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Inclusive and sustainable industrial development (ISID):
Partnering for Prosperity

Impact Assessment of COVID-19 on Thai Industrial Sector

JUNE 2020

UNIDO Regional Office Hub in Thailand
United Nations Thailand

Highlights

i) From overall observations based on information from responding firms, **small-size and low-tech firms have suffered the most** from the crisis and containment measures. Small-size firms also have the least access to support provided by government stimulus schemes.

ii) **Demand reduction has posed the biggest impact** to firms. Reduced orders have led to lessened revenue flows. While firms have tried to obtain additional loans to compensate for the cash flow shortage, difficulties in obtaining loans have exacerbated the situation. Cutting operational costs is another option that firms have undertaken. In addition, they are concerned about payments to employees and social security as well as repayment of loans to commercial banks.

iii) **The shortage of inputs** including raw materials is reported to be **the second biggest problem** for firms stemming from the lockdown and other restrictions because of the pandemic. The containment measures have led to disruptions of the supply chain from international border closures and domestic movement restrictions. Interestingly, we find that regardless of connection to global value chains (GVC), domestic upstream and domestic downstream firms have faced nearly the same level of shortages of inputs. This could imply that raw materials of firms are sourced both abroad and from within the country.

iv) **Consequently, extreme revenue loss is expected by most firms. We find that 90% or more of firms** regardless of their location (whether inside or outside provinces with high infection rates) expect extreme revenue loss with **more than 50% of revenue expected to be lost in 2020 compared to 2019**. Most expect extreme revenue loss because of reliance on GVC and for small-size firms. GVC firms rely on the situation in countries where their trading partners are located and the global situation unfortunately might not ease within coming months.

v) The prolonged containment measures such as movement restrictions worsen firms' prospects. **Should the containment measures be extended for a longer period, 52% of small-size and 44% of domestic downstream firms expect to close down in less than three months**. A small portion – 16% of small-size and 25% of domestic downstream firms – could last for more than a year. The easing of the lockdown beginning in mid-May could gradually slow the current crisis and bring a positive turn to the situation.

vi) While one-third of 307 respondent firms have received at least one form of government COVID-19 support, **small-size and domestic upstream firms have shown the smallest proportion**, with 26% and 27% of the firms receiving support respectively.

vii) **Tax-rate reductions or tax deferrals and a reduction of social contributions** are ranked the most preferred support measures from the government with 49% and 35% of firms indicating so respectively. In addition, other means to reduce operational costs including **rent and utility costs (32%) and better loan terms (27%)** are the next preferred measures.

viii) Within the manufacturing sector, COVID-19 measures had the strongest negative impact on the **automotive sector as indicated by the drop of manufacturing performance index (MPI) in April 2020, about 82% year on year, showing the lowest production since 1987**. According to the Office of Industrial Economics, Ministry of Industry,[1] **overall manufacturing performance index** in April 2020 dropped **17.21%** from that of April 2019. The five sub-sectors and products that dropped the most due to negative effects from the COVID-19 were **automotive, petroleum and petroleum products, malts and malt beverage, air conditioning systems and sugar.**

ix) On the other hand, the five sub-sectors and products that demonstrated the increase of the MPI in April 2020 were **concrete and cement, medicine, electronic circuit board, frozen seafood, and animal feeds,** of which productivity index of these sub-sectors have increased ranging from **10% to almost 40% year on year**[2].

x) Nonetheless, the expected reduction in revenues might lead to employment redundancy since almost half of responding firms reported that wages and social security posed the biggest financial burden. This finding is in accordance with the projection on layoffs by the state planning agency National Economic and Social Development Council (NESDC). The NESDC announced on 28 May that COVID-19 could result in **8.4 million people becoming unemployed, of which 1.5 million are in the manufacturing sector**. The malts and malt beverage and automotive sectors are particularly affected with the largest drops in performance. Some **automotive and spare parts manufacturers closed** already in May.[3] The manufacturing sector employs about 5.9 million people.[4] Out of the projected 8.4 million unemployed people, 4.4 million are in the non-tourism related service sector, such as malls, and 2.5 million are expected from the tourism sub-sector.

xi) The pandemic has potentially moved targets for Sustainable Development Goal 9 on Inclusive and Sustainable Industrial Development (ISID), particularly **Targets 9.2, 9.3 and 9.4, while Target 9.b could remain stagnant**.

xii) Recommended policy options include **job retention programmes, an extended period of tax exemption and loan deferrals, and tailored support programmes for micro and small firms**. Applying UNIDO's expertise on **industrial development facility, manufacturing repurposing and the 4th industrial revolution 4.0 (4IR) adoption** is also recommended.

[1] http://indexes.oie.go.th
[2] http://indexes.oie.go.th
[3] https://www.posttoday.com/economy/news/623937
[4] https://www.posttoday.com/economy/news/624626

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1 Rationale

The COVID-19 pandemic is unprecedented and its impacts have loomed large. According to the United Nations' Thailand Economic Focus, the pandemic has caused a deep contraction of the manufacturing sector in the first quarter of 2020. All three key sectors have faced economic losses during the first quarter of 2020: agriculture -5.7%, industry -1.9% and services -1.1%. Construction activities were hindered with a fall of 9.9% in the first quarter, while reduced tourist arrivals negatively impacted accommodation and food service activities at -24.1%. All figures are year on year.[5]

UNIDO aims to investigate these sectors, in particular the manufacturing sector, and to illuminate what kinds of impacts firms have experienced, how they have been coping with the pandemic crisis, and what kinds of support they have received so far. Additionally, we discuss to what extent these impacts have affected the country's progress towards inclusive and sustainable industrial development as embedded in Sustainable Development Goal (SDG) 9 to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Lastly, we offer some policy recommendations.

This micro-level impact assessment serves two key purposes. Firstly, it aims to contribute to United Nations Country Team (UNCT) in Thailand's *Socio-Economic Impact Assessment COVID-19 in Thailand: Actions to Safeguard the Country's Progress towards the SDGs* led by UNDP and UNICEF. Secondly, the assessment offers a baseline for UNIDO's global assessment to be done at a later stage. UNIDO (Department of Policy Research and Statistics together with Regional Hub Office in Thailand) conducts similar assessments in other countries in Asia including Cambodia, Lao PDR, Malaysia, Mongolia, Pakistan and Viet Nam. As a part of the global assessment, UNIDO plans to conduct a similar exercise in these countries in coming months to investigate the development of the impacts and their situations over time.

2 Method and data

2.1 Online survey

UNIDO launched an online survey for data collection from 15 April to 15 May 2020. In collaboration with Ministry of Industry, Industrial Estate Authority of Thailand and Small and Medium Enterprise Institute under Federation of Thai Industries and UNIDO's networks in Thailand (such as project partners and firms participating in UNIDO projects), the online survey was circulated to firms nationwide. Because of the COVID-19 situation and government containment measures to control the pandemic, the response rate was limited. A nationwide curfew from 10pm to 4am came into force on 3 April. In addition, the state emergency act enforced closures of all shops, restaurants, bars and malls, including fitness and sport and leisure facilities. The government also encouraged people to stay home to stop the spread of the virus. Since 1 June, the containment measures were eased and the curfew reduced to 11pm to 3am. Shops, restaurants and malls have reopened with the obligation to provide a tracking tool for all incoming and

[5] Thailand Economic Focus by Office of the UN Resident Coordinator, Thailand 21 May 2020

outgoing customers. The public is advised to wear face masks at all times when they are outside of their residence.

The survey questionnaire was designed by UNIDO Department of Policy Research and Statistics and Regional Hub Office in Thailand based on the questionnaire on the Resilience of Micro, Small and Medium Enterprises under the New Coronavirus Outbreak (COVID-19) included in the 2020 edition of the Enterprise Survey for Innovation and Entrepreneurship in China (ESIEC) led by Peking University.

The questionnaire contains 23 questions constituting four parts: i) expected impacts of COVID-19; ii) current impacts of COVID-19; iii) dealing with COVID-19 including government support and; iv) general information about responding firms.

2.2 Typology of firms

In our analysis, we segregate the information into three categories:

i) The size of firm. Following definitions set by the Department of Industrial Promotion, Ministry of Industry, our analysis segregates firms into small, medium and large.[6]

ii) Connection to global value chains (GVCs). We have three types: GVC firms, domestic upstream and domestic downstream. "GVC firms" refer to firms that fall into one of following behaviours:
- Producing intermediate inputs and sell a large share to foreign customers or domestically located MNCs.
- Subsidiaries of MNCs with a large proportion of exports and/or imports.
- Two-way traders.

The "domestic upstream" refers to non-GVC firms that sell intermediate goods, whereas the "domestic downstream" indicates non-GVC firms that sell finished goods.

iii) Technology level of firms. We categorise firms into: i) low tech; ii) medium to low tech and; iii) medium to high and high-tech firms. Table 1 elaborates manufacturing sub-sectors and their technology level.

[6] We use the universal definition of SMEs. Small firms are those with less than 20 employees. Medium firms are those with employees from 21 to 100. Large firms are firms with more than 100 employees.

