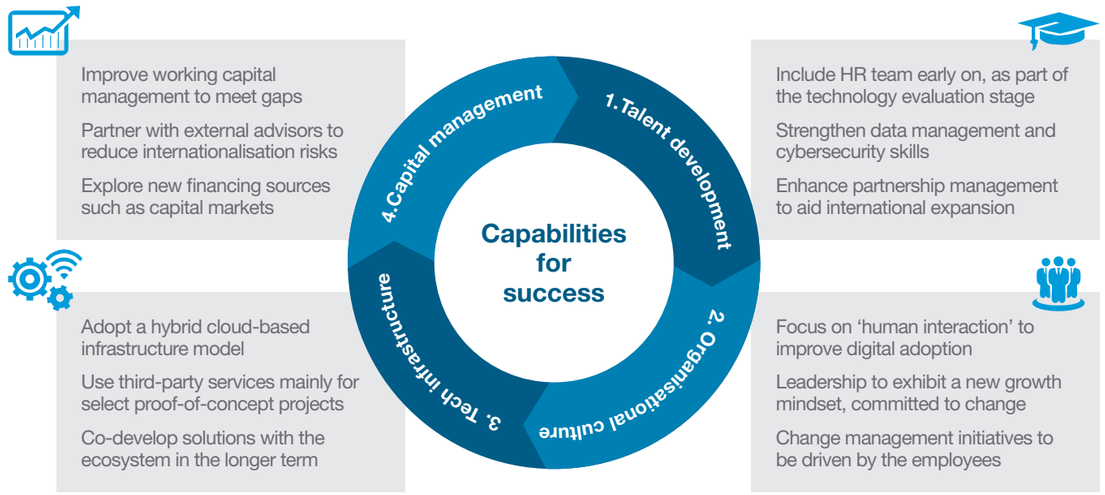
* as of end January 2019

Chapter 5:
Building capabilities for success

Capability foundation for ASEAN's mid-corporates

Adoption of the growth strategies detailed in the earlier chapters, will be imperative to enhancing the competitiveness of ASEAN's mid-corporates in the coming years. However, successful deployment of these strategies will also require mid-corporates to build a stronger and a more coherent capability foundation – one that is aligned to the company's growth ambition and the value proposition that it seeks to deliver, and can be adapted to different countries within ASEAN. This capability foundation will be based on an interconnection of four key elements including the availability of talent, a well-aligned organisational culture, the quality of support infrastructure and the availability of growth capital – all required to enable mid-corporate firms to outmanoeuvre competition in the face of the disruptive shifts being witnessed across our three focus sectors. Besides companies looking to strengthen their domestic position, developing these capabilities will also be essential for those planning to expand into other ASEAN markets or beyond, to tap into new suppliers or to reach out to new customers. Highlighted in Figure 5.1 are the four capability areas that seem most relevant to drive growth for an ASEAN mid-corporate.[128]

Figure 5.1: Capability areas for ASEAN's mid-corporates



Source: PwC analysis

1. Talent development

Build data and partnership management skills, establishing stronger governance standards through formalised processes. Hire or train cyber professionals to mitigate new security risks.

Skill development for mid-corporates

Availability of talent represents a major concern among companies looking to begin their digitalisation journeys. As per a study conducted by PwC, only 27% of company executives worldwide considered themselves equipped at present with the right workforce to digitally transform operations. The issue is even more pronounced for mid-corporates, as they typically face greater challenges in hiring and retaining talent than large enterprises, while having greater financial muscle and brand recognition than smaller firms. Mid-corporates will therefore need to prioritise skill development as part of their strategy implementation plans, outlining external hiring and internal training requirements from the outset. HR teams will need to be included much earlier into the process, as part of the technology evaluation and planning stage itself, to highlight any people-related issues. Mid-corporates will also need to build and showcase elements differentiating them from the larger corporate brands, such as a faster career growth, a more flexible work environment or greater opportunities for personal development – in order to attract millennial talent.[129]

New skill areas for growth

Three skill areas will need to be focused upon in particular, aligned to the growth strategies proposed in this report. These include data management, cybersecurity and partnership management skills. Going forward, strong data management skills (data gathering, analysis and interpretation) will be of utmost importance to differentiate over competition – requiring targeted hiring and learning development programmes. Companies will need to strengthen information exchange and governance standards by establishing codified practices around data ownership (who is responsible for the data), data sharing (when to share data, when to withhold) and dispute resolution (data-related issues with network partners). Besides using analytics to only monitor sales and production metrics, companies will also benefit from adopting new HR analytics tools, to better understand workforce expectations and employee behaviour – resulting in more effective HR practices.[130]

Besides new data skills, a successful digital transformation strategy will also require expertise in cybersecurity, to de-risk technology implementation from threats to customer privacy or loss of confidential information. Cyber threats remain a significant challenge in ASEAN, having witnessed multiple data breaches in recent past. To counter these, companies will need to invest in more robust data security systems (such as those based on machine learning algorithms), but more importantly, they will also need to hire or train specialised professionals who understand cybercrime risks, having expertise in domain areas such as security architecture, intrusion detection and incident response and recovery.[131]

Lastly, mid-corporates looking to venture into new geographies will need stronger go-to-market capabilities to navigate through the complexities of a new operational environment. Identifying and working with the right local partners (e.g. financial advisors, local brands, government agencies) will be essential in this regard, to develop relevant propositions for new customer segments and to adopt more efficient operational practices. Companies will need to learn ways of managing partnerships more effectively, focusing on aspects such as designing suitable contractual arrangements, building well balanced risk-sharing mechanisms and adopting more effective communication systems.[132]

Working with the ecosystem

Besides partnerships for market entry, mid-corporates will also need to work with other ecosystem stakeholders, as part of regional initiatives focused on bridging talent gaps. For example, Enterprise Singapore, a government agency, is working with its counterpart in Indonesia (the Agency for Research and Development of Industry) to enhance cross-border cooperation in developing digital manufacturing skills. Mid-corporates in both markets will need to work with these agencies, through training programmes and workshops, to share and learn best practices on manufacturing innovation in sectors such as automotive, chemicals, electronics, food and beverage, textile and garments. Other private sector initiatives also show strong promise in preparing the region for a digital future. Notable among these is the World Economic Forum's Digital ASEAN initiative that targets to train 20 million digital employees by 2020, having gained participation commitments from many large-scale technology firms.[133]

2. Organisational culture

Establish cross-functional teams to drive implementation, supported by a committed company leadership. Transformation initiatives must be centred on improving the 'people' experience.

