Corporate ESG Profiles and Consumption

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(*JEL* G21, G28, G38)

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I. Introduction

The value of environmental, social, and governance (ESG) profiles is well-established. Since the start of the COVID-19 pandemic, consumer behavior has changed fundamentally in a way that has further increased the value of a high ESG profile. People are now more aware of extreme weather events, social unrest, and economic pressures. Moreover, consumers have access to more information than ever to help them make informed purchasing decisions. In addition to price, consumers' attitudes toward the companies selling products and services are closely tied to their spending behavior. Consumers are also becoming more proactive in their pursuit of a sustainable lifestyle, whether by choosing brands that have ethical or environmentally sustainable practices and values, or by no longer purchasing certain products because they have concerns about the brand's ethical or sustainability practices or values.[2]

In this paper, we consider the relationship between consumption and ESG profiles by examining how firms' ESG ratings affect consumers' spending behavior. We use a novel administrative dataset on individual credit card-based consumption behavior that contains exact transaction records for 297,253 individual consumers from June 2013 to December 2015. We link this dataset with quarterly updated data from the Sino-Securities Index Information Service on corporate ESG ratings, which covers more than 80% of Chinese listed firms. Using the exact transaction dates and merchant names in the credit card data, as well as the firms' names in the ESG rating data, we are able to identify the effect of a consumer's spending preference on merchants' ESG profiles separately from the effect of the aggregate ESG preferences of the entire population at a given time. Consumption is aggregated at the individual-firm-quarter level. In each

[2] A Nielsen survey conducted in 2018 found that 48% of consumers were likely to change their consumption habits to limit their environmental impact, which was reflected in actual spending behavior, with $128.5 billion spent on sustainable fast-moving consumer goods.

quarter, an individual's credit card spending on a particular firm is calculated by summing their quarterly consumption on the firm. The panel structure of our data allows us to include individual fixed effects, which ensures that our findings are not driven by time-invariant differences in consumer behavior that are correlated with the ESG rating. Moreover, our detailed account data on listed firms enable us to include an extensive set of control variables, namely firm size, book-to-market ratio, equity-to-debt ratio, capital expenditure/total assets, and sales growth rate, to ensure that the baseline results are not driven by fundamental changes in firms' cash flow.

We find that a higher firm ESG rating in a given quarter is associated with significant increases in the spending activity of consumers on that firm in the next quarter. Specifically, a one-unit increase in the ESG rating is associated with a 4.9 % increase in consumers' next-quarter consumption. Moreover, we find that our results regarding control variables are consistent with the literature. Specifically, consumer spending is positively correlated with firm size and book-to-market ratio and negatively correlated with equity-to-debt ratio and capital expenditure/total assets (e.g., see Fama and French (2006), Harjoto and Jo (2015), Jo and Harjoto (2011), Saliha and Abdessatar (2011), and Titman et al. (2004)). We also show that the effects are temporally highly concentrated. Specifically, only the current quarterly ESG ratings and the first and second lags of quarterly ESG ratings have a significant impact on consumption, especially for the first lagged measurement, and these effects quickly die out after that, indicating that ESG ratings cause short-term changes in consumption. These results are consistent with studies finding that ESG and corporate social responsibility (CSR) influence purchase intention in the short term (Mela et al., 1997; Pauwels et al., 2002).

Next, we explore the impact of consumer spending on firms' value. Studies have shown that consumers' purchase intentions, loyalty, and satisfaction are important

channels by which ESG can enhance firm value.[3] By utilizing credit card transaction data, we can directly observe confirmed purchases and the characteristics of a company's consumer base to identify the sources of profitability. Following the literature, we utilize four proxies to measure the profitability of a firm: return on assets (*ROA*), return on equity (*ROE*), *ROE Growth Rate*, and *Sales per Share*. Credit card spending is aggregated at the firm-quarter level. We find that consumer spending is significantly and positively correlated with a firm's profitability. A one-standard-deviation increase in consumption is associated with increases of 16.7%, 8.6%, 3.4%, and 6% in the standard deviations of *ROA*, *ROE*, *ROE Growth Rate*, and *Sales per Share*, respectively. This highlights the fact that disaggregated sales affected by firms' ESG performance provide accurate and persistent consumer demand signals relevant to a firm's value.

Subsequently, we discuss the mechanisms that trigger changes in consumers' spending, starting with the role of attention (Barber and Odean, 2008; Gilbert et al., 2012; Sicherman et al., 2016). First, we examine what draws consumers' attention to firms' ESG ratings. Specifically, we investigate how media coverage of a firm responds to changes in its ESG rating and whether consumers seek out more information as a result of observing a higher ESG rating. To measure the media coverage related to firms' ESG ratings, we collect news reports on firms from the China Stock Market & Accounting Research (CSMAR) database and find that the level of media coverage rises as the ESG rating of a firm increases. Next, we introduce Baidu Search Index data as a proxy for consumers' attention. We analyze the Baidu Search Index for the term "Corporate Social Responsibility" at the province-quarter level, and the results indicate

[3] Albuquerque et al. (2019) find that high ESG standards can increase consumer loyalty through product quality signaling, leading to higher market share and higher and less volatile profits. Creyer (1997) shows that firms' business ethics exert a positive and significant impact on consumer purchase decisions. Consumers prefer products from ethical firms to those from unethical firms. Xie (2014) indicates that consumers satisfaction, trust, and identification are all important routes through which a firm's ESG activities translate into profitable consumer behavior.

that when firms' ESG ratings increase, media coverage also increases and consumers more actively search for information about the firms. Thus, an increase in the ESG ratings of firms ultimately results in a higher level of consumer interest. Moreover, we examine how the effects of ESG ratings on consumption vary with the level of media coverage. By introducing the interaction term of firms' ESG ratings and firms' media coverage, we observe that an increase in the number of firm-related news reports enhances the positive relationship between firms' ESG ratings and consumption. Utilizing the rich information available about transactions and credit card holders, we investigate heterogeneity in consumer spending responses to firms' ESG ratings. We find that female, unmarried, younger, and more educated consumers respond more positively to ESG ratings than their counterparts. In particular, the increase in female consumers' spending in response to a one-unit increase in ESG rating is 1.8% higher than that of male consumers. The corresponding difference between married and unmarried consumers is 1.9%, while that between younger and older consumers is 2.1%. Consumers with a bachelor degree or above increase their spending by 0.9% more than those with lower levels of education. We also examine the heterogeneous effect on different types of spending. The Merchant Category Codes are used to categorize consumption records into two categories: essential consumption and non-essential consumption. We find that both essential and non-essential consumption in the next quarter are positively and significantly influenced by the corporate ESG rating; however, the latter reacts more strongly. A one-standard-deviation increase in ESG rating is associated with an increase of 2.1% (1.1%) in the standard deviation of non-essential (essential) consumption in the next quarter.

To help "difference out" possible confounding factors and isolate the effect of ESG performance on consumption, we perform two difference-in-differences (DiD) analyses

using the public interest litigation (PIL) pilot program and the first release of a CSR report as exogenous shocks. A new Environmental Protection Law was implemented by the Chinese central government on January 1, 2015, and has been called the strictest environmental protection law in China's history. A pilot program for PIL was also introduced in July of the same year.[4] Firms in pilot cities face more severe penalties for environment violations following the implementation of this program. Therefore, these firms are expected to increase their environmental investments to avoid being punished, or even going bankrupt, and achieve sustainable development. Specifically, we examine how consumers respond to exogenous variations in the ESG performance of firms. This DiD analysis is conducted by considering consumers' spending records on firms registered in 73 pilot cities in 13 provinces as the treatment group and consumers' spending records on firms registered in non-pilot cities in the same provinces as the control group. The results show that the monthly credit card consumption by consumers in the treatment group increases by 5.1% more than that of consumers in the control group after the PIL pilot program, indicating that the shock to firms' ESG performance propagates through the PIL pilot program, resulting in changes in consumers' spending.

