




“Accounting information transparency and business performance: A case of G7 construction companies”

AUTHORS	Sevinj Abbasova  Mehriban Aliyeva  Leyla Huseynova
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Leyla Huseynova, 2022

Sevinj Abbasova, Ph.D. in Economics,
Associate Professor, Head of
Department of Applied Economics,
Azerbaijan State University of
Economics (UNEC), Azerbaijan.
(Corresponding author)

Mehriban Aliyeva, Ph.D. in Economics,
Associate Professor, Department of
Applied Economics, Azerbaijan State
University of Economics (UNEC),
Azerbaijan.

Leyla Huseynova, Ph.D. in Economics,
Lecturer, Department of Applied
Economics, Azerbaijan State University
of Economics (UNEC), Azerbaijan.



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Sevinj Abbasova (Azerbaijan), Mehriban Aliyeva (Azerbaijan),
Leyla Huseynova (Azerbaijan)

ACCOUNTING INFORMATION TRANSPARENCY AND BUSINESS PERFORMANCE: A CASE OF G7 CONSTRUCTION COMPANIES

Abstract

A high level of company bankruptcy in certain countries and a low level of profitability actualizes the need to find additional mechanisms for increasing the efficiency of their activities. One of such mechanisms is the growth of information transparency. The study deals with examining the effects of accounting information transparency on business performance on the example of construction companies in G7 countries. The transparency index was used as a parameter characterizing the level of accounting information transparency. The level of business performance was analyzed using the following indicators: value added of the construction industry, investment in the construction industry, number of construction firms, profitability of the construction industry, annual all-work construction output index, and total employees in construction firms. The dependence between the indicators was analyzed using the multiple regression analysis, Dickey-Fuller, Philips Perron, and Johansen tests. According to the results, the most vital link was between the level of accounting information transparency and the volume of investments (increased information transparency by 1 point leads to an increase in the volume of investments from 1.7% to 4.6%). At the same time, the level of accounting information transparency practically does not affect the number of employees (change by 0.1-0.2%) and added value (change by 0.1-0.3%). It was concluded that the policy of accounting information transparency should be an essential element of company strategy aimed to increase the level of its investment attractiveness and confidence of investors and consumers in its activities.

Keywords information transparency, business performance,
competitive advantages, risk, economic goals

JEL Classification L74, L25, M41, C23

INTRODUCTION

The active development of digital technologies, the leveling of borders, and the growing need to establish relations with partners and attract investments lead to several requirements for the successful functioning of the corporate sector of the economy. One of them is increasing accounting information transparency, the role of which both for consumers (regarding the quality of the final product and the development process itself) and for other counterparties (regarding cash flow) is constantly growing.

This forces businesses to disclose confidential information about their economic, environmental, and social activities to all stakeholders in financial decision-making. The information disclosure level about company activities indicates its open and honest activity, a critical factor in forming trust among all interested parties. In addition, accounting is aimed at determining and constantly improving the supply to the existing demand, so accounting occupies a central place in the information policy of companies.

Despite the theoretical substantiation of the dependence of business efficiency on the level of its information transparency and accounting disclosure, empirical confirmation of this hypothesis is practically absent today. Therefore, the need for an empirical study on the impact of accounting information transparency on business performance and substantiation of its role in increasing the company efficiency and the quality of management accounting is actualized.

Special attention should be paid to the analysis of the results of construction companies, which, on the one hand, play an important role in the economic development of most G7 countries, and on the other hand, are among the biggest polluters of the environment. The construction sector accounts for more than 35% of the total volume of waste in the EU. According to international experts, the amount of greenhouse gas emissions from the extraction and production of building materials, from the construction and reconstruction of buildings ranges from 5 to 12% of the total emissions of harmful substances. Realizing this, some construction companies are trying to hide these facts, including by not disclosing information about their activities. Thus, ensuring transparency in the construction company has not only an economic, but also a social and environmental effect.

1. LITERATURE REVIEW AND ANALYSIS

Despite the urgency of the problem of a low level of business performance in specific sectors of the economy, the systematization of the scientific literature proved the need for a unified approach to improving the quality of corporate governance and understanding the role of information transparency in these processes.

Under these conditions, the connection between business performance and the quality of its accounting information is significantly strengthened. Thus, Barth and Schipper (2008) and Szewieczek et al. (2021) consider accounting information transparency as the primary tool of the effective company's economic policy, as it makes its activities clear to internal and external users of information.

The problem of a low level of transparency in the economy's corporate sector has several negative consequences. In particular, they include deterioration of communication with the main internal and external stakeholders, low coordination efficiency between the company's structural divisions and its partners (Koskela & Howell, 2002), and untimeliness and ineffectiveness of decision-making (Jang & Kim, 2007). Moreover, there is the deterioration of planning procedures, control over the movement of financial resources, and employee dissatisfaction with working conditions (Hewage et al., 2008; Chauhan & Pathak, 2021; Theiri et al.,

2022; Danylyshyn & Bohdan, 2021). Furthermore, misunderstanding the full scope of goals and objectives of companies' work leads to a deterioration in the effectiveness of corporate management and high variability in the process of management decision-making (Dainty & Brooke, 2004; Picchi & Granja, 2004; Alarcón, 2005; Kadyan et al., 2022; Attor et al., 2022).