People-centred organisations

Cultural resistance remains a major barrier to undertaking growth initiatives among mid-corporates. Driving a cultural shift will therefore be critical to maximise the impact of strategies such as technology adoption or expansion beyond domestic borders. To do so, mid-corporates will need to keep people at the centre of their transformation journey, whether they are customers, value-chain partners or employees. New digital solutions will need to ensure that human interaction with technology promises a seamless and rewarding experience. This in turn, will require focus on aspects such as user experience and human-centred design to achieve customer delight, while incentivising partners and empowering employees for technology adoption. The impact of not doing so could be quite significant, as outlined by PwC's Future of Customer Experience Survey, showing that almost one-third of consumers worldwide would stop interacting with a brand after only one bad experience.[134]

Besides this, companies will also be able to derive much greater value from their digital investments by building a cross-functional team culture – establishing project teams that include a mix of business, operations and technology specialists. For example, a team to implement a digitally integrated supply chain should include a mix of business experts who understand the impact of market influencers (such as pricing, user experience) on customer demand, operational experts to anticipate the impact of changes in demand on supply chain parameters (such as production capacity, delivery time), and technology leads to oversee hardware and software related aspects.[135]

Role of company leadership

Leadership support and commitment towards digitalisation, in the form of codified practices and governance mechanisms, will also be essential for successful implementation of new technologies. Besides this, companies must also evaluate the need for dedicated leaders for business functions growing in their strategic importance. For example, the role of a Chief Supply Chain Officer is gaining momentum among firms, to oversee and drive integration across multiple supply chain components and geographies. Internationalisation initiatives will also require a new growth mindset from the leadership team. This will entail developing the willingness to recognise a company's capability gaps when expanding to new shores, and the capacity to work with partner firms to overcome these barriers. Leadership hiring in these new markets must remain aligned to the company's core values, though overall work culture should also be flexible enough to adopt new operational practices such as different communication styles.[136]

Change management initiatives

Finally, execution of change management initiatives will need to be more employee-driven, rather than being imposed by the senior leadership, focusing on both formal and informal levers to maximise impact. These formal levers will include changes along aspects such as corporate governance frameworks, role design, appraisal systems and other HR policies to create a stronger case for people to adopt new behaviours. Expected behaviours will also need to be reinforced through other informal levers such as by identifying 'role

models' to demonstrate successful digital adoption, or by utilising informal networks (online communities, interest groups) to influence co-workers.[137]

Gaining people buy-in represents a major challenge for most corporate transformation plans. Project implementation teams will therefore need to ensure that all stakeholders impacted by the new processes have a positive experience through the transformation phase. To do so, customers, partners and employees will need to be included as part of an iterative process, seeking their feedback on improvements. Communication from company leadership must explain in detail the rationale behind strategy implementation to enable more valued participation from the employees. Lastly, regular status checks must be undertaken (through interviews or surveys) to monitor changing awareness, understanding and adoption levels among key stakeholders.[138]

3. Technology infrastructure

Adopt off-the-shelf solutions for select pilot projects. Develop technology solutions based on a hybrid cloud model, in partnership with other ecosystem stakeholders in the longer term.

Cloud-based infrastructure

Besides focusing on people skills and organisational culture, mid-corporates will also need to build the right infrastructure that supports real-time interactions across business functions and can be easily integrated with external supply chain partners. Globally, mid-corporates are increasingly adopting cloud-based infrastructure for digitalisation, as it offers lower acquisition and maintenance costs, higher computing power and greater operational flexibility to smaller businesses than traditional technology infrastructure. The growing need to ensure visibility and collaboration across multiple production sites and supply chain components, further builds the case for these solutions, allowing network participants to work together by hosting their data and applications on the cloud. Aligned to these global trends, acceptance levels for cloud solutions are on the rise within the region as well – already a vast majority (70%) of companies surveyed in the Asia-Pacific region, considered cloud technology as 'very important' to their digital strategies.[139]

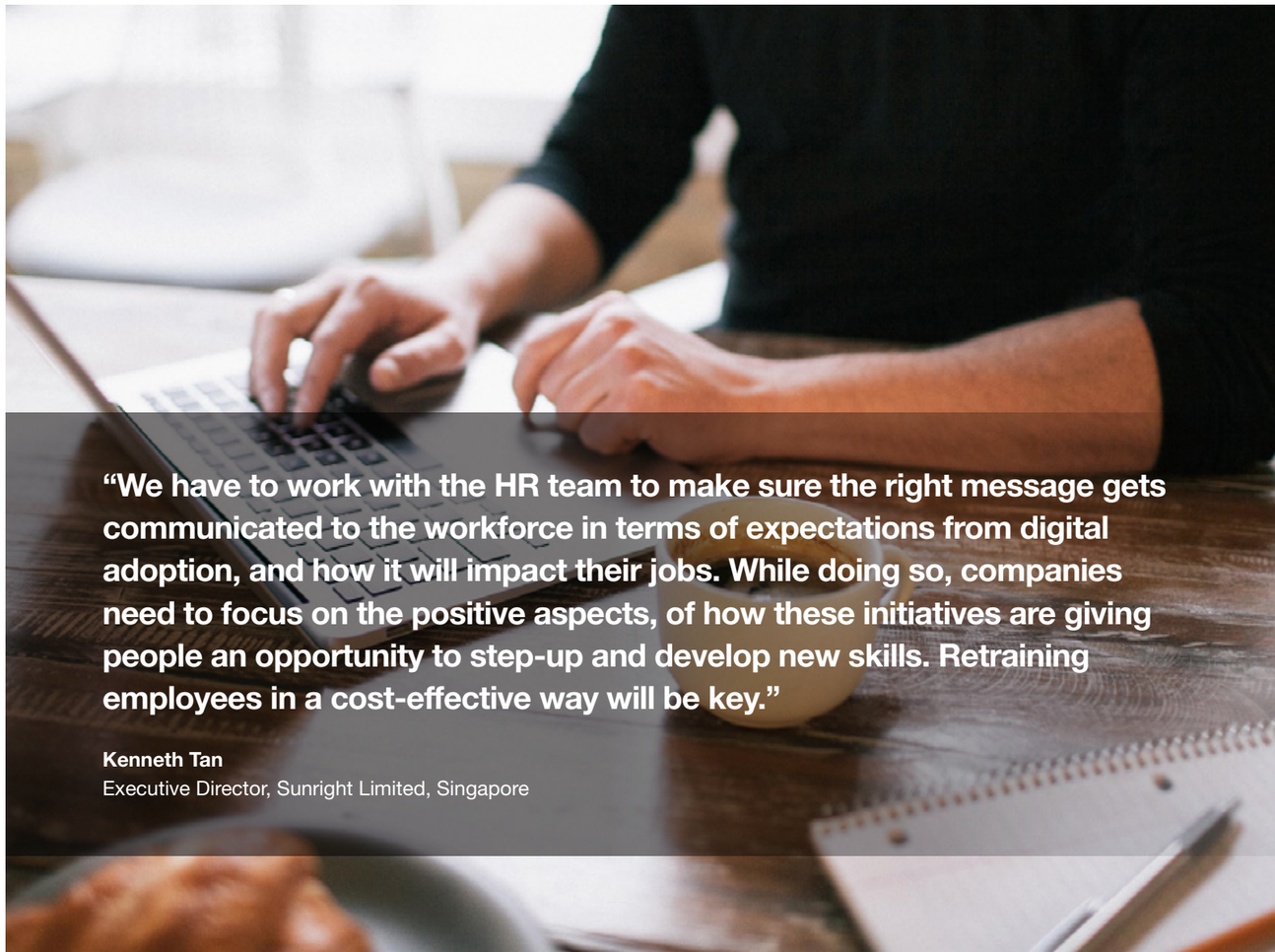
Outsourcing vs. in-house development

Mid-corporate firms with limited technical expertise and need for customisation could consider directly purchasing off-the-shelf solutions (such as licensed IoT platforms) from third-party service providers. This will help kick-start digitalisation more easily for the firm, but could also prove more expensive in the longer term as compared to building in-house capabilities. Though quicker to initialise, this model also offers limited scope for market differentiation and adaptability to changing business conditions. Hence, mid-corporates should limit this approach to only undertaking select proof-of-concept projects, testing a few solutions in a priority roll-out segment to familiarise themselves with digitalisation. Long-term focus must remain on co-developing solutions in partnership with other ecosystem players, including MNC customers, major suppliers, system integrators, and hardware and software vendors, to achieve a sustainable competitive advantage.[140]