We also perform a DiD analysis using the first release of a CSR report as a shock. ESG is closely related to CSR, which refers to "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (Gillan et al., 2021; McWilliams and Siegel, 2001). Therefore, many studies use "ESG" and "CSR" interchangeably, and some, such as He et al. (2022b), Wang and Li (2016), and Sethi et al. (2017), use the CSR report as a shock to a firm's ESG performance. Studies show that firms disclosing CSR information signal superior ESG performance (Healy

[4] For more details, please refer to http://www.npc.gov.cn/npc/c10134/201507/1b884f853d384b20a7cbd4d6945f5e4d.shtml.

and Palepu, 2001; Prado-Lorenzo and Garcia-Sanchez, 2010). In particular, the first release of a CSR report, which we use in our study, not only represents a qualitative leap in a firm's CSR performance but also reflects the great efforts made by firms to establish a good reputation for social responsibility. Meanwhile, the positive market signal sent by CSR reports may be enhanced by the information content of a firm's first CSR report. Different aspects of corporate issues are specified in the CSR reports, such as shareholder relations, creditor relations, and employee relations. These detailed disclosures may provide additional information (Kong et al., 2022; Wang et al., 2018). We use the CSR score, which represents how many aspects of ESG a firm discloses in its first CSR report, to proxy for the magnitude of the shock.[5] We find that a unit increase in the CSR score (i.e., one additional aspect being disclosed in the first CSR report) is associated with an increase of 1.1 % in consumers' monthly spending in the post-shock period.

We also conduct several robustness tests, including using alternative consumption measures, alternative ESG ratings, and different samples, and our results remain robust. First, we use the quarterly number of purchases as an alternative measure of consumption and examine its response to firms' ESG ratings. We find that a one-unit increase in firms' ESG ratings results in a statistically and economically significant increase of 0.8% in the number of consumer purchases. In addition, we use other ESG ratings obtained from Hexun.com.[6] The result shows that a one-unit increase in firms' annual ESG ratings results in a 16.3% increase in consumption in the next year. We only retain active cardholders, which refers to those with monthly spending records in

[5] The CSR reports data are obtained from the CSMAR database, where CSR performance is categorized into 10 categories: protection of shareholders' rights, protection of creditors' rights, staff relations, supplier issues, customer issues, environmental protection and sustainable development, public relations and philanthropy, CSR construction, safety conditions, and deficiencies. We define a dummy variable for each category that equals 1 if the firm mentions the specific item in its first CSR report and 0 otherwise. Firms' CSR scores are thus proxied by the summed score of the above 10 indicators.

[6] For more details about the Hexun ESG ratings, please refer to http://stock.hexun.com/2010/shzrbg/.

at least 15 or 20 months of the sample period, and then re-estimate the main regression. The key estimated coefficients are still significant. Furthermore, the magnitude of the response of consumers with spending records in at least 20 months is higher than that of consumers with spending records in at least 15 months, which suggests that more active consumers respond more strongly to changes in ESG ratings.

We directly contribute to the growing literature on the determinants of consumption at the micro-level. A large body of literature focuses on the consumption responses of individuals who face expected and unexpected shocks. For examples, see Aaronson et al. (2012), Agarwal and Qian (2014), Agarwal et al. (2007, 2017), Aydin (2022), de Araujo et al. (2020), Di Maggio et al. (2017), Gelman et al. (2020), Olafsson and Pagel (2018), Parker (1999), Parker et al. (2013), Scholnick (2013), Shapiro and Slemrod (1995, 2003), and Stephens (2003, 2008). However, micro-level evidence on household responses to firms' ESG profiles is largely undocumented. By matching the household credit card spending data with the ESG ratings data of firms in mainland China, we create a rich merchant–consumer dataset to test whether micro-level consumption responds to changes in firms' ESG performance. To the best of our knowledge, this is the first study to analyze the effect of ESG performance on credit card spending by representative consumers in China.

Second, our paper is related to the literature on the relationship between ESG performance and firm value (e.g., Albuquerque et al., 2019; Benabou and Tirole, 2010; Fatemi et al., 2015; Flammer, 2015). Some studies investigate this relationship through the lens of maximizing shareholder utility, especially for consumers. For example, Tian et al. (2011) note that a good CSR record can be converted into positive corporate evaluation, product association, and purchase intention. This effect may be even stronger for consumers aware of a firm's CSR. Kim et al. (2018) find that higher CSR

ratings are associated with more information searches on Google and that CSR activities are likely to influence a firm's financial performance through their influence on product market demand. The results of our paper also indicate that ESG performance is positively associated with firm value, and the channel that we emphasize is consumers' spending behavior. A higher ESG rating will raise consumers' awareness, increase their purchase intention, and boost the firm's profitability.

Last, we also contribute to the growing literature on the relationship between ESG/CSR performance and consumer behavior. Many studies demonstrate the impact of ESG/CSR performance on consumer behavior either directly or indirectly (Amoroso and Roman, 2015; Lee and Shin, 2010; Sen and Bhattacharya, 2001). A consumer's behavior can be characterized by purchase intentions, brand loyalty, brand equity, and brand preference. We contribute to this literature by directly measuring consumers' spending and highlighting the influence of ESG performance on consumer behavior using disaggregated credit card spending data.

The rest of the paper proceeds as follows: Section II introduces the data and empirical strategy. Section III presents the main empirical results on the consumption response. Section IV presents the source of endogeneity and two DiD analyses. Section V presents the robustness tests. Section VI concludes the paper.

II. Data and Empirical Strategy

A. Credit Card Data

The credit card spending data are from a leading commercial bank in China that enjoys a 10% share of China's credit card market, covering all 31 provinces and directly controlled municipalities in mainland China. The dataset contains extensive information on transaction details and consumer characteristics from June 2013 to

December 2015. For each transaction, we can observe the transaction amount, transaction date, merchant name, and Merchant Category Codes. Additionally, the dataset includes a rich set of demographic and socioeconomic characteristics, including card holders' birth date, gender, home ownership status, educational level, marital status, number of dependents, income, employment status, occupation, name and industry of the employer, and employer type (government, SOE, or private sector), for a random sample of the entire credit card-holding population.

The merchant name reported in each credit card transaction record is our primary identifier to establish the link between consumers and listed firms. We only retain credit card spending information pertaining to listed firms because of the availability of ESG ratings and accounting information for such firms. There is a more detailed discussion of the merged process in Section II.D.

The first advantage of our administrative dataset is that it provides high-quality observations with low measurement errors. We are able to capture individual behavior through recorded credit card transactions, which provide a higher level of precision than traditional survey-based data sources; in comparison with our data, self-reported consumption data are noisier and more subjective. Furthermore, unlike with indirect proxy measures of consumer behavior, such as consumer satisfaction (Chung et al., 2015; O'Sullivan and McCallig, 2012) and consumer purchase intention (Auger and Devinney, 2007), we can directly obtain consumption changes and observe the demographic and socioeconomic characteristics of individual credit card holders with greater accuracy. Every time a new banking relationship is established with an individual, the bank collects and verifies personal information.

Second, our dataset covers a large proportion of the consumption response because credit cards have become a primary method of household consumption in China

(Agarwal et al., 2022; Gu et al., 2021). According to the People's Bank of China, 800 million credit cards were in use in 2021, with a total credit limit of 21.02 trillion RMB. Since 2013, the credit utilization rate has exceeded 40%. The "Blue Book on the Development of China's Credit Card Industry," published by the China Banking Association, states that credit card transactions accounted for 55.8% and 58% of the total retail sales of consumer goods in 2013 and 2014, respectively, indicating that our dataset is representative of Chinese household consumption.

Last, the richness of the individual financial and demographic information facilitates a comprehensive understanding of the heterogeneity in consumers' response to corporate ESG profiles. For example, we can track individuals' credit card behavior at the transaction level, including the amount, type, location, and the exact merchant's name. Such rich and high-frequency data empower our adequate identification of the effect of corporate ESG performance on consumption behavior.

B. ESG Data

Data on corporate ESG performance are obtained from the Sino-Securities Index Information Service.[7] The Sino-Securities ESG rating provides a quarterly time series ESG rating covering over 80% of A-share firms since 2009 (Li et al., 2022). It is based on 14 primary indicators, 26 secondary indicators, and 130 tertiary indicators and addresses each of the three aspects of ESG. Nine rating levels are possible, namely "C," "CC," "CCC," "B," "BB," "BBB," "A," "AA," and "AAA," and we convert these ratings into a numeric variable with values of 1 to 9, respectively. The higher the ESG rating, the better the ESG performance (Feng et al., 2022; Li et al., 2022).

