

# ECONOMIC DRIVERS IN A POST-COVID WORLD

MAS-ESS ESSAY COMPETITION 2021

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## **Executive Summary**

The COVID-19 pandemic surfaced demand and supply side shocks across sectors in Singapore, leading Singapore into its worst recession since independence.

In section 1, we discuss four macro trends and effects of COVID-19. Following global lockdown restrictions and economic uncertainty, Singapore experienced a fall in demand for her exports and shocks to supply chains, while companies gravitated towards working from home. The pandemic also laid bare widening socioeconomic gaps. As the world recovers from the initial economic shock, Singapore must manage lingering economic uncertainties and growing inequalities.

In section 2, we propose three directions for Singapore to maintain her relevance as a global hub in the new post-pandemic normal.

First, Singapore should accelerate digitisation across all sectors to maintain her competitiveness and build resilience to weather future crises. We identify four specific recommendations — establishing Singapore as a cross-border payments hub for ASEAN, encouraging Singapore's financial institutions to adapt to the threat of disruption by fintech, supporting companies in the fourth industrial revolution to ensure resilience of supply chains, and enhancing port processes through technology.

The second direction prepares Singapore for a future with hybrid working models as Singapore transitions into the endemic stage of the coronavirus. To do so, Singapore should continually invest into equipping businesses and employees with WFH capabilities, and mitigate increasing cyber risks worsened by working from home.

Finally, sustainable and inclusive growth must be a priority. We recommend accelerating the adoption of green technologies along the entire carbon value chain. Furthermore, Singapore must ensure no one is left behind in our economic transition. To achieve this, Singapore should consider a more progressive real estate tax, and invest in empowering marginalised groups with technology.

As the world gradually recovers from the pandemic, Singapore will reimagine and reinvent our economy to deliver sustainable and inclusive growth.

**Word Count:** 299

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## Introduction

The COVID-19 pandemic disrupted the global economy greatly [Figure 1]<sup>1</sup>.

| Dependent Variable | 2020 Forecast in Oct 2019 | 2020 Forecast in Oct 2020 | Percentage point difference |
|--------------------|---------------------------|---------------------------|-----------------------------|
| World GDP          | 3.4                       | -4.4                      | -7.8                        |
| United States      | 2.1                       | -4.3                      | -6.4                        |
| Eurozone           | 1.4                       | -8.3                      | -9.7                        |
| Japan              | 0.5                       | -5.3                      | -5.8                        |
| Mainland China     | 5.8                       | 1.9                       | -3.9                        |
| Hong Kong SAR      | 1.5                       | -7.5                      | -9.0                        |
| Taiwan             | 1.9                       | 0.0                       | -1.9                        |
| Republic of Korea  | 2.2                       | -1.9                      | -4.1                        |
| Malaysia           | 4.4                       | -6.0                      | -10.4                       |
| Indonesia          | 5.1                       | -1.5                      | -6.6                        |
| Thailand           | 3.0                       | -7.1                      | -10.1                       |
| Philippines        | 6.2                       | -8.3                      | -14.5                       |

Figure 1. GDP forecasts before and during the pandemic. The pandemic drastically decreased economic growth across the globe (Ministry of Trade and Industry, 2020).

Due to both demand- and supply-side shocks<sup>2</sup>, major economic drivers such as trade, tourism, as well as domestic and international consumption all saw downturns, leading Singapore into its worst recession since independence<sup>3</sup> [Figure 2].

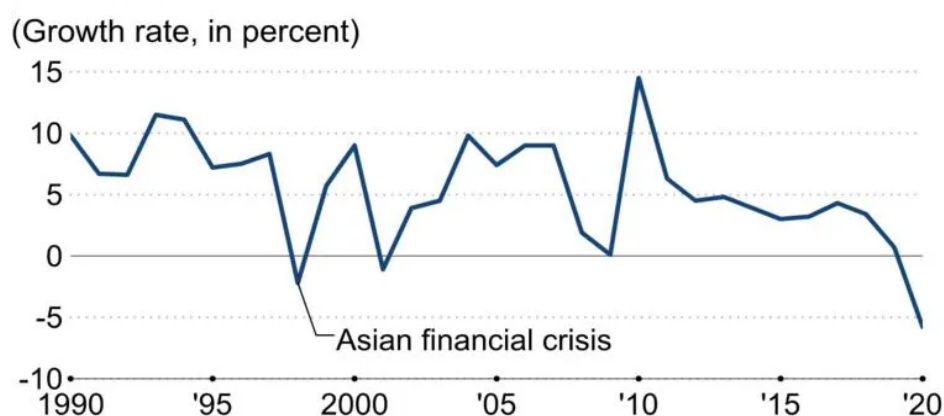


Figure 2. Singapore's Real GDP Growth Rate (%) from 1990-2020

<sup>1</sup> World GDP experienced an average contraction of 3.59% in 2020 (World Bank, 2021).

<sup>2</sup> These include economic slowdown in major economies, global travel restrictions, supply chain disruptions, and the implementation of the Circuit Breaker (CB) measures domestically.

<sup>3</sup> Singapore's GDP contracted 5.8% for the whole of 2020 (Ministry of Trade and Industry, 2021a).

While Singapore's GDP is expected to recover in 2021 driven by global growth, Singapore needs to manage a possible uptick in inflation pressures as consumption increases, while dealing with lingering economic uncertainties and widening inequalities across socioeconomic lines.

### Consumer prices rise for 6th straight month

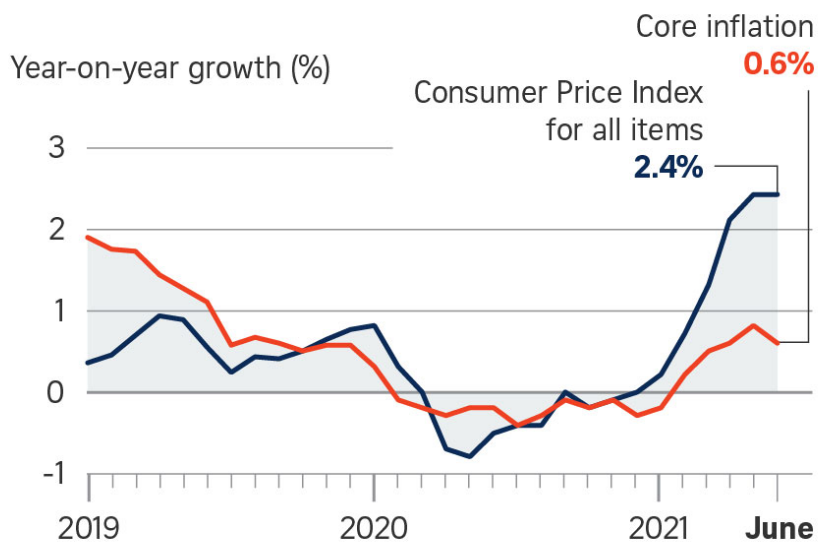
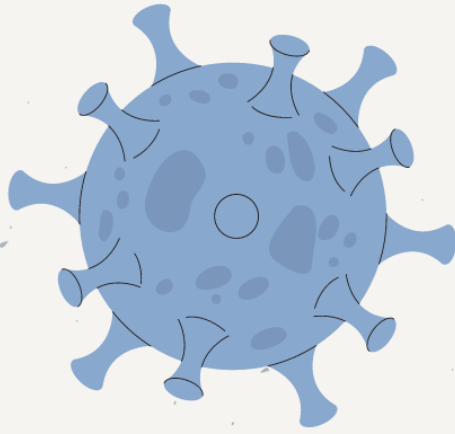


Figure 3. Singapore is experiencing an uptick in core inflation in 2021

As the world gradually recovers from COVID-19, Singapore's future economic growth is contingent upon how it reasserts itself as the world's finance, business, trade and transport hub in a post-COVID world.

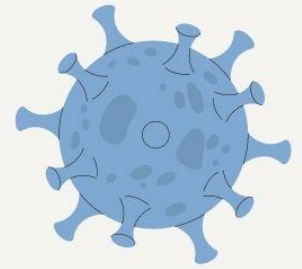


# EFFECTS OF COVID-19

*COVID-19 surfaced both demand- and supply-side shocks across sectors in Singapore. These threats and opportunities demand robust responses to ensure Singapore emerges stronger.*

1. Curbed Demand
2. Supply Chain Disruption
3. Working From Home
4. Inequity

# EFFECTS OF COVID-19



## 1. CURBED DEMAND

*As lockdown restrictions and economic uncertainty weighed on consumer and business sentiments, global demand for Singaporean exports dropped.*

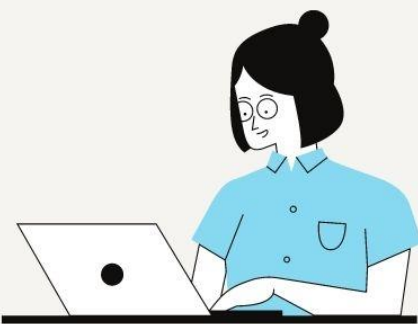
## 2. SUPPLY CHAIN DISRUPTION

*As the pandemic upends factory production in Asia and disrupts global shipping, the supply chain crunch has led to persistent input shortages.*



## 3. WORKING FROM HOME

*A shift to working from home and other hybrid work arrangements are likely to persist in the wake of the pandemic.*



## 4. INEQUITY

*COVID-19 exacerbated inequalities as the marginalised and low-income communities were most affected by the economic impact of the pandemic.*



## Curbed Demand — Trade & Business

Although Singapore's merchandise trade declined significantly during the pandemic,<sup>4</sup> trade rebounded when major economies emerged from their initial lockdowns.<sup>5</sup>

### WHOLESALE TRADE

#### REAL GROWTH

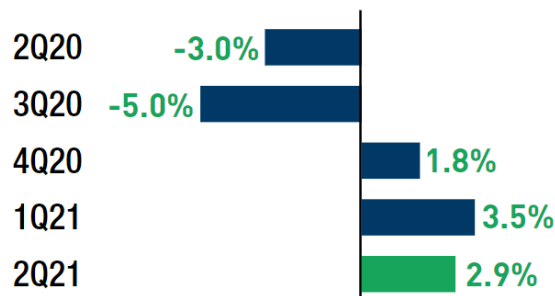


Figure 4. Singapore's quarterly wholesale trade growth (Ministry of Trade and Industry, 2021b)

However, the pandemic had a severe effect on consumer-facing sectors due to restricted business operations<sup>6</sup> and poor domestic consumption. They remained below pre-pandemic levels due to sluggish tourist demand and lacklustre consumer sentiments (Ministry of Trade and Industry, 2020).

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<sup>4</sup> Singapore's imports and exports in May 2020 reached a low of 76% and 82% of pre-pandemic levels respectively (Enterprise Singapore, 2021).

