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Credit Constraints, Corporate Transparency, and Export*

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Abstract

This study investigates the impact of corporate transparency on a firm's extensive margin in exports ("transparency-export" (TE) relationship). We propose a theoretical model for an asymmetric information environment and demonstrate that the TE relationship depends on a firm's current corporate transparency record. Moreover, we posit that mandated firms, especially those with severe financing constraints, can harm their export activities to enhance transparency. However, improving a city's financial deepening and legal environment could offset these negative impacts and positively impact its TE relationship. The Chinese data support these theoretical implications.

JEL Classification: F14, G32, G38, O16, O53
Keywords: Corporate transparency, Credit constraints, Export, Financial development

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1 Introduction

The effect of enhancing corporate transparency on a firm's export activities remains ambiguous. On the one hand, greater information disclosure is crucial to alleviate information asymmetry in international trade, especially for firms facing credit constraints. Export-oriented firms have higher financial requirements than those focusing solely on domestic markets (Manova, 2013) and require better communication with investors to secure external financing (Bushman and Smith, 2001, 2003; Bushman et al., 2004b). On the other hand, firms have an incentive to deliberately obscure information and benefit from the lack of transparency. Wang et al. (2022) observed that following Google's withdrawal from the Chinese market, Chinese investors had to pay more for foreign-related corporate information. Consequently, Chinese firms altered their information disclosure practices; they started using fraudulent activities and manipulating disclosures to reap higher returns from their share sales. This finding suggests that firms can exploit the ambiguity in their export operations for profit. Similarly, when a firm's competitive advantage is easily imitable or there are low entry barriers or high trade frictions, excessive disclosure might compromise a company's competitive position (Brown and Martinsson, 2019; Sodhi and Tang, 2019). Therefore, firms reliant on external investors may fear that excessive transparency could lead to competitors' expropriation of firm-specific knowledge, resulting in decreased incentives for innovation, investment, and the likelihood of export.

In addition to the incentives for firms to obscure information, literature on mandatory disclosure highlights its significant costs and impact on managerial learning. Jayaraman and Wu (2019) found that by discouraging informed trading, disclosure could reduce managers' ability to glean relevant information from markets. Pinto (2022) revealed that firms with reduced disclosure requirements attract more informed investors and learn more from financial markets than those with stricter disclosure requirements. In the context of exports, the compulsion to disclose more information can reduce managers' motivation to actively seek and interpret market signals. This is because such information becomes readily accessible to all market participants, including competitors, which diminishes the detailed understanding of specific export markets. Hence, the impact of corporate transparency on exports is not necessarily incremental. Instead, export decision has been analyzed in association trade policy and economic conditions of importing and exporting countries (Eicher and Henn, 2011), credit constraints (Manova, 2013), productivity (Melitz, 2003), information frictions (Eaton et al., 2011), cultural distance (Liu et al., 2020), and headquarter location (Wang, 2021).

To fill this research gap, we focus on the role of credit constraints, financial deepening, and legal environment in the relationship between corporate transparency and export probability (hereafter referred to as the "transparency-export" (TE) relationship). Manova (2013) investigated the influence of financing on international trade but ignored the issue of asymmetric information, a common characteristic in the financing market. Information asymmetry reflects agency problems between managers and owners, primarily resulting from inadequate corporate information disclosure and reluctance toward transparency. Specifically, we expand on Manova (2013)'s model in an asymmetric information environment, allowing firms to utilize corporate transparency to secure anticipated financing. This adaptation leads to a situation in which the information that firms disclose publicly becomes ambiguous and may inaccurately represent their true status. Imperfections in financial markets also contribute to investors' skepticism about disclosed information.

Furthermore, as a unique feature of this study, we utilize Wooldridge (2023)'s approach to nonlinear difference-in-difference (DID) estimation and the mandatory information disclosure policy of corporate social responsibility (CSR) in December 2008 as a quasi-natural experiment. This policy served as an exogenous shock, as very few firms in China disclosed CSR-related information before 2008, and targeted a subset of listed companies. China's significant role in global exports, combined with the relatively underdeveloped capital market, presents a unique context for this study. Moreover, transparency among Chinese companies is a critical concern for policymakers and investors (Cheung et al., 2010).

Our theoretical model and empirical results reveal several key findings. First, the TE relationship depends on a firm's level of information disclosure. Firms with high corporate transparency benefit from further transparency improvements. In contrast, nontransparent firms may lose export opportunities because increased transparency could reveal a firm's trade secrets or expose a weak financial position and uncertain future. Second, credit constraints can adversely affect TE relationship, particularly for nontransparent firms. However, regional financial deepening and legal environment can offset this effect, making firms to disclose more. Firms in such environments can capitalize on higher transparency to increase exports because the disclosed information can be fully acknowledged, used, and valued. Such business environments offer additional protection to a firm's intellectual property, enabling it to broaden its operations and penetrate international markets.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and proposes hypotheses for the empirical analysis. Section 3 presents a theoretical model that illustrates how credit restrictions, transparency, and regional financial development affect a firm's extensive export margin. Section 4 presents statistical data, and Section 5 reports estimation results and tests the validity of the hypotheses. Section 6 provides robustness checks, and Section 7 presents concluding remarks.

2 Literature Review and Hypothesis Development

We propose three hypotheses by identifying the factors that impact firms' export activities based on two strands of literature. The first group of literature focuses on the positive role of improving corporate transparency. There is limited research on the impact of transparency on international trade. Most investigate specific types of disclosure, such as environmental information (Xie et al., 2022) and CSR (Hamrouni et al., 2019). Focusing on firms' domestic operations, these studies concluded that increasing corporate transparency can benefit exports through voluntary disclosure, which can reduce information asymmetry between internal and external stakeholders. It improves firm performance in many aspects, such as innovation (Zhong, 2018), corporate investment (Ferracuti and Stubben, 2019), and patent transactions (Kim and Valentine, 2023).

However, some scholars doubt the positive effects of increased transparency. Suijs (2007) built an equilibrium model to demonstrate that the traditional unraveling argument leading to full disclosure may not be valid when firms are uncertain about investor responses to the disclosed information. Francis et al. (2008) argued that voluntary disclosure is associated with a lower capital cost, but this relationship can be explained by earnings quality and various types of voluntary disclosure yield different results. Glaeser (2018) discovered that firms heavily dependent on trade secrecy show decreased patent activity and corporate transparency. Transparent firms can be exploited by rivals (Zhong, 2018; Bernard et al., 2020), and, thus, they selectively withhold disclosure to prevent competitors through increased proprietary costs (Huang et al., 2017). This is especially true for firms facing intense competition (Allee et al., 2021).

Therefore, a high level of information transparency, which is often considered a positive signal, involves significant costs for firms. A salient component of these is the expenditure associated with safeguarding firms' strategic maneuvers from imitation by competitors. Therefore, increasing transparency in international trade may not be universally beneficial. Rather, these benefits are conditional and potentially contingent on factors, such as the extent of information disclosure already undertaken by the firm. Thus, we propose the following hypothesis:

Hypothesis 1. *The TE relationship depends on the current transparency level. When a firm has demonstrated a high level of transparency, a further improvement in transparency is positively correlated with its export probability. In contrast, increased transparency diminishes the export probability of nontransparent firms.*

Another strand of literature relates to credit constraints, financial deepening, and legal environment. Firms in industries with severe credit constraints can benefit from increased information transparency by reducing investor uncertainty and increasing trust in future returns, leading to external funding support. However, the negative impact of information transparency on exports can be amplified among international enterprises with severe credit constraints, because exporting is riskier and information disclosure incurs higher costs. In industries with severe credit constraints, firms in international markets face greater market uncertainty and risk than those specializing in domestic trade. As indicated by Auboin (2015) and Niepmann and Schmidt-Eisenlohr (2017), access to trade financing is difficult for poor countries. Trade finance providers are selective in risk-taking and focus on their largest customers in developed countries. Thus, smaller firms in poorer regions struggle to obtain affordable financing. Additionally, as firms participate in the global market, the cost of making information public may increase. Exporters are more susceptible to liquidity problems (Muûls, 2015; Gómez, 2019), which may limit transparency. Therefore, the impact of increased information transparency on financing and exports in credit-constrained industries must be balanced with the uncertainty and costs associated with international trade. Based on these considerations, we propose the following hypothesis:

Hypothesis 2. *The TE relationship worsens, especially for nontransparent firms in credit-constrained industries.*

Furthermore, Suijs (2007) found that investor responses depend on the firm's disclosure and other factors beyond the firm's control, such as disclosure by competitors. Moreover, uncertainty about investor responses results in less disclosure because of imperfect information about investors' prior expectations and different interpretations of the disclosed information among investors. This finding suggests that the degree of financial deepening in a region affects a firm's willingness and ability to disclose information, especially in industries with severe credit constraints. Researchers have emphasized the importance of financial deepening in international trade from the perspective of extensive and intensive margins (Berman and Héricourt, 2010; Manova, 2013). A well-developed financial market facilitates international trade by providing various financing through letters of credit and guarantees (Auboin, 2015). Furthermore, even with risky export businesses, firms in financially consolidated regions have various financing channels such as venture capital, risk hedging tools, other financial instruments, and valuable business networks (Allen et al., 2022). Consequently, the benefits of financial development outweigh the costs of disclosing excessive private information.

The legal environment also affects the TE relationship. First, it ensures the effective execution of contracts and protection of property rights, which reduces the likelihood of disputes and conflicts in international trade and increases investor confidence. This improves enterprises' financial stability and reduces their default risk (Li et al., 2023). Moreover, the stability of the legal environment is crucial for the financial health of businesses. A strong legal environment provides predictability and stability, which are essential for firms to make long-term plans and decisions (Hasan et al., 2009). Firms can more effectively plan their operations and financial management with clear, consistent, and enforceable laws, thereby reducing the default risk. Furthermore, a stable legal environment improves a firm's creditworthiness because investors and creditors are more willing to invest in companies operating under reliable legal protection (Klapper, 2006). Therefore, the increased transparency of firms under legal protection can improve the likelihood of export. Thus, we propose the following hypothesis:

Hypothesis 3. *The TE relationship is strengthened in cities with sound financial deepening and legal environments, especially for nontransparent firms.*

3 A Simple Theoretical Model

As a formal explanation of the proposed hypotheses, we develop a theoretical model by incorporating credit-constrained exporters into a monopolistic competition model as proposed by Melitz (2003). Notably, our model introduces information asymmetry between firms and investors. First, we assume that the utility function of consumers in country i follows a constant elasticity of substitution (CES) with a continuum of goods indexed by ω (Dixit and Stiglitz, 1977) and is represented as $U_{is} = \left[\int_{\omega \in \Omega_{is}} q_{is}(\omega)^{\frac{\sigma-1}{\sigma}} d\omega\right]^{\frac{\sigma}{\sigma-1}}$, where Ω_{is} is the mass of goods available in economic sector s and $\sigma > 1$ is the substitution elasticity. When the price is denoted as pr, the corresponding price index is $P_{is} = \left[\int_{\omega \in \Omega_{is}} pr_{is}(\omega)^{1-\sigma} d\omega\right]^{\frac{1}{1-\sigma}}$.

Next, we consider the behavior of firm j located in city p in country i. The firm must pay sunk entry costs $c_{is}f_{ei}$ before realizing productivity ϕ_j from distribution function $g(\phi)$ over a subset of $(0,\infty)$. c_{is} represents a bundle of inputs that minimizes the costs of industry s and captures the different aggregate productivity, factor prices, and factor intensities between countries and sectors. Then, c_{is}/ϕ_j is the cost of producing one output for firm j. f_{ei} serves as an equity multiplier depending on the actual cost of market entry in country i. Exporting firms must pay an iceberg cost τ_{ni} and fixed costs $c_{is}f_{ni}$ before selling abroad, where $f_{ni} > 0$ is an export fixed cost multiplier for firms in country i exporting to country n and for $n \neq i$ and $f_{ni} = 0$ for $n = i$. Firms' credit constraints are modeled so that a fraction $d_s \in (0,1)$ of fixed costs must be financed by investors, and a fraction t_s of the sunk entry costs must be secured by tangible assets as collateral (Manova, 2013). λ_{ip} represents the likelihood of receiving expected returns from investments in exporting firms. Hence, $1-\lambda_{ip}$ is the default probability, meaning that the investor can only obtain the value of collateral $t_s c_{is} f_{ei}$. At the beginning of each period, firm j with productivity ϕ_j makes a take-it-or-leave-it offer to potential investors with a contract specifying the borrowing amount $d_s c_{is} f_{ni}$, repayment F when the contract is enforced (with probability λ_{ip}), and collateral $t_s c_{is} f_{ei}$ when default occurs (with probability $(1-\lambda_{ip})$).[1]

We assume information asymmetry between firms and investors. Specifically, after establishing their presence in the domestic market, firms consider disclosing information about their productivity to investors for external financing due to credit constraints and try to deliver perceived productivity ϕ_j' by reducing corporate transparency.[2] Firms could use earnings manipulation, ob-

[1] Manova (2013) constructed the industry measures t_s and d_s from US data because her study includes many countries with limited relevant data and expects that US data reflect the optimal choice of firms from various countries. However, our empirical analysis only explores listed firms in China, whose financial systems and institutional policies differ from those of the US. Consequently, we use the (weighted) average values of the *KZ* index of firms within the industry as a proxy for their credit constraints (as elaborated in Section 4), which also ensures that the measures are exogenous to the export decision in the current period.

[2] Although the literature has shown that more non-mandatory information disclosure by firms can generate positive signals, thereby reducing financing costs and enhancing market confidence, this is often true for firms with relevant advantages, for example, patents and environmental protection. For nontransparent firms with low productivity, quality defects, and operation uncertainty, reducing negative information disclosure and corporate transparency enables them to

scuring business risks, and financial fraud, among others, to hide negative information when disclosing information and seeking investors. Investors can only obtain the perceived productivity $\phi_j^{'}$ conveyed by firm j. The logarithm of perceived productivity ($\ln\phi_j^{'}$) follows a normal distribution (i.e., $\ln\phi_j^{'} \sim N(\ln\phi_j, \varepsilon_j^2)$).[3] Given $\phi_j^{'}$ and the disclosed information measured by ε_j, investors form their belief about firm's productivity ϕ_j^B ($\phi_j^B = \phi_j^{'} - \xi_j$), where ξ_j is noise following a uniform distribution U$[0, \varepsilon_j]$. This indicates that investors are always risk-averse and the randomness of ξ_j depends on ε_j. For ξ_j and $\xi_j^{'}$, as ε_j increases, the probability of $\xi_j > \xi_j^{'}$ ($\Pr(\xi_j > \xi_j^{'})$) also increases. Given $\phi_j^{B,'} = \phi_j^{'} - \xi_j^{'}$, the higher probability of $\xi_j > \xi_j^{'}$ implies an increased likelihood of $\phi_j^B < \phi_j^{B,'}$ ($\Pr(\phi_j^B < \xi_j^{'})$). In other words, the higher probability of $\xi_j > \xi_j^{'}$ as ε_j increases suggests that a higher value of ε_j leads to a lower believed productivity ϕ_j^B, as it increases the likelihood of $\xi_j < \xi_j^{'}$. In other words, investors' lending decisions are based on the productivity they believe, that is, ϕ_j^Brather than what the firm tries to convey $\phi_j^{'}$.[4] Furthermore, since the noise about productivity is entirely derived from the transparency level through which firms share information with investors, variance ε_j^2 is identical between the information conveyed by firms and information believed by investors. The variance depends on the amount and quality of the information released by firm j such that a small ε_j means higher transparency. Thus, firms in sector s of city p exporting from country i to n face the following profit maximization problem:

$$\max_{pr,q,F} \pi_{nis}(\phi_j, \phi_j^{'}) = pr_{nis}(\phi_j) q_{nis}(\phi_j) - q_{nis}(\phi_j)\tau_{ni}\frac{c_{is}}{\phi_j} - (1-d_s)c_{is}f_{ni} - \lambda_{ip}F(\phi_j^{'}) - (1-\lambda_{ip})t_s c_{is} f_{ei} \tag{1}$$

subject to:

$$q_{nis}(\phi_j) = \frac{pr_{nis}(\phi_j)^{-\sigma}\theta_s Y_n}{P_{ns}^{1-\sigma}} \tag{1.1}$$

$$pr_{nis}(\phi_j) = \frac{\sigma}{\sigma-1}\frac{c_{is}\tau_{ni}}{\phi_j} \tag{1.2}$$

$$A_{nis}(\phi_j^{'}) \equiv \left(pr_{nis}(\phi_j^{'}) q_{nis}(\phi_j^{'}) - q_{nis}(\phi_j^{'})\tau_{ni}\frac{c_{is}}{\phi_j^{'}} - (1-d_s)c_{is}f_{ni} \right) \geq F(\phi_j^{'}) \tag{1.3}$$

$$B_{nis}(\phi_j^{'}) \equiv \mathbb{E}\left[-d_s c_{is} f_{ni} + \lambda_{ip} F(\phi_j^B) + (1-\lambda_{ip}) t_s c_{is} f_{ei} \middle| \phi_j^{'} \right] \geq 0 \tag{1.4}$$

where $\theta_s \in (0,1)$ is each industry's share of total expenditure Y_n and $\sum\theta_s = 1$. Equation (1) means

benefit from adverse selection. This means that investors are not aware of the firms' real performance. They only know the distribution of the firm's productivity based on past experiences (in this study, it refers to the productivity signal passed by the firm $\phi_j^{'}$ and the noise of information disclosure ε_j) and thus recognize the distribution of their believed productivity ϕ_j^B and make investment decisions accordingly.

