INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 15, Issue 2, (2026) E-ISSN: 2226-6348

The Effect of Financial Risk Management on the Performance of Construction Companies Mediated by Efficiency

Sugeng Dwi Hartantyo, Sasitharan Nagapan*, Mohd Haziman Wan Ibrahim

Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia

Email: gf210078@student.uthm.edu.my, haziman@uthm.edu.my

*Corresponding Author Email: sasitharan@uthm.edu.my

DOI Link: http://dx.doi.org/10.6007/IJARPED/v15-i2/28092

Published Online: 29 April 2026

Abstract

The construction industry has unique characteristics compared to other dynamic, multifaceted, complex, multidisciplinary, and expandable industrial sectors. Consequently, these characteristics are accompanied by numerous challenges and issues such as poor construction quality, poor project performance, cost and time overruns, accidents, poor communication, project failures, and other problems. The population in this study consists of construction service companies affiliated with the Indonesian National Construction Contractors Association (GAPENSI) in East Java Province, with a sample of 97 respondents. This research utilized the Smart PLS application. The study results indicate that Interest rate risk, foreign exchange risk, market risk, and liquidity risk do not significantly affect company performance. Credit risk and efficiency affect company performance. Interest rate risk and market risk do not significantly affect efficiency. Foreign exchange risk, credit risk, and liquidity risk significantly affect efficiency.

Keywords: Project Performance Challenges, Risk Factors, GAPENSI East Java, Smart PLS

Introduction

The construction industry is complex and faces various challenges such as poor performance, delays, and risks. East Java had the highest number of construction companies in Indonesia during 2020–2021, significantly contributing to national infrastructure. Out of 24,596 contractors, most are small-scale. Unmanaged risks—especially financial—can hinder project success in time, cost, and quality. Therefore, research on financial risk management is essential to enhance company efficiency and performance, benefiting practitioners, academics, and regulators in the construction sector.

Literature Review

A. Interest Rate Risk

Interest rate risk refers to potential investment losses due to interest rate changes. Gad, Adel-Monem, & Hamid (2022) identified key indicators such as taxes, local cost changes, interest

rates, financial costs, and political shifts. These factors impact financing costs and company planning. Understanding these risks allows firms to manage financial exposure more effectively.
H1: Interest rate risk on performance
H6: Interest rate risk on efficiency

B. Exchange Rate Risk

Foreign exchange risk arises from currency fluctuations in international transactions, affecting cash flow, imports, exports, and investments. Iqbal et al. (2015) noted that financial risk significantly impacts construction projects, with exchange rate volatility being a major factor (Perera et al., 2009; Fernando et al., 2015).
H2: Foreign exchange risk on performance
H7: Foreign exchange risk on efficiency

C. Market Risk

Financial risk is associated with the health of the Contractor cash flow is influenced by decision-making efficiency and risk (Akintoye & MacLeod, 1997; Zavadskas et al., 2010b; Jorion, 2009). Market risk—stemming from price volatility—affects assets, borrowing, and capital (Jorion, 2009). Gad, Adel-Monem, & Hamid (2022) identified key indicators like inflation, material and labor costs, transportation, energy, supply-demand dynamics, and real estate investor behavior, all of which impact financial performance in construction.
H3: Market risk on performance
H8: Market risk to efficiency

D. Credit Risk

Credit risk, as explained by Gad, Adel-Monem, & Hamid (2022), can be assessed through indicators like receivables ratio, billing progress, retention, credit rating, debt-equity ratio, bonding, insurance, central bank statements, commercial registers, business loans, and financial statements. These factors reflect a company's ability to manage debt and financial obligations.
H4: Credit risk on performance
H9: Credit risk on efficiency

E. Liquidity Risk

Liquidity risk arises when a company lacks sufficient working capital or liquid assets to meet obligations. Gad, Adel-Monem, & Hamid (2022) identify indicators such as working capital equity, under billing, delinquent payroll taxes, related party receivables, and cash flow coverage, which help assess a company’s liquidity health.
H5 : Liquidity risk on performance
H10 : Liquidity risk on efficiency

