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Information Transparency and Firm Performance: The Mediating Role of Business Ethics in Organic Coconut Sugar Exporters

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Abstract: Organic coconut sugar exports depend on claims about origin and process that buyers cannot verify directly, so exporting firms are increasingly required to make their information verifiable. Previous studies have examined traceability systems and business ethics separately and have rarely tested how transparency reaches performance, which constitutes the research gap of this study. This study analyses the effect of information transparency on business ethics and firm performance and tests the mediating role of business ethics in organic coconut sugar exporting companies in Central Java and the Special Region of Yogyakarta. Questionnaires were completed by 100 respondents drawn purposively from 350 employees of two exporting companies and processed with partial least squares structural equation modelling. Information transparency has a positive and significant effect on business ethics and explains 74.5 percent of its variance, while its direct effect on firm performance is not significant. Business ethics affects firm performance significantly and fully mediates the relationship, and together the two constructs explain 63.1 percent of the variance in firm performance. The novelty of this study lies in positioning information transparency as an antecedent of corporate governance and in identifying ethical conduct as the mechanism that converts verifiable information into export performance.

Keywords: Information Transparency, Business Ethics, Firm Performance, Organic Coconut Sugar Exporter, Structural Equation Modelling.

Indonesian Abstract: Ekspor gula kelapa organik bergantung pada klaim mengenai asal-usul dan proses produksi yang tidak dapat diverifikasi secara langsung oleh pembeli, sehingga perusahaan eksportir semakin dituntut untuk menyajikan informasi yang dapat diverifikasi. Penelitian terdahulu telah mengkaji sistem ketertelusuran dan etika bisnis secara terpisah namun jarang menguji bagaimana transparansi memengaruhi kinerja, yang menjadi celah penelitian ini. Penelitian ini menganalisis pengaruh transparansi informasi terhadap etika bisnis dan kinerja perusahaan, serta menguji peran mediasi etika bisnis pada perusahaan eksportir gula kelapa organik di Jawa Tengah dan Daerah Istimewa Yogyakarta. Kuesioner diisi oleh 100 responden yang dipilih secara purposif dari 350 karyawan di dua perusahaan eksportir dan diolah menggunakan metode *partial least squares structural equation modelling* (PLS-SEM). Transparansi informasi berpengaruh positif dan signifikan terhadap

etika bisnis serta menjelaskan 74,5 persen variansnya, sedangkan pengaruh langsungnya terhadap kinerja perusahaan tidak signifikan. Etika bisnis berpengaruh signifikan terhadap kinerja perusahaan dan memediasi hubungan tersebut secara penuh; secara bersama-sama, kedua konstruk ini menjelaskan 63,1 persen varians kinerja perusahaan. Kebaruan penelitian ini terletak pada penempatan transparansi informasi sebagai anteseden tata kelola perusahaan dan identifikasi perilaku etis sebagai mekanisme yang mengubah informasi yang dapat diverifikasi menjadi kinerja ekspor.

Keywords: Transparansi Informasi, Etika Bisnis, Kinerja Perusahaan, Eksportir Gula Kelapa Organik, Pemodelan Persamaan Struktural.

INTRODUCTION

International trade is one of the pillars of national economic growth because it widens market access, raises productivity, and creates added value. The export-led growth hypothesis positions exports as an engine of growth that expands production capacity, creates employment and generates foreign exchange (Balassa, 1978, in Sharma, 2022), although endogenous growth perspectives note that this effect is not automatic because it depends on the absorptive capacity of the domestic economy (Romer, 1990; Grossman and Helpman, 1991, both in Adelakun et al., 2025). Sharma (2022) shows for 107 countries between 1990 and 2018 that a one percent increase in real exports is associated with a 0.53 percent increase in real gross domestic product.

Indonesia's recent trade performance reflects this position. Total exports between January and December 2025 reached US\$282.91 billion, an increase of 6.15 percent over the previous year, driven entirely by non-oil and gas exports of US\$269.84 billion (Badan Pusat Statistik, 2026). The agriculture, forestry and fishery sector contributed US\$6.88 billion, about 2.55 percent of non-oil and gas exports, yet recorded the highest sectoral growth at 21.01 percent. Organic coconut sugar, a labour-intensive agro-processed commodity produced by tens of thousands of sap tappers in rural areas, belongs to this group and therefore carries economic value that extends beyond foreign exchange earnings to rural household income.

