

ALTMAN Z-SCORE MODEL FOR THE SUSTAINABILITY OF WONG POLO MANGROVE BEACH TOURISM BUSINESS

Hernawaty¹
Heriyati Chrisna²
Sri Wahyuni³

^{1,2} Faculty Of Social Science, University of Pembangunan Panca Budi, Indonesia

³ Faculty Of Science Technology, University of Pembangunan Panca Budi, Indonesia
(e-mail: hernawaty@dosen.pancabudi.ac.id)

Abstract: *This research is focused on analyzing business financial data, which aims to predict business sustainability using the Altman Z-Score method. The data collection technique was carried out using documentation techniques in the form of collecting the required data from existing financial data by the Wong Polo Mangrove Beach Tourism manager from 2019-2021. Data is analyzed using quantitative descriptive analysis. The main target of this research is to analyze financial data to anticipate the condition of financial difficulties (prediction of bankruptcy) using the Altman Z-Score method so that planned corrective actions can be taken for the sustainability of Wong Polo Mangrove Beach Tourism business and can be a reference for other tourist attractions in Kota Pari Village. In the planned improvement efforts, cooperation is needed from business owners, local governments, and communities around tourist sites.*

Keywords: *Altman Model, Business Sustainability, Wong Polo*

Introduction

The condition of Wong Plo Mangrove Tourism Beach, which is still clean and managed by the community, self-help requires attention and financial support from the local government, especially from the Environmental Service, so that it can become a more attractive and educational tourist spot because of the element of mangrove conservation which has a significant function such as holding sea water so as not to erode the soil on the coastline, as a carbon dioxide gas absorber (CO₂) and oxygen producer (O₂) as well as a place to live various kinds of marine life such as small fish to shelter and find food.

So important is the mangrove forest for the environment's survival, and as a source of income for the surrounding community, the management of Wong Polo Mangrove Beach Tourism will undoubtedly be a tourist spot that is no less interesting to visit. The emergence of the Covid outbreak, which caused a decrease in the number of tourists to the location and impacted the community's income from the tourist attractions, needs to be analyzed. The weakness in analyzing this condition is due to the lack of ability of community groups there in terms of financial management (still traditional) and the absence of a touch of business bankruptcy prediction studies to anticipate early things that can cause business bankruptcy.

Literature Review

Financial Risk Management of MSMEs

One thing that is quite important in running a business is the implementation of risk management. However, not many MSME actors have knowledge and concern for risk

management. Research results from Safi'i (2020) Safi'i (2020) revealed that at least three risks are included at a high level. The three risks are decreased *revenue*, decreased production, and increased raw material prices. At moderate risk, MSMEs will experience delays in the delivery of raw materials. MSME players can use financial strategies, resize, and look for new markets. Finding new markets with the help of social media and government policies is not easy to do. But amid a pandemic, making changes to marketing strategies is necessary (Santoso et al., 2020).

In addition to anticipating changes in selling or marketing methods, business actors, especially MSMEs, must have a financial risk management scheme. Risk management for MSMEs is not very popular among small business actors. But during the COVID-19 pandemic, the ability to face and control problems determines whether or not a business survives. MSME actors manage their business as an intelligence element to improve MSME performance (Santoso et al., 2017). Some small business actors have to close their businesses because they never have or have not considered all the risks that will whack, unlike business actors who have prepared to face even the most negligible business risks. The initial study (2020) stated that out of 37 thousand small and medium business actors, 83% experienced adverse effects due to corona. More than 60% admitted that their turnover fell by more than 30%. Every MSME person in business needs business financial management tips for various purposes. For example, to manage cash, generate profits, utilize capital sources, and business financial management tips to finance business. Although simple, with business financial management tips, every MSME entrepreneur will be able to apply the principles of good budget management, control business financial performance, and avoid business financial risks. Small and Medium Enterprises (MSMEs) are businesses that also require good financial management and reports so that the business can continue to run smoothly. To be able to continue business as an MSME entrepreneur, there are 5 practical financial management tips for MSMEs for business progress, namely separating the business budget from the personal budget, determining the percentage of funds for business capital, making financial reports correctly, avoiding the risk of business debt and controlling business cash flow.

