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Untapped Potential of Manufacturing MSEs in Bali Amidst the Covid-19 Pandemic

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Abstract

The macro health impact of the COVID-19 pandemic that resulted in an economic slump in Bali exposed the need for economic development outside the tourism sector. Manufacturing Micro and Small Enterprises (MSEs) is one sector that contributes significantly to the economy, export value, and employment, particularly during moments when the tourism sector is down. This study aims to determine the performance of manufacturing MSEs during 2018-2021 using Cobb-Douglas stochastic frontier production function analysis. The Technical Inefficiency (TE) value of manufacturing MSEs in Bali was 22.24% over 2018-2021. The impact of COVID-19 on each ISIC and business location has a varied impact on the production value of MSEs Manufacturing. The gender of the business owner, financial service, age of workers, and source of raw materials are inefficiency variables that significantly affect production value. However, the training received by manufacturing MSEs had no significant effect. The findings from this study can be used as a basis for government policy in further developing the untapped potential of manufacturing MSEs in Bali regarding impacts upon Bali's tourism sector during the pandemic.

Keywords:
stochastic frontier; enterprises; efficiency; macro health shock; gender; cobb-douglas

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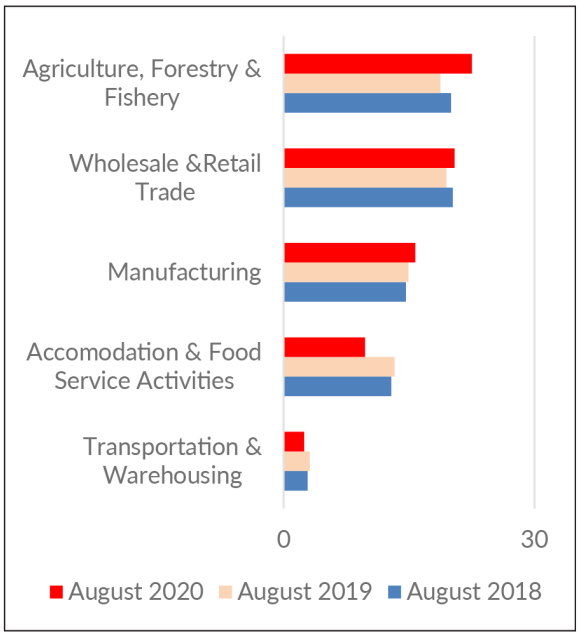
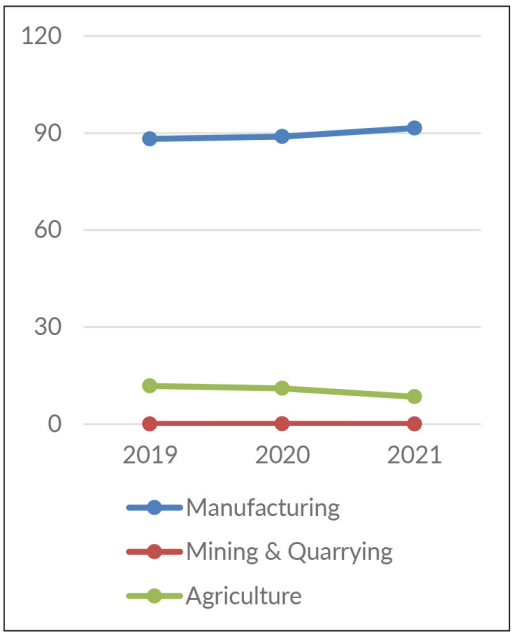
INTRODUCTION

The macro health shock due to COVID-19 was felt across all sectors globally. However, with restrictions on people's movements, the impact was especially felt by those predominately tourism-dependent economies. This condition was particularly true in the context of Bali. The pandemic exposed the fragilities of the economy in the province and the need to identify other potential sectors for growth. The increasing trend of manufacturing's contribution to the Bali economy over 2018-2021 indicates that Bali's manufacturing has the potential to be developed (BPS Province of Bali, 2022). The manufacturing sector in Bali has much potential, and this can be seen from the absorption of the number of manufacturing workers who occupy the third largest position after the agricultural and wholesale sector in August 2020 (BPS Province of Bali, 2020). Bali's manufacturing potential is also evidenced by data on manufacturing exports, wherein manufacturing accounts for the most significant percentage of the total (BPS Province of Bali, 2022). Based on the 2016 Economic Census results, the number of manufacturing businesses in Bali was 116,000, with 87.89% manufacturing Micro and Small Enterprises (MSEs) (see Figure 1). The contribution of the manufacturing sector to the Balinese economy can be seen from the consistent increase in the manufacturing industry's contribution during 2019-2021 to the Bali economy when other sectors experienced fluctuations. However, the fact that the percentage contribution of manufacturing is still below other sectors indicates that the potential of manufacturing MSEs needs to be studied in order to review their performance and the potential growth of manufacturing MSEs in Bali in the future.

