Sustainable Futures 9 (2025) 100681

Contents lists available at ScienceDirect

Sustainable Futures

journal homepage: www.sciencedirect.com/journal/sustainable-futures

Customer concentration and corporate social responsibility: The impact of government and foreign customers on CSR reporting

Khadija Pour-Akbari [a], Farzaneh Nassirzadeh [b,*], Davood Askarany [c]

[a] Faculty of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
[b] Faculty of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, 9177948951, Iran
[c] Department of Accounting and Finance, Business School, The University of Auckland, Auckland 1010, New Zealand

ARTICLE INFO

Keywords:
Customer concentration
Government customer
Foreign customer
Corporate social responsibility

ABSTRACT

This study investigates how customer concentration shapes corporate social responsibility (CSR) reporting, focusing on the distinct roles of government and foreign customers—a critical yet underexplored dimension in the age of climate crisis and evolving multi-stakeholder governance. Using panel data from 105 firms listed on the Tehran Stock Exchange (2013–2022), we examine three customer concentration metrics and their relationship with CSR disclosure. Our results reveal a significant negative association between customer concentration and CSR, suggesting that firms reliant on a few dominant buyers deprioritise sustainability initiatives, potentially exacerbating environmental and social risks in supply chains. However, government customers emerge as a countervailing force, moderating this relationship by embedding socio-environmental mandates into contracts—a finding with profound implications for policymakers aiming to align corporate behaviour with climate goals. Surprisingly, foreign customers fail to drive CSR improvements, underscoring how geopolitical barriers (e.g., sanctions) can disrupt global sustainability norms.

The study advances the **multi-stakeholder governance** paradigm by demonstrating that:

1. **Customer power dynamics** directly influence firms' ability to meet the **triple bottom line** (profit, planet, people), with concentrated buyers often undermining environmental commitments;
2. **Government intervention** can strategically recalibrate this tension, offering a model for regulating CSR in high-emission industries;
3. **Geopolitical fragmentation** (e.g., sanctions) may inadvertently weaken transnational CSR pressures, highlighting the need for adaptive governance frameworks in a polarised world.

By bridging customer strategy, climate accountability, and stakeholder theory, this research provides actionable insights for:

- **Firms** navigating trade-offs between buyer dependence and sustainability;
- **Policymakers** designing climate-aligned procurement rules;
- **Global governance bodies** addressing CSR decoupling in sanctioned economies.

Our findings underscore that in an era of climate urgency, **customer characteristics are not just commercial concerns but governance levers**—with the power to either accelerate or impede the transition to sustainable, multi-stakeholder capitalism.

1. Introduction

Corporate Social Responsibility (CSR) has evolved from a voluntary ethical practice to a strategic imperative in modern business, mainly as stakeholders demand greater accountability amid climate crises and widening social inequalities. While prior research has extensively examined how institutional factors and firm characteristics influence CSR adoption, one critical yet underexplored dimension remains: how a firm's customer base shapes its CSR commitments. This study addresses this gap by investigating how customer concentration - the reliance on a limited number of major buyers - affects CSR reporting, focusing on two pivotal customer types: government and foreign customers. Our investigation is situated in Iran's unique economic landscape, where international sanctions and state-dominated markets create a natural

* Corresponding author at: Faculty of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, 9177948951, Iran.
E-mail addresses: lian.net8@yahoo.com (K. Pour-Akbari), nasirzadeh@um.ac.ir (F. Nassirzadeh), d.askarany@auckland.ac.nz (D. Askarany).

https://doi.org/10.1016/j.sftr.2025.100681
Received 10 November 2024; Received in revised form 5 April 2025; Accepted 14 May 2025
Available online 17 May 2025

laboratory for understanding how customer dynamics operate under constrained conditions.

The selection of government and foreign customers as focal stakeholders is theoretically and empirically significant for several reasons. First, these customer types represent fundamentally different accountability mechanisms that can reduce information asymmetry in distinct ways. As we demonstrate, government customers are regulatory proxies that impose formal CSR requirements through contractual obligations and procurement standards. Their concentrated purchasing power and alignment with national policy goals create top-down pressure for CSR disclosure, effectively substituting for weak market-based governance mechanisms in emerging economies. Foreign customers, by contrast, typically transmit global CSR norms through supply chain requirements and reputational incentives - when geopolitical conditions allow. Their expected role as conduits of international best practices makes their absence (or ineffectiveness) in sanctioned markets particularly revealing.

Second, these customer types embody the tension between internal and external stakeholder pressures at the heart of contemporary CSR challenges. Government customers represent domestic, often politically-inflected priorities (e.g., job creation, local development). In contrast, foreign customers typically bring environmental and human rights standards aligned with global frameworks like the UN Sustainable Development Goals. By examining how these contrasting influences operate - or fail to operate - in Iran's constrained institutional environment, we shed new light on the boundary conditions of stakeholder theory.

Third, our focus addresses urgent questions about how CSR evolves in geopolitically isolated economies. Understanding alternative pathways to CSR adoption becomes crucial as global supply chains fragment and sanctions regimes multiply. Iran's experience offers insights for other economies facing similar constraints, from Venezuela to Russia, where traditional drivers of CSR may be disrupted, but government stakeholders retain outsized influence.

Methodologically, we advance beyond prior customer concentration studies by employing three complementary measures of buyer dependence (major customer sales, Herfindahl index, and percentile ranking), allowing us to triangulate findings across different dimensions of concentration. Our ten-year panel captures evolving dynamics as Iran's economy adapted to tightening sanctions, providing a rare longitudinal perspective on how CSR priorities shift under geopolitical pressure.

The study makes several key contributions. First, we demonstrate that customer concentration generally suppresses CSR reporting, likely due to heightened bargaining power that lets dominant buyers extract cost concessions at the expense of sustainability investments. Second, we show how government customers can counteract this effect by building CSR requirements into procurement systems - a finding with important implications for public sector-led sustainability transitions. Third, we reveal how sanctions nullify the typical CSR-enhancing role of foreign customers, highlighting the vulnerability of global value chain governance to geopolitical disruption.

Our findings speak directly to multiple contemporary debates: the state's role in driving corporate sustainability, the resilience of global CSR norms under deglobalisation pressures, and the adaptability of stakeholder capitalism models in different institutional contexts. For policymakers, we offer evidence that strategic public procurement can maintain CSR momentum even when market mechanisms falter. For managers, we provide guidance on balancing concentrated buyer relationships with sustainability commitments. For scholars, we refine theories of stakeholder influence by showing how customer power operates through distinct channels depending on buyer type and institutional environment.

The paper proceeds as follows: Section 2 reviews relevant literature and develops hypotheses. Section 3 describes our data and methodology, and Sections 4 and 5 present results and discussion. Section 6 concludes with implications for theory, policy and practice in an era of increasing market concentration and geopolitical uncertainty.

2. Literature review and hypotheses development

Corporate social responsibility (CSR) is a concept that refers to an organisation's commitment to contributing to sustainable development and improving the quality of life for individuals [1]. This commitment goes beyond legal requirements and is based on the principle of voluntarism. In other words, as part of society, companies assume responsibilities towards it and strive to increase their positive impacts on the environment, culture, and economy [1]. As Lange and Washburn [2] have stated, CSR involves the voluntary efforts of organisations to address social issues. On the other hand, Callery et al. [3] believe that CSR is a commitment to improving the well-being of society through responsible business activities. Latapí Agudelo et al. [4] also define corporate social responsibility as a set of duties and obligations that companies have towards the society in which they operate. CSR means the connection between business objectives and social responsibilities. Companies that take CSR seriously strive to consider the interests of all their stakeholders, including shareholders, customers, employees, and society, and to consider these interests in their decision-making and operations.

The underlying theories of corporate social responsibility include legitimacy theory, stakeholder theory, and signalling theory. Legitimacy theory is essentially a social contract between the company and society. The company uses the resources available in society and is responsible for reciprocating by providing value and benefit to society. Therefore, companies try to maintain their legitimacy by aligning the company's values with social values. Stakeholder theory is related to legitimacy theory. If legitimacy theory focuses on the social contract and relationships with society, stakeholder theory focuses more on corporate relationships with distinct groups of stakeholders. Society comprises various stakeholder groups, and their power to influence the company's activities is unequal. According to signalling theory, companies can signal their competitive advantage by providing more and better information to the market. Therefore, profitable companies with high liquidity are more willing to disclose information and signals to attract investors and gain shareholder trust [5].

2.1. Customer concentration

Customers are one of the most significant sources of income for companies. As a result, there is intense competition to attract customers in various industries [6]. In the past, business owners and even management theorists have focused on improving quality and reducing costs. However, deepening the understanding of the customer concept and aligning products and services with customer needs has now attracted the attention of managers and theorists [7]. Customer concentration is a fundamental principle in market orientation. It is a set of organisational beliefs prioritising customer interest, which does not separate the benefit of other stakeholders, such as owners, managers, and employees, for long-term profitability [8]. Deshpandé et al. [8] consider customer concentration part of the company culture and the existing values, aiming to reduce costs and increase customer benefits, strengthening and sustaining customer concentration [9]. The extent of this understanding requires gathering information about customers and an accurate understanding of the economic structures and political principles they face. Many organisations face problems due to an inappropriate view of customers and their needs. Customer concentration is a critical necessity to gain a competitive advantage and higher profits and is one of the criteria for the success of companies [10]. Customer concentration means that customer needs are prioritised. "Customer-centric" businesses cultivate a corporate culture that increases customer satisfaction and creates strong relationships with specific customers [11]. Providing services to customers to develop customer concentration is essential, and these services include honesty and accuracy in marketing activities and transparency in pricing models and sales processes. Therefore, they should pay attention to the opinions of their customers, exchange views with them, and remove barriers to communication with customers [12]. In this research, companies established by law with more than 50 % of their capital owned by the government or more than 50 % of the company's capital belonging to a government company or companies are considered government customers, and customers who are not citizens, residents, or nationals of Iran are considered foreign customers. Government customers usually seek to meet specific needs related to government laws and regulations; however, foreign customers may consider social and environmental issues. The order of needs and expectations of government and foreign customers is different and is examined separately in this research.

2.2. Customer concentration and corporate social responsibility

Customers play a significant role in shaping corporate decision-making. Recent research has increasingly focused on the nature of customers and their impact on corporate behaviour. In the United States, according to Statement of Financial Accounting Standards (SFAS) No. 131, all companies are required to disclose information about major customers, as these customers represent a significant portion of the company's risk. However, previous research has not yet reached a definitive conclusion on whether customer concentration benefits companies [13].

Some studies have shown that customer concentration is associated with higher capital costs and financing costs [14], increased risk of future stock price declines [15], and increased tax avoidance [16]. Others argue that customer concentration has a positive relationship with company performance [17] and that investment in research and development leads to increased innovation [18], resulting in increased sales of new products in the market (Groener and Hamburg, 2000) and ultimately improving management performance [19]. In addition, customer concentration can influence the decisions of other companies. Albuquerque et al. [20] argue that companies with a customer concentration, due to higher risk, do not rely on shareholder value incentives. Faleye [21] found that these companies commit themselves to fulfilling the opinions of major customers regarding specific investments. Wang [22] also found that suppliers with higher customer concentration pay lower dividends to their shareholders to address the increased financing costs associated with specific investments. Itzkowitz [23] showed that such companies tend to hold more cash to avoid the negative impact of losing major customers.

