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From Vulnerability to The Sustainability of SMEs in the Food and Beverage Sector in the Post-COVID-19 Era, in Surakarta, Indonesia

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Abstract. *SMEs have an important role in the development of the Indonesian economy; however, when there is uncertainty in the external environment, many of them experience high losses and even go bankrupt. This research aims to analyze the vulnerability level of SMEs to the COVID-19 threats, the technical efficiency of SMEs, and successful key variables of SMEs in the post-COVID-19 era. This study employed 3 analyses: business vulnerability, technical efficiency, and structural analysis. Vulnerability analysis is obtained from the index of vulnerability to the threat of COVID-19 compiled from all values of each aspect indicator of SMEs vulnerability. These values consist of exposure, sensitivity, and adaptive capacity. Technical efficiency analysis adopted a non-parametric approach, which was processed using DEAP. Structural analysis was used in determining key variables in SMEs business. The results of the study explain that SMEs are categorized into medium vulnerability, where sensitivity is the highest influence aspect as a determinant of the vulnerability level. The downturn in sales leading to the bankruptcy of small and medium-sized enterprises (SMEs) can be attributed to their inefficient operations, particularly in terms of resource management and achieving desired outputs. Research has identified 11 out of 20 critical factors that significantly impact the success of food and beverage entrepreneurs. These factors include market understanding, leadership and management abilities, optimism, effective marketing strategies, sound decision-making, fostering progress, achievement orientation, risk management, commitment, perseverance, and the presence of supportive partners and businesses.*

Keyword: Dynamic Capability, Efficiency, Sustainability, Vulnerability.

JEL Codes: D24; Q54

1. Introduction

Creative economy is a strategic issue in the national economic development in various developing countries (Purnomo et. Al., 2021; Goel, 2022; Yue, 2022) in the era of business environmental uncertainties**.** Generally, a food and beverage business is are Micro Small and Medium Enterprise (SMEs) for the creative sub-economy with low resilience (high level of vulnerability) to the threat of external environmental uncertainty (Isa et. al 2021). The food and beverage business plays a vital role in strengthening food security (Hadi, 2020), economic growth (Goel, 2022) and also employment (Purnomo et. Al., 2021). Ninety percent of national food products are provided by SMEs (Hadi, 2020). Small and medium enterprises (SMEs) are firms with less than 100 workers (Tambunan, 2009). In Indonesia, moreover, 99,9% of the industry market was dominated by SMEs, which employed 97% of national employment and contributed to 60% of the national Gross Domestic Product (GDP) (Statistics Indonesia, 2023)

Surakarta serves as a significant hub for the food and beverage sector in Indonesia (Rahadhini et al., 2021). The resilience of this industry in the face of COVID-19 is framed as the performance of small and medium-sized enterprises (SMEs), shaped by various combinations of internal and external factors (Gaffar et al., 2022; Isa and Mangifera, 2019).

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A key concern highlighted in this research is the lack of data regarding the performance of SMEs in the food and beverage sector from non-financial perspectives. This includes aspects such as their vulnerability to external environmental changes, operational efficiency, and the unclear significant impacts on overall business performance. This issue is fascinating for research in an effort to increase productivity and ensure the sustainability of business units.

SMEs in the food and beverage industry pose a formidable challenge e.g., rapid changes of business environment which are full of uncertainties (Gaffar et. Al 2022; Otengei and Ahebwa, 2021). As a result, they need to develop the capacity to endure and enhance their competitiveness (Tatiana and Ritala, 2016). This necessitates a consistent and ongoing response to changes in the external environment, along with a regular assessment of their internal capabilities (Schreyögg and Martina, 2017; Otengei and Ahebwa, 2021). COVID-19 threats have a high risk for SMEs (Otengei and Ahebwa, 2021), that is, 3.33% of SMEs closed their businesses, 11.67% experienced a decrease in turnover of less than 50%, and 75% experienced a decrease in assets of more than 50% (Kuncoro, 2023). Business actors must take notice of business environment uncertainties in the planning, implementation, and evaluation of business strategies (Hamze Moussavi et al., 2020). Not all business units can survive in a business environment of uncertainties (Day and Schoemaker, 2016).