For mid-corporates looking at strengthening in-house technological expertise, cloud infrastructure also enables easier transition for these more mature technology adopters – as many of these could be facing legacy concerns, looking to replace obsolete systems with next-generation solutions. However, even these players are concerned about data security and vendor lock-in issues associated with relying excessively on an external service provider. Adopting a hybrid cloud environment, where support infrastructure consists of a combination of 'on-premise' and 'Software-as-a-Service' (SaaS) solutions, is being considered as a suitable solution in this regard. This model allows companies to maintain confidential information within the firm, while utilising cloud-based services managed by third-parties for less sensitive requirements. Furthermore, to better manage legacy issues, companies must also adopt a step-wise approach to technology implementation. Results from pilot exercises must inform the development of a detailed roll-out plan prioritising implementation in specific segments (major customers, revenue streams or regions), while establishing clear schedules for decommissioning of older systems.[141]

Working with the ecosystem

Mid-corporates can also work with technology incubators, digitalisation agencies and other initiatives being undertaken by many ASEAN governments, to help less mature technology adopters in making sounder investment decisions. A notable example in the region is that of the 'Tech Access' initiative in Singapore, which provides companies with access to test equipment, user training and advisory services for technologies such as additive manufacturing, robotics and advanced inspection tools. The Singapore Government has also established two model digital factories, allowing companies to experience technology adoption in an actual production environment. On similar lines, Malaysia's Digital Transformation Labs assist mid-corporate firms in various aspects of technology adoption including diagnosing business issues, designing new business models, developing new products and piloting implementation plans.[142]



"We have to work with the HR team to make sure the right message gets communicated to the workforce in terms of expectations from digital adoption, and how it will impact their jobs. While doing so, companies need to focus on the positive aspects, of how these initiatives are giving people an opportunity to step-up and develop new skills. Retraining employees in a cost-effective way will be key."

Kenneth Tan
Executive Director, Sunright Limited, Singapore

4. Capital management

Strengthen management of working capital especially on the receivables front to meet gaps in growth financing. Explore alternatives to traditional bank loans such as capital markets.

Availability of capital is a growth enabler for companies of all sizes, with financing being required to build all other capability areas including hiring or training talent, deploying new infrastructure or undertaking cultural transformation projects. However, getting access to traditional sources of growth funding (such as bank loans) is typically more challenging for smaller businesses as compared to large enterprises. Financing applications for many smaller firms might get rejected on account of strict regulations around collateral requirements and creditworthiness, while others are offered funds at less affordable rates. An example of this is visible in the area of trade finance, where high operational costs make it less attractive for financial institutions to fund small-ticket transactions. The typical cost-to-income ratio in traditional trade finance is a high 50% to 60%, which represents only operational expenses, without considering costs of risk, liquidity and capital. Structural inefficiencies and regulatory pressures are major factors behind high costs of serving this market, resulting in many applications from mid-corporates being rejected by financial institutions.[143]

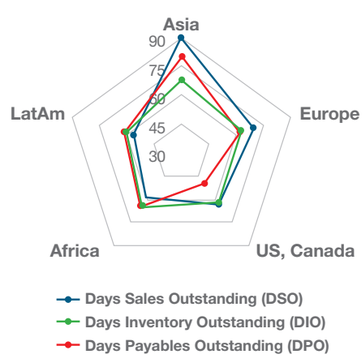
Working capital management

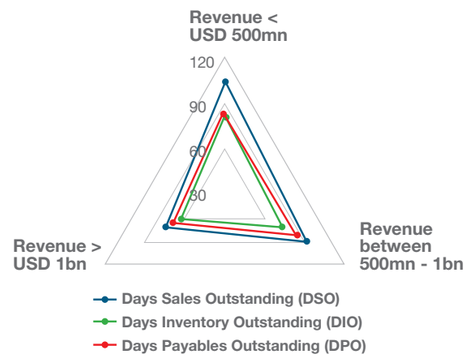
The importance of efficient working capital management increases significantly for mid-corporates, in view of these issues, to generate more cash for their growth initiatives. This will be particularly relevant for players in more capital intensive sectors such as manufacturing and infrastructure development, who can rely on working capital to partly finance investments in advanced digital technologies or new internationalisation strategies. While various aspects could impede working capital performance for smaller businesses, delays in collection of receivables represents a major factor. These delays become even more pronounced for players operating in multiple markets, as payment terms could vary significantly by geography.[144]

For example, as shown in Figure 5.2, the manufacturing sector in Asia is marked with longer payment cycles than other regions, recording higher values of Days Sales Outstanding (DSO). Moreover, smaller businesses (revenue < USD 500 million) have also been seen to record much higher DSO values or receivable days than their larger counterparts. Keeping these trends in mind, mid-corporates operating in Asia (including ASEAN) will need to focus more on improving receivables collection as part of their overall working capital performance. This will require strengthening of their internal management processes – by identifying specific opportunities to tighten credit terms or to address issues around delayed payments. Similarly on the payables front, companies would need to reassess their end-to-end inventory levels, from basic inputs to finished goods, to establish optimal levels that can free finance for other growth initiatives. Developing an enterprise-wide working capital dashboard, to regularly monitor compliance with these more optimised processes, will also be essential for sustainable change within the firm.[145]

> Most of our operations are automated, but we believe in bringing in the right technology at the right time, and in the process we focus on developing and skilling our talent. This mindset and our long-term view have enabled us to be pioneers in our industry. Fortunately, we can count on our financial partners to provide us with capital to invest and take the necessary risks to continue growing.
>
> **Tony Hambali**
> CEO, Dynaplast, Indonesia

Figure 5.2: Components of cash conversion cycle in manufacturing, by geography and company size





Source: PwC, Working Capital in Global Manufacturing, 2018

Role of growth advisors

Besides such internal improvements, companies could also seek professional assistance from specialised partners to maximise impact. Those looking to expand within ASEAN (or beyond) will need to work closely with growth advisors (such as financial, regulatory and tax advisors) to navigate through the business environment in these new markets. For example, financial advisors with presence in multiple markets worldwide could assist mid-corporate firms in developing suitable hedging strategies to secure their investments from foreign exchange risks, counterparty risks or any other market fluctuations. They could also help firms in adopting appropriate cash management solutions for cross-border transactions and improved yield management.[146]

Working with the right financial advisor will also be essential from a supply chain management perspective. In this regard, preference must be given to those who offer coverage over a wide spectrum of industry participants, facilitating seamless transactions between a mid-corporate, its small-scale suppliers, and its large-scale customers. In addition, a suitable financial partner must support a range of payment solutions, simplifying payments to or collections from local and cross-border supply chain members. For example, based on the market need, it must extend more innovative payment methods such as mobile wallets, besides only cash and cheque processing, to further accelerate the cash cycle. Such advisors who can cover the entire ecosystem of supply chain requirements will have greater visibility of industry risks and a stronger understanding of mutual dependencies in the network. Therefore, they can better maintain liquidity and strengthen growth along the supply chain, by offering integrated solutions that will be inevitable for the 'connected' future envisaged for ASEAN's mid-corporates in the coming years.[147]