Access of organic coconut sugar to export markets is determined not only by physical quality but also by the credibility of the claims attached to the production process. Buyers in destination countries cannot verify the process directly, so a mechanism is required to guarantee the validity of organic claims. Regulation in the main destination markets has turned verifiable information into a precondition for market participation rather than a source of competitive advantage: under the Strengthening Organic Enforcement rule, every organic shipment entering the United States must be accompanied by an electronic import certificate recorded in the Organic Integrity Database (United States Department of Agriculture, 2023). Exporters have responded by implementing digital traceability systems, understood as the digital recording of raw materials, processing and distribution along the chain, whose applications in food supply chains have been reviewed with attention to both their promise and their limits (Nurgazina et al., 2021; Charlebois et al., 2024). Evidence from comparable agro-export commodities indicates that such systems are adopted precisely in order to strengthen export potential (Khan et al., 2022).

A digital traceability system, however, produces records; it does not by itself produce transparency. Information transparency refers to the extent to which the information produced by that system is genuinely complete, accurate, current and accessible to stakeholders (Faisal et al., 2024), while recent reviews show that traceability, visibility and transparency are still often used interchangeably without a clear conceptual basis (Budler et al., 2024). This study therefore places information transparency at the centre of the model and treats the implementation of digital traceability systems as one of the principal drivers through which such transparency becomes attainable, alongside the integration of records across the chain and

the willingness of the firm to disclose them. In organic coconut sugar exports, information transparency covers at least the traceable origin of raw material down to registered and certified farmers, the record of the process from sap tapping to processing and packaging, the validity of organic certification issued by accredited bodies, and the consistency between information on labels and in export documents. Transparency in this sense is an organisational capability in recording, integrating and disclosing data, not merely an administrative requirement fulfilled at the moment of shipment.

These demands are faced directly by Indonesian organic coconut sugar exporters. Internal data of PT Mega Inovasi Organik for the 2021–2025 period show that export volume and value grew by approximately 61.5 percent and 65.5 percent respectively, but the growth was not linear, as presented in Table 1.

Table 1. Export Volume and Value of PT Mega Inovasi Organik, 2021–2025

Year	Export Volume (tons)	Export Value (US\$ million)
2021	1,300	5.8
2022	800	4.2
2023	1,400	6.3
2024	1,200	5.9
2025	2,100	9.6

Source: PT Mega Inovasi Organik (2026)

The fluctuation occurs in a supply chain that involves a large number of smallholder tappers, farmer groups and collectors, in which records are not yet fully integrated, so that the company finds it difficult to maintain consistent quality and to satisfy buyer requests for verification of raw material origin. At the same time, the application of ethical principles in relationships with suppliers and trading partners has never been measured empirically in this company. Evidence from multi-tier chains points in the same direction: K. Schäfer et al. (2025) find that chain complexity, the regulatory and industry environment, information sharing and the resources devoted to traceability determine how far traceability is actually achieved, which suggests that transparency problems in fragmented agricultural supply chains are organisational and relational as much as technical.

Growing global demand for transparency and sustainability has also made business ethics a decisive factor in international trade. Regulation can verify documents, but the truthfulness of the information underlying those documents remains in the hands of the exporting firm. An exporter knows whether all processed sap originates from certified farmers and whether production records reflect actual conditions, while the buyer has no direct access to that information. This information asymmetry makes transparency a reflection of the ethical stance of the firm rather than a purely technical matter, and its consequences reach beyond the individual firm: Mardenli et al. (2025) show that fraud in organic labelling erodes consumer trust not only in the offending party but also in farmers, processors and retailers elsewhere in the chain. External scrutiny reinforces this: N. Schäfer et al. (2024) show that the transparency practices of firms interact with the pressure exerted by non-governmental organisations. Reviews of contemporary practice identify leadership, codes of ethics and transparency as the pivotal elements of ethical business conduct (Sheikh et al., 2024), while Zvaríková et al. (2023) report that formalised ethical practices remain unevenly implemented among small and medium-sized enterprises, which are precisely the actors that dominate agricultural supply chains of this kind.