Changes in the business environment alter the critical success factors for small and medium-sized enterprises (SMEs), which in turn necessitate adjustments in their business strategies. These core strategies are fundamentally rooted in essential resources and competencies. As the business environment evolves, it leads to modifications in the resources and capabilities available to SMEs. To navigate these changes effectively, SMEs must develop dynamic capabilities that not only enable them to adapt but also to integrate and reorganize their skills, resources, and competencies (Teece et al., 1997; Purwati et al., 2021). These dynamic capabilities empower organizations to proactively engage with their surroundings, leverage information for internal enhancements, and seize new opportunities efficiently (Wang and Shi, 2011; Otengei and Ahebwa, 2021), thereby influencing both organizational performance and long-term sustainability.

Dynamic capability is the latest approach in building SMEs competitive advantage (Yuniarty et al. 2021; Yuniarty et al. 2022;Otengei and Ahebwa, 2021; Purwati et. al. 2021). Business units must posses three dynamic capabilities: adaptive capability, absorptive capability, and innovative capability (Wang and Shi, 2011; Otengei and Ahebwa, 2021). Adaptive capability refers to the ability of small and medium-sized enterprises (SMEs) to recognize and seize market opportunities. It is assessed by their responsiveness to these opportunities, their capacity to monitor market trends, customer preferences, and competitor actions, as well as their effectiveness in allocating resources for marketing initiatives. On the other hand, absorptive capability is the capacity of SMEs to assess and utilize external knowledge. This capability is measured by the intensity of their research and development efforts. Innovative capability pertains to the ability of SMEs to create new products and explore new market avenues. This capability is evaluated based on the number of innovations in products and services, the processes involved in innovation, and their effectiveness in addressing emerging challenges.

There are two dynamic capabilities (Tatiana and Ritala, 2016; Portillo-Tarragona et. Al 2018): specific domain capability (attached to special organizational ability and becoming short-term superior sources) and generic capability (not attached to certain functions in organization and becoming long-term superior competitive sources). The rationale is that high-level dynamic capabilities not only focus on responsible learning and creativity but also influence low-level dynamic capabilities for the implementation of

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more flexible, specific tasks. Generic dynamic capabilities are possessed by all organizations and expressed as organizational change capabilities that are deemed capable of expressing organizational change better than dynamic capabilities with a broader perspective (Tatiana and Ritala, 2016; Otengei and Ahebwa, 2021).

Changes in the strategy of food and beverage SMEs are determined by the leader's decisions by considering many things, as well as the leader's responses to information management (Ambrosini and Bowman. 2009; Brown, et al. 2022). Strengthening organizational quality emphasizes the importance of both the leader's role as the initiator and person in charge of implementing business unit improvements. This indicates the importance of a businessman's dynamic role in improving business unit performance (Otengei and Ahebwa, 2021). Leadership plays a role in directing employees to participate in and be committed to improving business unit performance. SMEs performance entirely depends on the leader's ability to adopt and adapt the improvement program of the business unit. Business owners and/or actors play a crucial role in supporting the performance and sustainability of SMEs in the post-pandemic era. This study has three objectives, namely compiling and analyzing vulnerability indexes of business units, analyzing technical efficiency, and analyzing key success variables for food and beverage SMEs after the COVID-19 pandemic.

2. Research Elaborations

The research was carried out in Surakarta City, Central Java, Indonesia, in 2023. Recognized as a culinary hotspot in Indonesia, Surakarta boasts a diverse array of food and beverage enterprises. The city is home to 727 food and beverage business units, offering a total of 1,729 different types of food and beverages (BPS, 2023). The 727 business units represent the study's population, which will be selected through purposive random sampling, focusing on entities with a minimum of two years of operational experience, prior experience in managing crises such as COVID-19, and excluding street vendors.

