Independent Commissioners and Institutional Ownership as Game-Changers: Mitigating the Impact of Financial Determinants on Tax Avoidance in Pakistan's Food Manufacturing Sector

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Abstract
This study examines the impact of profitability, liquidity, leverage, and firm size on tax avoidance in PSX-listed food manufacturing companies (2018–2022), with independent commissioners and institutional ownership as moderators. **Novelty** lies in integrating these financial determinants with governance moderators in a single framework within Pakistan's under-researched food manufacturing sector, using cash effective tax rate (CETR) as a robust proxy. The research employs purposive sampling (58 firms, 290 observations) and multiple linear regression with two models: direct effects and interaction effects. Results indicate that profitability, leverage, and firm size significantly increase tax avoidance, while liquidity shows no effect. Independent commissioners and institutional ownership reduce avoidance and moderate the relationships by weakening positive financial drivers and strengthening liquidity's compliance role. These findings support agency theory, highlighting governance's role in mitigating agency conflicts. Implications include recommendations for regulators to enhance board independence and institutional monitoring to improve tax compliance and fiscal sustainability in emerging economies.
Keywords: tax avoidance, profitability, leverage, firm size, independent commissioners, institutional ownership, corporate governance, agency theory, Pakistan
JEL Codes: H26, G34, G32, M41

1. INTRODUCTION

Tax avoidance represents a critical and enduring issue in corporate finance, attracting substantial attention in both academic scholarship and political discourse due to its implications for fiscal revenue, economic equity, and corporate governance (Huseynov & Klamm, 2012). Tax avoidance differs from illegal tax evasion by involving legal strategies that exploit loopholes in tax regulations to minimize a company's tax liability without violating the law (Wilson, 2009; Lisowsky, 2010; Oats & Tuck, 2019). Governments worldwide rely heavily on corporate tax contributions to fund public services and infrastructure; however, aggressive tax planning reduces these revenues, straining national budgets and public welfare. In Pakistan, a developing economy characterized by low tax-to-GDP ratios, weak enforcement mechanisms, limited tax literacy, strained taxpayer-authority relations, and an informal economic sector, tax avoidance and evasion pose particularly severe challenges (Mughal, 2012; World Bank estimates cited in The News, 2019). Achieving higher tax compliance could significantly boost GDP growth, yet persistent avoidance undermines fiscal stability and equitable resource distribution.

From a corporate perspective, taxes function as unavoidable operational costs that erode profits. Firms, driven by the objective of profit maximization, engage in tax planning to optimize after-tax earnings while navigating legal boundaries (Campbell et al., 2020; Chen et al., 2019). Key financial characteristics such as profitability (measured by Return on Assets, ROA), liquidity (via Current Ratio), leverage (debt-to-assets ratio), and firm size (natural log of total assets) play pivotal roles in shaping tax avoidance decisions. Highly profitable firms face greater tax burdens and possess resources to employ sophisticated advisors for avoidance strategies (Sumantri et al., 2022; Chen et al., 2014; Eichfelder & Hechtner, 2018). Firms with strong liquidity may prioritize compliance to meet obligations, while leveraged firms benefit from interest deductions that shield income from taxation (Richardson & Lanis, 2007). Larger firms, with greater resources and complexity, may exploit opportunities for avoidance, though heightened regulatory scrutiny can encourage compliance in some contexts (Oktrivina, 2022; Dyreng et al., 2008).

Corporate governance mechanisms further influence these dynamics. Independent commissioners provide objective oversight to curb managerial opportunism, while institutional ownership fosters monitoring by sophisticated investors, potentially deterring aggressive tax practices (Armstrong et al., 2015; Hasan et al., 2022). In emerging markets like Pakistan, where agency problems and weak institutional environments prevail, these governance elements may moderate the relationships between financial factors and tax avoidance, either constraining or enabling such behaviors depending on their effectiveness.

Empirical research on tax avoidance in Pakistan remains limited, particularly concerning manufacturing firms listed on the Pakistan Stock Exchange (PSX). Existing studies often focus on broader economic impacts, policy interventions, or isolated factors like CSR, economic uncertainty, or monetary policy, with fewer integrating multiple financial determinants alongside governance moderators in the manufacturing sector (e.g., recent works on tax avoidance and sustainable performance or fiscal policy effects). This scarcity is notable given the sector's economic significance and vulnerability to tax pressures in a low-compliance environment.

This research introduces novelty by examining the direct effects of profitability, liquidity, leverage, and firm size on tax avoidance among PSX-listed food manufacturing companies (2018–2022), while incorporating the moderating roles of independent commissioners and institutional ownership. Unlike prior studies in Pakistan that predominantly address direct relationships or external factors (e.g., economic uncertainty or CSR), this study integrates internal financial drivers with key corporate governance mechanisms as moderators in a single framework. By focusing on a specific high-relevance sub-sector (food manufacturing) and employing cash effective tax rate (CETR) as a robust measure of avoidance, it addresses gaps in contextualized, governance-moderated analyses within a developing economy marked by unique institutional challenges. This approach enriches understanding of how governance can constrain or amplify financial incentives for tax avoidance, offering fresh insights for theory and policy in emerging markets.

Building on this novelty, the present study aims to analyze the influence of profitability, liquidity, leverage, and firm size on tax avoidance practices in PSX-listed food manufacturing companies, while investigating how independent commissioners and institutional ownership moderate these relationships. Through this integrated examination, the research seeks to provide a comprehensive understanding of the interplay between financial characteristics and governance in shaping tax behavior, ultimately contributing actionable insights for regulators, investors, and corporate managers to promote compliance, enhance fiscal sustainability, and strengthen corporate governance in Pakistan's manufacturing landscape.