Previous research on traceability and transparency has largely stopped at conceptualisation and at the capability of digital systems to produce accurate and verifiable information (Budler et al., 2024; Charlebois et al., 2024; Cromwell et al., 2025; Poku et al., 2025), or has linked transparency directly to sustainability and competitive outcomes without

examining the conduct that carries the effect (Malik et al., 2021; Garcia-Torres et al., 2024). Studies on business ethics, in turn, generally model ethics as a direct predictor of organisational performance or route it through intangible capital (Ahmed et al., 2023; Sheikh et al., 2024). The research gap of this study therefore lies in the absence of an empirical model that places information transparency, business ethics and firm performance within a single structural model, particularly in export-oriented agro-industries whose supply chains are fragmented and whose transparency rests on digital traceability systems operated across a large number of smallholder suppliers.

The novelty (*state of the art*) of this study lies in three respects. Theoretically, it positions information transparency as part of corporate governance rather than as an operational by-product of a digital traceability system. Mechanically, it tests business ethics as a mediating variable, on the argument that accurate information does not automatically produce better performance unless it is translated into the conduct of the firm towards its stakeholders. Empirically, it examines organic coconut sugar exporters, whose supply chains run from individual sap tappers through farmer groups and collectors before reaching the exporter, a structure that challenges the consistency of recording and traceability.

Drawing on stakeholder theory, the resource-based view and signalling theory, the problem can accordingly be formulated as follows:

1. Does information transparency influence business ethics?
2. Does information transparency influence firm performance?
3. Does business ethics influence firm performance?
4. Does information transparency influence firm performance through business ethics?

Four hypotheses correspond to these questions: H1, information transparency has a positive effect on business ethics; H2, information transparency has a positive effect on firm performance; H3, business ethics has a positive effect on firm performance; and H4, business ethics mediates the effect of information transparency on firm performance.

METHODS

This study is quantitative and pursues a verificative aim, namely testing the causal relationships formulated in the research model. Primary data were gathered by questionnaire survey and processed with structural equation modelling based on partial least squares (SEM-PLS) using SmartPLS, an approach suited to models that carry a mediating construct and to samples of moderate size (Hair & Alamer, 2022; Sarstedt et al., 2022).

The research object comprises PT Mega Inovasi Organik and PT Agro Organik Lestari, two organic coconut sugar exporters operating in Central Java and the Special Region of Yogyakarta, and the population consisted of the 350 employees of these two companies. Data were collected in August 2026. Respondents were selected by purposive sampling using four criteria: a minimum tenure of three months; involvement in production, quality control, supply chain, logistics, export administration or managerial functions; understanding of the information transparency practices applied by the company; and willingness to participate. A total of 100 respondents were obtained, which exceeds the minimum required for a model with two predictors of the endogenous construct (Hair et al., 2022). The instrument consisted of 26 indicators measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), as operationalised in Table 2.

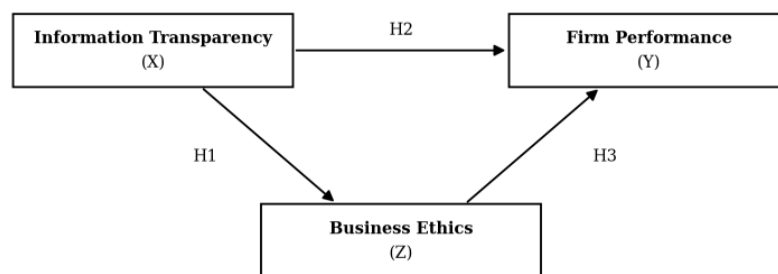
Table 2. Operational Variables

Variable	Dimension	Items	Scale
Information Transparency (X) (Charlebois et al., 2024)	Information transparency; data integrity; product traceability	IT1–IT8	Likert 1–5
Business Ethics (Z) (Kshetri, 2021; Faisal et al., 2024)	Transparency; accountability; responsibility; fairness	BE1–BE9	Likert 1–5

Variable	Dimension	Items	Scale
Firm Performance (Y) (Charlebois et al., 2024; Poku et al., 2025)	Operational performance; financial competitiveness	performance; market performance;	FP1–FP9 Likert 1–5

Source: Processed data (2026)

Assessment of the measurement model covered indicator loadings against a benchmark of 0.70, extracted variance above 0.50, internal consistency read from Cronbach's alpha and composite reliability above 0.70, and discriminant validity read from the heterotrait-monotrait ratio, whose upper limit is set at 0.90 (Becker et al., 2023; Hair et al., 2022). For the structural part, collinearity was checked through inner variance inflation factor values, explanatory power through R-square, and the four hypotheses through bootstrapped path coefficients; a path was treated as significant once its t-value passed 1.96 and its p-value fell below 0.05 (Guenther et al., 2023; Hair et al., 2022). The research model is presented in Figure 1.