Table 1 Manufacturing sub-sectors and technology groups

(source: UNIDO Industrial Statistics Database)

ISIC full description	Abbreviation used in this report	ISIC code Revision 3	Technology group
Food and beverages	Food and beverages	15	Low tech
Tobacco products	Tobacco	16	Low tech
Textiles	Textiles	17	Low tech
Wearing apparel, and fur & leather products, and footwear	Wearing apparel	18 & 19	Low tech
Wood products (excluding furniture)	Wood products	20	Low tech
Paper and paper products	Paper	21	Low tech
Printing and publishing	Printing and publishing	22	Low tech
Furniture; manufacturing n.e.c.	Furniture, n.e.c.	36	Low tech
Coke, refined petroleum products, and nuclear fuel	Coke and refined petroleum	23	Low/medium tech
Rubber and plastic products	Rubber and plastic	25	Low/medium tech
Non-metallic mineral products	Non-metallic minerals	26	Low/medium tech
Basic metals	Basic metals	27	Low/medium tech
Fabricated metal products	Fabricated metals	28	Low/medium tech
Chemicals and chemical products	Chemicals	24	Medium/high tech
Machinery and equipment n.e.c. & office, accounting, computing machinery	Machinery and equipment	29 & 30	Medium/high tech
Electrical machinery and apparatus & radio, television, and communication equipment	Electrical machinery and apparatus	31 & 32	Medium/high tech
Medical, precision and optical instruments	Precision instruments	33	Medium/high tech
Motor vehicles, trailers, semi-trailers & other transport equipment	Motor vehicles	34 & 35	Medium/high tech

n.e.c. = not elsewhere classified.

2.3 Data

About 320 firms responded to the online survey with information from 314 firms completed and used for analysis. From the 314 firms, 40% consist of small firms, 28% are medium firms and 32% came from large firms. In some questions, answers were not quantifiable. We included only valid responses that can be quantified and excluded those responses that cannot be quantified, such as “don't know” or “too early to state”. As a result, for these questions the response rate is lower than the sample size of 314 firms. Each response size is mentioned in those questions falling into this case.

Additionally, we capitalised on secondary data from official sources in some sections as follows. On the SDG 9 discussion (section 4.1), we use secondary data from the Office of Industrial Economics, the Ministry of Industry and Office of SME Promotion (OSMEP), and UNIDO’s SDG 9 monitoring platform for our analysis. For policy analysis of government support schemes (section 4.3), we use data from the Ministry of Industry, discussions with the Federation of Thai Industries and the SME Bank's website to gain insights about current support programmes and plans.

2.3.1 Responding firms by type

A majority of 79% responses came from domestic firms that are not connected to global value chains. The domestic upstream and the domestic downstream firms accounted for 33% and 46% of the responses respectively. The remaining 21% came from GVC firms. Figure 1 demonstrates the data by firm type.

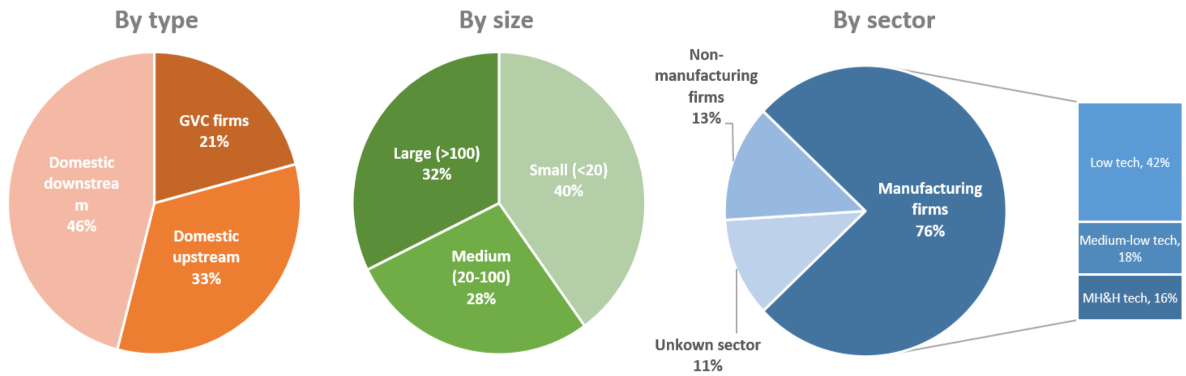
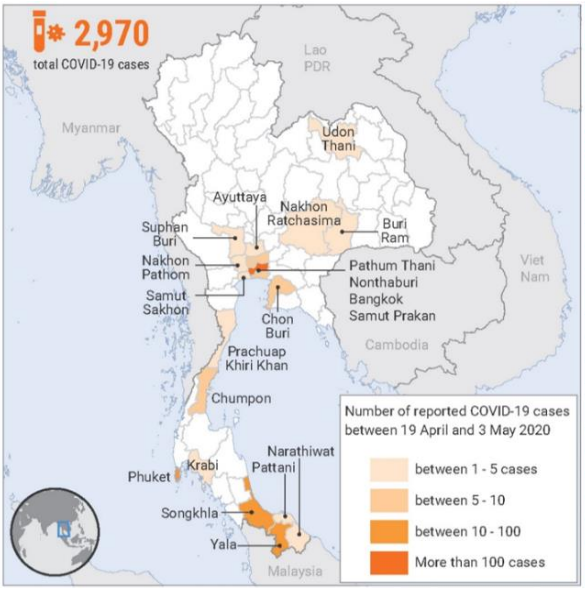


Figure 1 Responses by firm types

2.3.2 Responding firms by COVID-19 situations

Approximately 32% of responding firms are located in provinces with highest numbers of infection cases – Bangkok, Phuket, Nonthaburi, Yala, Samut Prakan, Chonburi and Pattani. We deployed information on cases from the website of the Department of Decease Control, Ministry of Public Health,[7] and the UN Resident Coordinator Office's Heatmap at the end of April, which we believe to have been the worst period with a total 2,970 infections during the questionnaire's input period. We then defined "provinces with high infection rates" as provinces with more than 50 cases. These are seven provinces accordingly (refer to Figure 2).

[7] https://covid19.th-stat.com/en



Province	Cases
Bangkok	1,532
Phuket	224
Nonthaburi	156
Yala	125
Samut Prakan	115
Chonburi	85
Pattani	79
Songkhla	44
Chiang Mai	41
Pathum Thani	39
Narathiwat	32
Nakhon Pathom	22
Chumphon	21
Nakhon Ratchasima	19
Surat Thani	18
Krabi	17
Chachoengsao	17
Prachuap Khiri Khan	17
Ubon Ratchathani	15
Samut Sakhon	14
Phatthalung	14
Buriram	13
Nakhon Si Thammarat	12
Sa Kaeo	10

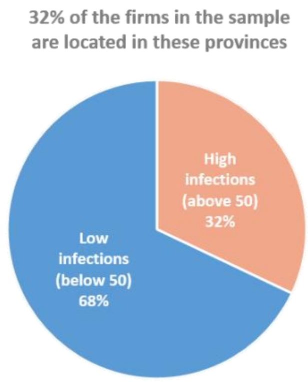


Figure 2 Reported cases and firm's locations

(source: UNRCO, Ministry of Public Health with UNIDO's analysis)

3 Findings and analysis

3.1 Current impact of COVID-19

a) Shortage of cash flow and inputs are reported as the biggest impacts of the pandemic and containment measures. The biggest issue with which the firms have struggled is the shortage of cash flow with 82% of responding firms facing this problem. The main cause are reduced sales due to reduced demand, which was reported by more than two-thirds of firms, and the increased difficulty of obtaining financing. The shortage of inputs ranked as the second biggest challenge with almost 70% of the firms facing this issue. Shortages might have been caused by value chain and logistics disruptions, including the inability to make deliveries perhaps due to containment measures such as border closures. In addition, more than half of firms have struggled to fulfill contracts and faced labour shortages. Figures 3 and 4 highlight the main challenges faced by firms. It also shows negligible differences between different types of firms in terms of size, GVC participation and technology level.