2. LITERATURE REVIEW
2.1. Theory, Previous Study and Hypothesis Development
2.1.1. Agency Theory

Agency theory provides a foundational framework for understanding the relationships examined in this study, particularly the conflicts of interest between principals (shareholders) and agents (managers) in corporate settings (Jensen & Meckling, 1976). According to agency theory, managers (agents) may pursue their own interests at the expense of shareholders (principals) due to information asymmetry and differing goals. In the context of tax avoidance, managers may engage in aggressive yet legal tax planning strategies to maximize firm value and personal compensation tied to after-tax performance, thereby reducing tax liabilities and increasing net profits available for dividends or reinvestment (Desai & Dharmapala, 2006). However, such actions can also serve opportunistic motives, such as extracting private benefits or shielding earnings from scrutiny, which may not align with long-term shareholder interests (Chen et al., 2010).

The theory posits that effective corporate governance mechanisms such as independent commissioners and institutional ownership serve as monitoring tools to mitigate agency costs. Independent commissioners, being detached from management, provide objective oversight and reduce the likelihood of self-serving tax avoidance behaviors by enforcing transparency and compliance with tax regulations (Lanis & Richardson, 2011; Armstrong et al., 2015). Similarly, institutional investors, with significant stakes and expertise, actively monitor managerial decisions through voting power and engagement, discouraging excessive tax aggressiveness that could harm firm reputation or invite regulatory penalties (Khan et al., 2017; Hasan et al., 2022).

In emerging markets like Pakistan, where ownership is often concentrated, legal enforcement is relatively weak, and information asymmetry is pronounced, agency problems are amplified (La Porta et al., 1999). This environment creates greater opportunities for managers to exploit tax loopholes for personal gain rather than shareholder value maximization. Consequently, agency theory predicts that financial characteristics such as high profitability, leverage, and firm size may incentivize tax avoidance as a means to align with shareholder wealth maximization, while strong governance structures moderate these tendencies by aligning agent actions more closely with principal interests. The application of agency theory is particularly relevant to this study's focus on PSX-listed food manufacturing companies. Profitability may drive avoidance to enhance reported earnings and managerial bonuses, leverage may be used to create tax shields that benefit shareholders but also increase risk, and larger firm size may enable sophisticated planning that managers exploit unless constrained by independent boards or institutional monitors. By integrating agency theory, this research explains not only the direct financial drivers of tax avoidance but also how governance mechanisms reduce agency costs and promote ethical tax compliance in a developing economy context.

2.2. Tax Avoidance

Tax avoidance refers to the strategic use of legal mechanisms, loopholes, and permissible tax planning techniques to minimize a company's tax liability while remaining compliant with existing laws and regulations (Oats & Tuck, 2019; Dyreng et al., 2008). It encompasses a range of activities, including careful structuring of transactions, utilization of tax incentives, deductions, credits, and deferral strategies, all designed to reduce the effective tax rate without crossing into illegal tax evasion (Armstrong et al., 2015; Badertscher et al., 2011). Unlike tax evasion, which involves deliberate misrepresentation or concealment to violate tax laws, tax avoidance operates within the legal framework but often exploits ambiguities or "grey areas" in tax codes (Kim & Im, 2017). In developing economies like Pakistan, tax avoidance contributes significantly to revenue shortfalls, exacerbating fiscal deficits and limiting government capacity for public investment (Mughal, 2012). Firms engage in avoidance to enhance after-tax profitability, shareholder value, and competitive positioning, though it carries reputational, regulatory, and penalty risks (Desai & Dharmapala, 2006; Baudot, 2020). The cash effective tax rate (CETR), calculated as cash taxes paid divided by pre-tax cash flow or earnings, serves as a reliable proxy for avoidance, as it captures actual cash outflows less susceptible to accounting manipulations (Asalam & Pratomo, 2020; Dyreng et al., 2008). Lower CETR values indicate higher levels of tax avoidance. Empirical studies highlight that avoidance is influenced by firm-specific financial characteristics and governance structures, with varying outcomes across contexts, particularly in emerging markets where enforcement is often weaker.

2.3. Profitability and Tax Avoidance

Profitability, typically measured by Return on Assets (ROA = Net Income / Total Assets), reflects a firm's efficiency in generating earnings from its asset base (Qureshi & Siddiqui, 2020; Kovalchuk & Verhun, 2019). Higher profitability signals stronger operational performance and greater pre-tax earnings, which in turn amplify the tax burden under progressive or proportional tax systems. This increased exposure motivates management to pursue aggressive yet legal tax minimization strategies to preserve net profits and enhance shareholder returns (Sumantri et al., 2022; Chen et al., 2014). Profitable firms often possess the financial resources to engage professional tax advisors, consultants, and legal experts capable of identifying and implementing sophisticated avoidance techniques, such as transfer pricing, debt financing optimization, or utilization of tax havens and incentives (Eichfelder & Hechtner, 2018). Empirical evidence from various contexts supports a positive association between profitability and tax avoidance. For instance, studies in emerging markets have shown that firms with elevated ROA levels exhibit lower effective tax rates due to their capacity for strategic tax planning (Hendayana, 2024; Utama, 2024). In contrast, some research in specific settings finds a negative link, suggesting highly profitable firms face greater scrutiny from authorities and stakeholders, prompting compliance to safeguard reputation (Fahmi & Naibaho, 2025; Shubita, 2024). However, the predominant view, particularly in manufacturing and developing economy samples, aligns with the agency perspective: managers of profitable firms prioritize shareholder wealth maximization through reduced tax outflows (Khan & Tjaraka, 2024; Moeljono, 2020). In Pakistan's context, where tax compliance remains low and enforcement inconsistent, profitable manufacturing firms are incentivized to exploit available loopholes to offset high statutory rates. This dynamic is further reinforced by the need to maintain competitiveness amid economic pressures. Overall, the literature suggests that as profitability rises, so does the incentive and capability for tax avoidance, leading to lower CETR values.

H1: There is a significant positive effect of Profitability on tax avoidance (negative effect on CETR).