The concept of accounting information transparency is a widespread research object. For example, financial and accounting issues, the growth of interest of its counterparties in the firm's activities (Hills et al., 2008; Hamed & Bohari, 2022), the features of voluntary (Behn et al., 2010; Quattrone, 2022) and that which is formed under market pressure (Phuong-Nguyen et al., 2020; Fernandez-Feijoo et al., 2014; Yang, 2022; Raditya et al., 2022; Bhaskar & Flower, 2021; Hariani & Fakhrorazi, 2021) disclosure of its performance indicators are discussed. In addition, drivers of transparency (Brady et al., 2018; Schnackenberg, 2009), the relationship between the level of business transparency and the cost of firm capital, non-financial indicators (Barth et al., 2013; Coram et al., 2011; Monteiro et al., 2022), and the connection between business digitalization and the level of its transparency (O'Donnell & David, 2000; Wu & Jin, 2022) are also relevant.

At the same time, the implementation of digital technologies often contradicts the level of business transparency. Under certain conditions, information and communication technologies can con-

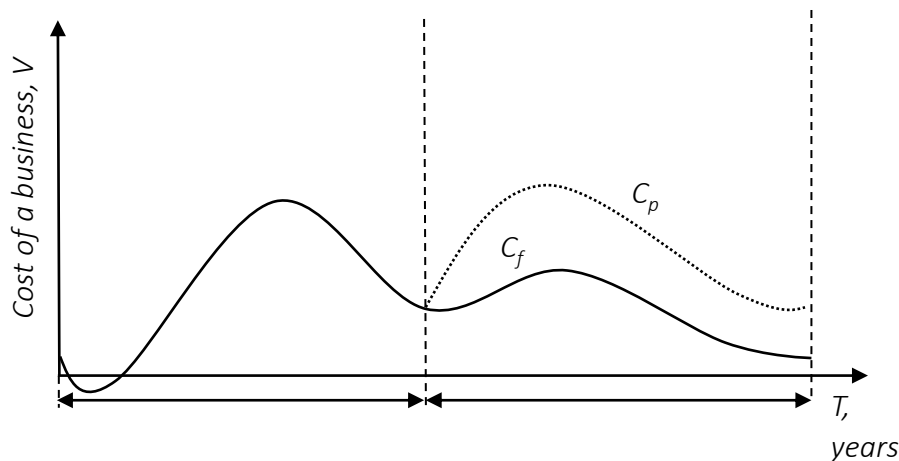


Figure 1. Change in the value of a business with an increase in the level of its information transparency

tribute to the growth of the functional capabilities of corporate management system. In contrast, it can create an imaginary visibility of a company's implementation of the policy of transparency and openness. By publishing information about secondary and less important areas of activity, a firm creates the illusion of openness and compliance with all legal requirements.

Quite often, business transparency is considered as an element of corporate social responsibility and sustainable development policy (Heinberg et al., 2021; Dubbink et al., 2008; Fernandez-Feijoo et al., 2014; Dragomir et al., 2022; Cho & Ryu, 2022; Barbu et al., 2022; N. Tran & M. Tran, 2022; Fisun et al., 2022; Jahid et al., 2022).

Behn et al. (2010) investigated the determinants of transparency in non-profit organizations. Based on econometric modeling, the most important drivers of increasing transparency in the non-commercial sector were identified. Thus, it was proved that the growth of the ratio of total liabilities to total assets at the end of the year, contributions to total income, total remuneration of officials and directors to total income, the level of higher education of employees, and the volume of total assets at the end of the year are accompanied by an increase in the level of transparency activities of non-commercial organizations.

The impact of increasing the level of disclosure of information about non-financial indicators of business performance on the decision-making

processes of financial analysts when assessing the value of shares was analyzed by Coram et al. (2011). They summarized and systematized the types of information that analysts use when evaluating the value of company shares and formalized the process of analyzing and processing information about the company's activities.

A similar study was conducted by Barth et al. (2013). With the help of the developed methodology of integral assessment of the level of transparency of the company's revenues (a model for building cross-regressions reflecting the relationship between the company's revenues and the change in revenues deflated by price), the study proved a significant negative relationship between the transparency of revenues and the cost of capital.

Thus, it is expedient to analyze the concept of information transparency not only to analyze benefits for sales volumes but also in the process of assessing the potential value of a business (C_p) as a reserve for possible growth of its actual value (C_f) as a result of increasing the level of information transparency (Figure 1).

Transparency Global (2022) conducted a comparative analysis of the transparency index of the world's 100 largest companies and the value of their portfolios for 2017–2022. At the initial stage, the value of a hypothetical investment of 10,000 US dollars was used, and later – the value of all companies that were taken into account when determining the transparency index. Based on the