Figure 1. The Number of Workers, Percentage of Goods Exports, Distribution of Gross Regional Domestic Product of Bali at Current Market Prices, by Industry (Percent), 2017-2021



(a) The Number of Workers



(b) Percentage of Goods Exports

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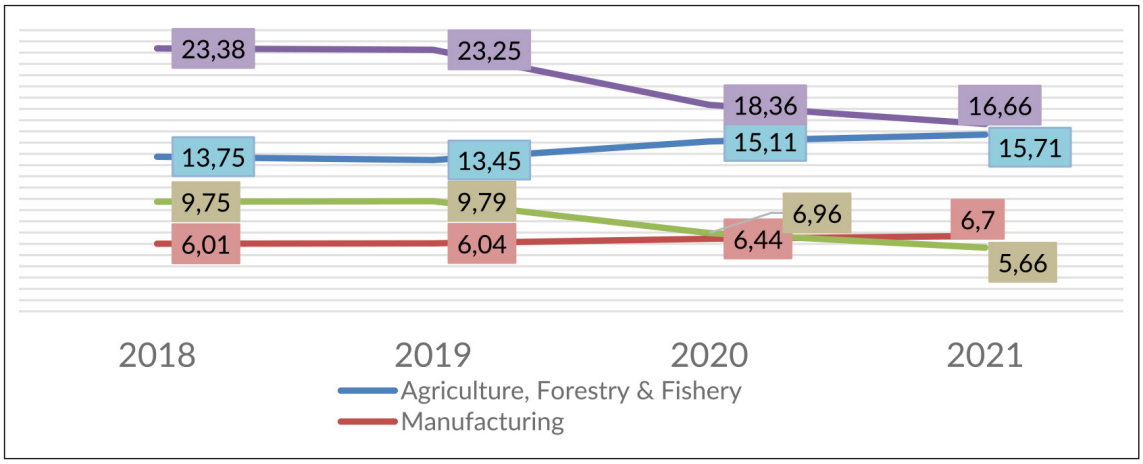

(c) Distribution of Gross Regional Domestic Product of Bali at Current Market Prices
Source : (a) (BPS Provinsi Bali, 2020) (b) (BPS Province Bali, 2022b) (c) (BPS Province Bali, 2022a)

This study uses data from the Annual Micro and Small Industry Survey (*IMK Tahunan*) conducted by the Central Agency on Statistics (BPS). BPS uses the International Standard Industrial Classification (ISIC) to classify manufacturing business fields in the Annual IMK survey. Some previous studies that examined manufacturing performance used technical efficiency for evaluation and policy-making material (Al-Durgham & Adeinat, 2020). Estimations of the efficiency of companies in Jordan with a stochastic frontier showed an average technical efficiency value of 74% from 2009-2017. Other research related to manufacturing conducted in Malaysia (Fahmy-Abdullah et al., 2021) found that the technical efficiency value was 81% in 2015 and showed that technical inefficiency factors such as the level of education and training could reduce the weight of company inefficiency. In Indonesia, a study conducted by (Astanto et al., 2022) on manufacturing companies using data from 2010-2014 indicated a technical efficiency value of 88.15%. The stochastic frontier production function has been widely used in various fields of processing manufacturing (Akite et al., 2022; Lu et al., 2022), agriculture (Akite et al., 2022), health (Sickles et al., 2022), taxation (Fisseha, 2022; Mohanty et al., 2022)

This study complements research conducted by (Purwa, 2022), who evaluated manufacturing micro and small enterprises (MSEs) in Bali based on two-digit ISIC business types by showing that the results of the pandemic had an impact on the total income of Manufacturing MSEs in Bali using a stochastic frontier production Cobb-Douglas function. (Purwa, 2022) examines how the gender and age of entrepreneurs, capital ownership, Micro Credit Program (KUR), and internet usage all affect the production value of manufacturing MSEs in 2019-2020 using *IMK Tahunan* data. Conversely, this study will examine other variables that have not been studied by looking at the business location (*Sarbagita* and non-*Sarbagita*) of manufacturing MSEs, the impact of cooperative and bank loans, managerial, production, and marketing training, and the source of raw materials used on the production value of manufacturing MSEs.

In addition, this study examines the relationship between the value of TE and the production value of manufacturing MSEs in Bali using data from 2018-2021. This

study aims to describe the condition of manufacturing MSEs based on business location (*Sarbagita* and non-*Sarbagita*) and ISIC during the COVID-19 pandemic. Besides that, this research also examines what variables affect the production value of Manufacturing MSEs in Bali. Finally, this research measures the technical efficiency (TE) value of manufacturing MSEs in 2018-2021 in Bali.

METHODS

This study used 8,589 samples of MSEs businesses from the results of the *IMK Tahunan* survey consisting of 4,336 samples of MSEs Bali businesses in 2018-2019 and 4,253 samples of MSES Bali businesses over 2020-2021. 2018-2019 represent the years before the Covid-19 pandemic, and 2020-2021 represent the conditions during the Covid-19 pandemic.

