



Impact of COVID-19 on Micro, Small and Medium Enterprises in Dire Dawa Administration

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Abstract

Background: Micro, Small and Medium Enterprises have long been engines for social and economic wellbeing of nations in every corner of the world. They play pivotal role in reducing poverty through creating massive employment opportunities, socio-cultural integration, and adds value for GDP growth. The main objective of this study was to assess the impact of COVID-19 on Micro, Small and Medium Scale Enterprises in Dire Dawa Town

Method: The study was done on 790 Micro, Small and Medium Enterprises in Dire Dawa town. A cross-sectional study design was employed. Stratified sampling technic was employed to select study participants. Data were collected using structured questionnaire and analyzed using SPSS version 24. Data was analyzed using binary logistic regression model.

Result: Our study revealed that 81.65% of Micro, Small and Medium Enterprises were highly economically affected due to the emergence of COVID-19. Among the five sectors, service sector (85.2%), trade (84.4%) and construction (83.1%) sectors were more economically impacted. The economic impact level of Micro and Small enterprises were estimated to be 84.16% and 82.46% respectively. Based on multivariable analysis, Managers' education level {no grade [AOR = 4.748, 95%, CI: 2.264, 18.581], ownership, {partnership [AOR = 0.289, 95%, CI: 0.085, 0.984], Association [AOR = 4.337, 95%, CI: 1.216, 15.469], workers delay to work [AOR = 4.337, 95%CI: 1.162, 10.265], and absenteeism of workers [AOR = 0.284, 95%CI: 0.094, 0.851] were significantly associated with economic impact level of Micro, Small and Medium Enterprises during the pandemic.

Conclusion: The study has found that enterprises have faced payment shortages for house/machine rent and material as well as supply chain problem due to emergence of Covid-19. It has been also indicated that annual sells, revenue, saving and employment have been seriously decreased. The government should help enterprises by solving the financial and supply chain related problems.

Key words: MSME, COVID-19, logistic regression

1. Introduction

The World has been gripped by a COVID-19 pandemic over the first half of 2020. The World Health Organization has declared that the new coronavirus outbreak is a public health emergency of international concern, and officially announced on Thursday, 30th January, 2020 (1).

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Doi: <https://doi.org/10.20372/hjasm.v1i2.46>

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Received: March 2022; Received in revised form: April 2022; Accepted: May 2022

COVID-19 continued its spreading across the world and could address all countries of the World within short periods of time resulting in a human tragedy and tremendous economic damage including Ethiopia. A more recent report of ILO shows that lockdowns (full or partial) measures are influencing 81% (around 2.7 billion) of the total global workers (2). Micro, Small and Medium Enterprises (MSME's) have long been engines for social and economic wellbeing of nations in every corner of the world. They play pivotal role in reducing poverty through creating massive employment opportunities, socio-cultural integration, and adds value for GDP growth. Evidences from Word Bank show that, MSMEs accounts 90% of businesses and more than 50% of the jobs around the world. Small businesses account for two-thirds of the globe's jobs and more than 40% of world GDP (3). In developed economies, MSME's contribute 60-70% of employment opportunity and 55% of GDP (4). For example, in Europe, the sector contributes 58% of GDP and 67% of employment. In the developing world, MSME sector take 33% share of the GDP and 45% of employment (5). In Africa, two out of three MSMEs said that they had been strongly affected by Covid-19, mostly involving reduced sales (75%) and/or difficulty of assessing inputs (45%). Hence, many MSMEs are running out of stock, some hardly continue to operate, and some will be out of soon. So, wage subsidies and temporary tax suspensions would allow MSEs to retain employees and reduce job loss. So, Supporting Small and Medium-sized Enterprises (SMEs) with business continuity in these contexts can help to mitigate adverse effects upon food security and livelihoods (6).

In Ethiopia the first Corona virus case was reported on March 3, 2020. After the onset of the virus in the country, the number of people that are being infected started to slightly increase. Then, following this increment of infection, the government could put restriction on human mobility declaring state of emergency and health professional advice measures such as stay-at-home, physical distancing, usage of sanitizers etc., that caused a massive damage on MSME's operation by affecting both the supply and demand side.

In Ethiopia, micro, small and medium scale enterprises are the second largest employment creating sector next to the agricultural sector (7). MSMEs represent the largest shares of businesses in Ethiopia, accounting cumulatively for over 98% of all business enterprises. Overall, it is estimated that MSMEs employ approximately 5

million people nationwide (8). Beyond GDP and employment contribution, micro and small scale enterprises have been generating more benefits such as accelerating urbanization, bringing balanced regional growth, reducing migration from rural to urban areas, enhancing the transition from agriculture based economy to industrial led economy, and protecting illegal migration of women and youth to foreign countries (9). Only 17% MSMEs had survived more than a decade, confirming that survival of enterprises in Ethiopia is low. This is also highly suggestive of the elevated levels of vulnerability that such enterprises have to cope with in the face of a large-scale crisis such as COVID-19.