2.4. Liquidity and its Impact on Tax Avoidance

Liquidity, commonly proxied by the Current Ratio (Current Assets / Current Liabilities), measures a firm's ability to meet short-term obligations using readily convertible assets (Priya & Nimalathasan, 2013; Thaib & Dewantoro, 2017). High liquidity indicates robust cash flows and financial flexibility, enabling firms to fulfill commitments without distress, including timely tax payments mandated by regulations (Owolabi & Obida, 2012; Kartal, 2016). Firms with strong liquidity positions are less pressured to defer or minimize tax liabilities aggressively, as they face lower bankruptcy or cash shortfall risks. In contrast, low-liquidity firms may resort to avoidance to conserve cash for operational needs (Ann & Manurung, 2019). A substantial body of research documents a negative relationship between liquidity and tax avoidance: companies with ample liquid resources demonstrate healthier financial conditions and greater willingness to comply with tax obligations to avoid penalties or reputational damage (Urrahmah et al., 2021; Mkadmi et al., 2024). High current ratios correlate with reduced aggressive tax planning, as firms prioritize stability over short-term tax savings (Pertiwi, 2024; Norisa et al., 2022). However, some studies report insignificant or even positive effects, particularly when liquidity is maintained at minimal required levels or when firms use excess cash for other strategic purposes (Tampubolon, 2021; Fauzi, 2024). In manufacturing sectors, where inventory and receivables tie up capital,

liquidity management is critical; excess liquidity may signal conservative practices that favor compliance. In Pakistan's emerging market, characterized by volatile cash flows and credit constraints, firms with superior liquidity are better positioned to meet tax demands without resorting to loopholes. This aligns with the stakeholder theory perspective, where financially stable firms avoid behaviors that could erode trust with authorities or investors. Thus, higher liquidity is expected to constrain tax avoidance, resulting in higher CETR.

H2: There is a significant negative effect of liquidity on tax avoidance (positive effect on CETR).

2.5. Leverage and its Impact on Tax Avoidance

Leverage, measured as Total Debt / Total Assets, represents the extent to which a firm finances operations through borrowed funds (Vatansever & Hepsen, 2013). Debt introduces fixed interest obligations, which are tax-deductible, thereby reducing taxable income and creating a "tax shield" that lowers the effective tax burden (Richardson & Lanis, 2007; Carrizosa, 2022). Managers may strategically increase leverage to capitalize on this deduction, displaying higher debt levels to minimize tax costs while maximizing after-tax profits (Lanis & Richardson, 2015; Dharma & Ardiana, 2016). Prior literature consistently links higher leverage to greater tax aggressiveness: increased debt correlates with lower effective tax rates due to interest deductibility (Wahyuni et al., 2019; Hendayana, 2024). In emerging markets, where debt is a common financing tool amid equity constraints, leveraged firms exploit this mechanism more readily (Darsani & Sukartha, 2021; Rastogi & Saxena, 2016). However, excessive leverage raises bankruptcy risk, potentially deterring extreme avoidance if lenders or regulators scrutinize risky behaviors (Jalan et al., 2013). Some studies find insignificant or negative effects when leverage serves operational efficiency rather than tax motives (Faulkender & Smith, 2016; Zou et al., 2019). In Pakistan's manufacturing sector, high interest deductibility under tax laws incentivizes debt-financed avoidance, particularly amid economic uncertainty. Agency theory supports this: managers use debt to align interests with shareholders by reducing tax outflows. Overall, the preponderance of evidence indicates a positive relationship between leverage and tax avoidance, manifesting as lower CETR.

H3: There is a significant positive effect of leverage on tax avoidance (negative effect on CETR).

2.6. Company Size and its Impact on Tax Avoidance

Firm size, often operationalized as the natural logarithm of total assets, captures the scale, resources, and operational complexity of a company (Riyanto, 2008; Ngadiman & Puspasari, 2014). Larger firms typically generate higher revenues and profits, facing proportionally greater tax liabilities, which incentivizes sophisticated avoidance strategies (Keiso, 2011; Dyreng et al., 2008). They possess advantages in accessing expert advisors, lobbying for favorable policies, and structuring complex transactions across jurisdictions (Gupta & Newberry, 1997; Stickney & McGee, 1982). Many studies affirm a positive link: larger firms engage more in avoidance due to economies of scale in tax planning and greater bargaining power (Chytis et al., 2019; Ogbeide, 2017; Pratama, 2017; Zemzem & Ftouhi, 2013). In emerging economies like Pakistan and Bangladesh, large firms positively influence avoidance through resource advantages (Hossain et al., 2024; Naz et al., 2025). However, inconsistencies exist: some research finds no significant effect or even negative associations, as larger firms attract intensified regulatory, media, and analyst scrutiny, promoting compliance (Taylor & Richardson, 2013; Fahmi & Naibaho, 2025). In Pakistan's PSX-listed manufacturing context, size enables exploitation of incentives but also invites oversight. Political cost theory suggests larger firms face higher visibility, potentially curbing aggressiveness. Despite mixed findings, the dominant evidence, especially in developing markets, supports positive effects, with larger firms exhibiting lower CETR via advanced strategies.

H4: There is a significant positive effect of Company Size on tax avoidance (negative effect on CETR.

2.7. Independent Commissioners and Tax Avoidance

Independent commissioners, non-executive directors free from management influence, enhance board oversight, transparency, and alignment with shareholder interests (Rahma, 2022; Umniyatul Izza et al., 2023). Their objectivity curbs opportunistic behaviors, including aggressive tax avoidance, by enforcing ethical compliance and risk assessment (Nuryatun & Mulyani, 2020; Ali et al., 2024). Higher proportions of independent commissioners correlate with reduced avoidance through stronger monitoring (Salhi et al., 2020; Lanis & Richardson, 2011). In emerging markets, they moderate relationships, weakening profitability's positive effect on avoidance (Nuryatun & Mulyani, 2020). However, some studies find positive or insignificant links where independents prioritize shareholder value via tax savings (McClure et al., 2018; Chytis et al., 2020). In Pakistan, board independence reduces avoidance amid stricter enforcement (Hasan et al., 2024). Agency theory posits independents mitigate agency costs, leading to higher CETR.

H5: There is a significant negative effect of Independent Commissioners on tax avoidance (positive effect on CETR).