Altman Z-Score Bankruptcy Prediction

The Altman Z-Score is a model for predicting financial distress or predicting bankruptcy developed by New York University Business Professor Edward I. Altman in 1968. Financial difficulties or bankruptcy of a company can be initiated by analyzing the signs that appear in the company's financial statement data. Altman predicts company bankruptcy by combining financial ratios that describe the company's financial condition.

Altman Z-score has 3 models :

1. Altman Z-Score Model (1968)
2. Revised Altman Z-Score Model
3. Modified Altman Z-Score Model

Since it was first discovered in 1968, the Altman *z-score* model has been revised to be applied to all public and private companies.

1. Altman Z-Score Model (1968)

Altman first invented the Altman Z-score model (1968). This model is suitable for predicting bankruptcy for manufacturing companies that *go public*. The equation is as follows:

$$Z = 1,2X_1 + 1,4X_2 + 3,3X_3 + 0,6X_4 + 0,999X_5$$

Description :

Z = *bankruptcy index*

X_1 = *working capital / total asset*

X_2 = *retained earnings / real asset*

- $X_3 = \text{earning before interest and taxes/total asset}$
- $X_4 = \text{market value of equity/book value of total debt}$
- $X_5 = \text{sales / total asset}$

The z value is the overall index of *multiple discriminant analysis*. By reading the results of the Z value with the following parameters:

- a. If the Z value is < 1.8 , the company is bankrupt.
- b. If the value is $1.8 < Z < 2.99$, it is a *gray area* (it cannot be determined whether the company is healthy or experiencing bankruptcy).
- c. If the Z value is > 2.99 , then it is a company that is not bankrupt.

2. Revised Altman Z-Score Model

The revised Altman z-score model is a model developed from the previous Altman z-score model. Altman realized that there were shortcomings in the last model. This model was designed so that in addition to being used for manufacturing companies that *go public*, it can also be used for companies in the private sector. Altman changed the *Market Value of Equity* (X_4) to the *book value of equity* because private companies do not have a market price of equity.

$$Z = 0,717X_1 + 0,847X_2 + 3,108X_3 + 0,42X_4 + 0,988X_5$$

Description:

- $Z = \text{bankruptcy index}$
- $X_1 = \text{working capital / total asset}$
- $X_2 = \text{retained earnings / real asset}$
- $X_3 = \text{earning before interest and taxes/total asset}$
- $X_4 = \text{book value of equity/book value to total debt}$
- $X_5 = \text{sales / total asset}$

The classification of healthy and bankrupt companies is based on the Z-score value of the Altman model (1983), namely:

- a. If the Z' value < 1.23 , it is a bankrupt company.
- b. If the value is $1.23 < Z' < 2.9$, it is included in the gray area (it cannot be determined whether the company is healthy or experiencing bankruptcy).
- c. If the value of Z' > 2.9 , it is a company that is not bankrupt.

3. Modified Altman Z-Score Model

Modification is a model that was refined by Altman in 1995. This model can be applied to all companies, manufacturing, non-manufacturing (service companies, property, and other), and bond-issuing companies in developing countries. The equation is as follows:

$$Z = 6,56X_1 + 3,26X_2 + 6,72X_3 + 1,05X_4$$

Description:

- $Z = \text{bankruptcy index}$
- $X_1 = \text{working capital/total asset}$
- $X_2 = \text{retained earnings / real asset}$
- $X_3 = \text{earning before interest and taxes/total asset}$
- $X_4 = \text{total equity/ total debt}$

With the following classification:

- a. If the Z value < 1.1 , it is a bankrupt company.
- b. If the value is $1.1 < Z < 2.6$, it is a *gray area* (it cannot be determined whether the company is healthy or experiencing bankruptcy).
- c. If the Z value > 2.6 , then it is a company that is not bankrupt

MSMEs are a different type of client with specific needs and uniqueness that require risk management tools and methodologies developed explicitly for them (Altman & Sabato, 2007).

Banks should realize other financing institutions because MSMEs are the dominant type of business in all developing countries and usually account for two-thirds of all employment, which will be essential for economic growth and success. It was found from research conducted by Altman that companies that do not register themselves make up the majority of companies that eventually fail. Another result is that not only do banks have to apply different procedures (in application process and conduct) to manage MSMEs compared to large corporate firms, but these organizations also have to use rating and ranking systems that are specifically geared toward MSME portfolios. The lack of non-financial and compliance information on the companies in their sample provided a significant limitation that forced them to exclude some relevant small companies without accounting data.