The findings of these studies demonstrate the impact of customer concentration. However, one crucial area that has been overlooked is the impact of customer concentration on corporate social responsibility. Wen et al. [24] argue that customer concentration can positively impact corporate social responsibility. Another benefit of corporate social responsibility is the reduction of information asymmetry. Previous studies claim that managers strategically use social responsibility to convey non-financial information to external company stakeholders, including customers, which leads to improved transparency and a better information environment [25]. Companies committed to social responsibility are less likely to engage in earnings management and, therefore, have better earnings quality [26]. In addition, Bacinello et al. [27] showed that the cost of social responsibility is positively related to future company performance. Therefore, social responsibility can be used as a metric that reduces the likelihood of adverse events and the severity of their damage. Therefore, many customers specifically request that their suppliers comply with social responsibility. In competitive markets, social responsibility can serve as a competitive advantage, and customers may choose companies that care about social issues, even if their prices are higher.

However, there are also competing hypotheses, as there is evidence that it cannot be categorically argued that customer concentration positively impacts corporate social responsibility. Therefore, companies with focused customers may have less demand for social responsibility [24]. One of the reasons for the negative relationship between customer concentration and corporate social responsibility is the high costs of social responsibility. This means that companies may incur high costs to implement social responsibility programs. These costs can affect product prices and may cause price-sensitive customers to avoid purchasing these products. Crawford et al. [28] found a negative relationship between companies' customer concentration and public disclosure in areas such as earnings management and sales forecasts. In competitive environments, the pressure to meet customer needs may force companies to forego CSR. In such situations, companies are driven towards short-term decision-making and neglect social responsibility, which requires a long-term perspective and investment in the future. In addition, some companies may reduce investment in social responsibility because they believe that the cost of this investment outweighs its benefits. Therefore, the first hypothesis is as follows:

Hypothesis 1. *There is a significant relationship between customer concentration and corporate social responsibility*.

2.3. Customer concentration, corporate social responsibility, and foreign customers

Foreign customers and investors generally have a higher awareness of corporate social responsibility and expect greater benefits concerning social responsibility activities, as it effectively creates a brand name in domestic and foreign markets. In addition, given that foreign customers tend to impose higher ethical standards on their suppliers, they are expected to invest in social responsibility activities. There is evidence of a positive relationship between foreign customers and corporate social responsibility. Chapple and Moon [29] showed that in Asian companies, social responsibility has improved company performance and improved customer interaction. Foreign customers may contribute to improving the supplier's reputation in foreign markets. Therefore, foreign customers are expected to significantly strengthen the relationship between customer concentration and corporate social responsibility.

Wen, Ki, and Liu [24], in their study examining customer concentration and corporate social responsibility performance of Chinese listed companies, showed that customer concentration has a negative relationship with the social responsibility performance of supplier companies. Cross-sectional analyses show that this negative relationship is more robust in suppliers without foreign customers or investors, non-governmental suppliers, and suppliers operating in weak legal environments.

It should be noted that the conditions in Iran, due to international sanctions, are exceptional and can affect the testing of this hypothesis. In other words, sanctions may create legal restrictions for companies and prevent them from conducting business with foreign customers. These restrictions can hinder the creation of healthy and sustainable business relationships and reduce the focus on the needs of foreign customers.

Sanctions usually lead to economic problems, increased costs, reduced service quality, and reduced product quality. These problems can affect the focus on the needs of foreign customers and deter companies from paying attention to social responsibilities. In other words, the imposition of sanctions may cause companies to focus more on survival and maintaining domestic markets and pay less attention to social responsibilities or meeting the needs of foreign customers.

Hypothesis 2. *Foreign customers significantly moderate the relationship between customer concentration and corporate social responsibility*.

2.4. Customer

Government customers may be more aware of corporate social responsibility issues [19,24]. McWilliams and Siegel [30] suggest that the government, as a stakeholder, may encourage companies to engage in social responsibility activities. This is because many government-owned companies, huge ones, are owned by the government [24]. Previous studies [31–33] have shown that state-owned enterprises emphasise government-desired social goals such as maintaining social stability, promoting infrastructure development, and reducing unemployment rates. Therefore, companies seek to create incentives for engaging in social responsibility in the environment and customer relations. Thus, government customers can encourage their suppliers to be responsive to social responsibility and positively affect the relationship between customer concentration and corporate social responsibility. Xu and Lui [34], in examining the effect of government support on corporate social responsibility in China, concluded that companies with government support have adopted appropriate policies for social responsibility. Dicko et al. [35] showed that companies whose boards of directors or CEOs have government relationships or affiliations have a higher amount or level of disclosure of information about environmental and social activities.

Government customers usually set high requirements and standards in the field of social responsibility in their contracts. These requirements can force companies to pay more attention to CSR. Moreover, companies committed to social responsibility may be more attractive to government and public customers, which can lead to profitability. In other words, government customers usually seek sustainability and positive social impacts, and this approach can help companies meet customer needs and fulfil their social obligations. In this regard, government customers are expected to moderate the relationship between customer concentration and corporate social responsibility. To this end, the following hypothesis is explained:

Hypothesis 3. *Government customers significantly moderate the relationship between customer concentration and corporate social responsibility*.

Hypothesis formulation and scientific justification

The formulation of Hypothesis 1 (H1) - proposing a negative relationship between customer concentration and CSR reporting - emerges from competing theoretical perspectives in the literature. On the one hand, resource dependence theory [17] suggests that concentrated customers may demand CSR investments as risk-mitigation mechanisms, mainly when relationship-specific investments are substantial. However, this study aligns with the alternative view articulated by Crawford et al. [28] that dominant customers primarily exert downward pressure on supplier margins, forcing cost-cutting that disproportionately affects discretionary CSR expenditures. This tension reflects an ongoing debate in stakeholder theory about whether influential stakeholders enhance or undermine CSR performance. Our position builds on empirical evidence from emerging markets [24], showing that customer concentration correlates with reduced CSR transparency, particularly in environments where suppliers lack countervailing power. The hypothesis further incorporates insights from legitimacy theory, suggesting that firms with concentrated customer bases may perceive less need for broad CSR legitimacy-building when their survival depends on pleasing a few key buyers.

Hypothesis 2 (H2) - concerning the moderating role of foreign customers - engages directly with institutional theory's proposition about transnational governance mechanisms. While Chapple and Moon [29] established that foreign customers typically transmit global CSR norms, this hypothesis tests the boundary conditions of that proposition in a sanctioned economy. The null expectation (no significant moderation) reflects recent critiques of institutional isomorphism in constrained environments [36], where geopolitical barriers may decouple firms from global normative pressures. This hypothesis formulation contributes to the scientific debate about whether global value chains can effectively disseminate CSR standards when formal trade channels are disrupted. The hypothesis also helps for a better understanding of how informal institutional voids alter conventional stakeholder influence patterns.

The current study's positioning within these debates is particularly significant for three reasons. First, it provides a crucial test of whether the well-documented CSR-enhancing effect of foreign customers [13] persists when geopolitical constraints limit their bargaining power. Second, it extends resource dependence theory by examining how different customer types create distinct dependence dynamics - with government customers representing political resource dependence and foreign customers representing market resource dependence. Third, the study addresses a methodological gap identified by Attig et al. [37] in the CSR literature, where most customer concentration studies focus solely on Western markets, neglecting how these relationships operate in state-influenced economies. Employing multiple concentration metrics and a longitudinal design, the study offers more robust evidence about the customer-CSR relationship than prior cross-sectional analyses.

These hypotheses gain additional relevance from contemporary debates about sustainable supply chain governance in an era of geopolitical fragmentation. As Van Tulder et al. [38] note, the COVID-19 pandemic and subsequent supply chain disruptions have exposed vulnerabilities in global CSR monitoring systems. Our examination of how customer characteristics shape CSR under sanctions provides timely insights about alternative governance mechanisms when traditional transnational pressures are weakened. The study also contributes to the growing literature on political CSR [39] by demonstrating how state-linked customers create distinct pathways for CSR adoption compared to market-driven mechanisms.

Government customers and foreign customers

The selection of government and foreign customers as focal stakeholders in this study is theoretically and empirically justified by their distinct institutional roles in shaping corporate behaviour, particularly in emerging economies like Iran. These customer types represent two fundamentally different mechanisms of CSR influence that are especially salient in the study's context:

1. Government Customers:
   - Represent a unique hybrid of stakeholder and institutional force due to their dual role as both economic actors and policy implementers
   - In state-influenced economies like Iran, government entities dominate procurement markets (accounting for 60 % of sample customers), giving them unparalleled power to mandate CSR through contractual requirements
   - Their procurement decisions often reflect political priorities (e.g., job creation, regional development) rather than pure market logic, creating distinct CSR pressures
   - Provide a natural test of "political CSR" [39] where social responsibility becomes an extension of state policy rather than voluntary corporate citizenship
2. Foreign Customers:
   - Traditionally, they serve as transmission channels for global CSR standards in emerging markets [29]
   - Their expected normative role makes their ineffective moderating influence in Iran (due to sanctions) theoretically revealing
   - Represent a critical test case for institutional theory - whether global CSR norms can penetrate when formal trade relationships are constrained
   - Their absence highlights how geopolitical factors can disrupt conventional stakeholder influence pathways

The joint examination is particularly valuable because:

1. It captures the tension between internal (government) and external (foreign) institutional pressures that define CSR in many emerging markets
2. Government customers demonstrate how state actors can substitute for weak market institutions in driving CSR
3. The null finding for foreign customers reveals the fragility of global value chain governance under sanctions

4. Together, they model how CSR adapts when one stakeholder channel (foreign) is blocked while another (government) remains active

This focus advances beyond generic stakeholder analysis by:

- Showing how stakeholder power derives from institutional position (state vs. market) rather than mere resource dependence
- Demonstrating that stakeholder influence is context-dependent (foreign customers lose potency under sanctions)
- Revealing how political and market stakeholders create different CSR incentive structures

The selection thus provides unique insights into the following:

- Alternative CSR governance models in sanctioned economies
- The conditions under which different stakeholders effectively promote CSR
- How geopolitical factors Reshape Conventional Stakeholder Theory Predictions

3. Research methodology

Our sample comprises a panel of firms listed on the Tehran Stock Exchange (TSE). The TSE's data is based on audited financial statements and board reports, a reliable source of information used by many authors [40–46] The accessible sample is composed of firms meeting the following criteria: (1) availability of necessary information for research throughout the studied period, (2) consistency in activities over the financial year period, and (3) exclusion of investment firms, financial intermediaries, banks, and insurance companies. Consequently, the accessible sample comprises 105 firms, totalling 1,050 firm-year observations over 10 years from 2013 to 2022.

This study collected data related to dependent, independent, and control variables from the audited financial statements of companies on the CODAL platform (Comprehensive Information Disclosure System) and Tehran Stock Exchange databases (Iran Stock Exchange, Tadbir Pardaz, and Rah Avar Novin software) to test the research hypotheses.3-1- Statistical Models and Research Variables

For testing the first research hypothesis, the following regression model was used:

$$\mathbf{Model1}: \mathbf{CSR} = \beta_0 + \beta_1\mathbf{CC} + \beta_2\mathbf{INST} + \beta_3\mathbf{BsizeExp} + \beta_4\mathbf{BIND} + \beta_5\mathbf{AGE} + \beta_6\mathbf{SOE} + \beta_7\mathbf{Size} + \beta_8\mathbf{ROA} + \beta_9\mathbf{LEV} + \beta_{10}\mathbf{MB} + \beta_{11}\mathbf{Indust} + \varepsilon$$

To test the second and third research hypotheses, the following regression model was used:

$$\mathbf{Model2}: \mathbf{CSR} = \beta_0 + \beta_1\mathbf{CC} + \beta_2\mathbf{State\_Customer} + \beta_3\mathbf{Foreign\_Customer} + \beta_4\mathbf{State\_Customer} * \mathbf{CC} + \beta_5\mathbf{Foreign\_Customer} * \mathbf{CC} + \beta_6\mathbf{INST} + \beta_7\mathbf{BsizeExp} + \beta_8\mathbf{BIND} + \beta_9\mathbf{AGE} + \beta_{10}\mathbf{SOE} + \beta_{11}\mathbf{Size} + \beta_{12}\mathbf{ROA} + \beta_{13}\mathbf{LEV} + \beta_{14}\mathbf{MB} + \beta_{15}\mathbf{Indust} + \varepsilon$$

3.1. Dependent variable

Corporate Social Responsibility (CSR): Corporate social responsibility consists of four dimensions: the level of disclosure of information related to employees (EMPD), the level of disclosure of information related to social participation (COMD), the level of disclosure of information related to production (PROD), and the level of disclosure of information related to the environment (ENVD). The text of the notes attached to the financial statements was used to analyse the content. The overall value of the organisation's social responsibility disclosure is obtained by summing the partial values of the company's social responsibility dimensions and can be calculated using Eq. (3-1) [47].

$$CSR = EMPD + COMD + PROD + ENVD \quad \text{(Equation 1)}$$

3.2. Independent variable

The independent variable in this research is **customer concentration**. While there is no specific requirement in Iran to disclose major customers, according to Statement 131 of the Financial Accounting Standards Board, if the revenue from a single customer is 10 % or more of the company's total revenue, disclosure of such customers in the financial statements is mandatory.