F. Construction Company Efficiency

Adequate resources are essential to achieving efficiency (Mesbah et al., 2017). Construction company efficiency is the effective use of resources—labor, materials, equipment, and time—to minimize costs without compromising quality. It involves reducing waste, improving productivity, and enhancing profitability and competitiveness.
H11: Efficiency on Performance

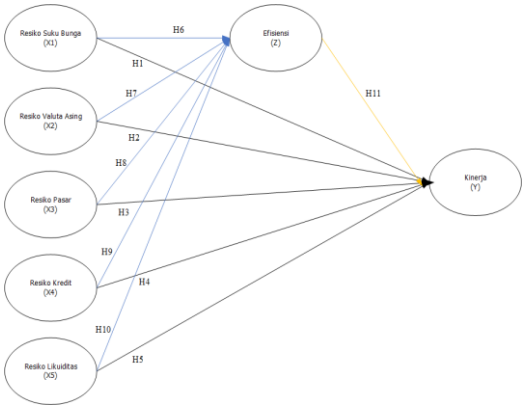

Figure 1 presents the research model, showing that interest rate risk, foreign exchange risk, market risk, credit risk, and liquidity risk affect construction company performance, with efficiency as the intervening variable.

Research Methods

The study population consists of 3,541 construction companies (K1: 978; K2: 1,369; K3: 1,194) under GAPENSI East Java. A survey method was used, and the sample was determined using Slovin's formula with random sampling and acceptable error margin.

$$n = \frac{N}{1 + Ne^2}$$	(1)

Where :

n = Number of samples of construction service companies
N = Total population of construction service companies
e 2 = Precision set (margin of error) of 10%

$$n = \frac{3541}{1 + (3541x0.1^2)} = 97 \text{ Responden}$$	(2)

The research sample was set at 97 respondents, using a 10% margin of error. Respondents were selected based on experience and nationwide distribution to ensure accurate and representative answers. Group sample sizes were calculated using a specific formula.

$$n = \frac{\text{Jumlah Sampel Seluruh Anggota}}{\text{Jumlah Populasi}} \text{x Jumlah populasi disetiap kelompok} \quad (3)$$

$$n = \frac{978}{3541} \text{x } 97 = 26.79 \text{ (K1)}$$

$$n = \frac{978}{3541} \text{x } 97 = 26.79 \text{ (K1)}$$

$$n = \frac{1369}{3541} \text{x } 97 = 37.50 \text{ (K2)}$$

$$n = \frac{1194}{3541} \text{x } 97 = 32.70 \text{ (K3)}$$

NO	BPD GAPENSI PROVINCE	K3	K2	K1	AMOUNT	Information
1	East Java	978	1,369	1,194	3,541	Population
		27	37	33	97	Sample

Data were collected using a questionnaire, which involves giving written statements to respondents to obtain primary data (Lubis, Z., 2017: 173).

Data Analysis and Result

A. Outer Model Analysis

The following is a picture of the structural model for data processing using the Smart PLS application.

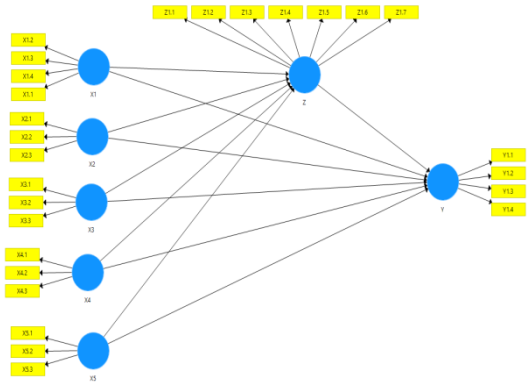

Fig 2. Structural Model

Validity testing ensures an instrument measures what it intends to (Hair et al., 2019). In PLS, convergent validity is adequate if loading > 0.7 and AVE > 0.5 (Muhtarom et al., 2021), while discriminant validity requires cross loading > 0.7, with diagonal values higher than others (Putri et al., 2023).