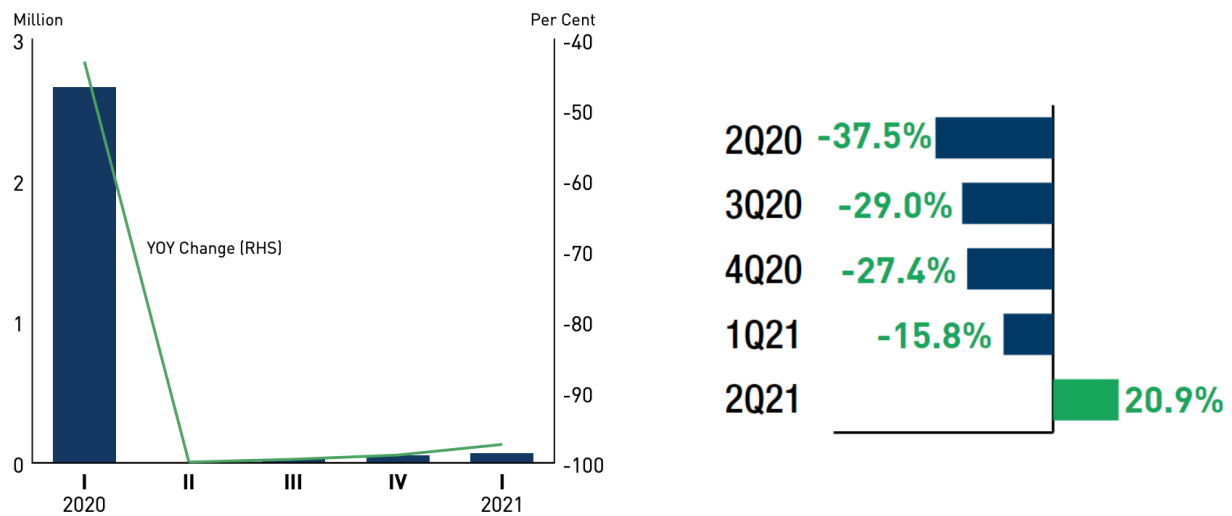
<sup>5</sup> By the end of 2020, exports recovered to surpass pre-pandemic levels while imports recovered to 98% of these levels (Enterprise Singapore, 2021).

<sup>6</sup> For example, physical workplace closures, suspension of dining-in services and reduced visitor capacity as part of safe-distancing measures (Jacob, 2021).

## Curbed Demand — Transport & Tourism

Travel restrictions were imposed globally to contain the spread of COVID-19, resulting in a sharp fall in air travel volumes to Singapore [Figure 5]. Consequently, most major carriers, including Singapore Airlines<sup>7</sup>, experienced a capacity reduction of 60-80% (Josephs, 2020).

**Exhibit 2.8: Visitor Arrivals**



*Left: Figure 5. Passenger arrivals fell dramatically due to the pandemic (MTI, 2021b).*

*Right: Figure 6. Quarterly growth in the transportation sector (MTI, 2021b).*

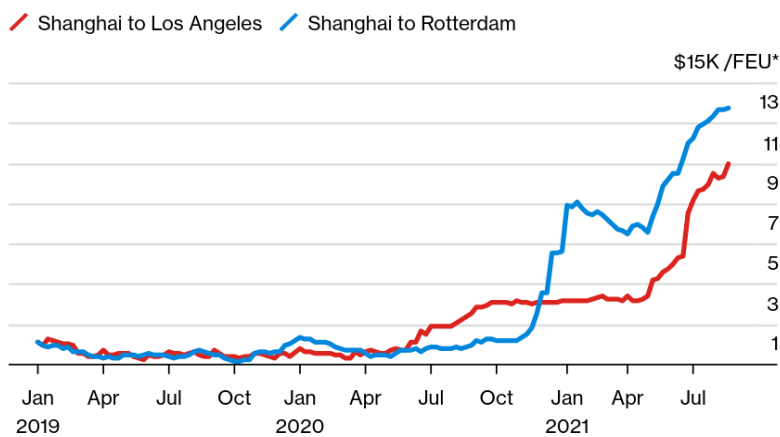
On the bright side, this was partially offset by higher cargo flown revenue [Figure 6] due to strong demand in key segments such as e-commerce and pharmaceuticals.<sup>8</sup>

<sup>7</sup> Singapore Airlines (SIA) Group's passenger traffic (measured in revenue passenger-kilometres) shrank 97.9% in the financial year ending 31 March 2021, leading to its first net loss in 48 years (Singapore Airlines, 2021). In response to massive losses in 2020, the SIA Group undertook an issuance of additional mandatory convertible bonds to raise gross proceeds of \$6.2 billion in a bid to increase liquidity needed to weather the current challenges (Singapore Airlines, 2021).

<sup>8</sup> Singapore Airlines cargo revenue increased by 38.8% year-on-year to \$2,709 million (Singapore Airlines, 2021)

## Supply Chain Disruption

Due to pandemic restrictions<sup>9</sup>, shipping ports globally reported year-on-year drops in cargo of 10%-20% (Baschuk, 2020). Consequently, freight rates were pushed to records, causing some manufacturers to cancel shipments (Wang & Curran, 2021). As a result, Singaporean companies struggled to fulfil their needs for raw materials<sup>10</sup>, leading some to raise costs of their services in response to higher input and manpower costs (Min, 2021).



Left: Figure 7. Rates for shipping containers have hit new highs (Wang & Curran, 2021).

Right: Figure 8. Many countries have introduced export restrictions in response to COVID-19 (Mattoo, 2020)

Moreover, developments in nationalist politics, exemplified by the introduction of export restrictions globally, have prompted countries to further decouple from the global economy (Albertoni & Wise, 2020).<sup>11</sup> This spells trouble especially for Singapore, who is vulnerable to imported inflation.

<sup>9</sup> >50 countries have changed port protocols, ranging from port closure and quarantine measures to additional documentation requirements and examination (Baschuk, 2020).

<sup>10</sup> Food businesses faced difficulties sourcing materials from overseas such as packaging materials and personal protective equipment, while manufacturing businesses had to grapple with the closures of suppliers' factories due to lockdown measures around the world (Subhani, 2020).

<sup>11</sup> >90 countries have taken steps to ban or limit the export of essential goods such as medical equipment, medicines and increasingly agriculture and food products, indicating growing protectionism across the globe at a critical time. (Mattoo, 2020)



## Working from Home

As lockdown restrictions necessitated working from home, companies realised the potential benefits of hybrid working models in increasing productivity.<sup>12</sup>



*Figure 9. Workers were required to work from home as part of lockdown restrictions*

Hence, the pandemic has triggered a desire for more permanent shifts in working models, with employees expecting flexible hours and preferring remote working.<sup>13</sup> In response, some employers have introduced new permanent hybrid working policies.<sup>14</sup>

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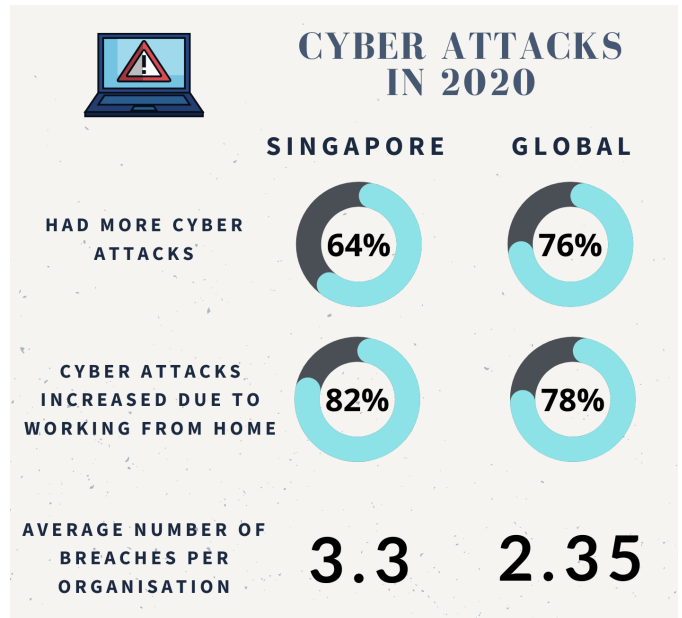
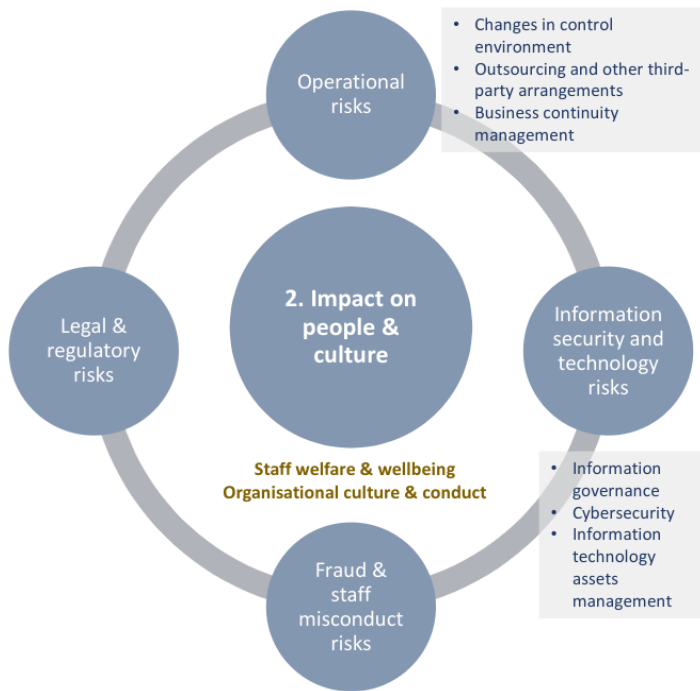
<sup>12</sup> Researchers estimate that the hybrid workforce will boost productivity in the post-pandemic economy by **4.6%** in the US. Most of that gain comes from a reduction in commuting time (Barrero et. al, 2021); Another study by Stanford of 16,000 workers over 9 months found that working from home increased productivity by **13%**. This was due to more calls per minute attributed to a quieter, more convenient working environment and fewer sick days. Workers also reported improved work satisfaction, and reduced attrition rates by 50% (Bloom et al., 2013);

<sup>13</sup> 8 out of 10 workers said in a survey commissioned by The Straits Times that they prefer to work from home or have flexible work arrangements (Sin, 2021).

<sup>14</sup> In DBS, all employees can choose to work remotely up to 40% of the time; in Siemens, approximately 65% of employees worked from home; in Cisco, around 90% of the company's 1,000 Singapore-based workforce worked from home. Some employers, including Microsoft and Facebook have gone further, allowing some staff to work entirely virtually in future. (Ng, 2021)



However, remote working also comes with drawbacks, such as greater risk of burnout and weaker organisational culture [Figure 10].<sup>15</sup> In addition, working from home may lead to inequitable outcomes, as high-earners stand to reap most of its benefits.<sup>16 17</sup>



Left: Figure 10. Risks and impacts of working from home arrangements (MAS, 2021).

Right: Figure 11. Cyber attacks were more frequent in 2020 (VMware, 2021)

Notably, working from home has also exposed cybersecurity weaknesses, as companies experienced a rise in cyber attacks in 2020 associated with increased remote working.<sup>18</sup>

<sup>15</sup> Barclays and Goldman Sachs have been outspoken in their views against permanent agile working, citing concerns around maintaining culture and collaboration as reasons for wanting to return to the 'old' normal. (BBC News, 2021)

<sup>16</sup> The share of survey respondents who worked from home ranged from 10% for those without high school degrees to 50% for those with graduate degrees. (Barrero et. al, 2021)

<sup>17</sup> Dr Ong Qiyang, an adjunct senior research fellow at NUS's Social Service Research Centre, said the pandemic has laid bare existing housing inequalities, as lower-income households have more crowded living spaces and thus have to endure more interference from other's activities. Moreover, they often lack the digital knowledge and financial ability to own the latest digital devices compared to more advantaged households. (Sen, 2021)

<sup>18</sup> About 8 in 10 public and private sector organisations here attributed remote working arrangement to a rise in cyber attacks across the board. (VMware, 2021)

## Inequity

Unfortunately, low-income communities were most affected by the economic impact of the pandemic [Figure 12].<sup>19 20</sup>



*Figure 12. In 2020, the bottom 10% saw the biggest income drop of 6.1%  
(Department of Statistics, 2021)*

In addition, lower-income groups face particular problems reintegrating into the new economy. Many lower-income workers lost their jobs (Gupta et al., 2020), and spells of unemployment, especially when prolonged, make it harder to reintegrate into the labor force (Gangl 2004), a difficulty that women disproportionately face (Alon et al., 2020).

