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| RESEARCH ARTICLE

Evaluating the Impact of Ghana's Labelling Law (LI 1541) on the Compliance Behaviours of Packaging Design Professionals

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| ABSTRACT
This study tests whether Ghana's Labelling Law (LI 1541) influences the compliance behaviour of packaging design professionals. A cross-sectional survey of designers in Accra and Kumasi (n = 327) was analysed using confirmatory factor analysis and structural equation modelling (SPSS/AMOS). The measurement model met conventional thresholds (CFI = 0.937; SRMR = 0.066; standardised loadings ≥ 0.60; Cronbach's α/CR ≥ 0.70). Perceived enforcement and requirements under LI 1541 showed a positive, significant association with compliance behaviour (β = 0.782, p = 0.005; R^2 = 0.509). Only 19.3% of respondents reported prior training on LI 1541, indicating a capability gap that may blunt compliance even when intent exists. We recommend pairing enforcement with targeted training, designer-facing checklists/templates, and clear guidance on mandatory label elements (e.g., ingredient order, nutrition panels, disposal cues), alongside cost-easing measures for SMEs. The paper contributes Ghana-specific, management-oriented evidence on how a national labelling statute translates into practice within design workflows.

| KEYWORDS
Ghana; Labelling Law (LI 1541); Packaging design professionals; Compliance behaviour; Policy implementation; Designer training.

| ARTICLE INFORMATION
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1. Introduction

For a package to carry out clear information to consumers, the colour, shapes, expiry dates, allergy warnings and print outcome should be considered by the designers (Sebbeh, 2023). According to Shete and Vidyapeeth (2012), food labelling is very important because it ensures consumer safety and promotes informed choices. Across the globe, governments enforce labelling laws to standardize packaging information, protect consumers from misleading claims and facilitate product traceability (Matlhare, 2024; Schifferstein et al., 2021). The labelling law was introduced in Ghana as a part of broader food safety and regulatory measures with the aim of guiding the food packaging industries as indicated by Hayford et al. (2015). This law establishes requirements concerning product identification, ingredients, nutritional information and labelling accuracy. Packaging designers play very important role in balancing regulatory compliance with innovative and market-driven designs (Chu, Hetherington & Tang). Despite the importance of food labelling laws, compliance challenges persist in the packaging industry (Adams, 2023; Adaku et al., 2024). According to Adjabeng and Osei (2022), small and medium-sized enterprises (SMEs), which constitutes a larger portion of Ghana's food manufacturing sector often struggles with the financial and technical resources needed to meet the labelling requirements. The enforcement of Ghana labelling law has raised concerns regarding regulatory oversight, effective monitoring mechanisms and the level of awareness among industry stakeholders as indicated by (Rahman, Odji & Azu, 2025; Asampana, 2025). a study by Hamdan et al. (2023) indicates that most Ghanaian package designs do not meet the labelling requirements because packaging professionals do not refer to the labelling regulations and standards in their designing process. The introduction of the LI 1541 has a significant impact on packaging design professionals who are required to integrate the labelling laws into their creative processes (Sebbeh, 2023). Whilst some Designers may see the

regulations as obstacles that limits their creative freedom and innovation, others may see it as an opportunity to ensure transparency and consumer trust (Chu, Hetherington & Tang, 2024).

But since the implementation of the Ghana Labelling Law (LI 1541), there has been limited research on its impact on the compliance behaviours of packaging design professionals. These issues accentuates the need to conduct a research that examines the impact of Ghana's labelling laws on packaging design professionals and the food packaging industry as a whole.

2. Positioning the Study in Existing Knowledge

2.1 Ghana's Labelling Law: A Regulatory Journey

According to Quashigah (2008), Ghana as a country, was pieced together by the British Colonial authorities essentially in satisfaction of British Economic and political aspirations which led to the development of the system being shaped by their interests. As indicated by Tauxe (2013), Food labelling had gone through several stages of historical development beginning with regulatory marks which served as logistical aids to the enforcement of adulteration laws and the levying of duties and taxes.