Table I
Composite Reliability and Convergent Validity Test Results

	Items	Factor Loading	AVE	Composite Reliability	Cronbach's Alpha
(X1) Interest Rate Risk	X1.1	0,913	0,718	0,910	0,867
	X1.2	0,707			
	X1.3	0,837			
	X1.4	0,916			
(X2) Exchange Rate Risk	X2.1	0,936	0,800	0,923	0,875
	X2.2	0,859			
	X2.3	0,887			
(X3) Market Risk	X3.1	0,709	0.675	0,860	0.754
	X3.2	0.933			
	X3.3	0.809			
(X4) Credit Risk	X4.1	0.739	0,613	0.825	0,694
	X4.2	0.717			
	X4.3	0.883			
(X5) Liquidity Risk	X5.1	0.827	0.659	0.853	0.751
	X5.2	0,791			
	X5.3	0.816			
(Y) Performance	Y1.1	0,761	0.667	0.889	0.834
	Y1.2	0.884			
	Y1.3	0.836			
	Y1.4	0.781			
(Z) Efficiency	Z1.1	0.933	0.676	0.943	0.929
	Z1.2	0.742			
	Z1.3	0.809			
	Z1.4	0.912			
	Z1.5	0.728			
	Z1.6	0.769			
	Z1.7	0.702			
	Z1.8	0.943			

The table indicates that each variable has a loading factor above 0.7 and an Average Variance Extracted (AVE) exceeding 0.5, confirming their validity (Muhtarom et al., 2021). Additionally, the Cronbach's Alpha values for all variables are above 0.6, supporting their reliability (Ghozali, 2011:48; Andreas, 2016).

B. *Inner Model Analysis*

Table II
R-Square Test Results

Variable	R Square	R Square Adjusted
(Y) Performance	0.843	0.832
(Z) Efficiency	0.879	0.872

This test assesses the extent of the influence variable X has on variable Y. An R-Square value of 0.67 indicates a strong relationship, 0.33 a moderate one, and 0.19 a weak relationship (Muhtarom et al., 2022). Based on the table, the R-Square value for the performance variable

is 0.843, indicating that interest rate risk, foreign exchange risk, market risk, credit risk, liquidity risk, and efficiency collectively influence company performance by 84.3%. Meanwhile, an R-Square value of 0.879 suggests that interest rate risk, foreign exchange risk, market risk, credit risk, and liquidity risk influence efficiency by 87.9%.

Hypothesis Testing

Mediation tests evaluate how mediating variables affect the relationship between independent and dependent variables (Muhtarom et al., 2022). There are three types: Non Mediation (positive main relationship, negative mediation), Full Mediation (negative main relationship, positive mediation), and Partial Mediation (all relationships positive). A P-value above 0.05 for the Specific Indirect Effect is considered insignificant, and vice versa (Muhtarom et al., 2022).

Table III
Path Analysis Output

Path Diagram	Path Coefficient	t-value	p-value	Information
X1 -> Y	-0.049	0.519	0.604	H1 is rejected
X2 -> Y	0.026	0.262	0.794	H2 is rejected
X3 -> Y	0.125	1,575	0.116	H3 is rejected
X4 -> Y	0.396	4,301	0,000	H4 is accepted
X5 -> Y	-0.073	1,261	0.208	H5 is rejected
X1 -> Z	0.062	0.897	0.370	H6 is rejected
X2 -> Z	0.460	5,535	0,000	H7 accepted
X3 -> Z	0.084	1,059	0.290	H8 is rejected
X4 -> Z	0.341	3,948	0,000	H9 accepted
X5 -> Z	0.094	2,055	0.040	H10 accepted
Z -> Y	0.509	4,739	0,000	H11 accepted

Table IV
Specific Indirect Effect

Path Diagram	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X1> Z> Y	0,031	0,037	0,038	0,822	0,411
X2> Z> Y	0,234	0,224	0,057	4,084	0,000
X3> Z> Y	0,043	0,042	0,042	1,014	0,311
X4> Z> Y	0,173	0,179	0,064	2,712	0,007
X5> Z> Y	0.048	0.049	0.025	1,924	0.055

Based on table 3, the variable X1 to Y shows a P Value of 0.604 > 0.05. In table 4, the variable X1 to Y which is intervening with Z has a P-Values = 0.411 > 0.05. So, the data results can be categorized as non-mediation.

The variable X2 against Y in table 3 shows a P value of 0.794 > 0.05. In table 4, the variable X1 to Y which is intervening with Z has a P-Values = 0.000 < 0.05, from the data results it can be categorized as full mediation. In contrast to The variable X4 to Y gets a P-Values value of 0.000 < 0.05, and in table 4, And finally, X5 against Y, whether intervening by Z or not, gets a P-Values value > 0.05, so it falls into the non-mediation category.