<sup>19</sup> While the overall median household income of Singapore families fell 2.4% in real terms in 2020, lower-income households were the hardest hit, with those in the bottom 10% seeing a 6.1% real decline in income, and the cumulative increase over the last 5 years was the second lowest at 4.3% (Elangovan, 2021).

<sup>20</sup> Another survey by Beyond Social Services showed that household income from work for poor families in Singapore fell 69% in 2020 due to COVID-19 (Menon, 2021).

Numerous government transfers including the COVID-19 Support Grant<sup>21</sup> helped decrease the Gini coefficient to its lowest point since 2000.<sup>22</sup> But as temporary COVID-19 relief is reduced as the economy recovers, we must ensure that the new normal does not exacerbate inequalities for vulnerable communities.

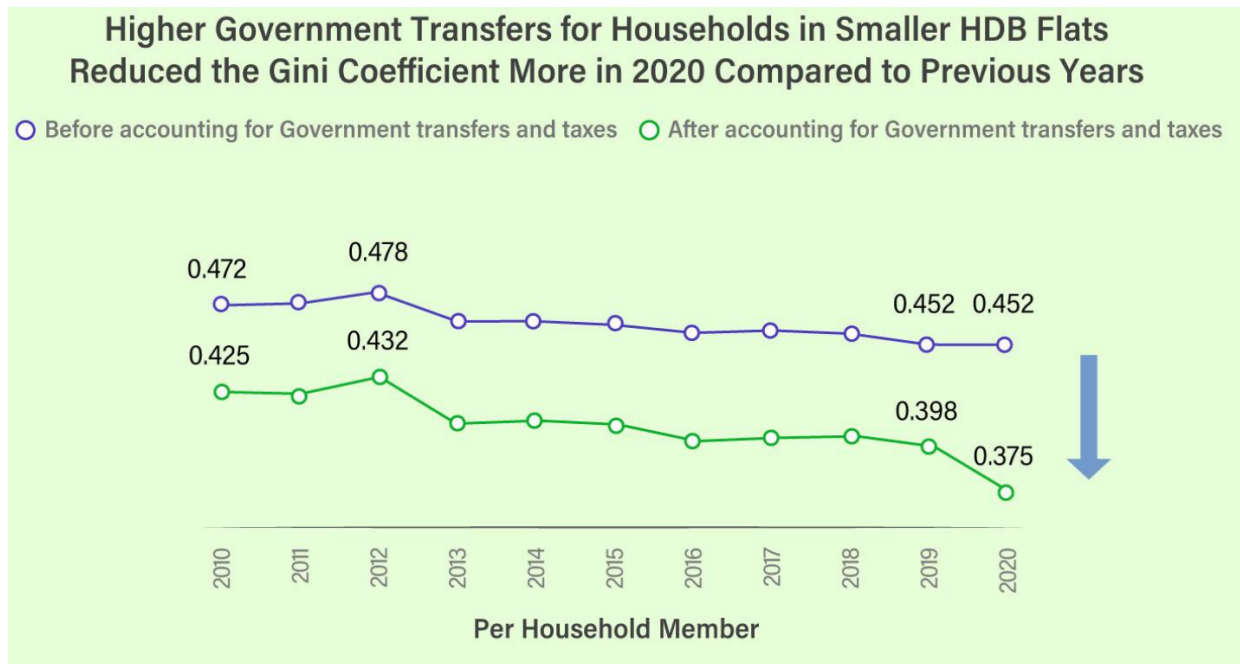
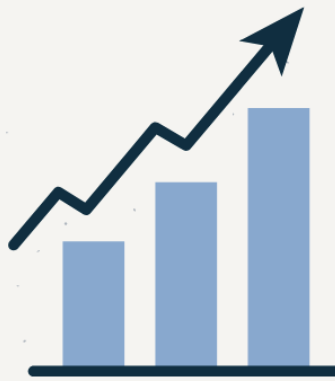


Figure 13. Gini coefficient decreased in 2020 following higher government transfers

<sup>21</sup> The COVID-19 Support Grant assisted those who lost their jobs or suffered a loss of income during the pandemic, e.g. for up to \$700 per month for three months to employees who at the point of application are unemployed (Ministry of Social and Family Development, 2021).

<sup>22</sup> The Gini coefficient in 2020, after government transfers and taxes, was 0.375, lower than 0.398 in 2019 (Elangovan, 2021).



# SECURING SINGAPORE'S FUTURE POST COVID-19

*In order to sustain her position as a major financial, business, trading and transportation hub post Covid-19 and pursue inclusive growth, we propose the following:*

1. Accelerate transition to digital infrastructure
2. Support the shift to agile work arrangements
3. Pursue sustainable and inclusive growth

# 1. ACCELERATE TRANSITION TO DIGITAL INFRASTRUCTURE

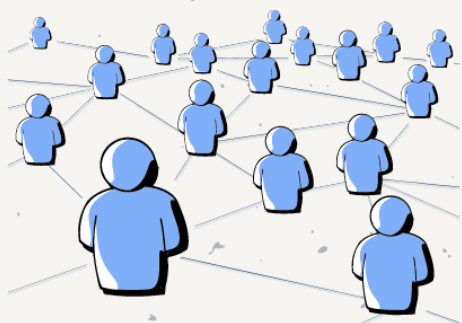


## *Recommendation 1*

ESTABLISH SINGAPORE AS A CROSS-BORDER PAYMENTS HUB FOR ASEAN

## *Recommendation 2*

ENCOURAGE SINGAPORE'S FINANCIAL INSTITUTIONS TO ADAPT TO THE THREAT OF DISRUPTION BY FINTECH



## *Recommendation 3*

SUPPORT COMPANIES IN THE FOURTH INDUSTRIAL REVOLUTION TO ENSURE RESILIENCE OF SUPPLY CHAINS

## *Recommendation 4*

ENHANCE PORT PROCESSES THROUGH TECHNOLOGY



## Accelerate Transition to Digital Infrastructure

Singapore's less-than-ideal productivity growth compared to her peers underscores the need to digitalise in all sectors or risk losing competitiveness.

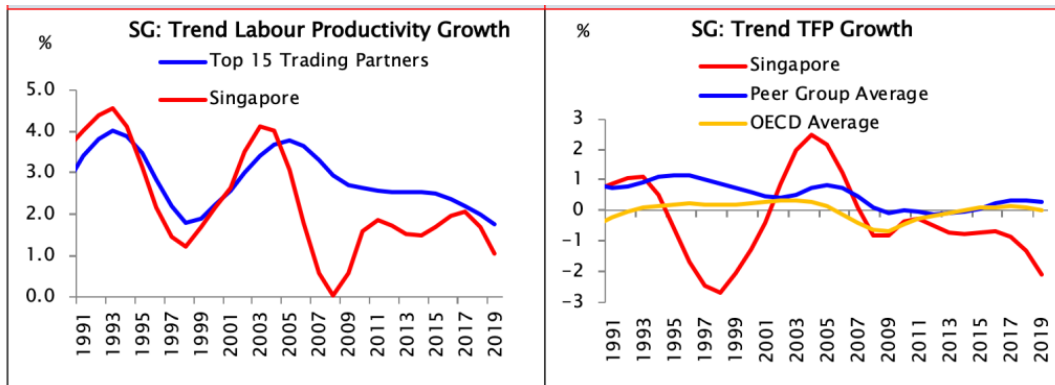


Figure 14. Singapore's and her peers' labour productivity and total factor productivity<sup>23</sup> growth from 1991 to 2019 (Bhaskaran & Chiang, 2020)

### **Recommendation 1: Establish Singapore as a cross-border payment hub for ASEAN**

Widespread lockdown restrictions led to rapid growth in local<sup>24</sup> and global e-commerce [Figure 15]<sup>25</sup>, accelerating the expansion of cross-border payments<sup>26</sup> [Figure 16].

<sup>23</sup> Total factor productivity (TFP) is a measure of the economy's capacity to extract the most output from combining labour, capital, technology and management ability (Bhaskaran & Chiang, 2020).

<sup>24</sup> The Singaporean e-commerce market is worth \$4.9 billion, and is expected to grow at a **compound annual growth rate of 8.35%** in 2021. (Gallaher & Cory, 2020).

<sup>25</sup> Consumers worldwide spent \$4.29 trillion online in a pandemic-fueled 2020, up from \$3.46 trillion in 2019. The 24.1% annual jump in global web sales was an increase from 17.9% growth in 2019 (Digital Commerce 360, 2021).

<sup>26</sup> Cross-border payments volume is predicted to **grow by ~25%** in the next 4 years globally from 2018 (Newman & Denecker, 2018). Similarly, the digital payments market is expected to grow in 2021 by 11% worldwide and as high as 15.9% in places like China (Gallaher & Cory, 2020).



Figure 15. Global e-commerce sales worldwide increased significantly in 2020  
(Digital Commerce 360, 2021)

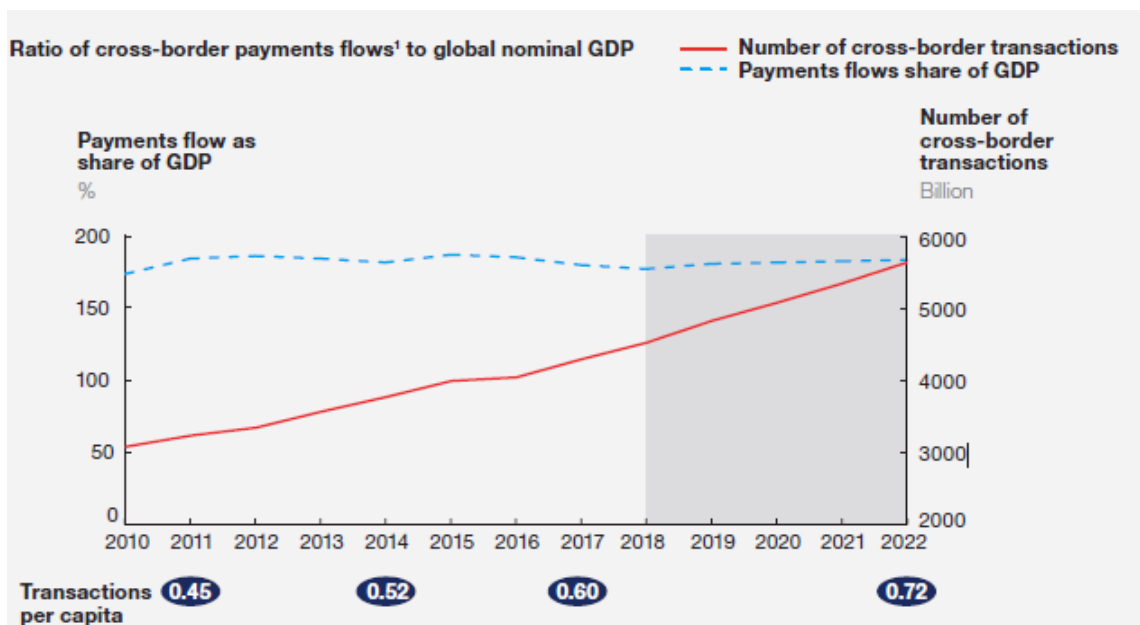


Figure 16. Cross border payments volume is poised for strong growth  
(Newman & Denecker, 2018)