[7] For more detail about the Sino-Securities ESG rating, please refer to https://www.chindices.com/esg-ratings.html#esg_indexes.

The Sino-Securities ESG rating is uniquely suited to our study because it starts early enough to cover the period in which we track consumption and includes a wide range of listed firms. Other widely used ESG databases would have limitations if we were to link them with our credit card data. For example, the SynTao Green Finance ESG database was launched in 2015; the MSCI and Bloomberg ESG databases were launched earlier, but only cover a small number of A-share companies.[8] Furthermore, those three datasets are only updated annually, a comparatively low update frequency.

Figure 1 presents the cross-sectional distribution of the Sino-Securities ESG ratings. We calculate the average ESG rating of all listed A-share firms during the sample period of our credit card data (2013: Q3 to 2015: Q4) and plot the distribution in Figure 1, Panel A. We can see that among 2,245 firms, almost all have an ESG rating greater than 3 (equivalent to "CCC") and approximately 70% have an ESG rating between 5 and 7 (equivalent to "BB" and "A"). We also calculate the Sino-Securities ESG rating for the firms matched with our credit card data, and plot the distribution in Figure 1, Panel B. Comparing the two figures, the cross-sectional distributions are evidently similar, which suggests that our sample firms are representative.

[Insert Figure 1 Here]

Figure 2 shows the mean value of the Sino-Securities ESG rating for the firms used in the empirical analysis at the quarter level. As can be seen, the ESG ratings are mainly in the range of 6 to 7 (equivalent to "BBB" to "A"), and there is no significant clustering of these ratings over time.

[Insert Figure 2 Here]

[8] In May 2020, MSCI's ESG rating covered approximately 700 A-share companies in China. Bloomberg has been monitoring companies' ESG performance since 2011, and the number of companies in China disclosing ESG ratings has increased from 593 in 2011 to 887 in 2021.

In addition, as a robustness check, we use the ESG ratings disclosed by Hexun.com, which have been increasingly applied in ESG-related research in China in recent years (He et al., 2022a; Yi et al., 2021; Zhou et al., 2021). Hexun began to evaluate the social responsibility performance of listed firms and to publicly release the ratings in 2010. The evaluation system used by Hexun is based on the CSR reports and annual reports released by firms listed on the Shanghai and Shenzhen stock exchanges through their official websites. Specifically, Hexun evaluates firms' ESG performance on five dimensions: shareholder responsibilities, employee responsibilities, supplier, client, and consumer responsibilities, environmental responsibilities, and social responsibilities. These ratings are updated annually and have five levels, which from highest to lowest are "A," "B," "C," "D," and "E." As with the Sino-Securities ESG ratings, we convert the classification variable into a numeric variable ranging from 1 to 5. The higher the score, the better the ESG performance.

C. Financials

After constructing the sample by matching the merchants in the credit card data with listed firms, we also incorporate a broad range of firm-level control variables to alleviate the problem of omitted variables. Specifically, we collect the following firm-level financial data: the logarithm of size (*Ln(Size)*), the book-to-market ratio (*BM*), the equity-to-debt ratio (*EDR*), the capital expenditure/total assets ratio (*Capex Ratio*), and the sales growth rate (*Sales Growth Rate*). These are chosen based on studies of the determinants of firm profitability (see, for example, Edmans et al. (2017), Kalcheva and Lins (2007), and Laeven and Levine (2008)). To analyze the relationship between consumption and firm value, we focus on firm profitability and introduce four proxies: *ROA*, *ROE*, *ROE Growth Rate*, and *Sales per Share*. All of these financial variables are

obtained from the CSMAR database. For a detailed explanation of each variable, please refer to Table A.1.

D. Merged Final Sample and Summary Statistics

A key step in our sample construction is to match the listed firms with their consumers. We follow three steps to match the merchants in the credit card data with the listed firms. The first step is to obtain information from all A-share listed firms in China, including those listed on the Main Board, the Sci-Tech Innovation Board, and the Growth Enterprise Board. As of 2021, there were 4,430 A-share listed firms. We begin with a list of these 4,430 firms and match the merchant names from the full credit card transaction record with the firm names based on similarity in wording.[9] After this step, we are left with 109,620 merchants and 2,027 listed firms. The second step is to manually verify the matching to ensure that it is accurate. After this step, each merchant is matched with only one listed firm, and we are left with 51,215 merchants and 1,162 firms. In the final step, the sample is restricted by removing firms listed after 2015. This is because the sample period of the credit card data runs from June 2013 to December 2015. Additionally, we exclude companies receiving special treatment (marked as "ST") due to their poor operating performance, and exclude consumers who are younger than 18 or older than 60 years of age because of age requirements for credit card eligibility. The final sample is comprised of 297,253 consumers and 773 listed firms.

We aggregate the data at the individual-firm-quarter level. Each individual's credit card spending on a firm within each fiscal quarter is calculated by summing their

[9] We obtain the securities abbreviations of these listed firms and perform exact matching in Python. For example, the abbreviation for Ping An Bank Co., Ltd. is "Ping An Bank," which we use for matching, and we retain the merchant names, including the unique words in the name, whether or not the merchant names contain other words.

quarterly consumption on the firm. In a given quarter, we code observations of flow variables as zero if the consumer had no transactions with the corresponding firms.

Table 1 presents the summary statistics of our sample. Panel A shows credit card spending at the individual-firm-quarter level. The quarterly consumption (C_t) ranges from 0 to 2,430,910 yuan, with a mean of 421 yuan. For the frequency of quarterly purchases (P_t), the mean is 0.407. Panel B presents the consumer characteristics, with variables relating to each individual's gender (*Male*), marital status (*Married*), age (*Age*), and education level (*Bachelor Degree or Above*). In our sample, more than half of the consumers are male (55.5%) and more than two thirds are married (70.2%). The average age is approximately 37. Approximately 55% of the consumers have a bachelor degree or above. Panel C contains firm-level consumption information, ESG ratings, and firm characteristics. The average quarterly credit card spending for each firm is 313,765 yuan. The ESG ratings in our sample range from "CC" to "AAA," with an average value of 6.94, which is close to an "A." This indicates that the overall ESG performance of the sample firms is generally considered good enough to achieve a "leader" rating, which is applied to firms rated "A," "AA," or "AAA." Table 1 also provides summary statistics for the other financial variables.

[Insert Table 1 Here]

E. Empirical Strategy

We examine the consumer spending response to firms' ESG ratings, controlling for firm-level characteristics. Specifically, we employ the following fixed-effects regression model:

$$Y_{i,j,t} = \beta_0 + \beta_1 * ESG_{i,t-1} + X_{i,t-1} + \delta_i + \varphi_j + \gamma_t + \varepsilon_{i,j,t}, \quad (1)$$

where $Y_{i,j,t}$ measures the total credit card spending in RMB by consumer *j* on firm *i* in fiscal quarter *t*, and we use the logarithm term in Eq. (1). $ESG_{i,t-1}$ is the key independent variable, representing the Sino-Securities ESG rating for firm *i* in fiscal quarter *t*-1. $X_{i,t-1}$ is a vector of firm-level control variables comprising *Ln(Size)*, *BM*, *EDR*, *Capex Ratio*, and *Sales Growth Rate* in fiscal quarter *t*-1. δ_i is a vector of firm fixed effects, and γ_t denotes the corresponding calendar year-quarter fixed effects to account for common macroeconomic conditions. We also include individual fixed effects φ_j to control for unobserved time-invariant differences in spending behavior across individuals that could be correlated with persistent differences in exposure to corporate ESG ratings. Hence, we identify the spending response to firms' ESG ratings from cross-sectional variation and within-individual variation. Our major interest is the coefficient for ESG rating, β_1 which denotes the average consumption response to a change in ESG rating in the last quarter. The standard errors are clustered at the individual level.

Furthermore, we examine the impact of consumption changes on firms' profitability by conducting a firm-level analysis. Specifically, we employ the following regression model:

$$Y_{i,t} = \beta_0 + \beta_1 * FC_{i,t} + X_{i,t} + \delta_{ffindustry} + \gamma_{ffyear} + \varepsilon_{i,t}, \quad (2)$$

where $Y_{i,t}$ represents the profitability of firm *i* in quarter *t*, which is measured by four variables: *ROA*, *ROE*, *ROE Growth Rate*, and *Sales per Share*. $FC_{i,t}$ measures the aggregate credit card spending at the firm level in quarter *t*. $X_{i,t}$ consists of a group of control variables at the firm level. $\delta_{ffindustry}$ is a vector of industry fixed effects and γ_{ffyear} represents the year fixed effects. The standard errors are clustered at the industry level.

