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IMPACT OF INSTITUTIONAL PRESSURES AND FOOD SAFETY PRACTICES IN VIETNAM FOOD ENTERPRISES

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Abstract: This study uses a qualitative analysis method according to the PLS-SEM model to explore the role of logistics integration in the relationship between institutional pressures and food safety practices in Vietnam food enterprises. Analysis of data from 246 businesses shows that companies can directly improve food safety performance by increasing internal and external pressures within the business. Regarding indirect effects, the mediating role of logistics integration has been discovered. By increasing logistics integration, institutional pressures will push businesses to improve the culture of food safety practices in food businesses in Vietnam. Food companies have chosen a supply chain approach to deal with food safety risks and save on transaction costs. In addition, the regulatory role of logistics integration in the impact of institutional pressures to food safety practices is explored.

Keyword: Logistics integration, institutional pressures, food safety practices, food enterprises, Vietnam

1. Introduction

In the congress time as globalization and international trade become increasingly bustling, food supply chains have become longer and more complex than ever, leading to serious consequences for food safety. With a large number of actors, processes, locations and respective conditions, global supply chains create more favorable opportunities for dirty food (van Asselt et al., 2010). Many serious food safety incidents have occurred on an international scale in recent decades such as concerns about salmonella outbreaks from peanut butter powder in the US and Canada (2008–2009), the dioxin-contaminated Irish pork products (2008), and melamine-laced Chinese dairy products (2008) have caused unprecedented scrutiny of food businesses to ensure food safety. Failure to address food safety concerns can have far-reaching consequences, including

economic damage, loss of reputation, and bankruptcy (Esteki et al. 2019), which in turn depress farming communities, people and workers lose their livelihood (Davidson et al. 2016). Ensuring food safety is one of the most important tasks that is always paid special attention by state agencies, considering it an issue of great economic significance, social safety, environment, etc. protect the health of citizens. Businesses in the food supply chain are under increasing pressure to join high value modern chains and implement food safety management regimes to improve their position in the global market. Institutional theory predicts that firms tend to respond to institutional pressures by choosing a governance regime that can conform to established regulatory requirements, industry and social norms. The present study was conducted to assess the impact of institutional pressures on food safety practices.

Talking about globalization and international trade is talking about logistics integration because trade is symbiotically linked with Logistics (Zupaniec, 2022). Logistics plays an important role in the global flow of goods because it links stages in the supply chain such as production and primary processing, distribution and storage. However, since Logistics - compared to production and processing - has no fixed location but takes place across borders, it faces a large number of entities, processes and locations, the diversity of products as well as the complexities in the composition and regulation of each region (Marucheck et al., 2011). Therefore, logistics is often considered a complex system, elusive but contributes greatly to the complexity of the global food supply chain (Zupaniec, 2022). So far, the field of Logistics has not been studied much in terms of food safety (Zupaniec, 2022). And the question is what role logistics has played in food safety events in the past. The lack of information and data on this is reflected in the fact that in the past decades, to improve food safety, the food industry has mainly focused on the production, processing and retail stages of the supply chain – while little attention is paid to the physical flow of goods connecting these stages (Ryan, 2017). However, the variety and complexity due to the large number of aspects of logistics integration (such as logistics-related stakeholders, processes and conditions) have contributed to the overall complexity of the global food supply chain, and can therefore have an impact on food safety practices.

The Law on Food Safety (2010) established guidelines for food cleanliness and safety for companies that specialize in food production in Vietnam. Additionally, this code has measures for penalizing businesses that disobey food safety laws. Despite the fact that the Law on Food Safety (2010) has been in force for a while. However, the Food Safety Department's statistics from 2019 show that there are almost 90,000 enterprises in Vietnam that produce, process, trade, and provide catering services. Inspecting and testing 224,791 facilities between 2012 and March 2019, the authorities discovered that 42.1% of them did not ensure food safety, and 2,109 samples (16.4%) did not fulfill cleanliness criteria. There were 2,213 incidents of food poisoning at collective kitchens nationally from 2012 to March 2017, 297 cases in industrial parks and export processing zones, 118 cases in schools, and 238 cases involving food poisoning from street food. Over 180 tons of food that did not ensure food safety were destroyed after 9,768 cases of food safety violations were handled by the authorities through inspection. The prevalence of food poisoning is on the rise, and it significantly affects public health. The reality of food safety violations in

Vietnam demonstrates the need of this research for ensuring social security and a high standard of living. And another issue that needs to be taken into account in the context of business is whether the institutions and provisions of the law on food safety in Vietnam have put enough pressure on food enterprises. Vietnamese cuisine is taking a more active role in trade and global integration.

In order to solve the issues raised, the present study focuses on analyzing the mediating role of logistics integration in the impact of institutional pressures on food safety practices of Vietnamese food businesses.