[3] We use $\ln\phi_j^{'} \sim N(\ln\phi_j, \varepsilon_j^2)$ to simulate that firms disclose information to enable the market to understand their productivity levels. However, due to information asymmetry, the market's perceived productivity $\phi_j^{'}$ often deviates from the firm's true value due to ε_j.

[4] This may be because investors, especially banks, are always risk-averse. They are more cautious about the operation of less transparent firms; unlisted firms find it more difficult to obtain external financing than listed firms.

that firms with export strategy are driven to finance a fraction d_s of their fixed costs externally and promise the investors to pay $F(\phi_j^{'})$ when the contract is enforced or use as collateral when they default. $F(\phi_j^{'})$ in Equation (1.3) demonstrates that firms have the motivation to signal sufficient profitability by reducing information transparency, thereby obtaining external financing even if, in terms of real productivity, firms are unable to repay promised returns to investors, that is, $pr_{nis}(\phi_j)q_{nis}(\phi_j) - q_{nis}(\phi_j)\tau_{ni}\frac{c_{is}}{\phi_j} - (1-d_s)c_{is}f_{ni} < F(\phi_j^{'})$. Investors follow Equation (1.4) to calculate the expected repayment $\mathbb{E}[F(\phi_j^B|\phi_j^{'})]$. Furthermore, we assume that F in Equations (1.3) and (1.4) is a linear function of productivity, $F(\phi) = a\phi + b$, where $a > 0$ and $b > 0$, suggesting that only high-productivity firms can make corresponding repayments to investors to raise sufficient external funds.

Without considering external financing of variable costs, firms can always produce, subject to Equations (1.1) and (1.2). In a competitive credit market, investors provide funds to firms only if their expected net return $B_{nis}(\phi_j^{'})$ exceeds zero. Considering the profit maximization function of firms and the corresponding constraint of Equation (1.4), firms extract all supplementary values, implying that Equation (1.4) is bounded, and the value of this equation is set to zero, $B_{nis}(\phi_j) = 0$. As net revenue $A_{nis}(\phi_j^{'})$ is positively related to productivity, Equation (1.3) is binding for firms with productivity below a certain threshold ϕ^*. It follows that our model differs from Manova (2013) because it assumes that firms can consciously send signals to make investors believe that they can meet the promised payment $F(\phi_j^B|\phi_j^{'})$. In other words, firms may set a repayment amount higher than what they can realistically fulfill. Investors may believe that it is feasible based on disclosed information and are left at risk because the collateral is lower than it should be. Thus, only firms with productivity above the threshold ϕ^* can obtain sufficient liquidity from investors, and ϕ^* is given by[5]

$$\begin{aligned}\frac{\theta_s Y_n}{P_{ns}^{1-\sigma}\sigma}\left(\frac{\sigma}{\sigma-1}c_{is}\tau_{ni}\right)^{1-\sigma}(\phi_j^*)^{\sigma-1}\\ = \exp\left(-\frac{(1-\sigma)^2\varepsilon_j^2}{2}\right) \times \left[(1-d_s)\,c_{is}f_{ni} + \frac{a}{2}\varepsilon_j + \left(\frac{1}{\lambda_{ip}}d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}}t_s c_{is} f_{ei}\right)\right]\end{aligned} \tag{3}$$

Due to fixed costs, only firms with productivity greater than ϕ^* can export. Moreover, owing to credit constraints, firms with productivity slightly higher than the cutoff point of Melitz (2003), that is, $d_s = 0, \lambda_{ip} = 1, \varepsilon_j = 0$, cannot export unless their productivity is higher than ϕ^*. When investors and firms share information fully (i.e., $\varepsilon_j = 0$), the cutoff productivity is the same as Manova (2013). As ϕ_j is drawn from the distribution function $g(\phi)$, a larger ϕ^* suggests a smaller export possibility or a smaller extensive margin in trade (EMT).

In a symmetric information market in which firms' information is transparent, ε_j equals zero, and the cutoff productivity is denoted by $\phi^*_{\varepsilon=0}$. Otherwise, if ε_j is not equal to zero, the corresponding

[5] See Appendix A.

productivity threshold $\phi^*_{\varepsilon=\varepsilon_j}$ depends on the value of $\varepsilon_j \in (0,1)$. By differentiating the right-hand side (RHS) of Equation (3) with respect to ε_j, we obtain

$$\begin{aligned}\frac{\partial RHS}{\partial \varepsilon_j} = & -\exp\left(\frac{-(\sigma-1)^2\varepsilon_j^2}{2}\right)(\sigma-1)^2\varepsilon_j\left[(1-d_s)c_{is}f_{ni}+\frac{a}{2}\varepsilon_j+\left(\frac{1}{\lambda_{ip}}d_sc_{is}f_{ni}-\frac{1-\lambda_{ip}}{\lambda_{ip}}t_sc_{is}f_{ei}\right)\right] \\ & +\frac{a}{2}\times\exp\left(\frac{-(\sigma-1)^2\varepsilon_j^2}{2}\right)\end{aligned} \tag{4}$$

Some calculations yield the following inequations:[6]

$$\begin{cases} \frac{\partial RHS}{\partial \varepsilon_j} > 0 & \varepsilon_j \in (0,\bar{\varepsilon}_j) \\ \frac{\partial RHS}{\partial \varepsilon_j} < 0 & \varepsilon_j \in (\bar{\varepsilon}_j,1) \end{cases} \tag{5}$$

Intuitively, Equation (5) reveals a threshold $\bar{\varepsilon}_j$ for each firm. Within the range $\varepsilon_j \in (\bar{\varepsilon}_j,1)$, in which corporate transparency is already low, a firm's EMT decreases as more information is disclosed (with decreasing ε_j). Conversely, when corporate transparency is already high, $\varepsilon_j \in (0,\bar{\varepsilon}_j)$, EMT increases as more information is disclosed (with decreasing ε_j). As the current level of a firm's corporate transparency can be used to measure whether it is already transparent, we can distinguish between the two types of firms that raise funds by varying corporate transparency. First is firms currently have high corporate transparency and their revenues, after deducting information disclosure costs, are sufficient to pay returns to investors, with $\varepsilon_j \in (0,\bar{\varepsilon}_j)$. The other type is nontransparent firms that cannot achieve high profits or afford information disclosure costs but manage to convince investors of their ability to bear high returns by providing ambiguous information, with $\varepsilon_j \in (\bar{\varepsilon}_j,1)$. This conclusion is consistent with Hypothesis 1:

Proposition 1: *The TE relationship depends on a firm's current level of transparency. Keeping all the other factors constant, for transparent firms ($\varepsilon_j \in (0,\bar{\varepsilon}_j)$), a positive association exists between the likelihood of exports and corporate transparency ($\frac{\partial EMT}{\partial \varepsilon_j} < 0$). In contrast, for nontransparent firms ($\varepsilon_j \in (\bar{\varepsilon}_j,1)$), increased opacity can improve the extensive export margin ($\frac{\partial EMT}{\partial \varepsilon_j} > 0$).*

Proposition 1 identifies a scenario in which the likelihood of export increases due to firms' opacity. This means that nontransparent firms cannot obtain external investor's confidence through increased transparency to boost exports. In other words, for mandating firms, particularly those with low corporate transparency, increasing information disclosure may not enhance export probability. Instead, it can deter them from entering the global market. Moreover, credit constraints can exacerbate this negative TE relationship, as Hypothesis 2.

[6]See Appendix B.

Proposition 2: *For firms with $\varepsilon_j \in (0, \bar{\varepsilon}_j)$ in credit-constrained sectors, an increase in corporate transparency has a relatively small effect on the EMT. For firms with $\varepsilon_j \in (\bar{\varepsilon}_j, 1)$, the increase in corporate transparency has a relatively greater detrimental impact on EMT in sectors with limited credit ($\frac{\partial^2 EMT}{\partial \varepsilon_j \partial t_s} < 0$, $\frac{\partial^2 EMT}{\partial \varepsilon_j \partial d_s} > 0$).*

Investors adjust their beliefs about productivity distribution and raise the productivity standards for new borrowers. If this continues, more companies will face limited financing and will be unable to enter overseas markets despite their high productivity.[7]

From Proposition 1 and Proposition 2, we observe that the export cutoff point varies according to external finance dependency and current transparency. Furthermore, reducing the default rate λ_{ip} can enhance the positive TE relationship, and the degree of financial deepening and legal environment in a city is closely related to the average default rate of firms in that place. Therefore, we have Hypothesis 3.

Proposition 3: *For firms currently with low transparency, a low default rate alleviates the reduction in the export probability associated with increased transparency ($\frac{\partial EMT}{\partial \varepsilon_j} > 0$, $\frac{\partial^2 EMT}{\partial \lambda_{ip} \partial \varepsilon_j} < 0$). For firms currently with high transparency, financial development boosts the positive effect of enhanced transparency on their export probability ($\frac{\partial EMT}{\partial \varepsilon_j} < 0$, $\frac{\partial^2 EMT}{\partial \lambda_{ip} \partial \varepsilon_j} < 0$).*

4 Data Description

Our dataset comprises A-listed Chinese enterprises operating between 2003 and 2014.[8] We obtain financial data for publicly traded firms from the China Stock Market & Accounting Research (CSMAR), whereas firms' transaction-level exporting activities are taken from the Chinese Customs database. Following Ge et al. (2015), we merge these two databases based on basic information such as firm name, year, ZIP code, and phone number. The statistical yearbooks of each prefecture-level city are used to compile the cities' macrodata. Considering trade data, $ExpDum_{jt}$ equals to one if there is an export record in year t; otherwise, zero. Thus, $ExpDum_{jt}$ indicates the extensive margin of exports, given the choice of whether a firm exports.

Furthermore, we filter the initial data using the following criteria: (1) the financial sector is excluded because it uses different accounting standards; (2) listed companies marked ST or ST* during the sample period are removed because of their abnormal operations; and (3) observations

[7] We did not discuss dynamic problems, but Equation (1.4) shows that if investors readjust their distribution of firms' productivity because of previous misjudgments by updating $\xi_j \in U[0, \varepsilon_j]$ to $\xi_j \in U[0, 2\varepsilon_j]$, they are willing to give financing opportunities to firms with higher productivity, that is, $a\phi_j^{updated} = \frac{a}{2} \times 2\varepsilon_j + b + \frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei} > \frac{a}{2}\varepsilon_j + b + \frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}$.

[8] China became a member of the WTO in 2001. To eliminate its effect on firms' exports, the beginning of our sample is 2002. As calculating the firm's transparency index requires the previous year's operating cash flow data, our sample starts in 2003. The analysis ends in 2014 due to the availability of the customs database.

with debt ratios exceeding 100% or missing key variables are eliminated. In the following, we use s to denote the sector, t the year, p the city, and j A-listed firms in our sample.[9] Sectors are grouped according to the one-digit code created by the China Securities Regulatory Commission (CSRC), whereas subsectors of the manufacturing industry (denoted as C) are grouped by a three-digit code (such as C1 and C2). After winsorizing the data at the 5% and 95% levels, we obtain panel data with 12,689 observations encompassing 2,203 A-listed firms.

Following Lang et al. (2012), Bushman et al. (2004a), and Zhu et al. (2023), we consider corporate transparency from the perspective of financial and governance transparency. Five relevant metrics–accrual quality (*DD*), information disclosure ratings (*DSCORE*), number of analysts following (*ANALYST*), analyst earnings accuracy (*ACCURACY*), and audit quality *BIG*–are used to compile a composite index for corporate transparency (*TRANS*). Accrual quality (*DD*) is obtained by taking the negative value of the standard deviation of the residuals from the revised *DD* model (Dechow and Dichev, 2002). A higher value of *DD* indicates greater corporate transparency. The information disclosure ratings (*DSCORE*) are evaluation scores for the transparency of information disclosure by the Shenzhen Stock Exchange. These scores are categorized into four grades from highest to lowest: A, B, C, and D. We assign numerical values to these categories from 1 to 4, with higher scores indicating greater corporate transparency. The number of analysts (*ANALYST*) is the annual number of financial analysts forecasting a company's earnings. Serving as information intermediaries, a large number of analysts enrich a company's information environment and the transmission of information. Higher values signify greater corporate transparency. The accuracy of analyst earnings (*ACCURACY*) is calculated by determining the median earnings forecasted by different analysts for the same year, then subtracting the actual value, and finally dividing by the price of shares from the previous year. We multiply the absolute value of this number by -1; thus, a larger value indicates higher corporate transparency. Last, the audit quality indicator (*BIG*) is assigned a value of one if the company is audited by one of the Big Four accounting firms and zero otherwise. Finally, *TRANS* is equal to the mean of the scaled percentile rank of the five variables above; in cases where any of these variables are missing, *TRANS* is computed using the mean of the scaled percentile ranks of the remaining available variables.

Another crucial measure is the dependence on external financing d_s and collateral t_s of firms in sector s, which reflect financial vulnerability or credit restrictions. Many academics have developed comprehensive credit constraint indicators based on corporate financial items. Popular indicators include the KZ index in the CSMAR database, introduced by Kaplan and Zingales (1997) and further developed by Lamont et al. (2001). The KZ index, which is less sensitive to macroeconomic conditions and is applicable to a wide range of firms, is estimated through an ordered logistic regression based on financial variables such as cash flow, asset-liability ratio, and dividends. Because Hadlock

[9] In the empirical analysis, we divide the international market into two parts: China and others; that is, n in Equation (1) denotes others (importer) and i refers to China (exporter).

and Pierce (2010) expressed concern that the KZ index of each firm could be subject to endogeneity problems, we compute industry-weighted averages (KZ_{st}) to ensure consistency with Equation (1).

The final core variable is the financial deepening and legal environment of cities.[10] A financial deepening environment mitigates transaction and information costs, thus providing investors and firms excellent access to various market tools (Levine, 1997). Considering the availability of data and drawing from the works of Zhang et al. (2012) and Zhang et al. (2015), we employ two indicators measured at the city level: DLR_{pt}, which reflects the scale of financial intermediation, is calculated as the ratio of total deposits and loans to GDP, and LR_{pt}, representing the overall depth of financial intermediation, is the ratio of total loans in financial institutions to GDP.

The rate of corporate financial failure also depends on the local legal environment, and its improvement can effectively enhance the efficiency of contract enforcement, including financing contracts. Based on Hasan et al. (2014), Hasan et al. (2009), and Li et al. (2023), we use the presence of legal professionals as a proxy for the quality of legal procedures and content to measure the regional legal environment ($Lawyers_{pt}$). This variable is the number of lawyers per 10,000 people in each province and is obtained from the statistical yearbooks of the provinces and the China Lawyers Yearbook.

In addition to these key variables, we include a vector of control variables relevant to a firm's self-selection to enter international markets. The control variables include the (log) asset size ($(ln)Size_{jt}$), return on assets (ROA_{jt}), proportion of the largest shareholder ($Top1_{jt}$), growth rate of operating income ($Growth_{jt}$), Tobin's Q value ($TobinQ_{jt}$), management expense ratio ($Mfee_{jt}$), (log) firm age (Age_{jt}), productivity (TFP), HHI index (HHI_{jt}), GDP per capita ($(ln)GDP_{pt}$), secondary industry proportion ($Manu_{pt}$), and exchange rate ($REER_t$). Table C.1 presents detailed explanations of these variables and Table C.2 provides their summary statistics.

5 Empirical Investigation

5.1 Effects of corporate transparency on EMT

We discussed three hypotheses in Section 2 and Section 3. Hypothesis 1 and Proposition 1 argue that the current corporate transparency level influences the impact of corporate transparency on exports and in case of already having high level of corporate transparency, EMT could be raised by disclosing more information. Figure 1 presents the impact of corporate transparency on export probability across different current levels of firm transparency, along with a quadratic fit curve. We observe a positive U-shaped curve, indicating that at higher values of $TRANS$ (the threshold is between 2 and 3 in the plot), an increase in transparency leads to a higher export probability.

[10] Here, *city* refers to either a prefecture-level city or a municipality (there are four municipalities in China: Beijing, Shanghai, Tianjin, and Chongqing).

In contrast, at lower values of $TRANS$, an increase in transparency slightly decreases the export probability. This finding is consistent with Proposition 1.

[FIGURE 1 about here.]