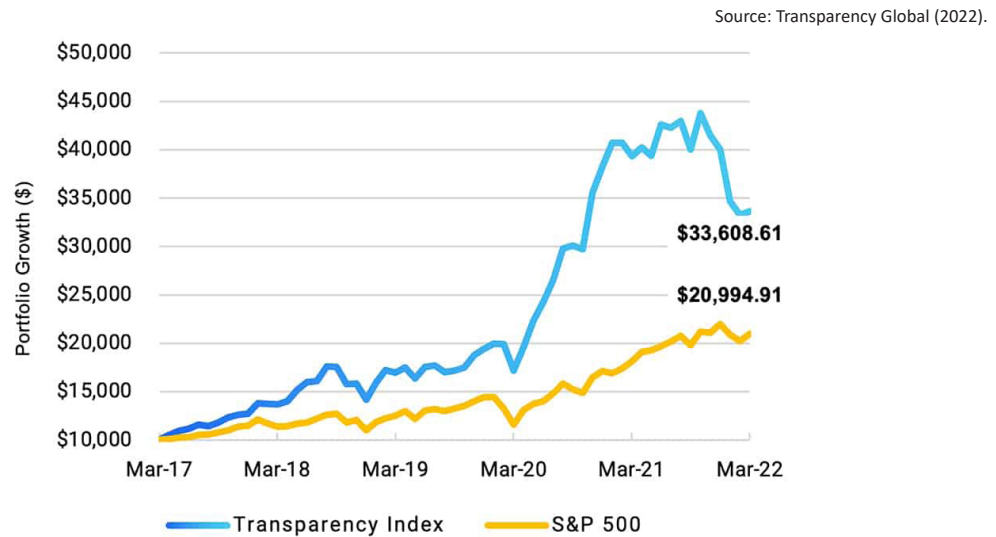


Figure 2. Dynamics of changes in the transparency index and the value of the portfolio of the 100 most informationally transparent companies in the world

analysis results, a conclusion about the similarity of the changes in these indicators and the positive relationship between them was substantiated (Figure 2).

Lee and Joseph (2013) conducted a theoretical analysis of the most common practices of disclosing information about the company's activities. Based on the analysis of the relationship between the amount of information that companies display on the Internet and the level of their transparency, it was concluded that counterparties are more inclined to organizations that voluntarily disclose financial information and information about the results of their activities on public websites. This is because such companies have an image of being more open, reliable, and transparent. Based on the analysis of information disclosed by non-profit organizations on the Internet, all components of web information disclosure were divided into two groups: financial information (annual reports, financial reports) and information about the organization's effectiveness (mission, performance indicators, success stories/feedback).

When analyzing the factors that prompt the management of companies in various sectors of the economy to disclose information about their activities, Fernandez-Feijoo et al. (2014) concluded that the pressure created by certain groups of interested parties increases the transparency of business and improves the quality of the informa-

tion displayed. As indicators reflecting the level of business transparency, the study used four variables: frequency of corporate social responsibility reporting, level of application, declaration of the level, and assurance of social responsibility.

Features of information disclosure about the company's activities and crisis conditions were analyzed by Albu and Wehmeier (2014). With the help of critical analysis, using the example of the crisis in the British Bank, transparency is considered a tool for fighting the crisis and minimizing its negative consequences.

Florini (2007) considers business transparency as giving outsiders access to company performance indicators. This allows them to make decisions and/or evaluate the effectiveness of previously made decisions. In addition to the amount of information disclosed, according to O'Malley et al. (2009), its quality becomes essential. It must meet the following requirements: be clear, accurate for the target audience, and easily perceived by the user. Information that meets these requirements is considered highly transparent and helps to make effective management decisions (Hanson, 2003; B. Holzner & L. Holzner, 2002; Schnackenberg, 2009).

The low level of information transparency about the company's activities significantly reduces the ability of all interested parties to respond quickly to possible changes in the company's financial,

economic, or social policy. As a result, this negatively affects the company's business reputation and reduces the potential to achieve its main goal – increasing its value for shareholders and other interested parties (Porrás-Gomez et al., 2022).

Disclosure of information about the company's mission and strategy and the decisions made shape the perception of all interested parties about the company's current financial and economic policy. This is the main element of effective corporate management. In addition to this information, accounting reporting plays a decisive role in achieving economic, operational, and political transparency.

At the same time, submitting unreliable or incorrect information negatively affects the company's general performance, its business reputation, and trust among clients and partners. Thus, business transparency is the driving force of the effective functioning of the capital market and is the main component of the corporate governance mechanism.

The availability of published information about the company's activities is a guarantee of establishing its communication with all interested parties. In addition, this allows investors, creditors, and market participants to access the firm's financial performance and assess its financial condition.

The analysis results allow the systematization of the company's principal risks of a low level of information transparency (Table 1).

Thus, the results of the conducted analysis testify to the high level of relevance of the investigated problem. However, most scientific papers are devoted to ensuring the transparency of public services, while the issues of transparency in the corporate sector of the economy still need to be studied. In particular, the issue of the relationship between the efficiency of the functioning of individual sectors of the economy and the level of accounting information transparency deserves more detailed attention.

One of these is the construction industry. Only during the first three months of 2020, 730 construction businesses went bankrupt in Great Britain, which is 8.8% more than last year. A similar situation is observed in most developed and developing countries. Playing an integral role in the economic development of countries, the constant increase in the level of bankruptcy of construction companies serves as a threat to their macroeconomic stability and sustainable development economies. The building and construction sector exerts a significant influence on many sectors of the economy in G7 countries, in particular, the labor market and the quality and living conditions of the population. In 2019, the construction sector's share in Canada's total GDP was 6.1% (9% of all companies – construction) and was the fifth largest number of jobs provided in the country (9% of all jobs). In the USA in 2020, the construction sector's share was 4.1% of GDP (Statista, 2022). Under these conditions, the issue of increasing the efficiency of the construction business is becoming more and more urgent.