2. Literature

2.1. Food safety practices (FSP)

The history of food safety is perhaps as old as human history itself and may have begun with recognizing and then avoiding naturally toxic foods. The first generations developed basic forms of food preservation such as drying, salting, and fermentation. The Chinese preserved vegetables by fermentation in prehistoric times and the Plinius preserved white cabbage in terracotta pots in Italy in the first century AD (Montville and Matthews, 2005). As people's culinary patterns change, food safety becomes a formal issue. The laws of ancient Israel included affirmations of the role of food safety and advice on foods to avoid. The Egyptians, Greeks, and Romans made laws to protect their people from food-related illnesses, such as washing clothes and bathing after slaughtering animals for sacrifice (Mossel et al., 1995). Later throughout history, governments, typically the UK, have passed legislation to protect consumers. Much of this original law was based on the need to prevent food from becoming contaminated with bacteria and to ensure it was prepared correctly.

The concept of food safety is no longer strange to everyone, but not everyone understands this concept as well as its importance to human health and socio-economic development of a country. Food safety is an attribute of the quality of food and it is closely related to suitability for humans (Paparella, 2020), used to describe the handling, processing, preservation and storage of food by measures to prevent and control food-borne illnesses. In a broader sense, food hygiene and safety are all issues that need to be handled related to ensuring food hygiene in order to ensure the health of consumers (Nguyen, 2022). The origin of the concept of food safety is due to microbiological contamination and the growth of pathogenic microorganisms as well as the presence of microbial/biological toxins that make raw materials and goods as well as Processed foods become dangerous and can cause illness in humans.

Food safety practices can be described as “Strategies and activities to protect food from biological, chemical, physical and allergen hazards that can occur during all stages of production, distribution and consumption” (Paparella, 2020). Over the years, the overall increase in foodborne illness outbreaks has been explained only in part by improvements in data collection and diagnosis. On the one hand, globalization and urbanization lead to increased opportunities for pathogen transmission, on the other hand, food product development tends to focus on clean label products where preservatives and barriers safety has been removed.

Over the past few decades, supply chain performance has often been associated with cost, quality, price and delivery conditions and has been applied in the context of non-food industries

(Prajogo and Olhager 2012). However, the nature of product/production and distribution is significantly different in the food supply chain. The effectiveness of food safety practices is measured (1) by assessing organizational structures that support food safety (Luning et al. 2011) and the status of implementing food safety management systems. Later on, a lot of Food Safety Management Systems came into existence to manage food safety in the supply chain, including Hazard Analysis Critical Control Points (HACCP), International Organization for Standardization (HACCP). ISO 22,000, British Retail Consortium (BRC), International Food Standards (IFS), Safe Quality Food (SQF) and Food Safety System Certification (FSSC) 22,000 (Akkerman et al. 2010). A strong organizational structure that supports food safety (Luning et al. 2011) and the implementation of one or more Food Safety Management Systems can effectively enhance food safety practices (Trienekens et al. 2012).

2.2. Institutional pressures (IP)

Food safety institution is a system of mandatory general rules of conduct set by the state and guaranteed to be implemented to regulate social relations arising in the field of food hygiene and safety (Nguyen, 2022). Institutional pressure has three levels (DiMaggio and Powell, 1983): coercive pressure, normative pressure, and imitative pressure. Coercive pressure arises when the rigor of government rules and regulations emerges and the efforts of organizations to comply with them (Wu et al. 2013). Trading partners (e.g. retailers) can also exert coercive pressure on other actors in the supply chain (e.g. manufacturers) to enforce compliance with specific requirements on food safety (Hattersley et al., 2013). Normative pressure is created by business associations as these try to establish rules in their communities (Bhakoo and Choi 2013); Alternatively, it can arise from social obligations when organizations try to do the right thing for society (March and Olsen 1983). Imitation pressure involves firms imitating the success of other firms but with uncertainty (John et al. 2001). In fact, the three aspects of institutional pressure are interdependent; therefore, a single activity or regulation can create three pressures at once (DiMaggio and Powell 1983).

The purpose of food safety regulations is to force businesses to produce higher quality products that are safer for consumers (Antle 1999). Condera et al. (2015) assert that improving food quality and safety, ensuring consumer protection and strengthening consumer confidence are the top priorities of policies and regulations. Law enforcement in the field of food safety and hygiene is a process of activities aimed at making the provisions of the law on food safety and hygiene come into life, becoming actual legal acts of the agencies, organizations and individuals (Nguyen, 2022). The Law on Food Safety (2010) of Vietnam has determined that the subject of regulation of the law on food safety is the social relations arising in the process of production, business, distribution and use of food. . The Law on Food Safety (2010) targets individuals and organizations that produce, trade and consume food. The Law on Food Safety (2010) is a system of codes of conduct issued by the Vietnamese government to regulate the production, business and use of food by organizations and individuals for the purpose of ensuring food safe, clean, safe, not harmful to human health and life. However, Fosu et al. (2017) argues that most surveillance systems in developing countries are often constrained by lack of resources and strict regulations. For example, major food safety regulations relating to pesticide use and compliance with

maximum residue levels of pesticides in agricultural products are often not fully enforced or enacted (Wanwimolruk et al. events, 2015).