To obtain the coefficients and statistical significance, we estimate Equation (6), where $TRANS_{jt}$ is a continuous variable used to measure a firm's corporate transparency and $ConVars_{jt}$ is a vector of control variables. Equation (6) includes time-fixed effects λ_t to control some unobservable and time-variable characteristics that influence exporting behaviors of firms across sectors and cities, such as policy stimulation and economic booms. Sector fixed effects λ_s are also included to account for the various comparative advantages in specific sectors, and city fixed effects λ_p are added to capture the impact of a firm's location, such as transportation convenience and natural resource benefits. An exhaustive set of fixed effects and control variables enables us to focus on coefficients β_0 and β_1.

$$Pr(ExpDum_{jt} = 1) = \Phi \begin{pmatrix} \alpha_0 + \beta_0 TRANS_{jt} + \beta_1 TRANS_{jt} \times TRANS_{jt} \\ +\alpha_1 ConVars_{jt} + \lambda_t + \lambda_s + \lambda_p + \eta_{spjt} \end{pmatrix} \quad (6)$$

Table 1 shows the results of Equation (6) from OLS, Logit, and Probit regressions and verifies Hypothesis 1. Regarding marginal effects, the estimated values of the variables do not differ significantly for each specification. The statistically significant and positive coefficients in Columns 1, 3, and 6 indicate that corporate transparency positively influences a firm's likelihood of exporting. However, when the quadratic term $TRANS_{j,t} \times TRANS_{j,t}$ is included, the coefficient of $TRANS_{j,t}$ becomes significantly negative, while that of the quadratic term becomes significantly positive. Columns 2, 5, and 8 report the marginal effects and corresponding standard errors of $TRANS_{j,t} \times TRANS_{j,t}$. Columns 5 and 8 follow the method suggested by Norton et al. (2004). In nonlinear models, the interaction effect is not simply a product of the individual effects. Instead, they proposed a method that involves computing partial derivatives, accounting for the interaction between variables. This approach considers the effect of a variable on the dependent variable, conditioned on the level of other interacting variables. Figure D.1 plots two marginal effects of the interaction term (one is calculated by the method of Norton et al. (2004) and the other by the conventional linear method) against predicted probabilities. Figure D.2 shows z-statistics of interaction term's marginal effect against predicted probabilities. Figure D.1 demonstrates the average interaction effect is 1.424 (Logit, as shown in Column 5) and 1.468 (Probit, as shown in Column 8), and these two estimates are significant at the 5% level in the vast majority of cases (not falling within the two dashed lines in Figure D.2). This finding suggests that the impact of corporate transparency on export probability has a threshold. An improvement in transparency increases the export probabilities for firms with high transparency levels, whereas for firms with lower transparency, increasing transparency can reduce their likelihood of exporting. The threshold point is around 0.28 according to OLS in Column 2 ($0.671/(2 \times 1.180)$; as for Logit (Column 5) and Probit (Column 8), the value is around 0.24 ($0.676/(2 \times 1.424)$ and $0.711/(2 \times 1.468)$, respectively).

[TABLE 1 about here.]

The marginal effects of $TRANS_{j,t}$ from nonlinear models are illustrated in Figure 2. Under the three estimation methods (OLS, Logit, and Probit), the marginal effect of corporate transparency on the export probability initially shows negative values and then turns positive. This transition occurs between approximately 0.24 and 0.28, within the $25th$ percentile value (0.200) and the $50th$ percentile value (0.332) of the distribution of $TRANS$ (Table C.2).[11] This implies that export probability increases with corporate transparency for more than half of the listed companies. However, some companies continue to experience decreased export probabilities and increased transparency. This could be because the proprietary characteristics of these firms are easily imitable or have inherent financial risks. Therefore, when such companies are required to increase their disclosures, they might face negative impacts, hindering their export capabilities.

[FIGURE 2 about here.]

5.2 Effects of credit constraints

The second hypothesis posits that firms within industries characterized by financial vulnerability exhibit a more negative impact on exports because of increased transparency. In other words, firms that are more susceptible to financing constraints and opt for a low degree of information disclosure are likely to experience a greater reduction in the TE relationship when they change their disclosure policies to improve transparency. To test Hypothesis 2, we proposed the following Equation (7):

$$Pr(ExpDum_{jt} = 1) = \Phi \begin{pmatrix} \alpha_0 + \delta_0 TRANS_{jt} + \delta_1 TRANS_{jt} \times TRANS_{jt} + \beta_1 KZ_{st} \\ +\beta_2 KZ_{st} \times TRANS_{jt} + \beta_3 KZ_{st} \times TRANS_{jt} \times TRANS_{jt} \\ +\alpha_1 ConVars_{jt} + \lambda_t + \lambda_s + \lambda_p + \eta_{spjt} \end{pmatrix} \tag{7}$$

Table 2 displays the estimated coefficients of Equation (7), and Figure 3 shows how the marginal impacts of corporate transparency vary export probabilities at different KZ_{st} levels. Estimating the marginal effects and standard errors of interaction terms involving three continuous variables in nonlinear models is complex. Gnangnon (2013) suggested using the LPM to interpret the coefficients of interaction variables.[12] Specifically, Column 2 reveals a significantly positive coefficient

[11] In the subsequent subgroup regression, e.g., Tables D.1 to D.3, we use 0.28 as the boundary to classify firms into groups of high and low transparency. From Table D.1, we find a negative *"transparency - export"* correlation for firms with lower corporate transparency, with an estimator between -0.277 and -0.328. This implies that for each standard deviation increase in the $TRANS$ (0.152), the probability of a firm's export decreases by 4.2% (-0.277×0.152) to 5% (-0.328×0.152), which is approximately 18% of the current proportion of exporting firms; while for firms with higher corporate transparency, the estimators are statistically positive around 0.3. Similar estimation results can be obtained even if we group using 0.28 as the lower bound and 0.24 as the upper bound.

[12] Table D.2 reports the results of a separate regression analysis. The entire sample is divided into two groups based

for $TRANS_{jt} \times TRANS_{jt} \times KZ_{st}$ and a significantly negative coefficient for $TRANS_{jt} \times KZ_{st}$. Additionally, the p-values of the joint F-test in the second-to-last row are all less than 0.05, suggesting that the estimators are not jointly equal to zero. This implies that companies with fewer information disclosures suffer significantly from losing export chances when increasing transparency in financially weaker industries (as indicated by the higher KZ_{st} values). Conversely, for firms with higher current transparency levels, the negative impact of increased transparency on exports is less pronounced in financially fragile industries. This suggests that in sectors more susceptible to financial instability, the downsides of heightened transparency on export activities are mitigated among firms already operating with greater transparency. For example, according to Column 2, for firms with a transparency ($TRANS$) value of 0.2 (at the $25th$ percentile), the partial derivative of the export probability with respect to TRANS is $\frac{\partial Pr(ExpDum_{jt}=1)}{\partial TRANS_{jt}} = -0.25KZ_{st} + 0.12$. If the KZ index exceeds 0.48, which is between the $5th$ and $25th$ percentiles of its distribution, an increase in transparency leads to a decrease in export probability. This decrease is more pronounced at higher KZ values. For firms at a $TRANS$ value of 0.45 (at the $75th$ percentile), the partial derivative is $\frac{\partial Pr(ExpDum_{jt}=1)}{\partial TRANS_{jt}} = -0.14KZ_{st} + 0.27$. Here, only when the KZ value exceeds 1.93, around the $75th$ percentile, does an increase in transparency reduce the likelihood of exporting, with the magnitude of the reduction being less significant as the KZ value increases.

[TABLE 2 about here.]

Figure 3 illustrates the marginal effects of corporate transparency on exports in four credit scenarios. The graph on the left-hand side represents industries with severe credit constraints and shows that for firms with a $TRANS_{jt}$ value of less than approximately 3, the export probability decreases as $TRANS_{jt}$ increases, considering credit constraints (as shown by the yellow line). The non-overlapping confidence intervals between the yellow and blue dashed lines indicate the extent to which a firm's credit constraints significantly affect the relationship between $TRANS_{jt}$ and exports. The graphs on the right-hand side depict industries with milder credit constraints, revealing that the impact of transparency on exports is significantly positive only within a specific range (as shown in the lower-right graph, between 3 and 4). In addition, $TRANS_{jt}$ does not significantly affect exports. Our results support Hypothesis 2, suggesting that the relationship among corporate transparency, credit constraints, and export performance is complex and depends on various factors.

[FIGURE 3 about here.]

on a threshold of $TRANS_{jt} = 0.28$: those with $TRANS_{jt} < 0.28$ representing lower current transparency and those with $TRANS_{jt} > 0.28$ indicating higher current transparency. Marginal effects and the corresponding standard errors for each variable (including interaction terms) are estimated following the methodology of Norton et al. (2004). Similar findings are observed, as suggested by the statistically negative marginal effect of $TRANS_{jt} \times KZ_{st}$ in Columns 1, 3, and 5, that for firms in financially fragile industries, increased transparency leads to a greater decrease in exports when their current information disclosure level is low.

Exporting firms face greater risks than companies that sell domestically (Manova, 2013; Manova et al., 2015). These firms typically face more severe credit constraints, and increased transparency can expose them to financial risks, operational instability, and less-protected nature of their proprietary attributes. This could make investors more cautious about financing, putting the firms at a competitive disadvantage in the market. Additionally, the management resources and costs required to enhance transparency may divert attention from core operations such as export activities. Moreover, investors might be more sensitive to a firm's short-term performance, especially in financially fragile industries, where such fluctuations can be more intense. This may affect their market reputation and investment appeal. Thus, although transparency is often a positive corporate governance practice for financially fragile firms, it can entail additional challenges and costs that negatively impact their export possibilities.

5.3 Effects of financial deepening and legal environment

Our findings suggest that higher transparency alone cannot improve a firm's export performance, particularly in industries with severe credit constraints. Although improving transparency helps build a firm's reputation and trustworthiness over time, it also entails costs and risks. Therefore, firms should complement their disclosure policy with other strategies, such as seeking alternative financing sources, obtaining consultations, expanding networks, and increasing creditworthiness, which can be facilitated by financial deepening and legal environment. Therefore, we propose Equation (8) to examine Hypothesis 3 and Proposition 3.

$$Pr(ExpDum_{jt}=1)=\Phi\begin{pmatrix}\alpha_0+\delta_0 TRANS_{jt}+\delta_1 TRANS_{jt}\times TRANS_{jt}+\beta_1 M_{pt}\\ +\beta_2 M_{pt}\times TRANS_{jt}+\beta_3 M_{pt}\times TRANS_{jt}\times TRANS_{jt}\\ +\alpha_1 ConVars_{jt}+\lambda_t+\lambda_s+\lambda_p+\eta_{spjt}\end{pmatrix} \tag{8}$$

where M_{pt} comprises measurements of financial deepening (DLR_{pt} and LR_{pt}) and legal environment ($Lawyers_{pt}$). Equation (8) implies that the impact of corporate transparency on a firm's export is moderated by financial deepening and legal environment. Table 3 presents the results with different measures for financial deepening and legal environment. It shows that when the squared term of $TRANS_{jt}$ and its interaction with M_{pt} are included, the coefficients of $TRANS_{st}\times TRANS_{st}\times M_{pt}$ become insignificant at a 5% significance level. The estimates without the squared term of $TRANS_{jt}$ (e.g., Columns 1, 3, and 5) show that the coefficients of $TRANS_{jt}\times M_{pt}$ are significantly positive for all specifications.

Taking the OLS results in Table 3a as an example, when DLR_{pt} equals the mean value of 3.364, the marginal effect of firm transparency is 0.09 ($\frac{\partial Pr(ExpDum_{jt}=1)}{\partial TRANS_{jt}}=0.150\times 3.364-0.416$). For every increase in the standard deviation of firm transparency, the export probability increases by

1.4% (0.152×0.09). When the value of DLR_{jt} of the city is 4.383 ($75th$ percentile), each increase in transparency by standard deviation increases the export probability by 3.6%. If the value of DLR_{pt} is greater than 2.77 (slightly higher than the $25th$ percentile in our sample), increasing the transparency of the firm increases the export probability regardless of whether the current transparency level of the firm is high or low. This indicates the importance of regional financial deepening and legal environment. At the same information disclosure level, firms with better financial development and more robust legal systems are likely to leverage transparency to increase their export probability.

[TABLE 3 about here.]

Figure 4 shows the marginal effects of firm transparency estimated from a nonlinear method (Logit). We find that when a firm's $TRANS_{pt}$ is relatively low, for example, below 0.28 (the threshold previously obtained in Table 1), firms located in cities with a higher financial deepening or more sound legal systems always exhibit a positive TE relationship. Among the three measures of M_{pt}, the positive effects of the scale of financial intermediation DLR_{pt} on the TE relationship are most apparent.[13]

[FIGURE 4 about here.]

Table 3 and Figure 4 demonstrate the validity of Hypothesis 3, which posits that in cities with well-developed financial systems and strong legal environment, corporate transparency has a crucial role in enhancing the likelihood of export. Companies that are reticent to disclose information due to financial problems or concerns about proprietary attributes can be incentivized to increase transparency to boost their export prospects. Financial deepening promotes financial innovation and diversification of financial products, which increases the channels and possibilities for firms to access various forms of funding. Additionally, financial development enhances the financial market's ability to understand and share information about firms, enabling a comprehensive understanding of businesses, a better assessment of risks and rewards, and increased investor confidence in expanding a firm's export activities. Similarly, a well-constructed legal framework provides a stable and predictable business environment that strengthens corporate credit and debt-repayment capabilities. It also protects proprietary attributes by ensuring contract enforcement and property rights, thereby preventing plagiarism and ensuring the competitiveness and innovation of exported products. A sound legal environment can improve corporate governance and reduce the costs associated with information disclosure. Drawing from Hypothesis 2, we infer that financing constraints exacerbate the negative impact on the exports of companies with lower levels of information disclosure, attempting to enhance transparency. Conversely, financial development can alleviate these adverse effects and may facilitate positive outcomes in exports, according to Hypothesis 3.

[13] Table D.3 conducts subgroup regression, where the estimated coefficients of $TRANS_{jt} \times M_{pt}$ are significantly positive for all groups with $TRANS_{jt} < 0.28$ or $TRANS_{jt} > 0.28$, and the estimators are twice larger for sub-groups with less information disclosure.

[FIGURE 5 about here.]

Our next question concerns the direct relationship between increased corporate transparency and export probability in financially constrained industries in cities with deep financialization and well-established legal systems. To analyze this relationship under their combined influence, we delineate the marginal effects of corporate transparency conditional on various values of the KZ_{st} index and M, that is, DLR_{pt}, LR_{pt}, and $lawyers_{pt}$. As illustrated in Figure 5, our sample is divided into two groups based on a $TRANS_{jt}$ threshold of 0.28: those with low information disclosure ($TRANS_{jt} < 0.28$ in Figures 5a, 5c and 5e) and those with high information disclosure ($TRANS_{jt} > 0.28$ in Figures 5b, 5d and 5f). The red points indicate a significant positive marginal effect and blue points a significant negative effect. We observe that for firms with low information disclosure, the negative impacts of financing constraints are gradually mitigated as the financial depth and legal system improve. Moreover, in industries with more severe financing constraints, the level of financial deepening or legal environment required to boost exports through enhanced transparency is higher. The red points at higher values of M_{pt} in Figures 5a, 5c and 5e demonstrate that at the $90th$ percentile of each distribution, even firms facing stringent financing constraints can increase their export probability by improving transparency despite having lower levels of information disclosure.

6 Robustness Check

6.1 Non-linear DID

Hypothesis 1 is the baseline involving all assumptions in this paper, and hence, it is crucial to establish the causal relationship between corporate transparency and exports. The influence of corporate transparency on exports has an inherent endogeneity problem, primarily because of reverse causality. This is because companies may improve the quality of their information disclosure to adapt to international market demands and comply with international trade regulations. Thus, following Chen et al. (2018) and Xue et al. (2023), we conduct a PSM-DID (propensity score matching-difference in differences) analysis using the mandatory CSR disclosure as an exogenous policy shock.[14] Although this policy mandates only the CSR disclosure, given that it represents the government's first initiative on corporate responsibility information disclosure and few companies voluntarily disclosed such information before this policy, it can be stated that this mandatory disclosure policy significantly enhances corporate transparency.

[14]The mandatory CSR disclosure, as implemented by the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE), is a crucial measure to increase corporate transparency. Mandated in December 2008, it obliges a subset of firms listed on these exchanges to disclose their CSR activities publicly. The SSE requires firms listed in its "Corporate Governance Sector," those with shares listed overseas, and financial firms to publish a CSR report alongside their annual report (http://www.sse.com.cn/aboutus/mediacenter/hotandd/c/c_20150912_3988269.shtml, in Chinese); the SZSE requires firms listed on its "Shenzhen 100 Index" to disclose their CSR activities (https://www.szse.cn/disclosure/notice/general/t20081231_500181.html, in Chinese).

This policy was introduced at the end of 2008. Therefore, we consider 2009 as the first year of the policy and set the sample period from 2006 to 2014. We first examine the impact of mandatory CSR disclosures on the likelihood of a firm engaging in export activities. This analysis involves regressing $ExpDum_{jt}$ against a binary variable $fs_{jt}, s = 2009$, which indicates whether the observation period is after policy implementation and is equal to one for the post-period (2009-2014) and zero otherwise (2006-2008). D_j indicates the firms required to report CSR and is set to one for firms under this mandate, including those in the corporate governance sector, firms with international listings, financial institutions, and firms listed on the Shenzhen 100 Index. The interaction term is $W_{jt} = fs_t \times D_j$.

The model also includes the same control variables and fixed effects as those previously used. According to Hypothesis 1, the TE relationship depends on a firm's current level of information disclosure. We categorize firms into two groups using a threshold of $TRANS_{2008,t} = 0.28$, distinguishing them into high and low information disclosure groups. We exclude a firm from our sample if it has no observations for 2008. Considering that the treatment and control groups may significantly differ in multiple characteristics, we first reduce these pre-existing differences by matching similar individuals through PSM. We employ a 1:1 nearest neighbor matching method, matching based on control variables and eliminating those that do not successfully find a match.