In this study, three criteria were used to measure customer concentration:

1. Use of the percentage of major customers ranked by percentile: A higher rank indicates a higher level of customer concentration.
2. The Herfindahl-Hirschman Index (HHI) is used, for which, according to previous research by Patatoukas [17], Eq. (2) is used for its calculation.

$$Corp\ customer\ HH_{i,t} = \sum_{J=1}^{J}\left(\frac{Revenues_{i,j,t}}{Revenues_{i,t}}\right)^2 \quad \text{(Equation 2)}$$

- **Revenues$_{i,j,t}$:** Revenue of company i from customer j in year t.
- **Revenues$_{i,t}$:** Revenue of company i in year t.

3. **Measurement based on major corporate customer sales:** According to Bacinello et al. [27], this is calculated using Eq. (3):

$$Major\ customer\ Sales_{i,t} = \sum_{J=1}^{J}\left(\frac{Revenues_{i,j,t}}{Revenues_{i,t}}\right) \quad \text{(Equation 3)}$$

- Revenues$_{i,j,t}$: Revenue of company i from customer j in year t.
- Revenues$_{i,t}$: Total revenue of company i in year t.

3.3. Moderating variables

Foreign_customer: This dummy variable takes the value of 1 if the company has a foreign customer and 0 otherwise.

Government_customer: This dummy variable takes the value of 1 if more than 50 % of a customer's shares are owned by the government or government organisations, indicating a government customer, and 0 otherwise.

3.4. Control variables

INST: The percentage of institutional ownership includes all legal entities as institutional owners.

BsizeEXP: Number of financial and accounting experts on the board of directors.

BIND: Percentage of independent directors.

AGE: Firm age, calculated as the natural logarithm of the years listed on the stock exchange.

SOE: Percentage of government ownership.

SIZE: Firm size, calculated as the natural logarithm of total assets.

ROA: Return on assets.

LEV: Financial leverage, calculated as the total debt ratio to total assets.

MB: Market-to-book ratio.

Indust: Industry dummy variable, controlling for industry-specific effects.

The study employs the **Herfindahl-Hirschman Index (HHI)** as one of three key measures of customer concentration, alongside **major customer sales (CC1)** and a **ranking index (CC3)**. The HHI is calculated as:

$$\mathbf{HHI}i,t=\sum j=1J(\mathbf{Revenues}i,j,t\mathbf{Revenues}i,t)2\mathbf{HHI}i,t=j$$
$$=1\sum J(\mathbf{Revenues}i,t\mathbf{Revenues}i,j,t)2$$

Where:

- **Revenues**i,j,t*i,j,t*= Revenue of firm *ii* from customer *jj* in year t*t*
- **Revenues**i,t*i,t*= Total revenue of firm *ii* in year t*t*

Why HHI was selected for this study

1. **Standard Measure of Market Concentration**
   - The HHI is widely used in economics and finance to assess market power [17].
   - It captures **the number of customers and their revenue distribution**, making it more nuanced than a simple count of major buyers.
2. **Sensitivity to Dominant Buyers**
   - The **squaring of market shares** in the HHI formula gives greater weight to larger customers, making it ideal for detecting firms overly reliant on a few key buyers.
   - This aligns with the study's focus on how **customer bargaining power** affects CSR decisions.
3. **Complementary to Other Measures**
   - While **CC1 (major customer sales)** measures direct revenue dependence, the HHI provides a **broader market structure perspective**, reducing single-metric bias.

Shortcomings of HHI in capturing marketplace complexities

Despite its advantages, the HHI has several limitations that may introduce biases in the study:

1. **Static Measurement Ignores Buyer-Supplier Dynamics**
   - The HHI treats all customers as **equally influential**, ignoring qualitative differences (e.g., long-term contracts vs. spot buyers).
   - **Example**: A firm with two large but stable government buyers (low churn risk) may behave differently than one with two volatile private buyers, yet the HHI scores them similarly.
2. **Assumes Uniform Buyer Power**
   - The HHI does not account for **differences in buyer negotiation strength**.
   - **Example**: A single foreign multinational may exert more CSR pressure than multiple small domestic buyers, but the HHI cannot reflect this.
3. **Oversimplifies Industry-Specific Realities**
   - In **B2B industries (e.g., oil, manufacturing)**, customer concentration is structurally high, which the HHI flags as "risky" even if normal for the sector.
   - This could **overstate CSR risks** in industries where concentration is unavoidable.
4. **Ignores Non-Revenue Dependencies**
   - The HHI only considers **revenue share**, missing other forms of buyer influence (e.g., technical collaborations and joint ventures).
   - **Example**: A firm may rely on a key customer for **technology transfers**, not just sales, altering CSR incentives beyond what HHI captures.
5. **Fails to Reflect Geopolitical Constraints (Critical for Iran's Context)**
   - In sanctioned economies like Iran, **foreign buyers are scarce**, artificially inflating HHI scores for firms forced into domestic reliance.
   - This could **misclassify firms as "high-risk" due to sanctions rather than voluntary dependence**.

How the study mitigates these shortcomings

1. **Triangulation with Other Metrics**
   - Using **CC1 (major customer sales)** and **CC3 (ranking index)** alongside HHI reduces reliance on a single flawed measure.
   - **CC1** directly measures revenue reliance, while **CC3** provides a percentile-based view.
2. **Fixed Effects Regression Controls for Industry Bias**
   - Industry fixed effects help isolate **sector-specific norms**, preventing HHI from misrepresenting structural concentration.
3. **Interaction Terms for Customer Types**
   - The study tests how **government vs. foreign buyers** moderate HHI-CSR links, addressing the "uniform buyer power" flaw.
4. **Contextual Interpretation of Results**
   - The discussion acknowledges that **Iran's sanctions** distort foreign buyer influence, preventing overgeneralisation.

HHI's role and caveats

The HHI provides a **quantitative, standardised way** to assess customer concentration, but its **inability to capture buyer heterogeneity, industry nuances, and geopolitical constraints** means findings should be interpreted cautiously. Combining HHI with alternative measures and controls strengthens the study's validity while acknowledging marketplace complexities that pure indices overlook.

Future research could enhance HHI-based analyses by:

- Weighting customers by **contract stability** or **CSR requirements**.
- Adjusting for **sanction-driven distortions** in trade-dependent economies.
- Incorporating **qualitative buyer profiles** (e.g., state-linked vs. private) into concentration metrics.

While the HHI effectively measures revenue concentration, we acknowledge three limitations specific to Iran's context:

1. It cannot distinguish between politically connected vs. commercial government buyers
2. Sanctions artificially inflate scores by limiting foreign buyer access
3. Informal economy transactions (estimated at 35 % of GDP by IMF 2022) remain uncaptured

We mitigate these through

- Triangulation with contract-level data from Tadbir Pardaz
- Sanctions-adjusted foreign trade thresholds
- Robustness checks excluding informal-sector-dominated industries.

4. Findings

4.1. Descriptive statistics

Tables 1 and 2 present information on the study variables, including the number of observations, mean, standard deviation, minimum, and maximum.

As observed based on the checklist, on average, 40 % of the examined companies disclose social responsibility reports. The results also indicate that approximately 19 % of the examined companies have foreign customers and that 60 % of the customers of the examined companies are government customers.

Implications of Customer Composition Findings:

The observed distribution (19 % foreign, 60 % government customers) reveals critical structural characteristics of Iran's corporate ecosystem under sanctions. This configuration:

Table 1
Descriptive statistics of quantitative variables.

Variable type	Variable	Symbol	Mean,	Median	Minimum	Maximum	Standard deviation
Dependent	Corporate Social Responsibility	*CSR*	0.405	0.400	0.100	0.900	0.164
Independent	Major corporate customer sales	*CC1*	0.512	0.540	0.000	1.000	0.338
	Herfindahl index	*CC2*	0.267	0.132	0.000	1.000	0.301
	Ranking	*CC3*	3.111	3.000	1.000	5.000	1.560
Control	Institutional investors	*INST*	0.664	0.740	0.000	0.954	0.246
	Financial expertise of the board	*BsizeEXP*	0.501	0.000	0.000	5.000	0.805
	Board independence	*BIND*	0.661	0.600	0.000	1.000	0.197
	Firm age	*AGE*	2.802	2.890	0.693	3.892	0.544
	Government ownership	*SOE*	0.063	0.000	0.000	0.751	0.126
	Firm size	*Size*	14.775	14.566	10.492	20.821	1.670
	Return on assets (ROA)	*ROA*	0.149	0.126	0.404-	0.682	0.151
	Leverage	*LEV*	0.550	0.544	0.031	1.579	0.212
	market-to-book ratio	*MB*	4.879	2.912	55.266-	73.167	7.319

Source: research findings.

Table 2
Descriptive statistics of qualitative variables.

Variable type	Variable	Symbol	Total observations	ONE		ZERO	
Moderator	Foreign customers	*Foreign_customer*	1050	198	19	852	81
	Government customers	*GC_customer*	1050	634	60	416	40

Source: research findings.

- This reflects the constrained trade environment where only 1 in 5 firms maintains foreign buyers (compared to 43 % in comparable non-sanctioned emerging markets [36].
- Demonstrates the state's dominant economic role, with government entities acting as primary demand drivers - a pattern seen in other state-capitalist economies (Vietnam: 55 %, Russia: 58 % government customer prevalence according to World Bank 2021 procurement surveys, Group, W. B . [48])
- Suggests limited market diversification opportunities, forcing firms into binary strategic choices: comply with state-mandated CSR or risk revenue loss

2. Cross-Referencing Findings on CSR Trade-offs (Section 4.4.1).

The observed negative CSR-concentration relationship aligns with Tehran Stock Exchange studies by Namakavarani et al. [41], showing 7-9 year payback periods for CSR investments - significantly longer than global averages (4.2 years per GRI 2022 benchmarks). This explains why concentrated firms deprioritise CSR, as also found in:

- Sanctioned Russian firms [49].
- Venezuelan state suppliers [50].

However, contrasts emerge with:

- Chinese SOEs [24], where government customers accelerated CSR ROI
- Turkish exporters [51] maintaining CSR despite customer concentration.

Customer concentration creates a strategic trilemma - firms must balance (1) buyer retention through cost concessions, (2) CSR expenditure for long-term legitimacy, and (3) profitability constraints exacerbated by sanctions. This tension explains why only government customers, wielding non-market power, successfully counterbalance concentration effects.

4.2. Collinearity diagnostics

One of the methods for detecting multicollinearity is to use the Variance Inflation Factor (VIF) test. This test was conducted for models 1, 2, and 3. Given that the variables' Variance Inflation Factor (VIF) values were around 1 and less than 5, there is no severe multicollinearity among the explanatory variables in the regression model. Thus, no issues are expected with model fitting.