Recent studies have noted that institutional pressure can motivate businesses to ensure food safety (Nguyen, 2022; Abebe, 2022). Ng and Salin (2012) also assert that legal responsibility is very important to coordinate the food safety activities of a food business. The food industry is one of the highly regulated; Businesses must respond to such legislative requirements by implementing different food safety practices. Therefore, institutional pressures are expected to promote food safety practices, as hypothesized below:

Hypothesis 1: Institutional pressures have a positive effect on Food safety practices

2.3. The mediating role of logistics integration (LINT)

In recent decades, the logistics industry has grown in tandem with the growth of world trade and is seen as the fuel for globalization (Hess, 2010). Logistics originated from the military supply system (Russell, 2007), later developed into a concept in economics related to the process of providing the right goods, to the right place, in the right quantity, at the right time, right customer, with the right conditions and costs (Plowman, 1964). Logistics integration aims to provide a seamless link for the flow of materials from supplier to processor (Prajogo and Olhager 2012). In the food supply chain, logistics integration is concerned with managing the emergence and growth of microorganisms and food waste as raw materials (or primary) are processed into products, which is the process of from supplier to manufacturer. This is necessary but not sufficient to ensure the quality and safety of the final product.

In a food safety-oriented supply chain, consumer demand can affect both the final distributor and the first players in the chain (Stranieri et al. 2017). Supply chain actors face many transactional risks (Trienekens and Wognum 2013). In the context of the study, Vietnamese food businesses face risks on both the supply and demand side. For example, supply-side risks stem from possibly contaminated input materials, unsafe food products leading to demand-side risks, such as product returns, bad corporate image, and so on. extremes, and the competitiveness of enterprises is reduced in the market.

Food safety rules and institutions not only revolve around the final product for the consumer, but also focus on other activities in the supply chain. For example, the Code of Hygiene Practice describes a method for ensuring the hygiene of ingredients during production, processing, and logistical activities such as transport and storage practices. Accordingly, the Codex General Food Hygiene Principles introduce the use of the Hazard Analysis and Critical Control Point System (HACCP) within all actors involved in the food supply chain. The new principles of the EU Basic Regulations are "farm-to-handle approach" (i.e. unifying food and feed law), "risk orientation", "preventive principle" prevention", "traceability" and "primary responsibility of food/feed businesses" for product safety. Thus, institutional pressure can make logistics activities of enterprises be carried out in a more systematic and synchronous manner towards the goal of food safety in the supply chain. In addition, food safety performance may also depend on intermediate stages such as the implementation of prerequisite programmes, critical monitoring

and control points and compliance procedures (Luning et al. al. 2011, Zupaniec, 2022). Therefore, logistics integration can affect food safety practices. From this, the following hypothesis is formed:

Hypothesis 2: Logistics integration mediates the relationship between institutional pressures and FSP

2.4. The moderating role of Logistics integration

As noted, food safety practices or food safety institutions are not focused on a single actor or stage in the supply chain. They relate to actors, objects, relationships from the beginning to the end of the supply chain, from the supplier to the input materials, the production process, the processing and preservation process to the transfer to the customer. customers and consumers use. Logistics integration helps businesses build a supply chain with synchronous goals, exchange and share information with other entities such as suppliers or customers. From there, the food business can motivate its suppliers to comply with its food safety requirements and principles, as well as take in the needs of customers to improve or enhance products and services in accordance with their requirements. conform to their standards. Thus, if a food business implements logistics integration, it can more successfully withstand institutional pressures and be able to follow strict rules and regulations. Industry can improve and increase food safety practices. In other words, when implementing logistics integration, the more stringent and pressured food safety institutions become, the more businesses increase and improve food safety practices to ensure compliance with those regulations. This relationship is presented as hypothesized below:

Hypothesis 3: Logistics integration moderates the relationship between institutional pressures and food safety practices

2.5. The moderating role of firm size

Ng and Salin (2012) believe that large enterprises have more advantages and more benefits in publicizing food safety practices that exceed the standards required by the institution or the law. The point is that these businesses are larger in size, they have the resources and capacity to respond to and overcome institutional pressures, and even carry out extra food safety enhancement activities that are out of scope. determined request. On the other hand, as highly recognizable businesses, their food safety lapses can result in significant liability, further damaging their business image and financial position. other businesses. For example, in the case of E. coli burgers contaminated with bacteria, Jack's restaurant had to pay court costs and lost revenue of up to 100 million (Martin, 1998). As a result, large businesses have an incentive to implement food safety practices that are higher than government mandated standards because it minimizes the possibility of them incurring brand-image consequences or financial risks. That is, the larger the business, the stronger the institutional pressures on food safety practices. Therefore, the following hypothesis is put forward:

Hypothesis 4: Firm size moderates the relationship between institutional pressures and food safety practices