This study employed fixed capital, Number of employees, business location (*Sarbagit*a and non-*Sarbagita*), business categorization according to International Standard Industrial categorization (ISIC), and macro health shocks as independent variables, using *IMK Tahunan* Survey of Bali data. The technical inefficiency used in this study was variables of age, gender, education of the entrepreneurs, place of business, year of operation, cooperative membership, Micro Credit Program (KUR), partnerships, cooperative services, Bank services, Foundation services, managerial training, production training, marketing training, age and education of the majority of workers, the composition of capital, and sources of raw materials. This study examined the effect of Covid-19 on production value data MSEs from 2018 to 2021, a complete explanation is in Appendix 1.

Cobb-Douglas Stochastic Frontier Analysis (SFA) was used to study TE of the MSEs business from 2018 to 2021. The Cobb-Douglas SFA used data by transferring it to a linear form utilizing a logarithm (Nicholson & Synder, 2008). Cobb Douglas SFA in this study was used to describe the relationship of the independent variable (X), namely fixed capital, Number of workers, business location (*Sarbagita* and non-*Sarbagita*), International Standard Industrial Classification (ISIC), macro health shocks, and Technical Inefficiency on the dependent variable (Y), namely the production value of the MSEs business. This research uses the Maximum Likelihood Estimation (MLE) as follows:

$$ln\, Y_i = \beta_0 + \ln \beta_1 X_1 + \ln \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + (V_i - U_i)$$

where

$$U_i = \delta_0 + \delta_1 Z_1 + \delta_2 Z_2 + \delta_3 Z_3 + \cdots + \delta_{19} Z_{19} + w_i$$

Where:

Y_i = Business production value of MSEs
X_1 = Fixed capital of MSEs business
X_2 = Number of business workers in the MSEs
X_3 = Business location MSEs (*Sarbagita* and non-*Sarbagita*)
X_4 = Two digits ISIC
X_5 = Health macro shock

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V_i = A random variable that cannot be controlled
U_i = Non-negative random variable or called technical inefficiency
Z_i = Technical Inefficiency

Technical efficiency (TE) of the company using the following formula:

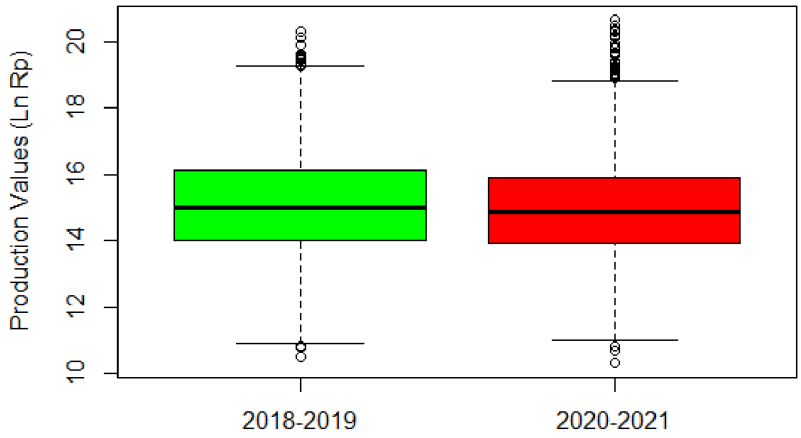
$$TE_i = \frac{y_i}{\exp(x_i\beta + v_i)} = \frac{\exp(x_i\beta + v_i - u_i)}{\exp(x_i\beta + v_i)} = \exp(-u_i)$$

Efficiency results from a company's effectiveness, is evaluated regularly to determine its performance. Efficiency is one of the parameters used to measure the performance of a person or business unit by measuring factors of production and how the performance of an industrial industry is achieved. In this case, the more efficient a business is, the better the business performance so far in using existing resources. This study used R statistical software.

RESULTS AND DISCUSSION

Figure 2 shows the production value of manufacturing MSEs before and during the macro health shock. Based on the decrease in the value of the first quartile, median, and third quartile of MSEs business conditions, this figure also shows a decrease in the production value generated by manufacturing MSEs businesses. This data shows that the COVID-19 pandemic impacts the decline in the production value of manufacturing MSEs in Bali. This condition is the case for both *Sarbagita* and non-*Sarbagita*, even though the production value of the MSEs business in the *Sarbagita* area is higher than that of non-Sarbagita. Nevertheless, these two business locations experience a decrease in production value when macro-health shocks occur, as shown in Figure 3.