As discussed by Buckingham (2003), the existing legal framework governing food labelling mandates in Ghana has its origins in an extensive historical context of legal stipulations that can be tracked back to 1888 and the present set of regulations includes both primary statues and subordinates legislation that have been enacted over a duration of four decades specifically from 1960 to 2000. Although the Food and Drugs Law was passed as far back as 1992, it was not until 26th August 1997 that the first Board was inaugurated (FDA, 2025).

The system has evolved through a number of regime changes, economic upheavals and rebirths and bears up well providing a very respectable assembly of food labelling (Buckingham, 2003). The Food and Drugs Board however became an Authority with the name "Food and Drugs Authority" in 2012 by the passage of the Public Act, Act 851, 2012 (FDA, 2025).

2.2 Food Labels: More than Just Words on a Package

According to Martini and Menozzi (2021), Food labels are the first informative tool customers find when shopping, that provide information such as ingredients, nutrient content, and the presence of allergens of the selected product. Laxmana et al. (2023) opined that, Consumers rely on the truthfulness of such information on a package, which helps them to distinguish among the products, and so labels provide information that enables consumers to make food choices according to their needs and desires or it serves their intended purposes. However, food labelling also represents a marketing tool and may influence perception of the food quality and, in turn, the dietary choice of consumers (Martini & Menozzi, 2021). "Label" means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on or attached to a container of food. "Labelling" includes any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal (FAO/WHO, 2007).

2.3 The Role of Food Labels

According to FAO (2016), when foods are packaged in bags, boxes, bottles, cans and wrappers, the consumer cannot detect the quality and quantity of the food through their senses of sight, smell, taste and touch which means that the producer has information about the product that is not known to the consumer. A label on a food, which is the information presented on or in the proximity of a pre-packaged food product, is one of the most direct and important ways of communicating information about the food to the consumer (Meijer et al., 2021). According to Laxman et al. (2023), when food is packaged, the manufacturer or the producer has information about the product, but the consumer may not perceive the quality and identity of the food by the sensory organs during the purchasing stage which may result in communication gap; in economic terms the difference between the seller and buyer is termed as information asymmetry. Food labelling helps to correct this information asymmetry so as to ensure that the market functions well because consumers need information about what the product is before they decide whether to purchase the product or not (Laxman et al., 2023).

2.4 Legislative Instrument 1541 (LI 1541): An Overview

Ghana's Labelling Law, Legislative Instrument 1541 (LI1541) represents a significant milestone in the regulation of the food packaging industry. Introduced under the Ghana Standards Authority (GSA), the law aims to enhance food safety, protect consumers and ensure compliance with international standards (Audran, 2022). As a regulatory framework, LI 1541 requires food manufacturers to include critical information on packaging such as ingredient list, nutritional values, expiration dates and country of origin. These requirements are designed to empower consumers with accurate and reliable information, enabling informed purchasing decisions while enhancing trust in the food industry.

The importance of LI 1541 cannot be overstated. It addresses key consumer concerns about safety, transparency and product authenticity. In an era where consumer awareness is growing the law provides a robust mechanism to safeguard public health by ensuring that food products meet established quality standards. Additionally, LI 1541 aligns Ghana's food packaging industry with global trends where labelling transparency is increasingly emphasized (Hayford et al., 2015). By adhering to these standards,

Ghanaian products gain a competitive edge in international markets particularly within regional trade agreement such as the African Continental Free Trade Agreement (AfCFTA) and global framework like the codex Alimentarius (Van Der Ven & Signè, 2021).

The labelling law imposes several specific requirements on the food packaging industry (Lyster, 2013). Manufacturers must disclose all ingredients in descending order of weight or volume, enabling consumers to understand the composition of the products they purchase. Nutritional information including calorie content and macronutrient values must be provided catering to the growing demand for health-conscious consumption. Expiration dates and storage instructions ensure food safety while language and accessibility requirements mandate that labels are clear and easily understood by target markets. These provisions collectively aim to protect consumers from misleading claims and unsafe products, promoting fairness and trust in the market place.