3. Sample

3.1. Context

The Law on Food Safety (2010) established guidelines for food cleanliness and safety for companies that specialize in food production in Vietnam. Additionally, this code has measures for penalizing businesses that disobey food safety laws. Despite the fact that the Law on Food Safety (2010) has been in force for a while. However, the Food Safety Department's statistics from 2019 show that there are almost 90,000 enterprises in Vietnam that produce, process, trade, and provide catering services. Inspecting and testing 224,791 facilities between 2012 and March 2019, the authorities discovered that 42.1% of them did not ensure food safety, and 2,109 samples (16.4%) did not fulfill cleanliness criteria. There were 2,213 incidents of food poisoning at collective kitchens nationally from 2012 to March 2017, 297 cases in industrial parks and export processing zones, 118 cases in schools, and 238 cases involving food poisoning from street food. Over 180 tons of food that did not ensure food safety were destroyed after 9,768 cases of food safety violations were handled by the authorities through inspection. The prevalence of food poisoning is on the rise, and it significantly affects public health. The reality of food safety violations in Vietnam demonstrates the need of this research for ensuring social security and a high standard of living. And another issue that needs to be taken into account in the context of business is whether the institutions and provisions of the law on food safety in Vietnam have put enough pressure on food enterprises. Vietnamese cuisine is taking a more active role in trade and global integration.

3.2. Data Collecting

The data collection was carried out from August 2021 to July 2022 with two forms: face-to-face survey (fill out survey form) and online survey (Google Forms). The respondents were middle to senior managers of 440 Vietnamese food enterprises. Collected primary data will be filtered and invalidated observations will be removed, obtaining the final 246 observations (reaching the rate of 56%). After that, the study conducted data analysis according to PLS - SEM model using two software SPSS 23 and Smart PLS 3.3.

The number of senior managers participating in the survey accounted for 45% (corresponding to 110 enterprises). This ensures that the survey values will be closer to reality because senior managers will be the ones who understand the goals, activities and relationships of the business in the process of implementing food safety. Products. In terms of business size, the majority of surveyed food businesses are small and medium enterprises (59% of enterprises have less than 200 employees). This result is close to the reality of Vietnamese food enterprises.

Table 1: Descriptive statistics of the study sample

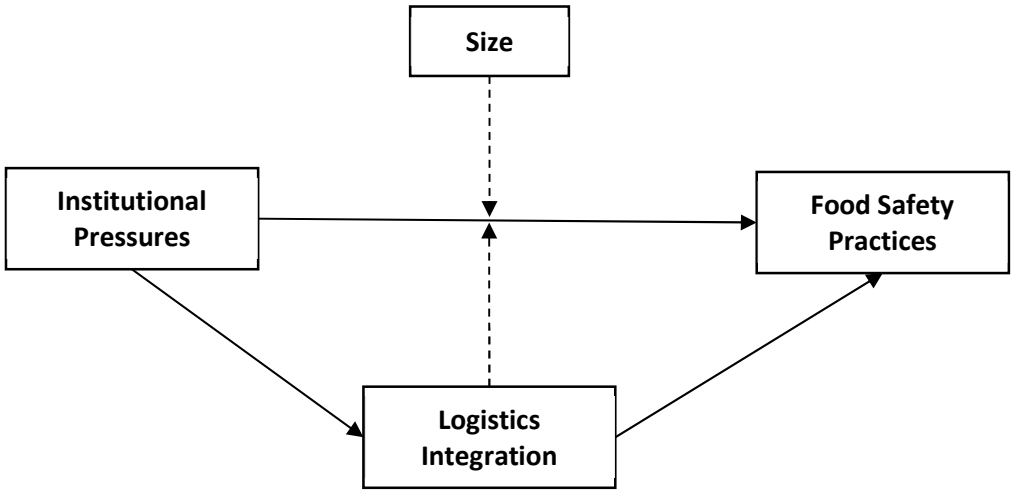
Features	**Amount**	**Ratio**
Job position		
Middle managers	*79*	*32%*
Senior manager	*110*	*45%*
Upper manager	*57*	*23%*
Total	**246**	**100%**

Firm's Location		
North	*96*	*39%*
Central	*44*	*18%*
male	*106*	*43%*
Total	**246**	**100%**
Size (according to the number of employees)		
< 100	*76*	*thirty first%*
[101;200)	*69*	*28%*
[201; 400)	*42*	*17%*
[401; 600)	*32*	*13%*
>600	*27*	*11%*
Total	**246**	**100%**

3.3. Measures

Through the process of synthesizing and analyzing the theoretical basis of the relationship between Institutional Pressures, Logistics Integration and Food Safety Practices, the study proposes the following model:

Figure 1: The conceptual model



In which, **Institutional pressures** is the independent variable, was developed based on research by Qijun and Batt (2016); Prajogo and Olhager (2012), including 7 items (for example: "There are internal and external pressures to implement food safety practices to meet customer requirements"). **Food safety practices** is the dependent variable, was developed based on research by Luning et al. (2015), including 3 items (for example: "Sufciency of information system towards food safety"). **Logistic integration** is both an intermediate and a moderator variable, was

developed based on research by Prajogo and Olhager (2012), including 4 items (for example: "Our inter-organizational logistics activities are closely coordinated").