H4: indirect effect of information transparency on firm performance through business ethics

Source: Processed data (2026)

Figure 1. Research Model

RESULTS AND DISCUSSION

Result

Respondent Characteristics

The characteristics of the 100 respondents are presented in Table 3. The composition shows that the respondents were dominated by employees in productive age groups who work in functions directly related to recording, verification and export documentation, so that they may be regarded as competent in assessing the constructs under study.

Table 3. Respondent Characteristics

No	Characteristic	Category	n	%
1	Gender	Male	56	56.0
		Female	44	44.0
2	Age	< 25 years	15	15.0
		25–35 years	63	63.0
		36–45 years	15	15.0
		> 45 years	7	7.0
3	Length of service	< 1 year	28	28.0
		1–3 years	30	30.0
		> 3 years	42	42.0
4	Department	Production (plant)	29	29.0
		Business development	17	17.0

No	Characteristic	Category	n	%
		Supply chain and certification	15	15.0
		QA/QC and quality engineering	15	15.0
		Operations (HRGA, purchasing, HSE, finance, logistics)	14	14.0
		International sales	8	8.0
		Corporate strategy and funding	2	2.0

Source: Processed data (2026)

Evaluation of the Measurement Model (Outer Model)

Table 4 reports the loadings, the reliability coefficients and the extracted variance of each construct. All indicators of information transparency load between 0.816 and 0.874, all indicators of business ethics between 0.768 and 0.896, and all indicators of firm performance between 0.694 and 0.848. One indicator of firm performance (FP7) falls marginally below 0.70. It was retained because the construct already satisfies the thresholds for extracted variance (0.630 against a minimum of 0.50) and composite reliability (0.938 against a minimum of 0.70), so that removing the indicator is not required in order to meet the criteria, and because FP7 represents the competitiveness dimension that is conceptually central to export performance. This treatment is acceptable for indicators loading between 0.60 and 0.70 (Hair et al., 2022; Guenther et al., 2023). Cronbach's alpha ranges from 0.926 to 0.945, composite reliability from 0.938 to 0.953, and extracted variance from 0.630 to 0.715, so that all constructs meet the criteria for convergent validity and internal consistency reliability.

Table 4. Loadings, Reliability Coefficients and Extracted Variance

Variable	Indicator	Loading	Cronbach's Alpha	pA	pc	AVE
Information Transparency			0.943	0.945	0.952	0.715
	IT1	0.821				
	IT2	0.860				
	IT3	0.816				
	IT4	0.864				
	IT5	0.854				
	IT6	0.837				
	IT7	0.874				
Business Ethics	IT8	0.837				
			0.945	0.947	0.953	0.695
	BE1	0.806				
	BE2	0.798				
	BE3	0.846				
	BE4	0.896				
	BE5	0.878				
	BE6	0.833				
	BE7	0.768				
	BE8	0.817				

Variable	Indicator	Loading	Cronbach's Alpha	ρ_A	ρ_c	AVE
Firm Performance	BE9	0.853	0.926	0.930	0.938	0.630
	FP1	0.775				
	FP2	0.818				
	FP3	0.848				
	FP4	0.834				
	FP5	0.799				
	FP6	0.727				
	FP7	0.694				
	FP8	0.813				
	FP9	0.821				

Source: Processed data (2026)

Discriminant validity was assessed using the heterotrait-monotrait ratio, as reported in Table 5. The values for business ethics against firm performance (0.838) and for information transparency against firm performance (0.771) are below the 0.90 threshold. The value between information transparency and business ethics (0.908) marginally exceeds the threshold, which is attributable to the conceptual proximity of the two constructs. The two are nevertheless distinct in what they measure. Information transparency concerns the completeness, accuracy, currency and accessibility of the information that the recording system produces, whereas the transparency dimension of business ethics concerns the willingness of the firm to be open towards farmers, partners and buyers, that is, a principle of conduct rather than a property of information. Because the reflective indicators therefore measure different objects, and because the collinearity test reported below does not indicate a serious problem, the model was retained for further analysis. This proximity is nevertheless acknowledged as a limitation of the study, and the result concerning the direct path from information transparency to firm performance should be read with that limitation in mind.