Data collection on 215 respondents who were SME owners or managers was carried out through structured interviews supported by a vulnerability index questionnaire. The questionnaire is composed of 3 variables forming a vulnerability index, namely exposure, sensitivity and adaptive capacity **(Table 1).** Exposure consists of 4 indicators, namely the number of infected with COVID-19, COVID-19 depth, COVID-19 duration, and comorbid employees. Sensitivity consists of indicators treatment frequency, availability of raw material, price of raw material, sales and turnover. Adaptive capacity consists of education indicators, a map of COVID-19 spread, information access, distance to health services, COVID-19 awareness, and COVID-19 prevention and socialization training.

Table 1. Vulnerability Variables and Indicators

Variables	Indicators	Definition
Exposure	Number of infected with COVID-19	Number of workers infected with COVID-19
	COVID-19 Depth	Length of time the business has not been operating due to COVID-19 pandemic
	COVID-19 duration	Total time workers infected with Covid-19 are unable to work
	Comorbid Employees	Percentage of workers with comorbid (%)
Sensitivity	Treatment frequency	Number of workers exposed to Covid 19 taking treatment (total)
	Availability of raw material	Availability of raw materials for food and beverage businesses during COVID-19 (%)

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	Price of raw material	Increase in raw materials during COVID-19 (%)
	Sale	Decline in sales during COVID-19 (%)
	Turn Over	Workers who resigned and changed jobs (%)
Adaptive Capacity	Education	Percentage of workers' tertiary education (%)
	Map of COVID Spread	Map of COVID spread cases (total)
	Information access	SMEs owner access to COVID-19 information (likert)
	Distance to health services	Distance to nearest hospital (m)
	COVID-19 awareness	Percentage of workers with guarantee (%)
	COVID-19 prevention and socialization training	Number of training and COVID-19 risk socialization attended by SMEs owners (total)

Source: Weis et al. (2016), Kamalipoor et al. (2022), Isa and Mardalis (2022)

After selecting appropriate indicators, researchers utilize them to guide the collection of respondents' answers, which form the dataset. To ensure comparability, this data is normalized, bringing the values of the indicators into a consistent range (Isa et al., 2018). Each observed value is normalized by deducting the mean from it and dividing the result by the standard deviation for each indicator. These indicators are then given weights after that. Then, using a predetermined method, the normalized variables are multiplied by their corresponding weights to provide indices for exposure, sensitivity, and adaptive ability.

$$I_i = \sum_{i=1}^{k} bi \left[\frac{aji - xi}{si}\right]$$

In this context, 'I' represents the index value for each indicator, 'b' denotes the loadings derived from the first principal component analysis (PCA), which are used as weights for the respective indicators. 'a' refers to the value of the indicator, 'x' signifies the mean value of the indicator, and 's' indicates the standard deviation of the indicators.

The formation of a vulnerability index encompasses all dimensions of vulnerability, including exposure, sensitivity, and adaptive capacity, with the assessment results subsequently compiled. A higher index value indicates a reduction in vulnerability levels. The compiled data for each vulnerability aspect is normalized to yield a score ranging from 0 to 1 (Luni et al., 2012; Isa et al., 2021). To represent the vulnerability level, the vulnerability index score is calculated as 1 minus the normalized data result. The findings reveal that a higher score (closer to 1) signifies a greater degree of vulnerability.

The subsequent step involves weighting the aspects of vulnerability. Each variable's weight is determined by assessing its influence on the overall vulnerability dimension; thus, aspects with greater influence receive higher weights. Focus group discussions (FGDs) were used to carry out this weighting process with research area stakeholders. The total score of all indicators is multiplied by the weights given to exposure, sensitivity, and adaptive capacity to determine the vulnerability index (Weis et al., 2016). The following formula is used to present the SMEs vulnerability index (Isa et al., 2021).