III. Main Results

A. Average Consumption Response to ESG Ratings

In this part, we exhibit the relationship between consumption and corporate ESG profiles in detail. We begin the analysis by calculating the cross-sectional correlation between consumption and ESG rating in the previous quarter, as shown in Figure 3. The fitted linear relationship and 95% confidence interval indicate a significant and positive cross-sectional correlation between consumption and corporate ESG ratings.

[Insert Figure 3 Here]

Next, we estimate Eq. (1) and the results are shown in Table 2. As can be seen, individuals increase their consumption in response to corporate ESG profiles. We first examine the cross-sectional variation of spending in response to a company's ESG rating by including the firm and year-quarter fixed effects. According to column (1), a one-unit increase in the ESG rating is associated with an increase of 4.9 % in consumption in the next quarter. There is also a significant economic impact. Increasing the ESG rating by one standard deviation is associated with an increase in overall consumption in the next quarter by 5.65 %, which is equivalent to 2.2% of the standard deviation of consumption.[10] To correct for unobserved time-invariant differences in spending behavior across individuals that may be correlated with corporate ESG ratings, we include the individual fixed effects and re-estimate Eq. (1) to examine the impact of corporate ESG ratings on spending within individuals. As shown in column (2), there is a significant and positive correlation between consumption and corporate ESG ratings. A one-unit increase in the ESG rating corresponds to an increase of 4.9 % in a

[10] More precisely, a one-unit increase in the ESG rating is associated with an increase of 5 % ($0.05 = e^{0.049} - 1$) in consumption in the next quarter. For simplicity, we use the coefficient directly in the subsequent analysis. We calculate that 0.049*1.154/2.547 = 2.2%, where 0.049 is the coefficient of ESG_{t-1} in column (1) in Table 2, and 1.154 and 2.547 are the standard deviations of the independent variable ESG_{t-1} and the dependent variable C_t, respectively.

consumer's next quarter spending. Additionally, the economic impact remains significant. A one-standard deviation increase in the ESG rating is associated with an increase of 2.2% in the standard deviation of consumption.

[Insert Table 2 Here]

How many quarters ahead do corporate ESG rating affect consumer spending? We further replace the ESG rating measure with its current value and the second, third, fourth, and fifth lags. Table 3 shows the corresponding results. As can be seen, only the ESG ratings in quarters *t, t*-1, and *t*-2 have significant effects on consumption in quarter *t*; all other lagged ratings have no significant effect. The biggest effect occurs when we introduce the ESG rating in quarter *t*-1. Moreover, we jointly include firms' ESG ratings for the current quarter and the previous two quarters in column (7) and show that in this case the first lag measure still has the biggest effect on consumption.

Moreover, the estimated results in Table (3) show that more distant ESG ratings, namely those in quarters *t*-3, *t*-4, and *t*-5, sometimes have the opposite sign, although non-significantly, which indicates that the effect of ESG ratings is not persistent. These findings further support the literature on the sustainability of the effects of firms' ESG ratings. Evidence shows that ESG and CSR can have both short-term and long-term impacts. The short-term impact is realized by encouraging purchase intention, which results in an immediate effect on sales or consumers' behavior (d'Astous and Jacob, 2002; d'Astous and Landreville, 2003; Pauwels et al., 2002). The long-term impact is exerted through more stable factors, such as reputational capital, repurchase intentions, and consumer loyalty (Mela et al., 1997). The present study focuses on consumers' response, using granular credit card spending data to confirm the short-term impact of ESG ratings.

[Insert Table 3 Here]

B. Consumption and Firms' Profitability

Studies show a positive association between ESG performance and measures of firm value, such as Tobin's q, stock return, and profitability (Benabou and Tirole, 2010; Fatemi et al., 2015). Consumers' purchase intentions are considered to be a critical mechanism by which ESG enhances firm value according to these studies (Brown and Dacin, 1997; Murray and Vogel, 1997). In this section, we examine the transactions related to credit card spending to directly observe confirmed purchases, as well as the characteristics of firms' clientele, to identify the sources of profitability associated with consumers' spending.

We construct a sample at the firm-quarter level by aggregating the total spending of consumers on each firm at the quarter level. We code observations of flow variables as zero if the firm did not have any corresponding transactions in the given quarter. We utilize four proxies to represent firms' profitability: *ROA, ROE, ROE Growth Rate*, and *Sales per Share*. The estimation results of Eq. (2) are shown in Table 4. It can be seen that the estimated coefficients for consumption are positively and significantly correlated with firms' profitability, which indicates that consumers place great importance on firms' participation in ESG activities and reward this by increasing spending, which ultimately enhances firms' profitability. For example, column (1) shows that a one-standard-deviation increase in log-scale consumption is associated with an increase in *ROA* by 16.7% of the standard deviation. Additionally, the signs of the coefficients for the control variables are consistent with existing empirical evidence regarding firms' profitability (Jiao, 2010; Lang et al., 2004; Lee, 2009; Mak and Kusnadi, 2005).

[Insert Table 4 Here]

C. Attention to ESG Ratings

How do consumers find out about corporate ESG profiles? The literature documents that consumer awareness of CSR increases their understanding of CSR activities, which makes it more likely that they have a positive attitude toward these firms and will reward them for their ESG efforts by increasing purchase intentions (e.g., Lee and Shin, 2010; Servaes and Tamayo, 2013; Tian et al., 2011). In this section, we examine what draws consumers' attention to firms' ESG ratings and how the impact of ESG ratings on consumption varies with the degree of media coverage.

To begin, we investigate how media coverage of a firm reacts to changes in its ESG rating and whether consumers seek out more information when a firm's ESG rating increases. To measure the coverage of firms in the media, we obtain information from the CSMAR database, which contains news reports on all listed firms in China. The CSMAR data are derived from real-time financial news published by mainstream media sources including Securities Daily, CCTV, CICC Research, and Sina Finance (Ma et al., 2021). We calculate the total number of news reports for each firm in each quarter. Panel A of Figure 4 displays the binned scatter plot, revealing a strong positive correlation between firms' normalized ESG ratings and the number of news reports, which holds conditional on industry fixed effects (Panel B). A higher ESG rating increases a firm's media exposure as well as its exposure to potential consumers.

[Insert Figure 4 Here]

Then, we find that when individuals observe high ESG ratings for firms that they are interested in, they will actively seek information about them. Following Da et al. (2011), we use ESG-related keywords on Baidu Search Index, the Chinese equivalent of Google Trends, as a proxy for people's attention, with a higher Baidu Search Index indicating greater attention to a firm's ESG performance. The Baidu Search Index is collected at

the province-quarter level for the term "Corporate Social Responsibility."[11] As shown in the binned scatter plots in Figure 5, there is a strong positive correlation between the Baidu Search Index and firms' ESG performance at the province level, both with and without province fixed effects. Using Baidu Search, individuals can quickly discover a company's ESG rating, improving their understanding of the company's ESG activities and reducing the information gap between consumers and companies. In addition, we obtain Baidu Search Index values for "Environmental Governance," "Social Responsibility," and "Corporate Governance" as proxies for people's attention to the "E," "S," and "G" elements of ESG, respectively, and the correlations are plotted in Figure A.1. The figures indicate that higher ESG ratings attract greater attention to all aspects of a firm's ESG performance. Consequently, an increase in a firm's ESG rating leads to a higher level of media coverage and increased consumer awareness.

[Insert Figure 5 Here]

Do the effects of firms' ESG ratings on consumption vary with media coverage? We re-estimate Eq. (1) by including the interaction term between ESG ratings and media coverage. The results are shown in Table 5. Column (1) introduces the logarithm of the number of news reports at the firm-quarter level. The positive coefficient of $ESG_{t-1} * Ln(Numer\ of\ news_{t-1})$ indicates that the higher the media coverage, the stronger the impact of ESG ratings on consumption. We replace the measure of media coverage with the dummy variable $Higher\ Media\ Coverage_{t-1}$, which equals one if the number of news reports on a firm is above the median for the industry-quarter level. We can see that a larger number of news reports enhances the positive correlation between firms' ESG ratings and consumption.