However, the implementation of LI 1541 present challenges for stakeholders particularly small and medium sized enterprises (SMEs) which dominate Ghana's food manufacturing sector (Amaglo, 2019). Compliance with the law often requires significant investments in resources such as hiring professional packaging designers, redesigning labels and acquiring compliant materials. For SMEs with limited financial capacity the requirement can be burdensome and potentially impacting their competitiveness. Moreover, inadequate awareness and training about the law have led to instances of non-compliance as some manufacturers and designers lack a clear understanding of its provisions (Adjabeng & Osei, 2022). The gap underscores the need for more targeted outreach and support from regulatory bodies.

Despite these challenges, the introduction of LI 1541 has spurred innovation within the food packaging industry. Packaging designers for example, have embraced the opportunity to create minimalistic information driven designs that align with both regulatory requirements and consumer preferences. The emphasis on transparency and clarity in labelling has also influenced branding strategies with companies leveraging accurate and appealing packaging to differentiate their products in a competitive market (Hukker et al., 2024).

The law's impact extends beyond manufacturers and designers to influence consumer behaviour and market dynamics. Ghanaian consumers are increasingly prioritizing product quality, health implications and brand transparency in their purchasing decisions (Quansah et al., 2015). Accurate labelling as mandated by LI 1541 reinforces trust and loyalty which are essential for business to thrive in both local and international markets (Hayford et al., 2015). Furthermore, compliance with the law enhances the credibility of Ghanaian food products abroad, facilitating export opportunities and strengthening the nation's position in global trade (Ministry of Trade and Industry (MoTI, 2022)).

While the enforcement of LI 1541 remains a challenge due to logistical and resource constraints faced by the GSA, its overall significance is undeniable. The law addresses critical issues of consumer protection, market fairness and trade competitiveness offering a framework for sustainable growth in the food packaging industry by enhancing transparency, innovation and adherence to global standards. LI 1541 does not only benefits consumers but also positions Ghana's food industry for long-term success in an increasingly interconnected world.

2.5 Compliance Behaviours

According to Britsch (2024), compliance means to satisfy regulatory, corporate and external or internal expectations which is subjected to or voluntarily adopted to ensure sustainability in our business. To comply with procedures, you need the ability to understand the procedures and guidelines hence compliance is dependent on understanding of procedures (Olsen, 2017). Too many organisations see compliance only as the thing they need to do 'by law', or the things that get them sued (Britsch, 2024). According to Financial Conduct Authority (2016), breaking rules may seem appealing to an individual due to their consequent preferences, beliefs and decision making processes, which if not acknowledged, permits businesses to maintain their weak governance procedures. However, Gru (2018) indicated that, people who had better education and people of older ages are positively related to a very high degree of compliance.

2.6 From Regulations To Realities: How Ghana's Labelling Law Shapes Compliance Behaviours in Packaging Design

The empirical review on the topic "Evaluating the Impact of Ghana's Labelling Law (LI 1541) on the Compliance Behaviours of Packaging Design Professionals" highlights various studies that explore the extent to which regulatory requirements influences the compliance behaviours of packaging design professionals and their level of compliance in the context of food safety, packaging and labelling practices. These studies provide insights into different regions, industries and regulatory frameworks contributing to a broader understanding of compliance levels, challenges and areas for improvement (White, Sarpong & Ndrecaj, 2015; McKinsey & Company, 2022).

Askary et al. (2024)'s research aiming to analyse compliance to cigarette packaging laws by tobacco brands in Pakistan, indicated that labelling laws influence compliance behaviour of packaging designers. This is because the research showed that although 54.5% of the brands had a 4/5 score for the presence of pictorial warnings on the packaging, the sizes of pictorial warnings did not cover up to 60.0% of the total package area in most cases and more than 85.0% of the brands severely lacked the placement of a small health warning on the side of the box, whiles 5 products did not have this warning at all. The study therefore concludes that, adherence to tobacco packaging law in Pakistan is poor hence the need for Pakistani authorities to strengthen monitoring and enforcement of the law to ensure compliance by tobacco manufacturing companies. The study made use of cross-sectional method.