Alternative sources of funding

Together, all these factors (internal optimisation and external assistance) will result in stronger returns on capital employed for mid-corporates, generating more cash to fund growth. However, besides improvements in capital performance, companies must also broaden their outlook on external financing sources. Mid-corporates in ASEAN have so far relied mainly on traditional bank loans to fund investments, and must also consider other solutions such as government financing schemes, structured trade products, syndicated loans and capital markets (corporate bonds, securitised debt and covered bonds) to garner growth capital. Infrastructure firms in particular, targeting projects in areas such as green buildings, renewable energy, sustainable transport, forestry, water treatment or waste management, could consider 'green bonds' as another alternative to finance their growth plans. Issuers from ASEAN nations including Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam have already issued a cumulative green bond debt of USD 4.5 billion, as of end of January 2019 – showing growing acceptance of this relatively new product in the region.[148]

“Banking institutions, which have been working for many years with construction companies across ASEAN, are quite well-equipped to analyse risks associated with a particular project and to propose tailor-made solutions. Those with extensive ASEAN presence also have the ability to set up more viable regional financing offers.”

CFO
Malaysian mid-corporate, construction

Case study: Financial advisors play a key role in managing the capital needs of mid-corporates

Hoan My Medical Corporation, a private healthcare services provider in Vietnam, has tapped into alternative financing sources such as bond markets to fund its growth plans, raising USD 100 million through the issuance of senior unsecured fixed-rate bonds in October 2018. Issued through Standard Chartered (SCB) Vietnam, and guaranteed by the Credit Guarantee and Investment Facility (a trust fund of Asian Development Bank), the transaction marks the first bond issuance in the country’s healthcare industry, as well as the first bond issuance by an unlisted issuer group. Acting as the company’s financial advisor with strong expertise in local currency bond origination, SCB played a critical role in executing the transaction – guiding Hoan My Medical through the guarantor’s credit and due diligence process, establishing transparent processes and disclosures aligned to international standards and coordinating communication between different stakeholders (the issuer, the guarantor, legal counsels and investors).[149]

Similarly, SCB has also assisted companies in better managing global liquidity as part of their internationalisation plans. It provided a logistics and supply chain firm with a multi-bank reporting solution, covering its global entities spread across the US, UK and the Asia-Pacific region. The integrated online platform (Straight2Bank) extended full visibility of the client’s bank accounts across geographies, and auto reconciliation with the client’s ERP allowed more effective management of cash flows.[150]

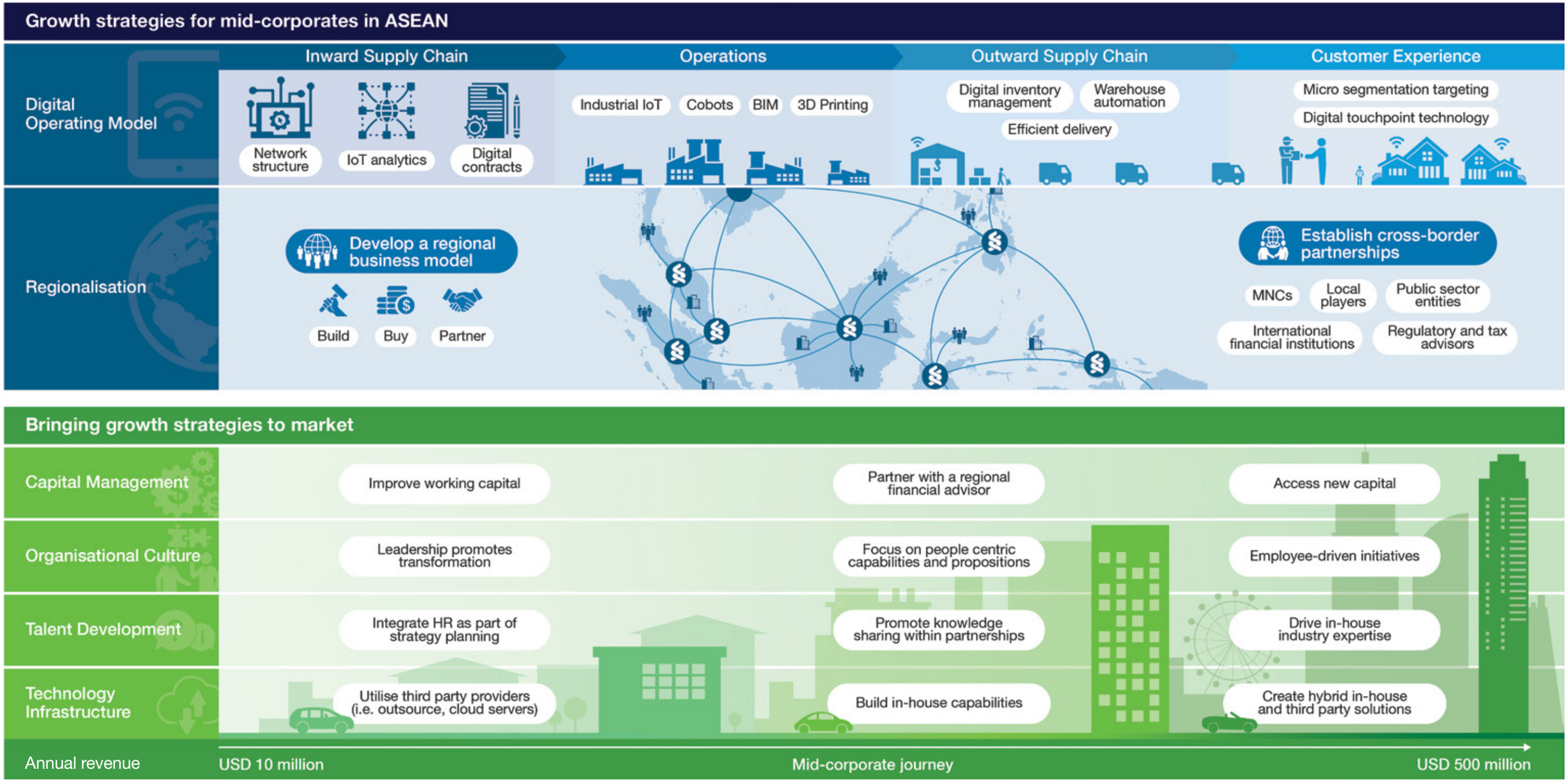
Key takeaways

Four capability areas will be essential for ASEAN’s mid-corporates to transform into a future-ready firm:

1. Talent development: Prioritise hiring and internal training to strengthen data management, cybersecurity and partnership management skills, including the HR team as part of the strategic planning stage.
2. Organisational culture: Implementation and change management initiatives need to focus on customer, partner and employee experience, with the leadership team showing strong commitment to new strategies.
3. Technology infrastructure: Adopt a hybrid cloud based infrastructure model, while leveraging technology incubators, digitalisation agencies and other government initiatives to reduce initial investment risks.
4. Capital management: Improve management of working capital and explore new financing sources (such as capital markets), while engaging with specialised regional partners to maximise impact.