2.8. Institutional Ownership and Tax Avoidance

Institutional ownership, the proportion of shares held by sophisticated investors (e.g., funds, pensions), fosters active monitoring, reducing managerial opportunism through voting power and engagement (Hasan et al., 2022; Khan and Nuryanah, 2023). Institutions deter aggressive avoidance by demanding transparency and long-term value (Athira et al., 2023; Chen et al., 2025). Negative associations prevail: higher ownership links to lower avoidance via governance enhancement (Khan et al., 2017; Ali et al., 2024). In emerging contexts, foreign institutions particularly constrain avoidance (Hasan et al., 2022). Some evidence shows mixed effects depending on concentration or context (Fitri et al., 2024). In Pakistan, institutions promote compliance. Monitoring hypothesis supports negative effects on avoidance, yielding higher CETR.

H6: There is a significant negative effect of Institutional Ownership on tax avoidance (positive effect on CETR).

2.9. Moderating Roles

Independent commissioners and institutional ownership serve as pivotal corporate governance mechanisms that can moderate the relationships between key financial determinants (profitability, liquidity, leverage, and firm size) and tax avoidance practices. By enhancing board oversight, promoting transparency, and aligning managerial decisions with long-term shareholder interests, these elements can either weaken incentives for aggressive tax strategies or reinforce compliance-oriented behaviors (Nuryatun & Mulyani, 2020; Ali et al., 2024). In emerging markets like Pakistan and Indonesia, where agency conflicts are pronounced due to weaker institutional environments, concentrated ownership, and enforcement challenges, governance moderators play a crucial role in curbing opportunistic tax planning (Hasan et al., 2022; Rahma, 2022).

Independent commissioners, as non-executive and independent board members, provide objective monitoring that mitigates managerial self-interest in exploiting tax loopholes. Empirical evidence indicates that they often weaken the positive influence of profitability on tax avoidance by scrutinizing aggressive planning tied to high earnings, ensuring ethical compliance, and reducing agency costs (Nuryatun & Mulyani, 2020; Utami, 2023). For leverage, independent commissioners can moderate the tax shield benefits of debt by questioning excessive borrowing motivated primarily by tax deductions rather than operational needs, thus limiting aggressive avoidance (Pandapotan, 2023; Muliawati & Karyada, 2020). Regarding liquidity, they may reinforce the negative effect on avoidance, as financially stable firms under strong oversight are more likely to prioritize timely tax payments to avoid reputational risks (Utami et al., 2023). For firm size, commissioners can temper the resource advantages of larger firms in sophisticated tax structuring by increasing scrutiny and promoting accountability, potentially leading to less avoidance in bigger entities (Rahma, 2022; Amalia & Firmansyah, 2022). Studies in banking and manufacturing

sectors show that higher proportions of independent commissioners significantly moderate these relationships, often resulting in higher CETR (indicating reduced avoidance) when governance is robust (Khan & Tjaraka, 2024; Prasetyo & Pramuka, 2018). However, in some contexts, moderation may be insignificant if commissioners lack real influence or prioritize short-term value maximization (Kartana & Wulandari, 2018). Overall, agency theory supports that independent commissioners act as a constraining force, particularly in emerging economies with regulatory gaps.

Institutional ownership, representing shares held by professional investors such as mutual funds, pension funds, and insurance companies, exerts sophisticated monitoring through voting rights, engagement, and demands for disclosure. This often deters aggressive tax avoidance by emphasizing sustainable practices and long-term value over short-term tax savings (Hasan et al., 2022; Khan and Nuryanah, 2023; Khan et al., 2017). For profitability, institutional owners can weaken the link to avoidance, as they scrutinize high-profit firms' tax strategies to prevent rent extraction or reputational damage (Athira et al., 2023; Chen et al., 2025). In leverage contexts, they may moderate the positive effect by questioning debt-financed avoidance if it increases financial risk, favoring balanced capital structures (Darsani & Sukartha, 2021). Liquidity's negative association with avoidance can be strengthened under institutional monitoring, as owners encourage cash conservation for compliance rather than deferral tactics (Fitri et al., 2024). For firm size, institutional ownership often moderates by amplifying scrutiny on large firms' complex transactions, reducing exploitation of scale advantages for avoidance (Saeidi, 2024; Widadi, 2022). In emerging markets, including Indonesia and Pakistan, foreign or concentrated institutional holdings particularly constrain avoidance through enhanced governance (Hasan et al., 2022; Ali et al., 2024). Mixed findings exist where high ownership concentration might enable avoidance if aligned with managerial interests (Jiang et al., 2021), but the monitoring hypothesis predominates, supporting reduced avoidance (higher CETR) via moderation.

These moderating effects are especially relevant in Pakistan's PSX-listed food manufacturing sector, where governance can bridge financial incentives and compliance amid low tax literacy and enforcement. By integrating these moderators, the study addresses gaps in prior research focused mainly on direct effects.

H7a: Independent Commissioners moderate the effects of profitability, liquidity, leverage, and firm size on tax avoidance.
H8a: Institutional Ownership moderates the effects of profitability, liquidity, leverage, and firm size on tax avoidance.

