Global Business and Management Research: An International Journal
Vol. 17, No. 1 (2025)

Developing a Halal Compliance Framework: The Case of Food Manufacturing and Processing

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Abstract
Purpose: The Halal industry is one of the fastest-growing global markets, driving food companies to improve their production processes to meet Halal standards. These companies are subject to monitoring and regulation by relevant Halal authorities, whether private or public. This study aims to develop a Halal compliance framework grounded in the economic theory of deterrence.
Design/methodology/approach: The literature in food economics shows that the likelihood of food risks resulting from malpractice or non-compliance increases with the potential profits from opportunistic behaviour. Although *halal* industry is highly regulated and routinely inspected, little is known about compliance behaviour amongst food producers. This study proposes a Halal compliance framework based on the fundamental theories of crime deterrent, legitimacy, morality and market forces.
Findings: An econometric model was developed based on the proposed framework.
Research limitations/implications: This framework can be used to explore Halal compliance behaviour in food processing and manufacturing firms, as well as to examine the effectiveness of the regulatory control in place.
Practical implications: This model can be used to identify which of the regulatory, morality and market-based factors most significantly influence Halal compliance attitudes in food processing and manufacturing. Based on these insights, targeted incentives can be designed and implemented to effectively promote and reinforce compliance within the industry.

Originality/value:

Keywords: *Halal* compliance, crime deterrent, legitimacy, morality, food risks

Introduction

The *Halal* industry is the fastest-growing global business across the world, expanding proportionately with the increasing number of Muslim populations, which is growing at an above-average rate (Pew Research Center, 2015). Halal, meaning "permitted" or "lawful" in Islam, refers to actions and items permissible under the *Shari'ah* law, usually associated with the food that Muslims are allowed to consume. According to Joe Regenstein of Cornell University, food companies will not achieve global reach unless they meet Halal standards (Power & Gatsiounis, 2007). As a result, these companies are expected to enhance their production processes to align with Halal requirements and ensure the authenticity of halal products. To maintain Halal integrity, these food companies are monitored and regulated by the relevant *Halal* authority, either a private or public authority.

Although the *halal* industry is highly regulated and routinely inspected, little is known about the compliance behaviour within this industry. Ensuring halal authenticity has become a significant challenge for consumers, as food production grows increasingly complex, and Muslims have limited control over the entire supply chain. Given that halal quality is a credence attribute (Verbeke, Rutsaert, Bonne & Vermeir, 2013), consumers find it difficult to ascertain halal quality with certainty, leading to market inefficiencies.

Recent years have seen a rise in public concern over food risks, driven by numerous food scares, including the potential contamination or exposure to hazardous elements. Food risks can arise from either technological hazards or moral hazards. Technological hazards stem from genuine gaps in knowledge regarding the effects of certain processes and substances, or safety breakdowns due to unintentional human or technical failures. In contrast, moral hazards occur when self-interested upstream sellers engage in opportunistic economic behavior, deliberately violating rules because many food quality attributes remain uncertain to downstream buyers. The presence of information asymmetry in the food industry is often exploited by these sellers for profit, leading to market failure, with a high probability of inferior or harmful food circulating, including non-halal food being falsely labeled or assumed as halal. In the halal industry, food producers are economic agents assumed to act rationally in their decision-making. Their compliance with specific standards and regulations depends on their assessment of the expected returns from different actions, weighing the associated costs and benefits. The food economics literature suggests that the likelihood of food risks caused by malpractice or non-compliance increases with the potential profit from opportunistic behaviour. Some scholars argue that misaligned incentives are a major source of food risks, particularly in imperfect markets with weak regulatory systems (Hennessy, Roosen, & Jensen, 2003; Hirschauer & Zwoll, 2006), where non-compliance becomes more profitable than adherence. This study proposes a framework for halal compliance based on the theories of crime deterrence, legitimacy, morality, and market forces. The framework is employed to explore compliance behaviour in food processing firms and examine the mechanisms of regulatory control in place. However, the focus of this paper is limited to the conceptual aspects of the study

Literature Review

Business compliance behaviour

Understanding the motivations that drive business compliance with standards and regulations is essential for developing effective strategies to enhance *halal* and food safety compliance among food businesses. The food safety literature identifies a range of strategies used by authorities to control and monitor compliance. Two primary approaches are frequently highlighted: one that emphasizes regulations and their enforcement, and another that focuses on the normative perspectives of firms towards regulations.