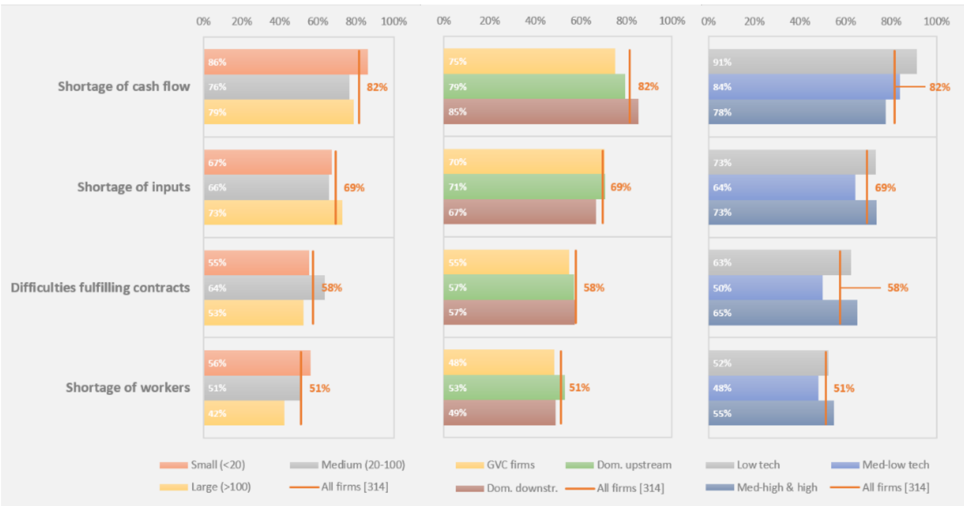


Figure 3 Main challenges faced by firms

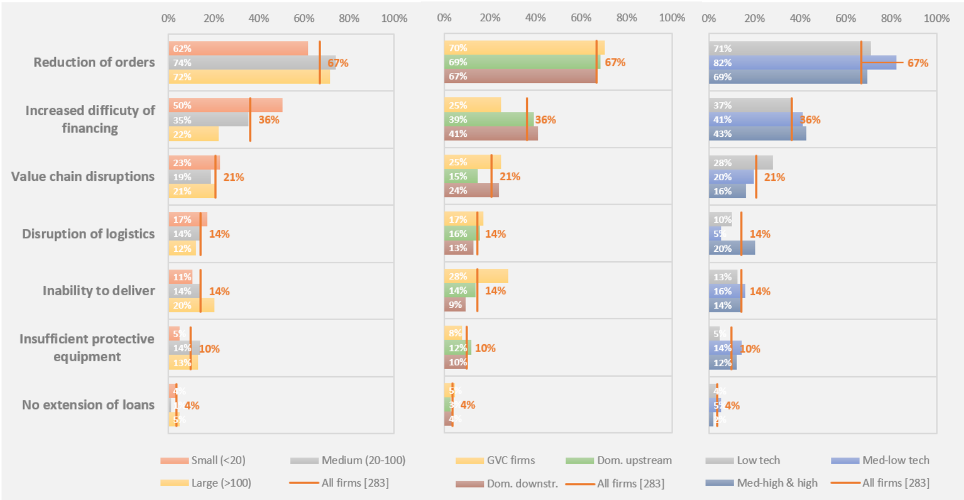


Figure 4 Main causes of challenges

b) More than 70% of 243 respondent firms with valid responses have been affected by containment measures enforced by the government in April during the survey period. We found that if the containment measures had been extended for a longer period, a majority of small-size and domestic downstream firms would have closed down in less than three months. Only a small portion expect to be resilient enough to survive a year-long lockdown. This latter group of firms are the main respondents from food and beverage manufacturers, which have been least affected so far.

For GVC firms, more than a third (36%) can survive for more than a year while nearly a quarter (24%) expect to close down within three months. On the contrary, but not so surprisingly, large firms seem to be best coping with government restrictions as more than a third (36%) expect to be able to survive more than a year of restrictions. Less than a quarter (24%) expect to close down within three months because of the restrictions. Figure 5 illustrates the situation.

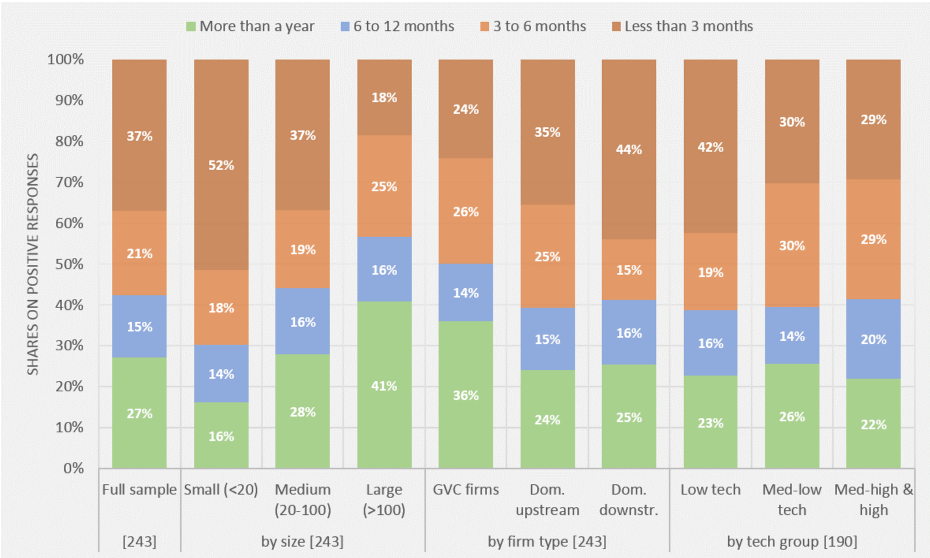


Figure 5 Expected survival of firms under restrictions in April

c) On the other hand, should restrictions be eased, about 40% or more of 307 respondent firms expected to be able to recover within a month. Among small-size and low-tech firms, 39% and 34% respectively were confident to recover within a month. On a positive note, less than 18% of the 307 expected recovery to take more than six months.

d) Payment of wages and social security posed the highest financial concern across all firms regardless of size, GVC participation and level of technology. Repayment of loans and fixed cost ranked second and third as most common concerns respectively. Interestingly, more than a third (37%) of large firms indicated no financial concerns. This compared to one-fifth (21%) of small firms and a quarter of medium firms reporting no financial concerns.

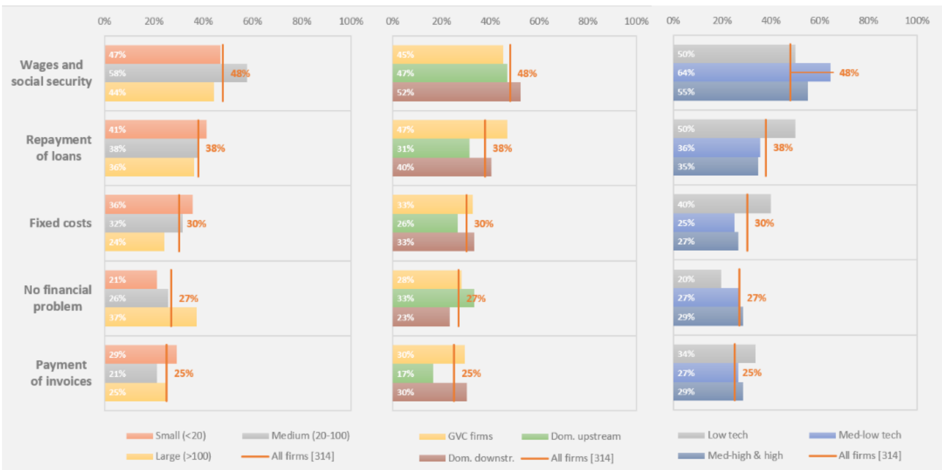


Figure 6 Main financial concerns

e) Firms that are small and not connected to global value chains have suffered the most from employees' inability to work. The technology level of firms does not correlate to different results in terms of impact from employees' inability to work. Out of 203 respondent firms with valid responses,[8] we find that 29% of small firms were affected by a large portion (76% to 100%) of the workforce being unable to work. Whereas 37% were affected by a small amount (1% to 25%). Domestic-oriented and low-tech firms faced similar numbers in terms of impact. Approximately 21% were affected by a large portion being unable to work (76% to 100%) and about half were affected by a small amount (1% to 25%). On the contrary, more than half of GVC firms were affected by a small amount of the workforce being unable to work.

3.2 Expected impact of COVID-19

f) Extreme revenue losses are expected by most firms. We found 90% or more of respondent firms regardless of their location expected more than 50% revenue losses in 2020. Out of 219 respondent firms with valid responses, more than half (56%) of firms in provinces with high infection rates and 49% of firms outside of those provinces expected more than 50% decrease in 2020 revenue. We find that less than one-fifth of 208 firms providing responses reported a majority of their workforce (76% to 100%) were unable to work. A majority of firms inside and outside of those provinces reported 1% to 25% of their workforce was unable to work. Figure 7 illustrates these findings. In addition, we found that small-size and GVC firms faced the highest impacts with more than 60% expecting to have more than 50% decrease in their 2020 revenue (Figure 13, page 18).

g) Layoffs were not the highest priority mitigation measure. On the bright side, regardless of their type and size, more than 80% of 307 firms with valid responses did not consider laying off employees as a coping measure. Small-size and domestic downstream firms showed slightly less optimism with 76% and 79% respectively reporting they did not plan layoffs. In addition, if small-size and domestic downstream firms were to cut staffing, more than 50% of 55 responding firms reported that they would cut only 1% to 25% of their workforce.