Key Growth Structure

Whilst the strategies for mid-corporate growth in ASEAN are applicable to mid-corporates of varying sizes (annual revenue of USD 10 million -> USD 500 million), their adoption will vary by companies' desire and readiness to adopt and transform the necessary capabilities to execute these strategies. Smaller mid-corporates may execute strategies in a piecemeal manner, which aligns with the redundancy of existing technologies and processes; whilst larger companies may be able to adopt new strategies via a broad digital transformation programme.



Conclusion

ASEAN still remains a positive growth story, but the extent of this depends on the adoption of new growth strategies by the private sector, sustenance of policy reforms by national governments and a renewed focus on infrastructure investments. Greater regional cooperation will also be vital in the longer term – to develop a new growth proposition for ASEAN – shifting from being a predominantly lower-cost manufacturing destination – to a formidable consumer market and a provider of high value-add products for global partners.

The private sector will play a major role in making ASEAN's growth expectations a reality, and in transferring the benefits to its people by generating more productive employment opportunities. This will include all segments of the industry including multinationals, mid-corporates, small-scale enterprises and start-ups. However, local mid-corporate businesses will have a more critical role to play in enabling future growth – especially as global supply chains transform in reaction to disruptive forces, and drive more regionalised business models in the coming years. Being more nimble than larger firms and having a stronger capacity to invest in growth capabilities than small-scale companies, the mid-corporate sector is also well suited in crafting new strategies required to drive more inclusive growth in ASEAN.

In order to fulfil their more prominent role in ASEAN's growth, mid-corporates will need to suitably attune their business strategies. Greater push towards 'digitalisation' and 'internationalisation' represent two major growth themes that emerge from our cross-sector analysis of mid-corporate businesses in ASEAN. Digitalisation will require focus on the 'operations' side of doing business, and will entail the adoption of more advanced technology solutions to improve operational reach, productivity and transparency. Internationalisation, on the other hand, will require focus on the 'market' side, requiring more mature mid-corporates to explore opportunities outside their domestic base to diversify risks and sustain growth. Successful implementation of these strategies will also require an internal transformation within firms – one that is supported by the right talent, a well-aligned organisational culture, robust technology infrastructure and effective capital management.

Capital constraints are a major concern for mid-corporates seeking opportunities for business expansion, and for those planning to invest in advanced technologies. Besides facing stricter collateral requirements for external funds, mid-corporate suppliers in ASEAN also have longer payment cycles than large-scale companies, which restricts the cash opportunity tied up in their working capital. In view of these issues, it will be essential for mid-corporates to work with specialised regional partners, especially financial advisors with presence in multiple markets. Having strong familiarity with local business conditions and a nuanced understanding of mid-corporate operations in ASEAN, these partners can act as growth catalysts for mid-sized firms. Their assistance in exploring alternative sources of finance, providing suitable cash management solutions or in devising suitable hedging strategies against counterparty risks or market fluctuations, will be a force multiplier for mid-corporates, as they seek to defend against emerging disruptions and venture on their next phase of growth.

"Global investors are increasingly looking at ASEAN to lead growth in an era of increased disruption. Achieving this leadership position will, however, require ASEAN's mid-corporates to develop new propositions through enhanced productivity and innovation that can enable their expansion into new regional markets. Standard Chartered is committed to partner these mid-corporates on their transformational journey and ensure that this future-ready transition is seamless and scalable. We will continue to help our clients achieve their aspirations by facilitating access to traditional and new finance as well as partnerships with companies of all sizes."

Jiten Arora
Global Head, Commercial Banking
Standard Chartered Bank

References

[1] International Monetary Fund, World Economic Outlook Database, October 2018; ASEAN Secretariat, ASEAN Statistical Highlights, October 2018; ASEAN Secretariat, Celebrating ASEAN: 50 years of Evolution and Progress, August 2017

[2] International Monetary Fund, World Economic Outlook Database, October 2018; PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018

[3] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; ASEAN Secretariat, ASEAN Strategic Action Plan for SME Development 2016-2025, November 2015

[4] International Monetary Fund, World Economic Outlook Database, October 2018

[5] International Labour Organisation, Key Indicators of the Labour Market, July 2017; International Enterprise Singapore, 'Region set for significant growth, despite the bumps', October 2016

[6] International Monetary Fund, World Economic Outlook Database, October 2018; IE Singapore, Outlook 2017: ASEAN Still Beckons, February 2017; PwC Growth Markets Centre, Winning in Maturing Markets, January 2017; Food Navigator Asia, 'Consumer food trends in Vietnam: Rising incomes offering big opportunities for manufacturers', June 2018

[7] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; International Labour Organisation, Labour productivity, November 2016

[8] International Labour Organisation, Modelled Estimates, May 2018; PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018

[9] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; Huawei, Harnessing the Power of Connectivity - Global Connectivity Index, 2017; World Bank, Digital Dividends, 2016

[10] World Trade Organisation, 'WTO downgrades outlook for global trade as risks accumulate', September 2017; World Trade Organisation, Report to the TPRB from the Director-General on Trade-Related Developments, December 2018; ASEAN Secretariat, ASEAN Economic Progress, October 2017; World Bank Statistics, 2018

[11] ASEAN Secretariat, ASEAN Statistical Highlights, October 2018; World Bank Statistics, 2018; Scotiabank, The NAFTA Success Story, February 2017; Channel News Asia, 'Commentary: Is ASEAN's economic integration still a work in progress?', May 2017; European Commission, DG Trade Statistical Guide, June 2017

[12] BMI Database, October 2018; PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; ASEAN Secretariat, Celebrating ASEAN: 50 years of Evolution and Progress, August 2017

[13] BMI Database, October 2018; ASEAN Briefing, 'Growing Opportunities for Manufacturing in ASEAN', April 2018

[14] Financial Times, 'China's relentless export machine moves up the value chain', September 2018; United Nations Industrial Development Organisation, Industrial Development Reports, 2016-2018; Singapore Business Review, 'US-China trade war will divert trade and investment to ASEAN', December 2018;

[15] Ibid

[16] Ibid

[17] Automotive World, Special report: The ASEAN Auto Industry; June 2018; PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; Katadata, 'Indonesia's First Step to Become Electric Car Manufacturer', June 2018

[18] Malaysian Investment Development Authority, Medical Devices, 2018; Agency for Science, Technology and Research (A*STAR), Report on Future of Manufacturing Initiative, August 2017; Government of the Philippines, The Philippine Manufacturing Industry Profile, July 2017

[19] United Nations Industrial Development Organisation, Industrial Development Reports, 2016-2018; Business Times, 'Strong prospects in Asean, but firms face hurdles to regional expansion', May 2018

[20] Nikkei Asian Review, 'Hungry leaders push Southeast Asia's minimum wages higher', February 2018; Vietnam Briefing, 'Vietnam to Hike Minimum Wages by 5.3 Percent in 2019', August 2018

[21] Oil & Gas Magazine, 'How digital technology can relieve margin pressure', June 2018; Supply Chain Drive, 'How suppliers are innovating to keep pace with the auto industry', February 2018

[22] ASEAN-Japan Centre, Global Value Chains in ASEAN: A Regional Perspective, September 2017; OECD, Mapping the participation of ASEAN small- and medium sized enterprises in global value chains, June 2017, OECD, Making Global Value Chains (GVCs) Accessible to All, May 2014