Regulatory compliance

A scientific study on people's motivation for compliance, grounded in rational theory, was first documented in Becker's seminal work (1974), which explains rule-breaking behaviour through the lens of economic rationality. Becker's deterrence hypothesis posits that decision-makers in businesses evaluate the costs and benefits of their actions, choosing to comply with regulations when the expected penalties for non-compliance outweigh the potential benefits

The expected penalty is calculated by discounting the anticipated sanction by the probability of detection and punishment, as employed in formal enforcement mechanisms such as prosecutions, statutory notices and civil sanctions (Greenstreet Berman, 2011). These enforcement actions are presumed to have both specific and general deterrent effects that

promote compliance within the regulated community. Specific deterrence refers to the impact of an enforcement action on the individual offender, while general deterrence refers to the broader impact on the public involved in the regulated activity.
Becker, as a rationalist, along with other proponents of this view, follows the logic of consequences in interpreting offenses. They argue that compliance through deterrence can be strengthened either by increasing penalties, raising the frequency of inspections to enhance the likelihood of detection, or altering legal rules to improve the probability of conviction. A well-calibrated set of sanctions is believed to be capable of deterring nearly all offenses.

Normative Compliance

Unlike rational economic theorists, who focus on self-interest and advocate for formal control systems based on rules and punishments, social control theorists emphasize the importance of informal control through social norms. Social norms refer to common values that exist in society, which form the basis for developing social patterns that guide relationships among individuals and businesses alike. Informal control relies on established social patterns between the regulator and the subject of regulation to administer the substantive remedial rules of control and to influence future adherence to the rules (Ellickson, 1987). These social patterns provide grounds for communicating the regulations that are to be upheld, the reward and punishment system that supports the regulations, and the legitimate power of the controller to enforce the regulations (Laufer & Robertson, 1997).
Social control theorists follow the logic of appropriateness (Grossman & Zaelke, 2005). They view regulated parties as good-faith actors who want to obey law but might face some limitations, which curb their capacity to follow regulations such as lack of knowledge of the rules, and lack of financial and technology ability to comply (Fairman & Yapp, 2004; Yapp & Fairman, 2005, 2006; Amodu, 2008). Despite these limitations, they believe that firms comply because of "compliance norms" stemming from the belief that laws that are developed and implemented fairly should be followed. This belief is often referred to as the normative perception of compliance, which encompasses personal morality and legitimacy. Normative commitment through personal morality means obeying a law because one feels that it is just, while normative commitment through legitimacy means obeying a law because one believes the authority enforcing it has the rightful power to dictate behaviour (Levi, Sacks, & Tyler, 2009; Tyler, 1990, 2006, 2024; Teichmann & Wittmann, 2024). Both personal morality and legitimacy promote voluntary compliance. Individuals are more likely to follow rules voluntarily when they perceive them as appropriate and feel personally committed to upholding them, regardless of the risk of punishment. should behave accordingly. Under the normative model, these compliance norms influence behaviour even in the absence of legal sanctions.

Market forces

Market pressure is also a crucial enforcement mechanism. Although compliance with certain standards may impose costly initial investments for food businesses, achieving certification can expand market access, while violations can lead to a loss of market share. To protect their business and market share, firms are expected to act rationally by adhering to standards and regulations. Unlike traditional regulatory enforcement, market pressure operates through economic incentives within supply chains. If a violation is detected, a firm risks losing access to markets and contracts (Priest, 2015). Strong market pressure can result in substantial punishment for non-compliant firms, such as investors' divestment and consumers' boycott (Nyiwul, Shittu, & Dhanda, 2015). However, market pressure often depends on regulatory monitoring to signal a firm's compliance status. This means that market punishment is applied only if the regulator discovers that the firm has violated the standard. Fear of negative publicity