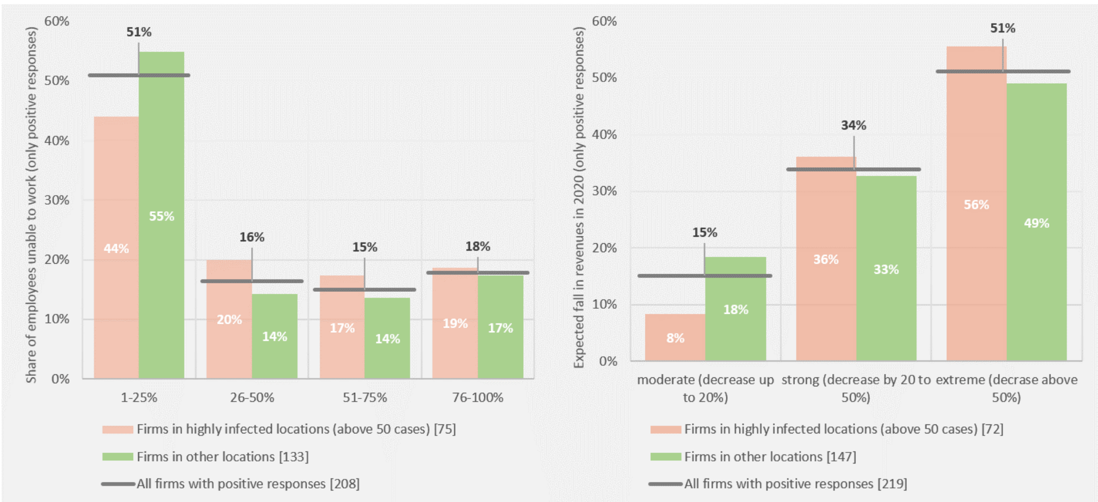


Figure 7 Comparison: firms inside and outside provinces with high infection rates

[8] Valid responses mean responses that can be quantified. Hence, we exclude those responses that cannot be quantified including responses such as “don't know” or “too early to state”.

3.3 Dealing with COVID-19

h) To cope with the cash flow shortages, firms are taking out loans and cutting operating costs. We found that regardless of size and type, 61% of all responding firms had chosen to take loans from commercial banks and an average of 52% had reduced their operating costs as main coping measures (Figure 8).

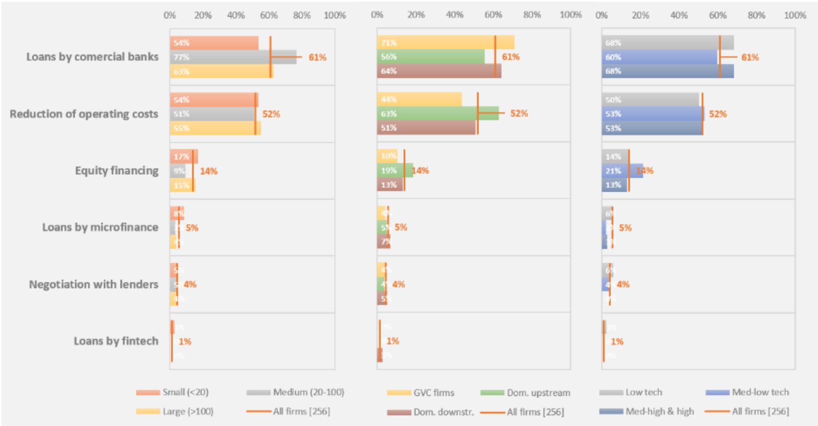


Figure 8 Shortage of cash flow coping measures

i) Referring to Figure 9 below, a majority of firms (59%) regardless of size and type would use technology to compensate for the shortage of workers. Large firms had a significantly higher proportion, with 88% taking advantage of technology as a countermeasure. Small-size and domestic upstream firms balanced between using technology and outsourcing as countermeasures.

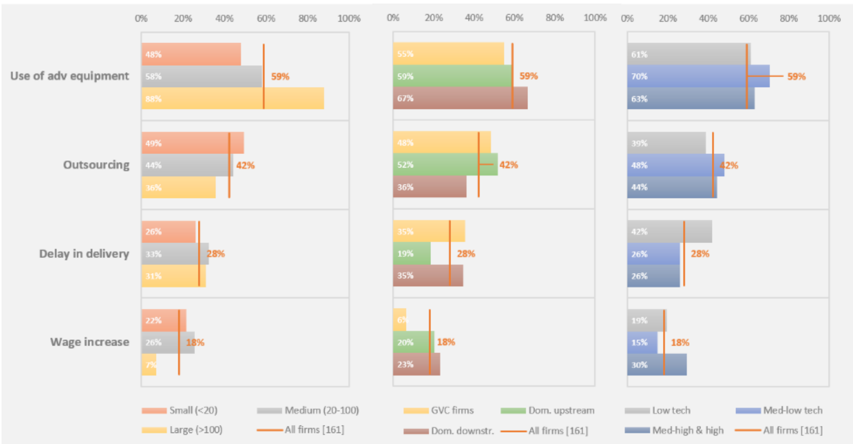


Figure 9 Dealing with shortage of workers

j) Increasing procurement channels, new production channels and reduction of production were reported to be the most preferred measures to cope with shortage of inputs by most firms regardless of size and type. However medium, medium-high and high-tech firms also preferred to delay deliveries as another coping measure.

3.4 Stimulus package

l) Firms of different size and type showed slightly different proportions receiving at least one form of government COVID-19 support programmes. We found GVC, medium to low-tech, and medium-size firms showed the highest percentage receiving government support, with 38%, 39% and 36% respectively. This means that support schemes have not reached firms that are most in need, such as small-size firms.

m) More than 40% of firms receiving support reported it was beneficial to them with medium-size, domestic upstream and low-tech firms demonstrating the highest proportion of satisfaction with support received so far. One-third did not have either positive or negative feedback on support.

n) Tax-rate reductions or tax deferrals and reduction of social contributions ranked as the most preferred support measures from the government, at 49% and 35% responses respectively. Other means to reduce operating costs including rent and utility costs (32%) and improved loan terms (27%) were the next most common preferred measures. Figure 10 illustrates firm preferences. Our finding regarding firms' preferences matches results from a survey of SMEs conducted by the Federation of Thai Industries.[9] This correlation confirms our understanding of firms' needs, in particular SMEs.

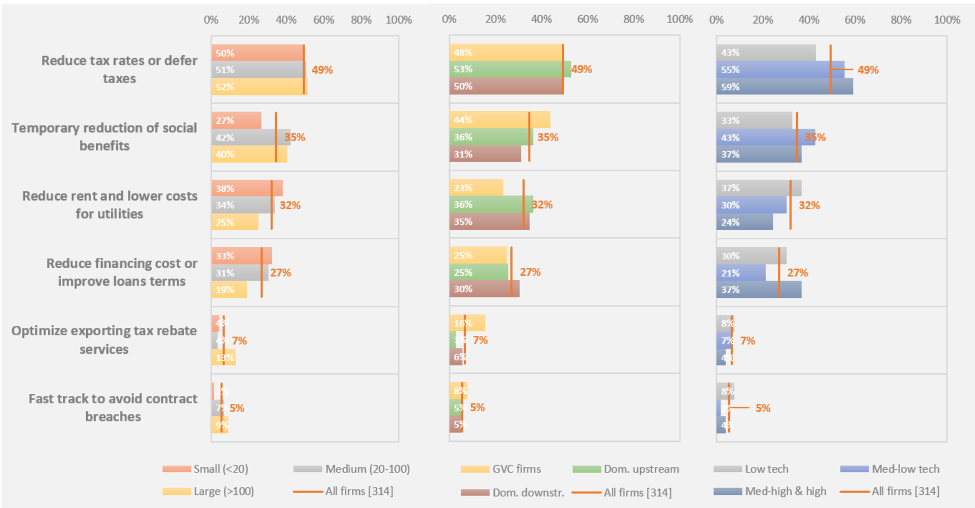


Figure 10 Firms' preferred support measures

4 Discussion

4.1 Inclusive and sustainable industrial development (ISID) – Sustainable Development Goal 9

o) Working with Thailand to achieve the SDGs lies at the core of the United Nations' mission in Thailand. This section discusses how the impacts at the firm level could affect the country's progress to achieve SDG 9, in particular in regard to ISID. We use UNIDO's own monitoring tool on the SDG 9 database on UNIDO Statistics Portal.[10]

4.1.1 Status of SDG 9.2, 9.4 and 9.b and impacts from COVID-19

p) SDG Target 9.2 aims to significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and to double its share in least

[9] https://www.fti.or.th/project_category/%E0%B8%A1%E0%B8%B2%E0%B8%95%E0%B8%A3%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B9%80%E0%B8%A2%E0%B8%B5%E0%B8%A2%E0%B8%A7%E0%B8%A2%E0%B8%B2%E0%B8%88%E0%B8%B2%E0%B8%81%E0%B8%A0%E0%B8%B2%E0%B8%84%E0%B8%A3%E0%B8%B1/

[10] https://stat.unido.org/SDG/THA

developed countries by 2030. Since 2015, we saw an increase both in terms of financial value and percentage of the manufacturing sector's contribution to the country's GDP from 1,600 USD to 1,800 USD per capita, while the ratio of the manufacturing sector in the overall employment rate dropped slightly by about 0.5%. This could mean the distribution has to be more effective and accelerated to create more employment stemming from the increasing value of the manufacturing sector. The Target's status as of the end of 2019 stated the need for accelerated, inclusive and sustainable industrialisation to achieve the SDGs.

Taking into account the impact from COVID-19 on SDG 9.2, we project the situation in three scenarios. Figure 11.a shows the projection of SDG 9.2.1 and the percentage of the manufacturing sector relative to GDP. Figure 11.b illustrates the projection of SDG 9.2.2 and the percentage of manufacturing employment from total employment. Scenario 1 is a continual trend to 2030. Scenario 2 posits no pandemic using the GDP forecast by the Economist Intelligence Unit (EIU) in collaboration with UNDP and UNICEF.[11] In their forecast, real GDP growth of 2.1% in 2020 and in 2021-22, brightening prospects for exports to boost growth close to 4%. We use the pre-COVID growth rate of the MPI, 3% predicted by the Office of Industrial Economics (OIE), Ministry of Industry.[12] We also use total employment forecast by the same report. Scenario 3 accounts for COVID-19 using the decrease of 17.21% of MPI by the OIE. We use GDP and total employment forecast in the COVID-19 scenario with government support from the same report as Scenario 2. With the government stimulus package in place, in 2020 GDP for Thailand's economy contracts by 4.3%. Over 2021-25, we expect GDP growth to average 3.2% per year.