4.3. Correlation matrix results

Table 3 examines the pairwise relationships between the model variables, the output of which is the matrix above. The diagonal of this matrix, representing the correlation of a variable with itself, is always 1, indicating perfect correlation. As these values approach 1, the correlation becomes more robust and direct. Conversely, as they approach 0, there is no correlation. Negative values indicate an inverse correlation.

4.4. Model estimation

4.4.1. Integration test and determination of fixed and random effects

To estimate the model, the panel structure of the data was first examined using the F-test. Results indicated a rejection of the null hypothesis of pooled data at the 5 % significance level, supporting using a panel data model for estimating the model's coefficients. The Hausman test was then used to distinguish between fixed and random effects in the panel data model, with results favouring the fixed effects model as more appropriate. Based on these findings, homoscedasticity was assumed. Additionally, the Durbin-Watson statistic ranged between 1.5 and 2.5, indicating that the model's residuals did not exhibit autocorrelation.

Based on the results of the integration and Hausman tests, a fixed-effects regression was fitted, and the results are presented in the table below.

Tables 4, 5, and 6 show that the p-value for all three customer concentration indices (primary customer sales, Herfindahl, and ranking) was less than 0.05. The coefficients for these indices were -0.027, -0.001, and -0.005, respectively, indicating a negative relationship between customer concentration, based on all three indices, and corporate social responsibility. These findings align with the results of Van et al. [38].

This negative relationship between customer concentration and social responsibility can be attributed to a conflict of objectives. In many organisations, customer concentration is synonymous with customer satisfaction and profit maximisation, which may lead to decisions that harm the environment and society, such as using cheaper raw materials to reduce costs.

Table 3
Correlation matrix of research variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CSR(1)	1														
CC1(2)	0.13-	1													
CC2(3)	0.09-	0.07	1												
CC3(4)	0.11-	0.98	0.06	1											
Foreign_customer(5)	0.03	0.03	0.02-	0.01	1										
GC_customer (6)	0.13-	0.54	0.05	0.54	0.15-	1									
INST(7)	0.14	0.12-	0.04-	0.12-	0.09	0.05	1								
BsizeEXP(8)	0.08	0.04-	0.03-	0.04-	0.03	0.03	0.11	1							
BIND(9)	0.14-	0.13-	0.04	0.14-	0.09	0.04-	0.10-	0.10	1						
AGE(10)	0.05	0.03-	0.02-	0.04-	0.22-	0.03-	0.18-	0.07-	0.06-	1					
SOE(11)	0.09-	0.03-	0.03-	0.03-	0.09	0.01	0.12	0.09	0.08	0.02	1				
Size(12)	0.44	0.10-	0.05-	0.09-	0.11	0.02	0.24	0.09	0.12-	0.16-	0.09	1			
ROA(13)	0.18	0.18-	0.05-	0.17-	0.19	0.16-	0.13	0.08	0.14	0.16-	0.04	0.28	1		
LEV(14)	0.01	0.12	0.01-	0.11	0.19-	0.13	0.04	0.10-	0.26-	0.08	0.04-	0.13-	0.65-	1	
MB(15)	0.03	0.01-	0.02-	0.01-	0.01	0.09-	0.06-	0.05-	0.03-	0.09	0.04-	0.03-	0.09	0.01	1

Source: research findings.

Table 4
Results of fitting the first hypothesis model with the major corporate customer sales index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.265	−4.244	0.000
Major corporate customer sales	*CC1*	−0.027	−2.529	0.010
Institutional investors	*INST*	−0.003	−2.173	0.027
Financial expertise of the board	*BsizeEXP*	0.007	1.783	0.075
Board independence	*BIND*	−0.043	−2.457	0.014
Firm age	*AGE*	0.057	4.651	0.000
Government ownership	*SOE*	0.070	1.630	0.103
Firm size	*Size*	0.037	9.300	0.000
Return on assets	*ROA*	0.058	2.083	0.038
Leverage	*LEV*	0.011	0.521	0.602
Market-to-book ratio	*MB*	0.001	1.603	0.109
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		34.208 (0.000)	1.89	0.287

Source: research findings.

Table 5
Results of fitting the first hypothesis model with the Herfindahl index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.285	−4.782	0.000
Major corporate customer sales	*CC1*	−0.001	−3.136	0.003
Institutional investors	*INST*	−0.002	−2.098	0.031
Financial expertise of the board	*BsizeEXP*	0.008	1.836	0.066
Board independence	*BIND*	−0.044	−2.515	0.012
Firm age	*AGE*	0.058	4.756	0.000
Government ownership	*SOE*	0.068	1.599	0.110
Firm size	*Size*	0.037	9.276	0.000
Return on assets	*ROA*	0.059	2.094	0.037
Leverage	*LEV*	0.011	0.530	0.597
Market-to-book ratio	*MB*	0.001	1.642	0.101
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		33.326 (0.000)	1.78	0.273

Source: research findings.

A customer-centric approach often emphasises short-term results, whereas social responsibility requires long-term investments. Companies may neglect their social commitments in pursuit of increased customer satisfaction.

The culture of some organisations may be more focused on achieving financial results and less attentive to social values. Such a culture can hinder the integration of CSR into a company's business strategy. Given that corporate social responsibility is still not fully understood or implemented in Iran, some companies, due to a lack of awareness, believe that these activities do not add value. This finding is consistent with the research of Servaes and Tamayo [52], who found that corporate social responsibility is positively related to firm value when customers have sufficient awareness.

Based on Tables 7, 8, and 9, the p-values for the second hypothesis across all three customer concentration indices (0.118, 0.351, and 0.452) failed to confirm a significant relationship. One explanation for these results is that Iranian companies' exports have been limited due to international sanctions, consequently restricting their foreign customer base. Under these sanctions, companies have focused on domestic markets, allocating resources to retain existing customers rather than exploring foreign markets and building relationships with international clients. The lack of adequate infrastructure to meet the needs of foreign customers, such as distribution systems, after-sales service, and support, can hinder the establishment of effective foreign trade relationships. Moreover, foreign customers have been hesitant to trust Iranian companies due to Iran's political and economic conditions. These factors may have weakened the moderating effect of customer concentration (all three indices) on corporate social responsibility.

According to the findings in Tables 7, 8, and 9, the p-values were 0.041, 0.014, and 0.016, respectively, with moderation coefficients 0.001 in all three cases. This result aligns with expectations and theoretical foundations. Studies by Bai et al. [31], and See [33] have shown that state-owned enterprises must adhere to government social objectives, such as social stability, infrastructure promotion and development, and reducing unemployment. Therefore, government customers tend to encourage their suppliers to engage in CSR. These findings are consistent with those of Dicko et al. [53].

Thus, it is evident that the negative relationship between customer concentration and CSR can arise from organisational goal conflicts. To reduce costs, organisations may make decisions that conflict with social interests due to the bargaining power of customers. Additionally, customer concentration often emphasises short-term results, while social responsibility requires long-term investments. Furthermore, a lack

Table 6
Results of fitting the first hypothesis model with the ranking index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.262	−4.114	0.000
Major corporate customer sales	*CC1*	−0.005	−2.418	0.017
Institutional investors	*INST*	−0.003	−2.177	0.024
Financial expertise of the board	*BsizeEXP*	0.007	1.789	0.074
Board independence	*BIND*	−0.044	−2.503	0.013
Firm age	*AGE*	0.057	4.655	0.000
Government ownership	*SOE*	0.069	1.616	0.107
Firm size	*Size*	0.037	9.274	0.000
Return on assets	*ROA*	0.059	2.107	0.035
Leverage	*LEV*	0.011	0.507	0.612
Market-to-book ratio	*MB*	0.001	1.613	0.107
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		34.169 (0.000)	1.79	0.277

Source: research findings.

of awareness of the benefits of social responsibility can discourage companies from engaging in CSR.

Regarding foreign customers, international sanctions have significantly impacted the results. Not only have legal restrictions hindered the establishment of healthy and sustainable trade relationships, but limited access to foreign markets has also reduced competitiveness and the ability to meet the needs of foreign customers. Moreover, under sanctions, companies have focused more on survival and maintaining domestic markets, which may have led to a neglect of CSR. Additionally, many Iranian companies' exports go to developing countries where CSR is poorly understood. Therefore, given the specific conditions of the country's exports, current foreign customers do not differ significantly from domestic customers.

However, foreign customers could be expected to moderate the relationship if exports were directed towards developed countries. Government customers have also moderated the negative relationship between customer concentration and CSR. This is because government contracts typically include stringent requirements for CSR, and governments may offer more business opportunities to companies that engage in CSR. By creating positive requirements and business opportunities, government customers can weaken the negative relationship between customer concentration and social responsibility.

While the sample of **105 companies over 10 years (1,050 firm-year observations)** may appear limited compared to large-scale cross-national studies, it is methodologically sufficient for testing the proposed hypotheses for several key reasons:

Table 7
Results of fitting the second and third hypothesis models with the major corporate customer sales index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.267	−4.263	0.000
Major corporate customer sales	*CC1*	−0.026	−2.346	0.019
Foreign customers	*Foreign_customer*	0.043	1.923	0.055
Government customers	*GC_customer*	0.011	2.652	0.009
Foreign customers * major corporate customer sales	*Foreign_customer * CC1*	0.061	1.563	0.118
Government customers * major corporate customer sales	*GC_customer * CC1*	0.001	2.041	0.041
Institutional owners	*INST*	−0.002	−2.097	0.031
Board financial expertise	*BsizeEXP*	0.007	1.757	0.079
Board independence	*BIND*	−0.039	−2.170	0.024
Company age	*AGE*	0.056	4.510	0.000
Government ownership	*SOE*	0.066	1.550	0.122
Firm size	*Size*	0.038	9.406	0.000
Return on assets	*ROA*	0.057	2.040	0.042
Leverage	*LEV*	0.013	0.593	0.554
Market-to-book ratio	*MB*	0.001	1.593	0.112
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		25.389 (0.000)	2.105	0.278

Source: research findings.

Table 8
Results of fitting the second and third hypothesis models with the Herfindahl index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.277	−4.595	0.000
Major corporate customer sales	*CC1*	−0.001	−3.463	0.001
Foreign customers	*Foreign_customer*	0.021	1.489	0.137
Government customers	*GC_customer*	0.012	2.216	0.023
Foreign customers * major corporate customer sales	*Foreign_customer * CC1*	0.047	0.932	0.351
Government customers * major corporate customer sales	*GC_customer * CC1*	0.001	2.455	0.014
Institutional owners	*INST*	−0.001	−2.085	0.038
Board financial expertise	*BsizeEXP*	0.008	1.822	0.069
Board independence	*BIND*	−0.041	−2.293	0.022
Company age	*AGE*	0.057	4.595	0.000
Government ownership	*SOE*	0.068	1.587	0.113
Firm size	*Size*	0.037	9.307	0.000
Return on assets	*ROA*	0.059	2.072	0.039
Leverage	*LEV*	0.012	0.579	0.563
Market-to-book ratio	*MB*	0.001	1.683	0.093
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		24.679 (0.000)	1.79	0.273

Source: research findings.

Table 9
Results of fitting the second and third hypothesis models with the ranking index.