In practice, building credit risk models for private companies is always limited by data availability. Indeed, market data is not available for unlisted companies. In addition, many unlisted firms are given leeway regarding the amount of financial statement data required to be filed, which means that the necessary data to calculate some of the accounting ratios used in studies on the failure of listed firms is not available for MSMEs. In recognition of the lack of available data, Hol (2007) analyzed the additional benefits of using macroeconomic data to predict bankruptcy on a sample of unlisted firms in Norway.

Recent literature has highlighted the usefulness of adding age, business type, industry sector, and other variables combined with financial ratios (Grunert et al., 2005). Timeliness in submitting financial statements is also a potential indicator of financial stress based on the research results of Peel (1989). Altman & Sabato (2007) conducted a study using an extensive sample of small firms for the 2000-2007 economic period that can prove the substantial soundness and significant predictive power of the MSME bankruptcy prediction model they created by adding non-financial and compliance information specifically for MSMEs. This information would have significantly improved the predictive accuracy of the model.

Most MSMEs do not have complete financial reports. As the findings of Altman & Sabato (2007) found that almost 60% of MSMEs only have an abbreviated balance sheet and no profit and loss account (small companies) and have a complete balance sheet but an abbreviated profit and loss account (medium-sized companies). Therefore, his research tested the impact of adding non-financial and event data to the model and presented a failure prediction model for small firms that do not file an income statement.

Method

This research uses a quantitative descriptive approach. Quantitative analysis is characterized by a deductive approach to the research process that aims to prove, disprove, or give credence to existing theories (Leavy, 2017). This type of research involves measuring variables and testing relationships between variables to reveal patterns, correlations, or causal relationships. Researchers may use linear data collection and analysis methods that produce statistical data. The underlying values of quantitative research include neutrality, objectivity, and the acquisition of a considerable scope of knowledge (e.g., statistical overview of a large sample). This approach is generally appropriate when the primary objective is to explain or evaluate. The selection of a research approach is based on the nature of the research problem or issue, the researcher's personal experience, and the research's audience (Cresswell, 2014). The modified Altman Z-Score model is used to analyze the sustainability of the Wong Polo Mangrove Tourism Beach MSME business.

Result and Discussion

Wong Polo Mangrove Beach Tourism Kota Pari is one of the MSMEs in Kota Pari Village, Serdang Bedagai. As with MSMEs in general, Wong Polo Mangrove Beach Tourism in Kota Pari is among those that do not have financial reports, according to SAK ETAP. For research purposes, researchers try to summarize all financial data owned by these MSMEs from the results of interviews and referring to existing financial records. Before calculating financial ratios and predicting the bankruptcy of the Altman Z-Score model, descriptive statistical analysis is first carried out. Descriptive statistics provide an overview or description of the data seen from the minimum, maximum, average, and standard deviation values. The descriptive statistical results of this research data can be seen as follows:

Table 1. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
ASET_LCR	3	70.440.441	80.777.953	75.902.674	5.193.690
KWJB_LCR	3	31.100.441	44.982.447	38.068.628	6.941.162
TOT_ASET	3	70.954.656	81.367.632	76.456.763	5.231.604
LABA_DITHN	3	19.420.289	45.142.425	28.168.640	14.702.053
EB_IT	3	-11.099.080	-2.069.658	-7.424.471	4.743.409
TTL_EKUITAS	3	40.883.638	50.737.952	45.682.618	4.932.156
TTL_HUTANG	3	35.854.791	42.859.500	39.095.943	3.531.453
Valid N (listwise)	3				

Source: Data Processed, SPSS 22 (2023)

In table 1, it can be seen that the distribution of the value of current assets, current liabilities, total assets, retained earnings, total equity, and total debt of Wong Polo Mangrove Beach Tourism is quite good because when compared between the average value and the standard deviation, the mean value is still higher than the normal deviation value. Meanwhile, the EBIT value has a poor distribution because the mean value is lower than the standard deviation.

To the financial condition using the Altman Z Score model, several ratios are calculated first. The following tabulation shows the results of the ratio calculation.