As a result, because of the drop of the overall manufacturing productivity index, the expected reduction of revenue of the sector, and the projection of the 1.5 million people to be laid off by the end of 2020, we see reduced contributions to GDP and employment, hence moving further away from the SDG Target as illustrated in Figure 11.a and 11.b. However, since the country's GDP and total employment are negatively impacted by the pandemic, the relative contraction of the Target might not be so significant.

[11] COVID-19 Economic impact assessment for Thailand, final results 22 May 2020 by the EIU in collaboration with UNDP and UNICEF in Thailand
[12] https://indexes.oie.go.th/

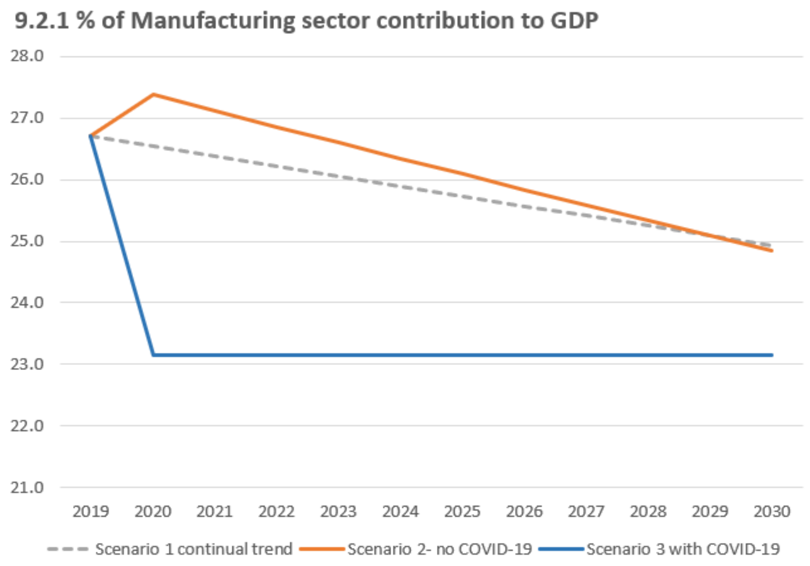


Figure 11.a SDG 9.2.1 projected scenarios

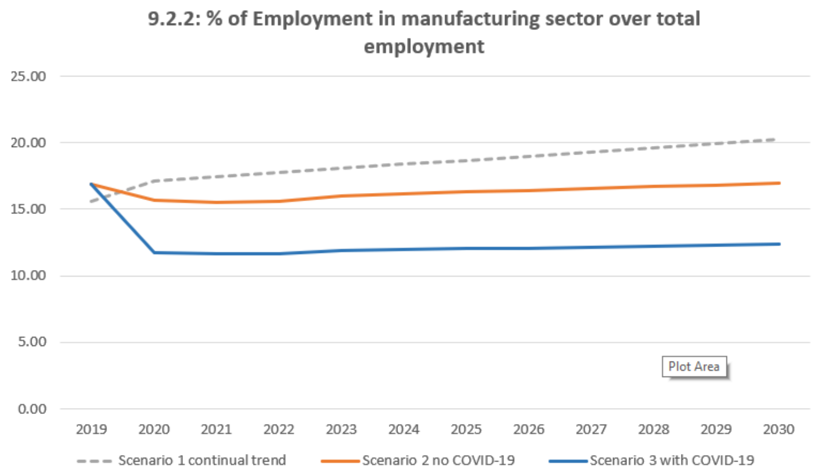


Figure 11.b SDG 9.2.2 projected scenarios

q) SDG 9.4 on carbon emissions from the manufacturing sector measured by carbon emissions over manufacturing value added shows a declining trend since 2015. This trend leads us to believe that the country is on track to achieve the goal by 2030.

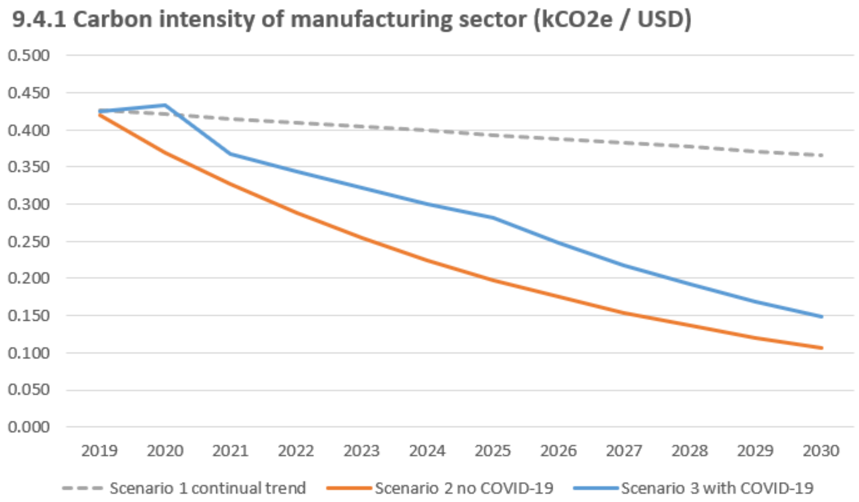


Figure 12 SDG 9.4.1 projected scenarios

Taking into account of the impact of the COVID-19, we project carbon emissions in three scenarios (Figure 12). Scenario 1 is a continual trend from the current trend to the 2030. Scenario 2 is a no-pandemic scenario and Scenario 3 is a COVID-19 scenario. We use the same manufacturing value added of Scenarios 2 and 3 from previous projections in Section p. For Scenario 2, we use percentage year-on-year carbon emissions from the manufacturing sector in a report by the Energy Policy and Planning Office (EPPO), Ministry of Energy.[13] The report shows a 9.1% reduction in 2019 in comparison to 2018. For Scenario 3, we use the expected reduction in energy consumption in the manufacturing sector in 2020 due to COVID-19, also by EPPO.[14] Our calculation resulted in a reduction of 16% of carbon emissions from the manufacturing sector from the 2019. From 2021 to 2025, taking into account the improved economic situation, energy consumption in manufacturing sector will rise coupled with an expected increase in renewable energy's percentage in the country's energy mix[15] and hence we estimate the reduction of carbon emissions from the sector to be 12.5%. From 2026, we expect the economy and the investment of low carbon technologies including renewables to return to pre-COVID-19 levels. Therefore, carbon emissions from the manufacturing sector would be equivalent to that of the pre-COVID-19 situation with a 9.1% decrease.

Figure 12 demonstrates our estimation. In Scenario 3, we see a spike in 2020 due to the huge drop of the manufacturing value added (MVA). With the pandemic, carbon emissions from manufacturing sector will decline, not because of the adoption of low carbon technologies but due to low production caused by the reduced demand as a result

[13] http://www.eppo.go.th/index.php/th/energy-information/situation-co2/half-year?orders[publishUp]=publishUp&issearch=1
[14] https://www.energynewscenter.com/%E0%B8%AA%E0%B8%99%E0%B8%9E-%E0%B8%9B%E0%B8%A3%E0%B8%B1%E0%B8%9A%E0%B8%95%E0%B8%B1%E0%B8%A7%E0%B9%80%E0%B8%A5%E0%B8%82%E0%B8%9E%E0%B8%A2%E0%B8%B2%E0%B8%81%E0%B8%A3%E0%B8%93%E0%B9%8C%E0%B8%81%E0%B8%B2/
[15] The global renewable energy is forecasted to increase by 3%, https://www.energytimeonline.com/content/7674/%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B9%8C%E0%B8%9E%E0%B8%A5%E0%B8%B1%E0%B8%87%E0%B8%87%E0%B8%B2%E0%B8%99%E0%B9%82%E0%B8%A5%E0%B8%81%E0%B9%83%E0%B8%99%E0%B8%A2%E0%B8%B8%E0%B8%84-covid-19.

of the crisis. In addition, GDP is expected to drop, but not enough to maintain the pre-COVID-19's trend.

r) Target 9.b on technological development is measured by the ratio of medium-high and high-tech industry value added in total value added. Technological development has been stagnant remaining at a rate of 41% of medium-to-high technology industry over total value added. Hence, ensuring a policy environment for industrial diversification and value addition to economic development is needed to boost progress. As a result, the status as of the end of 2019 marked the need to accelerate to achieve target. Taking into consideration the impact of COVID-19 and the economic downturn, the goal for firms to increase investment for higher technology adoption is now unlikely. Therefore, we expect progress on this Target to remain stagnant for an extended period.

4.1.2 SDG 9.3: Small and medium enterprises (SMEs)

s) Target 9.3 places importance on SMEs and their contribution to the country's overall economy and employment. Enabling the necessary ecosystem for SMEs to thrive could help the country to advance in economic growth with equal distribution in the long run. In line with Target 9.3 Pillar III "Protecting jobs, small and medium-sized enterprises, and informal sector workers" under the United Nations framework for immediate socio-economic response to COVID-19, for recovery efforts UNCTs should pay attention to protecting as well as extending financial support to SMEs.