ASEAN presents rich opportunities for Singapore's payments processing aspirations [Figure 17] as much of its growing middle class<sup>27</sup> still lack access to established banking systems<sup>28</sup> and cash remains the primary means of transaction [Figure 18].<sup>29</sup>

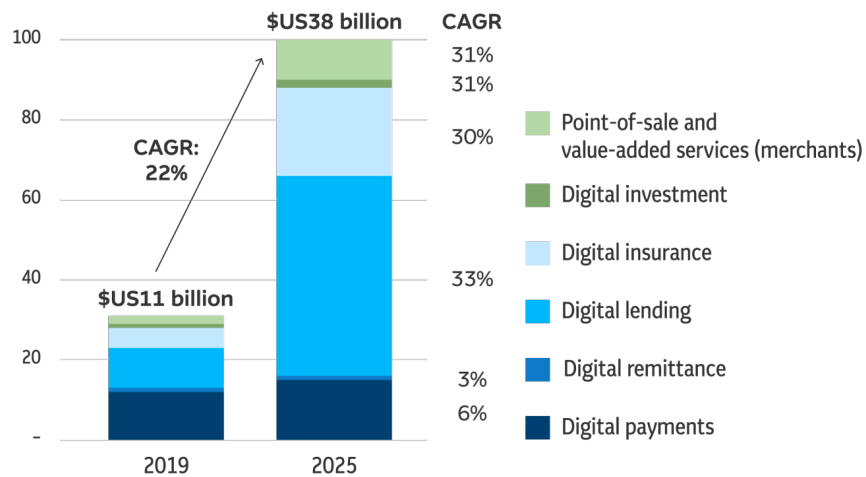


Figure 17. ASEAN digital financial services represent a **\$US38 billion** revenue opportunity by 2025 (Macquarie Group, 2021)

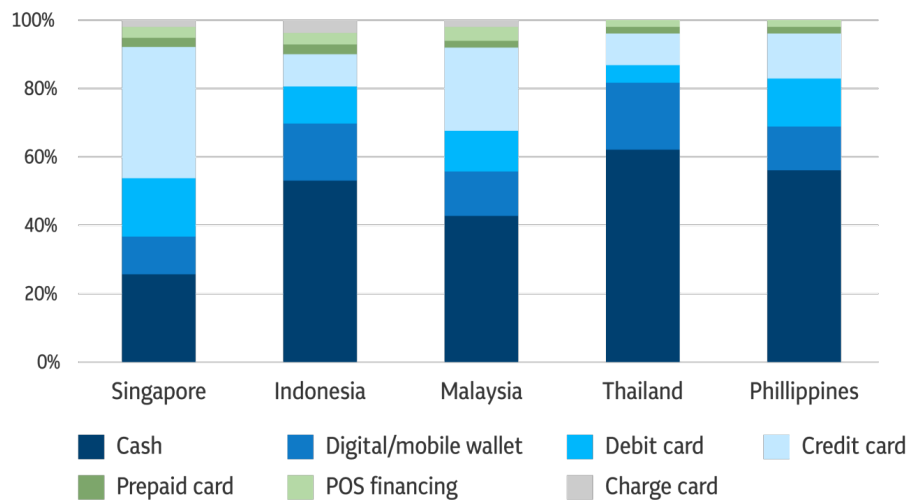


Figure 18. Cash usage remains dominant (>50%) in Thailand, Philippines, and Indonesia (Bain & Company et al., 2019)

<sup>27</sup> The proportion of ASEAN's population living under the poverty line fell below 10% for the first time in the past decade (United Nations University, 2020)

<sup>28</sup> In ASEAN countries, half the population — **266 million** — remain unbanked with no access to financial products, and a further fifth (18%) are underbanked, lacking access to anything other than a bank account. (Fitch Ratings, 2020)

<sup>29</sup> A majority of the ASEAN population continue to only accept cash payments and pay their employees and suppliers in cash. This underlies the reason 60% of the region's Gross Transaction Value is cash based. (Bain & Company et al., 2019)



Considering the complexity of cross-border payments involving a range of stakeholders and back-end processes [Figure 19], Singapore must overcome significant technical and regulatory hurdles in the region.

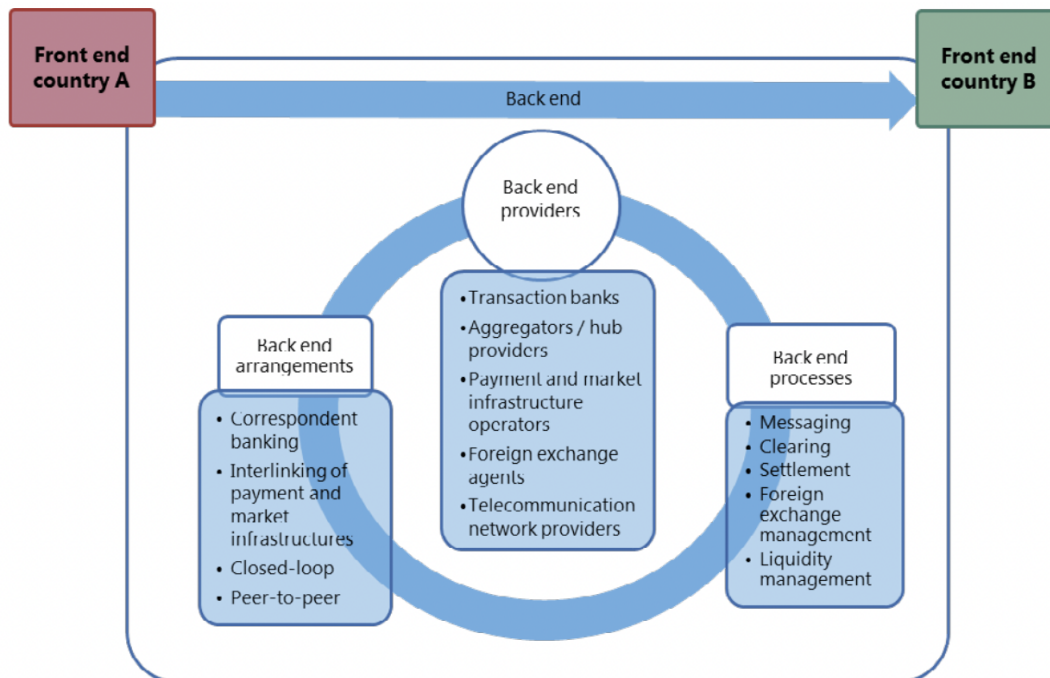


Figure 19. Back-end processes involved in cross-border payments (Bank for International Settlements, 2018)

Firstly, technical challenges<sup>30</sup> can be ameliorated with technological advancements such as DLT<sup>31</sup>. Singapore can pioneer the development of such technologies through schemes like MAS' Fintech Regulatory Sandbox.<sup>32</sup>

<sup>30</sup> Cross-border payments often require settlement in different currencies, which increases risks and costs (Bank for International Settlements, 2018). The risks include (i) exchange rate risk, where exchange rates move unfavourably from the moment a payment is initiated in one currency until it is completed in another; and (ii) settlement risk, where payment is made in one currency but the other party fails to make the reciprocal payment in the other currency (Bank for International Settlements, 2018).

<sup>31</sup> Distributed Ledger Technologies. DLT offers potential benefits by reducing risk and costs in cross-border payments. For example, services converting fiat currencies into a digital currency, and then back into a different fiat currency to transmit to the recipient can shorten FX settlement cycles and ultimately, potentially reduce risk (Bank for International Settlements, 2018).

<sup>32</sup> The FinTech Regulatory Sandbox enables financial institutions to experiment with innovative financial products or services within a well-defined space and duration. Depending on the

Secondly, vague regional regulations have stymied the interoperability of payment systems in ASEAN, paralleling the difficulties in deploying blockchain in the UAE.<sup>33</sup>

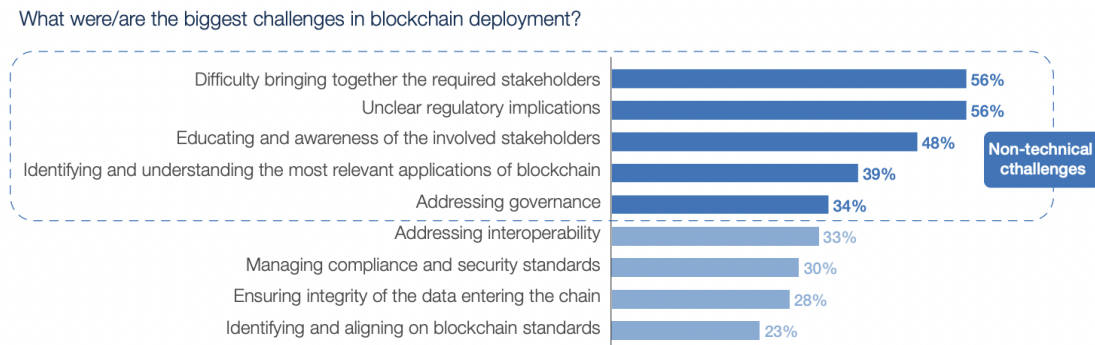


Figure 20. Challenges in blockchain deployment in the UAE (World Economic Forum, 2020)

Thus, MAS can spearhead the unification of payment systems across ASEAN, establishing a system like *Buna*, the cross-border payment system owned by the Arab Monetary Fund<sup>34</sup> utilising blockchain technologies<sup>35</sup>. Current efforts such as the Payments Council<sup>36</sup> and the successful collaboration with the Bank of Thailand indicate positive momentum for future expansion into ASEAN.

experiment, MAS provides the appropriate regulatory support by relaxing specific legal requirements for the duration of the sandbox.

<sup>33</sup> A survey of 40 government entities and 120 blockchain companies revealed that non-technical challenges such as “unclear regulatory implications” and “difficulty bringing together the required stakeholders” were most often cited as the greatest challenge faced in implementing blockchain [Figure 20] (World Economic Forum, 2020).

<sup>34</sup> Buna was launched as a regional payments market infrastructure aiming to deliver secure and efficient payment solutions in the Arab region to enhance growth and integration. Buna is transforming the payment scene by serving as a single entry point to the region’s financial systems for global financial institutions, as well as a multi-currency and multi-instrument system for local ones (Arab Monetary Fund, 2017).

<sup>35</sup> The UAE launched both the Emirates Blockchain Strategy 2021 and Dubai Blockchain Strategy 2020 to enhance government services by adopting blockchain technology. The use of blockchain technology will not only allow operational **cost reductions of – AED 11 billion (US\$3 billion)**, but will also support digital security of national transactions, as well as accelerate decision-making processes (World Economic Forum, 2020).

<sup>36</sup> The Payments Council, established in 2017, encourages collaboration within the payments industry, promotes interoperability among e-payments solutions, develops strategies to drive the pervasive adoption of e-payments, and makes recommendations to MAS on payments related policies (Monetary Authority of Singapore, 2017).



Figure 21. Buna



### CASE STUDY: MONETARY AUTHORITY OF SINGAPORE (MAS) AND THE BANK OF THAILAND (BOT)

The MAS and BOT launched the linkage of Singapore's PayNow and Thailand's PromptPay real-time retail payment systems in April 2021. The **first of its kind globally**, the linkage is the culmination of years of collaboration between MAS and BOT, both countries' payment system operators and participating banks.