[23] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; PwC Growth Markets Centre, Winning in Maturing Markets, January 2017

[24] Information Technology & Innovation Foundation, Why Manufacturing Digitalization Matters and How Countries Are Supporting It, April 2018; PwC, Industry 4.0: Building the digital enterprise, April 2016

[25] Bangkok Post, 'Thailand leads Asean IoT exploration poll', June 2018; Singapore Business Review, 'Thailand leads IoT learning in the ASEAN', June 2018; Orange Business Services, Powering up the assembly line, April 2017; PwC Growth Markets Centre, Winning in Maturing Markets, January 2017

[26] IDC, Industry Internet of Things: Manufacturing in Asia-Pacific, April 2018; EDB Singapore, 'What the IIoT means for manufacturing', April 2017; Orange Business Services, Powering up the assembly line, April 2017; Rockwell Automation, Smart Manufacturing, July 2016

[27] PACE, 'IoT-based condition monitoring now a game changer', April 2018; EDB Singapore, 'What the IIoT means for manufacturing', April 2017; Rockwell Automation, Smart Manufacturing; July 2016

[28] Manufacturng.net, 'Improving Quality And Productivity With IIoT', April 2018; Plant, 'Quality in real time: How IIoT is changing automotive production', August 2018; Orange Business Services, Powering up the assembly line, April 2017

[29] Information Technology & Innovation Foundation, Why Manufacturing Digitalization Matters and How Countries Are Supporting It, April 2018; Microsoft, The Internet of Your Things, 2018

[30] Innoprom, 'Industry Adopts the Internet of Things', August 2017; Enterprise Singapore, 'Case Study: Learning from German Manufacturers', 2018

[31] Digital News Asia, Universal Robots Launches E-series Cobots, June 2018; Robotic Industries Association, 'Collaborative Robots Market Update', February 2018; Universal Robots, The Role of Cobots in Industry 4.0, January 2018; Datamatics Business Solutions, Increasing Adoption of Cobots, 2017

[32] Ibid

[33] Robo Pro, Rise of the Cobot, August 2018; Digitalist Magazine, 'How Co-Bots Are Disrupting SME Manufacturing And Driving Productivity', March 2018; Universal Robots, The Role of Cobots in Industry 4.0, January 2018; Robotics & Automation, '4 reasons why collaborative robotics is the answer to SME automation', July 2018; Datamatics Business Solutions, Increasing Adoption of Cobots, 2017

[34] Ibid

[35] Ibid

[36] Universal Robots, Case Stories - PLC Industries, 2018; Enterprise Innovation, 'PT JVC Electronics Indonesia drives manufacturing automation with cobots', May 2018

[37] Universal Robots, Case Stories - Aurolab, 2018; Today Online, 'Robots: What is holding Singapore back?', April 2017

[38] Harvard Business Review, The 3D Printing Playbook, August 2018; IDC Survey Spotlight, 3D Printing Adoption, August 2018; Sculpteo, The State of 3D Printing, June 2018; 3D Printing Industry, 'Is 3D Printing Ready for Mass Production?', May 2018; Digital News Asia, 'Materialise Launches 3D Printing R&D centre in Malaysia', July 2016

[39] Harvard Business Review, The 3D Printing Playbook, August 2018; Sculpteo, The State of 3D Printing, June 2018

[40] Harvard Business Review, The 3D Printing Playbook, August 2018; Sculpteo, The State of 3D Printing, June 2018; Make Parts Fast, '3D printing cuts production tool costs by 40% for aerospace service provider', January 2018; Engineering.com, 'From Prototyping to

Manufacturing: What's 3D Printing Used For?', January 2017

[41] Harvard Business Review, The 3D Printing Playbook, August 2018; Sculpteo, 'Mass Customization In 3D printing: The Best Projects', April 2018; Stratasys Expert Services, 3D Printing: Understanding the Business Drivers for Technology Adoption, 2017

[42] Harvard Business Review, The 3D Printing Playbook, August 2018; PwC Strategy&, The Future of Spare Parts is 3D, January 2017; Stratasys Expert Services, 3D Printing: Understanding the Business Drivers for Technology Adoption, 2017

[43] Spring News, Online Edition, June 2017; TCT Magazine, '3D Metalforge opens metal additive manufacturing centre in Singapore', May 2017; Channel News Asia, '3D printing facility to be built at PSA's Pasir Panjang Terminal', October 2018; Company websites

[44] MHI Annual Industry Report, Overcoming Barriers to NextGen Supply Chain Innovation, April 2018; PwC Strategy&, HBR Webinar - Digital & Connected Supply Chain, October 2017, PwC Strategy&, How Digitization Makes the Supply Chain More Efficient, Agile, and Customer-Focused, September 2016

[45] Orange Business Services, Building Connected Supply Chains, September 2018; Amber Road, Digitization Creates a Strong Value Chain, January 2018; PwC Strategy&, How Digitization Makes the Supply Chain More Efficient, Agile, and Customer-Focused, September 2016

[46] Ibid

[47] Orange Business Services, Building Connected Supply Chains, September 2018; Amber Road, Digitization Creates a Strong Value Chain, January 2018; PwC Strategy&, How Digitization Makes the Supply Chain More Efficient, Agile, and Customer-Focused, September 2016

[48] Orange Business Services, Building Connected Supply Chains, September 2018; EDB Singapore, Logistics and Supply Chain Management, October 2018

[49] EDB Singapore, Logistics & Supply Chain Management, 2018; EDB Singapore, Company Highlights - Infineon Technologies, 2018; EDB Singapore, 'Henkel Unveils Global Supply Chain Hub in Singapore', July 2017; Supply Chain Asia, 'Embracing the Transformation of Tomorrow', November 2017; EET Asia, 'Infineon Unveils Co-Innovation Space in Singapore', October 2018

[50] MHI Annual Industry Report, Overcoming Barriers to NextGen Supply Chain Innovation, April 2018

[51] Orange Business Services, Building Connected Supply Chains, September 2018; Supply Chain Asia, Online Edition, July 2018; IDC Perspective, Role of Internet of Things and Analytics in Asia/Pacific (excluding Japan) Supply Chains, April 2018; Supply Chain Asia, July 2018; PwC Strategy&, How Digitization Makes the Supply Chain More Efficient, Agile, and Customer-Focused, September 2016

[52] Ibid

[53] Ibid

[54] Orange Business Services, Building Connected Supply Chains, September 2018; UNESCAP, Impact of implementation of digital trade facilitation on trade costs, January 2018; Wall Street Journal, 'Blockchain and IoT: New Ways to Fight Supply Chain Risks', December 2017; Chamber of Digital Commerce, Smart Contracts: 12 Use Cases for Business & Beyond, December 2016

[55] World Economic Forum, Trade Tech – A New Age for Trade and Supply Chain Finance, September 2018; Freight Waves, 'Wall Street Blockchain Alliance and BiTA announce partnership', February 2018

[56] Wall Street Journal, 'Blockchain and IoT: New Ways to Fight Supply Chain Risks', December 2017; IBM, 'Blockchain: Four use cases transforming business', May 2017; Chamber of Digital Commerce, Smart Contracts: 12 Use Cases for Business & Beyond, December 2016

[57] World Economic Forum, Trade Tech – A New Age for Trade and Supply Chain Finance, September 2018; Global Trade, 'Trade Finance Constraints Harmful to SMEs', June 2018; Hackernoon, 'What do the future blockchain technologies provide for SME lending?', May 2018