Figure 2. Production Value of MSES Enterprises Based on Macro Health Shock Conditions

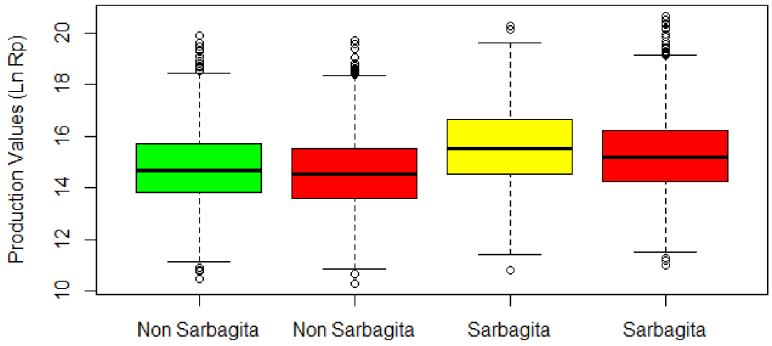


Source: Yearly Data MSEs 2019-2021 Processed

Meanwhile, when viewed from the types of ISIC in Figure 4, the impact of macro health shocks on the production value of MSE businesses is different for each kind of ISIC. ISIC with codes 3, 4, 5, 6, 7, 9, 20, and 21 are ISIC 13 (Textiles),

ISIC 14 (Apparel), ISIC 15 (Leather), ISIC 16 (Wood), ISIC 17 (Paper Goods), ISIC 20 (Chemicals and Goods from Chemicals), ISIC 32 (Other Processing Industries) experienced a decrease in production value due to macro health shocks. In contrast, some ISIC experienced increased production value during macro health shocks, such as ISIC 10 (Food), ISIC 11 (Beverage), ISIC 12 (Tobacco processing), ISIC 26 (Computers, Electronic, and Optical products), ISIC 27 (Electrical Equipment), and ISIC 31 (Furniture).

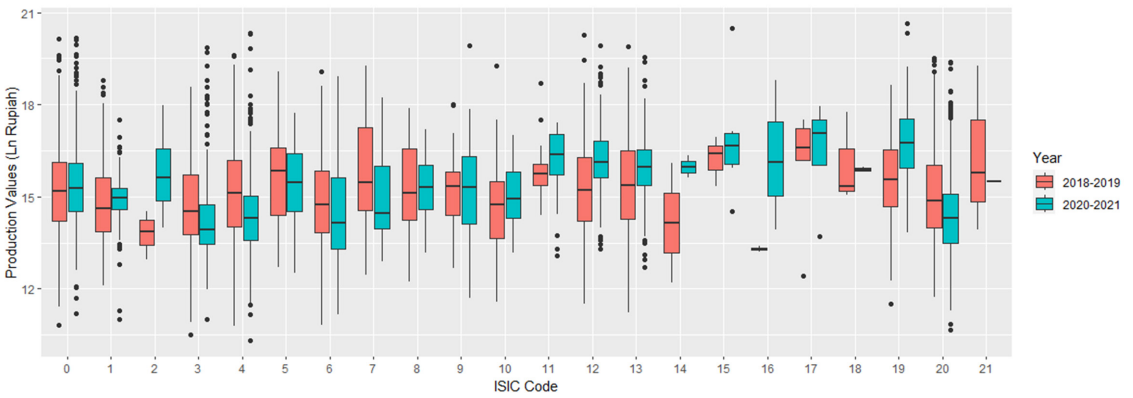
Figure 3. Production Value of MSES Enterprises by Business Area in Macro Health Shock Conditions



Source: Yearly Data MSEs 2019-2021 Processed

Table 2 shows the result of Cobb Douglas SFA with MLE by using R statistical software. Table 2 shows the significant estimation results for the Cobb-Douglas SFA. The interpretation of the estimated dummy coefficient in this study was used to see the independent variable's significance (Giles, 2011). Fixed capital and the number of workers were discovered to have a positive impact on production. A 1% increase in fixed capital increases the production value by 0.10%, and a 1% increase in the number of workers increases the production value by 0.67%. Meanwhile, the impact of macro health shocks on production value showed a negative result (-33.55%). The business location in the Sarbagita area positively impacted the production value by 55.33%.

Figure 4. Production Value of MSES Enterprises Based on ISIC in Macro Health Shock Conditions



Source: Yearly Data MSEs 2019-2021 Processed

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When viewed from KBLI, it shows that KBLI with codes 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, and 20, namely ISIC 11 (Beverage), ISIC 12 (Tobacco Processing), ISIC 13 (Textile), ISIC 14 (Apparel), ISIC 15 (Leather), ISIC 16 (Wood), ISIC 17 (Paper), ISIC 18 (Printing), ISIC 20 (Chemicals Products), ISIC 21 (Pharmaceuticals), ISIC 23 (Other Non-Metallic Mineral Products), and ISIC 32 (Other Manufacturing) has a significantly different effect on the production value of the reference category, ISIC 10 (food). ISIC 32 (Other Manufacturing) with the main product in Bali called the *banten* (Balinese Hindu needs), and *the Banten* equipment industry has a negative effect on the production value of MSEs businesses (-34.71%).