Using just a mobile number, customers will be able to transfer funds of up to S\$1,000 or THB25,000 daily across the two countries, enabling **seamless and secure transfers** between customers' accounts in Singapore and Thailand (Monetary Authority of Singapore, 2021).

## Recommendation 2: Encourage Singapore's financial institutions to adapt to the threat of disruption by fintech

As much of daily life moves online due to COVID-19, Singaporean financial technology (fintech) firms have seen healthy growth<sup>37</sup> which has disrupted traditional financial institutions (FIs) [Figure 22].

### Top three greatest sources of disruption – all respondents



Figure 22. According to banks, the greatest source of disruption comes from fintech (KPMG, 2018).

<sup>37</sup> Research published by the Swiss Finance Institute found that with more time spent at home, during COVID-19 pandemic, the daily average rate of Fintech app downloads increased from 29.2% to 32.8% (SIA Partners, 2021). Furthermore, 66% of Singaporean FinTechs saw an increase in demand in their business during COVID-19 (Oliver Wyman, 2020).

Local FIs need to boldly incorporate fintech into their business operations as others have done, or risk a Kodak moment<sup>38</sup>.

**CASE STUDY:**

**FIs INCORPORATING FINTECH**

**SANTANDER UK PARTNERS WITH  
A FINTECH FOR A SMALL  
BUSINESS LOAN SOLUTION**



Santander UK has licensed the Kabbage platform to power automated lending to small-medium UK businesses. The platform accelerates the underwriting process for businesses looking for loans up to 100,000 British pounds (GBP) online — **reducing the processing time** from 2-12 weeks to 24 hours (Dunkley, 2016).

 **AVIVA IMPROVES THE ONLINE  
BUYING JOURNEY**

Aviva's new initiative, 'Ask it Never', aims to **leverage big data to reduce the need to ask customers questions**. This reduces the number of forms customers must fill out to obtain new policies, thus improving the online buying journey and more accurately price premiums.

<sup>38</sup> In reference to the Eastman Kodak Company's decline when cameras and film were overtaken by smartphones and digital technologies (PricewaterhouseCoopers, 2016).

Furthermore, given the persistent local tech talent shortage<sup>39</sup> and the increasing allure of the tech industry<sup>40</sup> [Figure 23], FIs and MAS must ensure the continued pipeline of top talent to FIs. FIs should collaborate with polytechnics and universities by providing apprenticeships to prepare students for tech jobs, and train fresh and mid-career professionals through programmes like company-led training and TechSkills accelerators<sup>41</sup>.

|               | Avg. salary | Avg. cash bonus | Avg. stock bonus | Total  |
|---------------|-------------|-----------------|------------------|--------|
| Facebook      | \$110K      |                 | \$80K \$50K      | \$240K |
| Snap          | \$120K      |                 | \$18K \$59K      | \$197K |
| Twitter       | \$120K      |                 | \$19K \$19K      | \$157K |
| Amazon        | \$105K      |                 | \$37K \$13K      | \$155K |
| Yelp          | \$108K      | \$20K           | \$26K            | \$155K |
| Microsoft     | \$107K      | \$27K           | \$20K            | \$154K |
| Google        | \$107K      | \$27K           | \$16K            | \$151K |
| Uber          | \$108K      |                 | \$38K            | \$146K |
| Apple         | \$108K      |                 | \$16K \$13K      | \$137K |
| Capital One   | \$90K       | \$10K           |                  | \$100K |
| IBM           | \$91K       | \$6K            |                  | \$97K  |
| Goldman Sachs | \$85K       | \$12K           |                  | \$97K  |

Figure 23. Globally, top tech companies (Facebook, Snap, Twitter, etc.) are paying more than some banks (Capital One, Goldman Sachs) (Chia, 2021).

<sup>39</sup> Of the 21,000 net jobs created in the finance sector in the last five years, Singaporeans took up only 35% of the tech jobs (Min, 2021).

<sup>40</sup> Jobs in the tech industry have a perceived culture of dynamism and enjoy higher compensation — large fintechs in Singapore now pay more than big banks [Figure 23], as bank bonuses have been reduced in the current economic climate (Chia, 2021).

<sup>41</sup> Launched by IMDA, The TechSkills Accelerator (TeSA) initiative trains mid-career professionals for in-demand tech roles in areas such as data analytics and software engineering (IMDA, 2021).

FIs also need to inculcate innovation. Beyond in-house accelerators and innovation labs<sup>42</sup>, FIs should consider creating separate fintech spinoffs — unburdened by internal politics and with motivated staff — that are able to rectify weaknesses within their current business models.

Marcus by Goldman Sachs provides a successful case study (Graham, 2017):



### CASE STUDY: **MARCUS BY GOLDMAN SACHS**

Goldman Sachs expanded its offerings into consumer banking with Marcus in 2016. An independent offshoot of Goldman Sachs, Marcus is an online bank which offers a variety of financial instruments to customers. In a short span of four years, it has amassed \$96 billion in deposits and has expanded internationally.

Marcus has punched ahead of its peers, offering the best online savings accounts and rates. Their personal loans have been recognized by J.D. Power as #1 in personal loan customer satisfaction in 2019.

Key to Marcus' success is the combination of Goldman Sachs' established reputation and the agility of a start-up unhampered by legacy business practices and technology (Talwar, 2019).

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<sup>42</sup> According to MAS, 36 financial institutions have set up in-house accelerators and innovation labs (Monetary Authority of Singapore, 2020).



**Recommendation 3: Support companies in the fourth industrial revolution to ensure resilience of supply chains**

COVID-19 brought weaknesses in global supply chains into sharp relief. In our recovery, Singapore must ensure that our supply chains remain resilient in the face of future unpredictable, yet inevitable, disruptions. The ongoing fourth industrial revolution<sup>43</sup> (4IR), encompassing technologies such as big data<sup>44</sup>, holds great promise in navigating supply chain disruptions [Figure 24].<sup>45</sup>

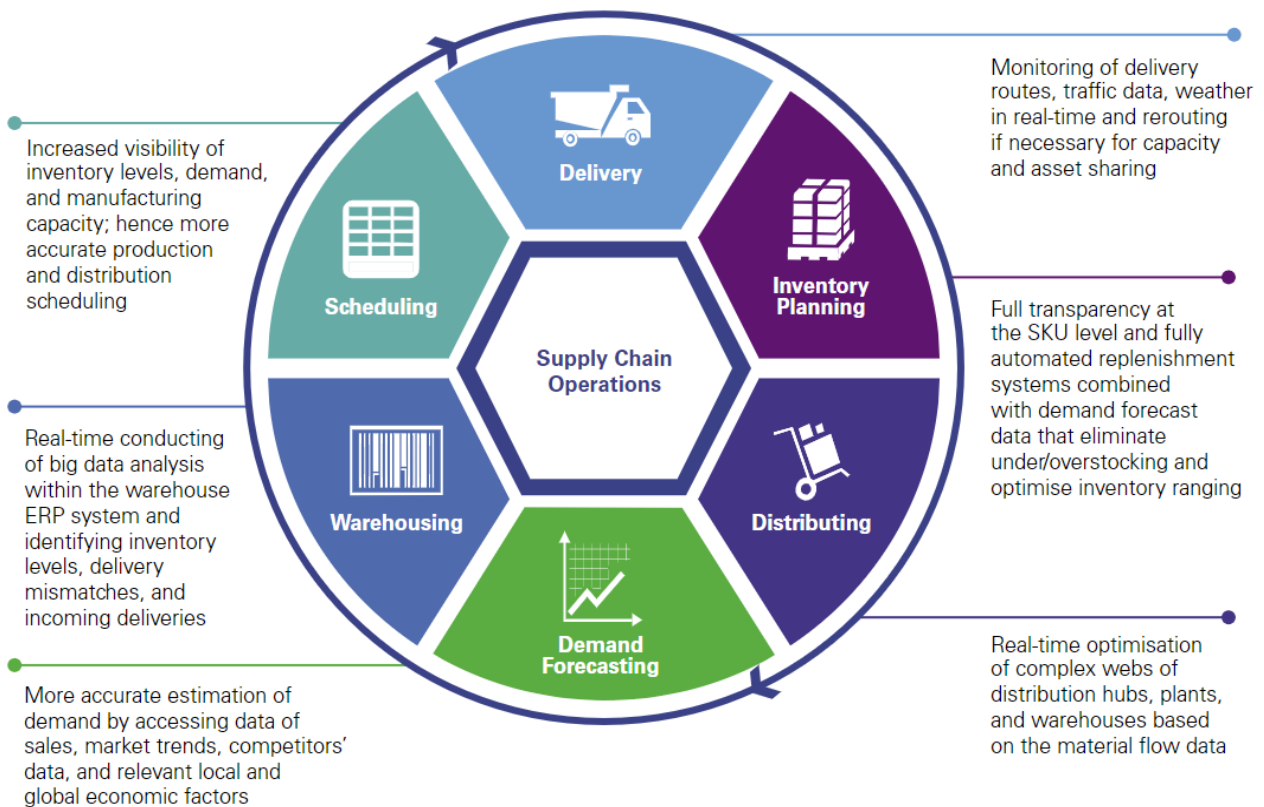


Figure 24. Applications of big data analytics in supply chain operations (KPMG, 2017).

<sup>43</sup> The Fourth Industrial Revolution is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres (Schwab, 2016). Technologies that fall under 4IR include artificial intelligence, Internet of Things (IoT), 5G and big data.

<sup>44</sup> Big Data refers to the vast amounts of data, structured and unstructured, that helps businesses establish trends and patterns in human behaviour. This knowledge of customer demands and behaviour enables better decision-making (Galea-Pace, 2020).

<sup>45</sup> Big Data can enable "smarter" global supply chains that can help companies maintain business continuity amid uncertainty.



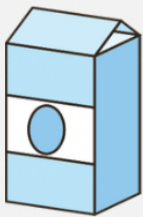
Unfortunately, while executives acknowledge the importance of big data, companies have not been able to reap its full benefits [Figure 25].

## KPMG Survey of 250 C-level Executives



Source: (KPMG, 2019)

Figure 25. Untapped potential of Big Data in businesses (KPMG, 2019).



### CASE STUDY:

## BIG DATA IN SUPPLY CHAINS – BENEFITS

Companies who have successfully integrated big data into their business operations have seen benefits ranging from **cost-reduction** to **better visibility** of their supply chain, allowing them to **better react in times of crisis** (Handfield, 2018).

For example, a dairy farm was able to use RFID (radio-frequency identification) and IoT (Internet of Things) sensors to detect issues regarding health of cows, quality of fodder, and variant temperature changes, all of which affected the overall quality of milk. The result was a more consistent product of higher quality.

As such, companies should tap on government programmes like EnterpriseSG and Smart Nation<sup>46</sup> to guide them in the 4IR transition.