and its impact on market reputation has been identified as a significant motivator for compliance, particularly among larger firms. Reputational sanctioning, such as regulatory disclosure, naming and shaming, can be more effective than traditional penalties or legal actions in deterring regulatory offences and encouraging compliance (Fisse & Braithwaite, 1993; van Erp, 2008; Preble & Early, 2024). Reputation is a critical form of capital, often considered more valuable than financial capital, because while financial losses can be recovered, rebuilding a damaged reputation is far more challenging. Firms convicted of committing crimes or offences risk a loss of reputation and future business opportunities. The marketplace indeed penalizes firms for fraudulent activity, particularly when customers are the victims. For example, a firm convicted of falsifying documents might be viewed as untrustworthy by its customers. Likewise, a firm known for producing halal products convicted of not following halal requirements may be boycotted by Muslim customers. Consequently, reputational risk can serve as a strong incentive for businesses to comply with regulations, especially in the food industry, where consumer perceptions of food safety and handling practices are critical to decision-making.

Theoretical Framework

The Halal compliance framework is built on a combination of Becker's economic deterrence theory (Becker, 1974), normative theories from social psychology (Levi et.al., 2009; Tyler, 1990, 2006, 2024) and market forces perspectives. This framework (refer to **Figure 1**) identifies three key factors influencing food businesses' decisions to adhere to halal practices: regulatory compliance, normative compliance and market forces.

Regulatory compliance is represented by the likelihood of non-compliance being detected by authorities, the expected severity of the penalties if caught, and the potential economic benefits of disregarding *halal* practices. Normative compliance, on the other hand, stems from the moral obligation and perceived legitimacy of the regulations. This dimension explains a firm's voluntary compliance, driven by internal motivation, when they believe in the legitimacy of the law and regulators, and when obeying the law aligns with their moral values (Hamid, Hirnissa & Gani, 2024). Meanwhile, market forces refer to the perceived market pressures that compel firms to follow *halal* practices strictly, as failure to do so could result in a loss of business. The halal industry is largely consumer-driven, indicating that consumers exert a strong influence on firms' decision to adopt halal practices and consistently follow halal regulations (Ab Talib & Ai Chin, 2018; Akram, H. W., 2020; Amalia, et.al., 2023; Najmi, Ahmed & Jahangir, 2023).

Regulatory compliance reflects the effectiveness of the enforcement mechanisms within the halal industry. If the regulatory enforcement system is robust, food businesses, such as poultry slaughtering and food processing firms – have less incentive to violate the halal practices. These businesses are likely to respond by strengthening their halal *assurance* system to address any non-compliance issues effectively. Conversely, if the enforcement mechanisms are weak, firms may find greater incentive to disregard *halal* practices as the economic gains of non-compliance outweigh the costs of being penalized or prosecuted.