Dire Dawa which is the second Federal Administrational city of Ethiopia has been suffered due to COVID-19's economic impact since its emergence. Before, the emergence of COVID-19, MSME in Dire Dawa town is confronted with a number of factors. The major factors include financial problems, lack of qualified employees, lack of proper financial records, marketing problems, lack of work premises, lack of infrastructures and information. Personal attitudes, training and technical experience are also coined as major challenges.

Given the existing vulnerabilities in the administration, the impact of the crisis on lives and livelihoods is expected to be particularly severe. As the result, it is clear that the impact of covid-19 on MSMEs is also expected to be worth.

Currently, Ethiopian government, many research institution and NGOs are assessing the economic impact of the virus on the country. Especially, many assessments have been done on the impact of COVID-19 on large scaled industries. Even though so many studies are being done on this area, they remained on the large scaled level with less attention for MSMEs that have great contributions for the development of the country as a whole. Not only this but also, these nation or World-wide studies have been done using only descriptive statistics, without applying inferential statistics. Starting the onset of the virus, few studies have also been done regionally including Dire Dawa Town related to Covid-19. Again all these studies are related to only awareness and practice rather than assessing the economic impact of the virus. Neither impact of the pandemic on the general economy nor on the MSMEs has been assessed still now. So, this study was done to: 1) estimate the prevalence of economic impact level among MSMs, 2)

determine whether there is economic impact difference among enterprise with respect to their size and types, and 3) determine the current most suffering operational cost in MSMEs due to COVID-19.

So, this study has assessed the economic impact of COVID-19 on micro, small and medium scaled enterprises in Dire Dawa City. Based on African Trade Policy Centre (ATPC) and International Economics Consulting Ltd, study in 54 African countries, key factors which make MSMEs highly vulnerable to the impact of COVID-19 were destruction of workers, liquidity reserves (limited financial alternatives or operational cash flows), lack of government support and lack of credit from micro finance banks, business closed, drop in demand and reduction of opportunities to meet new customers were the main challenges faced by African micro, small and medium enterprise including SSMEs (10).

A study done by UNDP in Nigeria in titled on ‘effect of covid-19 on small and medium scale enterprise’ revealed that the cessation of movement, the reduction in consumer demand, and destruction of supply chains, education level of managers, sector type, crisis past experience, market type, payment challenges of enterprises have negatively affected SMEs in Nigerian, while enterprises ownership type and sex of managers have less impact on the operational and financial status of SMEs (11).

According to UNDP assessment report on impact of COVID-19 on chines enterprise, three operational costs (i.e.; cost of staff salaries, loan repayment and rent), were estimated to be the biggest cost for SMEs during the pandemic. Similarly, supply chain, and customers’ demand have been impacted by the occurrence of the virus. It has also been indicated that government support and measurement taken to cop up with COVID-19 have greater impact on MSME’s financial status during the pandemic. The result of that study also showed that enterprises have accordingly adopted measures to cop up with COVID-19, including: introducing new business model, introducing new products/services, and reducing sales price reducing staff salary, reducing production cost, reducing prices of products/service to cope up with the pandemic (12).

Another study done by IOM, (2020), entitled on ‘Assessing impact of COVID-19 on SMEs’ in Iraq on Jun to July, 2020 using 465 samples showed that COVID-19 has negatively affected production and employment, with an average reduction of 67% and

27% respectively. The study has also estimated that on average, enterprises' revenues had been declined by 63% between February and June and had been severely impacted by COVID-19. It has also been expressed that temporary shutdown (86%), reduction of customer's demand (38%), and reduced logistic services (33%) had impacted SMEs. Based on that study, 55% of SMEs had faced lack of inputs domestically while 80% owners faced reduction of consumer sales. Related to measures taken to cop up with COVID-19, reduction of permanent employees was the most measurement taken (34% of enterprises had reduced their permanent employees without payment, 20% enterprises reduced their permanent workers with reduced payment, while 39% reduced their workers with full salary payment). It has also been estimated that 67% and 27% of MSMEs had expressed that their production and employment levels had declined respectively. The study had also indicated that 50% of SMEs had reduced their women workers while the decline in men employed was only 35 per cent in the same study period indicating that women employee had lost their work. According to this study, 69% of SMEs lacks raw materials or inputs and 97% of them had expressed that there were lack of suppliers. The study has also indicated that 94% of SMEs sales and production were decreased by had been affected by an average of 71% in the period 24 March to 21 April while production had reduced by 52%. Regarding to revenue, SMEs had witnessed that on average, weekly revenue had been declined by 79% while annual revenue was expected to be decreased by 27% (13).

Another recent study was done by Ruochen using Phone survey in China. The result of that study indicated that SMEs have been affected by problems of logistics blocks, labor shortages, drops in demand and rent payment (62.3%), salary payment (42.5%) were listed as a major expense. Survey responses also revealed that 14.6 percent of firms were shutdown (14).

A similar done by WFP on impacts of the COVID-19 pandemic and associated control measures on their businesses and their support needs in 17 countries in early May 2020, showed that, 94% of MSMEs were being impacted by the pandemic mainly via decreased sales (82%), difficulty in accessing raw materials (49%), difficulty in paying staff (44%), declined in production volume (84%), and decreased sales price 57%. According to this study, 85% their supply chains were impacted, including shortages of supplies (61%) and transportation disruptions (49%). The result of that study also

revealed that 80% and 84% of firms reported taking actions to mitigate the impact of the pandemic on their business and to protect their employees, respectively. About 81% and 64% of firms had reported that they would urgently need financial and technical support, respectively, to cope with the effects of the pandemic. They also expressed that they need government support via minimizing tax, providing new credits, relief of credit (15).