According to both UNESCAP and UNIDO data, no information is available to measure progress on this Target. Therefore, in this discussion, we use statistics from the Office of SME Promotion[16] as our main source.

t) The Office of SME Promotion's White Paper on SME 2019[17] indicated that in 2018 SMEs' contribution to the country's GDP amounted to 43.0% in comparison with 42.4% in 2017. In the same year, with more than 3.07 million enterprises, SMEs employed more than 11 million employees nationwide. SMEs' economic sectors were 39.1% from the service sector, 31.4% from wholesale and retail, 22.6% from manufacturing, and the remaining 6.9% from utility, construction and mining. Considering that SMEs accounted for 43% of 2018 GDP, manufacturing SMEs contributed almost 10% to GDP.

During previous years, SMEs in the largest sectors of trade and service continued to grow largely due to the continued expansion of domestic demand, notably growth in government and private-sector consumption, improved agriculture-sector earnings and revenue from inbound tourism. It is worth noting that 2019 saw a drop in total employment by SMEs to about 9.6 million employees. However, the total number of SMEs increased to 3.1 million enterprises. For manufacturing SMEs, in 2019 there were about 530,700 enterprises employing more than 1.9 million employees.

u) Taking into account of current and expected impacts from the COVID-19 crisis, based on available data, Target 9.3.1 measured by the proportion of small-scale industries' contribution to total industry value added will stay stagnant with the possibility to

[16] http://www.sme.go.th/th/index.php
[17] https://www.sme.go.th/en/download.php?modulekey=94

achieve the Target by 2030 seeming unlikely. Extrapolating from the survey sample,[18] we found 15% of responding firms that are manufacturing SMEs expected to close down if lockdown measures continued for three months. Providing an assumption that the same rate applies, this would translate into 79,605 enterprises with 245,000 people to be jobless from the manufacturing SMEs alone.[19] The potential closure of these manufacturing SMEs would exacerbate challenges to meet the Target. In addition, a majority of SMEs expected a drop in their 2020 revenues (Figure 13), meaning that their contribution to GDP and specifically to the manufacturing sector would be reduced. Target 9.3.1, which constitutes the ratio to the whole manufacturing sector, was expected to drop as well.

Therefore, the overall ratio of manufacturing SMEs to the manufacturing sector as a whole may remain unchanged or slightly change. In addition, SMEs need a longer time to get back on their feet (Figure 14). Without concerted and effective efforts from the government's recovery schemes, increasing SMEs' contributions to the economy as per the Target seems unlikely.

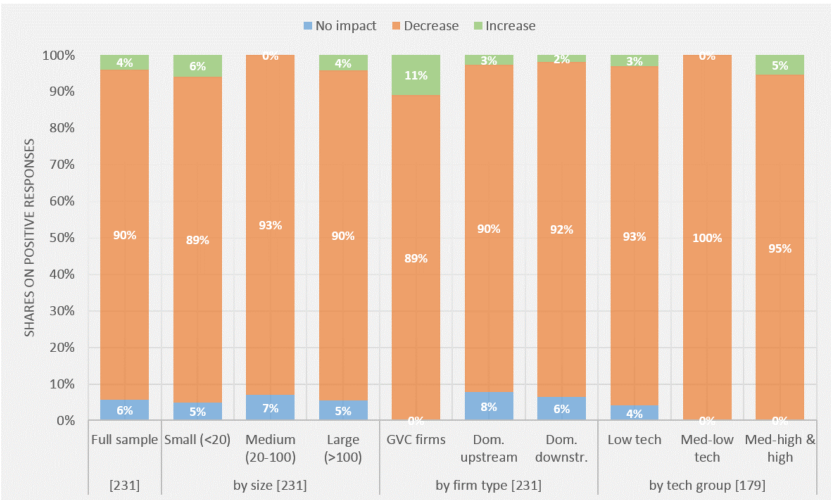


Figure 13 Expected drop in revenue 2020 by all firms

v) Most importantly, the hardest hit SMEs are in the service sector, tourism in particular. For instance, employees at small hotels, bed and breakfast facilities, small tour operators and tourist bus operators are projected by the NESDC to soon be unemployed or are already unemployed, since they rely on inbound and domestic tourists for revenue. Out of the total 3.9 million people employed in the tourism, 2.5 million are expected to become redundant.[20] In other words, 64% of employees in the sector face the prospect of unemployment. Repurposing SMEs in this sector might not be straightforward due to the nature of the business. Support schemes are urgently needed.

[18] From Figure 1, we will have 30% of the 314 firms assumed to be manufacturing SMEs and Figure 5 shows that 50% of them will close.
[19] Using 2019 statistics.
[20] https://www.posttoday.com/economy/news/624626

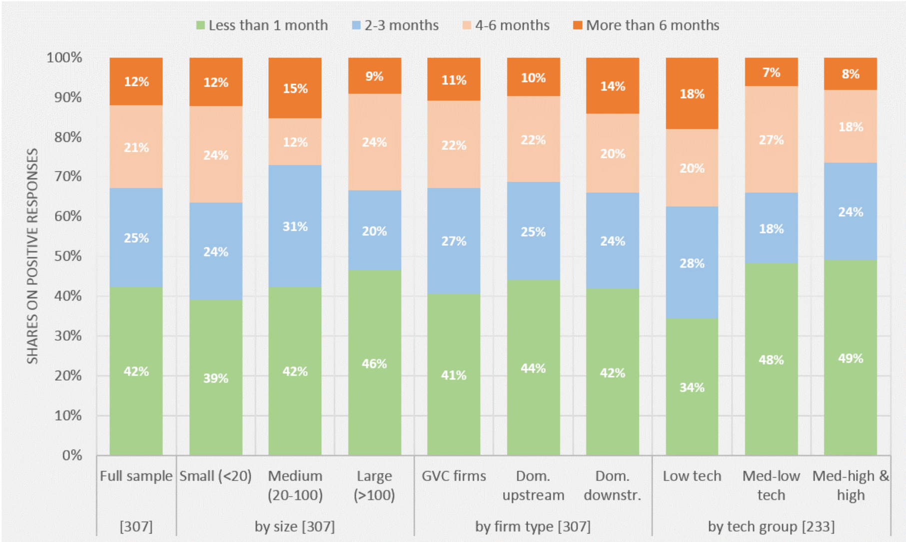


Figure 14 Expected recovery times

4.2 GVC firms and the automotive industry

q) The automotive industry comprising mostly GVC firms has been hit the hardest. According to our survey findings, 63% of GVC firms expected more than 50% reduction in revenue in 2020. They are hit by the reduction of orders (70% of responding firms), followed by an inability to make deliveries, difficulties in financing and value chain disruptions. Automotive products such as cars and trucks were ranked as Thailand's top exports prior to COVID-19. Thailand houses a South East Asian production hub of the two major automotive giants Honda and Toyota, making the country the largest automotive producer in ASEAN countries and the sixth largest in the world.[21]

In 2019, trading values of finished automotive goods amounted to 20,726 million US dollars of which, 18,175 million US dollars and 2,552 million US dollars represented export and import values respectively.[22] The auto parts trading value amounted to 46,055 million USD, of which 24,371 million and 21,684 million constituted export and import values respectively. Even before the pandemic, the sector saw a prevailing threat from the trade dispute between the United States and China.

Unfortunately, trading partners in the sector include countries severely affected by the pandemic, including China, Japan, Germany, Australia, the United Kingdom and the United States. Other trading countries such as Malaysia, Indonesia, Viet Nam and Philippines have significant number of infections as well, although not as severely affected as the first group. As a result, demand from these countries has dropped tremendously. Containment measures such as border closures have exacerbated the situation by disrupting the value chain and making deliveries impossible. At the end of May, however, the situation in China showed positive signs of improvement and borders were opening up. The situation in other main trading partners remained difficult as the number of infection cases continued to rise in the UK and the US.

[21] https://www.mreport.co.th/news/industry-movement
[22] https://www.prachachat.net/columns/news-458855

On the one hand, GVC firms in the survey demonstrated a faster recovery capacity because GVC firms reported better performance than other firms.[23] On the other, the recovery time for GVC firms depends largely on the situation for trading partners. Looking ahead, automotive GVC firms will continue to suffer as long as trading partners' situations do not improve.