[11] In the sample period of our analysis, i.e., the third quarter of 2013 through the end of 2015, firms' ESG performance was reported in their CSR reports, but the entry "ESG" was not included in the Baidu Search Index. Therefore, we use the search term "Corporate Social Responsibility" as a replacement and examine Baidu searches and firms' ESG performance both at the province level.

[Insert Table 5 Here]

D. Heterogeneity Analysis

The above results suggest that firms' ESG ratings have a significant and economically important impact on consumers' spending. In this section, we further investigate the heterogeneity of this impact from two aspects using detailed information about consumer characteristics and spending type.

Heterogeneous response across consumers: Who responds more—Taking advantage of the detailed demographic information on consumers in our dataset, we now assess the heterogeneity of consumer characteristics to investigate spending response. We estimate Eq. (1) by integrating the one-quarter lagged ESG rating with indicators based on consumers' gender, marital status, age, and education level. The results are shown in Table 6. The predetermined characteristics all remain constant throughout the panel and are therefore absorbed by the individual fixed effects.[12] The results show that female, unmarried, younger, and more educated consumers respond more to firms' ESG ratings. The finding that female consumers respond more than male consumers is indicated in column (1). For a one-unit increase in the corporate ESG ratings, the increase in female consumers' spending is 1.8% higher than that of male consumers. The difference between married and unmarried consumers is 1.9%. The effect of a one-unit increase in corporate ESG ratings on consumers' spending is 2.2% greater for younger than older consumers. Finally, consumers with a bachelor degree or above respond more than those with lower education levels by 0.9%. These empirical results are consistent with those in the literature. Luchs and Mooradian (2012) demonstrate that female consumers care more about CSR activities, especially environmental issues,

[12] The variable *Below Median Age* is also absorbed because we divide the sample into two categories using the age at which the consumers enter the sample, which is 36 years in our sample.

than male consumers. Given the evidence of the overwhelming strength of female consumers in the market, our results show that the influence of firms' ESG performance on consumption is driven by female consumers. Meanwhile, young consumers exhibit higher levels of social consciousness than older consumers as they are concerned about social causes and activism, which translates into strong brand preferences (Grant, 2004; Sheriff and Nagesh, 2007). Additionally, the literature shows that consumers with high incomes, high levels of education, and high levels of financial liquidity practice ethical consumption more often than their counterparts (Maignan and Ferrell, 2001). There is, however, a lack of accurate consumer-level data in the literature that would not allow researchers to focus on consumers' purchase intentions or attitudes. The results of our study provide insights into consumers' intuitive and real-world responses to corporate ESG ratings.

[Insert Table 6 Here]

Heterogeneous response across consumption types—Next, we examine the heterogeneity associated with the type of consumption. Our credit card transaction data include the Merchant Category Codes. Following the classifications used by Agarwal and Qian (2014, 2017), we divide consumption into essential and non-essential categories. The essential consumption sector comprises food and catering expenses, such as consumption in food retail stores and large warehouse supermarkets, and the non-essential consumption sector constitutes all other consumption. In Table 7, we report the results of re-estimating Eq. (1) using these two subsamples. The results show that both essential and non-essential consumption in the next quarter are positively and significantly influenced by the corporate ESG rating; however, the effect is stronger for non-essential consumption. A one-standard-deviation increase in ESG rating is

associated with an increase by 2.1% (1.1%) of the standard deviation increase in non-essential (essential) consumption in the next quarter.

[Insert Table 7 Here]

IV. Source of Endogeneity and Identification

A. Source of Endogeneity

We document that corporate ESG ratings have a direct and positive impact on consumers' credit card spending. However, interpretations of the relationship as causal may be confounded by endogeneity concerns.

First, there is potentially unobserved heterogeneity resulting primarily from omitted variables. Unobservable factors, such as CEOs' concerns or preferences regarding ESG issues, are likely to influence their firms' expenditure on ESG activities and ultimately the ESG rating. Studies have demonstrated that ESG/CSR scores are associated with differences in CEO preferences (Borghesi et al., 2014; Cronqvist and Yu, 2017; McCarthy et al., 2017). Although some of these factors are already taken into account in the firm fixed effects, there are still some time-variant variables that are not included in the regression. These will be de facto contained in the residuals $\varepsilon_{i,j,t}$. Therefore, firms' ESG ratings will be correlated with those residuals.

Second, there may be concerns about simultaneity, i.e., the question of whether consumer spending affects a firm's ESG rating. Duque-Grisales and Aguilera-Caracuel (2021) confirm a reverse causal relationship between ESG and firm value. An increase in consumer spending will enhance a firm's value by increasing its operating income. And then a higher level of firm value may direct firm executives to pay more attention to ESG in order to meet market expectations, and therefore to increase expenditures on

ESG activities. If so, parameter estimates of the main results would be contaminated by these endogeneity issues. The DiD approach may be able to mitigate such biases.

To mitigate endogeneity concerns, we conduct two DiD analyses to examine the relationship between firms' ESG performance and consumer spending. In addition to addressing concerns regarding omitted variables, the DiD analysis can also effectively remove the impact of concurrent macroeconomic shocks, which may affect consumer spending.

B. DiD Analysis Using PIL Pilot Program

In January 2015, a new Environmental Protection Law was enacted to safeguard the environment and promote sustainable economic development. The Supreme People's Procuratorate authorized a 2-year pilot project in July of the same year, which permitted procuratorial organs in 13 provinces to institute environmental public interest litigation (PIL), particularly against administrative organs violating the Environmental Protection Law. Qualified social organizations can file lawsuits in the People's Court to address behaviors that pollute the environment, cause ecological damage, or harm the public interest. This litigation substantially increases the responsibilities of polluting firms and strengthens penalties, and therefore encourages firms in pilot cities to adapt their production, operations, and investment activities to the continuous pressure of environmental regulations and green development trends (Yu et al., 2021).

Following Liu and Fan (2021) and Zhang et al. (2022), our identification strategy utilizes the quasi-exogenous shocks to firms' ESG performance that result from the PIL pilot program. Specifically, we examine how individuals respond to exogenous changes in firms' ESG performance. A total of 13 provinces were selected by the Supreme People's Procuratorate for the pilot program, with a few cities in each province. Local governments are unlikely to have interfered in the selection of pilot areas, ensuring that

the DiD strategy is exogenous. As with the earlier regressions, we conduct the analysis at the consumer level. Our treatment group consists of consumers with spending records on firms registered in the 73 pilot cities in the 13 provinces, and our control group consists of consumers with spending records on firms registered in other cities within the same 13 provinces.[13] We exclude consumers who purchase from more than one firm to mitigate the overlap effect between different firms. Finally, we have 109,753 (12,080) consumers in the treatment (control) group and estimate the following specification:

$$(3) \qquad Y_{i,j,t} = \beta_0 + \beta_1 * ESG\ Shock_i * 1_{[post]} + X_{i,t} + \mu_j + \gamma_t + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ measures consumer *j*'s credit card spending on firm *i* during month *t*, and the logarithm term is used in the regression model. The treatment dummy $ESG\ Shock_i$ equals one if firm *i* is registered in one of the pilot cities. The time dummy $1_{[post]}$ equals one if the month of observation is after the PIL event date, i.e., July 2015. The coefficient β_1 measures the difference between the treatment and control groups in the average change in credit card spending as a result of the PIL pilot program. $X_{i,t}$ consists of a group of control variables at the firm level. μ_i is a vector of individual fixed effects, and γ_t represents the year-month fixed effects. Standard errors are clustered at the individual level.