A study done by Common Market for Eastern and Southern Africa (CMESA), it has been estimated that in Africa, the most challenges that small business enterprises faced during covid-19 pandemic were business closed, lack of operational cash flow, drop in costumers demand, inability to change business strategies and offering alternatives product/services, lack of workers, challenges in logistics and shipping of products, difficulties in obtaining supply of raw materials, reduction of opportunities to meet new customers (16).

According to ITC business impact survey report, it has been indicated that in Africa, two out of three businesses said that they had been strongly affected by COVID-19, mostly involving reduced sales (75%) and difficulty in accessing inputs (54%). According to this study, 64% of women-led firm has declared that business operations has been strongly affected, compared with 52% of men-led companies.

Generally, the result of different studies done by ATP, UNDP, IOM, Rouchen, WFP, and ICT related to impact of Covid-19 on MSMEs were similar and indicated that lack of operational cash flow, drop in customers' demand, inability to change business strategies and offering alternative products/services, lack of workers, challenges in logistics and shipping of products, difficulties in obtaining of raw materials, reduction of opportunities to meet new customers etc. were the most factors that affect MSMEs due to the presence of Covid-19.

2. Materials

3.1. Study area and study population

The study was conducted at Dire Dawa Town, which is the second Federal Administration, located 515 km away from Addis Ababa in East of Ethiopia.

The study population of this study was the total number of MSMEs in Dire Dawa Town. The study units are those MSMEs that were participated in our study. Based on Dire Dawa Administration Technical, Vocational and Teaching Directorate, the total population of MSMEs is 2194 that is constructed from five sectors which include: manufacturing, construction, urban Agriculture, service and trade.

3.2. Study design and data collection method

This study employed a cross-sectional survey design. Both Primary and secondary data were collected from selected micro, small and medium enterprises managers using semi-structured questionnaire in Dire Dawa Town. We checked the correctness of the questionnaire by employing pretest on 79 managers of MSMEs out of the selected samples. So as to keep the quality of the collected data, training was given for five data collectors concerning the relevance of the study and some definitions of the variable on the questionnaire as well as the system of approaching respondents.

3.3. Inclusion and Exclusion Criteria

Inclusion Criteria

First, this study included only those enterprises which were active up to March, 2020. Second, the study included only those enterprises that are found in the Town.

Exclusion Criteria

This study excluded those enterprises which were inactive up to February, 2020 and those enterprises which are found in the rural Kebeles of Dire Dawa Town.

3.4. Sample size determination and Sampling Technique

There are several formulas developed for sample size calculation that conform to different research situations. Based on Cochran (1977), sample size determination formula, the required sample size for this study was obtained as follows (17):

$$n = \frac{\frac{Z^2 p(1-p)}{d^2}}{1 + \frac{1}{N} \left[\frac{Z^2 p(1-p)}{d^2} - 1 \right]}$$

$$= \frac{n_0}{1 + \frac{1}{N} [n_0 - 1]}$$

The required sample size was calculated using a single population proportion formula by taking the 50% proportion of those MSMEs whose economy has been highly impacted, 95% confidence level of normal distribution and 3% margin of error.

$$n = \frac{\frac{(1.96)^2 0.5(1-0.5)}{(0.03)^2}}{1 + \frac{1}{2194} \left[\frac{(1.96)^2 0.5(1-0.5)}{(0.03)^2} - 1 \right]} = 718$$

Adding 10% of response rate, the total number of MSMEs is 790.

After determining the total number of study participants (total sample size), we have used the proportional sampling technique. First, we stratified enterprises based on sector type (considering the types of sector as strata) and determined total number of enterprises in each enterprise. After stratifying and determining the total number of enterprises in each sector, we determined the required number of enterprise in each sector by employing proportional sample size allocation method among the five strata. Finally, we employed systematic random sampling method to select managers of MSMEs that was participated in the study. So, based on the above proportion to size allocation formula, the total member of study participants could be 790 which are composed from five sectors such as manufacturing (185), construction (307), Urban Agriculture (55), service (115) and trade (128).