Table 2. Estimation Result of The SFA Model with Cobb Douglass Production Function

Variable	Estimates	std. Error	
(Intercepts)	15.1239427	0.3221917	***
log(`Capital`)	0.0972329	0.008302	***
log(`Labour`)	0.6651847	0.0280674	***
`Covid-19`1	-0.4087855	0.0374869	***
Sarbagita1	0.4403846	0.0307309	***
`Isic`1	-0.305206	0.0807822	***
`Isic`2	-0.8551982	0.4650359	.
`Isic`3	-0.4029126	0.0638029	***
`Isic`4	-0.4556146	0.0528273	***
`Isic`5	-0.3411957	0.1147549	**
`Isic`6	-0.4634189	0.0516174	***
`Isic`8	-0.5395676	0.1665795	**
`Isic`9	-0.4806988	0.1640083	**
`Isic`10	-0.4579903	0.1780287	*
`Isic`12	-0.2078551	0.0620179	***
`Isic`20	-0.426332	0.0472194	***
Technical Inefficiency	Estimates	std. Error	
Z_(Intercept)	0.951887	1.1475726	
Z_`Gender Owner`1	-0.2440611	0.0494492	***
Z_'Businesses Located`	0.3791026	0.062814	.
Z_`KUR`1	-0.4725259	0.0738548	***
Z_'Cooperative Service'1	-0.1506027	0.0587352	*
Z_'Bank Service'1	-0.2202037	0.1034336	*
Z_'The age group of the majority of workers'1	-0.4652761	0.3879543	.
Z_'Raw Material from Bali'1	0.3373258	0.1616032	*
Z_'Raw Material other Province'2	0.5928885	0.1267917	***
Z_'Managerial training`	0.3586949	0.3586949	
Z_'Production training`	-0.0924956	-0.0924956	
Z_'Marketing training`	-0.414413	-0.414413	

Significant. codes: ***10%, **5%, *1%

SFA mean efficiency: 0.2224759

ISIC 11 (Beverage) with its main product Balinese arak, ISIC 12 (Tobacco Processing) with its primary product tobacco, ISIC 13 (Textile) with its main product Balinese woven cloth (*Tenun*), ISIC 14 (Apparel) with its main product *kebaya* clothes and apparel, ISIC 15 (Leather and Leather Goods and Footwear) with its main product Balinese dance wear, ISIC 16 (Wood) with its main product of Balinese handicrafts, ISIC 17 (Paper and Paper Products) with its primary product paper packaging goods, ISIC 18 (Printing) with its main product of printing, ISIC 20 (Chemicals and Chemical Products) with its main product of incense, ISIC 21 (Pharmaceuticals) with its main product *loloh/jamu*, ISIC 23 (Other Non Metallic Mineral Products) with its main product bricks (*batako*) and, ISIC 32 (Other Manufacturing) with its main product *Banten*, are business types that significantly affect the business value of MSEs, but the impact is still negative compared with reference category ISIC 10 (Food).

The technical inefficiency in the estimation results above is interpreted using calculations by multiplying the results again by -1 because technical inefficiency is a negative form in the Cobb-Douglas SFA. The male gender of the business owner has a significant positive impact on the production value by 21.66% compared to the female business owner. MSEs businesses located in buildings still have a significant adverse effect on the production value by -46.10%, or in other words, MSEs businesses located in permanent buildings increase the value of technical inefficiency compared to those located in non-permanent/semi-permanent buildings.

Another finding obtained from this estimate is that MSEs businesses participating in the Micro Credit Program (KUR), cooperative services, and Bank services have significant results that have a positive effect on the production value of 37.66%, 36.67%, 13.98%, and 19.76% or significantly has an impact on reducing the weight of technical inefficiencies in the model. Concerning human resources, this estimate yields results: MSEs businesses with the majority of workers in the 15-64 year age group (productive age group) have a positive effect on the production value of = 37.20% compared to MSEs businesses where most workers are under 15 years old. The source of raw materials for MSEs in Bali, such as from foreign sources, has a significantly different impact compared to MSEs businesses that source raw materials from Bali or other provinces in Indonesia. MSEs businesses that use raw materials from Bali and other provinces in Indonesia contribute negatively to the production value of MSEs businesses, respectively by -80.92% and -40.12%, with the comparison category being foreign sources of raw materials.

The average technical efficiency of MSEs in Bali from 2018 to 2021 is 22.25%. This fairly low-efficiency value indicates that the efficiency value of manufacturing MSEs in Bali still needs to be improved to maximize performance. The technical efficiency value of MSEs business in Bali has a positive relationship with the production value of the MSEs business. Figure 5 shows that the relationship of TE value to production value is positive. A rise in the value of technical efficiency can improve Manufacturing MSEs company performance, allowing for an increase in production value (Figure 5). Improving the business performance of MSEs can be accomplished by reducing variables that significantly affect the value of inefficiency.