4. Results

Measurement model

First, the quality of the observed scales is evaluated to eliminate inappropriate items (Hair et al., 2019) through the criterion of Outer loading ≥ 0.7. The results in Table 2 showed that two items: IP4 and IP5 are removed because Outer loading < 0.7. After removing IP4 and IP5, the remaining items all have Outer loading ≥ 0.7, so no more items were removed (Henseler et al., 2009). Next, the reliability was evaluated based on the following criteria: 0.7 ≤ Cronbach's Alpha, Composite Reliability < 0.95 as suggested by Hair et al (2019). The results in Table 2 show that 3 variables (FSP, IP, LINT) all satisfy the criteria of reliability. Besides, the AVE coefficients all ≥ 0.5 also ensure the convergent validity of these 3 variables (Hair et al., 2014).

Table 2: Outer loading, Cronbach's Alpha, Composite Reliability, AVE

	Outer loading [a]	**Outer loading** [b]	**Cronbach's Alpha**	**Composite Reliability**	**AVE**
FSP1	0.835	0.834	0.788	0.876	0.702
FSP2	0.853	0.855			
FSP3	0.826	0.825			
IP1	0.736	0.767	0.863	0.901	0.645
IP2	0.748	0.810			
IP3	0.810	0.826			
IP4	**0.520**				
IP5	**0.501**				
IP6	0.789	0.779			
IP7	0.773	0.834			
LINT 1	0.809	0.810	0.830	0.887	0.663
LINT 2	0.816	0.817			
LINT 3	0.783	0.777			
LINT 4	0.846	0.849			

a: before the items are removed, b: after the items are removed

To evaluate the discriminant validity, this study used the HTMT criterion < 0.85 as suggested by Henseler et al (2015). The results in Table 3 have shown that all variables ensure the discriminant validity because HTMT < 0.85 (Henseler et al., 2015).

Table 3: HTMT

	Food Safety Practices	Institutional Pressures	Logistics Integration
Institutional Pressures	0.268		
Logistics Integration	0.536	0.423	
Moderating Logistics Integration	0.230	0.062	0.159

To evaluate the problem of multicollinearity, the Outer VIF < 3 criterion is used as the most appropriate (Hair et al., 2019). The results in Table 4 show that the Outer VIF values are all less than 3 and thus ensure the multicollinearity problem. Thus, after two items (IP4, IP5) are removed, the measurement model evaluation criteria are all accepted.

Table 4: Outer VIF

	VIF
FSP1	1.605
FSP2	1,721
FSP3	1.647
IP1	1.885
IP2	2.335
IP3	2.358
IP6	1,952
LINT1	1,790
LINT2	1.836
LINT3	1.545
LINT4	2,088

Structural model

First, the R-square coefficient is evaluated. The results in Table 5 show that the structural model explained 32.9% of the variation of FSP. This result, although relatively modest, is acceptable (Hair et al., 2019).

Table 5: R-square

	R Square	R Square Adjusted
Food Safety Practices	0.329	0.315
Logistics Integration	0.133	0.130

Next, the model fit is evaluated. The results in Table 6 show that the two SRMR values are less than 0.08, demonstrating the model fit criteria as proposed by Hu and Bentler (1999). In

addition, the NFI coefficient > 0.8 also shows that this is a pretty good and usable model (Hair et al., 2014).

Table 6: Model Fit

	Saturation Model	Estimated Model
SRMR	0.064	0.066
NFI	0.822	0.835

Through the bootstrap technique, the path coefficients are estimated, and the results of hypotheses testing are obtained (Table 7 and Figure 2). The results show that the hypothesis of direct impact from institutional pressures on food safety practices is supported at the 5% significance level of institutional. This result also shows that increased internal and external pressure will motivate enterprises to improve their ability of food safety practices (because this coefficient has a positive value). In addition, the increased institutional pressure also helps integrate logistics activities better and thereby improves food safety practices. Indeed, the impact of institutional pressures on logistics integration (coefficient = 0.365) and the impact of logistics integration on food safety practices (coefficient = 0.338) are both statistically significant at the 1% level. As such, logistics integration could potentially act as a mediator for the impact of institutional pressures on food safety practices. The mediating role test result is completely confirmed this question (Table 7 – Mediating effect). In summary, the role of Institutional Pressures in Food Safety Practices in food enterprises in Vietnam is important. It not only directly motivates enterprises to implement strategies towards food safety, but also makes enterprises proactively better integrate logistics activities. As a result, enterprises improve their ability to implement food safety practices.