3.5. Study variables

The dependent variable was economic impact level of Micro, Small and Medium Enterprise which was measured through five liker-scale (i.e., 1=strongly disagree, 2=disagree, 3=undecided, 4=agree and 5=strongly agree). A psychologist and educator Rensis Likert (LEE-kurt, not LIE-kurt) wanted to measure subjective psychological attitudes in a “scientific” way during his thesis work at Columbia University. In 1932, he would publish A Technique for the Measurement of Attitudes, where he described a system that did exactly that Likert scales. He stated that the values of five point likert scale can be dichotomized by finding the weighted average of all the likert scale points. To do this, he multiplied the numerical value of each sentiment level by the amount of respondents and found the average. After calculating the weighted average, he classified the response of each respondent as low level, (for mean 1-3.44) and high level, (mean 3.5-5). Similarly, a research was done by (18) entitled on “Entrepreneurial Intentions of University Students: Insights for Entrepreneurial Education in Ethiopia”. In that study, dependent variable (Entrepreneurial intention) was measured with four items through a 5-point Liker-scale (i.e., 1=strongly disagree, 2= disagree, 3=undecided, 4=agree and 5=strongly agree). From the aggregated Liker scale score, data were weighted by the number of items for ease of analysis. Two contrasts were created for the dependent variable as low intent (with mean of ≤ 3) and high intent (with mean > 3)

for the logistic regression. So, in this study, the dependent variable (economic impact level of MSMEs) was measured with four items through five liker-scale (i.e., 1=strongly disagree, 2= disagree, 3=undecided, 4=agree and 5=strongly agree). We multiplied the numerical value of each sentiment level by the amount of respondents and found the average to be 3.75. In this study the average economic impact was estimated to be 3.75. Like the previous study, we created two contrasts for the dependent variable as low impact (for mean of ≤ 3.74 , coded as 0) and high impact (for mean of > 3.74 , coded as 1) for the logistic regression (18).

$$Y = \begin{cases} 0, \text{low level economic impact} \\ 1, \text{high level economic impact} \end{cases}$$

The independent variables that were classified as: enterprises' demographic characteristics (sex of managers, past experience of enterprises, sector type, age of enterprise, size of enterprises, education level of enterprises' managers, market type, enterprise ownership), payment challenges, supply chain problem, supplier's problem, worker's conditions and costumers' status of MSMEs.

3.6. Data quality assurance

The quality of the data was controlled at various levels, starting from training of data collectors to data collection, and data analysis. Data collectors were recruited carefully and trained on data collection procedures. Even if the questionnaire is standardized, pilot survey was employed on 79 enterprise managers to test the correctness of the questionnaire before duplication using some participants in similar enterprises with different areas.

3.7. Data Analysis

Data was analyzed using SPSS version 26. Descriptive analysis was employed by using frequency distributions, computing percentages, cross tabulations, and graphs and/or diagrams as a condition while inferential statistics was employed using binary logistic regression to identify significant factors associated with economic impact of enterprise.

Variable selection: Forward variable selection method was employed due to its ease to perform the selection process (19 & 20).

Significance Test: For the binary logistic model, significance tests on estimated parameters that focus on $H_0: \beta = 0$ versus $H_1: \beta \neq 0$ states that x has no effect on P (y = 1). This is the independence hypothesis. The Wald test is the most applicable test that

used to test the significance of the estimated parameters (20). So, in this study, Wald test was used to test the above hypothesis.

Goodness of fit-test: To check the model fitness we have used the Pearson's chi-squared X^2 and Deviance G^2 (to determine (assesses) if the fitted model is correct, the McFadden's R^2 / pseudo R^2 , the Cox and Snell R^2 and Nagelkerke R^2 (21 & 22).

3. Results

4.1. Socio-demographic characteristics of Enterprises

The response rate of the study was 100%. From Table 1 below, we can see that 434 (54.9%) enterprises' managers were females while. Among the total respondents, 517 (65.4%) were at primary and high school. From 790 enterprises, 463 (58.6%) had 2 – 5 years of age starting from their establishment. With respect to enterprise ownership, more than half 416 (52.7%) were partnership followed by association 309 (39.1%). From all enterprises, 307 (38.9%) and 185 (23.4%) were manufacturing and construction sectors. From the total enterprises, 418 (52.9%) and 372 (47.1%) had local and broader market type respectively. Most enterprise were at small scale level 536(67.8%). With respect to crisis experience, 753 (95.3%) had no crisis experience. Before emergence of Covid-19, most enterprises, 345 (43.7%) had annual revenue 151,000 – 250,000 birr which reduces to 272 (34.4%) after emergence of Covid-19. Similarly, 222(28.1%) enterprises had annual revenue of less than 100,000 before Covid-19 which increases to 282 (35.7%) after the emergence of the virus. Before Covid-19, 151(19.1%) had annual revenue of $\geq 251,000$ birr while only 120 (15.2%) enterprises had annual revenue $\geq 251,000$ after emergence of Covid-19.

Table 1. Socio-demographic characteristics of Enterprises, in Dire Dawa town, 2021

Variables	Frequency	percentage	Variables	Frequency	percentage
Sex			Size-of-enter.		
Female	434	54.9	Micro	101	12.8
Male	356	45.1	Small	536	67.8
			Medium	153	19.4
Education			Crisis-Exp.		
No grade	42	5.3	No	753	95.3
Primary & HS	517	65.4	Yes	37	4.7
>=Diploma	231	29.2			
Enterprise's age			Annua-BCcov-19		
<2 years	29	3.7	<100,000	222	28.1
2– 5 years	463	58.6	101,000 – 150,000	72	9.1
>=6 years	298	37.7	151,000 – 150,000	345	43.7
			>=251,000	151	19.1
Sector-Type			Annual-ACov-19		
Construction	185	23.4	<100,000	282	35.7
Manufacturing	307	38.9	101,000 – 150,000	116	14.7
Service	115	14.6	151,000 – 150,000	272	34.4
Urban Agri.	55	7.0	>=251,000	120	15.2
Trade	128	16.2			
Market-type					
Local	418	52.9			
Broader	372	47.1			