The results are shown in Table 8. In column (1), the variable $1_{[post]}$ equals one for the event month and post-event months. It is found that the interaction term of $ESG\ Shock_i$ and $1_{[post]}$ is positive and significant at the 1% level, indicating that the positive shock to the ESG performance of firms increases consumers' spending. Specifically, following the implementation of the PIL pilot program, the monthly credit

[13] Based on the classification of Chen et al. (2020) and the manual checking of news reports, all 73 cities in the 13 provinces are included in the pilot cities. For a list of pilot cities, please see Table A.2.

card consumption by consumers in the treatment group increases by 5.1% more than that of consumers in the control group. In column (2), $1_{[0m]}$ equals one for the event month (July 2015), and the variable $1_{[post]}$ only equals one for the post-event months. The results indicate that the shock to firms' ESG performance occurs in the event month, i.e., the interaction term between $ESG\ Shock_i$ and $1_{[0m]}$ is significant, and becomes stronger in the post-event months. However, if we include $1_{[-1m]}$, which equals one for the month before the event, its interaction term with $ESG\ Shock_i$ is non-significant, as shown in column (3). We find that the coefficient of the interaction term of $ESG\ Shock_i$ and $1_{[-1m]}$ is also non-significant when we consider the dynamic effects, as shown in column (4). Overall, the results indicate that consumption increases only after the event, suggesting that the documented increase in spending is indeed associated with the shock to firms' ESG performance.

[Insert Table 8 Here]

C. DiD Analysis Using the First Release of a CSR Report

The PIL pilot program described above is based on an external shock at the city level that is exogenous to each firm. In this section, we introduce another shock directly related to firms' ESG performance by exploiting the changes in consumer spending following the public release of a firm's first CSR report.

In 2008, the Shenzhen Stock Exchange and Shanghai Stock Exchange issued notices requiring financial institutions and companies that are included in the Shenzhen 100 Index, Shanghai Corporate Governance Index, or cross-listed on overseas stock exchanges to disclose their CSR reports. In addition, other firms are encouraged to disclose their CSR reports on a voluntary basis. Since then, the number of firms that

disclose CSR reports has increased dramatically.[14] The first release of a firm's CSR report has been used as an external shock in previous studies to examine how ESG/CSR performance affects a variety of firm outcomes, including firm risk (He et al., 2022b), earnings management (Hung et al., 2013; Wang et al., 2018), and firm value (Dhaliwal et al., 2011; Wang and Li, 2016). Both ESG and CSR focus on the social and environmental performance of companies, but one difference between the two is that ESG can be viewed as a broader term than CSR. Many studies confirm that firm disclosure of CSR information signals superior ESG performance (Healy and Palepu, 2001; Prado-Lorenzo and Garcia-Sanchez, 2010), especially the first release of a CSR report, which we use in our study. Therefore, we apply the first release of a CSR report as a shock to firms' ESG performance. In this section, we focus on consumers' spending response to the shock.

We obtain the information about the release of firms' CSR reports from the CSMAR database. The data provide information about the release time, the content of each firm's CSR report, and details of the firm's characteristics. First, we obtain the time when each firm released its first CSR report and retain those firms whose first release date falls within or after the sample period of our credit card data. Next, we match the firms with the credit card data. Similar to the above analysis, we only retain consumers who only purchase from one firm. Finally, we are left with 53 firms and 4,979 consumers. The CSMAR database provides information on whether a firm's CSR report discloses information on 10 areas related to shareholder protection, creditor protection, staff protection, delivery protection, customer protection, environmental protection, public relations, system construction, work safety and deficiency. We count how many areas each firm discloses in its first CSR report and use this as a CSR score

[14] A CSR report can be disclosed either as a separate report or as part of the annual report. According to the CSMAR database, 1,040 A-share firms disclosed separate CSR reports in 2021, representing 24% of A-share firms.

to measure the magnitude of the ESG performance shock (Kong et al., 2022; Wang et al., 2018).

We utilize a staggered DiD framework to examine the effect of the first release of a CSR report on consumers' spending. Each company released their first CSR report at a different time; therefore, the time dummy variable in the staggered DiD refers to the time relative to the first release of a company's CSR report. To maintain consistency with the level of observation in the earlier regression, the DiD analysis is performed at the consumer level. The model specification is as follows:

$$Y_{i,j,t} = \beta_0 + \beta_1 * CSR\ Score_i * 1_{[post]} + \mu_j + \gamma_t + \varepsilon_{i,j,t}, \quad (4)$$

where $Y_{i,j,t}$ measures the credit card spending by consumer *j* on firm *i* in month *t*, and the logarithm term is used in the regression model. $CSR\ Score_i$ represents how many aspects of information are disclosed in the first CSR report and ranges from 1 to 10. A higher CSR score is associated with a greater magnitude of this shock. $1_{[post]}$ equals one for the shock and post-shock months, and zero otherwise. μ_j is a vector of individual fixed effects, and γ_t represents the year-month fixed effects. We cluster standard errors at the individual level.

Table 9 shows the regression results of Eq. (4). In column (1), the estimate for the interaction term of shock magnitude and the post-shock dummy $CSR\ Score_i * 1_{post}$ is significant both statistically and economically. This means that consumers increase their consumption on firms in the months after they release their first CSR report. Specifically, for a one-point increase in CSR score (one additional aspect covered in the first CSR report), the affected consumers' monthly spending increases by 1.1% after the release of the report, compared with that of unaffected consumers. We also include the interaction term of $CSR\ Score_i$ with the event-month dummy ($1_{[0\mathrm{m}]}$) to study the

immediate response after the first release of a CSR report. We find a non-significant response during the release month, as the estimated coefficients of $CSR\ Score_i * 1_{[0m]}$ are statistically non-significant. In column (2), the estimated coefficient of $CSR\ Score_i * 1_{[post]}$ increases, meaning that the impact of the first CSR report on consumption strengthens when the shock month is isolated. When we include $1_{[-1m]}$, which equals one for the month before the shock, its interaction term with $CSR\ Score_i$ is non-significant, as shown in column (3). Overall, our findings suggest that a positive shock to firms' ESG performance through the release of their CSR report increases consumer spending.

[Insert Table 9 Here]

V. Robustness Tests

A. Alternative Measure of Consumption

In addition to examining the response of consumption to corporate ESG profiles, we test the robustness of our findings by examining the number of purchases as an alternative measure of consumption. We aggregate the number of purchases at the individual-firm-quarter level and then repeat our baseline analysis in Table 2 using this aggregate number as the dependent variable. Column (1) in Table 10 presents the results. The estimated coefficient of the lagged ESG rating is statistically and economically significant. A one-unit increase in the ESG rating is associated with an increase of 0.8 % in quarterly consumption by consumers. The economic impact is also significant. An increase in the ESG rating by one standard deviation is associated with an increase in

overall quarterly consumption by 0.9 %, which is equivalent to 2.1% of the standard deviation of consumption.[15]

B. Alternative ESG rating

We replace the ESG rating of the Sino-Securities Index with that of Hexun.com and re-estimate the baseline model, and the regression result is shown in column (2) in Table 10. Because the Hexun ESG ratings are updated annually, we aggregate the credit card data at the individual-firm-year level. The result shows that the coefficient of ESG_{t-1} is positive and significant at the 1% level, indicating that after using a different ESG evaluation method, ESG performance still significantly influences consumers' behaviors. Specifically, a one-unit increase in ESG rating during the previous year results in a 16.3% increase in annual consumption.

C. Active card holders

Additionally, we test the robustness of our results using a sample of active card holders. Compared with non-active card holders, active card holders are more likely to have higher income levels and thus have more disposable income to support firms' ESG activities (Awh and Waters, 1974). Dou et al. (2020) find that active consumers generally contribute more profit and utility to sellers. Therefore, we expect the positive and significant correlation between corporate ESG ratings and consumption to be stronger for active card holders than for non-active cardholders. We define active card holders in two ways. First, we define them as those who have spent in at least half of the months in the sample period (i.e., made transactions in at least 15 months in the 31-month sample period). Second, we define active card holders as those who have spent

[15] 0.008*1.154 = 0.009. 0.008 is the coefficient of ESG_{t-1} in column (1) in Table 10. 1.154 is the standard deviation of the independent variable ESG_{t-1}. 0.009/0.434 = 2.074%. 0.434 is the standard deviation of the dependent variable.

in at least two thirds of the sample period (i.e., been involved in transactions in at least 20 months of the 31-month sample period). Column (3) in Table 10 shows the results when we define active card holders as consumers with monthly spending for at least half of the sample period. The estimated coefficient of ESG_{t-1} is positive and significant at the 1% level. A one-standard-deviation increase in ESG rating is associated with an increase in consumption by 1.7% of the standard deviation. In column (4), we show the results when we define active card holders as consumers with monthly spending for at least two thirds of the sample period. Again, the estimated coefficient of ESG_{t-1} is positive and significant. A one-standard-deviation increase in ESG rating is associated with an increase in consumption by 1.8% of the standard deviation. Even though the impact of firms' ESG performance on consumers' spending is slightly weaker for active card holders compared with the baseline results in Table (2), we still find that the estimated coefficient of ESG_{t-1} in column (4) is greater than that of column (3), suggesting that more active consumers respond more to ESG rating changes.