Vulnerability = COVID-19 Vulnerability Index

W1 = Exposure weighting

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X1 = Exposure score

W2 = Sensitivity Weight

X2 = Sensitivity score

W3 = Adaptive capacity weight

X4 = Adaptive capacity score

Data collection on 215 respondents who were SME owners or managers was carried out through structured interviews supported by technical efficiency questionnaire. The analysis of technical efficiency employed a non-parametric approach. The inputs considered included business ownership, the educational level of the business owner or operator, the number of employees, and the amount of capital invested. The chosen outputs for the analysis were turnover and gross profit. Efficiency was assessed using data envelopment analysis (DEA) (Planinc, et al. 2022).

The DEA identifies a set of efficient Decision-Making Unit (DMU) and is used as a benchmark for repairing inefficient DMU. DEA also makes it possible to calculate the amount needed for improvements in input and output at the DMU so that it becomes efficient (Planinc, et al. 2022). The basic measure of efficiency used in DEA is the ratio of total output divided by total input. The symbols in the formulation use x and y to represent inputs and outputs, i and j to represent certain inputs and outputs. So that xi is the ith input and yj is the jth output on the DMU. The sum of the inputs is represented by I and the sum of the outputs is represented by J, where I, J > 0. Mathematically, the input formula is Input = $\sum_{i=1}^{I} \mu_i x_i$ μ is the weight of the X1 units during the accumulation process. The output formula is Output= $\sum_{j=1}^{J} v_i y_i$. v_j is the weight of the output y during the accumulation process. From the above model, the efficiency can be formulated as follows.

$$Efficiency = \frac{Output}{input} = \frac{\sum_{j=1}^{J} v_j y_j}{\sum_{i=1}^{I} \mu_i x_i}$$

If there are N DMU whose efficiency levels will be compared, the DEA program's linear fractional form is as follows:

$$Max\ E_m = \frac{\sum_{j=1}^{J} v_{jm} y_{jm}}{\sum_{i=1}^{I} \mu_{im} x_{im}}$$

Subject to

$$0 \leq \frac{\sum_{j=1}^{J} v_{jm} y_{jm}}{\sum_{i=1}^{I} \mu_{im} x_{im}} \leq 1; n = 1, 2, \ldots N$$

V_{jm}, $\mu_{jm} \geq 0$; 1,2 …I; j=1, 2, …N

Em is the efficiency of the-m DMU.

yjm is the jth output for the-m DMU.

vjm is the magnitude of the output weight.

xim is the ith input to the m DMU.

uim is the magnitude of the input weight

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Analysis of key variables for the success of SMEs uses structural analysis with the help of MICMAC software (Setiyawan and Isa, 2022). This analysis uses 20 important variables to support the success of SME businesses. Research respondents were representatives of academics, business actors, government and communities (ABGC) and data were collected through focus group discussions (FGD).

Structural analysis was conducted using MICMAC software, which serves as an analytical tool to evaluate the influence and dependence among various variables (Isa et al., 2019; Collewaert et al., 2021). MICMAC analyzes the driving and dependent powers of factors based on the multiplication properties of matrices. This method aims to identify key factors that influence the system across different categories. Factors are classified into four groups—autonomous, linkage, dependent, and independent—based on their driving and dependence powers. MICMAC is utilized to examine the driving forces and dependencies related to the various objectives of stakeholders. The analysis results highlight the key success variables for food and beverage SMEs in the post-COVID-19 context.