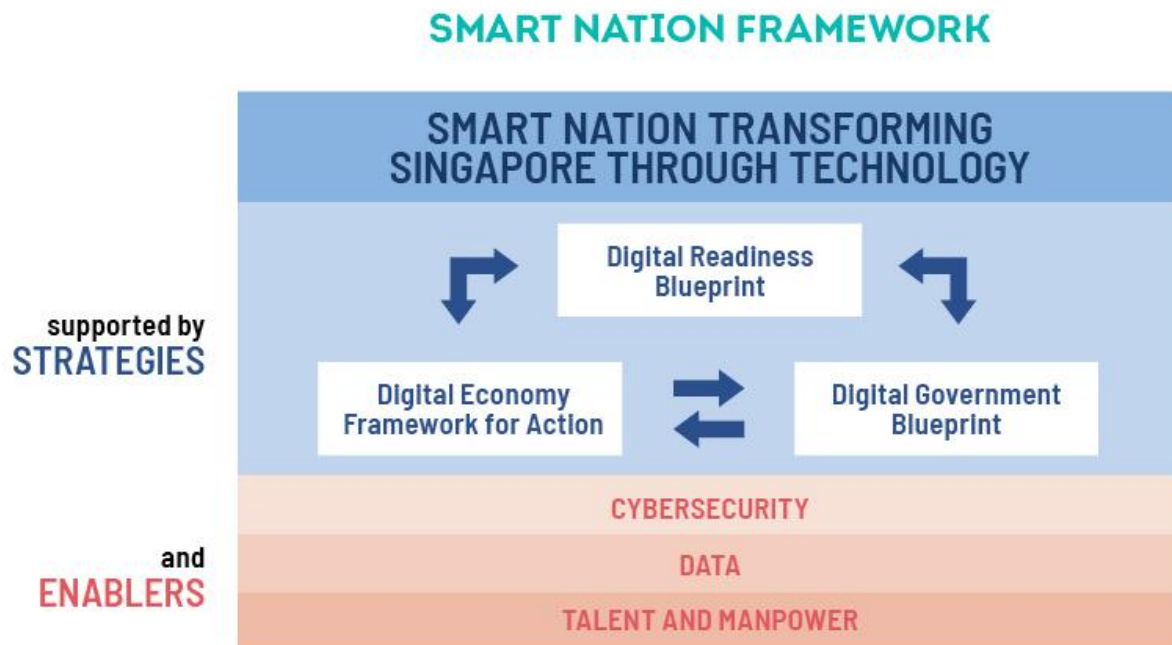


Figure 26. Singapore's Smart Nation Framework for Industry, of which data is a key enabler

(Ng, 2019).

<sup>46</sup> Singapore's Smart Nation initiative envisions a leading economy powered by digital innovation and a world-class city where the Government is responsive to the changing needs of citizens. A key pillar is the creation of a digital economy, which includes the Network Trade Platform (NTP), A Government-owned, one-stop trade platform that connects industry players digitally, NTP is a one-stop next-generation trade information management platform to support companies in the trade and logistics industry. It aims to be the open innovation platform allowing development of insights and new services with cross-industry data, and be the document hub for digitisation at source that enables reuse of data to cut costs and streamline processes. At its core is the translation of big data into business operations (Smart Nation and Digital Government Office, 2020).

## Recommendation 4: Enhance port processes through technology

While the Port of Singapore has bounced back from a pandemic-induced slowdown<sup>47</sup>, key challenges remain — slowing Chinese growth, global warming leading to opening of alternative trade routes, and fiercer competition by rival ports in the region<sup>48</sup>.

As such, Singapore must continually improve port efficiency to provide comparative advantages to secure traffic flows. Current efforts such as the development of Tuas Megaport<sup>49</sup> and the launch of digitalPORT@SG highlights the importance of enhancing existing port processes with technology in order to handle containers more rapidly, reduce berth times and delays, and enable larger storage capacity.



### CASE STUDY: MARITIME AND PORT AUTHORITY OF SINGAPORE – DIGITALPORT@SG

- 2019: Launch of digitalPORT@SG streamlining 16 different vessel, immigration and port health clearance forms into a single submission, **saving an estimated 100,000 man-hours each year.**
- January 2021: Trial of an electronic bill of lading (eBL) in lieu of a physical one for a shipment from Vietnam to Rotterdam via transshipment in Singapore slashed processing time from 6-10 days to <24h.
- February 2021, the **Electronic Transactions (Amendment) Bill** was passed to recognise electronic bills of lading (eBLs) as the functional equivalent of the physical versions.

<sup>47</sup> The Port of Singapore handled more cargo in the first five months of 2021 than in the same periods of 2020 and 2019 (Kok, 2021).

<sup>48</sup> Evidence shows that competition from Port Klang in Selangor and Tanjung Pelepas in Johor have a negative impact on Singapore's transshipment performance. The decline in Singapore's market share is a result of these two ports emerging as credible alternatives for transshipment operations, encouraging some shipping lines to relocate their transshipment hubs to these ports from Singapore. (Siu & Yap, 2008)

<sup>49</sup> When fully completed in 2040, Tuas Megaport will consolidate the existing Keppel, Brani, Tanjong Pagar and Pasir Panjang ports, and become the world's largest fully automated terminal.

## 2. SUPPORT THE SHIFT TO HYBRID WORKING MODELS



*As Singapore transitions into the endemic stage of the coronavirus, companies have to be accustomed to flexible working models. To do so, Singapore must continually invest into developing and adopting WFH technologies, as well as mitigate potential risks that come along with working from home.*



### *Recommendation 1*

**INCREASE INVESTMENT INTO DEVELOPING AND ADOPTING WFH TECHNOLOGIES**

### *Recommendation 2*

**BUILD RESILIENCE AGAINST CYBER ATTACKS AND FRAUD**



## Recommendation 1: Increase investment into adopting WFH technologies

Singapore is well suited for hybrid working models, with a high percentage of workers employed in the finance and professional services sectors.<sup>50</sup>

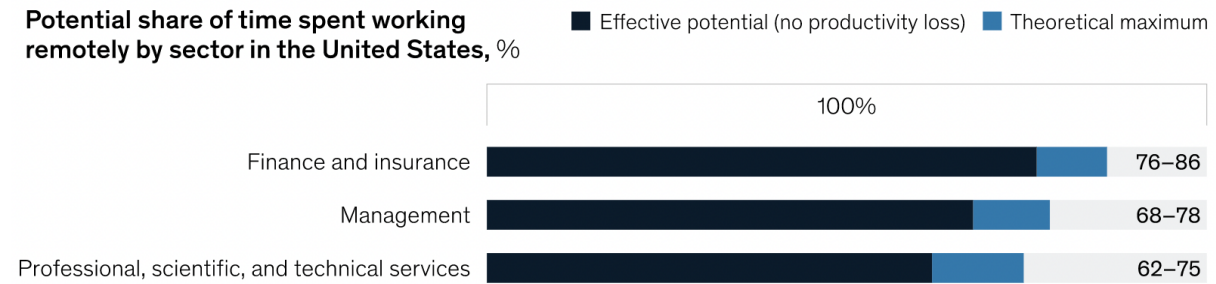


Figure 27. Top 3 sectors with highest potential for remote work<sup>51</sup> (Lund et al., 2021).

The sudden shift to WFH due to COVID-19 spurred firms and workers to invest in remote collaboration tools and equipment.<sup>52</sup> As part of the Resilience Budget, the Productivity Solutions Grant (PSG) was expanded to equip Singapore businesses with WFH capabilities till end-2020.<sup>53</sup> However, Singapore must do more to support our transition into hybrid working models.<sup>54</sup> As hybrid working models become prevalent, similar measures should be continued in the longer term.

<sup>50</sup> As of December 2020, of the 75.6% of Singaporeans employed in the services sector, 10.1% are employed in the financial services sector, while 7.1% are employed in the professional services sector (Ministry of Manpower, 2021).

<sup>51</sup> According to a study by McKinsey Global Institute **Finance and Insurance** has the highest potential for remote work, with three-quarters of time spent on activities that can be done remotely without a loss of productivity. **Management, business services, and IT** have the next highest potential [Figure 27] (Lund et al., 2021).

<sup>52</sup> In the US, workers invested an average of 15 hours and USD\$560 to upgrade their home work spaces (Barrero et. al, 2021).

<sup>53</sup> The Productivity Solutions Grant (PSG) provided an 80% subsidy for of COVID-19 relevant solutions, such as costs associated with online collaboration and virtual meetings (Infocomm Media Development Authority, 2020).

<sup>54</sup> According to a Singapore survey of 400 respondents, 31% of employees find their home offices lacking, while 42% of the respondents expressed that more training support could be given to help employees adapt to the new ways of working. (Navarrete, 2020)

In addition, COVID-19 is redirecting technical progress that enhances remote interactivity — the number of patents for WFH technologies doubled in 2020 (Bloom et. al, 2021).<sup>55</sup>

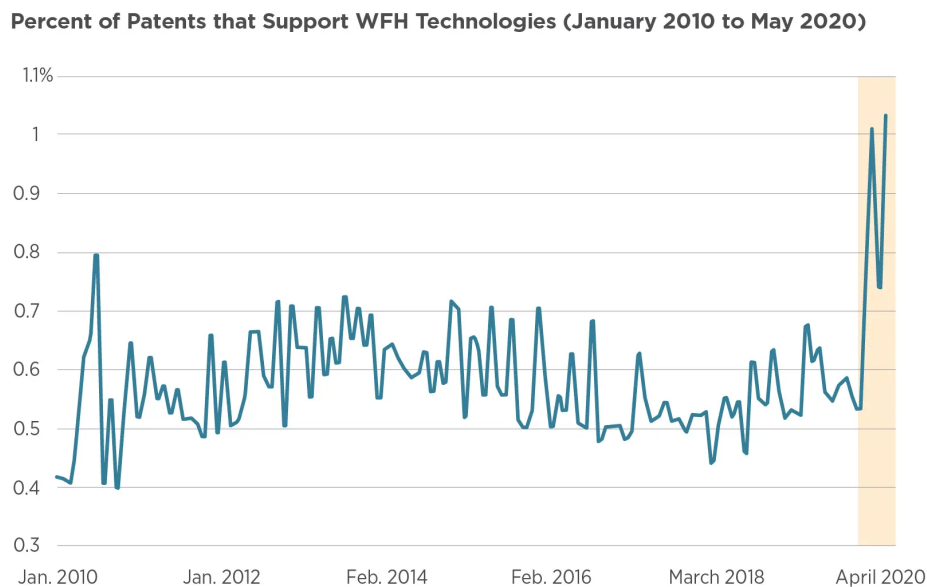


Figure 28. Patents for WFH technologies surged in the US in 2020 (Bloom et. al, 2021).

Singapore should encourage the adoption of technological innovations in this area as part of its Smart Nation<sup>56</sup> roadmap, which will engender lasting improvements in productivity and shifts to WFH in the post-COVID era.<sup>57</sup> For instance, the government could take the lead in promoting the widespread usage of digital signatures<sup>58</sup> among businesses.

<sup>55</sup> In response to demand for better WFH experiences, the number of patents for WFH technologies doubled in 2020 (Bloom et. al, 2021).

<sup>56</sup> The Smart Nation project should be updated for the post-COVID economy and include workplace transformation guidance, policy and plans. For instance, this can include subsidies for 4IR WFH technologies, such as virtual reality enhanced video-conferencing which has been shown to improve attention spans and promote feelings of presence (Campbell et al., 2019). The government could lead the usage of such technologies, which is key in convincing other businesses to adopt these technologies.

<sup>57</sup> By improving the productivity of remote work, the introduction of new WFH technologies will reinforce the shift to WFH even after the pandemic ends. Research suggests that the extent of WFH is responsive to technological innovations. In a study of 14 European countries from 2008-2016, Jerbashian & Vilalta-Bufi (2020) found that faster price declines for information and communication technologies (ICT) are associated with larger increases in adoption of WFH.

<sup>58</sup> Digital signatures are a document signing solution to create an office workflow where physical presence is not required to authenticate documents (Monton, 2020).



## Recommendation 2: Building resilience against cyber attacks and fraud

The rapid rise in online activity during COVID-19 has intensified fraud and cybersecurity risks. The adoption of 4IR further increases the vulnerability of critical business operations (Olejarz, 2015).