Ai and Norton (2003) highlighted that interpreting interaction effects in nonlinear models is not straightforward. They demonstrated that cross-partial effects could be non-zero even when the interaction coefficient is zero. Puhani (2012) theoretically validated the expression for the treatment effect in DID with strictly monotonic nonlinear transformation functions and noted that the interaction term always maintains the same sign as the DID effect. Wooldridge (2023) developed a straightforward and adaptable strategy for DID in nonlinear settings. His approach accommodates general staggered interventions, both with and without covariates. In addition, the assumption of parallel trends (PT) in nonlinear DID has garnered attention because of its dependence on functional form. Roth and Sant'Anna (2023) demonstrated the insensitivity of transformations of $Y_{it}(0)$, the potential outcome for unit i in period t without treatment, to functional form. Wooldridge (2023) argued that with zero as a potential outcome, $log(Y_{it}(0))$ is undefined and proposed nonlinear conditional mean functions that comply with the PT assumption, bypassing the need for $log(Y_{it}(0))$. Therefore, his approach requires only specifying a conditional mean function without imposing additional assumptions and leaves all other conditional moments unrestricted, including marginal and joint distributions over time. Employing a pooled quasi-maximum likelihood estimation (QMLE) within the linear exponential family (LEF) class of distributions ensures that the estimators for treatment effects on the treated (ATTs) do not depend on other distributional assumptions or patterns of serial dependence over time. Hence, we adopt the DID-Logit and DID-Probit models, following Wooldridge (2023). [15]

[15]Using pooled QMLE, we perform nonlinear estimation: Y_{it} on $1, D_i, \mathbf{X}_i, D_i \times \mathbf{X}_i, f2_t, f2_t \times \mathbf{X}_i, W_{it} \times f2_t, W_{it} \times f2_t \times$

[TABLE 4 about here.]

[TABLE 5 about here.]

Tables 4 and 5 report the impact of the CSR disclosure policy on the export probabilities of firms with varying information disclosure levels. According to Wooldridge (2023), at minimum, time-varying covariates should not be influenced by policy intervention, allowing for the substitution of $\mathbf{X}_i$ with $\mathbf{X}_{it}$. Thus, we first conduct a t-test on control variables before and after policy implementation and select variables with insignificant mean differences at the 5% level as controls for the DID estimation, including $(ln)Size$, $Top1$, $Growth$, $Mfee$, HHI, TFP, and a set of industry and province indicators.[16]

Table 4 shows that the ATT effect of the mandatory CSR disclosure policy is approximately 11%. This means that the policy implementation caused about an 11% decrease in the export probability of firms with lower levels of information disclosure, a non-negligible value relative to the sample mean of 25% exporting firms. Moreover, the policy's negative impact was significant at the 10% level for the first three years after its introduction, with its annual magnitude decreasing. The two

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$\dot{\mathbf{X}}_i$, where $\dot{\mathbf{X}}_i = \mathbf{X}_i - \overline{\mathbf{X}}_1$ and $W_{it} \equiv D_i \times f2_t$. In this study, Y is $Pr(ExpDum)$ and X is a vector of the control variables. Then, the constant time effects, ATTs $\tilde{\tau}_2$, can be estimated using the following equations as the average partial effect of W_{it} at $f2_t = 1$ averaged across the sub-sample with $D_i = 1$:

$$\begin{aligned} E\left(Y_{it} \mid D_i, \mathbf{X}_i, W_{it}\right) = & G\left[\alpha + \beta D_i + \mathbf{X}_i \kappa + \left(D_i \cdot \mathbf{X}_i\right) \eta + \gamma_2 f2_t + \left(f2_t \cdot \mathbf{X}_i\right) \pi_2 \right. \\ & \left. + \delta_2 \left(W_{it} \cdot f2_t\right) + \left(W_{it} \cdot f2_t \cdot \dot{\mathbf{X}}_i\right) \xi_2 \right] \end{aligned} \tag{9}$$

$$\begin{aligned} \tilde{\tau}_2 = & N_1^{-1} \sum_{i=1}^{N} D_i \left[G\left(\tilde{\alpha} + \tilde{\beta} + \tilde{\gamma}_2 + \mathbf{X}_i \left(\tilde{\kappa} + \tilde{\eta} + \tilde{\pi}_2\right) + \tilde{\delta}_2 + \dot{\mathbf{X}}_i \tilde{\xi}_2 \right) \right. \\ & \left. - G\left(\tilde{\alpha} + \tilde{\beta} + \tilde{\gamma}_2 + \mathbf{X}_i \left(\tilde{\kappa} + \tilde{\eta} + \tilde{\pi}_2\right)\right) \right]. \end{aligned} \tag{10}$$

Moreover, the policies have a common timing (the policy year is only 2009) in our context. Thus, we can add more pre- and post-intervention periods to obtain time-varying effects.

$$\begin{aligned} E\left(Y_{it} \mid D_i, \mathbf{X}_i, \mathbf{W}_i\right) = & G\left[\alpha + \beta D_i + \mathbf{X}_i \kappa + \left(D_i \cdot \mathbf{X}_i\right) \eta + \sum_{s=2006, s \neq 2008}^{2014} \gamma_s fs_t + \sum_{s=2006, s \neq 2008}^{2014} \left(fs_t \cdot \mathbf{X}_i\right) \pi_s \right. \\ & \left. + \sum_{s=2009}^{2014} \delta_s \left(W_{it} \cdot D_i \cdot fs_t\right) + \sum_{s=2009}^{2014} \left(W_{it} \cdot D_i \cdot fs_t \cdot \dot{\mathbf{X}}_{i,2009}\right) \xi_{2009,s} \right] \end{aligned} \tag{11}$$

$$\begin{aligned} \tilde{\tau}_r = & N^{-1} \sum_{i=1}^{N} D_i \left[G\left(\tilde{\alpha} + \tilde{\beta} + \mathbf{X}_i \tilde{\kappa} + \mathbf{X}_i \tilde{\eta} + \tilde{\gamma}_r + \mathbf{X}_i \tilde{\pi}_r + \tilde{\delta}_{2009,r} + \dot{\mathbf{X}}_i \xi_{2009,r}\right) \right. \\ & \left. - G\left(\tilde{\alpha} + \tilde{\beta} + \mathbf{X}_i \tilde{\kappa} + \mathbf{X}_i \tilde{\eta} + \tilde{\gamma}_r + \mathbf{X}_i \tilde{\pi}_r\right) \right]. \end{aligned} \tag{12}$$

where g is the start year of different policy shocks in a general staggered case (in our common timing, it is and only is 2009), s is the start year of the sample, and T is the end year. $\tilde{\tau}_r$ is the ATTs of year r as the average partial effect with respect to W_{it} at $D_i = 1$ and $fr_t = 1$ averaged across the sub-sample with $D_i = 1$.

Considering the parallel trends (PT) assumption, Wooldridge (2023) proposed two approaches. The first is the event-study-type test, where $D_i \times fs_t, s = 2006, 2007$ should be added, and a cluster-robust Wald test of exclusion restrictions, $D_i \times fs_{2006} = 0$ and $D_i \times fs_{2007} = 0$, should be employed. The second is a heterogeneous linear trend test, in which the significance of $D_i \times t$ should be tested using a cluster-robust t-statistic.

[16]Results without controlling for $(ln)Size$, $Top1$, $Growth$, $Mfee$, HHI, TFP are shown in Table D.5.

tests for pre-trends with p-values greater than 0.05 provide no evidence against the PT assumption in the linear or nonlinear models. Table 5 instead displays the impact of the mandatory CSR disclosure policy on firms with higher levels of information disclosure and shows an increase of approximately 10% in export probability. This effect is significantly positive at the 10% level for the four years after introducing the policy and reaches its maximum in the second year. The larger p-values in the last two rows of the table indicate no violation of the PT assumption.

Thus, using an exogenous policy shock, we demonstrate that increasing corporate transparency incentivizes firms with higher levels of information disclosure to export. However, it tends to decrease the export probability of firms with low disclosure.

6.2 Alternative Variables

The KV index, proposed by Kim and Verrecchia (2001) is a popular proxy for corporate transparency. A higher KZ value indicates a lower quality of information disclosure and, hence, less corporate transparency. The model used to estimate the KV index is

$$\text{Ln}\left|\frac{Pstock_{j,t} - Pstock_{j,t-1}}{Pstock_{j,t-1}}\right| = \lambda_0 + \lambda_1 \left(Vol_{j,t} - Vol_{j,0}\right) + \varepsilon_{j,t} \tag{13}$$

where $Vol_{j,t}$ and $Vol_{j,0}$ are the trading volumes of day t of firm j and the average daily trading volume during the study period, respectively. $Pstock_{j,t}$ is the closing price of stock j on day t and $\varepsilon_{j,t}$ is the white noise error. λ_0 and λ_1 are estimated using ordinary least squares (OLS), and λ_1 multiplied by one million is a measure of the KZ index. To modify the KV index such that higher values indicate greater transparency, we invert the scale of the variable by subtracting it from the maximum value and then taking the absolute value: $KV\_inv_{jt} = abs(KV\_max_{jt} - KV_{jt})$.

Table 6 lists estimated coefficients using KV_inv_{jt} as a proxy of corporate transparency. Table 6a checks the robustness of Hypotheses 1 and 2, while Table 6b is for the robustness of Hypothesis 3 using $M = DLR_{pt}$.[17] The results obtained using KV_inv_{jt} to measure corporate transparency are similar to those of Tables 1 to 3. The positive and significant quadratic term of KV in Columns 1–3 of Table 6a indicates that the current information disclosure level influences the impact of corporate transparency on exports. The threshold value is approximately 0.71 ($0.326/(2 \times 0.229)$) between the $25th$ and $50th$ percentiles of the KV_inv_{jt}-distribution. According to Columns 4, 6, and 8 of Table 6a, credit constraints reduce corporate transparency's positive impact on exports. Furthermore, after adding the product of KV_inv_{jt} quadratic term and KZ_{st}, the coefficients of $KV\_inv_{jt} \times KV\_inv_{jt}$ and $KV\_inv_{jt} \times KV\_inv_{jt} \times KZ_{st}$ become statistically significant, which indicates that credit constraints affect the TE relationship. Specifically, credit constraints have a more pronounced negative effect on this relationship for firms with lower disclosure levels. Finally, from Table 6b, we find that, unlike credit constraints, the coefficients of $KV\_inv_{jt} \times KV\_inv_{jt} \times DLR_{pt}$ are insignificant after the product

[17] Table D.6 reports the results of $M = LR_{pt}$ and $M = Lawyers_{pt}$.

of financial deepening and the KV quadratic term is added. Combined with the significantly positive coefficients of $KV\_inv_{jt} \times DLR_{pt}$ in Columns 1, 3, and 5, we can infer that financial deepening positively promotes the TE relationship, and this influence does not depend on the current level of corporate information disclosure.

[TABLE 6 about here.]

6.3 Others

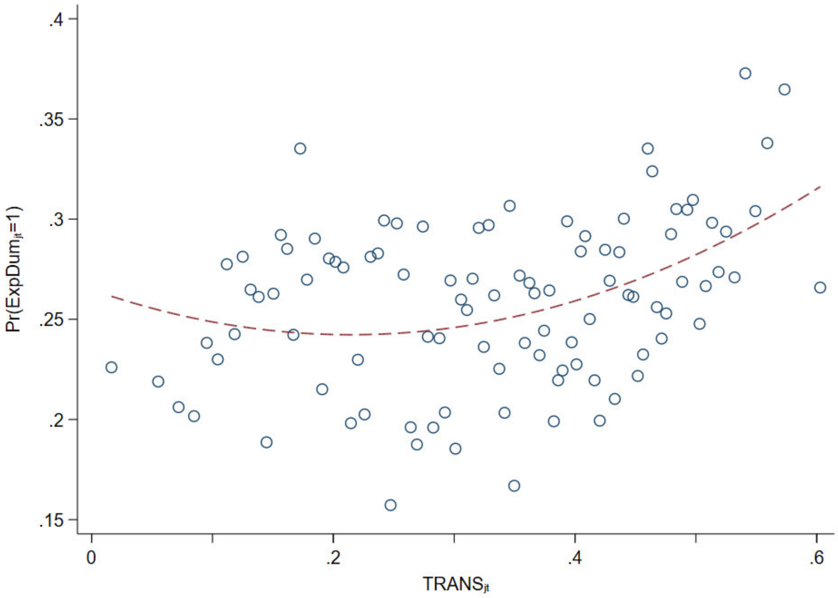
Besides, we conduct other robustness checks. (1) We exclude four municipalities (Beijing, Shanghai, Chongqing, and Tianjin) because these municipalities often receive special preferential policies. This exclusion enables us to control for the potential source of bias. (2) We consider year-industry and year-region interaction terms. A particular policy might significantly impact specific industries, or a natural disaster in a certain year might disproportionately affect some regions, influencing firms' exports. Despite such modifications, these robustness checks provide results consistent with our baseline regression analysis, as detailed in the appendix (see Tables D.7 and D.8). This consistency strengthens the credibility of our findings and suggests that unobserved factors, self-selection bias, or other potential sources of bias do not alter our conclusions.

7 Conclusion

In the context of the controversial relationship between information transparency and export, we examine the roles of information disclosure, credit constraints, financial deepening, and legal systems in firms' export decisions. Our theoretical model, which is based on asymmetric information between firms and investors, provides the economic conditions required for a positive TE relationship. Indeed, improving corporate transparency does not guarantee an increase in the likelihood of export; nontransparent firms often suffer from decreased export probability when required to increase corporate transparency. The negative effects of corporate transparency on exports complement Jayaraman and Wu (2019), Goldstein and Yang (2019), and Pinto (2022), highlighting the double-edged effects of information disclosure. This is because of the higher uncertainty of the export business and the ease of replicating firms' proprietary attributes, leading to disclosure costs far outweighing the benefits. In such cases, requiring firms to disclose more information can hinder their export operations and future development. Furthermore, by extending previous studies (Berman and Berthou, 2009; Manova, 2013; Manova and Yu, 2016; Li et al., 2020; Dai et al., 2021) that found negative impacts of credit constraints and benefits from financial development, our study demonstrates that nontransparent firms with higher credit constraints exhibit a stronger inverse TE relationship. However, improving the financial and legal environment helps firms broaden their financing channels, builds a supportive intellectual property business environment, and provides various risk management tools and services that can mitigate the restrictive impact of credit constraints and corporate transparency on the extensive margin in trade. We confirm these theoretical predictions using firm-level data from China, which is the second-largest economy in the global market and is considered to have substantial potential for improving corporate transparency.

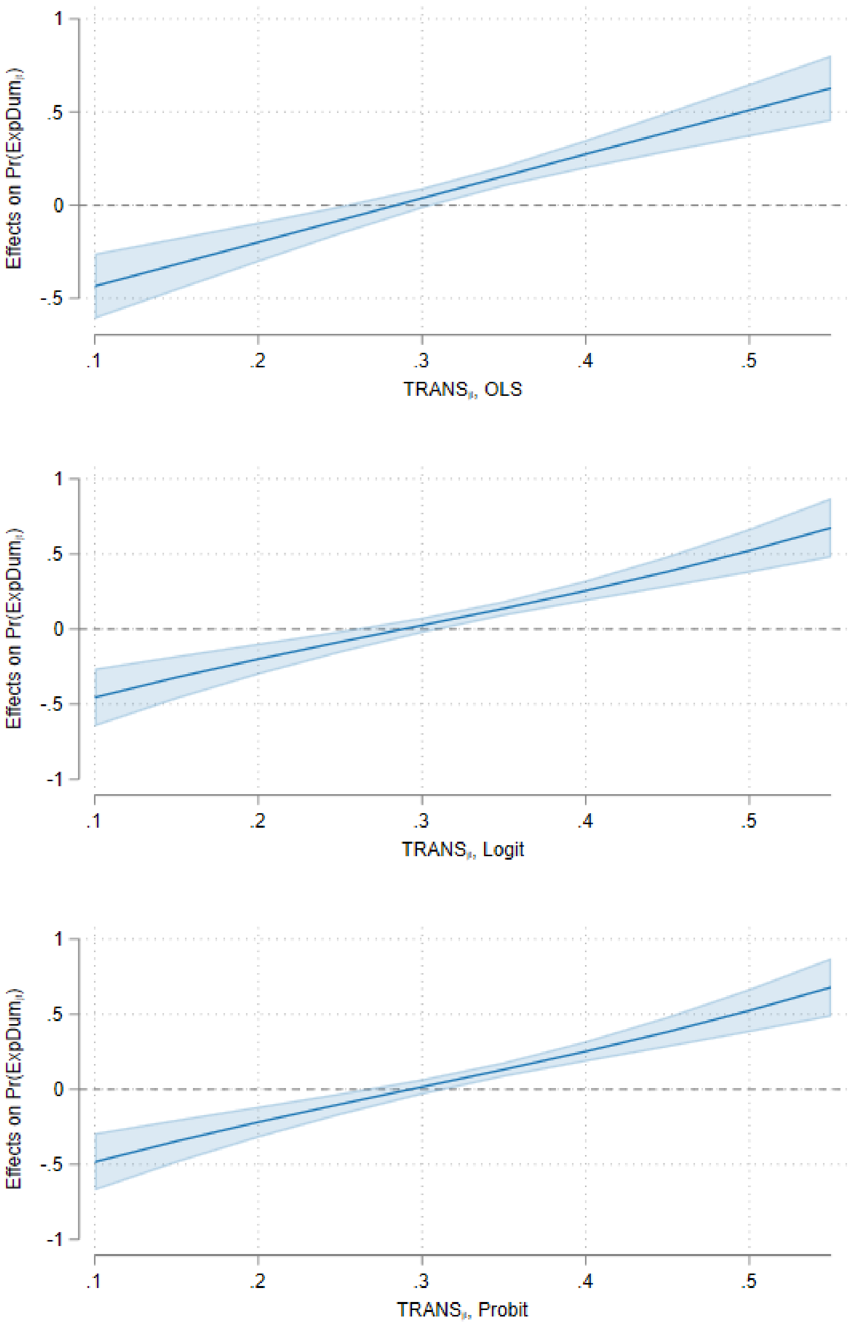
Our study offers valuable insights and contributes to the understanding of the complex interplay among credit constraints, corporate transparency, and export behavior, particularly in financially vulnerable sectors and firms with weak competitive advantages. Our findings suggest that firms with weaker competitive advantages should strategically leverage the benefits offered by financial development and legal systems to overcome the challenges posed by credit constraints and risks from information disclosure. This may enable their active participation in international trade. In other words, the government must consider the construction of financial markets and the legal environment to comprehensively increase firms' export probability when formulating information disclosure policies.