C. Result and Discussions

Among the hardest hit during the COVID-19 epidemic were the food and beverage SMEs, which function as regional flagship firms. Kuncoro (2023) reports that the impact was severe: 3.33% of these SMEs were forced to shut down completely, 11.67% had a major decline in turnover of less than 50%, and a startling 75% had a fall in assets of more than 50%. Not only were the direct economic effects of the pandemic detrimental to the performance and sustainability of these SMEs, but their intrinsic susceptibility to such an unprecedented catastrophe also had a significant impact. Key factors that exacerbated their struggles included the level of business vulnerability to the COVID-19 threat, inefficiencies within their operations, and the competence—or lack thereof—of the business actors managing these enterprises. These elements collectively underscore the fragile nature of SMEs in the face of global disruptions and highlight the critical need for resilience, adaptability, and enhanced managerial competence to safeguard their future sustainability.

1. Vulnerability Index of SMEs

The level of vulnerability of SMEs to the threat of COVID-19 affects the resilience of these SMEs (Kamalipoor et al. 2022). This resilience has an impact on the turnover of business actors, which ultimately has an impact on regional economic growth (Isa et al. 2015; Tanaka, 2021). The low resilience of SMEs, which can be seen from the number of SMEs that have experienced a decline in turnover and went bankrupt, indicates an unresolved economic problem, namely inefficiency in business management (Planinc, et al. 2022). Resilience describes the ability of business units to mitigate the threat of COVID-19.

Table 2. Sensitivity Index

Number	Indicator	Vulnerability Value
1	Treatment frequency	0.52
2	Availability of raw material	0.69
3	Price of raw material	0.50
4	Sale	0.73
5	Turn Over	0.29

Source: Authors by SPSS

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Sensitivity is a component of vulnerability that shows how well-prepared SMEs are to deal with the COVID-19 threat (Kamalipoor et al., 2022). Table 2 indicates that the five primary components of this sensitivity index are treatment frequency, raw material availability, raw material price, sales, and turnover. The raw material availability and sales indicators are classified as having a high level of vulnerability, meaning that they are very susceptible to disruption from the pandemic. The price of raw materials and the frequency of workers needing medical attention due to COVID-19 are classified as somewhat vulnerable, meaning there is a danger, but not as much as with the other two indicators. Meanwhile, employee turnover is in the low vulnerability category, meaning that its effect on SME sensitivity is relatively smaller. The results of this analysis confirm that the supply chain aspect, especially in terms of raw material availability and sales, has the greatest impact on the level of SME sensitivity, making it the most vulnerable variable and requiring special attention in mitigating risks related to the threat of COVID-19.

Capacity adaptive is the second most vulnerable variable to COVID-19 threats (Table 5). Isa et al. (2015) put forward adaptive capacity as a vulnerability aspect explaining the ability of SMEs to reduce risks (Chasanah, and Hiroyuki, 2021) from the threat of COVID-19. Table 3 shows all aspects of the adaptive capacity of SMEs, namely education, maps of the spread of COVID, access to information, distance to health services, awareness of COVID-19, as well as training and socialization of prevention of COVID-19 are in the moderate vulnerability category.

Table 3: Adaptive Capacity Index

Number	Indicator	Vulnerability Value
1	Education	0.46
2	Map of COVID Spread	0.37
3	Information access	0.54
4	Distance to health services	0.58
5	COVID-19 awareness	0.63
6	COVID-19 prevention and socialization training	0.38

Source: Authors by SPSS

Exposure ranks last as a determining factor for SMES' vulnerability to the threat of COVID-19 (Table 5). Weis et al. (2016) emphasized that exposure is an aspect of vulnerability explaining the extent to which the threat of COVID-19 affects the risk of SMEs related to the amount of exposure, depth, duration and number of comorbid co-workers. Based on Table 4 below, it is explained that the indicators for the amount of exposure, depth, and duration of COVID-19 are in the moderate vulnerability category. The number of Cormobid employees is not very vulnerable at this time. This feature calls for particular consideration of a number of criteria, including the length, depth, and amount of COVID-19 exposure.