A. Interest Rate Risk on Company Performance

Table 3 shows that the hypothesis test results for the interest rate risk variable on company performance have an Original Sample value of -0.049, a T-Statistic of 0.519 (below the T-table value of 1.987), and a P-value of 0.604 (above 0.050), indicating that H1 is rejected. This means that although the relationship is positive, it is not significant. The findings suggest that interest rate risk does not significantly influence company performance, possibly due to other more dominant factors. These results are supported by Sinaga (2021).

B. Exchange Rate Risk on Company Performance

Table 3 shows that the foreign exchange risk variable has a positive but insignificant effect on company performance, with a T-Statistic of 0.262 (< 1.987) and a P-value of 0.794 (> 0.050), leading to the rejection of H2. This suggests that exchange rate fluctuations have minimal impact, possibly due to effective risk management strategies (Bambang, 2020).

C. Market Risk on Company Performance

Table 3 reveals that market risk has a positive but insignificant effect on company performance, with a T-Statistic of 1.575 (< 1.987) and a P-value of 0.116 (> 0.050), leading to the rejection of H3. This suggests that market risk factors, such as stock price volatility or global uncertainty, do not significantly influence performance. However, this should be interpreted cautiously due to possible sample or methodological limitations. These findings align with Irmawati (2014) and Adityantoro (2013).

D. Credit Risk on Company Performance

Table 3 shows that the hypothesis test results for the credit risk variable on company performance have an Original Sample value of 0.396, a T-Statistic of 4.301 (above the T-table value of 1.987), and a P-value of 0.000 (below 0.050), indicating that H4 is accepted. This confirms a positive and significant relationship. Credit risk significantly affects company performance, particularly in the banking sector. For example, rising interest rates—often used as a proxy for market risk—lead to higher loan rates, which can reduce public interest in borrowing. This negatively impacts a bank's core income from lending and discourages investment in the sector, ultimately lowering banking performance and deterring investors.

E. Liquidity Risk on Company Performance

Table 3 shows that the hypothesis test results for the liquidity risk variable on company performance have an Original Sample value of -0.073, a T-Statistic of 1.261 (below the T-table value of 1.987), and a P-value of 0.208 (above 0.050), indicating that H5 is rejected. This means the relationship is positive but not significant. The data analysis reveals no significant

correlation between liquidity risk and company performance. Although liquidity risk is an essential aspect of financial management, its impact on overall performance tends to be minimal. The findings suggest that effective strategies can mitigate liquidity risk without compromising operational or financial stability. These conclusions align with the studies of Putri & Gandakusuma (2023), Parvin et al. (2014), and Sawada (2010).

F. Interest Rate Risk on Efficiency

Table 3 shows that the hypothesis test for the interest rate risk variable on efficiency has an Original Sample value of 0.062, a T-Statistic of 0.897 (below the T-table value of 1.987), and a P-value of 0.370 (above 0.050), indicating that H6 is rejected. This implies a positive but not significant relationship. The results suggest that interest rate risk does not significantly affect company efficiency, meaning interest rate changes do not substantially impact resource optimization. These findings are supported by Yudanto (2018), who stated that higher interest rate risk does not enhance a company's risk management.

G. Exchange Rate Risks on Efficiency

Table 3 shows that the hypothesis test for the foreign exchange risk variable on efficiency has an Original Sample value of 0.460, a T-Statistic of 5.535 (above the T-table value of 1.987), and a P-value of 0.000 (below 0.050), indicating that H7 is accepted. This confirms a positive and significant relationship. Foreign exchange risk emerges when countries with different currencies engage in transactions, and depreciation of the rupiah can increase market risk, especially for foreign exchange banks. To manage this, multinational companies must identify risks, apply strategies such as hedging, currency diversification, and financial restructuring, and consider Indonesian regulations related to financial reporting, taxation, and monetary policy.