Figures



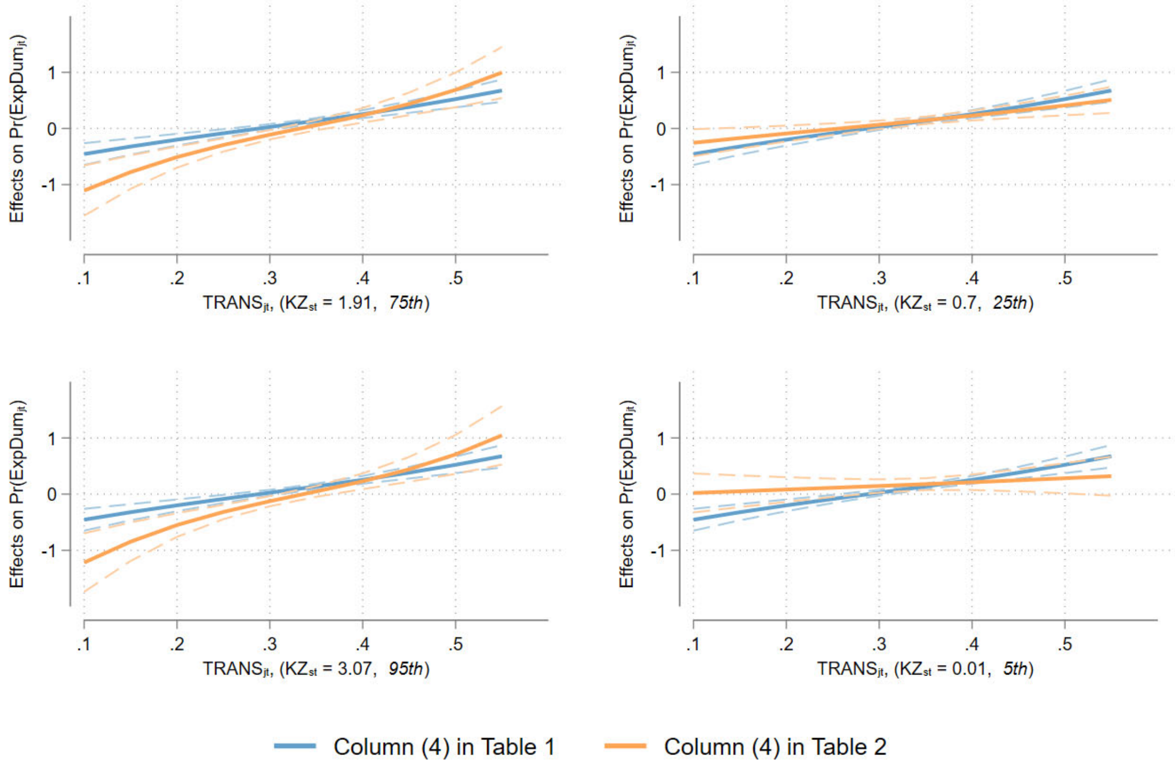
Note: This figure illustrates the marginal effect of increased corporate transparency on the export probability under varying levels of corporate transparency. It is a bin-scatter plot from OLS estimation. The x-axis represents firms' transparency level ($TRANS_{jt}$), and the y-axis indicates the export probability ($ExpDum_{jt}$). The sample data are divided into 100 bins, with the average value in each bin represented by a dot in the plot. The curve in the graph is a quadratic fit line.

FIGURE 1. THE MARGINAL IMPACT OF CORPORATE TRANSPARENCY ON EXPORT PROBABILITY - A BINSCATTER ANALYSIS WITH QUADRATIC FIT



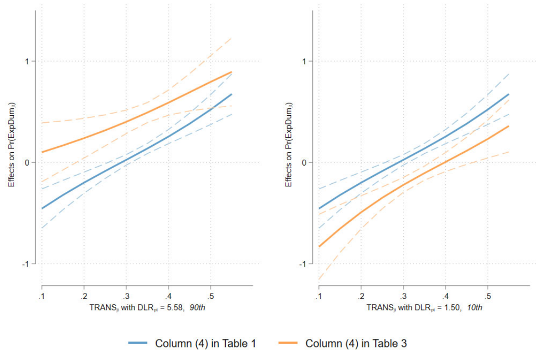
Note: Based on Table 1, this figure illustrates the marginal impact of corporate transparency ($TRANS_{j,t}$) on export probability ($Pr(ExpDum_{j,t})$) at different values. The curves in the figure represent the estimated values, and the shaded areas indicate the 95% confidence intervals. The Y-axis represents the export probability ($Pr(ExpDum_{j,t})$), while the X-axis shows the values of corporate transparency ($TRANS_{j,t}$), along with the corresponding econometric estimation methods, that is, OLS, Logit, and Probit.

FIGURE 2. AVERAGE MARGINAL EFFECTS OF TRANS WITH 95% CIS BASED ON TABLE 1

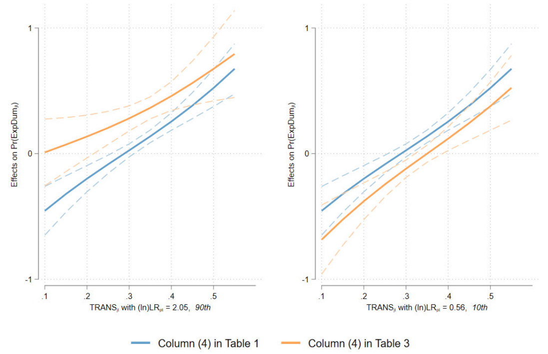


Note: This figure depicts the marginal effects of corporate transparency on the export probability under different financing constraints. The top-left graph has a *KZ* index of 1.91, which corresponds to the 75*th* percentile; the top-right graph's *KZ* index is 0.7, corresponding to the 25*th* percentile; the bottom-left is at the 95*th* percentile with a *KZ* index of 3.07; and the bottom-right is at the 5*th* percentile (as shown in Table C.2). A higher KZ index indicates that a company is facing greater financing constraints.

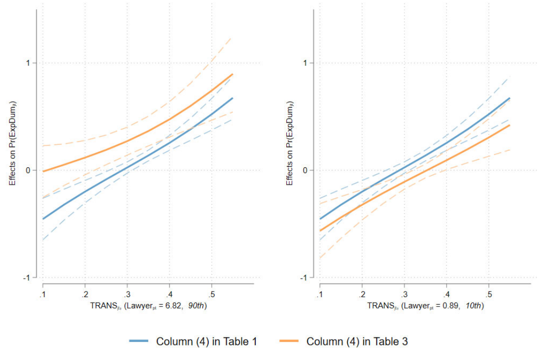
FIGURE 3. AVERAGE MARGINAL EFFECTS OF TRANS UNDER VARYING CORPORATE TRANSPARENCY AND FINANCING CONSTRAINTS, WITH 95% CIS BASED ON TABLE 1 AND TABLE 2



(a) M_{pt}: THE DEPTH OF FINANCIAL INTERMEDIATION, DLR_{pt}



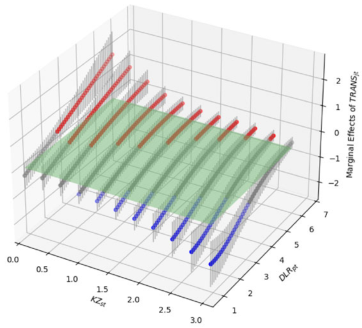
(b) M_{pt}: THE DEPTH OF FINANCIAL INTERMEDIATION, LR_{pt}



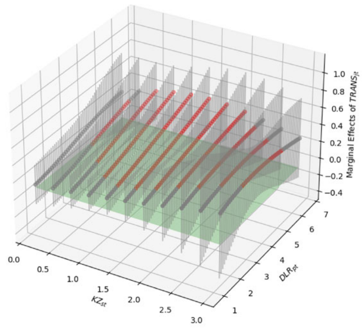
(c) M_{pt}: THE NUMBER OF LAWYERS, $Lawyers_{pt}$

Note: This figure displays the marginal effects of corporate transparency on the export probability with different financial deepening and legal environments. Figure 4a, Figure 4b and Figure 4c are plotted with DLR_{pt}, LR_{pt} and $Lawyers_{pt}$, respectively, at its 90th and 10th percentiles. The blue lines are the marginal effect according to Column 1 in Table 1, while the yellow lines are correspondingly based on Table 3.

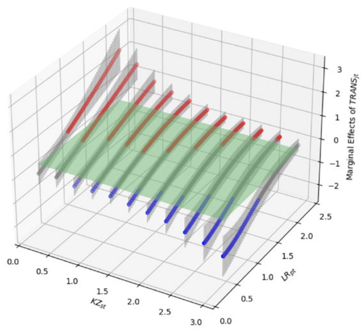
FIGURE 4. AVERAGE MARGINAL EFFECTS OF $TRANS_{jt}$ UNDER VARYING SCENARIOS, WITH 95% CIS



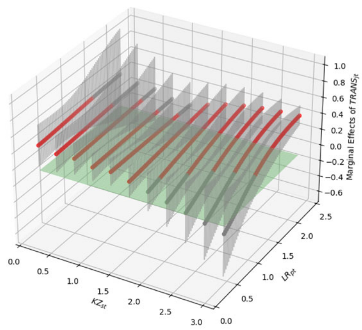
(a) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} < 0.28$



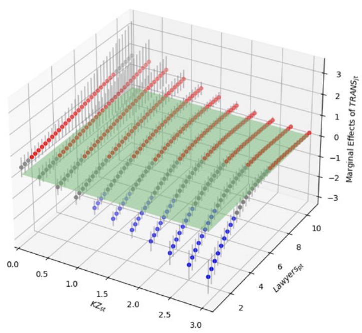
(b) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} > 0.28$



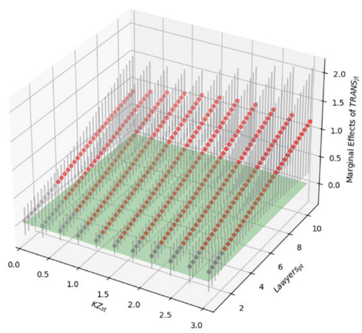
(c) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} < 0.28$



(d) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} > 0.28$



(e) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} < 0.28$



(f) SUB-SAMPLE: FIRMS WITH $TRANS_{jt} > 0.28$

Note: This figure displays the marginal effects of corporate transparency on the export probability with different credit constraints (x-axis, KZ_{st}) and financial deepening or legal environment (y-axis, M_{pt}) by 3D plots. The green plane in the figure represents $z = 0$, indicating a marginal effect of zero. Red points signify a significantly positive marginal effect, while blue points denote a significantly negative one. Gray points indicate a non-significant marginal effect. The gray lines represent the 95% confidence interval. The sample is divided into two groups for regression analysis based on $TRANS_{jt} = 0.28$, and the regression equation used is

$$Pr(ExpDum_{jt} = 1) = \Phi\Big(\alpha + \delta_1 TRANS_{jt} + \delta_1 M_{pt} + \delta_3 KZ_{pt} + \beta_1 TRANS_{jt} \times M_{pt} + \beta_2 TRANS_{jt} \times KZ_{st} + \beta_3 M_{pt} \times KZ_{st} + \gamma_1 TRANS_{jt} \times M_{pt} \times KZ_{pt} + \lambda_t + \lambda_s + \lambda_p + \eta_{spjt}\Big) \quad (14)$$

which is estimated by the Logit method. The marginal effects in Figures 5a, 5c and 5e are with $TRANS_{jt} = 0.104$, $5th$ percentile, while Figures 5b, 5d and 5f show the marginal effects with $TRANS_{jt} = 0.575$, $95th$ percentile.

FIGURE 5. 3D SCATTER PLOT WITH 95% CIS AND $z = 0$ PLANE

Tables

TABLE 1. THE INFLUENCE OF CORPORATE TRANSPARENCY ON EXTENSIVE MARGIN IN TRADE

	OLS		Logit			Probit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Marginal Effect	Marginal Effect			Marginal Effect			Marginal Effect
$TRANS\_jt$	0.100***	-0.671***	0.584***	-4.148***	-0.676***	0.306***	-2.567***	-0.711***
	(0.027)	(0.127)	(0.163)	(0.774)	(0.126)	(0.095)	(0.452)	(0.125)
$TRANS\_jt \times TRANS\_jt$		1.180***		7.192***	1.424***		4.380***	1.468***
		(0.191)		(1.150)	(0.245)		(0.672)	(0.236)
$(ln)Size\_jt$	0.555***	0.401**	3.341***	2.438**	0.397**	1.955***	1.409**	0.390**
	(0.156)	(0.158)	(1.006)	(1.026)	(0.167)	(0.586)	(0.596)	(0.165)
$(ln)Age\_jt$	-0.162**	-0.163**	-1.086***	-1.102***	-0.180***	-0.672***	-0.692***	-0.192***
	(0.068)	(0.067)	(0.377)	(0.378)	(0.062)	(0.224)	(0.225)	(0.062)
ROA_jt	0.208**	0.058	1.306**	0.381	0.062	0.834**	0.264	0.073
	(0.095)	(0.097)	(0.585)	(0.606)	(0.099)	(0.347)	(0.358)	(0.099)
$Top1\_jt$	-0.029	-0.030	-0.146	-0.145	-0.024	-0.082	-0.085	-0.023
	(0.027)	(0.027)	(0.168)	(0.169)	(0.028)	(0.098)	(0.098)	(0.027)
$Growth\_jt$	0.035**	0.031**	0.248***	0.223**	0.036**	0.139**	0.122**	0.034**
	(0.014)	(0.014)	(0.093)	(0.094)	(0.015)	(0.055)	(0.055)	(0.015)
$TobinQ\_jt$	-0.018***	-0.021***	-0.128***	-0.149***	-0.024***	-0.076***	-0.088***	-0.024***
	(0.006)	(0.006)	(0.037)	(0.037)	(0.006)	(0.022)	(0.022)	(0.006)
$Mfee\_jt$	0.032	0.022	-0.282	-0.305	-0.050	-0.122	-0.142	-0.039
	(0.089)	(0.089)	(0.599)	(0.600)	(0.098)	(0.348)	(0.348)	(0.096)
HHI_jt	0.013	0.011	0.098	0.093	0.015	0.030	0.024	0.007
	(0.016)	(0.016)	(0.101)	(0.102)	(0.017)	(0.059)	(0.059)	(0.016)
TFP_jt	0.024***	0.023***	0.156***	0.148***	0.024***	0.093***	0.088***	0.024***
	(0.008)	(0.008)	(0.049)	(0.050)	(0.008)	(0.029)	(0.029)	(0.008)
$(ln)GDP\_jt$	0.035***	0.034***	0.216***	0.207***	0.034***	0.126***	0.120***	0.033***
	(0.012)	(0.012)	(0.066)	(0.067)	(0.011)	(0.039)	(0.039)	(0.011)
$Manu\_jt$	0.001	0.001	0.001	0.002	0.000	0.001	0.001	0.000
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.002)	(0.002)	(0.001)
$REER\_jt$	-0.002	-0.026***	-0.152***	-0.153***	-0.025***	-0.088***	-0.088***	-0.024***
	(0.002)	(0.004)	(0.021)	(0.022)	(0.003)	(0.013)	(0.013)	(0.003)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13	0.13						
Pseudo R2			0.14	0.14	0.14	0.14	0.14	0.14
Wald Chi2			1407.93	1454.96	1454.96	1523.45	1577.03	1577.03
Obs.	12,689	12,689	12,689	12,689	12,689	12,689	12,689	12,689

Note: This table examines the effect of corporate transparency on a firm's exporting probability using OLS (Columns 1 and 2), Logit (Columns 3, 4, and 5) and Probit (Columns 6, 7, and 8) methods. The dependent variable is $ExpDum_{jt}$. Columns 3, 4, 6, and 7 show the results of estimated coefficients, while Columns 1, 2, 5, and 8 are marginal effects of each variable. The marginal effects of interaction term $TRANS_{j,t} \times TRANS_{j,t}$ in nonlinear regressions, as in Columns 5 and 8, are estimated following Norton et al. (2004). All regressions control for a set of variables, including $(ln)Size_{jt}$, $(ln)Age_{jt}$, ROA_{jt}, $Top1_{jt}$, $Growth_{jt}$, $TobinQ_{jt}$, $Mfee_{jt}$, HHI_{jt}, TFP, $(ln)GDP_{pt}$, $Manu_{pt}$, $REER_t$, as well as year (t), city (p), and sector (s) fixed effects. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 2. THE INFLUENCE OF CREDIT CONSTRAINT ON THE RELATIONSHIP BETWEEN TRANSPARENCY AND EXTENSIVE MARGIN IN TRADE