[Insert Table 10 Here]

VI. Conclusion

In this paper, we examine how corporate ESG ratings influence consumers' spending behavior based on transaction-level credit card spending from a major Chinese commercial bank. We find that ESG performance profoundly affects consumers' credit card spending behavior and the effects are temporally highly concentrated. Only the current quarterly ESG rating and the first and second lags of quarterly ESG rating have an impact on consumption, especially the first lagged measurement. A one-unit increase in ESG rating in a given quarter corresponds to a 4.9 % increase in consumer consumption in the next quarter. In addition, we find that the consumption responses to

firms' ESG performance are heterogeneous in the type of consumption and the type of consumer. The response to firms' ESG ratings is stronger among female, unmarried, younger, and more educated consumers, and in the consumption of non-essentials. Additionally, we find that consumers' attention plays a crucial role in determining the relationship between firms' ESG performance and consumers' spending. As a firm's ESG rating rises, the amount of related news coverage also increases, as well as consumer attention, which leads to a greater impact on consumer spending. Furthermore, we find that consumer spending has an impact on the value of a firm, particularly its profitability. This may be due to the fact that consumers are more likely to reward firms with high ESG performance by increasing their purchase intentions, and as a result, the increased cash flow associated with the improved ESG performance ultimately improves the value of the firm.

To mitigate endogeneity concerns, we apply two DiD analyses using the PIL pilot program and the first release of a firm's CSR report as shocks to firms' ESG performance. The PIL pilot program is perceived as a shock at the city level, while the first release of the CSR report is perceived as a direct shock at the firm level. We find that consumers in the treatment groups increase their spending in the months following the event, compared with those in the control groups. We also conduct several robustness tests, including using alternative consumption measures, alternative ESG ratings, and different samples, and our main results remain robust.

Overall, our paper provides direct evidence that firms' ESG performance influences consumers' spending behavior, which is an effective mechanism to increase firm value.

REFERENCES

Aaronson, Daniel, Sumit Agarwal, and Eric French. 2012. "The Spending and Debt Response to Minimum Wage Hikes." *American Economic Review* 102 (7): 3111-39.

Agarwal, Sumit, Yongheng Deng, Quanlin Gu, Jia He, Wenlan Qian, and Yuan Ren. 2022. "Mortgage Debt, Hand-to-mouth Households, and Monetary Policy Transmission." *Review of Finance* 26 (3): 487-520.

Agarwal, Sumit, Chunlin Liu, and Nicholas S. Souleles. 2007. "The Reaction of Consumer Spending and Debt to Tax Rebates—Evidence from Consumer Credit Data." *Journal of Political Economy* 115 (6): 986-1019.

Agarwal, Sumit, Nathan Marwell, and Leslie McGranahan. 2017. "Consumption Responses to Temporary Tax Incentives: Evidence from State Sales Tax Holidays." *American Economic Journal: Economic Policy* 9 (4): 1-27.

Agarwal, Sumit, and Wenlan Qian. 2014. "Consumption and Debt Response to Unanticipated Income Shocks: Evidence from a Natural Experiment in Singapore." *American Economic Review* 104 (12): 4205-30.

Agarwal, Sumit, and Wenlan Qian. 2017. "Access to Home Equity and Consumption: Evidence from a Policy Experiment." *Review of Economics and Statistics* 99 (1): 40-52.

Albuquerque, Rui, Yrjö Koskinen, and Chendi Zhang. 2019. "Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Management Science* 65 (10): 4451-69.

Amoroso, Donald L., and Francisco Roman. 2015. "Corporate Social Responsibility and Purchase Intention: The Roles of Loyalty, Advocacy and Quality of Life in the Philippines." *International Journal of Management* 4 (1): 25-41.

Auger, Pat, and Timothy M. Devinney. 2007. "Do What Consumers Say Matter? The Misalignment of Preferences with Unconstrained Ethical Intentions." *Journal of Business Ethics* 76: 361-83.

Awh, Robert Y., and Don Waters. 1974. "A Discriminant Analysis of Economic, Demographic, and Attitudinal Characteristics of Bank Charge-card Holders: A Case Study." *Journal of Finance* 29 (3): 973-80.

Aydin, Deniz. 2022. "Consumption Response to Credit Expansions: Evidence from Experimental Assignment of 45,307 Credit Lines." *American Economic Review* 112 (1): 1-40.

Barber, Brad M., and Terrance Odean. 2008. "All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors." *Review of Financial Studies* 21 (2): 785-818.

Beijing Hexun Online Consulting Co., Ltd. 2013-2014. "Corporate Social Responsibility Rating of Listed firms." http://stockdata.stock.hexun.com (accessed March 1, 2021).

Bénabou, Roland, and Jean Tirole. 2010. "Individual and Corporate Social Responsibility." *Economica* 77 (305): 1-19.

Borghesi, Richard, Joel F. Houston, and Andy Naranjo. 2014. "Corporate Socially Responsible Investments: CEO Altruism, Reputation, and Shareholder Interests." *Journal of Corporate Finance* 26: 164-81.

Brown, Tom J., and Peter A. Dacin. 1997. "The Company and the Product: Corporate Associations and Consumer Product Responses." *Journal of Marketing* 61 (1): 68-84.

Chen, Tianhao, Jianshu Shao, and Xuechun Wang. 2020. "Effect Test and Improvement Path of Procuratorial Administrative Public Interest Litigation System-An Empirical Analysis Based on Difference-in-differences Method." *Peking University Law Journal* 32 (5): 1328-52.

Chung, Ki-Han, Ji-Eun Yu, Myeong-Guk Choi, and Jae-Ik Shin. 2015. "The Effects of CSR on Customer Satisfaction and Loyalty in China: The Moderating Role of Corporate Image." *Journal of Economics, Business and Management* 3 (5): 542-47.

Creyer, Elizabeth H. 1997. “The Influence of Firm Behavior on Purchase Intention: Do Consumers Really Care About Business Ethics?” *Journal of Consumer Marketing* 14 (6): 421-32.

Cronqvist, Henrik, and Frank Yu. 2017. “Shaped by Their Daughters: Executives, Female Socialization, and Corporate Social Responsibility.” *Journal of Financial Economics* 126 (3): 543-62.

Da, Zhi, Joseph Engelberg, and Pengjie Gao. 2011. “In Search of Attention.” *Journal of Finance* 66 (5): 1461-99.

d’Astous, Alain, and Isabelle Jacob. 2002. “Understanding Consumer Reactions to Premium-based Promotional Offers.” *European Journal of Marketing* 36 (11/12): 1270-86.

d'Astous, Alain, and Valérie Landreville. 2003. “An Experimental Investigation of Factors Affecting Consumers’ Perceptions of Sales Promotions.” *European Journal of Marketing* 37 (11/12): 1746-61.

de Araujo, Douglas Kiarelly Godoy, Joao Barata Ribeiro Blanco Barroso, and Rodrigo Barbone Gonzalez. 2020. “Loan-to-value Policy and Housing Finance: Effects on Constrained Borrowers.” *Journal of Financial Intermediation* 42: 100830.

Dhaliwal, Dan S., Oliver Zhen Li, Albert Tsang, and Yong George Yang. 2011. “Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting.” *The Accounting Review* 86 (1): 59-100.

Di Maggio, Marco, Amir Kermani, Benjamin J. Keys, Tomasz Piskorski, Rodney Ramcharan, Amit Seru, and Vincent Yao. 2017. “Interest Rate Pass-through: Mortgage Rates, Household Consumption, and Voluntary Deleveraging.” *American Economic Review* 107 (11): 3550-88.

Dou, Guowei, Xudong Lin, Robert Chi, and Zunxin Zheng. 2020. “Pricing Strategy of a Two-sided Platform Under Consumer Categorization.” *Journal of Electronic Commerce Research* 21 (2): 130-43.