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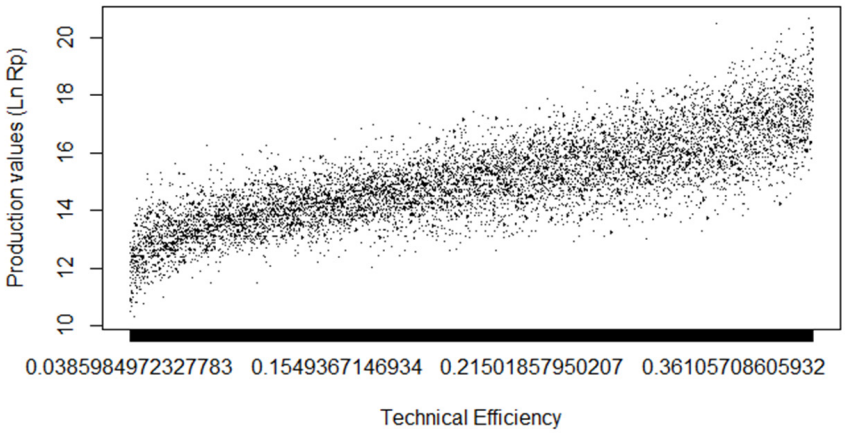
Figure 5. MSEs Business Production Value Based on Technical Efficiency



Source: Yearly Data MSEs 2019-2021 Processed

Macro health shocks caused by the Covid-19 pandemic negatively affected MSE businesses in Bali by -33.55%. This result shows that Bali's MSEs manufacturing experienced a negative impact from the pandemic. However, the decline did not reach 50% of the pre-pandemic production value, which means that Bali manufacturing MSEs survived the Covid-19 pandemic. Manufacturing MSEs have made various business adaptations to persevere during the Covid-19 pandemic (Abdallah, 2021; Ardolino et al., 2022; Liu et al., 2021). When viewed based on business location, the *Sarbagita* area (Denpasar City, Badung, Gianyar, and Tabanan Regencies) has a more excellent production value of 55.33% compared to other districts in Bali. This condition shows that the location of the business in an integrated urban area affects the production value obtained by MSEs manufacturing. Several related studies regarding the relationship between business location and business success have also been conducted and resulted in the same thing wherein the business location has a significant positive effect on business success (Alkusani & Ilmafa'ati, 2021; Kakooza et al., 2023).

During the macro health shock, ISIC manufacturing MSEs experienced production value changes. Manufacturing MSEs with ISIC 10 (Food), ISIC 11 (Beverage), ISIC 12 (Tobacco processing), ISIC 26 (Computers, Electronic, and Optical products), ISIC 27 (Electrical Equipment), and ISIC 31 (Furniture) experienced an increase in production during the macro health shock. This fact shows that Balinese people, during the health macro health shock, consumed more food and beverages from the production of manufacturing MSEs, and due to the impact of restrictions on social activities, the purchase of computers and furniture also experienced an increase in demand. ISIC 32, which produces Balinese Hindu needs called *upakara* is the most significant business in Bali, whose production value is still under food manufacturing. This condition is similar to ISIC 21, which produces *loloh* (herbal drink), ISIC 13 which produces *kain tenun* (Balinese woven cloth), ISIC 14 with *kebaya* (Balinese woman cloth), ISIC 15 with Balinese dance clothing, and ISIC 16 with Bali wood handicraft, is a production with local wisdom of Bali which has the potential to be developed as an export commodity due to uniqueness

that can not be found in other regions. The high selling power of products with local wisdom in micro and small businesses was found in previous studies such as those conducted by Ningsih et al. (2019) and Gunawan (2017).

Fixed capital and the number of workers were discovered to have a significant positive impact on production. This result shows that manufacturing MSEs in Bali is still labor-intensive and requires more fixed capital to grow. The fact that managerial, production, and marketing training do not significantly affect the production value of manufacturing MSEs in Bali also indicates that the government needs to create new programs related to appropriate training for manufacturing MSEs in Bali. Studies related to human resources, which have an essential influence on the progress of manufacturing businesses, have also been studied by Rabiu et al. (2020) and Muogbo et al. (2013).

The male business owner has a significant positive impact on the production value by 21.66% compared to the female business owner. There is a difference in MSE business challenges, with a higher proportion of female entrepreneurs suffering competitive problems than male entrepreneurs. Gender disparity exists; male business owners are socio-culturally viewed as superior to female business owners, indicating that women still have fewer options for managing MSEs than males. This condition is inextricably linked to Balinese women's numerous responsibilities in their traditional everyday lives and the family sphere. Other study results showed that women's rural businesses are not significantly smaller than those of men. Women's income is lower and more sensitive to business and industry variables (Tillmar et al., 2022). Anggadwita et al. (2022) showed that social perceptions are issues that women consider in entrepreneurship. Balinese women have limited access to entrepreneurship due to differences in access to technology and marketing amid a culture of gender inequity (Setini et al., 2020).

MSEs businesses located in permanent buildings have a more inefficiency value than those that operate in non-permanent/semi-permanent buildings. This result is related to the fact that MSEs businesses in Bali earn less money than they should while using semi-permanent for business. This condition is also associated with renting a non-permanent business location, which is cheaper than a permanent one, especially if it is in a strategic place. This result is in line with previous research which shows that manufacturing enterprises pay attention to strategic factors in determining a business location (Ellram et al., 2013).