4.2. Operational characteristics of enterprises

As it can be seen from Table 3 below, 614 (77.7%) of enterprise have faced difficulty of salary payment for their workers while 642 (81.3%) of enterprises has faced difficulty of payment for house/machine rent. Similarly, 619 (78.4%) of enterprises have difficulty of material payment. With respect to supply chain problem, 705 (89.2%) enterprises have faced lack transport to bring raw materials and to reach products/service to their customers. Similarly, 750 (95%) of enterprises have faced lack of communication with suppliers while 732 (92.7%) enterprises have faced dalliance of orders from their suppliers. Finally, 687 (87%) of enterprise workers were unable to reach at work on time due to lack of transportation while 217 (27.5%) enterprise workers were unable to come to work due to infection of Covid-19. Among the total respondents, 722 (91.4%) have responded that their customers are not satisfied with their product/service while 768 (97.2%) of them have responded that the number of their customers have been decreased due to emergence of Covid-19.

Table 2. Operational characteristics of Enterprises, in Dire Dawa town, 2021

Variables	Frequency	Percent
Payment challenges		
Difficulty of Salary payment		
Yes	614	77.7
No	176	22.3
Difficulty of house/machine rent payment		
Yes	642	81.3
No	148	18.7
Difficulty of raw materials payment		
Yes	619	78.4
No	171	26.6
Supply chain problem		
Lack of transportation to bring raw materials/deliver products to customers		
Yes	705	89.2
No	85	10.8
Lack of communication with suppliers		
Yes	732	92.7
No	58	7.3
Delay of orders from suppliers		
Yes	750	95.0
No	40	5.08
Workers status		
Some workers are un able to reach at work on time		
Yes	687	87.0
No	103	13
Some workers are un able to come to work due to infection		
No	217	27.5
Yes	573	72.5
Customers status		
Customers are not satisfied with our product/service		
Yes	722	91.4
No	68	8.6
Number of customers have been decreased		
Yes	768	97.2
No	22	2.8

4.3. Economic impact level of SMEs

As we can see from Table 3 below we can see that 363 (45.9%) of respondents have strongly agreed that their annual sells have been seriously decreased while 337 (42.7%) have agreed that their enterprise annual sells have been seriously decreased. Similarly, 365 (46.2%) of respondents have strongly agreed that their annual revenue has been seriously decreased while 354 (45.2%) have agreed that their enterprise annual revenue

has been seriously decreased. We can also see that, 377 (47.7%) of respondents have strongly agreed that their enterprise annual saving has been seriously decreased while 3922 (49.6%) respondents agreed that their enterprise annual saving has been decreased seriously. Finally, 333 (42.2%) of respondents have strongly agreed that their annual employment has been seriously decreased while 290 (36.7%) agreed that their annual employment has been seriously decreased.

Table 3. Economic Impact Situation of Enterprises due to Covid-19, in Dire Dawa town, 2021

Variables	Frequency	Percent
Annual sells have been decreased		
Strongly disagree	5	0.6
Disagree	16	2.0
Undecided	69	8.7
Agree	337	42.7
Strongly agree	363	45.9
Annual revenue has been decreased		
Strongly disagree	6	0.8
Disagree	11	1.4
Undecided	51	6.5
Agree	354	45.2
Strongly agree	365	46.2
Annual saving has been decreased		
Strongly disagree	7	0.9
Disagree	5	0.6
Undecided	9	1.1
Agree	392	49.6
Strongly agree	377	47.7
Annual employment has been decreased		
Strongly disagree	17	2.2
Disagree	32	4.1
Undecided	118	14.9
Agree	290	36.7
Strongly agree	333	42.2

After determining the economic impact level of enterprises, using the four measurement items individually, the scores of the five liker scales were averaged and dichotomized to determine economic impact level as low and high. From the five liker scale measures, the mean economic impact level of MSMEs was found to be 3.75. So, mean values, 0 – 3.74 were assigned to be low impact while values 3.75 – 5, were assigned to be high impact. From the pie chart in Fig 4, we can see that 81.65% of MSMEs were highly economically impacted due to the emergence of COVID-19.