Table 1. Risks related to transparency

No.	Type of risk	Essence of risk
1	The risk of deteriorating business reputation	The business reputation depends both on the fulfillment of previously assumed obligations and on the reliability of the information presented: with a high level of information transparency, the firm's reputation improves
2	The risk of reducing the effectiveness of the corporate management system	Due to a low level of awareness of the company's management and its employees about the tasks and goals of its activities, the main vectors of its policy may be the deterioration of communication between various management units and the adoption of effective or untimely decisions
3	The risk of a decrease in the value of assets	Due to the company's non-observance to the principle of transparency, it is possible to reduce the level of trust on the part of the central counterparties and reduce the value of the business
4	The risk of lost market opportunities	Decrease in competitiveness as a result of non-compliance with the rules of openness; decrease in the amount of additional financial income from potential (especially international) investors, commercial banks
5	The risk of bankruptcy	The low level of transparency of information impairs the ability of the company's management to respond quickly to possible changes in the company's financial, economic, or social policy

Therefore, the purpose of this study is to confirm the hypothesis about the effects of accounting information transparency on business performance on the example of construction companies in G7 countries.

2. METHODOLOGY

This study is based on econometric analysis and modeling the dependence between factors and resulting indicators. The annual data of the OECD, World Bank, and European Commission serve as the information base of the analyses. The research object is the dependence between accounting information transparency and business performance indicators of seven developed countries of the world (G7 countries): the USA, Japan, Germany, France, Great Britain, Italy, and Canada. Methodological calculations are carried out using Stata and Statista software packages.

The indicators characterizing the level of business performance of construction companies included: IDS – value added of the construction industry (% GDP); INV – investment in the construction industry, million US dollars; CF – number of construction firms; CSIP – profitability of construction industry, million US dollars; Cout – the annual all work construction output index; EMP – total employees in construction firms, thousands.

The level of accounting information transparency (AIT) is evaluated based on the annual values of the transparency index, which Transparency Global calculates for all sectors of the economy.

Testing the hypothesis about the positive impact of accounting information transparency on business performance multiple regression analysis was used:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + u_i, \quad (1)$$

$$i = 1, \dots, n.$$

where indicators ($X_{1i}, \dots, X_{ki}, Y_i, i = 1, \dots, n$, are modeled in such a way that the $i = id$ assumption is fulfilled; u_i – an error term with a conditional mean of zero taking into account regressors, i.e., $E(u_i | X_{1i}, X_{2i}, \dots, X_{ki}) = 0$; significant deviations are unlikely; there is no perfect multicollinearity.

The reliability of the obtained results is checked using VAR/VEC modeling. The choice of the model is based on the analysis of the data for stationarity and cointegration. In the case of cointegrated non-stationary time series, the vector error correction model (VEC model) is used:

$$Y_t = a + \sum_{t=1}^p A_t Y_{t-p} + B X_t + \varepsilon_t, \quad (2)$$

where Y_t is a vector of dimension k of first-order integrated variables; X_t is a vector of exogenous variables of dimension d ; ε_t is a vector of disturbances.

For stationary and non-cointegrated indicators, the relationship is described using a VAR model:

$$Y_t = C_0 + \sum_{t=1}^p C_t Y_{t-p} + \varepsilon_t, \quad (3)$$

where Y_t is a k -dimensional vector of stationary variables of the model; C_0 is a k -dimensional vector of constants; C_j are coefficient matrices with dimensions $k \times k$ ($j = \overline{1, p}$); ε_t is a k -dimensional perturbation vector of the model with covariance matrix Σ .

If, during the data check, it is impossible to decide the stationarity/non-stationarity of the data, the calculation of the first differences of the data series and their stationarity check will be conducted. Provided the stationarity of the first data differences is confirmed, the relationship between accounting information transparency and business performance is described as:

$$D(IT) = f(D(IT(L)), D(IDS(L)), \quad (4)$$

$$D(INV(L)), D(CF(L)), D(Cout(L)),$$

$$D(EMP(L))),$$

where $D(IT)$ – the value of the first differences of the series information transparency; $D(IDS(L))$ – the value of the first differences of the series value added in the industry (including construction); $D(INV(L))$ – the value of the first differences of the series investment in construction; $D(CF(L))$ – the value of the first differences of the series number of construction firms; $D(Cout(L))$ – the value of the first differences of the series the annually all-work construction output index; $D(EMP(L))$ – the value of the first differences of the series total employees in construction firms.

The data are tested for stationarity using the Dickey-Fuller test and the Philips Perron Test Statistics. Evaluation of data series using the Dickey-Fuller test is done by:

$$x_t = D_t \gamma_1 + \gamma_2 x_{t-1} + \sum_{i=1}^n \pi_i \Delta x_{t-1} + \varepsilon_t, \quad (5)$$

where D_t is the vector of the deterministic term (constant, trend, etc.); n is the time lag difference, Δx_{t-1} is the ARMA error structure; and ε_t is the error term.

$$x_t = a_0 + a_1 \gamma_{t-1} + a_2 t + \mu_1 D_p + \mu_2 D_L + \sum_{i=1}^k \beta_i \Delta y_{t-1} + \varepsilon_t, \quad (6)$$

where D_p is a pulse dummy when $t = t + 1$, $D_p = 1$, and zero otherwise. D_L is the level dummy such that $D_L = 1$ when $t > t$, and zero otherwise.