Table 5. Heterotrait-Monotrait Ratio

Variable	Business Ethics	Information Transparency	Firm Performance
Business Ethics	–		
Information Transparency	0.908	–	
Firm Performance	0.838	0.771	–

Source: Processed data (2026)

Evaluation of the Structural Model (Inner Model)

Before the paths were read, the two predictors of firm performance were checked against each other. As shown in Table 6, the inner variance inflation factor values of information transparency and business ethics on firm performance are both 3.920, below the maximum of five recommended in current guidance on partial least squares structural equation modelling (Hair et al., 2022; Becker et al., 2023). The non-significant direct effect reported below is therefore unlikely to be a mere artefact of collinearity, although the value lies above the stricter benchmark of 3.3 also applied in part of the literature, so that a degree of shared variance between the two predictors is acknowledged.

Table 6. Inner Variance Inflation Factor Values

Construct	Business Ethics	Firm Performance
Information Transparency	1.000	3.920
Business Ethics	–	3.920

Source: Processed data (2026)

The coefficient of determination is presented in Table 7. Information transparency explains 74.5 percent of the variance in business ethics, a value categorised as substantial, while information transparency and business ethics jointly explain 63.1 percent of the variance in firm performance, a value in the moderate to substantial range. The remaining variance is attributable to factors outside the model.

Table 7. R-Square

Variable	R ²	R ² adjusted
Business Ethics	0.745	0.742
Firm Performance	0.631	0.623

Source: Processed data (2026)

Tables 8 and 9 carry the direct and the indirect path results, and Figure 2 places the coefficients on the model itself.

Table 8. Direct Effect Test Results

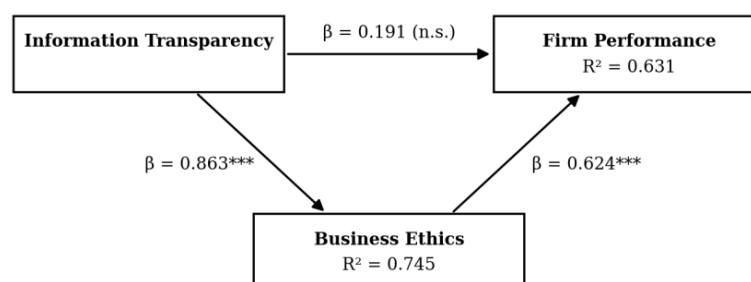
Path	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values	Decision
Information Transparency → Business Ethics	0.863	0.856	0.051	16.839	0.000	H1 accepted
Information Transparency → Firm Performance	0.191	0.182	0.153	1.247	0.213	H2 rejected
Business Ethics → Firm Performance	0.624	0.620	0.147	4.240	0.000	H3 accepted

Source: Processed data (2026)

Table 9. Indirect Effect Test Result

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values	Decision
Information Transparency → Business Ethics → Firm Performance	0.539	0.532	0.135	3.995	0.000	H4 accepted

Source: Processed data (2026)


 Indirect effect: $\beta = 0.539$; $t = 3.995$; $p < 0.001$ (full mediation). *** $p < 0.001$; n.s. = not significant

Source: Processed data (2026)

Figure 2. Structural Model Results

Discussion

1. The Effect of Information Transparency on Business Ethics

The path running from information transparency to business ethics is positive and significant ($\beta = 0.863$; $t = 16.839$; $p < 0.001$), so H1 is accepted. The magnitude of the coefficient indicates that the availability of complete, accurate and accessible information is closely bound up with the way the firm behaves towards its stakeholders. When the origin of raw material can be traced to registered farmers and process records can be verified at any time, room for manipulating claims narrows and commitments to buyers become verifiable. The finding supports the argument of Faisal et al. (2024) that transparency is an organisational capability rather than a documentary formality, and complements Garcia-Torres et al. (2024), who trace collaboration and traceability through to transparency and triple bottom line performance, by showing that the chain of effects also runs into the ethical conduct of the firm rather than into performance alone.