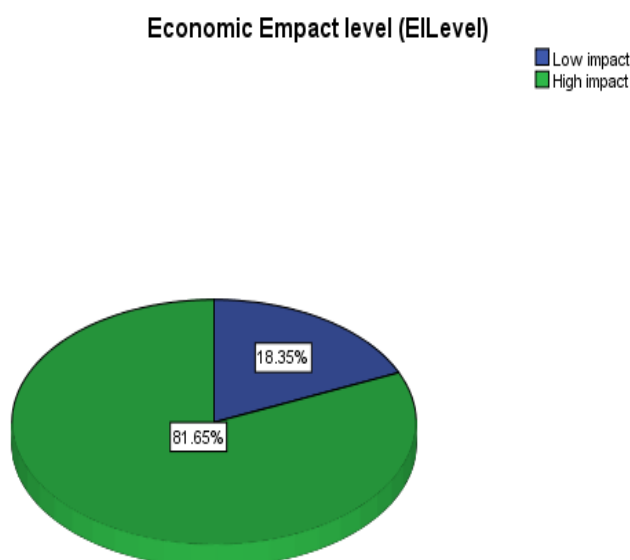


Figure 1. Economic impact level of MSMEs in DDT, 2021

4.4. Economic impact level of SMEs by sectors type and size

As we can see from Fig. 3 below, all sectors have been economically impacted without more difference among them. With respect to sector type, the economic impact level of service, trade and construction enterprises were 85.2%, 84.4% and 83.1% respectively. Similarly, from enterprises size perspective, the economic impact level of micro and small enterprises was 84.16% and 82.46% respectively.

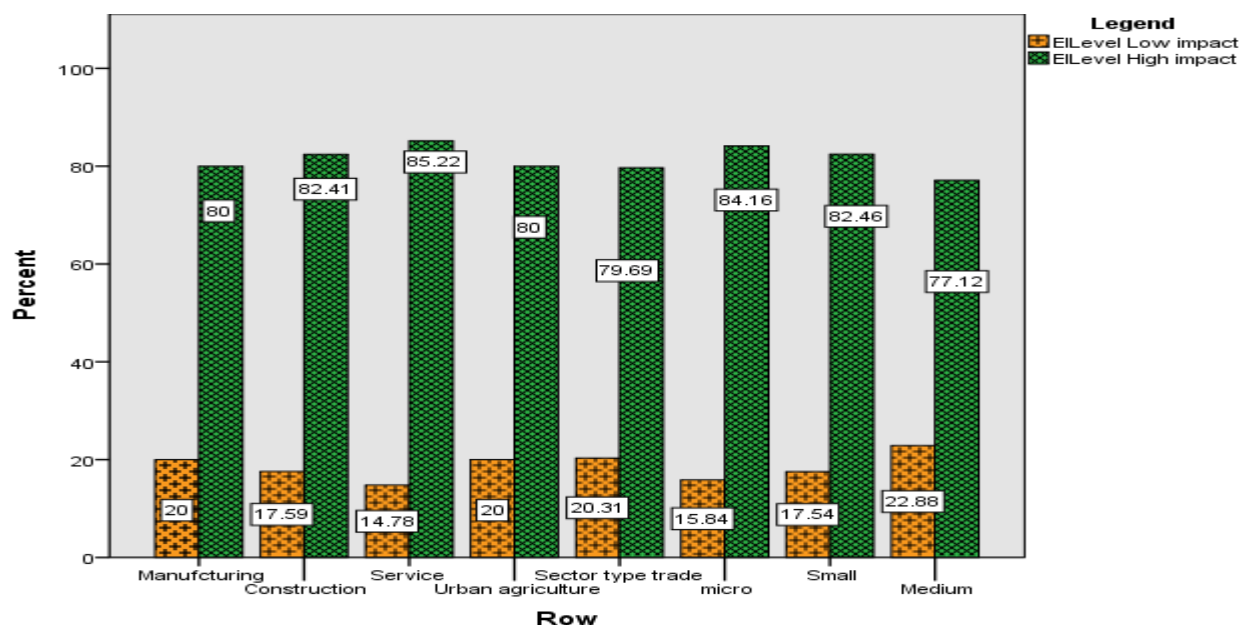


Figure 2. Economic impact level with enterprises type and size

4.5. Measurement taken to protect COVID-19

As we can see from Table 4 below, 260 (32.9%) of respondents have encouraged workers to stay at home, 710 (89.9%) of enterprises have made their workers keep physical distancing, 682 (86.3%), had used staggered shift work, 655 (82.9%) make

workers to use protecting equipment like mask, and 257 (32.5%) had given expanded paid sick leave to protect workers from Covid-19.

Table 4. Measurement taken to protect workers from COVID-19, in Dire Dawa town, 2021

Variables	Frequency (yes)	Percent
Encourage workers to stay at home	260	32.9
Physical distancing	710	89.9
Staggered shift work	682	86.3
Use protecting equipment like mask	655	82.9
Expanded paid sick leave	257	32.5

4.6. Fitting the logistic regression model

Variables were selected using backward elimination method. In the final step of backward elimination method, education, sector type, payment difficulty, supply chain problem and customer conditions were incorporated to the logistic regression.

Model adequacy

Omnibus test was employed to test the overall goodness of fit with respect to model coefficients. As we can see it from Table 5 below the result of Omnibus test shows that the overall model is statistically significant ($X^2_{(9)} = 43.535, P = 0.000$).

Table 5. Omnibus test of model coefficients

	Chi-square	Df.	Sig.
Step	43.535	9	0.000
Block	43.535	9	0.000
Model	43.535	9	0.000

As it can be seen from Table 6 below, the log-likelihoods of the null and the full model were estimated to be 721.499 and 565.213 respectively. The reduction of the log-likelihood in the full model shows better fit of the model. On the other hand, Cox & Snell R square and the Nagelkerke R square values have been estimated to be 0.56 and 0.65 respectively. This indicates that 56% or 65% of variations in the economic impact level was explained by variables in the model.