	OLS		Logit		Probit	
	(1) Marginal Effect	(2) Marginal Effect	(3)	(4)	(5)	(6)
$TRANS\_jt \times KZ\_st$	-0.084***	-0.329**	-0.497**	-3.208***	-0.317***	-1.785***
	(0.030)	(0.136)	(0.205)	(0.929)	(0.117)	(0.536)
$TRANS\_jt \times TRANS\_jt \times KZ\_st$		0.416**		4.333***		2.373***
		(0.206)		(1.372)		(0.792)
$TRANS\_jt \times TRANS\_jt$		0.601*		1.703		1.306
		(0.345)		(2.075)		(1.218)
$TRANS\_jt$	0.182***	-0.237	1.036***	-0.195	0.612***	-0.321
	(0.050)	(0.236)	(0.307)	(1.439)	(0.179)	(0.845)
KZ_st	-0.011	0.016	-0.078	0.240*	-0.035	0.134*
	(0.011)	(0.021)	(0.074)	(0.138)	(0.042)	(0.080)
$(ln)Size\_jt$	0.501***	0.349**	3.056***	2.151**	1.777***	1.230**
	(0.156)	(0.158)	(1.010)	(1.030)	(0.588)	(0.598)
$(ln)Age\_jt$	-0.159**	-0.156**	-1.067***	-1.058***	-0.665***	-0.672***
	(0.067)	(0.067)	(0.377)	(0.378)	(0.224)	(0.225)
ROA_jt	0.140	0.002	0.951	0.057	0.598*	0.061
	(0.096)	(0.098)	(0.589)	(0.610)	(0.350)	(0.361)
$Top1\_jt$	-0.030	-0.030	-0.159	-0.154	-0.089	-0.090
	(0.027)	(0.027)	(0.168)	(0.169)	(0.098)	(0.099)
$Growth\_jt$	0.036**	0.031**	0.257***	0.224**	0.144***	0.122**
	(0.014)	(0.014)	(0.093)	(0.094)	(0.055)	(0.055)
$TobinQ\_jt$	-0.018***	-0.021***	-0.129***	-0.149***	-0.076***	-0.088***
	(0.006)	(0.006)	(0.037)	(0.037)	(0.022)	(0.022)
$Mfee\_jt$	0.017	0.003	-0.358	-0.438	-0.173	-0.224
	(0.089)	(0.088)	(0.600)	(0.602)	(0.348)	(0.349)
HHI_jt	0.012	0.010	0.094	0.085	0.027	0.018
	(0.016)	(0.016)	(0.101)	(0.102)	(0.059)	(0.059)
TFP_jt	0.025***	0.023***	0.157***	0.148***	0.094***	0.089***
	(0.008)	(0.008)	(0.050)	(0.050)	(0.029)	(0.029)
$(ln)GDP\_jt$	0.039***	0.038***	0.234***	0.231***	0.135***	0.131***
	(0.012)	(0.012)	(0.067)	(0.068)	(0.040)	(0.040)
$Manu\_jt$	0.000	0.000	0.001	0.000	0.001	0.001
	(0.001)	(0.001)	(0.004)	(0.004)	(0.002)	(0.002)
$REER\_jt$	-0.023***	-0.023***	-0.132***	-0.133***	-0.076***	-0.076***
	(0.004)	(0.004)	(0.022)	(0.022)	(0.013)	(0.013)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13	0.14				
Pseudo R2			0.14	0.14	0.14	0.14
Wald Chi2			1441.50	1482.84	1559.99	1598.90
Joint F-test, p-value		0.017		0.001		0.002
Obs.	12,689	12,689	12,689	12,689	12,689	12,689

Note: This table examines the effect of corporate transparency on a firm's exporting probability conditional on credit constraints using OLS (Columns 1 and 2), Logit (Columns 3 and 4), and Probit (Columns 5 and 6) methods. The dependent variable is $ExpDum_{jt}$. Columns 3, 4, 5, and 6 show the results of estimated coefficients, while Columns 1 and 2 are marginal effects of each variable by LPM. The joint F-test examines whether the coefficients of $TRANS_{jt} \times KZ_{st}$ and $TRANS_{jt} \times TRANS_{jt} \times KZ_{st}$ are jointly equal to zero. All regressions control for a set of variables, including $(ln)Size_{jt}$, $(ln)Age_{jt}$, ROA_{jt}, $Top1_{jt}$, $Growth_{jt}$, $TobinQ_{jt}$, $Mfee_{jt}$, HHI_{jt}, TFP, $(ln)GDP_{pt}$, $Manu_{pt}$, $REER_t$, as well as year (t), city (p), and sector (s) fixed effects. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 3. THE INFLUENCE OF FINANCIAL DEEPENING AND LEGAL ENVIRONMENT ON EXTENSIVE MARGIN IN TRADE

(a) M_{pt}: THE SCALE OF FINANCIAL INTERMEDIATION, DLR_{pt}

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
$TRANS\_jt \times DLR\_pt$	0.150***	0.255***	0.970***	1.497***	0.567***	0.900***
	(0.017)	(0.083)	(0.104)	(0.515)	(0.060)	(0.298)
$TRANS\_jt \times TRANS\_jt \times DLR\_pt$		-0.165		-0.863		-0.540
		(0.122)		(0.735)		(0.427)
$TRANS\_jt$	-0.416***	-1.475***	-2.634***	-8.543***	-1.601***	-5.271***
	(0.066)	(0.319)	(0.378)	(1.840)	(0.221)	(1.085)
$TRANS\_jt \times TRANS\_jt$		1.643***		9.210***		5.719***
		(0.474)		(2.691)		(1.586)
DLR_pt	-0.035***	-0.047***	-0.232***	-0.283***	-0.132***	-0.164***
	(0.008)	(0.014)	(0.051)	(0.086)	(0.029)	(0.050)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.14	0.14				
Pseudo R2			0.15	0.15	0.15	0.15
Wald chi2			1479.88	1522.44	1590.33	1642.69
Obs.	12,689	12,689	12,689	12,689	12,689	12,689

(b) M_{pt}: THE DEPTH OF FINANCIAL INTERMEDIATION, LR_{pt}

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
$TRANS\_jt \times LR\_pt$	0.295***	0.623***	1.932***	3.151**	1.124***	1.958**
	(0.046)	(0.221)	(0.271)	(1.337)	(0.158)	(0.780)
$TRANS\_jt \times TRANS\_jt \times LR\_pt$		-0.516		-2.031		-1.364
		(0.328)		(1.932)		(1.131)
$TRANS\_jt$	-0.300***	-1.460***	-1.934***	-7.793***	-1.175***	-4.880***
	(0.070)	(0.337)	(0.389)	(1.892)	(0.230)	(1.123)
$TRANS\_jt \times TRANS\_jt$		1.800***		9.153***		5.782***
		(0.503)		(2.785)		(1.655)
LR_pt	-0.131***	-0.169***	-0.823***	-0.940***	-0.466***	-0.549***
	(0.020)	(0.035)	(0.122)	(0.215)	(0.070)	(0.125)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13	0.14				
Pseudo R2			0.14	0.15	0.14	0.14
Wald Chi2			1445.68	1490.89	1553.51	1605.80
Obs.	12,689	12,689	12,689	12,689	12,689	12,689

(c) M_{pt}: THE NUMBER OF LAWYERS, $Lawyers_{pt}$

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
$TRANS\_jt \times lawyers\_pt$	0.073***	0.059	0.511***	0.508*	0.296***	0.313*
	(0.009)	(0.043)	(0.061)	(0.304)	(0.034)	(0.172)
$TRANS\_jt \times TRANS\_jt \times Lawyers\_pt$		0.014		-0.057		-0.059
		(0.063)		(0.417)		(0.236)
$TRANS\_jt$	-0.108***	-0.741***	-0.785***	-4.738***	-0.502***	-2.929***
	(0.037)	(0.180)	(0.225)	(1.098)	(0.130)	(0.640)
$TRANS\_jt \times TRANS\_jt$		0.991***		6.171***		3.791***
		(0.268)		(1.605)		(0.937)
$Lawyers\_pt$	-0.033**	-0.030**	-0.269***	-0.258***	-0.156***	-0.153***
	(0.013)	(0.014)	(0.083)	(0.094)	(0.048)	(0.054)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.14	0.14				
Pseudo R2			0.14	0.15	0.14	0.15
Wald Chi2			1475.67	1502.99	1602.03	1633.99
Obs.	12,689	12,689	12,689	12,689	12,689	12,689

Note: This table investigates the effect of corporate transparency on a firm's export possibility with various levels of financial deepening and legal environment, using OLS (Columns 1 and 2), Logit (Columns 3 and 4), and Probit (Columns 5 and 6) methods. The dependent variable is $ExpDum_{jt}$. Table 3a and Table 3b present the results of financial deepening measured by DLR_{pt} and LR_{pt}, respectively, while Table 3c shows the estimated outcomes for the legal environment assessed using lawyers $Lawyers_{pt}$. All regressions control for a set of variables, including $(ln)Size_{jt}$, $(ln)Age_{jt}$, ROA_{jt}, $Top1_{jt}$, $Growth_{jt}$, $TobinQ_{jt}$, $Mfee_{jt}$, HHI_{jt}, TFP, $(ln)GDP_{pt}$, $Manu_{pt}$, $REER_t$, as well as year (t), city (p), and sector (s) fixed effects. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 4. THE AVERAGE TREATMENT EFFECTS ON THE TREATED (ATTS), SUB-SAMPLE: $TRANS_{j,t=2008} < 0.28$, WITH COVARIATES

	Single Effect			Separate Effects		
	(1) DID-OLS	(2) DID-Logit	(3) DID-Probit	(4) DID-OLS	(5) DID-Logit	(6) Probit
τ	-0.108***	-0.110***	-0.110***			
	(0.039)	(0.038)	(0.038)			
$\tau_{year=2009}$				-0.199***	-0.174***	-0.177***
				(0.058)	(0.048)	(0.047)
$\tau_{year=2010}$				-0.175***	-0.163***	-0.170***
				(0.058)	(0.048)	(0.049)
$\tau_{year=2011}$				-0.098*	-0.118**	-0.124**
				(0.058)	(0.050)	(0.049)
$\tau_{year=2012}$				-0.052	-0.041	-0.033
				(0.079)	(0.076)	(0.072)
$\tau_{year=2013}$				-0.042	-0.049	-0.048
				(0.075)	(0.061)	(0.062)
$\tau_{year=2014}$				-0.057	-0.052	-0.055
				(0.084)	(0.056)	(0.057)
Adj R2	0.14			0.17		
Pseudo R2		0.16	0.16		0.17	0.17
Wald Chi2		384.44	424.67		431.82	481.21
Obs.	2,724	2,724	2,724	2,724	2,724	2,724
Event Study p-value (2 df)	*0.89*	*0.93*	*0.86*	*0.96*	*0.98*	*0.99*
Heterogenous Trend Test (1 df)	*0.63*	*0.88*	*0.65*	*0.78*	*0.79*	*0.74*

Note: The table reports the impact of the CSR disclosure policy on the export probability of firms with less information disclosure. Columns 1 to 3 estimate the constant ATT of the policy, while Columns 4 to 6 estimate the ATT of the policy over time following Wooldridge (2023). Control variables include $(ln)Size$, $Top1$, $Growth$, $Mfee$, HHI, TFP, as well as industry and province fixed effects. The last two rows of the table, “event study p-value" and “heterogeneous linear trend test," are used to test the parallel trends (PT) assumption. A larger p-value indicates the inability to reject the null hypothesis that the estimated coefficients are zero. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 5. THE AVERAGE TREATMENT EFFECTS ON THE TREATED (ATTS), SUB-SAMPLE: $TRANS_{j,y=2008} > 0.28$, WITH COVARIATES

	Single Effect			Separate Effects		
	(1) DID-OLS	(2) DID-Logit	(3) DID-Probit	(4) DID-OLS	(5) DID-Logit	(6) Probit
τ	0.097***	0.103***	0.107***			
	(0.036)	(0.038)	(0.037)			
$\tau_{year=2009}$				0.104*	0.110*	0.105*
				(0.057)	(0.061)	(0.061)
$\tau_{year=2010}$				0.167***	0.178***	0.174***
				(0.059)	(0.062)	(0.062)
$\tau_{year=2011}$				0.110**	0.120**	0.120**
				(0.055)	(0.059)	(0.058)
$\tau_{year=2012}$				0.127**	0.123*	0.123**
				(0.058)	(0.063)	(0.061)
$\tau_{year=2013}$				0.085	0.086	0.088
				(0.059)	(0.068)	(0.066)
$\tau_{year=2014}$				0.031	0.037	0.032
				(0.064)	(0.065)	(0.064)
Adj R2	0.19			0.21		
Pseudo R2		0.19	0.19		0.19	0.19
Wald Chi2		506.84	578.53		504.94	587.19
Obs.	3,000	3,000	3,000	3,000	3,000	3,000
Event Study p-value (2 df)	*0.52*	*0.52*	*0.42*	*0.79*	*0.78*	*0.74*
Heterogenous Trend Test (1 df)	*0.27*	*0.24*	*0.23*	*0.75*	*0.67*	*0.65*

Note: The table reports the impact of the CSR disclosure policy on the export probability of firms with more information disclosure. Columns 1-3 estimate the constant average treatment effect on the treated (ATT) of the policy, while Columns 4 to 6 estimate the ATT of the policy over time following Wooldridge (2023). Control variables include $(ln)Size$, $Top1$, $Growth$, $Mfee$, HHI, TFP, as well as industry and province fixed effects. The last two rows of the table, "event study p-value" and "heterogeneous linear trend test," are used to test the parallel trends (PT) assumption. A larger p-value indicates the inability to reject the null hypothesis that the estimated coefficients are zero. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 6. Robustness Check: by Replacing Variables

(a) H1 and H2

	H1			H2					
	(1) OLS	(2) Logit	(3) Probit	(4) OLS	(5) Logit	(6) Probit	(7) OLS	(8) Logit	(9) Probit
KV_inv_jt	-0.326***	-1.983***	-1.235***	0.083***	-0.131	0.462***	-0.192	0.277***	-0.189
	(0.069)	(0.419)	(0.245)	(0.023)	(0.128)	(0.143)	(0.775)	(0.084)	(0.456)
KV_inv_jt × *KV_inv_jt*	0.229***	1.375***	0.843***		0.124*		0.374		0.268
	(0.042)	(0.252)	(0.147)		(0.076)		(0.452)		(0.266)
KZ_st				-0.008	0.025	-0.061	0.340*	-0.023	0.198*
				(0.012)	(0.028)	(0.082)	(0.191)	(0.047)	(0.111)
KV_inv_jt × *KZ_st*				-0.038***	-0.147**	-0.217**	-1.453***	-0.142***	-0.828***
				(0.014)	(0.074)	(0.095)	(0.503)	(0.055)	(0.292)
KV_inv_jt × *KV_inv_jt* × *KZ_st*					0.076*		0.788***		0.441**
					(0.045)		(0.300)		(0.174)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13			0.13	0.13				
Pseudo R2		0.14	0.14			0.14	0.14	0.14	0.14
Wald Chi2		1412.69	1534.87			1407.75	1442.32	1526.70	1559.99
Joint F-test, p-value					0.036		0.008		0.007
Obs.	12,481	12,481	12,481	12,481	12,481	12,481	12,481	12,481	12,481

(b) H3

	OLS		Logit		Probit	
	(1) M = DLR	(2) M = DLR	(3) M = DLR	(4) M = DLR	(5) M = DLR	(6) M = DLR
KV_inv_jt	-0.196***	-0.723***	-1.219***	-4.197***	-0.743***	-2.575***
	(0.031)	(0.174)	(0.176)	(0.993)	(0.103)	(0.587)
KV_inv_jt × *KV_inv_jt*		0.328***		1.851***		1.140***
		(0.104)		(0.587)		(0.347)
DLR_pt	-0.043***	-0.062***	-0.280***	-0.378***	-0.161***	-0.219***
	(0.009)	(0.018)	(0.054)	(0.113)	(0.031)	(0.066)
KV_inv_jt × *DLR_pt*	0.070***	0.129***	0.450***	0.774***	0.264***	0.459***
	(0.008)	(0.045)	(0.048)	(0.278)	(0.028)	(0.162)
KV_inv_jt × *KV_inv_jt* × *DLR_pt*		-0.037		-0.206		-0.124
		(0.027)		(0.161)		(0.094)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.14	0.14				
Pseudo R2			0.14	0.15	0.14	0.15
Wald chi2			1446.64	1480.69	1559.68	1602.35
Obs.	12,481	12,481	12,481	12,481	12,481	12,481

Note: The two tables demonstrate the results of robustness checks using alternative, independent variables (KV_inv_{jt}) to measure corporate transparency. The dependent variable is $ExpDum_{jt}$. All regressions control for a set of variables, including $(ln)Size_{jt}$, $(ln)Age_{jt}$, ROA_{jt}, $Top1_{jt}$, $Growth_{jt}$, $TobinQ_{jt}$, $Mfee_{jt}$, HHI_{jt}, TFP, $(ln)GDP_{pt}$, $Manu_{pt}$, $REER_t$, as well as year (t), city (p), and sector (s) fixed effects. Errors are clustered at the firm level. Standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A Calculation of Cut-off Productivity

Given the distribution of $\phi_j^B = \phi_j^{'} - \xi_j, \xi_j \sim U[0, \varepsilon_j]$, and $F(\phi) = a\phi + b$, Equation (1.4) can be expressed as:

$$a\phi_j^{'} - \frac{a}{2}\varepsilon_j + b \geq \frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei} \tag{15}$$