As we become a Smart Nation, Singapore must also strive towards becoming a Secure Nation to maintain our reputation as a secure and stable economic hub. We must strengthen collaboration between governments and businesses.<sup>59</sup> Singapore should kickstart this process by setting up platforms for information exchanges like launching cybersecurity conferences similar to the I-4 Conference<sup>60</sup> and DEF CON<sup>61</sup>, as well as implementing global cybersecurity best practices, such as measures from the IMF.



### CASE STUDY: IMF'S MEASURES FOR CYBERSECURITY AND FRAUD

1. Tools to monitor digital payments in (close to) real-time
2. Consumer protection tools such as electronic complaints handling and dispute resolution
3. Market surveillance tools to monitor the development of FinTech so that regulators may scrutinise its growth
4. Digitalisation of regulatory processes such as licensing applications, regulatory reporting and other regulator-industry engagements

*Source: (International Monetary Fund, 2018)*

<sup>59</sup> The public and private spheres can collaborate on a wide variety of cybersecurity issues such as sharing intelligence on potential and actual attacks as well as encouraging innovative cybersecurity solutions.

<sup>60</sup> An annual conference organised by KPMG and the UK government that gathers Chief Information Security Officers (CISOs) and cyber security leaders to exchange cybersecurity knowledge and experience (KPMG, 2021).

<sup>61</sup> DEFCON, held annually in Las Vegas, Nevada, is the most well known event for cybersecurity experts, corporate IT professionals, and government agencies aiming to expand their knowledge and skillsets in the world of cybersecurity (Conventions, 2021).

# 3. PURSUE SUSTAINABLE & INCLUSIVE GROWTH



*Singapore must ensure no one is left behind in our economic transition, and that our growth is achieved sustainably.*



## *Recommendation 1*

**CEMENT SINGAPORE AS A HUB  
IN THE SUSTAINABILITY  
ECOSYSTEM**

## *Recommendation 2*

**MAKE REAL ESTATE TAX MORE  
PROGRESSIVE FOR WEALTH  
REDISTRIBUTION**



## *Recommendation 3*

**INVEST IN EMPOWERING  
MARGINALISED GROUPS WITH  
TECHNOLOGY**



## Recommendation 1: Cement Singapore as a hub in the sustainability ecosystem

As COVID-19 halted global growth, sceptics claimed that ESG<sup>62</sup> concerns would lose importance. In fact, ESG has only become more critical for companies' bottom-line, both in terms of resilience<sup>63</sup> and market performance.<sup>64</sup> Moreover, it is in the long-term interests of businesses to reduce greenhouse gas emissions [Figure 29]. The need for resilient supply chains amid disruptions further underscores the importance of sustainability on a national level.



### GAINS FROM DECARBONISATION



#### 1) Consumer Pressure

- Consumers prefer and are willing to pay more for sustainably produced goods
- As consumers are becoming savvier to marketing tactics, businesses must provide more tangible evidence of how their products are environmentally-friendly

#### 2) Regulatory Uncertainty

- Taking ambitious actions now helps companies stay ahead of future policies and regulations to limit emissions
- Companies leading in this field are often better able to influence policy makers and shape developing legislation



#### 3) Investor Confidence and Credibility

- Companies committed to environment bolster their credibility among stakeholders
- Institutional investors have committed to decarbonise \$600bn worth of portfolio out of \$3.2 trillion in assets under management as part of the Portfolio Decarbonisation Coalition (PDC).

#### 4) Financial Gains from Energy-efficient Measures

- Potential financial savings from emissions reductions activities, especially given the rising price of raw materials.
- Nestle's Energy Target Setting program (ETS) saved €1.2 million after adopting energy efficiency measures
- Research into sustainable products will catalyse development of new technologies and operational practices.



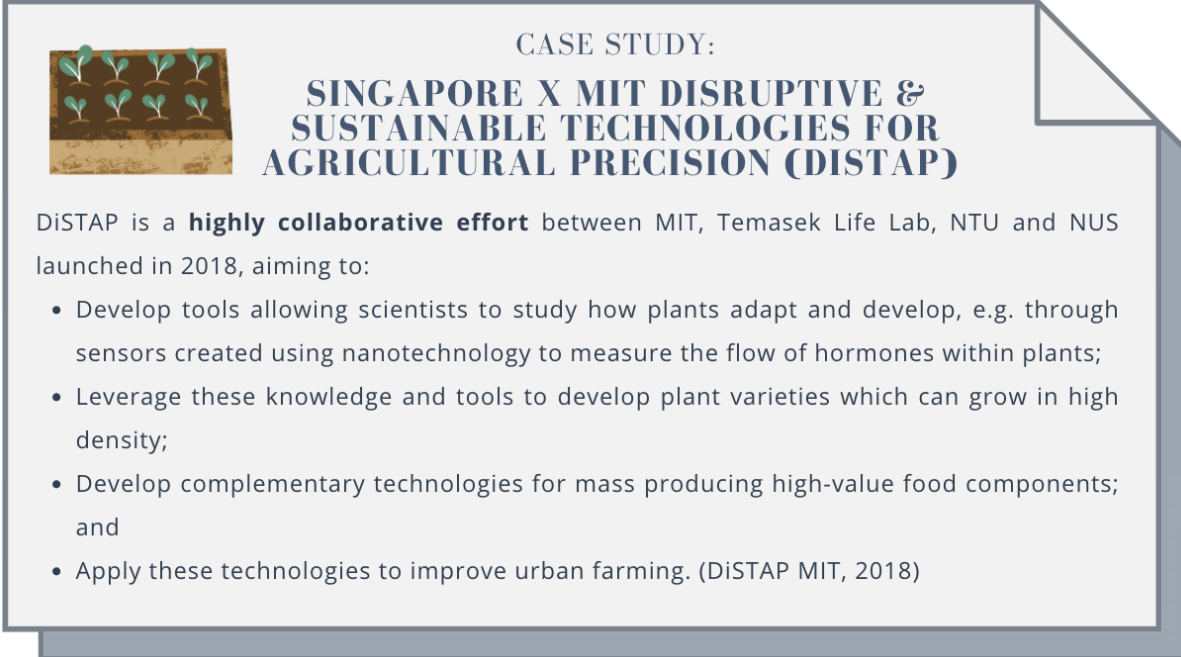
Figure 29. Businesses stand to gain strongly from decarbonisation

<sup>62</sup> Environmental, social, and governance (ESG) criteria are a set of standards for a company's operations that socially conscious investors use to screen potential investments.

<sup>63</sup> Improved resilience, correlating with higher ESG standards, can be attributed to the following reasons: 1) Companies have located critical issues across the entire supply chain in the process of achieving sustainability targets, 2) Supply Chain Digitisation to monitor sparser activities, e.g. agricultural sourcing by Unilever to deal with farmers directly. (Davidson & MacLennan, 2020)

<sup>64</sup> In stock markets, MSCI ESG Leaders indices have outperformed their mainstream counterparts in most geographies. The UK is the most striking example with the FTSE 100 ESG Leaders index returning -27.3% year-to-date compared to -33.7% for the FTSE 100 index. (Raven et al., 2020)

Singapore must develop and adopt green technologies to cement her position as a global hub in the sustainability ecosystem. For example, Singapore can call on tertiary research groups<sup>65</sup> to collaborate on green innovations along the entire carbon value chain.



The graphic is a light blue rectangular box with a folded top-right corner. On the left side, there is a small square image showing several green seedlings growing in a brown soil tray. To the right of the image, the text is centered and reads: 'CASE STUDY: SINGAPORE X MIT DISRUPTIVE & SUSTAINABLE TECHNOLOGIES FOR AGRICULTURAL PRECISION (DISTAP)'. Below the title, it states: 'DiSTAP is a highly collaborative effort between MIT, Temasek Life Lab, NTU and NUS launched in 2018, aiming to:'. This is followed by a bulleted list of four points: 1. Develop tools allowing scientists to study how plants adapt and develop, e.g. through sensors created using nanotechnology to measure the flow of hormones within plants; 2. Leverage these knowledge and tools to develop plant varieties which can grow in high density; 3. Develop complementary technologies for mass producing high-value food components; and 4. Apply these technologies to improve urban farming. (DiSTAP MIT, 2018)

Singapore can also invest in her own sustainability accelerator programs<sup>66</sup> similar to AB InBev's Accelerator 100+ program.<sup>67</sup>

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<sup>65</sup> Current measures to promote research and industrial collaboration include the MAS Global FinTech Innovation Challenge which are driving the development of Fintech to support green finance. The S\$1.75 million MAS Global FinTech Innovation Challenge seeks innovative solutions for financial institutions to respond to two critical global challenges: COVID-19 and climate change. (Monetary Authority of Singapore, 2020)

<sup>66</sup> Sustainability accelerator programs give funding and training towards local start-ups to develop sustainability innovations, further strengthening the local start-up ecosystem while enhancing innovation capabilities along the entire carbon value chain.

<sup>67</sup> AB InBev's Accelerator 100+ program finances global startups to develop green technologies to meet its own sustainability goals, which will lead to expected savings of \$80M annually. Teams receive industry connections, training, and up to \$100,000 for pilot execution, with the possibility of additional investment from AB InBev and its partners (Highline Beta, 2021).

In addition, Singapore can consider establishing a Green Corridor<sup>68</sup>, similar to Heineken's, which could facilitate logistics for the plethora of manufacturing facilities and agricultural produce such as palm oil sourced in Southeast Asia. Amidst a tenuous recovery in air transport, the green corridor can open new markets for Singapore's logistics hub.



CASE STUDY:  
**HEINEKEN GREEN CORRIDOR IN THE NETHERLANDS**

- Heineken is working together with Nedcargo (sustainable logistics provider) and GoodFuels (sustainable fuel market leader) to establish a clean, climate-neutral container shuttle between their brewery in Zoeterwoude and the port of Rotterdam.
- Plans to use trucks that run on renewable fuels and invest in ships with fully electrical propulsion systems
- Digital techniques ensure goods flow efficiently, e.g. ensuring all containers return full

*Source: (Heineken, 2018)*

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<sup>68</sup> A green corridor is a transport corridor where efficient and environmentally friendly technologies are used to transport goods across long distances, so as to achieve energy efficiency and reduce environmental impact (European Commission, 2016).

## Recommendation 2: Make real estate tax more progressive<sup>69</sup> for wealth redistribution

Real estate prices surged during the pandemic, and price increases in private housing have consistently outtripped public housing.<sup>70</sup> The ability of the affluent to enjoy substantial value appreciation through investments in private housing raises concerns about widening the wealth gap, as historically, wealth inequality has been driven most strongly by property investments globally (Ho, 2021).

Furthermore, with Singapore drawing upon its past reserves again in 2021 to fund extended COVID-19 relief measures<sup>71</sup>, a wider tax base is needed to fund social programmes sustainably.

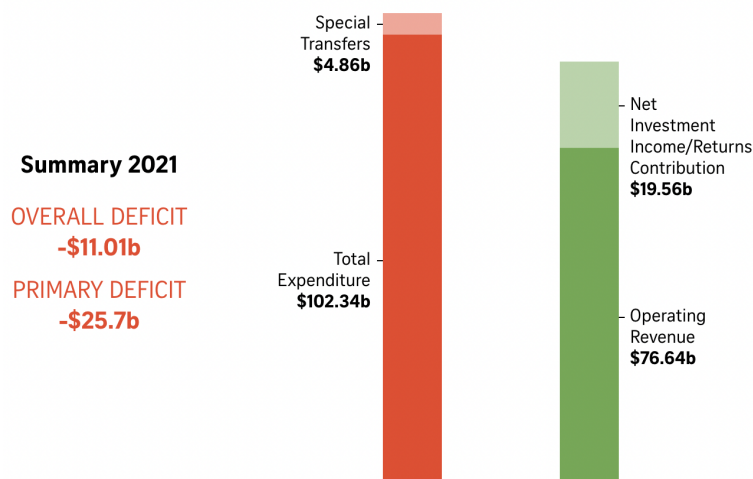



Figure 30. Singapore draws on past reserves for the second straight year in 2021 (Choy, 2021).