2. The Effect of Information Transparency on Firm Performance

The direct effect of information transparency on firm performance is not significant ($\beta = 0.191$; $t = 1.247$; $p = 0.213$), so H2 is rejected. This result indicates that investment in digital recording and traceability systems does not by itself raise productivity, customer satisfaction, cost efficiency or export competitiveness. Two explanations are consistent with the field context. First, in a supply chain that involves many smallholder tappers, farmer groups and collectors, the information produced still requires organisational processes before it can be converted into operational and commercial decisions. Second, in the perception of buyers, transparency has become a market entry requirement rather than a differentiator, so that its fulfilment prevents rejection rather than creating additional value; this reading is consistent with the regulatory framework outlined earlier, in which an electronic import certificate is a condition of admission to the destination market (United States Department of Agriculture, 2023). The result is consistent with K. Schäfer et al. (2025), whose multi-tier evidence shows that the reach of traceability is set by chain complexity, information sharing and the resources devoted to it rather than by the recording technology itself, and it qualifies the assumption in part of the literature that digitalisation translates directly into performance (Malik et al., 2021; Poku et al., 2025).

3. The Effect of Business Ethics on Firm Performance

The path from business ethics to firm performance is likewise positive and significant ($\beta = 0.624$; $t = 4.240$; $p < 0.001$), so H3 is accepted. Transparency, accountability, responsibility and fairness in dealings with farmers, partners and buyers strengthen trust, and trust reduces transaction costs, sustains repeat orders and eases access to markets with strict certification requirements. The finding is consistent with Ahmed et al. (2023), who report across 474 firms that ethics in corporate governance, human resource management and marketing raises organisational performance, and with Sheikh et al. (2024), who identify codes of ethics and transparency as pivotal elements of ethical conduct. It also aligns with the stakeholder perspective adopted by Garcia-Torres et al. (2024), in which the support of stakeholders is a condition for sustained performance.

4. The Mediating Role of Business Ethics

The indirect effect of information transparency on firm performance through business ethics is positive and significant ($\beta = 0.539$; $t = 3.995$; $p < 0.001$), so H4 is accepted. Because the direct effect is not significant while the indirect effect is, business ethics operates as a full mediator. Substantively, the value of transparency for export performance is realised through conduct: accurate records matter when they are used to honour commitments, to disclose

problems to buyers, and to treat farmers and partners fairly. Information becomes a credible signal only when it is backed by consistent conduct, which is why fraudulent claims damage trust across an entire chain (Mardenli et al., 2025). From a resource orchestration perspective, a digital traceability system is an imitable resource, whereas the ethical conduct organised around it is far harder for competitors to replicate, and therefore closer to what keeps an advantage alive over time (Malik et al., 2021). The mediating pattern found here also parallels Patabandige and Galahitiyawwe (2022), who report that traceability and visibility carry the effect of sustainable supply chain collaboration on environmental performance rather than acting as ends in themselves.

5. Theoretical and Managerial Implications

Theoretically, the study repositions information transparency from an operational output of digital traceability systems to an antecedent of corporate governance, and demonstrates that business ethics is the mechanism through which transparency is converted into performance. This extends the traceability literature, which has largely stopped at the capability of systems to generate accurate information (Budler et al., 2024; Cromwell et al., 2025), and refines the business ethics literature, which has generally modelled ethics as a direct predictor of performance (Ahmed et al., 2023).

For managers of organic coconut sugar exporters, the results suggest that expenditure on digital recording and traceability systems should be accompanied by governance arrangements that convert information into conduct: supplier codes of conduct that are enforced rather than declared, disclosure protocols for quality deviations, transparent pricing and payment schemes for tappers and farmer groups, and internal audits of the consistency between physical records, labels and export documents. Firms that treat the traceability system solely as a means of satisfying certification requirements are likely to bear the cost of the system without obtaining its performance benefits.