Table 4. Exposure Index

Number	Indicator	Vulnerability Value
1	Number exposed to COVID-19	0.37
2	COVID-19 Depth	0.62
3	COVID-19 duration	0.46
4	Comorbid Employees	0.29

Source: Authors by SPSS

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The SMES vulnerability index to the threat of COVID-19 was obtained by multiplying the indicator score by the weight of exposure, sensitivity, and adaptive capacity. Vulnerability Index of SMEs is 0,499. This index shows that SMEs are in the moderate level category.

Table 5. Vulnerability Index of SMEs on COVID-19

Description	Exposure		Sensitivity		Adaptive Ability		Vulnerability Index
	Score	Weight	Score	Weight	Score	Weight	
Vulnerability Index	0.43	0.25	0.55	0.4	0.49	0.35	0.499
	0.107		0.220		0.171		

Source: Authors by SPSS

The value between 0.34-0.66 indicates that SMEs in Surakarta City are somewhat vulnerable to COVID-19. Table 5 indicates that sensitivity has the greatest impact on the degree of SMES vulnerability, followed by exposure and adaptive ability. Consequently, this result differs from other research in coastal regions that concluded exposure to be the most sensitive factor. In addition to the level of vulnerability of SMEs to the threat of COVID-19, the level of efficiency in managing SMEs is also a pivotal factor affecting the performance and sustainability of SMEs. The efficiency level of SMEs is obtained based on a comparison between the input variables used and the output obtained (Planinc et. al., 2022). The ownership of the corporate organization, the owner's or executor's educational background, the number of workers, and the amount of capital used are the input variables; turnover and gross profit are the outputs.

Measurement of the efficiency level of SMEs is analyzed using the Data Envelopment Analysis Program (DEAP). The analysis results of using the output maximization approach explained that 80.28% of business actors run their business inefficiently. Therefore, many business units inefficiently achieve their output. Furthermore, 70.42% of business actors are not yet efficient in achieving turnover and 73.24% in achieving gross profit. Based on the results of the efficiency analysis, it is also explained that the input which should be owned by business actors is achieving even greater output. As many as 29.58% of business units have successfully achieved efficiency by having turnover and 26.76% in gaining gross profit. Food and beverage SMEs in Surakarta City, Indonesia have high potential to optimize the output achievement.

The results of the efficiency analysis using the input minimization approach explained that 80.28% of business actors run their business inefficiently. Moreover, the analysis results also explain that 70.42% of business units are inefficient for the aspect of the business owners' and manager's education level, 94.35% are inefficient for the aspect of business entity ownership, 73.24% for the aspect of capital use, and 61.97% for determining the number of employees. These findings suggest that business players should be able to use resources efficiently by producing the current output. Additionally, SMEs may take a variety of actions to reduce the number of resources they allocate.

In Surakarta City, the food and beverage industry typically performs below par, with many business players continuing to operate inefficiently (Setiyawan and Isa, 2022). This research shows that the COVID-19 pandemic's direct effects were not the sole factor contributing to the insolvency that food and beverage companies faced. On the other hand, ineffective business management also had an impact on this failure, both in terms of allocating resources and meeting output targets. This demonstrates that even if the pandemic has increased pressure, an important component that exacerbates the situation is the inability to manage the firm. This highlights the significance of improved efficiency and managerial methods to boost the resilience and sustainability of the organization going forward. Moreover, many businesses in this sector

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lack the necessary knowledge and skills to implement effective marketing strategies, adapt to changing consumer preferences, and leverage digital tools to enhance their operations. This inefficiency is further compounded by inadequate financial management practices, which limit their ability to sustain operations during economic downturns. Additionally, the absence of innovation and reluctance to adopt new technologies contribute to their struggle in maintaining competitiveness. Addressing these issues requires a comprehensive approach that includes training and support for business owners in areas such as digital marketing, financial planning, and strategic resource management.