At the next stage, the Johansen test checks data series for cointegration, which consists of three stages:

1. Pre-check the data series to determine the integration order and the lag length.
2. Estimation of model parameters and determination of rank P is vital. If $P = 0$, the variables are not cointegrated; if $0 < \text{rank}(P) = r < n$, all variables ($I(1)$ endogenous) are cointegrated; if $\text{rank}(P) = n$, the variables are stationary. Akaike, Hannan-Quinn, and Schwarz-Bayes tests are used to evaluate the rank.
3. Normalization of the cointegrating vector and estimation of the speed of adjustment coefficients.

3. RESULTS

In the first stage, an analysis of static indicators reflects the stability of the analyzed data series (standard deviation, coefficient of variation, maximum and minimum values). Table 2 shows the little variability of indicators during the analyzed period. At the same time, the values of the standard deviation are significantly different. Thus, the indicators in Germany are the most variable. If the variation of the share of the construction sector in

the country's GDP in Japan is 1.468, in Germany, this indicator is lower by almost 2.5 years (0.62). A similar situation is observed for other business performance indicators. Great Britain has the highest variation in the number of construction firms (59,590.35), which is almost three times higher than Canada's.

Table 2. Descriptive statistics for the period from 2010 to 2021

Country	Var	Mean	Std. dev.	Max	Min
USA	IDS	19.87	1.29	18.04	22.45
	INV	66,627.98	14,245.02	47,336.13	92,719.20
	CF	242,604.22	51,868.64	172,359.20	337,606.98
	CSIP	90,347.53	19,316.25	64,187.79	125,727.20
	Cout	8.19	1.70	4.82	11.74
Japan	EMP	1,222.73	107.59	997.61	1,370.81
	IDS	28.91	1.47	26.56	32.51
	INV	96910.11	16,212.33	69,690.57	134,272.64
	CF	352866.81	59,031.96	253,755.66	488,910.37
	CSIP	128367.13	21,474.85	92,312.13	177,857.53
Germany	Cout	11.92	1.93	7.09	17.00
	EMP	1,778.46	122.45	1,468.72	1,985.16
	IDS	26.85	0.62	24.74	27.71
	INV	90,025.50	6,852.73	64,897.64	114,444.89
	CF	327,798.74	24,951.98	236,303.76	416,714.05
France	CSIP	119,247.78	9,077.12	85,963.42	151,593.71
	Cout	11.07	0.82	6.61	14.49
	EMP	1,652.11	51.76	1,367.71	1,692.02
	IDS	18.62	1.34	16.45	21.29
	INV	62,410.64	14,823.28	43,145.69	87,938.41
Great Britain	CF	227,248.15	53,974.16	157,101.08	320,199.28
	CSIP	82,669.13	19,634.91	57,150.78	116,483.22
	Cout	7.68	1.77	4.39	11.14
	EMP	1,145.34	111.96	909.29	1300.13
	IDS	19.32	1.48	17.11	22.77
Italy	INV	64,787.00	16,365.69	44,882.75	94,050.92
	CF	235,900.90	59,590.35	163,426.00	342,456.00
	CSIP	85,816.86	21,677.99	59,451.69	124,579.85
	Cout	7.97	1.95	4.57	11.91
	EMP	1,188.95	123.61	945.90	1390.50
Canada	IDS	22.39	1.20	20.80	24.31
	INV	75,053.43	13,189.59	54,567.41	100,391.10
	CF	273,282.77	48,025.61	198,689.56	365,541.72
	CSIP	99,415.77	17,470.93	72,279.99	132,978.05
	Cout	9.23	1.57	5.55	12.71
Canada	EMP	1,377.35	99.62	1,150.00	1,484.24
	IDS	27.01	1.88	23.30	29.50
	INV	90,546.64	20,806.94	61,118.27	121,827.46
	CF	164,848.15	37,880.88	111,271.21	221,797.64
	CSIP	119,938.08	27,560.88	80,957.27	161,372.66
Canada	Cout	11.14	2.48	6.22	15.43
	EMP	1,661.68	157.16	1,288.06	1,801.16

Correlation between the level of accounting information transparency and business performance used the multiple regression method. The analysis results in Table 3 prove the impact of accounting information transparency on the business performance of construction firms in G7 countries. Most of the results are statistically significant at the 1% and 0.5% levels. The strongest, for all analyzed countries, is the connection between the level of accounting information transparency and the volume of investments. At the same time, according to the calculations, a low level of influence of accounting information transparency on the number of employed in the construction sector and added value in construction has been proven.

Table 3. Multiple regressions for accounting information transparency and business performance of construction firms in G7 countries

Country	IDS	INV	CF	Cout	EMP
USA	0.3466*	4.6121*	0.87184*	0.6646**	0.2196*
	0.3710	0.5930	0.32065	0.3246	0.1411
Japan	0.2782**	3.7023*	0.61518*	0.3404**	0.1288*
	0.0703	0.9352	0.47059	0.1159	0.0045
Germany	0.2352*	3.1306*	0.92362*	0.0162*	0.1505*
	0.0539	0.7174	0.59017	0.0602	0.0517
France	0.2239*	2.9793*	0.93613*	0.2812*	0.1047**
	0.0121	0.1615	0.76668	0.1353	0.0590
Great Britain	0.2392*	3.1831*	0.33633*	0.0946*	0.2005**
	0.0569	0.7579	0.50606	0.1441	0.0316
Italy	0.1954*	2.6007*	0.87000*	0.3054*	0.1185*
	0.0166	0.2208	0.77969	0.1549	0.0647
Canada	0.1263**	1.6812**	0.40148*	0.2244*	0.2393*
	0.0241	0.3212	0.09604	0.0763	0.0922

Note: * p < 0.05, ** p < 0.01, and *** p < 0.001. Standard errors within parentheses.