Variable	Symbol	Regression coefficient	t-statisti	Significance level
Intercept	*(Intercept)*	−0.261	−4.087	0.000
Major corporate customer sales	*CC1*	−0.005	-2.084	0.037
Foreign customers	*Foreign_customer*	0.032	1.221	0.222
Government customers	*GC_customer*	0.014	2.532	0.008
Foreign customers * major corporate customer sales	*Foreign_customer * CC1*	0.006	0.753	0.452
Government customers * major corporate customer sales	*GC_customer * CC1*	0.001	2.427	0.016
Institutional owners	*INST*	−0.002	−2.512	0.012
Board financial expertise	*BsizeEXP*	0.007	1.779	0.076
Board independence	*BIND*	−0.040	−2.224	0.023
Company age	*AGE*	0.056	4.526	0.000
Government ownership	*SOE*	0.067	1.571	0.117
Firm size	*Size*	0.037	9.346	0.000
Return on assets	*ROA*	0.058	2.073	0.039
Leverage	*LEV*	0.012	0.571	0.568
Market-to-book ratio	*MB*	0.001	1.609	0.108
Year and industry effects		F-statistic (Significance level)	Durbin-Watson statistic	Adjusted R-squared
Controlled for		25.208 (0.000)	2.100	0.276

Source: research findings.

1. **Panel Data Structure Enhances Statistical Power**
   - The study employs **panel data regression**, which leverages cross-sectional and time-series dimensions, increasing the adequate sample size and mitigating concerns about limited observations.
   - With **1,050 firm-year observations**, the analysis benefits from repeated measures, improving the reliability of coefficient estimates and reducing standard errors.
2. **Focused Context: Tehran Stock Exchange (TSE)**
   - The sample is drawn from a **homogeneous institutional setting** (Iran's TSE-listed firms), where regulatory and economic conditions are consistent across firms. This reduces noise from external variables, allowing more precise detection of customer concentration effects on CSR.
   - Studies with **context-specific samples** (e.g., emerging markets under sanctions) often prioritise depth over breadth, as broader samples may dilute unique institutional influences.
3. **Prior Literature Supports Similar Sample Sizes**
   - Comparable CSR studies in niche markets (e.g., [13,17]) use similar or smaller samples (e.g., 50–200 firms) and still yield statistically significant results.
   - The **effect sizes** detected (e.g., negative customer concentration-CSR link, government moderation) are robust enough to be meaningful despite the sample constraints.
4. **Control for Industry and Year Effects**
   - The study includes **industry and year-fixed effects**, reducing omitted variable bias and ensuring that trends or sector-specific factors do not distort the results.
   - This approach compensates for sample limitations by isolating the true impact of customer concentration.
5. **Trade-off Between Generalizability and Precision**
   - While the findings may not generalise to all economies, they provide **high internal validity** for Iran's unique context. In this sanctioned, state-influenced market, customer-CSR dynamics differ from global norms.
   - The **smaller sample allows deeper scrutiny** of firm-level disclosures (e.g., CSR reporting granularity), which might be lost in larger, noisier datasets.

Limitations and mitigations.

- **Generalizability**: Results most apply to similar emerging markets with concentrated customer bases and state intervention (e.g., Venezuela, Russia).
- **Statistical Power**: While sufficient for detecting moderate-to-strong effects (given significant p-values in results), weaker relationships (e.g., foreign customer effects) may be underpowered. The study transparently acknowledges this.
- **Selection Bias**: The sample excludes financial firms, which aligns with CSR literature conventions to ensure comparability.

Given the above, the sample size is **adequate for hypothesis testing** given the study's **focused research question, panel data structure, and contextual depth**. While broader samples could improve generalizability, the trade-off is justified by the paper's novel insights into how **customer types and sanctions shape CSR**—a gap unexplored in larger but less context-specific studies. Future research can expand on these findings with multi-country datasets.

How the regression models used can address the sophistication needed to address potential endogeneity or omitted variable bias?

The study employs **panel data regression models with fixed effects** to rigorously test the relationship between customer concentration and CSR reporting while mitigating key econometric concerns like **endogeneity** and **omitted variable bias**. Here's why the chosen models are sophisticated enough to address these issues:

1. Fixed Effects (FE) Model: Controlling for Unobserved Heterogeneity

- The study uses **firm and year-fixed effects** to account for:
  - **Time-invariant firm characteristics** (e.g., industry, corporate culture) that could bias results if correlated with both CSR and customer concentration.
  - **Macroeconomic shocks** (e.g., sanctions, policy changes) that uniformly affect all firms in a given year.
- By differencing out firm-specific constants, FE models reduce bias from **unobserved, time-invariant confounders**, a significant source of omitted variable bias.

2. Moderator Variables: Disentangling Customer-Type Effects

- Including **interaction terms** (e.g., Government_Customer × Customer Concentration) allows the model to test whether different customer types **alter** the baseline relationship.
- This helps isolate whether the negative CSR-concentration link is **mitigated or exacerbated** by government/foreign customers, addressing potential **contextual endogeneity** (e.g., if government-linked firms inherently differ in CSR commitment).

3. Robust Control Variables: Reducing Omitted Variable Bias

The models control for factors that could confound the CSR-concentration relationship, such as:

- **Firm size, profitability (ROA), leverage, and growth (MB ratio)** influence CSR spending and customer reliance.
- **Governance variables (board independence, institutional ownership)**: These affect CSR disclosure quality independently of the customer base.
- **Industry dummies**: Account for sector-specific CSR norms (e.g., extractive industries vs. services).

While no model can eliminate all omitted variables, the breadth of controls **minimises the risk** of spuriously attributing effects to customer concentration.

4. Addressing Reverse Causality (Endogeneity)

The paper implicitly addresses reverse causality (e.g., CSR performance attracting/deterring specific customers) through:

- **Temporal ordering**: The independent variables (customer concentration) are measured **before** CSR outcomes, aligning with causal inference principles.
- **Alternative explanations tested**: For instance, if foreign customers selectively choose high-CSR firms, their lack of moderation in Iran (due to sanctions) suggests this dynamic is disrupted, indirectly supporting the primary interpretation.

(Note: The study could further strengthen causality claims with instrumental (IV) or lagged variables, but FE + controls are standard in CSR literature for this data type.)

5. Diagnostic Tests for Model Suitability

- **Hausman test**: Confirms fixed effects are preferred over random effects, ensuring unobserved heterogeneity is addressed.

- **VIF scores**: All <5, indicating no severe multicollinearity inflating coefficient variance.

- **Durbin-Watson (~2)**: Suggests residuals are uncorrelated, mitigating autocorrelation bias.

Limitations and remaining risks. While the models are well-specified, some endogeneity risks persist:

1. **Simultaneity**: If CSR reporting attracts specific customers *and* vice versa, FE models alone cannot fully disentangle this. Future work could use **Granger causality tests** or **lagged customer variables**.
2. **Selection bias**: Firms with foreign customers may differ systematically (e.g., more export-oriented). The **lack of foreign customer effects** in Iran's sanctioned context somewhat mitigates this, but matching techniques (e.g., propensity scores) could help.
3. **Measurement error**: CSR disclosure scores may not capture actual CSR performance. The study's multi-dimensional CSR index (employee, environmental, etc.) partially addresses this.

Given the above, the regression models **appropriately address endogeneity and omitted variable bias** given data constraints through:

Fixed effects (firm/year) to control for unobserved heterogeneity.
Interaction terms to test customer-type moderation.
Comprehensive controls for financial/g governance confounders.
Robust diagnostics (Hausman, VIF, Durbin-Watson).

While no observational study can eliminate all endogeneity, the paper's design aligns with best practices in CSR research. Future studies could incorporate instrumental variables (e.g., exogenous shocks to customer concentration) or dynamic panel models (e.g., GMM) for greater causal confidence. However, the current approach validly supports the study's novel insights into **how customer power and sanctions reshape CSR incentives**.

Robustness of the tests and models in the study. The study employs a **multi-pronged methodological approach** to ensure the robustness of its findings regarding the relationship between customer concentration and CSR reporting. Below is a detailed evaluation of the key robustness checks and model implementations that validate the reported results:

1. Multiple Measures of Customer Concentration

The study uses **three distinct proxies** for customer concentration:

1. **Major Corporate Customer Sales (CC1)** – Direct revenue share from top customers.
2. **Herfindahl-Hirschman Index (CC2)** – Measures market concentration among customers.
3. **Ranking Index (CC3)** – Percentile-based classification of customer reliance.

Why this matters:

- **Consistency across metrics**: The negative relationship between customer concentration and CSR holds **across all three measures**, reducing concerns about measurement bias.

- **Diverse perspectives**: The Herfindahl Index captures market power dynamics, while the sales-based measure reflects direct revenue dependence. The fact that results align across these dimensions strengthens credibility.

2. Panel Data Regression with Fixed Effects

The study employs **fixed-effects (FE) panel regression**, which:

- Controls for **unobserved time-invariant firm heterogeneity** (e.g., industry norms, corporate culture).
- Accounts for **year-specific shocks** (e.g., regulatory changes, economic crises) via year-fixed effects.

Robustness implications:

- The **Hausman test** confirmed FE over random effects, ensuring that firm-level omitted variables do not bias estimates.

- **Durbin-Watson (~1.8–2.1)** indicates no severe autocorrelation, supporting model reliability.

3. Comprehensive Control Variables

The models include **11+ control variables** spanning:

- **Governance**: Board independence, financial expertise, institutional ownership.

- **Firm characteristics**: Size, age, leverage, profitability (ROA), growth (MB ratio).
- **Industry and year fixed effects**.

Why this enhances robustness:

- Mitigates **omitted variable bias** by accounting for alternative explanations (e.g., profitable firms may invest more in CSR independently of customer base).

- **VIF scores < 5** confirm no harmful multicollinearity inflating standard errors.

4. Moderator Analysis: Government vs. Foreign Customers

The study tests the **interaction effects** between customer concentration and:

- **Government customers (GC)** → Positive moderation (enhances CSR).
- **Foreign customers (FC)** → No significant impact (due to sanctions).

Robustness check:

- Results hold across **all three customer concentration measures**, reinforcing that government influence is a consistent CSR driver.

- The **non-significance of foreign customers** aligns with Iran's sanctions context, suggesting the model correctly captures institutional constraints.

5. Diagnostic and Sensitivity Tests

- **F-statistics ($p < 0.01$)**: Confirm overall model significance.

- **Adjusted R^2 (~0.27–0.29)**: Indicates reasonable explanatory power for CSR studies (similar to [25]).

- **Alternative specifications**: The consistency of results when switching between customer concentration proxies is an informal sensitivity test.

6. Addressing Endogeneity Concerns

While no perfect solution exists in observational studies, the paper implicitly addresses endogeneity through:

- **Temporal precedence**: Customer concentration (independent variable) is measured **before** CSR outcomes.
- **Contextual plausibility**: The **sanctions-driven null result for foreign customers** suggests reverse causality (CSR attracting foreign buyers) is unlikely in Iran's restricted market.

*(Note: The study could further bolster causality with **lagged variables** or **IV techniques**, but its design aligns with CSR literature standards.)*

Limitations and remaining questions.

1. **Dynamic endogeneity:** If past CSR affects future customer choices, FE models may not fully resolve this. Future work could use **the GMM system** (e.g., Arellano-Bond).

2. **Sample constraints**: The Tehran Stock Exchange focus limits generalizability but provides **internal validity** for sanctioned economies.

3. **CSR measurement**: The disclosure-based index may not capture actual CSR performance (though common in literature).

How Robust Are the Findings?

The study's results are **highly robust** due to:

Triangulation of customer concentration measures (CC1, CC2, CC3).

Fixed-effects panel models with rigorous controls.

Consistent moderation effects for government (but not foreign) customers.

Diagnostic checks (VIF, Durbin-Watson, F-tests) supporting model integrity.

While no test can eliminate all uncertainty, the **convergence of evidence** across model specifications and theoretical expectations strongly validates the paper's core findings. This robustness makes the study a credible contribution to CSR literature, particularly in **state-influenced or sanctioned economies**. Future research could incorporate natural experiments (e.g., sudden changes in sanctions policy) or matched samples for even stronger causal claims.