Since Equation (1.3) and Equation (1.4) are binding for the cut-off productivity, we plug $B_{nis}(\phi_j^{'}) = 0$ in to $A_{nis}(\phi_j^{'}) = 0$. $\ln \phi_j^{'}$ is a random variable firm drawing from a normal distribution $N(\ln \phi_j, \varepsilon_j^2)$, we further take expectation and replace expressions of optimal price and quantity with Equation (1.1) and Equation (1.2):

$$\frac{\theta_s Y_n}{P_{ns}^{1-\sigma}\sigma}\left(\frac{\sigma}{\sigma-1} c_{is}\tau_{ni}\right)^{1-\sigma} \mathbb{E}\left(\frac{1}{\phi_j^{'}}\right)^{1-\sigma} = (1-d_s)\, c_{is} f_{ni} + \frac{a}{2}\varepsilon_j^2 + \frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei} \tag{16}$$

We have $\ln \phi_j^{'} \sim N(\ln \phi_j, \varepsilon_j^2)$, and hence, $exp\left((\sigma-1)\ln \phi_j^{'}\right) \sim LogN\left((\sigma-1)\ln \phi_j, (\sigma-1)^2 \varepsilon_j^2\right)$. The cut-off productivity can be written as:

$$\begin{aligned} &\frac{\theta_s Y_n}{P_{ns}^{1-\sigma}\sigma}\left(\frac{\sigma}{\sigma-1} c_{is}\tau_{ni}\right)^{1-\sigma} \left(\phi_j^*\right)^{\sigma-1} \\ &= \exp\left(-\frac{(1-\sigma)^2\varepsilon_j^2}{2}\right) \times \left[(1-d_s)\, c_{is} f_{ni} + \frac{a}{2}\varepsilon_j + \left(\frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}\right)\right] \end{aligned} \tag{17}$$

B Proof of Proposition 1

Given Equation (3), let $LHS = \frac{\theta_s Y_n}{P_{ns}^{1-\sigma}\sigma}\left(\frac{\sigma}{\sigma-1} c_{is}\tau_{ni}\right)^{1-\sigma}\left(\phi_j^*\right)^{\sigma-1}$. Taking the first derivative, we get $\frac{\partial LHS}{\partial \phi^*} = \frac{\theta_s Y_n}{P_{ns}^{1-\sigma}\sigma}\left(\frac{\sigma}{\sigma-1} c_{is}\tau_{ni}\right)^{1-\sigma}(\sigma-1)\left(\phi^*\right)^{\sigma-2}$ with $\sigma > 1$, and hence $\frac{\partial LHS}{\partial \phi^*} > 0$. Also, let $RHS = \exp\left(-\frac{(1-\sigma)^2\varepsilon_j^2}{2}\right) \times \left[(1-d_s)\, c_{is} f_{ni} + \frac{a}{2}\varepsilon_j + \left(\frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}\right)\right]$. We take the first derivative respect to ε_j, and

$$\begin{aligned} \frac{\partial RHS}{\partial \varepsilon_j} = &-\exp\left(\frac{-(\sigma-1)^2\varepsilon_j^2}{2}\right)(\sigma-1)^2\varepsilon_j \left[(1-d_s) c_{is} f_{ni} + \frac{a}{2}\varepsilon_j + \left(\frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}\right)\right] \\ &+ \frac{a}{2} \times \exp\left(\frac{-(\sigma-1)^2\varepsilon_j^2}{2}\right) \end{aligned} \tag{18}$$

where $\exp\left(\frac{-(\sigma-1)^2\varepsilon_j^2}{2}\right)$ is always positive, then, the above equation can be re-organized as:

$$\begin{aligned} &\exp\left(\frac{(\sigma-1)^2\varepsilon_j^2}{2}\right)\frac{\partial RHS}{\partial \varepsilon_j} = \\ &\frac{-a(\sigma-1)^2}{2}\varepsilon_j^2 - (\sigma-1)^2\left[(1-d_s) c_{is} f_{ni} + \left(\frac{1}{\lambda_{ip}} d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}\right)\right]\varepsilon_j + \frac{a}{2} \end{aligned} \tag{19}$$

With $a > 0$, the right side of Equation (19) (which we denote as $h(\varepsilon_j)$) is a parabola that opens downward and has one positive and one negative solution. We can calculate $h(0)$ and $h(1)$, with the assumption that the loan should exceed collateral $d_s c_{is} f_{ni} > t_s c_{is} f_{ei}$:

$$h(0) = \frac{a}{2} > 0 \tag{20.1}$$

$$h(1) = \frac{-a(\sigma-1)^2}{2} - (\sigma-1)^2\left[(1-d_s)c_{is}f_{ni} + \left(\frac{1}{\lambda_{ip}}d_s c_{is} f_{ni} - \frac{1-\lambda_{ip}}{\lambda_{ip}} t_s c_{is} f_{ei}\right)\right] + \frac{a}{2} < 0 \tag{20.2}$$

thus, the positive solution, $h(\bar{\varepsilon}_j) = 0$, is between 0 and 1. If $\varepsilon_j \in (0, \bar{\varepsilon}_j)$, $\frac{\partial RHS}{\partial \varepsilon_j} > 0$; if $\varepsilon_j \in (\bar{\varepsilon}_j, 1)$, $\frac{\partial RHS}{\partial \varepsilon_j} < 0$. This has proved Equation (5). Together with $\frac{\partial LHS}{\partial \phi^*} > 0$, we have:

$$\begin{cases} \frac{\partial \phi^*}{\partial \varepsilon_j} > 0 & \varepsilon_j \in (0, \bar{\varepsilon}_j) \\ \frac{\partial \phi^*}{\partial \varepsilon_j} < 0 & \varepsilon_j \in (\bar{\varepsilon}_j, 1) \end{cases} \tag{21}$$

C Variable Explanation

TABLE C.1. VARIABLE DEFINITION

Variables	Description	Source
Dependent Variables		
$ExpDum_{jt}$	$ExpDum_{jt} = 1$ if firm j exports in year t otherwise, $ExpDum_{jt} = 0$	Chinese Custom Database
Key Variables		
$TRANS_{jt}$	Corporate transparency following Lang et al. (2012)	CSMAR and calculated by authors
KZ_{st}	Sector-average credit constraints	CSMAR
DLR_{pt}	The ratio of loans and deposits in financial system to GDP	Statistics year books
LR_{pt}	The ratio of loans in financial system to GDP	Statistics year books
$Lawyers_{pt}$	The number of lawyers per ten thousand people in each province	China Lawyers Yearbook
Control Variables		
$(ln)Size_{jt}$	(Log) Asset size	CSMAR
$(ln)Age_{jt}$	(Log) Firm age	CSMAR
ROA_{jt}	Return on Assets	CSMAR
$Top1_{jt}$	The proportion of largest shareholder	CSMAR
$Growth_{jt}$	The growth rate of operating income	CSMAR
$TobinQ_{jt}$	Tobin's Q value	CSMAR
$Mfee_{jt}$	The ratio of management expense	CSMAR
TFP_{jt}	Firm's productivity, OP method following Olley and Pakes (1996)	CSMAR
HHI_{jt}	Herfindahl-Hirschman Index	CSMAR
$(ln)GDP_{pt}$	(Log) GDP per capita of city p	Statistics year books
$Manu_{pt}$	Secondary industry proportion of city p	Statistics year books
$REER_{t}$	Real effective exchange rate index (2010 = 100)	The world bank

Note: We apply a logarithmic transformation to some of the variables to mitigate differences in scale and skewness among the data. We also perform a 5% and 95% Winsorization on all data to minimize the impact of extreme values on the model. This approach reduces the influence of extreme values on the model, enhancing the stability of the estimated results.

TABLE C.2. DESCRIPTIVE STATISTICS

Variable	N	Mean	SD	Min	*p*25	*p*50	*p*75	Max
ExpDum	12,689	0.258	0.438	0	0	0	1	1
= 0	9,412	74.174 (%)						
= 1	3,277	25.826 (%)						
TRANS	12,689	0.331	0.152	0.104	0.200	0.332	0.450	0.575
KZ	12,689	1.360	0.838	0.009	0.701	1.335	1.906	3.070
DLR	12,689	3.364	1.506	1.306	2.177	3.162	4.383	6.255
LR	12,689	1.361	0.612	0.458	0.837	1.365	1.838	2.211
Lawyers	12,689	2.694	2.681	0.776	1.175	1.713	2.386	10.970
(ln)Size	12,689	3.167	0.040	3.111	3.132	3.164	3.198	3.236
(ln)Age	12,689	1.534	0.067	1.406	1.481	1.549	1.587	1.618
ROA	12,689	0.043	0.043	-0.045	0.014	0.038	0.069	0.133
Top1	12,689	0.362	0.146	0.143	0.239	0.342	0.480	0.638
Growth	12,689	0.166	0.263	-0.266	-0.004	0.134	0.299	0.805
TobinQ	12,689	1.812	0.821	1.004	1.197	1.527	2.145	4.014
Mfee	12,689	0.088	0.058	0.019	0.045	0.075	0.115	0.238
HHI	12,689	0.788	0.237	0.340	0.558	0.909	1.000	1.000
TFP	12,689	7.887	0.931	6.403	7.179	7.777	8.513	9.773
(ln)GDP	12,689	10.951	0.556	9.989	10.534	11.044	11.396	11.722
Manu	12,689	46.389	9.794	23.138	41.770	47.350	53.060	61.800
REER	12,689	104.417	10.369	85.848	100.000	102.695	114.656	118.362

Note: This table lists the descriptive statistics of the variables, with the definitions of the variables as shown in Table C.1. The variables are winsorized at the 5% and 95% levels.

D Other Results

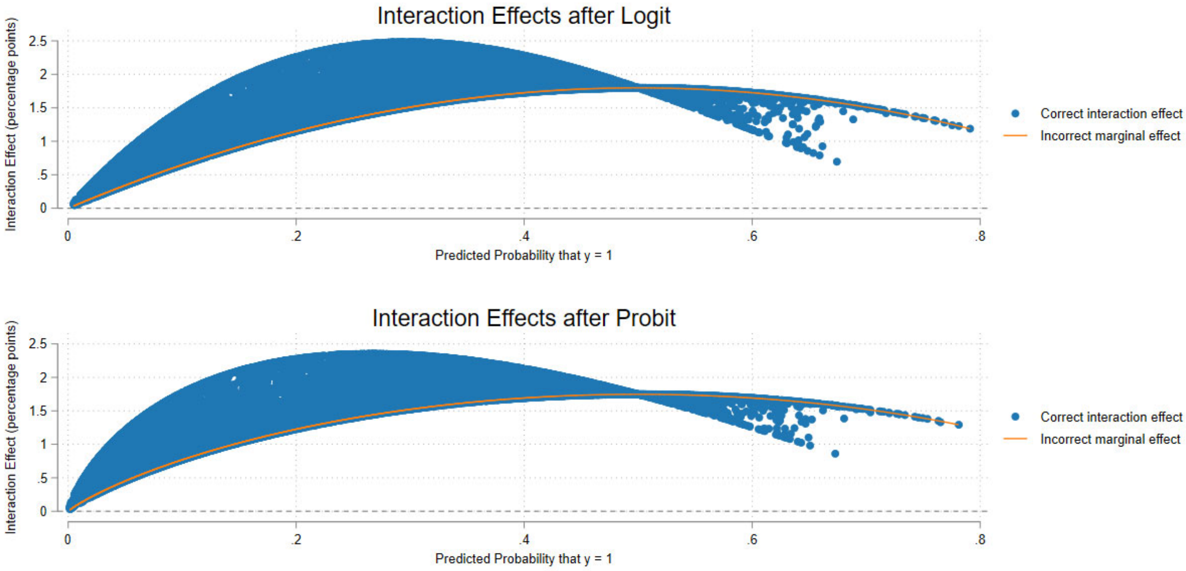


FIGURE D.1. ESTIMATED COEFFICIENT OF INTERACTION EFFECT FOLLOWING NORTON ET AL. (2004)

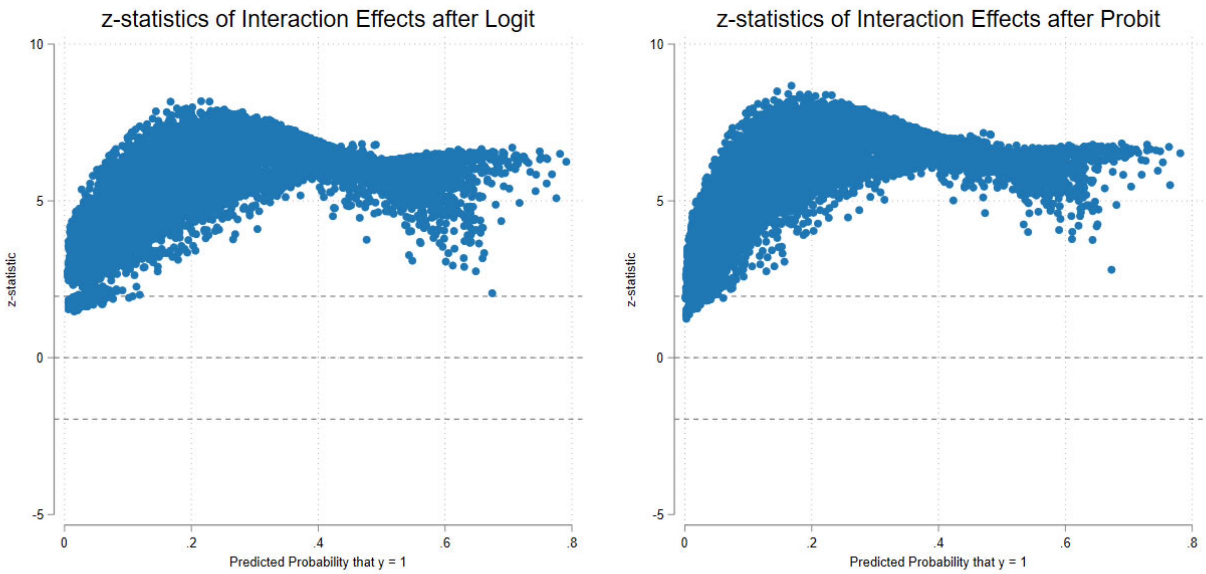


FIGURE D.2. Z-VALUE OF INTERACTION EFFECT FOLLOWING NORTON ET AL. (2004)

TABLE D.1. SUB-SAMPLE MARGINAL EFFECTS BASED ON EQUATION (6) (AS APPENDIX TO TABLE 1)

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$
$TRANS\_jt$	-0.277***	0.313***	-0.306***	0.300***	-0.328***	0.290***
	(0.101)	(0.060)	(0.104)	(0.059)	(0.102)	(0.058)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.11	0.16				
Pseudo R2			0.13	0.16	0.13	0.16
Wald Chi2			528.23	1032.31	602.84	1124.98
Obs.	5,108	7,581	5,108	7,581	5,108	7,581

TABLE D.2. SUB-SAMPLE MARGINAL EFFECTS BASED ON EQUATION (7) (AS APPENDIX TO TABLE 2)

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$
$TRANS\_jt$	0.294	0.401***	0.406**	0.323***	0.373*	0.336***
	(0.204)	(0.101)	(0.200)	(0.101)	(0.198)	(0.100)
KZ_st	0.040*	-0.004	0.061***	-0.024	0.057***	-0.014
	(0.021)	(0.028)	(0.022)	(0.032)	(0.022)	(0.031)
$TRANS\_jt \times KZ\_st$	-0.375***	-0.087	-0.510***	-0.035	-0.497***	-0.054
	(0.103)	(0.065)	(0.117)	(0.072)	(0.114)	(0.070)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.11	0.16				
Pseudo R2			0.13	0.17	0.13	0.17
Wald Chi2			545.78	1046.09	622.59	1136.70
Joint F-test, p-value	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	5,108	7,581	5,108	7,581	5,108	7,581

TABLE D.3. SUB-SAMPLE MARGINAL EFFECTS BASED ON EQUATION (8) (AS APPENDIX TO TABLE 3)

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$
$TRANS\_jt$	-1.032***	-0.093	-0.973***	-0.134	-1.022***	-0.150
	(0.252)	(0.142)	(0.240)	(0.132)	(0.238)	(0.131)
DLR_pt	-0.111***	0.014	-0.100***	0.011	-0.102***	0.011
	(0.016)	(0.017)	(0.016)	(0.017)	(0.015)	(0.017)
$TRANS\_jt \times DLR\_pt$	0.240***	0.118***	0.227***	0.129***	0.234***	0.131***
	(0.067)	(0.036)	(0.071)	(0.034)	(0.069)	(0.034)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.12	0.16				
Pseudo R2			0.14	0.17	0.14	0.17
Wald Chi2			589.21	1096.80	669.49	1211.01
Joint F-test, p-value	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	5,108	7,581	5,108	7,581	5,108	7,581