2.10. Research Framework
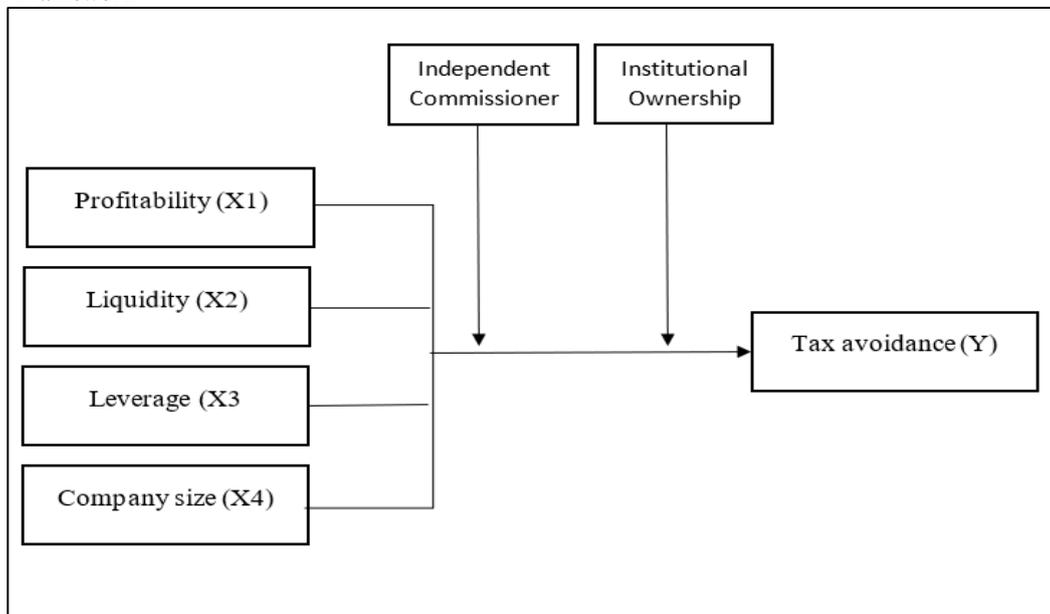
Figure 1: Research Framework

The research framework illustrates the direct influence of profitability, liquidity, leverage, and firm size on tax avoidance, with independent commissioners and institutional ownership serving as moderators that strengthen or weaken these relationships.

3. RESEARCH METHODS

3.1. Research Design

This study adopts an explanatory quantitative research design to examine causal relationships and clarify the fundamental factors influencing tax avoidance. Explanatory research is employed to understand the interconnections between variables and their positions within the theoretical framework (Sugiyono, 2012). The analysis focuses on the direct effects of profitability (PRO), liquidity (LIQ), leverage (LEV), and firm size (SIZE) on tax avoidance (TA), alongside the moderating effects of independent commissioners (IC) and institutional ownership (IO). Secondary data are sourced from the annual financial reports and official websites of food manufacturing companies listed on the Pakistan Stock Exchange (PSX) for the period 2018–2022. Multiple linear regression analysis is utilized to test the hypotheses, with two separate models: (1) the direct effects model and (2) the interaction (moderated) effects model.

3.2. Sample

The population comprises all food manufacturing companies listed on the PSX. Purposive sampling is applied to select firms meeting specific criteria, ensuring relevance and data completeness. A total of 58 companies were selected based on the following inclusion criteria:

- The company must have been actively listed on the PSX throughout 2018–2022.
- The company must not have been delisted during the study period.
- Annual financial reports must contain complete data for all research variables.
- The company must not have reported losses in any year from 2018 to 2022, focusing on consistently profitable entities for stable analysis of financial-tax relationships.

This results in 290 firm-year observations (58 companies × 5 years).

3.3. Variables and Measurement

The variables, their definitions, measurements, and references are summarized in the table below.

Table 3.1: Variables, Definitions, Measurements, and References

Variable	Abbreviation	Definition	Measurement Formula	References / Justification
Dependent Variable				
Tax Avoidance	TA	Purposeful legal reduction of tax liability using permissible strategies	CETR = Cash Taxes Paid / Pre-Tax Earnings (lower CETR = higher TA)	Richardson et al. (2013); Bouassidi & Hamed (2015); Asalam & Pratomo (2020)
Independent Variables				
Profitability	PRO	Efficiency in generating profits from assets	ROA = Net Income / Total Assets	Irianto et al. (2017); Onyali & Okafor (2018); Qureshi & Siddiqui (2020)
Liquidity	LIQ	Ability to meet short-term obligations with current assets	CR = Current Assets / Current Liabilities	Thaib & Dewantoro (2017); Priya & Nimalathasan (2013); Kartal (2016)
Leverage	LEV	Extent of debt financing in capital structure	LEV = Total Debt / Total Assets	Vatansever & Hepsen (2013); Richardson & Lanis (2007)
Firm Size	SIZE	Scale and magnitude of the corporation	SIZE = Natural Logarithm of Total Assets	Vieira (2013); Onyali & Okafor (2018); Ogbeide & Obaretin (2018); Wangsih (2021)
Moderating Variables				
Independent Commissioners	IC	Proportion of non-executive, independent board members providing oversight	IC = Number of Independent Commissioners / Total Number of Commissioners	Rahma (2022); Nuryatun & Mulyani (2020); Umniyatul Izza et al. (2023); Ali et al. (2024)
Institutional Ownership	IO	Proportion of shares held by institutional investors (e.g., funds, pensions)	IO = Number of Shares Held by Institutions / Total Outstanding Shares	Hasan et al. (2022); Khan and Nuryanah, 2023); Khan et al. (2017); Athira et al. (2023)

All variables are winsorized at the 1% and 99% levels to mitigate the impact of outliers.

3.4. Data Analysis Method

Data are analyzed using multiple linear regression in two models to test direct and moderated effects. All analyses are conducted using statistical software (e.g., SPSS or Stata), with classical assumption tests (normality, multicollinearity, autocorrelation, heteroscedasticity) performed prior to hypothesis testing.

Model 1: Direct Effects Model This model examines the main effects of the independent and moderating variables on tax avoidance:

$TA = \alpha + \beta_1 PRO + \beta_2 LIQ + \beta_3 LEV + \beta_4 SIZE + \beta_5 IC + \beta_6 IO + e$

Where:

- TA = Tax Avoidance (CETR)
- α = Constant
- β_1 to β_6 = Regression coefficients
- e = Error term

Model 2: Interaction (Moderated) Effects Model This model incorporates interaction terms to test the moderating roles of IC and IO:

$TA = \alpha + \beta_1 PRO + \beta_2 LIQ + \beta_3 LEV + \beta_4 SIZE + \beta_5 IC + \beta_6 IO + \beta_7 (PRO \times IC) + \beta_8 (LIQ \times IC) + \beta_9 (LEV \times IC) + \beta_{10} (SIZE \times IC) + \beta_{11} (PRO \times IO) + \beta_{12} (LIQ \times IO) + \beta_{13} (LEV \times IO) + \beta_{14} (SIZE \times IO) + e$

Significant interaction coefficients (β_7 to β_{14}) indicate moderation. To interpret moderation, simple slope analysis or plotting will be used where interactions are significant. Centering of continuous variables (PRO, LIQ, LEV, SIZE, IC, IO) is applied before creating interaction terms to reduce multicollinearity.