Table 6. Model summary

-2LL null	-2LL full	Cox & Snell R square	Nagelkerke R square
721.497	565.213	0.56	0.65

From Table 7 below it can be also seen that the Hosmer and Lemeshow test was employed to test the null hypothesis which states that predictions made by the model fit

perfectly with observed group members. A chi-square test was computed to compare the observed frequencies with the expected one under the linear model. Since the calculated Chi-square test statistic value was not significant ($X^2_9 = 5.52, P = 0.701$), we didn't reject the null hypothesis and concluded that the data fits the model well.

Table 5. Hosmer and Lemeshow test

Chi-square	Df.	Sig.
5.520	8	0.701

Multivariable logistic regression model

Wald test was employed to test significance of model coefficients. Based on the Wald test, education level of enterprises managers, ownership, crisis experience, delay of workers and workers' absenteeism were significantly associated with economic impact status of MSMEs during Covid-19 in Dire Dawa town. Table 8 presents the result of multivariate binary logistic regression. Based on the result, MSMEs whose managers have no grade were 6.486 times more likely to have economic impact than MSMEs whose managers has diploma and above education level [AOR = 4.748, 95%CI: 2.264, 18.581, $P = 0.000$]. With respect to ownership, partnership enterprises were 0.289 times less likely to be impacted economically as compared to private enterprises [AOR = 0.289, 95%CI: 0.085, 0.984, $P = 0.047$]. Association enterprises were 4.337 times more likely to be impacted economically than private enterprises [AOR = 4.337, 95%CI: 1.216, 15.469, $P = 0.024$]. Enterprise whose workers delay to work were 3.454 times more likely to be impacted economically than enterprise whose workers don't delay to work [AOR = 4.337, 95%CI: 1.162, 10.265, $P = 0.007$]. Finally, Enterprises whose workers were absent from work place were 0.284 time more likely to be economically impacted as compared to those enterprises whose workers are present at work [AOR = 0.284, 95%CI: 0.094, 0.851, $P = 0.004$].

Table 6. Multivariable logistic regression model for MSMEs in Dire Dawa town, 2022

Step 6	Coefficients	S.E.	Wald	$Exp(\beta)$	95%CI of AOR	
					UB	LB
Education						
No grade	-	-	-	-	-	-
Primary & HS	1.565	1.216	1.657	4.784	0.441	15.874
Diploma & above	1.870	0.537	12.120	6.486*	2.264	18.581
Ownership						
Private	-	-	-	-	-	-
Partnership	-1.242	0.625	3.942	0.289*	0.085	0.984
Association	1.467	0.649	5.114	4.337*	1.216	15.469
Crisis experience						
Yes	-	-	-	4.454*	1.132	17.521
No	1.494	0.699	4.570	-	-	-
Diff rent payment						
Yes	-	-	-	-	-	-
No	-24.687	15.2	0.000	0.000	0.000	0.000
Delay of workers						
Yes	-	-	-	-	-	-
No	1.240	0.556	4.977	3.454*	1.162	10.265
Absence of workers						
Yes	-	-	-	-	-	-
No	-1.260	0.561	5.052	0.284*	0.094	0.8511
Constant	-2.034	0.640	10.103	0.131*	-	-

4. Discussion

Table 3 of our result indicated that, 614 (77.7%) of enterprise have faced payment difficulty of salary 642 (81.3%), house/machine rent and material 619 (78.4%). This result is higher than a study done by Ruochen in China (14), which revealed that Enterprise in China had faced payment difficulty of salary (42.5%), house/material rent (62.3%). The difference might be due capital level of enterprises. As Enterprises in China are more power full in economy than Enterprises in our Enterprises, they might have more chance to use their previous saved money. This result is also similar with a survey of food system on SMEs in 17 countries in early May 2020, which indicated that Enterprises had faced difficulty in paying staff (44%) (11).

With respect to supply chain problem, enterprises have faced, 89.2% lack transport to bring raw materials and to reach products/service to their customers, 95% lack of communication with suppliers and 92.7% dalliance of orders from their suppliers. This study result was similar with a study done by UNDP in Nigeria, which revealed that 69% of SMEs had dalliance raw materials due to lack of transportation and 97% had lack communication of suppliers (12). This is also higher than a study done in Iraq (13), which revealed that Enterprises have faced reduced logistic services (33%) and lack of

inputs (55%). The result of the study is similar with different studies, which showed that Enterprises had 85% supply chains problem, 61% shortages of supplies and (49%) transportation disruptions (12).

In this study, 687 (87%) of enterprise workers were unable to reach at work on time due to lack of transportation while 217 (27.5%) enterprise workers were unable to come to work due to infection of Covid-19.

Our study has revealed that 722 (91.4%) have responded that their customers are not satisfied with their product/service while 768 (97.2%) of them have responded that the number of their customers have been decreased due to emergence of Covid-19. This is also the same with a study done by UNDP in Nigeria (12) and African Trade Policy Centre (23), which showed that customers were not satisfied with products and services of Enterprises.