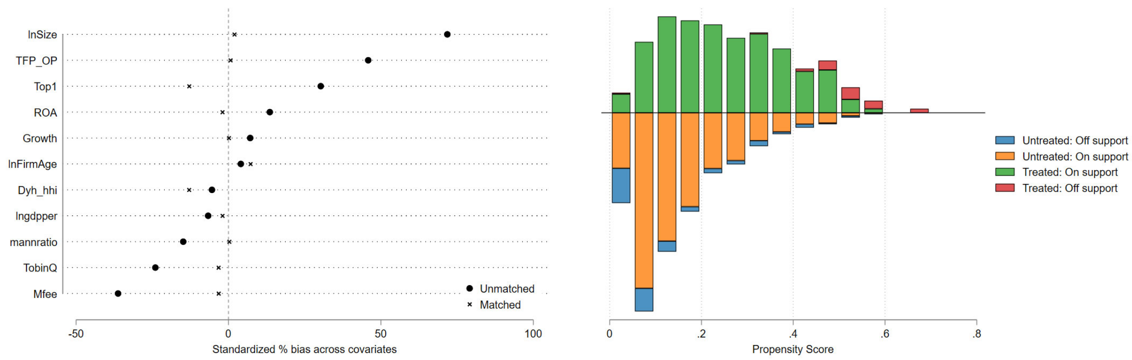
	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$
$TRANS\_jt$	-1.245***	-0.021	-1.156***	-0.111	-1.209***	-0.111
	(0.262)	(0.150)	(0.244)	(0.137)	(0.244)	(0.138)
LR_pt	-0.234***	-0.094**	-0.208***	-0.121***	-0.211***	-0.110**
	(0.038)	(0.044)	(0.037)	(0.044)	(0.036)	(0.043)
$TRANS\_jt \times LR\_pt$	0.752***	0.241**	0.702***	0.304***	0.720***	0.294***
	(0.176)	(0.097)	(0.178)	(0.092)	(0.174)	(0.091)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.12	0.16				
Pseudo R2			0.14	0.17	0.14	0.17
Wald Chi2			574.73	1038.08	651.71	1133.87
Joint F-test, p-value	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	5,108	7,581	5,108	7,581	5,108	7,581

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$	$TRANS\_jt < 0.28$	$TRANS\_jt > 0.28$
$TRANS\_jt$	-0.718***	0.027	-0.798***	0.002	-0.809***	-0.010
	(0.144)	(0.081)	(0.151)	(0.079)	(0.145)	(0.078)
$Lawyers\_pt$	-0.128***	0.005	-0.145***	-0.003	-0.139***	-0.003
	(0.023)	(0.017)	(0.025)	(0.019)	(0.023)	(0.018)
$TRANS\_jt \times Lawyers\_pt$	0.189***	0.091***	0.234***	0.096***	0.223***	0.095***
	(0.040)	(0.018)	(0.052)	(0.018)	(0.047)	(0.017)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.12	0.16				
Pseudo R2			0.14	0.17	0.14	0.17
Wald Chi2			565.31	1044.19	645.63	1138.97
Joint F-test, p-value	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	5,108	7,581	5,108	7,581	5,108	7,581

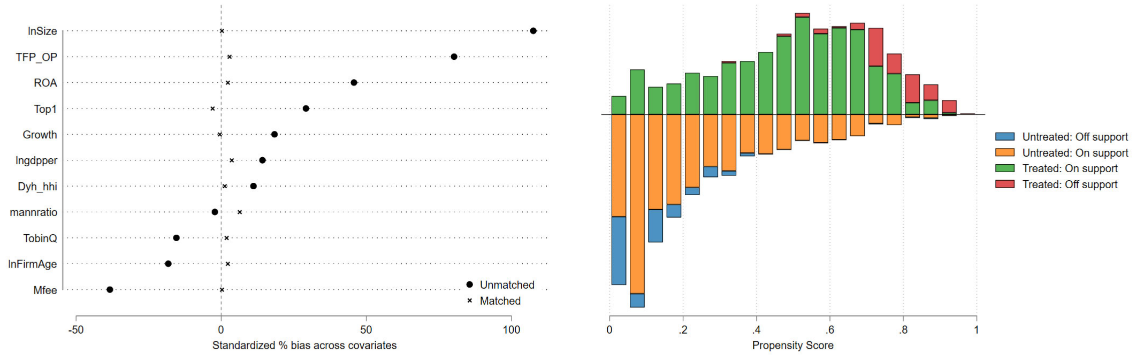
TABLE D.4. NONPARAMETRIC EQUALITY-OF-MEANS TEST BETWEEN 2008 AND 2009

Variables	Year = 2008		Year = 2009		Difference	p-Value
	Obs.	Mean	Obs.	Mean		
$(ln)GDP$	941	10.690	1,036	10.775	-0.085	0.000***
$Manu$	941	48.410	1,036	46.527	1.883	0.000***
$(ln)Size$	941	3.160	1,036	3.163	-0.003	0.068*
$(ln)Age$	941	1.519	1,036	1.528	-0.009	0.001***
ROA	941	0.035	1,036	0.043	-0.008	0.017**
$Top1$	941	0.364	1,036	0.362	0.002	0.778
$Growth$	941	0.198	1,036	0.226	-0.028	0.708
$TobinQ$	941	1.380	1,036	2.340	-0.960	0.000***
$Mfee$	941	0.090	1,036	0.105	-0.015	0.303
HHI	941	0.767	1,036	0.773	-0.006	0.591
TFP	941	7.810	1,036	7.804	0.005	0.908

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.



(a) SUB-GROUP: $TRANS_{j,2008} < 0.28$ **(b)** SUB-GROUP: $TRANS_{j,2008} < 0.28$



(c) SUB-GROUP: $TRANS_{j,2008} > 0.28$ **(d)** SUB-GROUP: $TRANS_{j,2008} > 0.28$

Note: This figure demonstrates the matching quality of 1:1 propensity score matching (PSM). As can be seen from the graph, the standard deviations of all variables have decreased after matching, and the post-matching standardized biases (%bias) for most variables are relatively small. Furthermore, the t-values do not reject the null hypothesis of no systematic bias between the treatment and control groups. This indicates that the matching has successfully balanced the covariates between the two groups.

FIGURE D.3. MATCHING RESULTS WITH 1:1 NEAREST NEIGHBOR

TABLE D.5. THE AVERAGE TREATMENT EFFECTS ON THE TREATED (ATTS), WITHOUT COVARIATES

(a) SUB-SAMPLE: $TRANS_{j,y=2008} < 0.28$ (AS APPENDIX TO TABLE 4)

	Single Effect			Separate Effects		
	(1) DID-OLS	(2) DID-Logit	(3) DID-Probit	(4) DID-OLS	(5) DID-Logit	(6) Probit
τ	-0.088**	-0.084**	-0.083**			
	(0.039)	(0.037)	(0.037)			
$\tau_{year=2009}$				-0.204***	-0.180***	-0.185***
				(0.063)	(0.049)	(0.049)
$\tau_{year=2010}$				-0.188***	-0.167***	-0.163***
				(0.056)	(0.047)	(0.046)
$\tau_{year=2011}$				-0.080	-0.084	-0.087
				(0.061)	(0.061)	(0.071)
$\tau_{year=2012}$				-0.036	-0.028	-0.025
				(0.072)	(0.069)	(0.075)
$\tau_{year=2013}$				0.046	0.045	0.055
				(0.075)	(0.074)	(0.082)
$\tau_{year=2014}$				-0.029	-0.030	-0.018
				(0.067)	(0.073)	(0.084)
Adj R2	0.13			0.15		
Pseudo R2		0.14	0.14		0.15	0.15
Wald Chi2		330.00	364.38		362.26	403.77
Obs.	2,724	2,724	2,724	2,724	2,724	2,724
Event Study p-value (2 df)	*0.79*	*0.79*	*0.79*	*0.94*	*0.92*	*0.93*
Heterogenous Trend Test (1 df)	*0.61*	*0.64*	*0.64*	*0.79*	*0.79*	*0.79*

(b) SUB-SAMPLE: $TRANS_{j,y=2008} > 0.28$ (AS APPENDIX TO TABLE 5)

	Single Effect			Separate Effects		
	(1) DID-OLS	(2) DID-Logit	(3) DID-Probit	(4) DID-OLS	(5) DID-Logit	(6) Probit
τ	0.095***	0.103***	0.106***			
	(0.036)	(0.038)	(0.038)			
$\tau_{year=2009}$				0.103*	0.108*	0.106*
				(0.056)	(0.062)	(0.062)
$\tau_{year=2010}$				0.154***	0.171***	0.165***
				(0.056)	(0.062)	(0.062)
$\tau_{year=2011}$				0.119**	0.133**	0.137**
				(0.054)	(0.063)	(0.061)
$\tau_{year=2012}$				0.095*	0.105*	0.111*
				(0.054)	(0.061)	(0.059)
$\tau_{year=2013}$				0.076	0.076	0.080
				(0.054)	(0.062)	(0.061)
$\tau_{year=2014}$				-0.017	-0.006	-0.006
				(0.054)	(0.058)	(0.058)
Adj R2	0.18			0.18		
Pseudo R2		0.18	0.18		0.18	0.18
Wald Chi2		495.50	568.16		493.71	561.14
Obs.	3,000	3,000	3,000	3,000	3,000	3,000
Event Study p-value (2 df)	*0.42*	*0.43*	*0.40*	*0.84*	*0.89*	*0.88*
Heterogenous Trend Test (1 df)	*0.28*	*0.29*	*0.30*	*0.91*	*0.81*	*0.83*

TABLE D.6. ROBUSTNESS CHECK: BY REPLACING VARIABLES

(a) H3, $M = LR_{pt}$

	OLS		Logit		Probit	
	(1) M = LR	(2) M = LR	(3) M = LR	(4) M = LR	(5) M = LR	(6) M = LR
KV_inv_jt	-0.143***	-0.692***	-0.907***	-3.691***	-0.552***	-2.295***
	(0.033)	(0.183)	(0.181)	(1.022)	(0.107)	(0.608)
KV_inv_jt × *KV_inv_jt*		0.342***		1.741***		1.090***
		(0.110)		(0.608)		(0.362)
LR_pt	-0.148***	-0.198***	-0.925***	-1.105***	-0.528***	-0.644***
	(0.022)	(0.047)	(0.132)	(0.288)	(0.076)	(0.168)
KV_inv_jt × *LR_pt*	0.140***	0.297**	0.904***	1.530**	0.528***	0.931**
	(0.021)	(0.121)	(0.126)	(0.725)	(0.074)	(0.424)
KV_inv_jt × *KV_inv_jt* × *LR_pt*		-0.099		-0.412		-0.263
		(0.072)		(0.424)		(0.248)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13	0.14				
Pseudo R2			0.14	0.14	0.14	0.14
Wald chi2			1412.93	1448.11	1522.76	1565.16
Obs.	12,481	12,481	12,481	12,481	12,481	12,481

(b) H3, $M = lawyers_{pt}$

	OLS		Logit		Probit	
	(1) M = Lawyers	(2) M = Lawyers	(3) M = Lawyers	(4) M = Lawyers	(5) M = Lawyers	(6) M = Lawyers
KV_inv_jt	-0.050***	-0.341***	-0.350***	-2.153***	-0.225***	-1.345***
	(0.017)	(0.098)	(0.105)	(0.593)	(0.061)	(0.347)
KV_inv_jt × *KV_inv_jt*		0.183***		1.127***		0.700***
		(0.059)		(0.351)		(0.206)
Lawyers_pt	-0.034***	-0.030*	-0.272***	-0.261**	-0.159***	-0.156***
	(0.013)	(0.015)	(0.085)	(0.104)	(0.049)	(0.060)
KV_inv_jt × *Lawyers_pt*	0.034***	0.025	0.231***	0.224	0.135***	0.142
	(0.004)	(0.024)	(0.028)	(0.162)	(0.016)	(0.093)
KV_inv_jt × *KV_inv_jt* × *Lawyers_pt*		0.004		-0.006		-0.010
		(0.014)		(0.091)		(0.052)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.14	0.14				
Pseudo R2			0.14	0.14	0.14	0.14
Wald chi2			1439.72	1460.05	1566.14	1590.83
Obs.	12,481	12,481	12,481	12,481	12,481	12,481

TABLE D.7. ROBUSTNESS CHECK: BY LIMITING SAMPLES

(a) H1 AND H2

	H1			H2					
	(1) OLS	(2) Logit	(3) Probit	(4) OLS	(5) Logit	(6) Probit	(7) OLS	(8) Logit	(9) Probit
TRANS_jt	-0.583***	-3.503***	-2.200***	0.094	0.378	0.573*	3.444**	0.343*	1.800*
	(0.148)	(0.866)	(0.510)	(0.058)	(0.274)	(0.345)	(1.645)	(0.203)	(0.971)
TRANS_jt × *TRANS_jt*	0.916***	5.396***	3.316***		-0.454		-4.444*		-2.288
	(0.223)	(1.296)	(0.764)		(0.405)		(2.406)		(1.421)
KZ_st				0.018	0.097***	0.129	0.727***	0.088*	0.416***
				(0.013)	(0.025)	(0.083)	(0.159)	(0.048)	(0.092)
TRANS_jt × *KZ_st*				-0.064*	-0.708***	-0.446*	-5.303***	-0.306**	-3.007***
				(0.036)	(0.167)	(0.234)	(1.071)	(0.135)	(0.623)
TRANS_jt × *TRANS_jt* × *KZ_st*					1.027***		7.631***		4.282***
					(0.252)		(1.592)		(0.929)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13			0.13	0.13				
Pseudo R2		0.14	0.14			0.14	0.14	0.14	0.14
Wald Chi2		1070.51	1191.85			1067.20	1083.12	1187.82	1198.91
Joint F-test, p-value					0.000		0.000		0.000
Obs.	10,084	10,084	10,084	10,084	10,084	10,084	10,084	10,084	10,084

(b) H3

	OLS		Logit		Probit	
	(1) M = DLR	(2) M = DLR	(3) M = DLR	(4) M = DLR	(5) M = DLR	(6) M = DLR
TRANS_jt	-0.346***	-1.760***	-2.033***	-9.631***	-1.233***	-5.895***
	(0.079)	(0.377)	(0.452)	(2.186)	(0.267)	(1.287)
TRANS_jt × *TRANS_jt*		2.174***		11.631***		7.152***
		(0.567)		(3.210)		(1.896)
DLR_pt	-0.028***	-0.063***	-0.159***	-0.338***	-0.088**	-0.194***
	(0.010)	(0.018)	(0.061)	(0.113)	(0.036)	(0.065)
TRANS_jt × *DLR_pt*	0.120***	0.397***	0.705***	2.130***	0.405***	1.259***
	(0.024)	(0.114)	(0.145)	(0.710)	(0.084)	(0.412)
TRANS_jt × *TRANS_jt* × *DLR_pt*		-0.256		-1.544		-0.954
		(0.172)		(1.029)		(0.600)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13	0.14				
Pseudo R2			0.14	0.14	0.14	0.14
Wald chi2			1069.49	1099.09	1182.69	1218.14
Obs.	10,084	10,084	10,084	10,084	10,084	10,084

TABLE D.8. ROBUSTNESS CHECK: BY ADDING MORE FIXED EFFECTS

(a) H1 AND H2

	H1			H2					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	Logit	Probit	OLS	Logit	Probit	OLS	Logit	Probit
TRANS_jt	-0.712***	-4.423***	-2.701***	0.187***	-0.283	1.137***	-0.198	0.677***	-0.339
	(0.130)	(0.797)	(0.461)	(0.051)	(0.242)	(0.318)	(1.488)	(0.182)	(0.859)
TRANS_jt × *TRANS_jt*	1.246***	7.693***	4.653***		0.672*		1.823		1.409
	(0.196)	(1.186)	(0.687)		(0.354)		(2.152)		(1.245)
KZ_st				-0.015	0.011	-0.079	0.258*	-0.040	0.138*
				(0.012)	(0.022)	(0.077)	(0.144)	(0.044)	(0.082)
TRANS_jt × *KZ_st*				-0.089***	-0.332**	-0.548**	-3.435***	-0.344***	-1.889***
				(0.031)	(0.140)	(0.213)	(0.967)	(0.120)	(0.547)
TRANS_jt × *TRANS_jt* × *KZ_st*					0.416*		4.638***		2.512***
					(0.213)		(1.435)		(0.815)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-City-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.13			0.12	0.13				
Pseudo R2		0.15	0.15			0.15	0.15	0.15	0.15
Wald Chi2		1626.12	1853.70			1624.97	1667.41	1851.15	1885.41
Joint F-test, p-value					0.017		0.001		0.001
Obs.	12,689	12,268	12,268	12,689	12,689	12,268	12,268	12,268	12,268

(b) H3

	OLS		Logit		Probit	
	(1)	(2)	(3)	(4)	(5)	(6)
	M = DLR	M = DLR	M = DLR	M = DLR	M = DLR	M = DLR
TRANS_jt	-0.414***	-1.512***	-2.635***	-8.741***	-1.584***	-5.334***
	(0.066)	(0.321)	(0.381)	(1.856)	(0.223)	(1.089)
TRANS_jt × *TRANS_jt*		1.704***		9.521***		5.848***
		(0.479)		(2.719)		(1.595)
DLR_pt	-0.037***	-0.049***	-0.239***	-0.290***	-0.137***	-0.167***
	(0.008)	(0.014)	(0.051)	(0.087)	(0.030)	(0.050)
TRANS_jt × *DLR_pt*	0.150***	0.258***	0.976***	1.511***	0.569***	0.892***
	(0.017)	(0.083)	(0.105)	(0.521)	(0.060)	(0.300)
TRANS_jt × *TRANS_jt* × *DLR_pt*		-0.171		-0.879		-0.527
		(0.123)		(0.744)		(0.430)
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
City-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.14	0.14				
Pseudo R2			0.14	0.15	0.14	0.15
chi2			1481.54	1522.89	1656.49	1707.61
Obs.	12,689	12,689	12,340	12,340	12,340	12,340

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