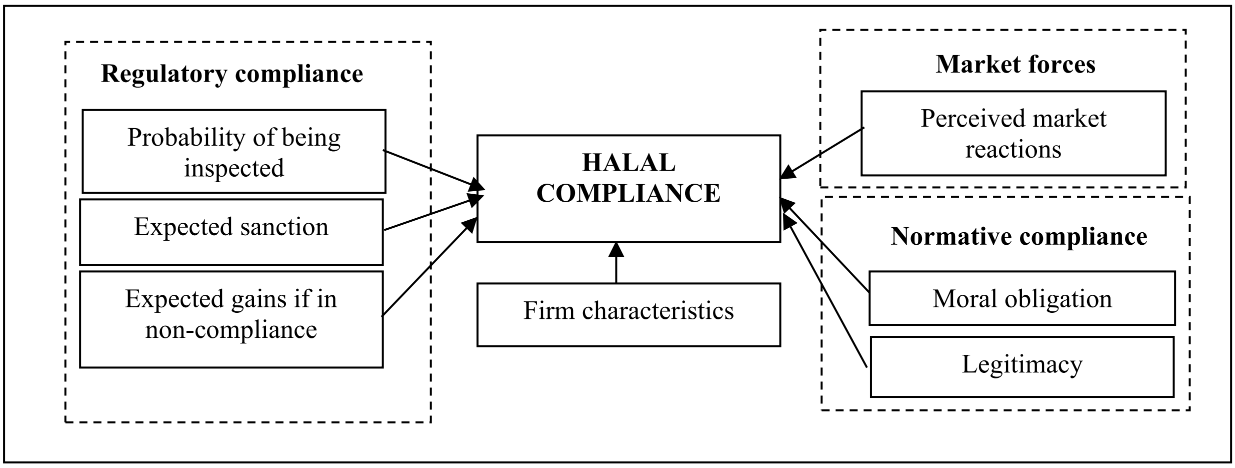

Figure 1: Halal Compliance Theoretical Framework

Econometric Model

Basic Model

Studies on compliance behaviour in economics often draw from Becker's (1974) model of criminal behaviour. This model frames an individual's utility function in terms of the expected costs and benefits of legal versus illegal actions, considering a given budget constraint. Rooted in decision-making theory under risk, the model posits that an individual's utility is influenced by the probability of being caught, convicted, and sanctioned for illegal activities. Given that these probabilities are uncertain, so too is the net payoff from illegal behaviour. Furthermore, both the potential gains and the penalties from such activities are typically uncertain in practice. The expected utility from illegal behaviour, denoted as $EU(V)$, depends on the expected monetary gain from the illegal act (Y), the expected monetary penalty (F), and the probability of being caught and convicted (p), as expressed in the following standard form:

$$EU(V) = pU(Y - F) + (1 - p)U(Y) \quad \ldots\ldots (1)$$

Where:

$EU(V)$ is the expected utility that resulted from deviant behaviour
$U(\cdot)$ represents the utility function
Y denotes income, in terms of monetary and psychic, from deviant behaviour
F denotes monetary equivalent punishment for deviant behaviour
p is the probability of being caught and being convicted of deviant behaviour

From this, we derive:

$$\frac{\partial EU}{\partial p} = U(Y - F) - U(Y) < 0$$

and

$$\frac{\partial EU}{\partial F} = -pU(Y - F) < 0$$

assuming the marginal utility of income is positive. This implies that an individual is more likely to break the law when the returns from illegal activity (Y) exceed the financial penalty (F).

It is often assumed that if caught and convicted, the illegal income, *Y*, will be forfeited, thus, the resultant sign of *(Y-F)* will be problematic in explaining marginal conditions (Hatcher, Jaffry, Thebaud, & Bennett, 2000). Acknowledging this problem, the formulation of the expected utility function in terms of deviation from an existing level of wealth, *W*, as proposed by (Brown & Reynolds, 1973) is more appropriate than *(Y-F)*, thus

$$EU(V) = (1-p)U(W+Y) + pU(W-F) \quad \text{(2)}$$

In this study, the focus is on examining malpractices related to the violation of halal requirements in a food processing firm. Compliance with the halal requirements can be represented by a certain outcome $U = U(W_0)$. The expected utility from violating this standard depends upon the anticipated monetary gains (*Y)*, the perceived likelihood of sanction (*p)*, the expected penalty size (*F)*, and the individual's degree of risk aversion. The decision to violate the standards will be influenced by these variables, leading to a violation function (V), that can be expressed as:

$$V = f(Y, p, F, \boldsymbol{X}) \quad \text{(3)}$$

where $\boldsymbol{X}$ represents a vector of other variables, including personal characteristics such as the individual's existing level of wealth and their willingness to engage in illegal acts (Becker, 1974). Becker's model also incorporates both monetary and psychic costs and benefits of legal and illegal activity, but only to the extent that these can be quantified in monetary terms.

Extensions of the Basic Model

Dowell, Goldfarb, & Griffith (1998) provided a theoretical basis for incorporating normative factors in the utility function, which supports its inclusion in the compliance model discussed earlier. They expanded the utility function to account for the moral content of a household, suggesting that the utility derived from consuming a given commodity bundle is influenced by the household's moral behaviours. Specifically, the utility function is defined as $U = U(\bar{X}, H)$, where *H* represents some moral values such as honesty, so, $^{\Delta U}/_{\Delta H} > 0$. Moral values cause a shift in the utility from the consumption of a given set of goods depending on the moral content of the individual's behaviour. The utility function is higher for any commodity bundle if the household behaves morally. Immorality generates guilt, which lowers household consumption of the resulting commodity bundle. Thus, a morally conscious producer will avoid violating halal practices if the guilt from earning extra income through such actions outweighs the financial benefits.