<sup>69</sup> A progressive tax is one that takes a larger percentage of income from high-income groups than from low-income groups (Horton, 2020).

<sup>70</sup> Singapore house prices grew 7.1% YoY in Jun 2021, following an increase of 6.6% YoY in the previous quarter (Ho, 2021)

<sup>71</sup> The overall deficit in 2021 was S\$11 billion, compared to S\$42.7 billion in 2020. Still, the total drawdown of \$53.7 billion for the past 2 years is equivalent to a few decades' worth of Budget surpluses (Choy, 2021).

Considering that heavy-handed taxation could deter FDI<sup>72</sup> and negatively affect the wealth management industry, a change to the existing real estate tax strikes the best balance between attracting wealth to Singapore and raising revenues to fund social programmes [Figure 31].



## COMPARISON OF WEALTH TAXES

| TYPE OF WEALTH TAX | DESCRIPTION  | PROS   | CONS   |
|--------------------|--|--|--|
| NET ASSET TAX      | TAX APPLIED TO A PERSON'S NET WORTH (ASSETS - LIABILITIES)<br><small>(SCOTT, 2021)</small> | <ul style="list-style-type: none"> <li>• MOST PROGRESSIVE TAX</li> </ul>   | <ul style="list-style-type: none"> <li>• SIGNIFICANTLY AFFECTS INFLOW OF FOREIGN WEALTH</li> <li>• IMPACT ON WEALTH MANAGEMENT HUB</li> <li>• EASILY DODGED AS ASSETS CAN BE SHIFTED OFFSHORE</li> </ul> |
| CAPITAL GAINS TAX  | LEVY ON PROFIT OF INVESTMENTS<br><small>(FERNANDO, 2021)</small>                           | <ul style="list-style-type: none"> <li>• PROGRESSIVE TAX</li> </ul>  | <ul style="list-style-type: none"> <li>• EASILY DODGED AS ASSETS CAN BE SHIFTED OFFSHORE</li> </ul>  |
| ESTATE DUTY        | A TAX ON A PERSON'S ASSETS UPON THEIR DEATH  | <ul style="list-style-type: none"> <li>• IN PRINCIPLE, LEVELS PLAYING FIELD BY REDISTRIBUTING WEALTH TO NEXT GENERATION</li> </ul>   | <ul style="list-style-type: none"> <li>• AFFECTS MIDDLE CLASS SIGNIFICANTLY, AS THEY HAVE THE WEALTH TO PAY THE TAX, BUT NOT ENOUGH TO JUSTIFY PLANNING FOR THE TAX</li> </ul>                           |
| REAL ESTATE TAX    | TAX PAID ON ASSESSED VALUE OF A PROPERTY   | <ul style="list-style-type: none"> <li>• CAN COOL DOWN PROPERTY PRICES</li> <li>• LESS EASILY EVADED (PROPERTY IS IMMOBILE)</li> <li>• MAY INCREASE SUPPLY OF RENTAL PROPERTY</li> </ul> | <ul style="list-style-type: none"> <li>• COULD NEGATIVELY AFFECT PROPERTY MARKET AND INDUSTRY</li> </ul>   |

Figure 31. Comparison of Wealth Taxes

Moreover, net asset and estate taxes have been trialed and abolished in Europe [Figure 32]<sup>73</sup>.

<sup>72</sup> Foreign Direct Investment

<sup>73</sup> In a number of countries, net wealth taxes have been abolished altogether over time for various reasons. Austria, for example, abolished the wealth tax in 1993 mainly due to the high administrative costs that accrued in the data collection process and because of the economic burden the wealth tax meant to Austrian enterprises. Denmark used to apply some of the highest marginal tax rates, but the country abolished the tax scheme in the 1990s. One evident reason was the comparatively small tax revenue that it yielded (only 0.8% of total tax revenues) and the weak enforcement given the high administrative costs of implementing it (Drometer, 2018).

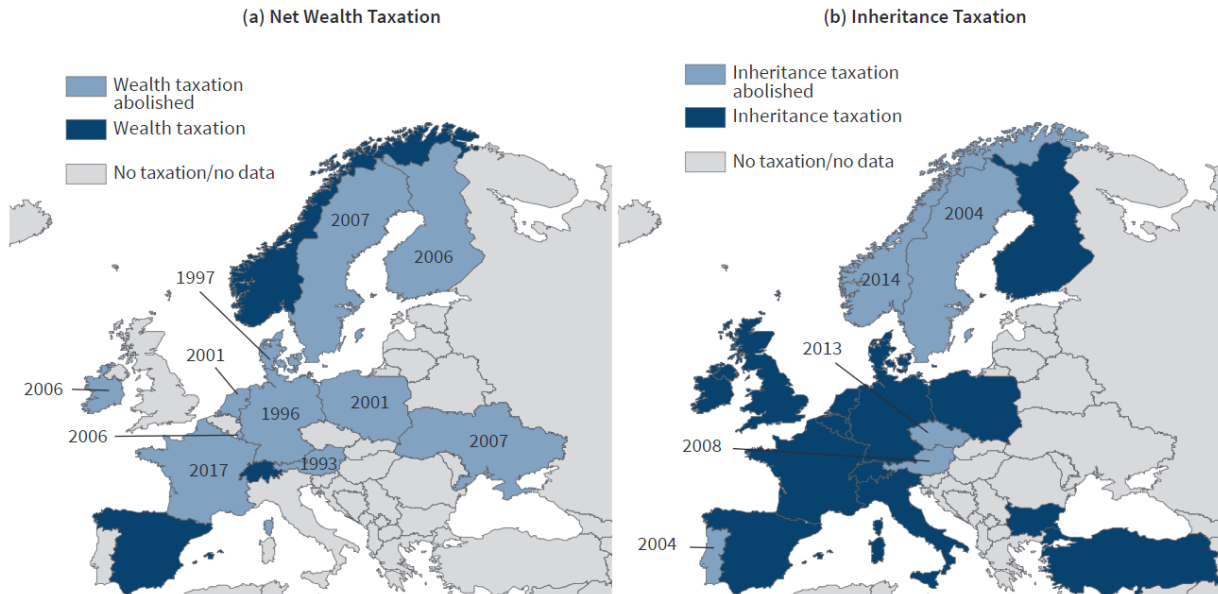


Figure 32. Net Wealth and Inheritance (Estate) Taxation were abolished in Europe. The year marks the date of abolition of the tax (Drometer, 2018).

As such, the current property tax regime could be modified to become more progressive. Additional taxes should be collected on vacant properties and properties priced above \$2 million, which will not affect the majority of house owners in Singapore.<sup>74</sup>

<sup>74</sup> On average, a HDB flat costs S\$532,768, a condominium is S\$1,780,051, and a landed property costs S\$5,063,507 (Evlanova, 2021). In 2020, 81% of the resident population in Singapore lived in public housing under the Housing and Development Board (HDB) (Statista, 2021).

### Recommendation 3: Invest in empowering marginalised groups with technology

With COVID-19 accelerating digital adoption, Singapore must help marginalised groups stay ahead of structural changes in the economy. These groups face additional obstacles adjusting to new working models and technologies, leaving them more vulnerable to economic shocks<sup>75</sup> (World Bank and CCAF, 2020), including job loss and displacement.<sup>76</sup>

Crucially, IMDA needs to establish metrics [Figure 33] for measuring digital inclusion. IMDA should conduct the measurement annually and the results will help map out key deficiencies in digital inclusion and formulate appropriate policy responses.

- 1** **Access** to electricity, the internet, devices and quality of that access
- 2** Traditional and digital **skills** including critical thinking, literacy and entrepreneurship
- 3** **Use** of technology, public and private digital services, digital products and content, various types of work, social and civic engagement activities, as well as places of access to measure actual value creation and digital inclusion of marginalised communities
- 4** A **supportive environment**, particularly in terms of affordability, legally valid identification, financial inclusion, trust and security

Figure 33. Suggested metrics for measuring digital inclusion (Digital Future Society, 2019)

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<sup>75</sup> For instance, elderly workers often find mastering new technology complicated as they have no experience in using technology (No Isolation, 2021). The Household Expenditure Survey 2017/2018 also revealed that 19% of households lack personal computers, and 13% lack internet access (Ong, 2021).

<sup>76</sup> Up to 20 million manufacturing jobs will be lost globally to robots by 2030 according to research by Oxford Economics, a UK-based research firm. Furthermore, By 2028, about one-fifth of Singapore's full-time equivalent workforce (20.6%) will have their jobs displaced, the highest in Southeast Asia (Ping, 2019).



Countries that have established such metrics, such as the UK's Essential Digital Skills Framework<sup>77</sup>, have seen their efforts bear fruit, and should be adopted in Singapore.<sup>78</sup>

For example, these indicators would highlight the need for targeted policies to address Singapore's poor digital literacy skills<sup>79</sup> among the elderly and low-income students<sup>80</sup> (Soon, 2021). To address this, we can consider adapting digital literacy programmes like MediaWise to the local context.



**CASE STUDY:  
MEDIAWISE FOR SENIORS IN  
THE US**

Mediawise is a project in the US that encourages seniors to adopt the habits of professional fact-checkers when assessing information online. Seniors are encouraged to ask questions like “who is behind the information?”, “what is the evidence?” and “what do other sources say?”

About 85 per cent of seniors who completed the course could accurately identify disinformation, a 22 percentage point increase from before they started.

<sup>77</sup> The UK government launched the Essential Digital Skills Framework in 2018, which defined and measured a ladder of skill sets needed for all to benefit from and contribute to the digital economy (UK Department for Education, 2019). The skills measured were:

1. digital foundational skills that underpin all other digital skills, such as knowing how to connect to the Internet and maintain online login information.
2. digital communication skills, such as communicating with others via email or text and using word processors to create and share documents like a personal resume.
3. online transaction skills, like being able to access digital financial services and fill in request forms for public goods and services. (Department for Education, 2019)

<sup>78</sup> Establishing a similar framework in Singapore will help identify critical digital skills deficiencies for different segments of society, and thus aid the design of targeted interventions to plug existing gaps (Soon, 2021).

<sup>79</sup> 6 in 10 Singaporeans have encountered and believed false information (Institute of Policy Studies, 2020).

<sup>80</sup> Poor digital literacy further amplifies digital exclusion as it leaves marginalised groups vulnerable to cybercrime and creates distrust toward new technologies which limits their participation in the digital economy (NUS & SUTD, 2021).

## **Conclusion**

COVID-19 has been the crisis of a lifetime, upending livelihoods and deeply affecting all sectors of the economy. As the world gradually recovers, we are witnessing an acceleration of profound changes in the socioeconomic order. To maintain sustainable and inclusive growth as a global economic hub amid novel circumstances, Singapore's efforts to reinvent and reimagine her economy are more urgent than ever. Digitisation and adapting to new working practices while keeping sustainability and inclusivity at the forefront will be the central imperatives of our time: transitions that we must make if we are to emerge stronger, together from this crisis.

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