To select a model that most fully describes the dependence of business performance on accounting information transparency, data series were checked for stationarity. For this purpose, the Dickey-Fuller test was used. The results presented in Table 4 show that most of the indicators are non-stationary – absolute values are less than critical values at the 1% and 5% significance levels. The Philips Perron Test Statistics results confirm the previous results and allow rejecting the null hypothesis of the unit root about the stationarity of all indicators at the 10% level of statistical significance.

Table 4. The Dickey-Fuller and Philips Perron tests

Country	Variables	ADF test statistics			Philips Perron test statistics		
		Prob.	lag	Test statistic	Prob.	lag	Test statistic
USA	IDS	0.0098	1	3.2288	0.0098	1	3.2288
	INV	0.0700	1	2.5521	0.6742	1	1.0435
	CF	0.9135	1	0.0992	0.9135	1	0.0992
	Cout	0.0001	0	4.3801	0.0001	0	4.3801
	EMP	0.3984	0	1.6248	0.4674	0	1.4915
Japan	IDS	0.0074	0	3.3158	0.0400	0	2.7666
	INV	0.0812	1	2.4906	0.0442	1	2.7288
	CF	0.9300	1	0.4442	0.9300	1	0.4442
	Cout	0.0269	0	2.9065	0.0189	0	3.0247
	EMP	0.1425	0	2.2392	0.1326	0	2.2732
Germany	IDS	0.0002	0	4.2327	0.0307	0	2.8612
	INV	0.0008	2	3.9151	0.0008	2	3.9151
	CF	0.0156	1	3.0871	0.4017	1	1.6182
	Cout	0.0104	0	3.2137	0.3597	0	1.7014
	EMP	0.2179	0	2.0190	0.2179	0	2.0190
France	IDS	0.6815	0	1.0256	0.0098	0	1.0256
	INV	0.8223	1	0.5709	0.8608	1	0.3752
	CF	0.8637	0	0.3563	0.8667	0	0.3384
	Cout	0.3752	0	1.6702	0.3995	0	1.6220
	EMP	0.5852	0	1.2496	0.7182	0	0.9282
Great Britain	IDS	0.0121	0	3.9711	0.0121	0	3.9711
	INV	0.0861	2	3.1388	0.8292	2	1.2834
	CF	1.1234	1	0.1221	1.1234	1	0.1221
	Cout	0.0001	1	5.3870	0.0001	1	5.3870
	EMP	0.4900	0	1.9983	0.5749	0	1.8344
Italy	IDS	0.0091	1	4.0781	0.0492	1	3.4026
	INV	0.0999	0	3.0632	0.0544	0	3.3561
	CF	1.1438	0	0.5464	1.1438	0	0.5464
	Cout	0.0331	0	3.5747	0.0233	0	3.7200
	EMP	0.1753	0	2.7540	0.1631	0	2.7958
Canada	IDS	0.0002	1	5.2057	0.0378	1	3.5189
	INV	0.0009	1	4.8151	0.0009	1	4.8151
	CF	0.0192	1	3.7967	0.4941	1	1.9902
	Cout	0.0128	0	3.9525	0.4424	0	2.0925
	EMP	0.2680	0	2.4831	0.2680	0	2.4831

To confirm the reliability of the previous results about the non-stationarity of the data series, the paper checks the first differences of the data series for stationarity according to the Dickey-Fuller test. The results presented in Table 5 do not allow for rejecting the null hypothesis of the presence of unit roots. Estimated values of the t-statistics for the first differences of the data exceed the critical values for the significance level of 1%, 5%, and 10%. The P-value for all indicators is less than 10%, which allows rejecting the null hypothesis about the non-stationarity of the first differences of a data series with a minimal probability of error (al-

most 0% of cases at 100%). Thus, the first differences of the analyzed data series are stationary and have the order of integration 1.

Table 5. The first differences of the data series for stationarity by the Dickey-Fuller test

Country	Variables	ADF test statistics*		
		Prob.	lag	Test statistic
USA	IDS	0.0098	1	3.2288**
	INV	0.0077	0	3.3045*
	CF	0.0251	1	2.9292**
	Cout	0.0001	0	4.3801***
	EMP	0.0047	0	4.0200**
Japan	IDS	0.0074	0	3.3158**
	INV	0.0812	1	2.4906**
	CF	0.0300	1	0.4442***
	Cout	0.0269	0	2.9065*
	EMP	0.0013	0	3.7865**
Germany	IDS	0.0002	0	4.2327**
	INV	0.0008	1	3.9151*
	CF	0.0465	1	2.7109*
	Cout	0.0104	0	3.2137**
	EMP	0.0024	0	3.6334***
France	IDS	0.0285	0	2.8857**
	INV	0.0415	1	2.7534**
	CF	0.0434	0	2.7364*
	Cout	0.0000	0	4.7657*
	EMP	0.0409	0	2.7581*
Great Britain	IDS	0.0121	0	3.9711**
	INV	0.0094	2	4.0641***
	CF	0.0309	1	3.6026**
	Cout	0.0001	1	5.3870*
	EMP	0.0058	0	4.9441*
Italy	IDS	0.0091	1	4.0781**
	INV	0.0999	0	3.0632**
	CF	0.0038	0	0.5464**
	Cout	0.0331	0	3.5747**
	EMP	0.0016	0	4.6570**
Canada	IDS	0.0002	1	5.2057**
	INV	0.0009	1	4.8151*
	CF	0.0472	1	3.3341**
	Cout	0.0128	0	3.9525**
	EMP	0.0029	0	4.4687***