The Micro Credit Program (KUR), cooperative services, and bank services have significant results that positively affect the production value. Macro health shocks cause MSEs businesses to require capital to continue operations; however, the micro-credit program (KUR), cooperative services/assistance, and bank services/assistance have proven to reduce the value of MSEs business inefficiency. Therefore, the financial assistance program for MSEs businesses in Bali should be developed evenly in the future so that the benefits become apparent in MSEs businesses in Bali. Several related studies also find that financial support is effective for MSEs financial support to grow (Kakooza et al., 2023).

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MSEs businesses with the majority of workers in the 15-64 year age group (productive age group) have a positive effect on the production value of 37.20%, and this result shows that workers in the productive age group (15-64 years) have a more efficient impact on MSEs businesses in Bali because older workers have lower scores in ability than younger workers (Børing & Grøgaard, 2023). The source of raw materials from Bali and other provinces in Indonesia contributes negatively to the production value of MSEs businesses, with the comparison category being foreign sources of raw materials. This condition is related to MSE businesses in Bali that use raw materials from abroad, which are contract manufacturing businesses whose raw materials come from original equipment manufacturers (OEMs) located abroad. The high value of contract manufacturing with low risk makes contract manufacturing more efficient than others. This result aligns with research (2019), which states that future contract manufacturing is a promising business in India (Børing & Grøgaard, 2023).

The average technical efficiency of MSEs in Bali from 2018 to 2021 is 22.25%. Manufacturing MSEs in Bali needs to be improved to maximize performance. The relationship of TE value to production value is positive. A rise in the value of technical efficiency can improve Manufacturing MSEs company performance, allowing for an increase in production value. Improving the business performance of MSEs can be accomplished by reducing variables that significantly affect the value of inefficiency. The TE value of manufacturing MSEs needs to be increased again by making the right policies to develop the potential of manufacturing MSEs in Bali. Market mechanism strategy and government policy intervention can increase manufacturing productivity.

Based on the results of this study, in order to increase the potential of Bali's manufacturing MSEs, new policies are needed. Firstly, increasing access to information related to financial assistance, cost efficiency, and business development for manufacturing MSEs, especially for women business owners and businesses located in non-*Sarbagita*. Secondly, assistance related to marketing, production and managerial strategy for MSEs in manufacturing businesses, especially those that produce products with Balinese local wisdom. Thirdly, improve the quality of human resources by providing training programs and marketing strategies that are right on target according to the manufacturing sector being cultivated.

CONCLUSION

The results of this study indicate that the impact of the COVID-19 pandemic shows the same pattern, namely a decrease in production value in the *Sarbagita* and non-*Sarbagita* regions. However, when viewed based on ISIC, it shows a different pattern in each ISIC for production value. Based on the results of Cobb-Douglas SFA, the COVID-19 pandemic, *Sarbagita* region, and several ISIC categories significantly affect the production value of manufacturing MSEs. Male business owners, non-permanent business locations, financial assistance from KUR, cooperatives, and banks, productive workers aged (15-64) years, and raw materials from abroad in manufacturing activities increase the

efficiency of manufacturing MSEs in Bali. Managerial training, production, and marketing activities were found to have little influence on the manufacturing efficiency of MSEs. The TE value of 22.25% indicates a need for policies related to improving the efficiency of MSEs in the processing industry sector in Bali by paying attention to variables that significantly affect the efficiency of manufacturing MSEs and variables that do not.

Policies related to equal access to information on capital assistance, cost efficiency, and business development, assistance related to marketing, production, and managerial strategies for improving the quality of human resources of manufacturing MSEs need to be considered for maximizing the potential of manufacturing MSEs in Bali, particularly as a critical element of locally relevant disaster and pandemic preparedness plans.

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Appendix 1. Variable Dependent and Independent