4.3 Support from government

Some key government schemes launched since April are highlighted below.

i) In late April, the Bank of Thailand announced the Government Gazette on debt suspension for a maximum of six months for affected enterprises. Commercial banks are to implement this scheme.

ii) The SME Development Bank announced five measures to help firms. Firstly, 1% of debt rate is offered for one year for five business categories: hotels/dormitories, spas, restaurants, tourism guides and tourist transport. Secondly, capital and debt repayment can be deferred for six months for current customers. Thirdly, loan payment periods can be expanded up to five years. Fourthly, debt payment conditions can be renegotiated. Lastly, additional extra loans with a 3% interest rate and transformation loans with a 4% interest rate are being offered.

iii) Additionally, the Cabinet has implemented various relief measures to people and business. Grants of 5,000 baht are being paid for affected citizens with conditions under the social insurance system for three months. Personal tax payments can be deferred and social insurance payment rates reduced from March to May. Soft loans with 0.1% monthly interest rate for freelance earnings of less than 30,000 baht per month are being offered by the Government Saving Bank (GSB) and Bank of Agriculture and Agricultural Cooperatives (BACC).

iv) Utility usage is also being partially subsidised by utility agencies including the provision of 10GB free internet for everyone, free water supply provisions and a 20% reduction in water tariffs for larger amounts for Bangkok households. Electricity deposit charges are being returned and reduced electricity tariffs applied for registered users living in Bangkok and other provinces.

v) On 2 June, the Minister of Industry in partnership with the SME Development Bank launched an extended loan scheme tailored to support SMEs.[24] This loan scheme aims to improve SMEs' access to the financial support schemes offered by the government. It aims to provide working capital, enhance the liquidity of employment, and enable recovery as soon as possible. The overall programme put forward by the Minister worth more than 40,000 million baht helps SMEs in approximately 24,000 businesses. As a result, the scheme is expected to help to continue the employment of 120,000 people and boost economic turnover of approximately 90,000 million baht. The

[23] OECD-UNIDO (2019), Integrating Southeast Asian SMEs in Global Value Chains: Enabling Linkages with Foreign Investors, Paris. www.oecd.org/investment/Integrating-Southeast-Asian-SMEs-in-global-value-chains.pdf

[24] http://iiu.oie.go.th/news/1195

funds for this extended loan scheme from the Ministry of Industry will be fed into existing financial support programmes for SMEs by the SME Development Bank and Office of Small and Medium Enterprises Promotion (OSMEP). The SME Development Bank will use additional funds to top up the Bank's existing schemes such as the Civil State Loan and Small SMEs Credit schemes with an interest rate of 1% per year. The OSMEP's existing scheme SME One will benefit from additional funds with a 1% interest rate and an exemption of repayment up to 12 months.

According to the Federation of Thai Industries, 10% of the loan scheme has been successfully accessed so far. This low access rate shows barriers hindering affected firms to access the loan. In addition, based on our findings, 14% of small-size firms reported that the support they received from the government was not beneficial. Therefore, in order to launch the next set of stimulus packages, the government should revisit and evaluate existing programmes to better reach those who are most in need and to target recipients.

5 Policy recommendations

We believe that the most helpful recovery support is to immediately restart and stimulate demand for goods and services. Since the stimulus package and supporting programmes launched so far by the government are still at an initial phase, based on analysis and discussion in previous sections we offer an initial set of policy recommendations below.

These recommendations are not by any means exhaustive. Our policy recommendations ultimately aim to help Thailand to build back a stronger manufacturing sector and get on track to achieve sustainable and inclusive industrial development as per SDG 9. The United Nations Department of Economic and Social Affairs (UNDESA) emphasises how a stimulus package is being implemented matters. Drawing on lessons learned from the economic crisis in 2008, UNDESA concludes the key to achieve an effective package includes: i) protecting jobs better and avoiding layoffs; ii) expanding existing programmes more effective than creating new ad hoc programmes and; iii) consider groups that are often not protected.[25] Our recommendations follow these principles.

i) **Improvements on current support schemes.** As discussed in Section 4.3, several government agencies such as the Ministry of Industry and Bank of Thailand have announced and started implementation of support schemes for affected firms. Some improvements could be considered so that schemes could be more effective and targeted.

- Ease access and remove barriers to loans for firms to stay afloat.
- Expand the reduction of electricity and water tariffs to firms.
- Tax and social security contribution deferrals for a longer period of three to five years at a minimum.
- Customise support programmes for micro and small firms. Special programmes and fast-tracked applications should be tailored accordingly. For instance, this could include tax exemptions for up to three years for SMEs and domestic

[25] https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-58-covid-19-addressing-the-social-crisis-through-fiscal-stimulus-plans/

downstream firms. To ease conditions for small firms to gain access to additional loans, the government could come in as a guarantor to commercial banks. The recently announced additional loan scheme for SMEs with 1% interest rate is a good model. However, a guarantor needs to be identified or a condition attached that would not require a guarantor under this new scheme.

ii) **Employment retention scheme.** Although layoffs are not the first priority for firms, wages and social security expenses are reported as the largest financial burdens. An effort should help affected firms to stay afloat. Worsening unemployment will aggravate income inequalities both at the present time and in the future. Diverse wage subsidy schemes are being implemented in many countries to sustain business and secure jobs. For instance, in Singapore, the government has subsidised up to 75% of wages for nine months. Self-employed people in the UK can apply for grants worth 80% of their average monthly profits, up to 2,500 pounds, while salaried employees are being provided with wage subsidies of 80%.[26] Other countries have implemented wage schemes, including the Netherlands, Germany, Canada and Australia, among others.

- We suggest consideration for a wage subsidy of 60% to 80% of salaries for six months coupled with short-term work scheme with a focus on **micro, small and medium-size firms and domestic-downstream firms**. The wage subsidy could vary depending on type and size of firms. Under the short-term work scheme, all employees will reduce working time by the same amount, at least by 10% and the base wage cut proportionally. This scheme works for firms with continuing production.
- Another option for the wage retention scheme is to allow employees to take long leaves until demand and production resume. During this long leave, the government could consider subsidising an appropriately reduced wage. For example, in Germany the state is considering subsidising two-thirds of workers' wages. This scheme fits those firms with low or no production.

iii) **Support automotive sector**. An automotive industry association under the Federation of Thai Industries has explored the possibility of a "cash for clunkers" programme to stimulate demand for new cars. The programme incentivises car owners to trade in old cars and buy a new one with some price offsets. This programme is also being considered by countries with automotive industries such as the US and Germany.[27] However, in Thailand, the programme might not benefit used car dealerships and that could cause an issue if the programme were not designed properly. We recommend a proper analysis with all concerned stakeholders consulted as a foundation for the programme.

In addition, another way to create demand for new cars is through a mandatory scrapping policy. The scrapping policy could be implemented based on vehicle age, for example banning cars older the 10 years; vehicle safety standards such as mandatory annual inspection and certification; and/or environmental standards such as emission controls.

[26] https://www.bbc.com/news/business-51982005
[27] https://cars.usnews.com/cars-trucks/cash-for-clunkers

This would have significant collateral benefits in terms of average fuel efficiency and reduced air pollution.

iv) Lastly, UNIDO's support programmes leverage UNIDO's expertise to work with Thailand to bring the manufacturing sector and businesses back from the crisis and at the same time move towards inclusive and sustainable manufacturing.

Industrial development facility. An independent body could be established to provide support for firms in various areas such as technological and product improvement, production innovation, business expansion and how to cope with crises such as COVID-19. The body could be funded by diverting a small percentage of tax paid by firms and provide service to firms with minimal charges to cover operating costs for staff time and travel. The facility could use incoming revenue from the tax to subsidise firms with interest rates such as 2% paid by the firm and 2% by the facility for a 4% rate. The facility should have a legal status and could be a guarantor for firms who are in need of support. This would benefit firms a great deal in particular during the crisis since many micro and small firms face difficulties in obtaining additional loans from commercial banks.

Investing in advanced technology – IR 4.0 Technology. To achieve changes in the workplace, including the initial shortage of workers, advanced technology needs to be introduced. The COVID-19 crisis is likely to result in structural transformation of manufacturing into a "new normal", which appears most likely to be more digitalisation, more circular and more resilient. 4IR Technology will be a defining factor, helping industry to resume operations as soon as possible and providing a platform to develop new, more resilient operations, value chains and businesses.

In order to support a smooth transformation, UNIDO is leading in addressing opportunities, challenges and risks stemming from 4IR while ensuring that no one is left behind. To cater to the growing demand for 4IR-related services in light of the crisis, UNIDO has developed technical cooperation programmes and integrated packages for Member States, such as the COVID-19 Industrial Recovery Programme (CIRP), which will provide targeted support to national governments with the restructuring of their industrial sector in the recovery period. Through its different programmes focused on SMEs, UNIDO is supporting the business sector to restructure and respond to the disruptions through the adoption of advanced technologies and innovative solutions, building flexibility and long-term resilience. (Figure 15 and Figure 16).

Business repurposing scheme. One of the solutions proposed by UNIDO as an immediate response is repurposing manufacturers and service providers.[28] Repurposing is a rapid response solution to address the global shortage of COVID-19 critical items that can save lives by using idle manufacturing capacity. It can also contribute to ensure business continuity and employment retention. Repurposing is in principle a temporary strategy that could be expensive and filled with challenges. Hence, to capitalise on opportunities that repurposing has to offer, policy responses are essential to help manufacturers address repurposing challenges and facilitate the transition to the new

[28] https://www.unido.org/news/covid-19-critical-supplies-manufacturing-repurposing-challenge

normal during this COVID-19 crisis. Opportunities exist to leverage proven designs and methods.

Figure 15 4IR in fighting against COVID-19

Figure 16 4IR and the 'new normal'

Annex 1: Questionnaire

COVID19: IMPACT ON MANUFACTURING FIRMS SURVEY

Current impact of COVID-19

1. Because of the pandemic, what is the percentage of your company's employees who are unable to physically come to work and cannot adequately work from home at present?