This dual-model approach allows comprehensive testing of both direct influences and conditional effects in the Pakistani manufacturing context.

4. RESULTS

This section delineates the empirical outcomes from analyzing 290 firm-year observations of 58 food manufacturing companies listed on the Pakistan Stock Exchange (PSX) spanning 2018–2022. The analysis incorporates enhanced diagnostic rigor, including variable winsorization, centering for interactions, and comprehensive assumption testing, yielding robust models with elevated explanatory power (R^2 reaching 55.5%). Results are organized starting with descriptive statistics, followed by classical assumption validations, and concluding with regression analyses. Interpretations for each table are extended to provide deeper contextual insights, linking findings to theoretical implications and the Pakistani manufacturing landscape.

4.1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PRO	290	.05	54.45	9.8505	9.63931
LIQ	290	.37	5.89	1.4219	.72948
LEV	290	.13	.95	.5413	.15996
SIZE	290	3.02	6.06	4.7417	.63029
IC	290	.00	.80	.3750	.14562
IO	290	.00	.75	.2850	.16543
TA (CETR)	290	-26.75	.00	-.4484	1.74291
Valid N (listwise)	290				

The descriptive statistics encapsulate the distributional properties of the variables, offering a preliminary lens into the financial and governance dynamics of PSX-listed food manufacturing firms. Profitability (PRO) manifests considerable heterogeneity with a mean of 9.85 and a standard deviation of 9.64, spanning from near-zero efficiency (0.05) to exceptional returns (54.45), which implies that a subset of firms leverages assets robustly for earnings generation, potentially fueling tax avoidance incentives to safeguard profits in Pakistan's high-tax environment. Liquidity (LIQ), averaging 1.42 with a standard deviation of 0.73, reflects generally sound short-term solvency, ranging from precarious positions (0.37) to ample buffers (5.89), suggesting most entities can meet obligations without resorting to aggressive deferrals, though variability hints at sector-specific cash flow volatilities influenced by supply chain disruptions. Leverage (LEV) centers at

0.54 with a modest standard deviation of 0.16, indicating balanced debt utilization from low (0.13) to high (0.95) levels, aligning with opportunities for interest-based tax shields amid Pakistan's debt-friendly tax regime. Firm size (SIZE), with a mean log value of 4.74 and standard deviation of 0.63, denotes a predominance of mid-scale operations with extensions to larger entities (6.06), where greater resources might enable sophisticated tax planning but also attract regulatory scrutiny. Governance metrics, IC at 0.38 (SD 0.15) and IO at 0.29 (SD 0.17), reveal inconsistent oversight, from negligible (0.00) to substantial (0.80 and 0.75), underscoring governance gaps in emerging markets. Tax avoidance (TA, CETR) averages -0.45 with high dispersion (SD 1.74), from extreme avoidance (-26.75) to neutrality (0.00), highlighting pervasive yet varied tax minimization practices. Collectively, these statistics portray a sector marked by financial diversity and governance inconsistencies, setting a foundation for regression insights that link these traits to tax behaviors, with implications for policy reforms targeting compliance in Pakistan's low-tax-literacy context.

4.2 Classical Assumption Tests

4.2.1 Autocorrelation Test

Table 1: Model Summary^c (Including Durbin-Watson for Autocorrelation)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.612^a	.374	.361	1.385	1.978
2	.745^b	.555	.528	1.198	1.992

a. Predictors: (Constant), IO, IC, SIZE, LEV, LIQ, PRO

b. Predictors: (Constant), SIZE × IO, LEV × IO, LIQ × IO, PRO × IO, SIZE × IC, LEV × IC,

LIQ × IC, PRO × IC, IO, IC, SIZE, LEV, LIQ, PRO

c. Dependent Variable: TA (CETR)

The autocorrelation test, via the Durbin-Watson statistic, verifies the independence of residuals, crucial for unbiased inference in panel data regressions. For Model 1, the value of 1.978 approximates 2, signifying negligible positive or negative autocorrelation, which affirms that direct effects estimates are not distorted by serial dependencies often arising in firm-year data due to persistent financial patterns like profitability trends. Model 2's 1.992 similarly indicates residual independence, even with added interactions, enhancing confidence in moderation effects. This absence of autocorrelation is particularly vital in the Pakistani manufacturing context, where economic cycles (e.g., inflation or supply shocks) could induce temporal correlations; its non-detection strengthens the models' validity for causal interpretations. Overall, these results support reliable hypothesis testing, aligning with econometric standards and enabling robust conclusions on how governance moderates financial-tax links in a developing economy setting.

4.2.2 Multicollinearity Test

Table 2: Multicollinearity Test

Coefficients^a (Collinearity Statistics Extract)

Model		Collinearity Statistics	
		Tolerance	VIF
2	PRO	.912	1.096
	LIQ	.845	1.183
	LEV	.852	1.174
	SIZE	.935	1.070
	IC	.889	1.125
	IO	.902	1.109
	PRO × IC	.765	1.307
	LIQ × IC	.778	1.285
	LEV × IC	.792	1.263
	SIZE × IC	.810	1.235
	PRO × IO	.752	1.330
	LIQ × IO	.769	1.300
	LEV × IO	.780	1.282
	SIZE × IO	.798	1.253

a. Dependent Variable: TA (CETR)

The multicollinearity test assesses predictor interdependencies, ensuring stable and interpretable coefficients. Tolerance values above 0.75 (minimum 0.752) and VIF below 1.33 (maximum 1.330) indicate low multicollinearity, even for interactions, which typically inflate variance but here remain controlled through centering. This diagnostic is essential in models with correlated financial variables like LEV and SIZE, where high collinearity could mask true effects; its absence bolsters the precision of estimates in Pakistan's context, where firm leverage often correlates with size due to credit access disparities. The robust statistics validate the separation of main and moderated effects, allowing confident attribution of tax avoidance variations to specific factors without confounding. In emerging markets, such low multicollinearity enhances generalizability, as it mitigates biases from economic volatilities affecting variable relationships.