Table 7: Hypotheses testing

	Path coefficients	Standard Deviation	P Values	suppo rt
Institutional Pressures → Food Safety Practices	0.134	0.059	0.024	5%
Institutional Pressures → Logistics Integration	0.365	0.051	0.000	first%
Logistics Integration → Food Safety Practices	0.338	0.065	0.000	first%
Institutional Pressures → Logistics Integration → Food Safety Practices *(Mediating effect)*	0.123	0.028	0.000	first%
Moderating Logistics Integration → Food Safety Practices	0.150	0.054	0.006	first%

Moderating Size → Food Safety Practices	0.144	0.077	0.060	ten%
Size → Food Safety Practices	0.285	0.061	0.000	first%

The moderating role results were also tested in this section. The results in table 7 and figure 2 show that logistics integration has a moderating role in the impact of institutional pressures on food safety practices at the 1% level (p-value = 0.006 < 1%). Firm size, on the other hand, only moderates this effect at the 10% level (p-value = 0.060 < 10%). In general, based on this result, depending on the context of the business (such as size, or ability to integrate logistics), the effectiveness of improving food safety practices from institutional pressures is different. This will be discussed further in the next section.

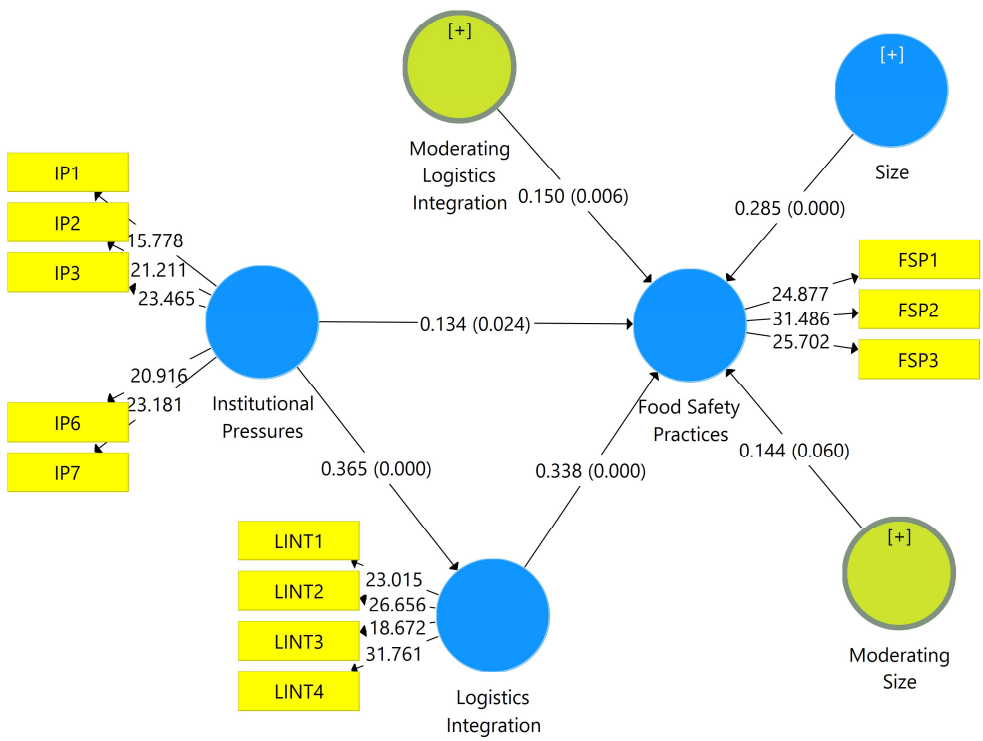


Figure 2: Hypotheses testing

5. Discussion and conclusion

This study empirically examined the effect of institutional pressure on FSP of food businesses in Vietnam. The survey results of 246 food enterprises in Vietnam were used to test the suitability of the proposed research model. The results show that measures of increasing institutional pressure have a positive effect on food safety practice performance. This influence is both direct and indirect. In terms of direct effects, as expected, perceived pressures directly affect the implementation of food safety practices in organizations. The findings suggest that companies can directly improve food safety performance by increasing internal and external pressures within the business. Regarding indirect effects, the mediating role of logistics integration has been discovered. By increasing logistics integration, institutional pressures will push businesses to

improve the culture of food safety practices in food businesses in Vietnam. Food companies have chosen a supply chain approach to deal with food safety risks and save on transaction costs. Along with the trend of economic globalization, the food industry has very high requirements for enterprise logistics integration. The gap between final consumption and production is no longer confined to a single country, and therefore integrated logistics strategies to address this issue in emerging regions are important (Aung and Chang 2014). In general, the implementation of food safety practices is seen as a prerequisite for improving the quality of food safety outputs (Abebe, 2022). Therefore, businesses need to focus first on improving their ability to practice food safety.

Expanding on the role of logistics integration on the impact of institutional pressures on food safety practices, the regulatory role of logistics integration has been confirmed. This result is shown in Figure 3. The results show that when enterprises have good logistics integration (High Logistics), the increase in institutional capabilities can be effective. On the other hand, if enterprises have not well integrated logistics, increasing institutional pressure will not bring about effective food safety practices. This result is consistent with the context of food businesses in Vietnam. When the seamless integration of logistics activities has not been established, institutional pressures will not push businesses to improve FSP because businesses still have to deal with several other problems with customers and suppliers. And perhaps this is similar to the regulatory role of firm size. The results in Figure 3 show that, in the context of large-scale enterprises, the more institutional pressure increases, the more institutional pressure increases. In contrast, for small firms, increased institutional pressure can even lead to a decline in FSP. Large enterprises have the ability to operate more smoothly, when facing increased pressure, they can better improve their ability to deploy FSP.