[58] Press Release, 'Standard Chartered completes its first blockchain-enabled cross-border supply chain financing in Singapore for Agrocorp', January 2019; Standard Chartered, 'Standard Chartered to pilot industry's first blockchain-based smart guarantees in trade finance', August 2018; Gulf News, 'Standard Chartered to pilot blockchain-based smart guarantees in trade finance', August 2018

[59] Nikkei Asian Review, 'Thailand's leading banks to share blockchain platform', March 2018; The ASEAN Post, 'Banks in Thailand are embracing blockchain', March 2018

[60] Euromonitor, Economies and Consumer, 2018

[61] Nikkei Asian Review, 'Southeast Asia digital consumer market to hit $50bn in 2017', May 2017

[62] Google and Temasek, 'E-conomy SEA: unlocking the $200B Digital Opportunity', May 2016

[63] E-Marketer, 'Retail Ecommerce Sales in Southeast Asia: Opportunities and Challenges for Six Key Markets', August 2016

[64] PwC, Global Consumer Insights Survey, 2018

[65] LogiAnalytics 'What is Predictive Analytics', November 2017; Customer Think, 'Predictive Analytics, As Your Customers Already Live in Future', June 2017

[66] SelectHub 'Cloud-Based Inventory Management – What is it and Top Solutions'

[67] Standard Chartered, 'Banking the ecosystem'

[68] The Straits Times, BrandInsider, 'Tapping on data science in Retail', September 2015

[69] Wasp Barcode Technologies, State of Small Business Report, 2017

[70] Entrepreneur Asia Pacific, The 4 essential elements inventory, 2013

[71] Getapp Lab, 'Inventory management apps save SMBs more than five hours a week', 2015

[72] Tech in Asia, 'How smart logistics can break the Asian ecommerce ceiling', June 2016

[73] CeMAT Insider, '4 benefits of warehouse automation', May 2018

[74] Futurism, 'They've Increased Productivity by 300 Percent', September 2017

[75] International Labour Organisation (ILO), "Safety and health at work in Asia and the Pacific"

[76] ASEAN.org, "ASEAN to promote safe and decent work", April 2017

[77] Business Insider, "The challenges of last mile logistics & delivery technology solutions", May 2018; Honeywell, 2016

[78] World Bank, 'Indonesia: $400 Million Approved for Logistics Reform', November 2016

[79] Retail News Asia, 'GreyOrange installs 50th Sorter at Pos Indonesia', September 2017

[80] Asia Insurance Review, 'In-transit hijacking main form of cargo theft around the world', November 2018

[81] Tech in Asia, 'Uber for trucks' hauls $840 seed finding for Southeast Asia rollout', 2017; VulcanPost, 'Southeast Asia's "Uber For Logistics" Ezyhaul Raises S$1.2 Million In Seed Investment', 2017

[82] The Nation, 'Giztix out to revolutionise transport, logistics via online platform', September 2016

[83] Forbes, 'Southeast Asia's Logistics Startups Are Winning Big By Tailoring Themselves To Local Markets', October 2018

[84] Frost & Sullivan, 'Omni Channel Customer Experience - Not An Option, But A Strategic Necessity', 2015

[85] Experian, 'Personalisation in marketing – where's the line between 'cool' and 'creepy'?, 2016

[86] Strategy&, 'Your company's customer strategy - A path to delivering distinctive value and experience', 2016

[87] Strategy+Business, '10 Principles of Customer Strategy', Sept 2016; Artesian, 'AI – Building long-term value into micro-segmentation', Sept 2017; Full Surge, 'How Brands are Using Artificial Intelligence in Customer Segmentation'; Chief Marketer, 'Understanding why micro-segmentation is critical to digital experiences', June 2018

[88] Artesian, 'AI – Building Long Term Value into Micro-Segmentation', September 2017

[89] Forbes, 'How Geofencing Marketing Optimizes The Online Experience', November 2017

[90] Trinity Insight, 'How geo-targeting can improve your Marketing performance and ROI'

[91] MarTech Today, 'A new era of personalization: The hyperconnected customer experience', January 2018

[92] TNS Global, 'Navigating the touchpoint revolution', 2016

[93] Sociomantic, ‘Case Study: ZALORA Expands Customer Base Across South East Asia with Programmatic Advertising’, 2015

[94] The ASEAN Post, ‘Banking Southeast Asia’s unbanked’, May 2018

[95] Architonic, ‘Siam Discovery – The Exploratorium’, 2016; InsideRetail Asia, ‘Siam Discovery design wins global honour’, April 2017

[96] ExchangeWire, ‘Asean Marketers Want More Help in Digital; SEA Moving Towards Video Ads’, 2016

[97] PwC, ‘Global Consumer Insights Survey 2018’

[98] SME Portal, SPRINGnews, ‘Innovative Technologies for Higher Productivity’, June 2016

[99] Harvard Business School, ‘The North Face & IBM Watson: A Winning E-Commerce Combination?’, November 2018

[100] Salesforce, ‘State of the Connected Consumer’, 2018

[101] The ASEAN Post, ‘Southeast Asian companies gaining an edge on chatbots’, August 2017

[102] Asian Development Bank (ADB) report, ‘Meeting Asia’s Infrastructure Needs’, February 2017

[103] Standard Chartered Bank, ‘Collaboration key to going global’

[104] BMI; Singapore Finance Minister Heng Swee Keat at the World Bank Singapore Infrastructure Finance Summit, April 2018

[105] Bloomberg, ‘Indonesia needs $157 billion for infrastructure plan’, 2018

[106] PwC, ‘Repaving the ancient Silk Routes’, 2017

[107] Harvard Business Review, ‘Regional Strategies for Global Leadership’, 2005

[108] MIT Sloan Management Review, ‘Building Your Company’s Capabilities Through Global Expansion’, 2012

[109] Channel News Asia, ‘Commentary: Why a small Singapore construction firm ventured to Myanmar 30 years after its founding’, 2018

[110] Journal of Economic, Business and Management, ‘Supplier-Contractor Partnering Impact on construction performance: a study on Malaysian Construction Industry’, 2015

[111] PwC, ‘Presence to Profitability’

[112] El País, ‘ACS y Puentes construirán la amplificación del puente de Rande’, 2014

[113] Standard Chartered Bank, ‘Collaboration key to going global’

[114] Refinitiv, ‘Belt and Road Initiative: 9 overlooked facts’, November 2018

[115] Standard Chartered Bank, ‘A road worth travelling for Singapore businesses’, November 2017

[116] PwC, ‘Building Smart: How digital technology can help construction companies achieve more value’, 2017

[117] United Kingdom Government, ‘Industry strategy: government and industry in partnership’, 2016

[118] RICS, BIM Conference, 2018

[119] American Institute of Physics Conference Proceedings, ‘An Overview of BIM Uptake in Asian Developing Countries’, November 2017

[120] Ibid

[121] PwC, ‘Building Smart: How digital technology can help construction companies achieve more value’, April 2017

[122] Building and Construction Authority, Build Smart, ‘BIM Spotlight: Singapore Sports Hub’, February 2012

[123] Barbour, ‘Is digital fabrication the future?’, Nov 2016

[124] 3D Printing Media Network, ‘Singapore bolsters construction 3D printing through new AM.NUS program’, July 2018