The research finding (*novelty*) of this study is that information transparency does not reach export performance on its own but only by way of business ethics, so that the value of a digital traceability system is realised in the conduct organised around it rather than in the records it produces. This full mediation pattern has not previously been demonstrated in export-oriented agro-industries whose supply chains are fragmented across large numbers of smallholder suppliers, and it repositions information transparency from an operational output of a traceability system to an antecedent of corporate governance that carries its effect through transparent, accountable, responsible and fair conduct.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The study finds that information transparency shapes business ethics strongly, leaves firm performance untouched when it acts on its own, and reaches performance only by way of ethical conduct, which carries the whole of the effect, in organic coconut sugar exporting companies in Central Java and the Special Region of Yogyakarta. Information transparency explains 74.5 percent of the variance in business ethics, and together with business ethics explains 63.1 percent of the variance in firm performance. In answer to the research questions, information transparency influences business ethics, it does not influence firm performance directly, business ethics influences firm performance, and information transparency influences firm performance through business ethics in a pattern of full mediation.

The improvement of export performance therefore depends less on the existence of a digital recording and traceability system than on the capacity of the firm to translate the resulting information into transparent, accountable, responsible and fair conduct. For the field of logistics and supply chain management, the study contributes a governance reading of transparency in fragmented agricultural export chains, in which the mechanism connecting

information systems to performance is organisational conduct rather than recording technology.

Limitations

This study has several limitations. First, it covers two exporting companies in two provinces during a single period, so the results cannot yet be generalised to other sectors or regions. Second, the model contains a single mediating variable, and other factors that may influence firm performance, such as technological innovation, supply chain relationship quality and external market conditions, were not tested. Third, firm performance was measured through respondent perceptions rather than objective performance data, so the potential for common method bias remains and long-term changes were not captured.

Recommendations

For practitioners, digital traceability and transparency systems are best positioned not merely as instruments for meeting market and certification requirements but as instruments for strengthening corporate governance and building stakeholder trust, which means pairing the recording system with enforced supplier codes of conduct, disclosure protocols and transparent payment schemes. Future studies are encouraged to widen the coverage of respondents, sectors and regions, to enlarge the sample, to add variables such as technological innovation, customer trust and supply chain sustainability, and to use objective performance data or a longitudinal design so that the dynamics of the relationship between transparency, ethics and performance can be observed over time.

Author Contributions

The first author took primary responsibility for the research conceptualisation, data collection, data analysis, and drafting of the manuscript. The second and third authors contributed to the development of the theoretical framework, the interpretation of results, and the critical review and revision of the manuscript. All authors have read and approved the final version of the article submitted for publication.

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REFERENCES

- Adelakun, O. J., Ojo, O. O., & Mpungose, S. (2025). Empirical re-investigation into the export-led growth hypothesis (ELGH): Evidence from EAC and SADC economies. *Economies*, 13(6), 175. <https://doi.org/10.3390/economies13060175>
- Ahmed, R. R., Pahi, M. H., Nadeem, S., Soomro, R. H., Parmar, V., Nasir, F., & Ahmed, F. (2023). How and when ethics lead to organizational performance: Evidence from South Asian firms. *Sustainability*, 15(10), 8147. <https://doi.org/10.3390/su15108147>
- Badan Pusat Statistik. (2026). Statistik perdagangan luar negeri Indonesia. Badan Pusat Statistik.
- Becker, J.-M., Cheah, J.-H., Gholamzade, R., Ringle, C. M., & Sarstedt, M. (2023). PLS-SEM's most wanted guidance. *International Journal of Contemporary Hospitality Management*, 35(1), 321-346. <https://doi.org/10.1108/IJCHM-04-2022-0474>
- Budler, M., Quiroga, B. F., & Trkman, P. (2024). A review of supply chain transparency research: Antecedents, technologies, types, and outcomes. *Journal of Business Logistics*, 45(1), e12368. <https://doi.org/10.1111/jbl.12368>