H. Market Risks to Efficiency

Table 3 shows that the hypothesis test for the market risk variable on efficiency has an Original Sample value of 0.084, a T-Statistic of 1.059 (below the T-table value of 1.987), and a P-value of 0.290 (above 0.050), indicating that H8 is rejected. This means there is a positive but not significant relationship. The findings suggest that market risk does not significantly impact company efficiency. Stock price volatility or global economic uncertainty does not notably hinder resource optimization. This may result from effective risk management strategies like investment diversification or the use of derivatives. The results are supported by Arfiani (2020) and Haliza (2023), who also found that market risk does not significantly affect profitability or influence investor decisions.

I. Credit Risk to Efficiency

Table 3 shows that the hypothesis test for the credit risk variable on efficiency has an Original Sample value of 0.341, a T-Statistic of 3.948 (above the T-table value of 1.987), and a P-value of 0.000 (below 0.050), indicating that H9 is accepted. This confirms a positive and significant relationship. The findings suggest that credit risk significantly affects efficiency, and improved efficiency can strengthen the relationship between credit and company performance. Since credit risk is closely linked to interest rates, rising rates can lead to reduced borrowing, negatively impacting bank revenue and investor interest in the sector.

J. Liquidity Risk to Efficiency

Table 3 shows that the hypothesis test for the liquidity risk variable on efficiency has an Original Sample value of 0.094, a T-Statistic of 2.055 (above the T-table value of 1.987), and a P-value of 0.040 (below 0.050), indicating that H10 is accepted. This confirms a positive and significant relationship. Liquidity risk arises when banks face difficulties fulfilling credit requests and fund withdrawals, often due to higher credit distribution than available deposits. This condition can lead to an inability to meet short-term obligations. A high level of liquidity risk—reflected by a high Loan to Deposit Ratio (LDR) and elevated Non-Performing Loans (NPL)—can negatively impact company performance, highlighting the importance of effective liquidity risk management.

K. Efficiency on Company Performance

Table 3 shows that the hypothesis test for the credit risk variable on efficiency has an Original Sample value of 0.509, a T-Statistic of 4.739 (above the T-table value of 1.987), and a P-value of 0.000 (below 0.050), indicating that H11 is accepted. This confirms a positive and significant relationship. The findings suggest that higher efficiency is associated with better company performance. Measuring efficiency involves not only risk levels but also other inputs such as financial ratios and incurred costs. Additionally, external economic factors may affect risk unpredictably, making efficiency less dependent on fluctuating risks. Liquidity risk, in particular, differs from operational risk in both cause and management approach, often arising from the inability to meet short-term funding needs at optimal costs.

Conclusion

Interest rate risk, foreign exchange risk, market risk and liquidity risk do not have a significant effect on company performance. Credit risk and efficiency influence company performance. Interest rate risk and market risk do not have a significant effect on efficiency. Foreign exchange risk, credit risk and liquidity risk have a significant effect on efficiency.

Existing factors that pose a high risk in the construction business should be an important concern for managers to be prioritized in risk analysis management and financing planning, with consideration of supporting elements as the basis for analyzing the dominant risks that arise in projects.

Acknowledgement

We thank Universiti Tun Hussein Onn Malaysia (UTHM) and BP Renalcare Sdn Bhd for their financial support under the Industry Grant M085, and the Indonesian National Construction Contractors Association (GAPENSI) in East Java Province

References

Adityantoro, Y. W. K., & Rahardjo, S. N. (2013). Factors that influence banking profitability in Indonesia. *Diponegoro Journal of Accounting*. ISSN 2337-3806.

Akintoye, A., & MacLeod, M. (1997). Risk analysis and management in construction. *International Journal of Project Management, 15*(1), 31–38. https://doi.org/10.1016/S0263-7863(96)00035-X

Gunawan, A. (2016). The influence of compensation and work discipline on employee performance at PT Gesit Nusa Tangguh. *Scientific Journal of Business Management, 16*(1), 1–12.

Arfiani. (2020). *The impact of financing risk, liquidity risk and market risk on the profitability of Sharia banking in Indonesia* (Bachelor's thesis, UIN Alauddin Makassar).

Mesbah, A., Babaei, M., & Shabanali, A. (2017). Measuring the success level and effectiveness of knowledge management in organizations: A case study. *Engineering, Technology & Applied Science Research, 7*(2), 1575–1581.