[125] World Economic Forum, ‘Demonstrating the Viability of 3D printing at Construction Scale’, 2016

[126] 3Ders.org, ‘Thai cement maker SCG develops an elegant 3m-tall 3D printed ‘pavilion’ home’, April 2016

[127] Eco-Business, ‘Asean gets funding boost for sustainable infrastructure projects’, May 2017; Monetary Authority of Singapore, ‘The Asian Green Bonds Opportunity’, June 2018; World Bank, ‘The New ASEAN Green Bonds Standards’, April 2018; International Finance Corporation, ‘IFC’s Pioneering Komodo Green Bond Raises $134 Million for Climate Investments in Indonesia’, October 2018. Standard Chartered bank input

[128] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; PwC Growth Markets Centre, Winning in Maturing Markets, January 2017

[129] PwC, Preparing for tomorrow’s workforce, today, November 2018; PwC, Global Digital Operations Study, April 2018; The Peak Magazine, ‘How business leaders and SMEs can attract and retain talent in Singapore’, March 2018; Enterprise Innovation, ‘Shaping the modern workplace for a millennial workforce’, July 2017

[130] Orange Business Services, Building Connected Supply Chains, September 2018; Centre for Strategic and International Studies, Hacking the Skills Shortage, 2017

[131] Centre for Strategic and International Studies, Hacking the Skills Shortage, 2017; Forbes, ‘The Growing Importance Of Cybersecurity Skills’, November 2018

[132] PwC Growth Markets Centre, Future of ASEAN – Time to Act, May 2018; PwC Growth Markets Centre, Winning in Maturing Markets, January 2017

[133] Ministry of Trade and Industry Singapore, ‘Speech by SMS Koh Poh Koon at the Opening of SMT Technology Pte Ltd.’s Smart Manufacturing Demo Factory’, November 2018; CIO Asia, ‘Microsoft, Google join pledge to develop digital skills for ASEAN’, November 2018; Enterprise Singapore, Media Factsheet, October 2018

[134] PwC, Experience is everything: Here’s how to get it right, 2018; PwC, Global Digital IQ Survey, February 2017

[135] Ibid

[136] Forbes, ‘How to maintain your culture in a rapid growth environment’, August 2018; Business Times, ‘Overseas expansion is not for all local SMEs’, May 2018; Harvard Business Review, ‘Create a growth culture, not a performance-obsessed one’, March 2018

[137] PwC, Change management and communications website, 2017; PwC, Global Digital IQ Survey, February 2017; PwC Strategy&, Building a digital culture, 2013

[138] Ibid

[139] Red Reply, How to take advantage of cloud computing for Industrie 4.0 and Enterprise 4.0, 2018; Singtel, ‘How cloud computing meets SME needs’, 2018

[140] Orange Business Services, Building Connected Supply Chains, September 2018; IoT Analytics, Guide to Internet of Things (IoT) Innovation: SME Focus, September 2017

[141] NTT Group - Dimension Data, The Digital Workplace Report, 2017; CeMAT Insider, ‘Is hybrid cloud right for your supply chain?’, April 2017; Digital Supply Chain Institute, Digital Supply Chain Transformation Guide, October 2017; PwC Strategy&, How Digitization Makes the Supply Chain More Efficient, Agile, and Customer-Focused, September 2016

[142] Ministry of Trade and Industry Singapore, ‘Speech by SMS Koh Poh Koon at the Opening of SMT Technology Pte Ltd’s Smart Manufacturing Demo Factory’, November 2018; MDEC, ‘What are the critical steps to successful digital adoption’, April 2018; A*STAR, Tech Access Initiative Website, 2018; MDEC, Digital Transformation Acceleration Program Website, 2018

[143] World Economic Forum, Trade Tech – A New Age for Trade and Supply Chain Finance, September 2018; Asian Development Bank, ‘$1.5 Trillion Trade Finance Gap Persists Despite Fintech Breakthroughs’, September 2017

[144] PwC, Pressure on the Production Line: Working Capital in Global Manufacturing, 2018

[145] PwC, Pressure on the Production Line: Working Capital in Global Manufacturing, 2018; Star Online, ‘Asean listed companies’ debt burden at all-time high’, September 2018; Morgan Stanley, The Case for Middle Market High Yield Investing, March 2015

[146] OECD, New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments, 2015; Standard Chartered Bank input

[147] Standard Chartered, Banking the ecosystem, September 2016

[148] OECD, New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments, 2015; Standard Chartered, ‘ASEAN looking for green shoots’, March 2017, Standard Chartered Bank input

[149] Vietnam News, ‘Hoan My Medical Corporation issues USD99.7 million in bonds’, October 2018; Vietnam Economic Times, ‘Hoan My Medical issues fixed rate bonds’, October 2018

[150] Standard Chartered Bank input

Standard Chartered offices

Brunei Darussalam

Standard Chartered Bank
51-55 Jalan Sultan
Omar Ali Saifuddien
Jalan Sultan Complex
Bandar Seri Begawan
Brunei Darussalam
BS8811.

www.sc.com/bn

+673 265 8000

Cambodia

Standard Chartered Bank
Phnom Penh
Representative Office
Unit G-02
Himawari Hotel
No. 313
Preah Sisowath Quay
Phnom Penh
Cambodia.

www.sc.com/kh

+855 232 127 29

Indonesia

Standard Chartered Bank
Menara Standard Chartered
Jl. Prof. DR. Satrio No.164
Jakarta 12930
Indonesia.

www.sc.com/id

+62 21 2555 0000

Laos

Standard Chartered Bank
Representative Office
House No. 099/05 Ban Naxay
Nongbone Street
Hom # 2 (Postal Address:
P.O. Box 6895)
Vientiane Capital
Lao P.D.R.

www.sc.com/la

+856 21 413032

Malaysia

Standard Chartered Bank
Malaysia Berhad
Level 16
Menara Standard Chartered
30 Jalan Sultan Ismail
50250 Kuala Lumpur
Malaysia.

www.sc.com/my

+603 2117 7777

Myanmar

Standard Chartered Bank
Myanmar Representative
Office
Unit No 6H No.65
Centrepoint Towers
6/F Kyauktada Township
Yangon
Myanmar.

www.sc.com/en/contact-us

+95 1 379960

Philippines

Standard Chartered Bank
Philippines Branch
SkyPlaza Bldg.
6788 Ayala Avenue
Makati City
1226 Philippines.

www.sc.com/ph

+632 8867888

Singapore

Standard Chartered Bank
Singapore Branch &
Standard Chartered Bank
(Singapore) Limited
Marina Bay Financial Centre
(Tower 1)
8 Marina Boulevard
Level 27 Singapore 018981.

www.sc.com/sg

+65 6596 8888

Thailand

Standard Chartered Bank
(Thai) PCL
100 North Sathorn Road
Silom
Bangrak
Bangkok
Thailand
10500.

www.sc.com/th

+66 2724 40 00

Vietnam

Standard Chartered Bank
(Vietnam) Ltd
Room 1810-1815
Level 18 Keangnam Hanoi
Landmark Tower
Pham Hung Road
Me Tri Ward
Nam Tu Liem District
Hanoi 10000 Vietnam.

www.sc.com/vn

+84 2493 680 00