- Charlebois, S., Somogyi, S., Music, J., & Sterling, B. (2024). Digital traceability in agri-food supply chains: A comparative analysis of OECD member countries. *Foods*, 13(1).
- Cromwell, J., Turkson, C., Dora, M., & Yamoah, F. A. (2025). Digital technologies for traceability and transparency in the global fish supply chains: A systematic review and future directions. *Marine Policy*, 178, 106700.
- Faisal, M. N., Sabir, L. B., & Sharif, K. J. (2024). Operationalizing transparency in supply chains using a systematic literature review and graph theoretic approach. *Benchmarking: An International Journal*, 31(4), 1270-1294. <https://doi.org/10.1108/BIJ-05-2022-0291>
- Garcia-Torres, S., Rey-Garcia, M., & Sáenz, J. (2024). Enhancing sustainable supply chains through traceability, transparency and stakeholder collaboration: A quantitative analysis. *Business Strategy and the Environment*, 33(7), 7607-7629. <https://doi.org/10.1002/bse.3884>
- Guenther, P., Guenther, M., Ringle, C. M., Zaefarian, G., & Cartwright, S. (2023). Improving PLS-SEM use for business marketing research. *Industrial Marketing Management*, 111, 127-142. <https://doi.org/10.1016/j.indmarman.2023.03.010>
- Hair, J. F., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications.
- Khan, M. A., Rahman, M. M., & Islam, M. S. (2022). ShrimpChain: A blockchain-based transparent and traceable framework to enhance the export potentiality of Bangladeshi shrimp. *Smart Agricultural Technology*, 2, 100049. <https://doi.org/10.1016/j.atech.2022.100049>
- Kshetri, N. (2021). Blockchain and supply chain management. *International Journal of Information Management*, 60, 102376. <https://doi.org/10.1016/j.ijinfomgt.2021.102376>
- Malik, M., Ghaderi, H., & Andargoli, A. (2021). A resource orchestration view of supply chain traceability and transparency bundles for competitive advantage. *Business Strategy and the Environment*, 30(8), 3866-3881. <https://doi.org/10.1002/bse.2841>
- Mardenli, A., Sträter, K. F., Herrmann, C., Alghababsheh, M., Fiedler, A., & Sackmann, D. (2025). Consumer trust in the agri-food supply chain: A randomized controlled study of organic food labeling fraud. *British Food Journal*, 127(8), 2777-2799. <https://doi.org/10.1108/BFJ-04-2024-0414>
- Nurgazina, J., Pakdeetrakulwong, U., Moser, T., & Reiner, G. (2021). Distributed ledger technology applications in food supply chains: A review of challenges and opportunities. *Computers & Industrial Engineering*, 152, 107029. <https://doi.org/10.1016/j.cie.2020.107029>
- Patabandige, G. M. J., & Galahitiyawe, N. W. K. (2022). Mediating role of supply chain traceability and supply chain visibility on environmental performance led by sustainable supply chain collaboration. *International Journal of Management Concepts and Philosophy*, 15(4), 349-364.
- Poku, E., Nuerthey, D., Agbemude, S., Owusu, F., & Buabeng, S. (2025). Building resilient supply chains through digitalization: The roles of supply chain traceability and desorptive capacity. *Benchmarking: An International Journal*, 1-26. <https://doi.org/10.1108/BIJ-01-2025-0057>
- Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing*, 39(5), 1035-1064. <https://doi.org/10.1002/mar.21640>

- Schäfer, K., Kähkönen, A., & Luzzini, D. (2025). Traceability in multi-tier supply chains: Insights from five case studies. *Supply Chain Management: An International Journal*, 30(7), 77-99. <https://doi.org/10.1108/SCM-07-2024-0428>
- Schäfer, N., Petersen, L., & Hörisch, J. (2024). The interplay between supply chain transparency and NGO pressure: A quantitative analysis in the fashion industry context. *Journal of Business Ethics*, 192(4), 713-727.
- Sharma, S. (2022). On exports and economic growth: Revisiting export-led growth hypothesis including North-South divide. *SEISENSE Journal of Management*, 5(1), 31-48. <https://doi.org/10.33215/sjom.v5i1.733>
- Sheikh, R., Sabur, M. A., & Sina, M. A. (2024). Ethical horizons: A comprehensive exploration of contemporary business ethics practices. *International Journal of Research - GRANTHAALAYAH*, 12(4), 101-117. <https://doi.org/10.29121/granthaalayah.v12.i4.2024.5556>
- United States Department of Agriculture. (2023). Strengthening organic enforcement (Final rule). Agricultural Marketing Service.
- Zvaríková, K., Bařínová, D., Belás, J., & Palčák, Ľ. (2023). Empirical research on business ethics of SMEs in the V4 countries. *Ethics & Bioethics*, 13(1-2), 51-63. <https://doi.org/10.2478/ebce-2023-0007>.