5.1. Economic Impact assessment of Enterprises due to Covid-19

In this study, the economic impact level of Enterprises is presented in Table 3. It shows that 45.9% of respondents have strongly agreed that their annual sells have been seriously decreased while 42.7% have agreed that their enterprise annual sells have been seriously decreased. This result is concord with a study done on SMEs in 17 countries by World Food Program, which states that 57% of Enterprises' sales and price had decreased as a result of the pandemic (15). Similarly, our study shows that 46.2% of respondents have strongly agreed that their annual revenue has been seriously decreased. This is lower than a study done in Iraq, which states that on average, enterprises' revenues had been declined by 63% due to the pandemic and had been severely impacted by COVID-19 (13). Finally, 42.2% of respondents have strongly agreed that their annual employment has been seriously decreased. This result is concord with a study done in Iraq, which showed that COVID-19 has negatively affected employment, with an average reduction of 27%.

5.2. Factors associated with Economy impact on MSMEs during COVID-19

Table 9 presented the result of multivariate binary logistic regression. Based on the result, MSMEs whose managers have no grade were 6.486 times more likely to have economic impact than MSMEs whose managers has diploma and above education level [AOR = 4.748, 95%CI: 2.264, 18.581, P = 0.000]. With respect to ownership,

partnership enterprises were 0.289 times less likely to be impacted economically as compared to private enterprises [AOR = 0.289, 95%CI: 0.085, 0.984, P = 0.047]. Association enterprises were 4.337 times more likely to be impacted economically than private enterprises [AOR = 4.337, 95%CI: 1.216, 15.469, P = 0.024]. Enterprise whose workers delay to work were 3.454 times more likely to be impacted economically than enterprise whose workers don't delay to work [AOR = 4.337, 95%CI: 1.162, 10.265, P = 0.007]. Finally, Enterprises whose workers were absent from work place were 0.284 time more likely to be economically impacted as compared to those enterprises whose workers are present at work [AOR = 0.284, 95%CI: 0.094, 0.851, P = 0.004].

5. Conclusions and recommendations

6.1. Conclusion

This study employed a cross-sectional study design to assess the impact of COVID-19 on MSMEs in Dire Dawa town. To determine factors that associated with economic impact level of MSMEs during COVID-19, logistic regression was employed. We have also found that enterprises have faced payment shortages for house/machine rent and material as well as supply chain problem that hinder them to transport raw material communicate with their suppliers due to emergence of Covid-19. It has been also indicated that MSMEs annual sells, revenue, saving and employment have been seriously decreased. Variables were selected using backward elimination method and so that age of enterprise, sector type, payment difficulty, supply chain problem and customer conditions were incorporated to the logistic regression in which all of them were significant at 0.05 significance level. Overall goodness of fit was checked by Omnibus test and the result of test shows that the overall model is statistically significant.

6.2. Recommendations

The government should help MSMEs by facilitating:

- Allowing transportation access and movement for these enterprise with special case to transport their raw materials and give service for their workers
- Should provide financial credit that enables enterprise to solve their financial shortages since all of them have critical financial problem.

Micro, Small and Medium Enterprises should

- encouraged workers to work well keeping physical distancing and other care methods instead of allowing them stay at home

- use and practice electronic market system to overcome the current problems they faced
- should try to satisfy their customers with their products/service
- provide transportation service for their workers to solve dalliance of workers to work place due to transportation problem

Limitation of the study: The study had the following limitations:

- It doesn't assess the governments' support for enterprise during the crisis
- It didn't include large industries in which their economy has great influence on the development of the country.

6. Abbreviations

ATPC: African Trade Policy Center, ECA: Economic Commission for Africa, EU: European Union, FDRE: Federal Democratic Republic of Ethiopia, GFC: Global Financial Crisis, ILO: International Labor Organization, IMF: International Monetary Fund, IOM: International Organization for Migration, ITC: International Trade Center, ITCS: International Trade Center Survey, JCCE: Job Creation Center of Ethiopia, MSEs: Medium and Small Enterprises, MSMEs: Micro Small Medium Enterprises, COECD: Commerce Organization for Economic Cooperation and Development, UNCTAD: United Nation, UNDP: United Nation Development Program, UNECA: United Nation Economy for Africa, UNICEF, United Nation International Children Education Fund, UNIDO: United Nation Industrial Development Organization, UN: United Nation, WFP: World Food Program, WHO: World Health Organization, AOD: Adjusted Odd Ratio.

7. Acknowledgements

We would like to thank Dire Dawa University for giving the chance to do this research. Again, we would like to acknowledge Dire Dawa MSMEs Bureau workers for their cooperativeness to give us important information and our genuine thanks go to the collectors for their time and honestly collect the required data.

8. Ethical Consideration

Ethical clearance was obtained from the ethical review committee of college of natural and computational sciences, Dire Dawa University. Support letters were also obtained from Dire Dawa MSME Bureau and formal letters were written to the selected MSMEs Managers. Before data collection, agreement was formed between data collectors and

study participants. After explaining the objective, method of the study and informed voluntary, written and signed consent was obtained from each respondent.

9. Conflict of interests

The authors stated that they have no conflicting interests.

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