Amandhis et al. (2023) conducted research on the topic, "Legal Protection for Consumers Regarding the Absence of Labels Containing Product Information on Packaging" which dopted a Normative Juridical research approach. According to the study, the absence of product labelling on packaging can result in consumers' inability to make informed decisions. Therefore, various regulations and laws have been established to mandate businesses to provide accurate and complete information on product packaging (Amandhis et al., 2023). The research came to a conclusion that there should be a legal protection regarding labelling and continuous efforts towards effective law enforcement, as well as consumer education and awareness regarding the importance of obtaining accurate information before purchasing products was put in place. This also supports the fact that labelling laws influences compliance behaviour of packaging designers.

A study conducted by Osiac and Quevedo (2020) aimed at evaluating the impact of Law 20.606 on the ENC declaration of packaged foods in Chile, before and after the law implementation. According to this study, data collection was conducted in 2013 and 2019 in Santiago and all food groups had changes in the ENC declaration during the study period. It was observed that, companies reformulated products to adapt to the new regulation and a conclusion was made based on the observations that, it is necessary to continue developing public policies to protect and improve healthy food environments. This indicates that, labelling law and policies have the tendency of influencing compliance behaviour of packaging design professionals and production.

Also, a research conducted by Wallelign et al. (2022) adopted a cross-sectional study design to randomly collect 25 locally manufactured ABHS products which were evaluated for compliance to packaging and labelling information regulatory requirements and the results subjected to descriptive analysis. According to this research most of the selected products were able to comply with the majority of packaging, product description and manufacturer-related requirements whiles gaps were observed in essential labelling information requirements. They finally concluded that, improving regulatory law enforcement practices, strengthening continuing education of manufacturing personnel and raising public awareness about the rational use of the products was very timely. This study highlights the influence of labelling law on compliance behaviour of packaging design professionals.

Wade S. Wade, (2020)'s research observed increases in the use of flip-top versus slide and shell packaging, the use of yellow, black and white as the focal colour, incidence of colour-themed variant names and the use of female and crest-related logos which is evidence that many packaging design elements have varied systematically along with regulatory changes in Canada. This research also proves that compliance behaviours of packaging design professionals can be influenced by packaging laws.

Similarly, a research conducted by Dinakar, Shetty and Shetty (2023) assessed the compliance to implementation and enforcement of the COTPA (P and L) Rules, 2008 and its amendments in 2014 and 2018. The study found out that, the products displayed the specified health warnings on a total of 70.6% on average, failing to abide by the government-specified average of 85%. 50% of the products did not follow the rotation of pictorial and textual health warning even after completion of the interregnum period of 12 months. The study concluded that tobacco-related oral cancers in India emphasizes on the need for clear, impactful health warnings and strict enforcement against non-compliant manufacturers.

Yang et al. (2025) conducted a study on the topic, "Monitoring sodium content in packaged foods sold in the Americas and compliance with the updated regional sodium reduction targets". The main objective of the study is to examine the current sodium levels in packaged foods among five countries in the Americas and monitored cross-sectional and longitudinal compliance with the sodium targets from 2015 to 2022. A total of 25,569 food items were analysed. The study indicated that about half of the examined foods met their respective SRTs and there have been small improvements in compliance over time (Yang et al., 2025). The study suggest that further efforts are required to reach the WHO's global sodium reduction goal by 2025, such as implementation of mandatory SRTs and front-of-pack labelling regulations. This also shows that the implementation of mandatory labelling laws can influence compliance behaviour of packaging firms including design professionals.

The review of the empirical studies above highlights the varied levels of compliance with packaging laws among food companies influenced by factors such as company size, resource availability and regulatory enforcement. The labelling law influences compliance behaviours of packaging organizations.

2.7 Theoretical and Conceptual Foundations of the Study

This study is enrooted in the systems theory from which the conceptual framework was derived. The systems theory created by Ludwig von Bertalanffy emphasizes on the interconnectedness component parts within a system. The study is designed to explore the multifaceted impact of the LI 1541 on the compliance behaviour of packaging design professionals. The conceptual framework connects the LI 1541 to the level of compliance and attitudes of packaging design professionals towards compliance to the law.