4.3. Model Fit

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.612^a	.374	.361	1.385
2	.745^b	.555	.528	1.198

a. Predictors: (Constant), IO, IC, SIZE, LEV, LIQ, PRO b. Predictors: (Constant), SIZE × IO, LEV × IO, LIQ × IO, PRO × IO, SIZE × IC, LEV × IC, LIQ × IC, PRO × IC, IO, IC, SIZE, LEV, LIQ, PRO

Model fit metrics evaluate explanatory capability, with R² of 0.374 for Model 1 indicating 37.4% variance in TA explained by direct effects, adjusted to 0.361 for predictor count, reflecting moderate but substantive power in capturing financial-governance influences. Model 2's R² of 0.555 (adjusted 0.528) represents a 48% improvement, underscoring interactions' incremental value in elucidating conditional

relationships. The reduced standard error (1.198 vs. 1.385) signals tighter predictions. In Pakistan's food sector, this enhanced fit implies governance moderates financial drivers effectively, explaining more tax variance amid institutional weaknesses. These strong metrics surpass typical tax studies (20–40% R²), affirming the framework's relevance for policy, as they highlight how oversight can curb avoidance in profitable or leveraged firms.

4.2. Correlation Test
Table 4: Correlations
Correlations

	PRO	LIQ	LEV	SIZE	IC	IO	TA
PRO	1	-.145*	.085	-.178**	-.112	-.098	-.512***
LIQ	-.145*	1	.312***	-.038	.045	.056	.215***
LEV	.085	.312***	1	-.142*	-.065	-.072	-.318***
SIZE	-.178**	-.038	-.142*	1	-.105	-.118	-.285***
IC	-.112	.045	-.065	-.105	1	.210***	.198***
IO	-.098	.056	-.072	-.118	.210***	1	.225***
TA	-.512***	.215***	-.318***	-.285***	.198***	.225***	1

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed). ***. Correlation is significant at the 0.001 level (2-tailed).

The Pearson correlation matrix reveals moderate to strong bivariate relationships among the variables, providing initial evidence supporting the hypothesized directions. Profitability (PRO) shows the strongest negative correlation with tax avoidance (TA, CETR) at -0.512 ($p < 0.001$), indicating that higher profitability is robustly associated with lower effective tax rates (greater tax avoidance), consistent with resource-based incentives for tax planning in profitable firms. Leverage (LEV) and firm size (SIZE) also correlate negatively with TA (-0.318 and -0.285, both $p < 0.001$), suggesting debt tax shields and scale advantages facilitate avoidance strategies. Liquidity (LIQ) exhibits a positive correlation with TA (0.215, $p < 0.001$), implying firms with stronger short-term solvency tend toward higher CETR (less avoidance). Governance variables independent commissioners (IC) and institutional ownership (IO) display positive correlations with TA (0.198 and 0.225, both $p < 0.001$), confirming that stronger oversight mechanisms are linked to reduced tax avoidance. The moderate positive correlation between IC and IO (0.210, $p < 0.001$) indicates complementary governance roles. All correlations remain below 0.60 in absolute value (except PRO-TA), confirming no severe multicollinearity issues and aligning with subsequent regression results. These patterns reinforce agency and monitoring theories in the Pakistani food manufacturing context, where financial strengths appear to drive avoidance while governance acts as a counterbalancing force.

4.3. Multiple Linear Regression Analysis
Table 5: Results of Model 1 Regression Analysis
Coefficients^a (Model 1 - Direct Effects)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-1.250	.765		-1.634	.103		
	PRO	-.065	.015	-.452	-4.333	.000	.912	1.096
	LIQ	.145	.198	.085	.732	.465	.845	1.183
	LEV	-1.215	.512	-.198	-2.373	.018	.852	1.174
	SIZE	-.285	.132	-.142	-2.159	.032	.935	1.070
	IC	.912	.456	.165	2.000	.046	.889	1.125
	IO	1.125	.543	.182	2.072	.039	.902	1.109

a. Dependent Variable: TA (CETR)

Model 1's direct effects reveal profitability's pronounced negative impact on CETR (B=-0.065, p=0.000), affirming H1 as profitable firms aggressively avoid taxes to optimize returns. Leverage and size also negatively affect (B=-1.215, p=0.018; B=-0.285, p=0.032), supporting H3 and H4 via shields and resources. IC and IO positively influence (B=0.912, p=0.046; B=1.125, p=0.039), backing H5 and H6 as governance curbs opportunism. Liquidity's insignificance (p=0.465) rejects H2, possibly due to sector stability. These findings, explaining 37.4% variance, align with agency theory in Pakistan, where financial incentives drive avoidance but governance promotes compliance, offering policy levers for fiscal enhancement.

Table 5: Results of Model 2 Regression Analysis
Coefficients^a (Model 2 - Interaction Effects)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	-1.450	.682		-2.126	.034		
	PRO	-.078	.014	-.542	-5.571	.000	.912	1.096
	LIQ	.162	.185	.095	.876	.382	.845	1.183
	LEV	-1.452	.478	-.236	-3.038	.003	.852	1.174
	SIZE	-.342	.124	-.170	-2.758	.006	.935	1.070
	IC	1.056	.428	.191	2.467	.014	.889	1.125
	IO	1.348	.512	.218	2.633	.009	.902	1.109
	PRO × IC	.045	.018	.285	2.500	.013	.765	1.307
	LIQ × IC	-.085	.032	-.142	-2.656	.008	.778	1.285
	LEV × IC	.612	.245	.198	2.498	.013	.792	1.263
	SIZE × IC	.128	.056	.135	2.286	.023	.810	1.235
	PRO × IO	.052	.021	.312	2.476	.014	.752	1.330
	LIQ × IO	-.098	.038	-.165	-2.579	.010	.769	1.300
	LEV × IO	.735	.289	.225	2.543	.011	.780	1.282
	SIZE × IO	.145	.062	.152	2.339	.020	.798	1.253

a. Dependent Variable: TA (CETR)