Note: * p < 0.05, ** p < 0.01, and *** p < 0.001.

The next criterion for selecting a model that describes the relationship between the business performance and the level of its accounting information transparency is the verification of data series for cointegration. Testing the hypothesis about the cointegration of data series uses Johansen tests.

Table 6 shows that the calculated values exceed the critical values for all analyzed countries.

Estimated values for rank 0 are greater than the critical values, which allows accepting the hypothesis of cointegration of the analyzed data series.

Table 6. Johansen tests for cointegration

Country	Rank	5% critical value	1% critical value	Trace statistic				
				IDS	INV	CF	Cout	EMP
USA	0	15.41	20.04	42.30	28.71	25.54	22.32	24.87
	1	3.76	6.65	12.24	12.24	9.91	5.06	94.38
Japan	0	15.41	20.04	37.68	46.44	19.76	15.41	21.73
	1	3.76	6.65	11.90	10.69	6.05	7.02	92.72
Germany	0	15.41	20.04	20.77	45.62	19.50	20.51	31.72
	1	3.76	6.65	2.43	15.61	2.36	3.34	70.64
France	0	15.41	20.04	19.96	34.75	34.54	22.71	21.47
	1	3.76	6.65	2.13	10.56	10.49	9.46	45.04
Great Britain	0	15.41	20.04	29.17	19.80	17.61	17.39	19.19
	1	3.76	6.65	8.44	8.44	6.83	0.73	72.84
Italy	0	15.41	20.04	25.99	32.02	17.63	19.63	16.77
	1	3.76	6.65	8.20	7.37	4.17	4.84	71.56
Canada	0	15.41	20.04	17.32	31.46	20.45	23.14	24.48
	1	3.76	6.65	1.67	10.76	1.62	2.30	54.52

Thus, the obtained results testify to the expediency of using the VAR model to describe the dependence between indicators. In order to take into account all possible interrelationships between the analyzed indicators, the presence of a time lag, during which the maximum influence of the factor indicator on the resulting indicator occurs, was determined. Using the maximum lag and exclusion tests, the study determined the optimal lag structure for the model.

Table 7 shows that for most countries, the maximum lag is one year. The VAR model with these lags has the best values for the Akaike, Hannan-Quinn, and Schwarz-Bayes tests, among the other model specifications considered. Thus, according to the analysis results, the stationary and non-cointegrated indicators were confirmed.

Table 7. The maximum lag of the influence of accounting information transparency on business performance

Lag	LL	LR	df	p	FPE	AIC	HQOC	SBIC
USA								
0	113.236	–	27	–	1.478E–18	–30.730	–31.272	–30.774
1	–	–	27	–	–1.82E–91	–	–	–
2	1508.524	–	27	–	–	–419.640	–423.439	–419.947
3	1501.341	–14.364	27	–	–	–417.587*	–421.387*	–417.895*
4	1505.921	9.163	27	1.135	–	–418.897	–422.696	–419.205
5	1521.174	30.509	27	0.414	–	–423.255	–427.055	–423.562
6	1531.369	20.396	27	0.960	–	–426.168	–429.968	–426.476
Japan								
0	86.220	0.000	27	–	1.125E–18	–23.398	–23.811	–23.431
1	–	–	27	–	–1.38E–91	–	–	–
2	1148.611	–	27	–	–	–319.520*	–322.413*	–319.753*
3	1143.141	–10.937	27	–	–	–317.957	–320.850	–318.191
4	1146.629	6.977	27	0.865	–	–318.954	–321.847	–319.188
5	1158.243	23.230	27	0.315	–	–322.272	–325.165	–322.506
6	1166.005	15.530	27	0.731	–	–324.490	–327.383	–324.725
Germany								
0	62.309	0.000	27	–	8.13E–19	–16.909	–17.208	–16.933
1	–	–	27	–	–1E–91	–123.908*	–125.103*	–124.005*
2	830.068	–	27	–	–	–230.908	–232.998	–231.077
3	826.116	–7.904	27	–	–	–229.778	–231.869	–229.948
4	828.636	5.042	27	0.625	–	–230.499	–232.589	–230.668
5	837.029	16.788	27	0.228	–	–232.897	–234.988	–233.066
6	842.639	11.223	27	0.528	–	–234.500	–236.591	–234.669
France								
0	–	–	27	–	1.511E–18	–31.418	–31.973	–31.463
1	115.773	–	27	–	–1.86E–91	–	–	–
2	1542.316	–	27	–	–	–429.040*	–432.925*	–429.354*
3	1534.972	–14.686	27	–	–	–426.941	–430.826	–427.256
4	1539.655	9.368	27	1.161	–	–428.280	–432.165	–428.595
5	1555.249	31.192	27	0.423	–	–432.736	–436.621	–433.050
6	1565.673	20.853	27	0.982	–	–435.715	–439.599	–436.030
Great Britain								
0	189.808	–	27	–	2.477E–18	–51.509	–52.419	–51.583
1	–	–	27	–	–3.05E–91	–377.457*	–381.096*	–377.751*
2	2528.603	–	27	–	–	–703.404	–709.773	–703.919
3	2516.562	–24.077	27	–	–	–699.964	–706.333	–700.480
4	2524.240	15.359	27	1.903	–	–702.159	–708.527	–702.675
5	2549.807	51.139	27	0.693	–	–709.465	–715.834	–709.979
6	2566.896	34.188	27	1.610	–	–714.348	–720.716	–714.864
Italy								
0	126.110	–	27	–	1.646E–18	–34.223	–34.827	–34.272
1	903.064	–	27	–	–2.03E–91	–250.785*	–253.203*	–250.980*
2	1680.019	–	27	–	–	–467.346	–471.578	–467.688
3	1672.019	–15.997	27	–	–	–465.060	–469.292	–465.403
4	1677.121	10.205	27	1.265	–	–466.518	–470.750	–466.861
5	1694.107	33.977	27	0.461	–	–	–475.604	–471.714
6	1705.461	22.714	27	1.070	–	–474.617	–478.848	–474.960
Canada								
0	118.131	–	27	–	4.205E–19	–32.128	–32.671	–32.172
1	762.367	1288.416	27	–	1.705E–84	–208.078*	–211.334*	–208.340*
2	1516.775	1508.797*	27	–	–	–421.999	–425.799	–422.306
3	1523.765	13.971	27	1.118	–	–423.995	–427.795	–424.302
4	1514.434	–18.666	27	–	–	–421.329	–425.128	–421.636
5	1524.993	21.124	27	0.929	–	–424.346	–428.145	–424.653
6	1522.708	–4.561	27	–	–	–423.694	–427.494	–424.002