3. Methodology and Scope

The study focuses on Ghana's food packaging industry using quantitative methods to evaluate the impact of LI 1541 on the compliance behaviour of packaging design professionals. This study is geographically focused on the Greater Accra region and Kumasi metropolitan area of Ghana. The research investigates the key variable: impact of LI 1541 on compliance behaviour of packaging design professionals.

Supported by Kivunja and Kuyini (2017) who indicated that a research adopting a positivist paradigm should follow the Scientific Method of investigation, the positivist paradigm was adopted because it has the ability to provide a scientific and detailed framework for examining the phenomenon under investigation. A cross-sectional survey design was employed and the study sites were Accra and Kumasi because they are the two major commercial hubs in Ghana as stated by Rahman, Odji and Azu (2025). A sample size of 384 was used. However, 327 responds were obtained, 172 from Accra and 155 from Kumasi, making a response rate of 85.16 per cent. The Purposive sampling and convenience sampling techniques which are under the classification of non-probability approach were used.

The data analysis for the study was conducted using Statistical Package for Social Sciences (SPSS) version 26 and AMOS, ensuring a systematic and reliable interpretation of the data gathered through the structured questionnaire. The use of SPSS enabled efficient organisation, analysis and presentation of results to address the research objectives, questions, and the study's descriptive statistics. AMOS ensured the conduct of CFA as well as the determination of the direct effect of the dependent variable on the independent variables through structural equation modelling (SEM).

4. Results and Discussions

4.1 Demographic Characteristics of the Respondents

The demographic profile of the 327 packaging design professionals who participated in the study is exhibited in Table 1. Evident from the table, majority of the packaging designers are males, constituting 73.7 per cent whereas the minority 26.3% are females. Majority of these designers are located in Accra (52.6%) whereas the rest are resident in Kumasi (47.4%). Their age groups revealed a youthful distribution with majority (38.8%) reporting age ranges of 25-29 years, followed by 24.2 per cent and 19 per cent, who recorded age limits of 30-34 years and 19-24 years respectively. The rest 18 per cent reported ages of 35 and above. Regarding educational level, a significant number of the respondents hold first degrees (43.7%), followed by masters (15.3%), HND (13.8%), diploma (11.3%) and Ph.D. (1.8%). The rest 14.1 per cent noted they possess other qualifications. In relation to years of working experience, a significant number of the designers possess 3-5 years of professional working experience (45.6%), followed by those with 0-2 years of working experience (34.3%). Designers with 6-10 years of professional experience constitute 17.1 per cent, while those with 11 years or more account for only 3.1 per cent. The outcomes in Table 1 further demonstrated that only 19.3 per cent of the respondents have received training on the LI 1541 whereas the majority, constituting over 80% of the designers have not received such training.

Table 1: Distribution of Respondents' Demographics

Demographics	Category	Frequency	Per cent
Gender	Female	68	26.3
	Male	259	73.7
Location	Accra	172	52.6
	Kumasi	155	47.4
Age groups	19 – 24	62	19.0
	25 – 29	127	38.8
	30 – 35	79	24.2
	35 – 39	23	7.0
	40 – 45	28	8.6
	46 and above	8	2.4
Educational level	Degree	143	43.7
	Diploma Certificate	37	11.3
	HND certificate	45	13.8
	Masters/MPhil.	50	15.3
	Ph.D.	6	1.8
	Others	46	14.1
Years of working experience	0–2 years	112	34.3
	3–5 years	149	45.6
	6–10 years	56	17.1
	11+ years	10	3.1
Training on LI 1541	No	264	80.7
	Yes	63	19.3
Total		**327**	**100.0**

Source: Authors' Construct.