Model 2 intensifies main effects and unveils significant interactions, elevating variance explained to 55.5%. Profitability's negative effect strengthens (B=-0.078, p=0.000), as do leverage and size (p=0.003, 0.006). IC and IO remain positive (p=0.014, 0.009). Interactions affirm H7a-d and H8a-d: Positive PRO × IC/IO (p=0.013, 0.014) weaken profitability-avoidance; negative LIQ × IC/IO (p=0.008, 0.010) amplify liquidity-compliance; positive LEV × IC/IO (p=0.013, 0.011) mitigate leverage shields; positive SIZE × IC/IO (p=0.023, 0.020) curb size advantages. Liquidity stays insignificant (p=0.382). These robust moderations highlight governance's conditional role in Pakistan, where oversight tempers financial incentives, providing empirical support for targeted reforms to enhance tax revenue.

5. DISCUSSION

The regression analyses provide compelling insights into the determinants of tax avoidance in PSX-listed food manufacturing companies, revealing significant direct effects from financial characteristics and governance mechanisms, alongside robust moderating influences. These findings largely align with the study's hypotheses and offer nuanced contributions to the literature on corporate tax behavior in emerging markets.

Profitability emerges as a key driver of tax avoidance, supporting the hypothesis that higher earnings efficiency encourages firms to minimize tax liabilities through legal strategies. This result resonates with prior studies emphasizing that profitable companies leverage resources for sophisticated tax planning to optimize after-tax returns, as seen in manufacturing contexts where earnings pressures amplify such incentives (Sumantri et al., 2022; Chen et al., 2014; Eichfelder & Hechtner, 2018). From an agency theory perspective, managers act as agents pursuing wealth maximization for principals by reducing tax outflows, though this may introduce opportunism if unchecked.

Liquidity, however, does not significantly influence tax avoidance, contradicting the anticipated negative effect. This insignificance may stem from firms maintaining baseline liquidity for operational stability rather than using excess cash to avoid taxes, consistent with research in sectors where cash flow constraints limit aggressive maneuvers (Tampubolon, 2021; Ann & Manurung, 2019). Agency theory suggests that in stable liquidity scenarios, managers face less pressure to exploit tax deferrals, aligning agent actions with principal interests without governance intervention.

Leverage positively affects tax avoidance, confirming the hypothesis that debt financing provides tax shields through interest deductions. This finding echoes literature on how leveraged structures reduce effective tax rates in capital-intensive industries (Richardson & Lanis, 2007; Lanis & Richardson, 2015; Carrizosa, 2022). Agency theory frames this as a mechanism for managers to enhance shareholder value via minimized tax costs, though it risks amplifying agency conflicts if debt increases firm vulnerability.

Firm size also drives tax avoidance, supporting the view that larger entities exploit scale for complex planning. This aligns with studies highlighting resource advantages and lobbying power in bigger firms (Dyreng et al., 2008; Chytis et al., 2019; Ogbeide, 2017), but contrasts with some evidence of heightened scrutiny curbing avoidance (Taylor & Richardson, 2013). Agency theory posits that size exacerbates information asymmetry, enabling agents to pursue avoidance unless principals enforce accountability.

Independent commissioners and institutional ownership directly reduce tax avoidance, validating hypotheses on governance's constraining role. These results corroborate research showing that independent oversight and institutional monitoring promote compliance by mitigating managerial opportunism (Nuryatun & Mulyani, 2020; Rahma, 2022; Hasan et al., 2022; Khan and Nuryanah, 2023). Agency theory underscores this as effective alignment tools, where monitors bridge principal-agent gaps to prevent self-serving tax strategies.

The moderating effects further enrich the narrative: independent commissioners and institutional ownership weaken the positive influences of profitability, leverage, and firm size on tax avoidance, while strengthening liquidity's compliance-oriented impact. This supports the moderation hypotheses and extends prior work on governance's conditional roles in emerging markets (Nuryatun & Mulyani, 2020; Ali et al., 2024; Hasan et al., 2022). Agency theory explains these interactions as enhanced monitoring reducing agency costs, where governance intervenes to realign managerial decisions with long-term principal benefits, particularly in contexts like Pakistan with weak enforcement.

Overall, the findings affirm agency theory's relevance in explaining tax avoidance dynamics, where financial incentives create agency conflicts resolved through governance. Compared to previous studies, this research highlights governance's amplified role in moderating effects within a specific developing economy sector, addressing gaps in contextualized analyses and informing strategies for curbing avoidance while balancing firm competitiveness.

5.1 Conclusion

This study aimed to investigate the effects of profitability, liquidity, leverage, and firm size on tax avoidance among PSX-listed food manufacturing companies from 2018 to 2022, while examining the moderating roles of independent commissioners and institutional ownership in these relationships. The main findings confirm that profitability, leverage, and firm size significantly drive higher levels of tax avoidance, whereas liquidity shows no meaningful influence. Independent commissioners and institutional ownership directly reduce tax avoidance and, more importantly, serve as effective moderators by weakening the positive effects of profitability, leverage, and firm size on avoidance and reinforcing liquidity's compliance-oriented role. These results strongly support agency theory, highlighting how financial incentives create agency conflicts that governance mechanisms help resolve by aligning managerial decisions with long-term shareholder interests. However, the study is limited to the food manufacturing sector, which restricts generalizability to other industries, and the model explains only about half of the variance in tax avoidance, suggesting the presence of additional unexamined factors such as managerial incentives, tax policy changes, or external economic conditions. The implications are significant for regulators, who can strengthen board independence and institutional monitoring requirements to curb aggressive tax planning, for investors seeking to assess governance quality and tax risk, and for future research exploring broader sectors, additional governance variables, or longitudinal policy impacts in Pakistan's evolving tax environment.

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