Variables	Description
Dependent	
Production Value	The value of the goods produced includes semi-finished goods and income from industrial services (*maklon*) for one month in rupiah units.
Independent	
Fixed capital	Value of land, business buildings/buildings, machinery, equipment, and tools owned by the MSEs business in rupiah units.
Total manpower	The Number of workers in the businessMSEspaid or unpaid (if family worker) by person unit.
International Standard Industrial Classification (ISIC)	ISIC is presented in five ISIC digits for complete digits and two ISIC digits for general classification digits. This study uses 22 categories, beginning with ISIC 10 (Food) as a reference category (ISIC 11 (Beverage) = 1; ISIC 12 (Tobacco Processing) = 2; ISIC 13 (Textile) = 3; ISIC 14 (Apparel) = 4; ISIC 15 (Leather and Leather Goods and Footwear) = 5; ISIC 16 (Wood, Wood and Cork Products Excluding Furniture and Woven Products from Bamboo, Rattan and The Like) = 6; ISIC 17 (Paper and Paper Products) = 7; ISIC 18 (Printing and Reproduction of Recording Media) = 8; ISIC 20 (Chemicals and Chemical Products) = 9; ISIC 21 (Pharmaceuticals, Medicinal Chemical and Botanical Products) = 10; ISIC 22 (Rubber and Plastic Products) = 11; ISIC 23 (Other Non Metallic) Mineral Products) = 12; ISIC 25 (Fabricated Metal Products, Excepts Machinery and Equipment) = 13; ISIC 26 (Computers, Electronic and Optical Products) = 14; ISIC 27 (Electrical Equipment) = 15; ISIC 28 (Machine and Equipment NEC) = 16; ISIC 29 (Motorized Vehicles, Trailers, and Semi Trailers) = 17; ISIC 30 (Other Transport Equipment) = 18; ISIC 31 (Furniture) = 19; ISIC 32 (Other Manufacturing) = 20, and ISIC 33 (Repair and Installation for Machines and Equipment) = 21)
Business Location	The business location of MSEs is located in the area of Denpasar City, Badung Regency, Gianyar, and Tabanan (*Sarbagita*). In contrast, the businessMSEsthose located in Jembrana, Klungkung, Karangasem, Bangli, and Buleleng Regencies are included in business locations non-*Sarbagita*. The measurement scale uses categorical.
	0 = non-*Sarbagita*; 1 = Location of *Sarbagita*
Health macro shock	Conditions caused by the Covid-19 pandemic use data from 2018 to 2021, divided into two periods: before the Covid-19 pandemic (2018-2019) and during the Covid-19 pandemic (2020-2021). The categorical measurement scale uses the following:
	0 = conditions before the Covid-19 pandemic; 1 = during the Covid-19 pandemic
Technical Inefficiency	
Age of business owner of MSEs	Age of business owner conditions at the time of data collection.
	0 = age 0-14 years; 1 = age 15-64 years; 2 = age 65+
MSEs entrepreneur/business owner gender	0 = female ; 1 = male
Education of MSEs Entrepreneur	The last level of education is completed.
	0 = did not finish elementary school; 1 = graduated from elementary school; 2 = graduated from junior high school; 3 = graduated from high school & vocational school; 4 = graduated from DI/DII/DIII; 5 = graduated from undergraduate education (DIV/S1) ; 6 = Graduated from Master (S2)/Doctorate (S3) education
Place of business	Places where MSES operates
	0 = producing in around/non-permanent buildings; 1 = producing in a fixed building
Operational year	The year the MSEs business started.
	0 = before 2000 ; 1 = during or after 2000
Cooperative membership	Cooperative members status.
	0 = UMK businesses are not included in cooperative members; 1 = UMK businesses are included in cooperative members

Variables	Description
Micro Credit Program (KUR)	Business status of MSEs in KUR.
	0 = the MSEs business do not use KUR; 1 = the MSEs business use KUR
Partnership	Cooperation relationships with other businesses/companies (including BUMN/ BUMD) that are mutually beneficial, strengthening, and supportive
	0 = no partnership; 1 = establish a partnership
Services/assistance from the cooperative	Manufacturing MSEs obtained Services/Assistance from the cooperative.
	0 = no cooperative services/assistance; 1 = there is cooperative services/ assistance
Services/assistance from the bank	Manufacturing MSEs obtained Services/Assistance from the bank.
	0 = no bank services/assistance; 1 = there is bank service/assistance
Services/assistance from the foundation	Manufacturing MSEs obtained Services/Assistance from foundations.
	0 = no Foundation services/assistance; 1 = there is Foundation services/assistance
Managerial guidance/training/ counseling	Manufacturing MSEs obtained Managerial guidance/training/ counseling conducted by the company or external parties.
	0 = no guidance/counseling in the form of managerial material; 1 = there is guidance/counseling in the form of managerial material
Production Guidance/training/ counseling	Manufacturing MSEs obtained Production guidance/training/ counseling conducted by the company or external parties.
	0 = no guidance/counseling in the form of production materials; 1 = there is guidance/counseling in the form of production materials
Marketing guidance/training/ counseling	Manufacturing MSEs obtained guidance/training/marketing counseling conducted by the company or external parties
	0 = no guidance/counseling in the form of marketing materials; 1 = there is guidance/counseling in the form of marketing materials
The age group of the majority of workers	The average age of workers is dominant in the MSEs business.
	0 = age 0-14 years; 1 = age 15-64 years; 2 = age 65+
The majority of workers' education	The average education is dominant in workers in the MSEs business.
	0 = did not finish elementary school; 1 = graduated from elementary school; 2 = graduated from junior high school; 3 = graduated from high school & vocational school; 4 = graduated from DI/DII/DIII; 5 = graduated from undergraduate education (DIV/S1) ; 6 = Graduated from Master (S2)/Doctorate (S3) education
Capital composition	Manufacturing MSEs Ownership of venture capital
	0 = capital from family loans; 1 = own capital; 2 = capital from bank, cooperative, government and private loans
Ingredients source	Manufacturing MSEs with The origin of the raw material source area used for production.
	0 = raw materials from abroad; 1 = raw materials from outside the province of Bali within the country of Indonesia; 2 = raw materials from Bali

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