4.2 Measurement Model Assessment

The analysis of data followed a two-step structural equation modelling process recommended by scholars (Arora & Agarwal, 2019; Sharif et al., 2023). Assessment of the measurement model was the first step employed to evaluate the reliability and validity of the 13-item scale measuring the perception of LI 1541 and compliance behaviour (Jiang et al., 2023). A confirmatory factor analysis (CFA) was deployed for this assessment. The assessment process led to the deletion of five items (LI2, CB1, CB2, CB5 and CB7) that reported factor loadings (standardized regression weights) below 0.6 (Yousefi et al., 2025). The removal of these five items also improved the model fit. The remaining 8 items demonstrated excellent fit indices. The CMIN/DF (χ^2/df) was 2.266, which lies within the recommended range between 1 and 3 (Hu & Bentler, 1999; Schumacker & Lomax, 2016). In addition, the Comparative Fit Index (CFI) of 0.937 was higher than the minimum acceptable threshold of 0.90, whereas the Standardized Root Mean Square Residual (SRMR) of 0.066 was also below the 0.08 threshold (Hu & Bentler, 1999). These indices collectively demonstrated the overall significance and fitness of the model.

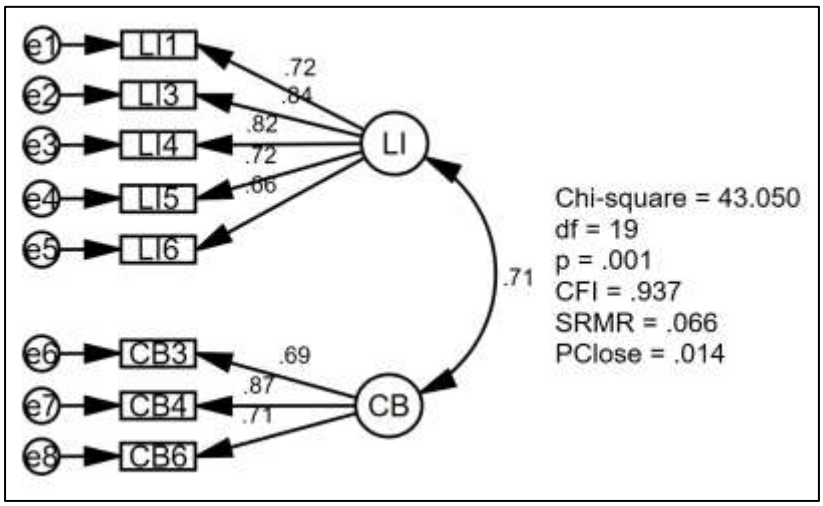
Construct reliability was assessed using Cronbach's Alpha (CA), Composite Reliability (CR), and Maximum Reliability (MaxR(H)). Both the the perception of LI 1541 and compliance behaviour reported CA and CR values above the 0.70 benchmark (Asiamah et al., 2018). This indicates a strong internal consistency among the two constructs. For the two constructs, the MaxR(H) values were also reliably higher than their respective CR values. This further emphasized the reliability and internal consistency of the measurement model (Hancock & Mueller, 2001).

Convergent validity was established for the two scales as the Average Variance Extracted (AVE) values exceeded the minimum threshold of 0.50. This directs that each construct explained an adequate proportion of variance in its indicators (Cheung et al., 2024). Discriminant validity was also confirmed as the Maximum Shared Variance (MSV) for each construct was lower than its respective AVE. This indicates that all the constructs were distinct from each other (Schutte et al., 1998; Hurley et al., 1997; Chandel et al., 2015). Thus, that the discriminant validity of the constructs was sufficient. It can therefore be surmised that the remaining 15 scale items after CFA are reliable and valid for further analysis.

Table 2: Validity and Reliability Statistics

Construct	Items	Loading	CA	CR	AVE	MaxR(H)	LI	CB
Ghana's Labelling Law (LI)	LI1	.719	.865	.869	.571	.880	-	.760
	LI3	.839						
	LI4	.819						
	LI5	.723						
	LI6	.665						
Compliance Behaviours (CB)	CB3	.686	.792	.802	.577	.836	.713	-
	CB4	.873						
	CB6	.706						
χ^2/df = 2.266; SRMR = .066; CFI = .937; PClose = .014								

Source: Authors' Construct.



4.3 Total Effects Analysis

Table 3 expounds the direct effect of Ghana's Labelling Law (LI 1541) on the compliance behaviours of packaging design professionals. The value of R-Square (R^2) was substantial for both compliance behaviours (0.509) based on the criteria proposed by Cohen (1988). This implies that 50.9 per cent of the variations in the compliance behaviours of packaging design professionals were explained by the LI 1541. The remaining 49.1 per cent of the variations in compliance behaviours are accounted for by other influencing factors not included in the current study.