4. DISCUSSION

The study results confirmed the hypothesis that business performance is quite sensitive to accounting information transparency. This finding confirms that the relationship between indicators is substantiated by the example of another group of countries (Hills et al., 2008; Barth et al., 2013; Coram et al., 2011; Monteiro et al., 2022). At the same time, this study does not support Heinberg et al. (2021), Fernandez-Feijoo et al. (2014), Dragomir et al. (2022), Barbu et al. (2022), and N. Tran and M. Tran (2022), who consider a company's information transparency only as an element of corporate social responsibility. According to the study, the level of accounting information transparency has an impact on various areas of the company's

activity. Moreover, it should consist not only in disclosing information about the environmental component of its activity but also about other types of the company's activities.

At the same time, this paper has some limitations that can be regarded in further research. First, the lack of a sufficient volume of data characterizing construction companies' activity significantly limits the possibilities for substantiating the impact of information transparency on all components of the company's activities. Second, future studies should cover a significantly larger number of countries. This will make it possible to compare the strength of the connection between the analyzed indicators for countries with high, medium, and low levels of economic development.

CONCLUSION

This study focuses on the dependence between accounting information transparency and business performance. With the help of economic and mathematical modeling tools, the relationship between indicators characterizing business performance and the level of accounting information transparency was analyzed. Based on economic and mathematical modeling, the impact of accounting information transparency on value added in the industry (including construction), investment in the construction industry, number of construction firms, the annually all-work construction output index, and total employees in construction firms has been proven. Thus, an increase in the level of information transparency by 1 point leads to an increase in the volume of investments by 4.6% in the USA, 3.7% – in Japan, 3.1% – in Germany, and 3.2% – in Great Britain. At the same time, the number of employed in the construction sector and added value in construction practically do not depend on the information transparency of construction companies.

The close connection between the company's level of information transparency and the amount of investments it has attracted allows this study to conclude that a necessary element of solving the fiscal deficit problem is the implementation of a policy of transparency and openness. On the other hand, the low level of transparency of corporate policy in terms of its personnel, financial, investment, production, and other components deepens existing problems and increases the level of economic instability.

Thus, the obtained results conclude that achieving a high level of business transparency is an instrument for the growth of the company's financial indicators. Therefore, in interaction with the company's financial resources, an effective management system ensuring business transparency should become the most critical resource for its economic development.

AUTHOR CONTRIBUTIONS

Conceptualization: Sevinj Abbasova, Mehriban Aliyeva.

Data curation: Leyla Huseynova.

Formal analysis: Sevinj Abbasova, Mehriban Aliyeva.

Funding acquisition: Sevinj Abbasova, Leyla Huseynova.

Investigation: Sevinj Abbasova.

Methodology: Sevinj Abbasova, Mehriban Aliyeva, Leyla Huseynova.

Project administration: Mehriban Aliyeva.

Resources: Mehriban Aliyeva.

Software: Sevinj Abbasova, Leyla Huseynova.

Supervision: Mehriban Aliyeva.

Validation: Sevinj Abbasova, Leyla Huseynova.

Visualization: Sevinj Abbasova, Leyla Huseynova.

Writing – original draft: Mehriban Aliyeva.

Writing – review & editing: Sevinj Abbasova.

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