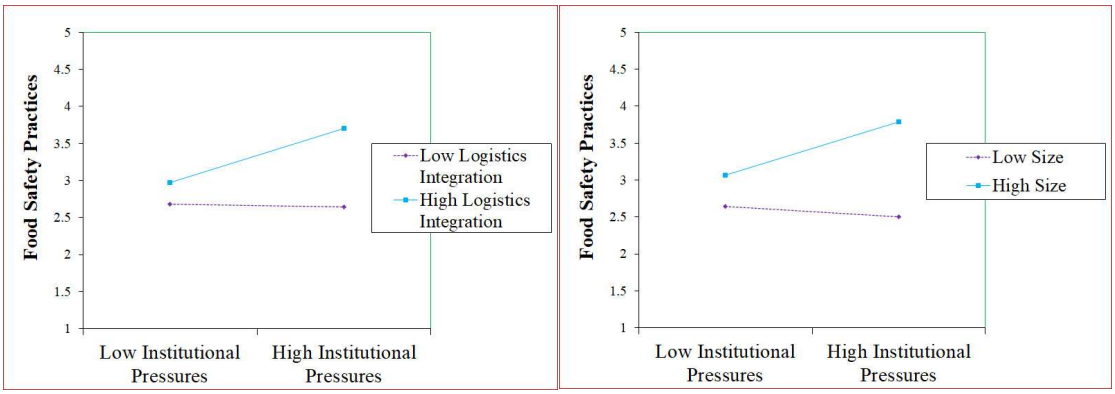


Figure 3: Moderating roles of logistics integration and firm size

In short, increasing institutional pressure needs to be done in the right context to help businesses improve their FSP. This depends on the size and ability to integrate logistics of the enterprise. need to have true and honest businesses assessments of these two aspects in order to make more appropriate economic decisions. Based on the research results, we assess that there are many risks in increasing institutional pressures in small businesses that are not well integrated with logistics. These businesses should approach some other safety solutions such as improving engineering and technology.

From these results, the study makes some suggestions for food businesses on food safety management in Vietnam. First, food manufacturers should maintain and strengthen their relationships with key suppliers by investing in information technology and strategic information sharing. This is the basis for building an integrated agro-food supply chain and improving the ability to face institutional (food safety) pressures. The findings suggest that, amid increasing institutional pressures, businesses cannot improve the performance of food safety without good enough logistics integration and large scale. can increase coordination with partners to create businesses seamless integration in logistics and improve the overall logistics capabilities of enterprises. In addition, food businesses should aim to establish long-term supply relationships, strengthen strategic information sharing, invest in information technology, and integrate logistics with supply chain partners to cope with institutional pressures. From there, businesses can convert these pressures into effective outputs such as improving food safety. The establishment of appropriate institutional pressures by enterprises is also an aspect that can be directed if enterprises assess their logistics integration ability as good and have strong capital bases.

Referencces:

1. Abebe, G. K. (2022). Effects of institutional pressures on the governance of food safety in emerging food supply chains: a case of Lebanese food processors. In Social Innovation and Sustainability Transition (pp. 191-204). Springer, Cham.
2. Akkerman, Renzo, Poorya Farahani, and Martin Grunow. (2010). Quality, safety and sustainability in food distribution: a review of quantitative operations management approaches and challenges. OR Spectrum 32 (4): 863–904.
3. Antle, J. M. (1999). “Benefits and Costs of Food Safety Regulation.” Food Policy 24 (6): 605–623.
4. Aung, M. M., & Chang, Y. S. (2014). Traceability in a food supply chain: Safety and quality perspectives. Food control, 39, 172-184.
5. Bhakoo, Vikram, and Thomas Choi. (2013). The iron cage exposed: Institutional pressures and heterogeneity across the healthcare supply chain. Journal of Operations Management 31 (6): 432–449.
6. Condera, E., G. Constantinescu, A. C. Stanciu, and M. Constandache. (2015). “Particularities of FSSC 22000 – Food Safety Management System.” Journal of Environmental Protection and Ecology 16 (1): 274–279
7. Davidson, Debra J., Kevin E. Jones, and John R. Parkins. 2016. Food safety risks, disruptive events and alternative beef production: A case study of agricultural transition in Alberta. Agriculture and Human Values 33 (2): 359–371.
8. DiMaggio, Paul J., and Walter W. Powell. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational felds. American Sociological Review 48: 147–160.