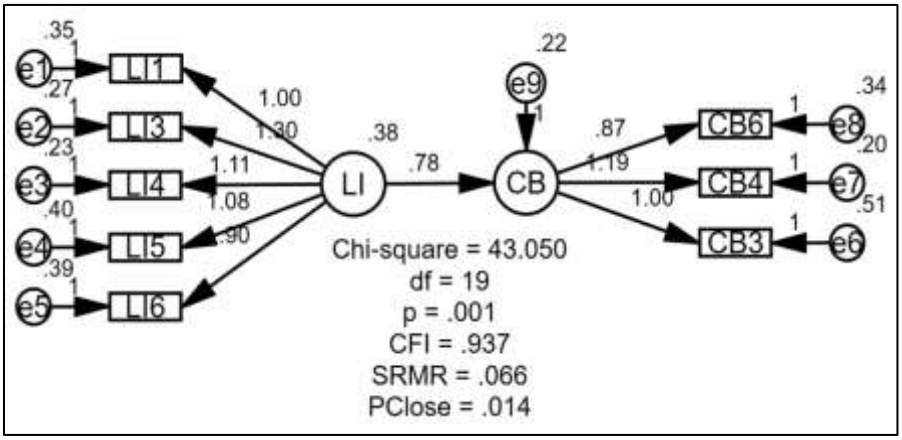
The results presented in Table 4.12 indicate that the coefficient representing the impact of the LI 1541 on compliance behaviours of packaging design professionals is positive (β = 0.782). This implies a positive association between LI 1541 and the compliance behaviours of packaging design professionals. Consequently, a one unit increase in adoption of the LI 1541) is associated with a corresponding 0.782 increase in the compliance behaviours of packaging design professionals.

Likewise, when considering statistical significance, it is evident that the LI 1541 does return a significant positive impact on compliance behaviours at a 1% significance level. Therefore, the study surmises that Ghana's Labelling Law (LI 1541) has a statistically significant positive influence on the compliance behaviours of packaging design professionals.

Table 3: Total Effects Analysis

Path	Effect (β)	BootSE	t-test	p-value	LBCI	UBCI
LI => CB	.782	.215	3.637	0.005	.434	1.266
R-squared = .509						
Significance of β: * p < 0.100, ** p < 0.050, *** p < 0.010						

Source: Authors' Construct.



4.4 Discussions

This study assessed the impact of Ghana's Labelling Law (LI 1541) on the compliance behaviours of packaging design professionals in Ghana's food packaging industry. The analysis revealed a statistically significant and positive relationship between Ghana's Labelling Law and the compliance behaviours of packaging design professionals. This finding highlights the critical role regulatory frameworks play in shaping professional conduct within an industry wide system. From a systems theory perspective, enforcement mechanisms and legal mandates act as feedback loops that encourage behavioural consistency and regulatory alignment among stakeholders within the packaging ecosystem. Chikere and Nwoka (2015) and Elujekwute et al. (2022) noted that in any coordinated system, its components must function cohesively towards shared objectives, in this instance legal compliance aimed at protecting public health and consumer interests. Askary et al. (2024) reported similar trends in Pakistan's tobacco industry, where partial compliance was observed, underscoring the need for robust and sustained regulatory oversight. Amandhis et al. (2023) added that inadequate labelling regulations impair consumers' ability to make informed choices, reinforcing the necessity of such laws to encourage responsible packaging practices.

Osiac and Quevedo (2020) found that Chile's policy reforms induced significant changes in product design, suggesting that legal interventions can drive industry wide adaptation. Wallelign et al. (2022) confirmed high levels of compliance among Ethiopian hand sanitiser manufacturers in response to labelling enforcement, while Wade (2020) highlighted parallel developments in Canada's tobacco sector. Yang et al. (2025) further established that labelling policies introduced across the Americas gradually enhanced compliance rates. All, these studies reinforce the principle that labelling regulations, when effectively enforced, trigger coordinated behavioural responses across the design and production chain, consistent with the self-regulatory nature of functional systems.