Bambang. (2020). *The influence of market risk on financial performance in national commercial banks* (Bachelor's thesis, Duta Wacana Christian University).

Yudanto, A. E. (2018). *Test of bank specific factors on risk management efficiency in family banks listed on the Indonesia Stock Exchange (2014–2016)* (Bachelor's thesis, Universitas Islam Indonesia).

Fernando, C. K., Hosseini, M. R., Zavadskas, E. K., Perera, B., & Rameezdeen, R. (2015). Managing the financial risks affecting construction contractors: Implementing hedging in Sri Lanka. *International Journal of Strategic Property Management, 21*(2), 212–224. https://doi.org/10.3846/1648715X.2017.1301592

Putri, A. F. S., Muhtarom, A., & Kusbandono, D. (2023). Determination of product variations, service quality, word of mouth and location on increasing sales volume mediated by customer loyalty. *Journal of National Development Economics, 16*(1), 99–114. https://doi.org/10.46306/jbbe.v16i1

Gad, N. A., Abdel-Model, M., El-Dash, K., & Abdel Hamid, M. (2022). Modeling financial risk contributions to construction projects: Case study of expanding food industries. *HBRC Journal, 18*(1), 85–106.

Ghozali, I. (2011). *Application of multivariate analysis with IBM SPSS 19* (5th ed.). Diponegoro University Publishing Agency.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Haliza, L. N. (2023). *The influence of financing risk, liquidity risk and market risk on Sharia banking assets* (Bachelor's thesis, UIN Syarif Hidayatullah Jakarta).

Iqbal, S., Choudhry, R., Holschemacher, K., Ali, A., & Tamošaitienė, J. (2015). Risk management in construction projects. *Technological and Economic Development of Economy, 21*(1), 65–78. https://doi.org/10.3846/20294913.2014.994582

Irmawati, & Sari, D. K. (2014). Analysis of the effect of capital adequacy ratio (CAR), loan to deposit ratio (LDR), and net interest margin (NIM) on return on assets (ROA): Case study at PT Bank Mandiri (Persero) Tbk 2008–2012. *Journal of Management and Business, 18*(1).

Jorion, P. (2009). *Financial risk manager handbook* (5th ed.). Wiley.

Lubis, Z. (2017). *The influence of competency, work discipline, teamwork, and organizational support on quality of work life, satisfaction and performance of inter-city autobus drivers in East Java* (Doctoral dissertation, Universitas 17 Agustus 1945 Surabaya).

Muhtarom, A., Syairozi, M. I., & Yonita, H. L. (2022). Analysis of perceptions of price, location, facilities and service quality on customer loyalty mediated by purchasing decisions. *Jurnal Ekombis Review, 10*, 391–402.

Muhtarom, A., Zulyanti, N. R., & Mufidah, N. (2021). Analysis of the influence of brand equity, product quality, service quality and promotion on customer loyalty during the new normal. *Journal of Applied Management Research, 6*(2), 101–113.

Perera, B., Dhanasinghe, I., & Rameezdeen, R. (2009). Risk management in road construction: The case of Sri Lanka. *International Journal of Strategic Property Management, 13*(2), 87–102. https://doi.org/10.3846/1648-715X.2009.13.87-102

Sawada, M. (2010). Liquidity risk and bank portfolio management in a financial system without deposit insurance: Empirical evidence from prewar Japan. *International Review of Economics & Finance, 19*, 392–406.

Parvin, S. (2014). Effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. *Asian Business Review.*

Sinaga, F. (2021). *The influence of interest rates and inflation rates on financial performance at PT BPR Mitra Dana Madani Medan* (Bachelor's thesis, Universitas Medan Area).

Putri, J. Y., & Gandaksuma, I. (2023). Analysis of the influence of credit risk, liquidity risk and operational risk on banking performance: Case study of conventional commercial banks listed on the Indonesia Stock Exchange for the 2016–2020 period. *Indonesian Journal of Management and Entrepreneurship, 46*(1), 34–48.

Zavadskas, E. K., Vilutiene, T., Turskis, Z., & Tamošaitienė, J. (2010). Contractor selection for construction works by applying SAW-G and TOPSIS grey techniques. *Journal of Business Economics and Management, 11*(1), 34–55. https://doi.org/10.3846/jbem.2010.03