Table 2. Tabulation of Financial Ratio Calculation Results of Wong Polo Mangrove Beach Tourism

Year	WCTA Ratio (X ₁)	RETA Ratio (X ₂)	EBITDA Ratio (X ₃)	TETD Ratio (X ₄)
2019	0,5891	0,5859	-0,1182	1,4151
2020	0,5242	0,2451	-0,1364	1,0599
2021	0,3587	0,2737	-0,0292	1,0881

Source: Data processed (2023)

Source: Data processed by the author (2023)

After calculating the financial ratios used in the Altman Z-Score model, the Z-Score value can be calculated by entering the value of each variable into the equation. The following are the results of the Z-Score calculation for each year.

Table 3. Calculation of Z Score for Wong Polo Mangrove Beach Tourism 2019-2021

Tahun	X ₁	X ₂	X ₃	X ₄	Z Score	Kesimpulan
2019	0,5891	0,5859	-0,1182	1,4151	6.46	Safe
2020	0,5242	0,2451	-0,1364	1,0599	4.43	Safe
2021	0,3587	0,2737	-0,0292	1,0881	4.19	Safe

Source: Data processed (2023)

When viewed from the results of the Z Score calculation displayed in table 3, the financial condition of Wong Polo Mangrove Beach Tourism is in good condition (no indication of bankruptcy) even though from the author's observations and information from the manager since Covid 19 broke out there has been a significant decrease in the number of visitors. Until the last confirmation to the manager around the end of February 2023, the number of visitors was still small even though the economy had begun to improve and the Covid outbreak had begun to decrease even though the government still advised the public to remain vigilant.

The condition of Wong Polo Mangrove Beach Tourism, which still survives despite the Covid storm, is certainly not far from the efforts made by its managers and hopes for an increase in the number of tourist visits in the future. Although reaching this tourist location is quite time-consuming, because mangrove beach is a beach tour with its beauty with the combination of seawater and the rustling of mangrove tree leaves, it becomes a *magic* power that makes tourists feel at home (Alib, 2023).

Many things make Wong Polo Mangrove Beach Tourism as mangrove beach tourism is still the target of tourists, including because :

1. It has advantages with the lush and cool mangrove forest at Mangrove Beach.
 The dark atmosphere makes this place seem romantic. This area was previously a tiger shrimp pond in the 1980s. Due to abrasion, residents planted mangrove trees independently in 2005 to restore healthy beach conditions. In 2012, a cooperative was built to manage the beach as a tourist attraction.
2. A bamboo bridge crosses over the sea, making the mangrove forest even more beautiful. At low tide, the view under the bridge is wet sand with various marine animals trapped. But when the sea is high, the sight of small seawater waves will decorate visitors' feet.
3. The white sandy beach is equipped with huts lined up to be used to unwind while enjoying the sea breeze or having a picnic with the family.
4. Lodging is available in the middle of the mangrove debt for those who need more time to enjoy the beautiful beach.

Wong Polo Mangrove Beach Tourism, an environmentally friendly nature tourism, conducts mangrove forest conservation activities such as feed management with mangrove-based ingredients and intensive pond maintenance where all mangrove plants are cleaned except those left in the pond. This activity certainly supports the government program through the Ministry of Tourism and Creative Economy of the Republic of Indonesia, which is stated in the Book of Tourism Industry Trends 2022-2023 (2022) in the *sustainable trend* section that environmental issues are an issue that concerns many people, especially during the last pandemic. When people reduce their mobility, they feel the difference in the surrounding environment. Usually, when going to work, many residents are forced to breathe pollution due to the density of vehicles going to work, but when the government enacted the Restriction of

Community Activities (PPKM), this condition was drastically reduced. Based on the results of a study conducted by the Hakuodo Institute of Life and Living ASEAN (2020), around 86 percent of Indonesians have begun to realize the importance of considering the impact of a product on themselves and the environment.

In addition, from the data Sustainable Development Goals (2022) in the discussion of *Nature Climate Change*, it is reported that world tourism currently contributes 8 percent of global emissions, of which 40 percent comes from transportation services. Tourism industry players can utilize this issue. Kemenparekraf (2022a) launched the *Carbon Footprint Program* to raise awareness and concern from stakeholders in the tourism industry. This carbon footprint program is a pilot project for local governments and five destinations: Plataran Menjangan in West Bali National Park, Tembudan Berseri Mangrove in Berau, 3 Warna Beach in Malang, Bukit Peramun in Belitung, and Klawalu Mangrove Tourism Park in Sorong. The sustainable tourism market has also increased considerably as the pandemic has begun to subside. Around 90% of tourists visiting Bali are interested in knowing more about ecotourism, and 83% believe sustainable travel is essential. In addition, 69% of them have committed to reducing the carbon footprint of each trip. Reducing single-use products, saving energy, and using recycled products are some things that can be done to make this happen. Looking at these conditions, with the Kemenparekraf program, it is hoped that in the coming period, the number of tourists to Wong Polo Mangrove Beach Tourism will increase because it supports government programs.