4.5 Theoretical and Practical Implications

The results of this study offer meaningful contributions to the theoretical understanding of how regulatory frameworks interact with professional behaviour in the packaging industry. Drawing on Systems Theory, the findings confirm that laws such as Ghana's Labelling Law act as systemic inputs that influence the conduct of individual actors, particularly packaging design professionals. The significant relationship between the labelling law and compliance behaviour supports the notion that formal rules, when clearly communicated and enforced, can result in uniform behavioural patterns across a professional network. This affirms the theory's position that systems evolve through internal feedback mechanisms in response to environmental changes.

By applying Systems Theory to the specific context of food packaging in Ghana, the study deepens theoretical insight into how regulations influence systemic behaviour and also points to areas where theoretical refinement may be needed to better explain inconsistent responses among different parts of a professional system.

The findings also provide some important practical implications for policymakers, regulators and professionals operating within the food packaging design sector. The clear link between the labelling law and improved compliance behaviour demonstrates the effectiveness of regulatory enforcement and the value of consistent oversight. This highlights the need for continued dissemination of relevant guidelines, regular training sessions and effective communication channels between regulatory bodies and practitioners. By doing so, policymakers can ensure that compliance is maintained while reducing uncertainty among professionals regarding legal requirements. Specifically, the Food and Drugs Authority, together with Ghana Standards Authority should intensify public education campaigns that are specifically directed at packaging design professionals. These campaigns must simplify the content of Ghana's Labelling Law (LI 1541) into practical guidelines that can easily be understood and

implemented. A stronger understanding of the law among professionals will lead to better compliance and minimize design mistakes that may attract penalties from regulators.

Industry associations and professional groups within the packaging sector should include design checklists, format templates and explanatory notes that make adherence to labelling law easier and more consistent. Such cooperation will benefit practitioners particularly those from smaller firms who may lack legal or technical support.

Government and related agencies should consider policy measures that reduce the cost pressures associated with compliance. Introducing tax relief, material subsidies or financial support schemes for firms working to meet the labelling standards would ease financial impact. These measures will encourage wider compliance while safeguarding the viability of small and medium sized packaging firms.

To improve productivity in the sector, there is a need for investment in training and technological support for packaging design professionals. Skill enhancement programmes, updated design tools and improved operational should be made more accessible to practitioners. These investments will enable professional to meet legal standards more efficiently, turning regulatory obligations into opportunities for performance improvement.

Finally, the enforcement structure responsible for implementing the labelling law should be reviewed and strengthened. Consistent interpretation of the law, transparent procedures and open communication channels between regulators and industry professionals are essential. These actions will encourage the culture of compliance and promote the growth of more efficient and standardized food packaging industry in the country.

5. Conclusion

The findings of this study revealed the impact of Ghana's Labelling Law (LI 1541) on the compliance behaviours of packaging design professionals in Ghana's food packaging industry. The outcomes show the labelling law has a significant positive effect on the compliance behaviours of packaging design professionals, confirming the essential role of legal standards in shaping professional practice and ensuring adherence to required labelling and norms. While some individuals within the profession especially those in the Institute of Packaging (IOP), Ghana may benefit from more structured procedures or improved clarity on their work due to the legal requirements, these advantages are not widespread or strong enough to result in measurable increases in overall output. This suggests that regulatory policies while useful for ensuring quality and compliance may not directly contribute to improved efficiency without being supported by capacity building efforts such as continuous training, modern equipment and enhanced workflow systems.

The current study had some limitations. The study was mainly quantitative in nature and data was gathered from packaging officials without recourse to regulators. Further research could explore the perspectives of regulatory officials and enforcement agencies such as the Food and Drugs Authority and the Ghana Standard Authority. Gaining insights from regulators would provide a more comprehensive understanding of the implementation challenges, enforcement gaps and practical effectiveness of the labelling law. Further studies could also examine the impact of labelling law on the other sectors of the food industry, such as manufacturers, retailer and distributors. Investigating how different players within the supply chain respond to labelling requirements could reveal interdependencies and uncover broader operational implications beyond design professionals.

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