	_________% (_ _% women, _ _% men)
	I don't know

2. Please indicate the most significant financial problems for your firm during the outbreak (please select all that apply):

	Staff wages and social security charges
	Fixed costs, e.g. rent
	Repayment of loans
	Payments of invoices
	Other expenses, please specify: _________________
	No specific problem

3. Are there any other business problems your firm is facing due to the pandemic? (Up to two options)

	Reduction of orders
	Inability to deliver existing orders
	Increased difficulty of financing
	Existing loans cannot be extended
	Disruption of logistics
	Upstream and downstream chain disruptions
	Insufficient protective equipment (e.g. masks)
	Other, please specify: ____________________

Expected impact of COVID-19

4. What impact do you currently expect on your firm's revenue this year as a result of COVID-19?

	No impact
	Decrease of ____%
	Increase of ____%
	Too early to state
	I don't know

5. Is your firm currently considering layoffs, or has already done some because of the pandemic?

	Yes (go to question 5.1)
	No (go to question 6)

5.1. What percentage of staff are you expecting to (or have already) cut?

	_____% (go to question 5.2)
	Too early to state (go to question 6)

5.2. Do you expect these layoffs to be temporary or permanent (total should sum up to 100%)?

_____%	Temporary (of which_ _% women, _ _% men)
_____%	Permanent (of which__ % women, _ _% men)
_____%	Too early to state

5.3. If possible, please indicate how these layoffs are distributed with respect to their qualification (please insert value as percent of total sales for every option; total should sum up to 100%)

___%	University degree
___%	Technicians
___%	Semi-skilled
___%	Unskilled
___%	Apprentice
	Unable to say at this stage

5.4. If possible, please indicate how these layoffs are distributed over the following areas (please insert value as percent of total sales for every option; total should sum up to 100%)

___%	Research and development
___%	Design
___%	Manufacturing / Assembly
___%	Customer Service
___%	Administrative
	Unable to say at this stage

6. Are there currently restrictions by your government that impact your normal way of operating as a business?

	Yes (go to question 6.1)
	No (go to question 7)

6.1. If the current restrictions in your country continue, how long can your firm's current cash flow maintain the company's operation?

	Indefinitely
	More than 12 months
	Between 6 and 12 months
	Between 3 and 6 months
	Between 1 and 3 months
	Less than 1 month

7. If the international COVID-19 crisis were to end today, how long would you estimate it would take for your company to get back to business as usual?

_____ days

Dealing with COVID-19

8. What is the main means you are considering to deal with the cash flow shortage? (Up to two options)

	Loans by commercial banks
	Loans by Internet finance
	Loans by microfinance companies or private individuals
	Negotiating with lenders to avoid withdrawing loans
	Equity financing (adding new shareholders or capital increase of former shareholders)
	Reduction of operating costs (e.g. layoffs and salary reductions)
	No cash flow shortfalls problem
	Other, please specify: ____________________

9. What is the main means you are considering to deal with the shortage of workers? (Up to two options)

	Wage increases
	Use of advanced equipment or software to reduce the amount of work
	Outsourcing of orders
	Delay in delivery
	No shortage of workers
	Other, please specify: ____________________

10. What is the main means you are currently considering to deal with the shortage of inputs such as intermediate goods and raw materials? (Up to two options)

	Reduction of production
	Outsourcing orders
	Increasing the procurement channels
	Seeking new production channels
	Delaying goods delivery
	No shortage of inputs
	Other, please specify: ____________________

11. What is the main means you are currently considering to deal with difficulties in fulfilling contracts?

	Settlement by mutual agreement
	Legal or arbitral settlement
	Expect the government to coordinate and provide clear disclaimer agreements
	Payment of liquidated damages
	No contractual performance issues
	Other, please specify: ____________________

12. Are there currently any measures / support packages by your government that your company is benefiting from?

	Yes (go to 12.2)
	No (go to 13)

12.1. Please specify what measures/support you are receiving:

	Loans up to THB 3 Million for SME at 3% interest rate for the first two years of taxes and fee cuts for debt restructuring with non-financial institution creditors
	Date for filing corporate income tax extended to August (Por Ngor Dor 50) and September (Por Ngor Dor 51)
	Filing of excise tax by service businesses extended by one month Filing of excise tax for oil products operators extended to the 15th of the following month for the next three months
	Filing of other taxes for affected operators extended by three months
	Exemption of import duty for products related to the prevention and treatment of Covid-19
	Exemption of taxes and fee cuts for debt restructuring with non-financial institution creditors
	Other, please specify: ____________________

12.2. To what degree this support is useful to your company

	Strongly beneficial
	Beneficial
	Neutral
	Almost beneficial
	Not beneficial
	Other, please specify: ____________________

13. In the face of the impact of the pandemic, governments at all levels and financial institutions have announced relief measures. Which policy do you believe is the most effective for your firm? (Up to two options)

	Reduce rent for small and medium-sized enterprises and lower costs for electricity, gas, logistics, etc.
	Reduction of tax rates, reduction or deferral of taxes
	Reduction of financing costs for SMEs, extension of loan terms or partial debt relief
	Temporary reduction of social insurance premiums and reimbursement of unemployment insurance to enterprises that do not lay off staff
	Optimization of exporting tax rebate services
	Provide fast-track "force majeure" certification to avoid contract breaches
	Others, please specify:__________________

Background Information:

Profile of the firm

14. When did the firm start to operate?

	Insert year

15. Please select the industry that best describes the products your firm produces:

	Food and beverages
	Tobacco products
	Textiles
	Wearing apparel, fur
	Leather, leather products and footwear
	Wood products (excl. furniture)
	Paper and paper products
	Printing and publishing
	Coke, refined petroleum products, nuclear fuel
	Chemicals and chemical products
	Rubber and plastics products
	Non-metallic mineral products
	Basic metals
	Fabricated metal products
	Machinery and equipment n.e.c.
	Office, accounting and computing machinery
	Electrical machinery and apparatus
	Radio, television and communication equipment
	Medical, precision and optical instruments
	Motor vehicles, trailers, semi-trailers
	Other transport equipment
	Furniture; manufacturing n.e.c.
	Recycling

16. What is the ownership structure of your company?

	100% nationally owned enterprise
	Foreign subsidiary
	Joint venture
	Other, please specify: ____________________

17. What was the number of employees of the firm at the end of 2019?

	Insert the number of employees at the end of 2019 (of which __% women, _ _% men)

18. In relation to the main production activity, the firm produces predominantly (please select one option):

	Finished goods for consumers
	Finished goods for industrial business
	Intermediate inputs for agriculture
	Intermediate inputs for manufacturing
	Intermediate inputs for services

19. Which share of purchases of raw materials and intermediate goods corresponded to each of these categories in 2019? (please insert value as percent of total sales for every option; total should sum up to 100%):

___%	Import: foreign suppliers
___%	National: Multinational corporations/foreign-owned suppliers located in the county

___%	National: domestic suppliers

20. Which share of sales/turnover corresponded to each of these categories in 2019 (please insert value as percent of total sales for every option; total should sum up to 100%):

___%	Export: foreign costumers
___%	National: Multinational corporations /foreign-owned customers located in the country
___%	National: domestic customers

21. Has the firm run part of its production activity in another country in 2019 (offshores)? (please select one option):

	Yes, through direct investment (i.e. foreign affiliates/controlled firms)
	Yes, through contracts with domestic firms abroad (e.g. technical/manufacturing partnership agreement, licensing agreement)
	No

22. Which regions does you company have offices or production plants in?

	Bangkok
	Samut Prakan
	Pathum Thani
	Samut Sakhon
	Nakhon Pathom
	Nonthaburi
	Saraburi
	Sing Buri
	Chainat
	Ang Thong
	Lopburi
	Phra Nakhon Si Ayutthaya
	Chonburi
	Chachoengsao
	Rayong
	Trat
	Chanthaburi

	Nakhon Nayok
	Prachinburi
	Sa Kaeo
	Khon Kaen
	Udon Thani
	Loei
	Nong Khai
	Mukdahan
	Nakhon Phanom
	Sakon Nakhon
	Kalasin
	Nakhon Ratchasima
	Chaiyaphum
	Yasothon
	Ubon Ratchathani
	Roi Et
	Buriram
	Surin
	Maha Sarakham
	Sisaket
	Nong Bua Lamphu
	Amnat Charoen
	Bueng Kan
	Chiang Mai
	Lampang
	Uttaradit
	Mae Hong Son
	Chiang Rai
	Phrae

	Lamphun
	Nan
	Phayao
	Nakhon Sawan
	Phitsanulok
	Kamphaeng Phet
	Uthai Thani
	Sukhothai
	Tak
	Phichit
	Phetchabun
	Phuket
	Surat Thani
	Ranong
	Phang Nga
	Krabi
	Chumphon
	Nakhon Si Thammarat
	Songkhla
	Satun
	Yala
	Trang
	Narathiwat
	Phattalung
	Pattani
	Ratchaburi
	Kanchanaburi
	Prachuap Khiri Khan
	Phetchaburi

	Suphan Buri
	Samut Songkhram

Follow up

23. We would greatly appreciate your participation in a follow up survey in a few months. If you would like to participate, please leave your contact details

Name and Email (optional, mobile or landline number)