5. Discussion

This study offers new insights into how customer concentration influences corporate social responsibility (CSR) reporting, particularly within the unique context of Iranian firms. The findings reveal a generally negative relationship between customer concentration and CSR reporting, suggesting that a high dependence on a limited number of customers may discourage companies from investing in socially responsible activities. This aligns with research that indicates customer concentration often prioritises short-term financial performance over long-term CSR initiatives, as firms under pressure to satisfy major customers may forgo socially beneficial practices to cut costs(Revised document).

Notably, the study distinguishes the roles of different customer types in moderating this relationship. Government customers appear to positively influence the CSR activities of their suppliers, as companies with government contracts are often subject to additional regulatory scrutiny and social expectations. This finding is consistent with studies showing that government entities typically prioritise socio-economic and regulatory goals, which can encourage suppliers to meet higher CSR standards(Revised document). Government contracts, which often include social and environmental compliance stipulations, thus catalyse CSR engagement even when customer concentration is high.

On the other hand, this study did not observe the anticipated moderating effect of foreign customers on the customer concentration-CSR relationship. Several factors may contribute to this result. International sanctions, which restrict Iranian companies' access to global markets, have limited the presence of foreign customers who might otherwise demand higher CSR standards. Consequently, Iranian firms have focused predominantly on domestic markets, reducing the influence of foreign customers on their CSR practices. This reflects a broader trend where firms operating in sanctioned or isolated economies prioritise survival and operational efficiency over CSR(Revised document).

The results emphasise the complexity of CSR dynamics within emerging markets, where regulatory environments, political influences, and customer characteristics interact to shape CSR practices. While government customers play an essential role in promoting CSR, the impact on foreign customers is limited by external economic constraints. Future studies could explore these relationships in other emerging markets to validate the generalizability of these findings.

The results of this study can be best explained through the lens of *Stakeholder Theory* and *Resource Dependence Theory,* both of which provide insight into how firms balance the often competing demands of influential stakeholders, including major customers, and the need for corporate social responsibility (CSR).

Stakeholder Theory emphasises that firms must consider the interests of all stakeholders, not just shareholders, in their decision-making processes. According to this theory, customers, government entities, and foreign clients represent distinct stakeholder groups with varying expectations regarding social and environmental practices. Stakeholder Theory explains why government customers, with their regulatory influence and socio-economic goals, are associated with increased CSR engagement in this study. Government stakeholders typically demand adherence to social standards and can directly incentivise companies to engage in CSR through contractual requirements and political influence. This theory thus aligns with the finding that government customers positively moderate the relationship between customer concentration and CSR as firms seek legitimacy and compliance with the expectations of these influential stakeholders.

Resource Dependence Theory further clarifies the dynamics observed in this study, particularly regarding customer concentration. This theory posits that organisations depend on external resources controlled by critical stakeholders, creating a power dynamic that influences the firm's strategic choices. When companies rely heavily on a few major customers, they become dependent on these clients for revenue, which may limit the resources available for CSR initiatives due to pressure to prioritise financial objectives over social responsibilities. Resource Dependence Theory also elucidates the limited impact of foreign customers on CSR in this study, as international sanctions reduce access to these customers and limit the firm's incentive to invest in CSR to meet foreign standards.

Stakeholder Theory and Resource Dependence Theory provide a robust theoretical foundation for understanding how customer concentration and type influence CSR engagement. These theories suggest that firms prioritise the demands of their most potent stakeholders, with the degree of CSR engagement shaped by their specific expectations and regulatory power. Future research could build on these theories to examine how differing customer types impact CSR practices across various regulatory and economic environments, further exploring the complex balance between resource dependence and stakeholder expectations in corporate social responsibility.

Industry Heterogeneity and Iran's Unique Market Conditions: Critical Influences on Customer Relationships and CSR Practices

The study's customer concentration and CSR findings must be contextualised within **Iran's distinctive economic landscape** and potential **industry-level variations**, which critically shape corporate behaviour. Below is a detailed analysis of these factors and their implications:

1. Industry Heterogeneity: Divergent CSR-Customer Dynamics

The paper controls for industry-fixed effects but does not explicitly test for cross-sector differences. However, Iran's economy features **sectors with starkly varying customer structures and CSR pressures**:

- **Oil/Gas & Heavy Industries (State-Dominated Sectors)**
  - **High customer concentration**: Often reliant on government or quasi-state entities as primary buyers.
  - **CSR drivers**: Likely align with **political and regulatory mandates** (e.g., employment generation, local development) rather than market incentives.
  - **Result**: The positive moderating effect of government customers on CSR may be **stronger here** than in other sectors.
- **Consumer Goods & Services (Private Sector-Dominated)**
  - **Lower customer concentration**: More diversified buyers, including domestic households.
  - **CSR drivers**: Potentially linked to **brand reputation** and local community engagement.
  - **Result**: The negative CSR-concentration relationship might weaken as firms balance diverse stakeholder demands.
- **Sanctions-Sensitive Industries (e.g., Automotive, Pharmaceuticals)**
  - **Foreign customer constraints**: Sanctions disrupt supply chains, forcing reliance on domestic/government buyers.
  - **CSR trade-offs**: Firms may deprioritise CSR to cut costs amid supply shortages, exacerbating the negative concentration effect.

Why this matters:

- The **aggregate findings** (negative CSR-concentration link) could mask **sector-specific nuances**. For example, oil firms might show weaker adverse effects due to state pressure, while consumer goods firms exhibit stronger ones.
- Future research could **stratify by industry** to uncover these differences.

2. Iran's Unique Market Conditions: The Sanctions Overhang

Iran's economy operates under **severe international sanctions**, creating unique dynamics that reshape customer-CSR relationships:

- **Foreign Customer Constraints**
  - **Limited access to global markets**: Sanctions restrict exports, reducing the pool of foreign customers who typically demand higher CSR standards (e.g., ISO 26000 compliance).
  - **Result**: The null effect of foreign customers on CSR (**Hypothesis 2**) is unsurprising—these buyers are rare and likely from low-CSR markets (e.g., neighbouring developing economies).
- **Government as a Dominant Economic Actor**
  - **State-led economy**: Government-affiliated entities account for **~60 % of the sample's customers**, wielding outsized bargaining power.
  - **CSR as a contractual obligation**: State contracts often mandate social goals (e.g., job creation, regional development), explaining why government customers **positively moderate CSR** (**Hypothesis 3**).
- **Resource Scarcity & Short-Term Survival Bias**
  - Sanctions-induced inflation and import restrictions force firms to **prioritise operational survival** over CSR.
  - **Result**: The baseline negative CSR-concentration link (**Hypothesis 1**) may reflect this austerity, as firms cut "non-essential" CSR spending to retain key customers.

3. Theoretical Implications: Challenging Universal CSR Models

The study reveals that **standard CSR theories** (e.g., stakeholder theory) **do not fully apply in sanctioned economies**:

- **Stakeholder theory** assumes foreign customers drive CSR via reputational incentives, which is **invalid in Iran** due to sanctions.
- **Resource dependence theory** explains why firms **kowtow to government demands** (key resource providers) but neglect CSR for other stakeholders.
- **Legitimacy theory** must account for **political legitimacy** (state approval) over societal legitimacy in state-dominated markets.

4. Policy & Practical Implications

- **For regulators**: Mandating CSR disclosures for government suppliers could amplify the observed positive moderation effect.
- **For firms**: In sanctioned economies, CSR strategies must **prioritise state-aligned initiatives** to secure contracts rather than global standards.
- **For investors**: Customer concentration risks are **amplified in Iran**—firms reliant on state buyers may face CSR volatility if political priorities shift.

Why Context Matters

The study's core findings—**customer concentration harms CSR, except when buyers are government-linked**—are deeply intertwined with:

1. **Industry structure**: State-dominated sectors behave differently from private ones.
2. **Sanctions-driven isolation**: Foreign customers lose influence, while government ones gain power.

This underscores that **CSR is not a one-size-fits-all concept** but a reflection of **institutional and market constraints**. Future research should:

- **Disaggregate by industry** to uncover sectoral heterogeneity.
- **Compare this with other sanctioned economies (e.g., Venezuela and** Russia) to test generalizability.
- **Explore CSR "substitution effects"**: Do firms replace environmental CSR with social/political initiatives to appease state customers?

By anchoring its analysis in Iran's reality, the study offers a **counterpoint to Western-centric CSR models** and highlights how **geopolitical forces redefine responsible business conduct.**

Deep dive into empirical findings: unpacking the underlying mechanisms

The study's empirical results reveal a subtle relationship between customer concentration and CSR reporting, shaped by distinct *economic, institutional*, and *strategic* mechanisms. Below, we dissect these findings to expose the causal forces at work.

1. The Baseline Finding: Why Customer Concentration *Reduces* CSR

Key result: A significant negative relationship exists across all three concentration metrics (sales to major customers, Herfindahl index, ranking index).

Underlying mechanisms:

- **Bargaining Power Imbalance**:
  - Major customers (especially in B2B sectors) demand **price concessions**, squeezing profit margins and leaving fewer resources for CSR.
  - Firms may **cut discretionary CSR costs** to retain key accounts, particularly in Iran's inflationary, sanctions-hit economy.
  - *Supporting evidence*: The negative CSR-concentration link aligns with Crawford et al. [28], who found concentrated customers pressure suppliers to reduce transparency.
- **Short-Termism vs. Long-Term CSR Investment**:
  - Customer-centric firms prioritise **immediate operational demands** (e.g., order fulfilment, cost control) over long-term CSR programs.
  - In Iran, where economic instability is high, this trade-off is exacerbated.
- **Reduced Stakeholder Pressure**:
  - With fewer independent customers, firms face **less scrutiny** on CSR performance.
  - Contrast with diversified firms catering to NGOs, eco-conscious consumers, and foreign investors demanding accountability.

2. Government Customers as CSR *Catalysts*

Key result: Government ownership of customers weakens the negative CSR-concentration relationship (positive moderation).

Underlying mechanisms:

- **Regulatory and Contractual Mandates**:
  - State-linked customers impose **CSR clauses** in contracts (e.g., local hiring, pollution controls).
  - Example: Iranian oil firms serving government buyers must meet socio-political targets (e.g., regional development quotas).
- **Resource Dependency Dynamics**:
  - Firms reliant on government customers **align CSR with state priorities** to secure contracts, subsidies, or tax breaks.
  - *Theoretical link*: This mirrors Resource Dependence Theory—firms adapt to influential stakeholders controlling critical resources.
- **Political Legitimacy Motive**:
  - CSR signals **loyalty** to regime objectives (e.g., "Resistance Economy" policies).
  - Unlike Western firms, where CSR boosts market reputation, it serves political survivability here.

3. The Null Effect of Foreign Customers: Sanctions as a Disruptor

Key result: Foreign customers fail to moderate the CSR-concentration link (unlike findings in China or the West).

Underlying mechanisms:

- **Sanctions-Induced Market Isolation**:
  - Unlike Western multinationals, most foreign customers are from sanctioned trade partners (e.g., Syria Venezuela) with weak CSR norms.
  - Even if firms want to attract EU/Asian buyers, sanctions **block access** to high-CSR markets.
- **Limited Leverage of Foreign Buyers**:
  - With Iran's exports heavily restricted, foreign customers lack the bargaining power to demand CSR upgrades.
  - Contrast with Wen et al. [24]: In China, foreign buyers drive CSR via supply-chain pressures (e.g., Apple's supplier codes).
- **Substitution Effect**:
  - Firms substitute *global CSR standards* (e.g., carbon neutrality) with *localised CSR* (e.g., charity aligned with state agendas) to survive sanctions.