9. Esteki, M., J. Regueiro, and J. Simal-Gándara. (2019). Tackling fraudsters with global strategies to expose fraud in the food chain. Comprehensive Reviews in Food Science and Food Safety 18 (2)
10. Fosu, P. O., A. Donkor, C. Ziwu, B. Dubey, R. Kingsford-Adaboh, I. Asante, S. Nyarko, R. Tawiah, and N. Nazzah. (2017). "Surveillance of Pesticide Residues in Fruits and Vegetables from Accra Metropolis Markets, Ghana, 2010–2012: A Case Study in Sub-Saharan Africa." Environmental Science and Pollution Research International 24 (20): 17187–17205.
11. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. In European Business Review (Vol. 31, Issue 1). https://doi.org/10.1108/EBR-11-2018-0203
12. Hair, Jr. J. F., Hult, G. T. M., Ringle, C. M., & Rstedt, M. S. (2014). a prımer on partıal least squares structural equation modelling. In Practical Assessment, Research and Evaluation (Vol. 21, Issue 1).
13. Hattersley, Libby, Bronwyn Isaacs, and David Burch. (2013). Supermarket power, own-labels, and manufacturer counterstrategies: International relations of cooperation and competition in the fruit canning industry. Agriculture and Human Values 30 (2): 225–233.
14. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1).
15. Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. Advances in International Marketing, 20
16. Hess, J. (2010). Globalisation? Not Without the Logistics! In Globalisation 2.0, Springer, Berlin, Heidelberg
17. Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1).
18. John, Caron H.St, Alan R. Cannon, and Richard W. Pouder. (2001). Change drivers in the new millennium: Implications for manufacturing strategy research. Journal of Operations Management 19 (2): 143–160.
19. Luning, P.A., W.J. Marcelis, J. Rovira, M.A.J.S. van Boekel, M. Uyttendaele, and L. Jacxsens. (2011). A tool to diagnose context riskiness in view of food safety activities and microbiological safety output. Trends in Food Science & Technology 22: S67–S79.
20. March, James G., and Johan P. Olsen. (1983). The new institutionalism: Organizational factors in political life. American Political Science Review 78 (3): 734–749.
21. Martin, R. (1998). Foodmaker settles E. coli contamination law suit. Nation's Restaurant News, 216-231.
22. Martin, R. (1998). Foodmaker settles E.coli contamination law suit.

23. Marucheck, A., Greis, N., Mena, C., & Cai, L. (2011). Product safety and security in the global supply chain: Issues, challenges and research opportunities. Journal of Operations Management, 29(7-8), 707-720.
24. Montville, T.J. and Matthews, K.R. (2005), Food Microbiology: An Introduction, ASM Press, Washington DC.
25. Mossel, D.A.A., Corry, J.E.L., Struijk, C.B. and Baird, R.M. (1995), Essentials of the Microbiology of Foods: A Textbook for Advanced Studies, John Wiley & Sons, Chichester
26. Paparella, A. (2020). Food safety: definitions and aspects. Food safety hazards, 1.
27. Plowman, E. G. (1964). Lectures on elements of business logistics, Stanford, Calif.: Stanford University, Graduate School of Business.\
28. Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. International Journal of Production Economics, 135(1), 514-522.
29. Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. International Journal of Production Economics, 135(1), 514-522.
30. Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. International Journal of Production Economics, 135(1), 514-522.
31. Prajogo, Daniel, and Jan Olhager. (2012). Supply chain integration and performance: The efects of long-term relationships, information technology and sharing, and logistics integration. International Journal of Production Economics 135 (1): 514–522.
32. Russell, S. H. (2007). Supply chain management: more than integrated logistics. Air Force Journal of Logistics, 31(2), 56-64
33. Ryan, J. M. (2017). Guide to Food Safety and Quality During Transportation: Controls, Standards and Practices, Academic Press, Cambridge.
34. Stranieri, Stefanella, Luigi Orsi, and Alessandro Banterle. (2017). Traceability and risks: an extended transaction cost perspective. Supply Chain Management: An International Journal 22 (2): 145–159.
35. Trienekens, Jacques, and Nel Wognum. (2013). Requirements of supply chain management in diferentiating European pork chains. Meat Science 95 (3): 719–726.
36. Trienekens, Jacques, and Nel Wognum. (2013). Requirements of supply chain management in diferentiating European pork chains. Meat Science 95 (3): 719–726.
37. van Asselt, E. D., Meuwissen, M. P. M., van Asseldonk, M. A. P. M., Teeuw, J., & Van der Fels-Klerx, H. J. (2010). Selection of critical factors for identifying emerging food safety risks in dynamic food production chains. Food Control, 21, 919-926.
38. Wanwimolruk, S., O. Kanchanamayoon, K. Phopin, and V. Prachayasittikul. (2015). “Food Safety in Thailand 2: Pesticide Residues Found in Chinese Kale (Brassica

oleracea), a Commonly Consumed Vegetable in Asian Countries." Science of the Total Environment 532: 447–455.

39. Wu, Ting, Elizabeth M. Daniel, Matt Hinton, and Paul Quintas. (2013). Isomorphic mechanisms in manufacturing supply chains: A comparison of indigenous Chinese frms and foreign-owned MNCs. Supply Chain Management: An International Journal 18 (2): 161–177.
40. Zupaniec, M. A. How logistics contribute to the complexity of global agri-food supply chains and thus to potential food safety risks–Experience gained by a sector stakeholder case study based on a conceptual framework for global agri-bulk commodity flows.