Following this approach, the expected utility of additional income from violating halal practices can be expressed as

$$EU(V) = m(M)[(1-p)U(W+Y)] + pU(W-F) \quad \text{(4)}$$

Wher$m(\cdot)$ is a decreasing function, $(1 \geq m(\cdot) \geq 0)$hat represents the influence of moral norm on compliance measured by an index *M*. Smaller values of *M* correspond to weaker moral judgments, where violations are perceived as only slightly wrong, while large values indicate stronger moral judgment, where violations are perceived as very wrong. The function *m(M)*

could be linear or a smooth non-linear function, or *m(M)* could be changing in *M*, so that hit hhas only small marginal utility costs until a point is reached where the value of *m(M)* decreases more rapidly. In an extreme case, the value of*(M)* could be a discontinuous function taking on the values 0 or 1. In any case, f $m(\cdot) = 1$ (no moral obligation to comply), then, $EU(V) = m(\cdot) = 0$ (an absolute moral obligation to comply), then $EU(V) = 0$.

Similar reasoning is applied to incorporate external market pressure and food businesses' perceptions of the legitimacy of regulations. In brief, a function *s(S)* is incorporated into the model to measure the effect of market forces, where *S* is an index representing subjective market pressures from consumers, trading partners and competitors. Market forces are considered effective enforcement mechanisms, as businesses fear losing access to key markets and contracts, which are crucial for survival in a competitive environment. Similarly*, L (L)* is incorporated to measure the effect of the perceived legitimacy of regulations, where *L* is an index of legitimacy. The propensity to comply is expected to be greater when regulations are perceived as legitimate.
The expected utility function then becomes:

$$EU(V) = m(M)s(S)l(L)[(1-p)U(W+Y)] + pU(W-F) \quad \ldots\ldots (5)$$

with the condition:

$$0 < EU(V) < (1-p)U(W+Y) + pU(W-F)$$

The individual's supply of violations function can thus be expressed as:

$$V = f(Y, p, F, M, L, S, X) \quad \ldots\ldots (6)$$

Based on the extension of Becker's model, this study will employ the following econometrics model:

$$V_i = f(Y_i, D_i, Y_i, M_i, L_i, S_i, X_i)$$

where:

- ***V*** represents the violation of certain rules and regulations,
- ***D*** include deterrent factors such as the probability of inspection and the severity of punishment,
- ***Y*** denotes the expected gains from non-compliance,
- ***M*** reflects the moral obligation to follow rules and regulations,
- ***L*** represents perceived legitimacy of the authority,
- ***S*** captures perceived market forces
- ***X*** includes the firm's characteristics.

The study focuses on testing the following hypotheses:

1. $\frac{\partial V_i}{\partial Y_i} > 0$: The higher the expected economic benefit of disregarding halal practices, the greater the likelihood of non-compliance in food processing firms.

2. $\frac{\partial V_i}{\partial D_i} < 0$: The stronger the effect of deterrence factors, such as higher probability of detection and severe punishment, the less the occurrence of non-compliance with halal regulations.
3. $\frac{\partial V_i}{\partial M_i} < 0$: The stronger the sense of moral obligation among food operators and food processing businesses, the less the occurrence of non-compliance with the halal regulations.
4. $\frac{\partial V_i}{\partial L_i} < 0$: : The more positive judgment concerning the legitimacy of halal regulations and halal authorities, the less the occurrence of non-compliance with the halal regulations.
5. $\frac{\partial V_i}{\partial S_i} < 0$: The stronger the expectation of market reactions against halal violations, the less the occurrence of non-compliance with the halal regulations.

Conclusion

A holistic approach in regulating *halal* should be initiated to protect both the consumers and the reputation of the industry. Apart from regulation, voluntary compliance stemming from the moral obligation of the food business operators and the legitimacy that they accord to regulators and regulations provides substantial effect and less cost in securing *halal* adherence. Additionally, consumers' power is also important in dictating to food businesses to sustain their *halal* practices. Understanding the relationships and interactions of these three compliance factors will offer insights into the relevant incentives needed to strengthen the existing regulatory and control system to ensure halal integrity. For Malaysia to maintain its position as a leader in the global *halal* market, it must demonstrate a strong commitment to fostering the growth of the *halal* market, which should be reflected in the commitment of local industrial players to consistently adhere to and comply with standard *halal* practices and regulations.

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