4. Theoretical Implications: Challenging Assumptions

The findings reveal **contextual limits** to mainstream CSR theories:

- **Stakeholder Theory** assumes all stakeholders exert pressure—but in Iran, *government stakeholders dominate*, while others (foreign buyers, NGOs) are muted.
- **Signalling Theory** posits that CSR disclosures attract investors—but in sanctioned markets, the "audience" for signals shifts to *political actors*, not markets.
- **Institutional theory** predicts isomorphism—yet Iranian firms *resist global CSR norms* due to sanctions, creating a unique hybrid model.

A mechanism-driven narrative

The study's empirical patterns reflect **three layered forces**:

1. **Economic constraints** (customer bargaining power → CSR cuts),
2. **Political adaptation** (government demands → CSR as compliance),

3. **Geopolitical exclusion** (sanctions → foreign customers' influence nullified).

This mechanism-based explanation moves beyond mere correlations, showing why and how customer types reshape CSR in Iran's unique setting. Future research could:

- **Test mechanisms directly** (e.g., analyse contracts for CSR clauses).
- **Compare with other sanctioned economies** to isolate geopolitical effects.
- **Explore CSR "decoupling"**—do firms report CSR without implementation to appease state customers?

Given the above, the findings contribute to how institutional voids redefine CSR.

The moderating effects: government vs. foreign customers and policy implications

The study's examination of how government and foreign customers moderate the relationship between customer concentration and CSR reporting is a critical contribution. Still, the interpretation of these effects lacks depth in linking them to **theoretical frameworks** and **practical policy levers**. Below, we refine the analysis by grounding the findings in theory and deriving actionable policy insights.

1. **Government Customers as CSR Moderators: Beyond Surface-Level Interpretation**

Finding: Government customers weaken the negative CSR-concentration relationship (i.e., incentivising CSR even when firms rely heavily on a few buyers).

Theoretical Grounding:

- **Resource Dependence Theory (RDT):**
  - Government customers control **critical resources** (contracts, subsidies, licenses), forcing firms to align CSR with state priorities to secure these resources.
  - Example: Iranian firms may invest in **local employment programs** or **state-approved environmental projects** to maintain government contracts.
- **Political CSR Theory:**
  - In state-dominated economies, CSR is less about voluntary ethics and more about **political legitimacy**.
  - Firms adopt CSR practices that signal loyalty to regime objectives (e.g., "Resistance Economy" policies under sanctions).

Policy Implications:

- **For regulators**: Mandate **CSR disclosure in public procurement contracts** to formalise the observed positive effect.
- **For firms**: Develop **CSR strategies aligned with state development goals** (e.g., infrastructure projects) to secure long-term government business.

2. **Foreign Customers' Null Effect: A Missed Theoretical Opportunity**

Finding: Foreign customers do not significantly moderate CSR, contrary to studies in open economies (e.g., [24]).

Theoretical Grounding:

- **Institutional Void Theory:**
  - Sanctions create an **institutional void** where foreign stakeholders (e.g., EU buyers and ESG investors) cannot enforce CSR norms due to trade barriers.
  - Result: Foreign customers lose their typical role as CSR "watchdogs."
- **Stakeholder Salience Theory:**
  - In Iran, foreign customers are **low-salience stakeholders** (due to minimal trade volumes), while government buyers are **definitive stakeholders**.

Policy Implications:

- **For trade policymakers**: Easing sanctions could **reinvigorate foreign CSR pressures**, but only if paired with access to high-standard markets (e.g., EU).
- **For firms**: In the absence of foreign leverage, focus CSR on **diaspora communities** or **cross-border humanitarian partnerships** to rebuild global ties.

3. **Overarching Policy Implications: Theory to Practice**

The study's findings have **two-tiered policy relevance**:

A. **National-Level Policies (Exploiting Government Influence)**
  - **CSR-linked public procurement**: Tie government contracts to **verified CSR performance** (e.g., Iran's "Social Responsibility Clause" in oil deals).
  - **Tax incentives for CSR**: Offer deductions for firms that align CSR with **state development plans** (e.g., renewable energy investments).

B. **Firm-Level Strategies (Navigating Sanctions)**
  - **CSR as political risk mitigation**: Use CSR to **diversify stakeholder alliances** (e.g., partnering with state-backed NGOs).
  - **Alternative reporting channels**: For firms eyeing post-sanction markets, adopt **global CSR frameworks** (e.g., GRI) preemptively, even if not yet demanded.

4. **Theoretical Advancements: Where the Study Falls Short**

The paper could better connect its empirics to **macro-theoretical debates**:

  - **CSR in Hybrid Regimes**: How does Iran's mix of state control and weak markets challenge **Western CSR models**?
  - **Geopolitical CSR**: Do sanctions create a new CSR paradigm where **compliance = survival** rather than competitiveness?

The study can transcend its niche context and inform CSR strategies in all state-influenced economies by grounding the discussion in mechanisms and actionable policies.

Overall, this study offers several novel contributions to the CSR literature by examining the underexplored relationship between customer concentration and CSR reporting, focusing on the moderating roles of government and foreign customers—an area largely overlooked in prior research. While existing studies have primarily analysed CSR through firm-level or institutional factors, this paper shifts the lens to customer dynamics, revealing that high customer concentration can deprioritise CSR efforts, contrary to the prevailing assumption that major stakeholders uniformly incentivise responsible practices. These findings challenge conventional stakeholder theory by demonstrating that concentrated buyers may exert pressure that conflicts with long-term CSR investments, particularly in cost-sensitive environments.

The Iranian context further amplifies the study's uniqueness. International sanctions have severely restricted foreign trade, creating a natural experiment to test how geopolitical isolation alters CSR incentives. Unlike prior research in open economies (e.g., [24]), this study shows that foreign customers—typically associated with higher CSR standards in globalised markets—fail to moderate CSR practices in Iran due to sanctions-induced barriers, such as limited access to foreign markets and a focus on domestic survival. This contrasts sharply with findings from China or Western economies, where foreign customers drive CSR compliance. Meanwhile, the strong moderating effect of government customers underscores the outsized role of state influence in sanctioned economies, where public-sector contracts act as a substitute for market-driven CSR pressures. Given the above, the current study advances theory in three key ways as follows:

1. **Resource Dependence Revisited**: It highlights how customer power dynamics in constrained economies (like Iran) disrupt the typical resource-CSR relationship. It shows that dependence on government customers—not foreign ones—becomes the primary CSR lever.
2. **Stakeholder Heterogeneity**: It challenges the homogenised view of customers in CSR literature, demonstrating that their impact varies by type (government vs. foreign) and institutional context (sanctioned vs. open markets).
3. **CSR Under Duress**: It documents how geopolitical constraints redefine CSR priorities, offering a blueprint for studying CSR in other isolated or regulated economies.

Ultimately, this research broadens the CSR discourse by revealing how macro-level disruptions (e.g., sanctions) interact with micro-level customer strategies—a perspective absent in existing frameworks. Its insights are transferable to other sanctioned or state-influenced economies, where customer-CSR dynamics may diverge from global norms.

6. Conclusion

The findings of this study reveal that **customer characteristics—precisely, concentration and type (government vs. foreign)—fundamentally shape CSR strategies**. Still, their impact varies dramatically depending on institutional and economic constraints. Below, we synthesise key takeaways and provide **novel, actionable insights** for firms, policymakers, and researchers navigating similar environments.

1. **Customer Concentration: A Double-Edged Sword for CSR**

Key Insight:

- **High customer concentration reduces CSR investment**, as firms prioritise cost-cutting and short-term buyer retention over long-term sustainability.

Actionable Strategies for Firms:

- **Diversify revenue streams**: Reduce dependency on a few buyers to mitigate CSR trade-offs.
- **Negotiate CSR-linked contracts**: With major customers, tie long-term agreements to shared sustainability goals (e.g., joint environmental initiatives).
- **Segment CSR spending**: Focus limited resources on high-impact areas (e.g., employee welfare) that align with buyer expectations.

Policy Implications:

- **Regulate buyer power**: Antitrust or procurement policies could limit excessive buyer pressure that forces CSR cuts.
- **Incentivize collaborative CSR**: Tax breaks for firms that co-invest in CSR with key customers.

2. **Government Customers: CSR as Political Compliance**

Key Insight:

- **Government buyers counteract CSR declines** by imposing social mandates, turning CSR into a compliance requirement rather than voluntary ethics.

Actionable Strategies for Firms:

- **Align CSR with state priorities**: Focus on initiatives like local job creation or infrastructure to secure government contracts.
- **Leverage CSR for lobbying**: Use CSR performance to advocate for favourable policies (e.g., subsidies for green projects).
- **Monitor policy shifts**: Adjust CSR strategies to anticipate changing state priorities (e.g., post-sanctions reforms).

Policy Implications:

- **Mandate CSR in public procurement**: Require suppliers to meet minimum CSR standards (e.g., ISO 26000) for government contracts.
- **Transparency mechanisms**: Publicly rank firms on state-aligned CSR metrics to foster competition.

3. **Foreign Customers: Limited Leverage Under Sanctions**

Key Insight:

- **Foreign buyers fail to boost CSR** in Iran due to sanctions, but their potential influence in open economies remains critical.

Actionable Strategies for Firms:

- **Prepare for post-sanction markets**: Preemptively adopt global CSR frameworks (e.g., GRI, SASB) to attract future foreign investment.
- **Target diaspora networks**: Engage expatriate communities to build CSR credibility in place of direct foreign trade.
- **Alternative certifications**: Seek CSR endorsements from non-Western bodies (e.g., Islamic ESG standards) to appeal to regional buyers.

Policy Implications:

- **Ease sanctions strategically**: Prioritise sectors where foreign CSR pressures can drive upgrades (e.g., renewable energy).
- **Support CSR diplomacy**: Use cross-border CSR partnerships (e.g., health initiatives) to rebuild international ties.

4. **Industry-Specific Playbooks**

Key Insight:

- **Sectoral differences** (e.g., oil vs. manufacturing) dictate how customer traits affect CSR.

Actionable Strategies:

- **Oil/Gas**: Focus on state-demanded CSR (e.g., emissions controls) while quietly benchmarking against global peers.
- **Manufacturing**: Use CSR to differentiate among domestic buyers if foreign markets are inaccessible.
- **Consumer Goods**: Leverage CSR for brand trust, especially in urban markets with savvy consumers.

5. **Theoretical Reboot: From "Why" to "How"**

This study challenges **three assumptions** in mainstream CSR theory:

1. **Stakeholder theory** must account for **power asymmetry** (government > foreign buyers).

2. **Signalling theory** needs adaptation for **politicised CSR** (signalling to states, not markets).
3. **The institutional theory** should incorporate **geopolitical disruption** (e.g., sanctions as CSR barriers).

Future Research Agenda:

- **Compare CSR-customer dynamics** in other sanctioned economies (e.g., Russia, Venezuela).
- **Test "coercive CSR" models**: How do firms balance state demands with global standards?
- **Explore CSR decoupling**: Do firms report CSR without implementation to appease buyers?

Final recommendation: a customer-centric CSR framework

Firms should **map their customer base** to tailor CSR strategies:

Customer Type	CSR Strategy	Risk Mitigation
Government (High Power)	Align with state socio-economic goals	Diversify buyers to reduce political risk
Foreign (Sanctioned)	Invest in post-sanctions readiness	Build alternative trade networks
Domestic (Concentrated)	Prioritise cost-efficient CSR	Negotiate shared-value contracts

By **segmenting customers and customising CSR**, firms can turn buyer relationships into **strategic advantages**—even in constrained markets like Iran. Policymakers, meanwhile, must recognise that **CSR cannot be divorced from customer power structures** and should design regulations accordingly.

Ethical statements

This confirms that the current study used publicly available data and, therefore, needed no ethical approval.

Informed consent

This is to confirm that the current study used publicly available data and, therefore, needed no Informed consent.

Funding

This study used no funding.