The performance and sustainability of the food and beverage business unit is not only influenced by the level of vulnerability to the threat of COVID-19 and the efficiency of business management, it is also influenced by the ownership of business actors in key success variables in business. Determining these variables was carried out using structural analysis, which was processed using MICMAC software. Twenty important determinants for business performance are identified and mapped into four quadrants using this approach, which takes into account each variable's influence and dependence. Risk management abilities, dedication, optimism, decision-making, achievement motivation, perseverance, drive to advance, financial management, workforce management, leadership, networking, efficient marketing, technology use, talent, comprehension of the market and competitors, knowledge of laws and regulations, having government networks, strategic location, and family business background are some of these variables. With the use of this mapping, we hope to shed more light on the various ways that each variable affects the success of the business as well as the ways that dependencies and interactions between variables can impact strategy and overall performance. Understanding where these variables fall inside the quadrants and how they relate to one another can help business actors plan and execute the best possible strategy.

The results of the MICMAC analysis are explained through 4 quadrants as follows (Mafruhah, et al. 2020; Isa, et. al. 2019a). Variables in quadrant I are independent factors, namely variables that have a strong influence and weak dependency. This is a pivotal variable in maintaining business continuity. Quadrant II is a dependent variable, which has a strong influence but is highly dependent. This variable must be studied attentively because the relationship between factors is unstable. The dependent variable in quadrant III has a significant dependency and a mild effect. There is a dependent variable in this region. There is an autonomous variable in quadrant IV. There are variables with weak dependency and influence in this quadrant. Stakeholders cannot prioritize this variable in order to ensure business continuity because it is not closely tied to, and may not even have a correlation with, the key to the success of the food and beverage industry.

Based on Figure 1, it is explained the mapping of key business success variables that support the success of food and beverage businesses in Surakarta City. Quadrant I consist of talent, where talent is a key variable in winning business competition. The talent possessed by business actors is the initial capital for success. Quadrant II is a critical variable for business continuity in the food and beverage business. There are 11 factors in this quadrant: (1) commitment, (2) leadership and management skills, (3) tenacity, (4) encouragement of progress, (5) decision making, (6) effective marketing, (7) achievement oriented, (8) managing risk, (9) ability to understand the market, (10) optimism, and (11) partners and supporting businesses. This supports research (Mangifera and Mawardi, 2022).

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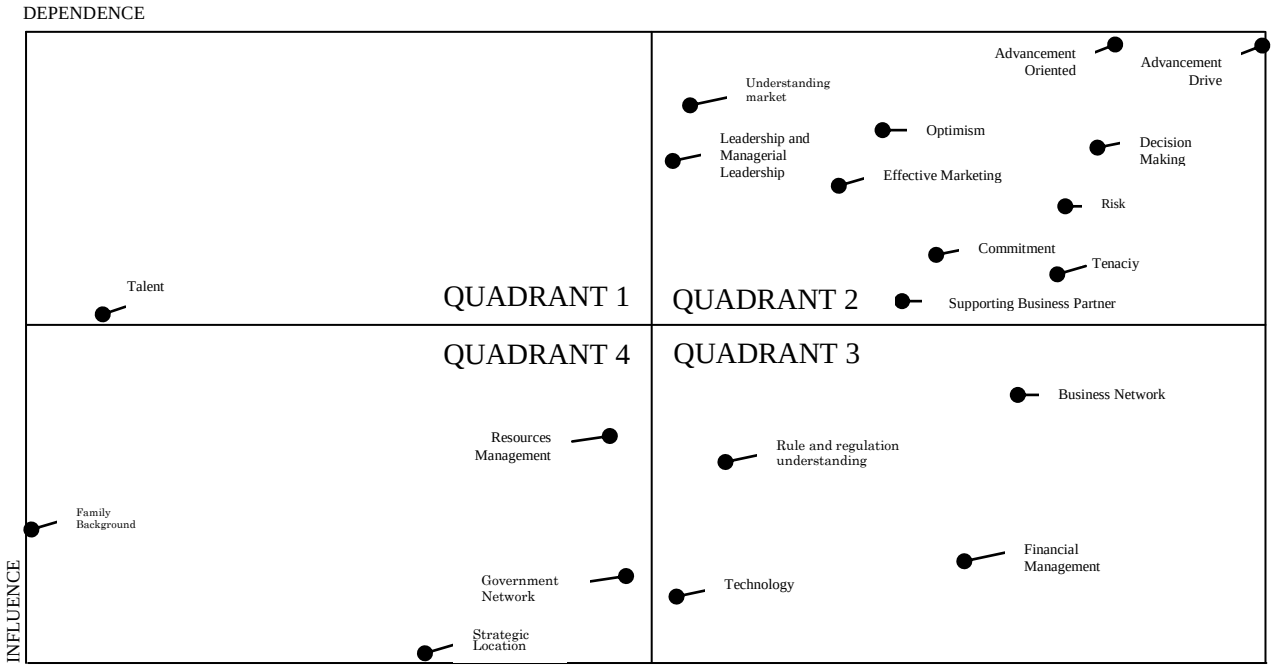