Conclusion

The financial condition of Wong Polo Mangrove Beach Tourism is in good condition (no indication of bankruptcy) when viewed from the calculation of the Altman Z- Score model bankruptcy prediction. From the results of the author's observations and information from the manager, since Covid 19 broke out, there has been a significant decrease in the number of visitors. Until the last confirmation to the manager around the end of February 2023, the number of visitors was still small even though the economy had begun to improve and the Covid outbreak had begun to decrease even though the government still advised the public to remain vigilant.

Many things that make the condition of Wong Polo Mangrove Beach Tourism still considered safe (not experiencing bankruptcy), including mangrove beach cultivation, is one of the Kemenparekraf programs to support environmental protection in addition to very fresh natural conditions that will not be consumed by time and become a tourist-target for those who want to enjoy the pristine beach atmosphere while enjoying *seafood* directly from the source.

Future researchers are expected to analyze from a non-financial angle, such as human resources, marketing, and other things not discussed here.

References

- Alib. (2023). *Pantai Mangrove Serdang Bedagai – Daya Tarik, Aktivitas Liburan, Lokasi & Harga Tiket*. Accessed 11 March 2023
- Altman, E. I., & Sabato, G. (2007). Modelling credit risk for SMEs: Evidence from the U.S. market. *Abacus*, 43(3), 332–357.
- Cresswell, J. W. (2014). Research Design. In *SAGE Publications Asia-Pacific Pte. Ltd* (Fourth Edi, Vol. 13, Issue 1). SAGE Publications Asia-Pacific Pte. Ltd.
- Grunert, J., Norden, L., & Weber, M. (2005). The role of non-financial factors in internal credit ratings. *Journal of Banking and Finance*, 29(2), 509–531. <https://doi.org/10.1016/j.jbankfin.2004.05.017>
- Hakuodo Institute of Life and Living ASEAN. (2020). *Hakuodo Institute of Life and Living ASEAN*. Accessed 11 March 2023.

- Hol, S. (2007). Transactions in Operational. *International Transactions in Operational Research*, 14, 75–90. <https://doi.org/10.1111/j.1475-3995.2006.00576.x>
- Kemenparekraf. (2022a). *Siaran Pers : Menparekraf Luncurkan Carbon Footprint di Bali Wujudkan Pariwisata Berkelanjutan dan Berkualitas*. Accessed 11 March 2023
- Kemenparekraf. (2022b). *Tren Industri Pariwisata 2022_2023*. Kementerian Pariwisata dan Ekonomi Kreatif RI. Accessed 11 March 2023
- Leavy, P. (2017). Research Design. In *The Guilford Press*. The Guilford Press.
- Peel, M. J. (1989). The going-concern qualification debate: Some UK evidence. *The British Accounting Review*, 21(4), 329–350.
- Safi'i, I., Widodo, S. R., & Pangastuti, R. L. (2020). Analisis Risiko pada UKM Tahu Takwa Kediri terhadap Dampak Pandemi COVID-19. *Jurnal Rekayasa Sistem Industri*, 9(2), 107–114.
- Santoso, R., Candraningrat, C., & Binawati, L. (2017). Elemen Kecerdasan Wirausaha Untuk Meningkatkan Kinerja Industri Kecil dan Menengah (IKM) di Surabaya. *BISMA (Bisnis Dan Manajemen)*, 10(1), 73-89.
- Santoso, R., Erstiawan, M. S., & Kusworo, A. Y. (2020). Inovasi Produk, Kreatifitas Iklan Dan Brand Trust Mendorong Keputusan Pembelian. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, 5(2), 133–145.
- Sustainable Development Goals. (2022). UN Report: Nature's Dangerous Decline' Unprecedented'; Species Extinction Rates 'Accelerating.' *Sustainable Development Goals*.