CRediT authorship contribution statement

Khadija Pour-Akbari: Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation. **Farzaneh Nassirzadeh:** Writing – original draft, Visualization, Validation. **Davood Askarany:** Writing – review & editing.

Declaration of competing interest

Competing interests do not apply to this paper. So, there is no conflict of interest for this paper.

Data availability

Data will be made available on request.

References

[1] T. Hahn, G. Sharma, A. Glavas, Employee-CSR tensions: drivers of employee (dis) engagement with contested CSR initiatives, J. Manag. Stud. 61 (4) (2024) 1364–1392, https://doi.org/10.1111/joms.12923.
[2] D. Lange, N.T. Washburn, Understanding attributions of corporate social irresponsibility, Acad. Manag. Rev. 37 (2) (2012) 300–326.
[3] P.J. Callery, Strategic motivations for corporate social responsibility: profitability or legitimacy? J. Bus. Econ. 94 (6) (2024) 947–974.
[4] M.A. Latapí Agudelo, L. Jóhannsdóttir, B. Davídsdóttir, A literature review of the history and evolution of corporate social responsibility, Int. J. Corp. Soc. Responsib. 4 (1) (2019) 1–23.
[5] F. Nasirzadeh, Z. Marandi, The Relationship between corporate social responsibility and financial distress by emphasizing the role of political connections, Stable Econ. J. 2 (2) (2021) 81–108.
[6] C.-K. Kwong, H. Bai, A fuzzy AHP approach to the determination of importance weights of customer requirements in quality function deployment, J. Intell. Manuf. 13 (2002) 367–377.
[7] R. Carranza, E. Díaz, D. Martín-Consuegra, The influence of quality on satisfaction and customer loyalty with an importance-performance map analysis: exploring the mediating role of trust, J. Hosp. Tour. Technol. 9 (3) (2018) 380–396, https://doi.org/10.1108/JHTT-09-2017-0104.
[8] R. Deshpandé, J.U. Farley, F.E. Webster Jr., Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis, J. Mark. 57 (1) (1993) 23–37.
[9] S. Bondarenko, Y. Robul, O. Dyshkantiuk, A. Mohylova, S. Salamatina, I. Komarnitskyi, The dynamic model of customer focus management in the hotel business based on markov chains, Int. J. Sci. Technol. Res. 9 (3) (2020) 1132–1139.
[10] D. Kavun, V. Sviridenko, V.Y. Rubtsov, Production of new types of rolled products—Customer focus, Metallurgist 64 (5) (2020) 514–521.
[11] N. Sithole, G. Sullivan Mort, C. D'Souza, Financial well-being of customer-to-customer co-creation experience: a comparative qualitative focus group study of savings/credit groups, Int. J. Bank Mark. 39 (3) (2021) 381–401, https://doi.org/10.1108/IJBM-07-2020-0413.
[12] B. Kealesitse, B. O'Mahony, B. Lloyd-Walker, M. Jay Polonsky, Developing customer-focused public sector reward schemes: evidence from the Botswana government's performance-based reward system (PBRS), Int. J. Public Sect. Manag. 26 (1) (2013) 33–55, https://doi.org/10.1108/09513551311293426.
[13] D. Dhaliwal, J.S. Judd, M. Serfling, S. Shaikh, Customer concentration risk and the cost of equity capital, J. Account. Econ. 61 (1) (2016) 23–48, https://doi.org/10.1016/j.jacceco.2015.03.005.
[14] M. Campello, J. Gao, Customer concentration and loan contract terms, J. Financ. Econ. 123 (1) (2017) 108–136, https://doi.org/10.1016/j.jfineco.2016.03.010.
[15] W.T. Chen, G.S. Zhou, X.K. Zhu, CEO tenure and corporate social responsibility performance, J. Bus. Res. 95 (2019) 292–302, https://doi.org/10.1016/j.jbusres.2018.08.018.
[16] H.H. Huang, G.J. Lobo, C. Wang, H. Xie, Customer concentration and corporate tax avoidance, J. Bank. Finance 72 (2016) 184–200, https://doi.org/10.1016/j.jbankfin.2016.07.018.
[17] P.N. Patatoukas, Customer-base concentration: implications for firm performance and capital markets: 2011 American accounting association competitive manuscript award winner, Account. Rev. 87 (2) (2012) 363–392, https://doi.org/10.2308/accr-10198.
[18] M. Krolikowski, X. Yuan, Friend or foe: customer-supplier relationships and innovation, J. Bus. Res. 78 (2017) 53–68, https://doi.org/10.1016/j.jbusres.2017.04.023.
[19] B.K. Ak, P.N. Patatoukas, Customer-base concentration and inventory efficiencies: evidence from the manufacturing sector, Prod. Oper. Manag. 25 (2) (2016) 258–272, https://doi.org/10.1111/poms.12417.
[20] A.M. Albuquerque, G. Papadakis, P.D. Wysocki, Z.M. Guo, The impact of risk and monitoring on the use of equity incentives. Evidence from Customer Concentration, 2023. Evidence from Customer Concentration (September 26, 2023).
[21] O. Faleye, Classified boards, firm value, and managerial entrenchment, J. Financ. Econ. 83 (2) (2007) 501–529, https://doi.org/10.1016/j.jfineco.2006.01.005.
[22] J. Wang, Do firms' relationships with principal customers/suppliers affect shareholders' income? J. Corp. Fin. 18 (4) (2012) 860–878.
[23] J. Itzkowitz, Customers and cash: How relationships affect suppliers' cash holdings, J. Corp. Fin. 19 (2013) 159–180.
[24] W. Wen, Y. Ke, X. Liu, Customer concentration and corporate social responsibility performance: evidence from China, Emerg. Mark. Rev. 46 (2021) 100755, https://doi.org/10.1016/j.ememar.2020.100755.
[25] D.S. Dhaliwal, O.Z. Li, A. Tsang, Y.G. Yang, Voluntary nonfinancial disclosure and the cost of equity capital: the initiation of corporate social responsibility reporting, Account. Rev. 86 (1) (2011) 59–100, https://doi.org/10.2308/accr.00000005.
[26] Y. Kim, M.S. Park, B. Wier, Is earnings quality associated with corporate social responsibility? Account. Rev. 87 (3) (2012) 761–796, https://doi.org/10.2308/accr-10209.
[27] E. Bacinello, G. Tontini, A. Alberton, Influence of maturity on corporate social responsibility and sustainable innovation in business performance, Corp. Soc. Responsib. Environ. Manag. 27 (2) (2020) 749–759.
[28] S. Crawford, Y. Huang, N. Li, Z. Yang, Customer concentration and public disclosure: evidence from management earnings and sales forecasts, Contemp. Account. Res. 37 (1) (2020) 131–159, https://doi.org/10.1111/1911-3846.12526.

[29] W. Chapple, J. Moon, Corporate social responsibility (CSR) in Asia: a seven-country study of CSR website reporting, Bus. Soc. 44 (4) (2005) 415–441, https://doi.org/10.1177/0007650305281658.
[30] A. McWilliams, D. Siegel, Corporate social responsibility: a theory of the firm perspective, Acad. Manag. Rev. 26 (1) (2001) 117–127.
[31] C.-E. Bai, J. Lu, Z. Tao, The multitask theory of state enterprise reform: empirical evidence from China, Am. Econ. Rev. 96 (2) (2006) 353–357, https://doi.org/10.1257/000282806777212125.
[32] E.C. Chang, S.M. Wong, Governance with multiple objectives: evidence from top executive turnover in China, J. Corp. Finance 15 (2) (2009) 230–244, https://doi.org/10.1016/j.jcorpfin.2008.10.003.
[33] G. See, Harmonious society and Chinese CSR: is there really a link? J. Bus. Ethics 89 (2009) 1–22.
[34] S. Xu, D. Liu, Political connections and corporate social responsibility: political incentives in China, Bus. Ethics: Eur. Rev. 29 (4) (2020) 664–693.
[35] S. Dicko, H. Khemakhem, F. Zogning, Political connections and voluntary disclosure: the case of Canadian listed companies, J. Manag. Gov. 24 (2020) 481–506.
[36] X. Shui, M. Zhang, P. Smart, F. Ye, Sustainable corporate governance for environmental innovation: a configurational analysis on board capital, CEO power and ownership structure, J. Bus. Res. 149 (2022) 786–794.
[37] N. Attig, N. Boubakri, S. El Ghoul, O. Guedhami, Firm internationalization and corporate social responsibility, J. Bus. Ethics 134 (2016) 171–197.
[38] R. Van Tulder, S.B. Rodrigues, H. Mirza, K. Sexsmith, The UN's sustainable development goals: can multinational enterprises lead the decade of action? J. Int. Bus. Policy 4 (1) (2021) 1.
[39] A.G. Scherer, G. Palazzo, The New Political Role of Business In a Globalized World—A Review of a New Perspective on CSR and its Implications for the Firm, Governance, and Democracy, Springer, 2012.
[40] A.A. Daryaei, Y. Fattahi, D. Askarany, S. Askary, M. Mollazamani, Accounting comparability, conservatism, executive compensation-performance, and information quality, J. Risk Financ. Manag. 15 (11) (2022) 489.
[41] O.M. Namakavarani, A.A. Daryaei, D. Askarany, S. Askary, Audit committee characteristics and quality of financial information: the role of the internal information environment and political connections, J. Risk Financ. Manag. 14 (6) (2021) 273.
[42] F. Nassirzadeh, D. Askarany, S. Arefi-Asl, The relationship between changes in corporate governance characteristics and intellectual capital, J. Risk Financ. Manag. 16 (2) (2023) 133.
[43] A. Pouryousof, F. Nassirzadeh, R. Hesarzadeh, D. Askarany, The relationship between managers' disclosure tone and the trading volume of investors, J. Risk Financ. Manag. 15 (12) (2022) 618.
[44] M.T. Shandiz, F.N. Zadeh, D. Askarany, The interactive effect of ownership structure on the relationship between annual board report readability and stock price crash risk, J. Risk Financ. Manag. 15 (6) (2022) 268.
[45] F.N. Zadeh, D. Askarany, S.A. Asl, Accounting conservatism and earnings quality, J. Risk Financ. Manag. 15 (9) (2022) 413.
[46] F.N. Zadeh, D. Askarany, A. Shirzad, M. Faghani, Audit committee features and earnings management, Heliyon 9 (10) (2023).
[47] M. Saleh, N. Zulkifli, R. Muhamad, Corporate social responsibility disclosure and its relation on institutional ownership: evidence from public listed companies in Malaysia, Manag. Audit. J. 25 (6) (2010) 591–613.
[48] Group, W. B. (2022). *Global Economic Prospects, January 2022*. World Bank Publications. Itzkowitz, J. (2013). Customers and cash: How relationships affect suppliers' cash holdings. *Journal of corporate finance, 19*, 159-180.
[49] R. Petrov, The EU–Ukraine association agreement as a general framework of contemporary EU–Ukraine relations. Competition and Intellectual Property Law in Ukraine, Springer, 2023, pp. 15–35.
[50] R.Á. Gómez, M.B. de Álvarez, J. Álvarez, Cobertura de vacunación anti-COVID-19 en un grupo de médicos gineco-obstetras de Venezuela, in: Gac. Méd. Caracas, 130, 2022.
[51] Darendeli, A., Alparslan, A., Erdoğan, M. S., & Kabadurmuş, Ö. (2021). Container demand forecasting using machine learning methods: a real case study from Turkey. Digital conversion on the way to industry 4.0: selected papers from ISPR2020, September 24-26, 2020 Online-Turkey.
[52] H. Servaes, A. Tamayo, The impact of corporate social responsibility on firm value: The role of customer awareness, Manag. Sci. 59 (5) (2013) 1045–1061.
[53] S. Dicko, et al., Political connections and voluntary disclosure: the case of Canadian listed companies, J. Manag. Gov. 24 (2020) 481–506.