Figure 1. Supporting variables of the success in the food and beverage business.

Source: Authors by Mactor

Quadrant III includes dependent factors. This quadrant's variables are those with significant dependence and weak driving forces. There are 4 factors included in this quadrant, namely (1) business networks, (2) understanding of laws and regulations, (3) technological resources, and (4) financial management. Quadrant 4 is an autonomous factor. This quadrant's variables are those with minimal dependency and influence. Stakeholders seeking to maintain the sustainability of the business cannot give priority to these success characteristics since they are not intimately associated with or correlated with the primary success of the food and beverage industry. The key success factors are (1) family business background, (2) government network, (3) strategic location, and (4) resource management.

D. Conclusions

Food and beverage SMEs are potentially developed for national economic development. Many of them suffered significant losses and even filed for bankruptcy during the COVID-19 pandemic. These SMEs are categorized into moderate vulnerability (0.499) to the threat of COVID-19, and sensitivity is the aspect that has the highest influence on forming the vulnerability level of SMEs, followed by adaptive ability and exposure. The decline in sales and bankruptcy of food and beverage SMEs was also because the majority (80.28%) of SMEs had not operated efficiently, either in resource allocation or output achievement. These findings support the dynamic capabilities hypothesis in SMEs, which states that in order for them to succeed and adapt to dynamic changes in their surroundings, they must possess a specific set of capabilities that allow them to create, integrate, and adjust their resource base.

In maintaining business continuity in the post-COVID-19 era, SME actors must optimize their resources as the main variables to business key success. There are 11 of the 20 main variables that have a major influence on the success of food and beverage entrepreneurs: ability to understand the market, decision making, effective marketing, leadership and management skills, encouragement of progress, commitment, achievement oriented, managing risk, optimism, tenacity, and partners and supporting businesses. In future

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research, further identification needs to be carried out apart from the 20 factors that have been analyzed for improvement and a more holistic understanding. Apart from that, further researchers can analyze it using other approaches or other analytical tools.

The implication of this research is that SME owners or managers must be able to increase business efficiency by improving the ratio of input and output, as well as having core organizational resources to maintain business sustainability in the uncertain external environment. These resources are the ability of SMEs to understand the market, effective marketing methods, leadership and management skills, decision-making methods, business partners, risk management, encouragement to progress, achievement orientation, and an optimistic, committed and tenacious attitude in running a business. Apart from that, the Government must support the sustainability of SMEs through regulations, policies and programs that support a conducive business system. Apart from that, the Government must support the sustainability of SMEs through regulations, policies, and programs that support a conducive business system. This includes providing financial assistance, facilitating access to markets, offering training and mentoring programs, and creating a stable economic environment that encourages entrepreneurial activities. Public-private partnerships can also play a significant role in driving the growth and development of SMEs.

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