Duque-Grisales, Eduardo, and Javier Aguilera-Caracuel. 2021. “Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack.” *Journal of Business Ethics* 168 (2): 315-34.

Edmans, Alex, Vivian W. Fang, and Katharina A. Lewellen. 2017. “Equity Vesting and Investment.” *Review of Financial Studies* 30 (7): 2229-71.

Fama, Eugene F., and Kenneth R. French. 2006. “Profitability, Investment and Average Returns.” *Journal of Financial Economics* 82 (3): 491-518.

Fatemi, Ali, Iraj Fooladi, and Hassan Tehranian. 2015. “Valuation Effects of Corporate Social Responsibility.” *Journal of Banking and Finance* 59: 182-92.

Feng, Jingwen, John W. Goodell, and Dehua Shen. 2022. “ESG Rating and Stock Price Crash Risk: Evidence from China.” *Finance Research Letters* 46: 102476.

Flammer, Caroline. 2015. “Does Corporate Social Responsibility Lead to Superior Financial Performance? A Regression Discontinuity Approach.” *Management Science* 61 (11): 2549-68.

Gelman, Michael, Shachar Kariv, Matthew D. Shapiro, Dan Silverman, and Steven Tadelis. 2020. “How Individuals Respond to a Liquidity Shock: Evidence from the 2013 Government Shutdown.” *Journal of Public Economics* 189: 103917.

Gilbert, Thomas, Shimon Kogan, Lars Lochstoer, and Ataman Ozyildirim. 2012. “Investor Inattention and the Market Impact of Summary Statistics.” *Management Science* 58 (2): 336-350.

Gillan, Stuart L., Andrew Koch, and Laura T. Starks. 2021. “Firms and Social Responsibility: A Review of ESG and CSR Research in Corporate Finance.” *Journal of Corporate Finance* 66: 101889.

Grant, Ian C. 2004. “Communicating with Young People Through the Eyes of Marketing Practitioners.” *Journal of Marketing Management* 20 (5-6): 591-606.

Gu, Quanlin, Jia He, Wenlan Qian, and Yuan Ren. 2021. “Housing Booms and Shirking.” SSRN Working Paper 3189933.

Harjoto, Maretno A., and Hoje Jo. 2015. “Legal vs. Normative CSR: Differential Impact on Analyst Dispersion, Stock Return Volatility, Cost of Capital, and Firm Value.” *Journal of Business Ethics* 128: 1-20.

He, Feng, Hanyu Du, and Bo Yu. 2022a. “Corporate ESG Performance and Manager Misconduct: Evidence from China.” *International Review of Financial Analysis* 82: 102201.

He, Feng, Shuqi Qin, Yuanyuan Liu, and Ji George Wu. 2022b. “CSR and Idiosyncratic Risk: Evidence from ESG Information Disclosure.” *Finance Research Letters* 49: 102936.

Healy, Paul M., and Krishna G. Palepu. 2001. “Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature.” *Journal of Accounting and Economics* 31 (1-3): 405-40.

Hung, Mingyi, Jing Shi, and Yongxiang Wang. 2013. “The Effect of Mandatory CSR Disclosure on Information Asymmetry: Evidence from a Quasi-Natural Experiment in China.” SSRN Working Paper 2206877.

Jiao, Yawen. 2010. “Stakeholder Welfare and Firm Value.” *Journal of Banking and Finance* 34 (10): 2549-61.

Jo, Hoje, and Maretno A. Harjoto. 2011. “Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility.” *Journal of Business Ethics* 103: 351-83.

Kalcheva, Ivalina, and Karl V. Lins. 2007. “International Evidence on Cash Holdings and Expected Managerial Agency Problems.” *Review of Financial Studies* 20 (4): 1087-112.

Kim, Jeong-Bon, Bing Li, and Zhenbin Liu. 2018. “Does Social Performance Influence Breadth of Ownership?” *Journal of Business Finance and Accounting* 45 (9-10): 1164-94.

Kong, Dongmin, Mengxu Xiong, and Ni Qin. 2022. “Business Tax Reform and CSR Engagement: Evidence from China.” *International Review of Financial Analysis* 82: 102178.

Laeven, Luc, and Ross Levine. 2008. “Complex Ownership Structures and Corporate Valuations.” *Review of Financial Studies* 21 (2): 579-604.

Lang, Mark H., Karl V. Lins, and Darius P. Miller. 2004. “Concentrated Control, Analyst Following, and Valuation: Do Analysts Matter Most When Investors Are Protected Least?” *Journal of Accounting Research* 42 (3): 589-623.

Lee, Jim. 2009. “Does Size Matter in Firm Performance? Evidence from US Public Firms.” *International Journal of the Economics of Business* 16 (2): 189-203.

Lee, Ki-Hoon, and Dongyoung Shin. 2010. “Consumers’ Responses to CSR Activities: The Linkage Between Increased Awareness and Purchase Intention.” *Public Relations Review* 36 (2): 193-95.

Li, Hao, Xuan Zhang, and Yang Zhao. 2022. “ESG and Firm’s Default Risk.” *Finance Research Letters* 47: 102713.

Liu, Wei, and Wenyu Fan. 2021. “Does Public Interest Litigation Promote the Performance of Urban Environmental Governance? An Empirical Study Based on Micro-data of 287 Prefecture-level Cities.” *Journal of Shanghai University of Finance and Economics* 23 (4): 48-62.

Luchs, Michael G., and Todd A. Mooradian. 2012. “Sex, Personality, and Sustainable Consumer Behaviour: Elucidating the Gender Effect.” *Journal of Consumer Policy* 35: 127-44.

Maignan, Isabelle, and Odies Collins Ferrell. 2001. “Corporate Citizenship as a Marketing Instrument-Concepts, Evidence and Research Directions.” *European Journal of Marketing* 35 (3/4): 457-84.

Mak, Yuen Teen, and Yuanto Kusnadi. 2005. “Size Really Matters: Further Evidence on the Negative Relationship between Board Size and Firm Value.” *Pacific-Basin Finance Journal* 13 (3): 301-18.

McCarthy, Scott, Barry Oliver, and Sizhe Song. 2017. “Corporate Social Responsibility and CEO Confidence.” *Journal of Banking and Finance* 75: 280-91.

McWilliams, Abagail, and Donald Siegel. 2001. “Corporate Social Responsibility: a Theory of the Firm Perspective.” *Academy of Management Review* 26 (1): 117-27.

Mela, Carl F., Sunil Gupta, and Donald R. Lehmann. 1997. “The Long-Term Impact of Promotion and Advertising on Consumer Brand Choice.” *Journal of Marketing Research* 34 (2): 248-61.

Murray, Keith B., and Christine M. Vogel. 1997. “Using a Hierarchy-of-effects Approach to Gauge the Effectiveness of Corporate Social Responsibility to Generate Goodwill toward the Firm: Financial versus Nonfinancial Impacts.” *Journal of Business Research* 38 (2): 141-59.

Olafsson, Arna, and Michaela Pagel. 2018. “The Liquid Hand-to-Mouth: Evidence from Personal Finance Management Software.” *Review of Financial Studies* 31 (11): 4398-446.

O’Sullivan, Don, and John McCallig. 2012. “Customer Satisfaction, Earnings and Firm Value.” *European Journal of Marketing* 46 (6): 827-43.

Parker, Jonathan A. 1999. “The Reaction of Household Consumption to Predictable Changes in Social Security Taxes.” *American Economic Review* 89 (4): 959-73.

Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland. 2013. “Consumer Spending and the Economic Stimulus Payments of 2008.” *American Economic Review* 103 (6): 2530-53.

Pauwels, Koen, Dominique M. Hanssens, and Sivaramakrishnan Siddarth. 2002. “The Long-Term Effects of Price Promotions on Category Incidence, Brand Choice, and Purchase Quantity.” *Journal of Marketing Research* 39 (4): 421-39.

Prado-Lorenzo, Jose-Manuel, and Isabel-Maria Garcia-Sanchez. 2010. “The Role of the Board of Directors in Disseminating Relevant Information on Greenhouse Gases”. *Journal of Business Ethics* 97: 391-424.

Scholnick, Barry. 2013. “Consumption Smoothing after the Final Mortgage Payment: Testing the Magnitude Hypothesis.” *Review of Economics and Statistics* 95 (4): 1444-49.

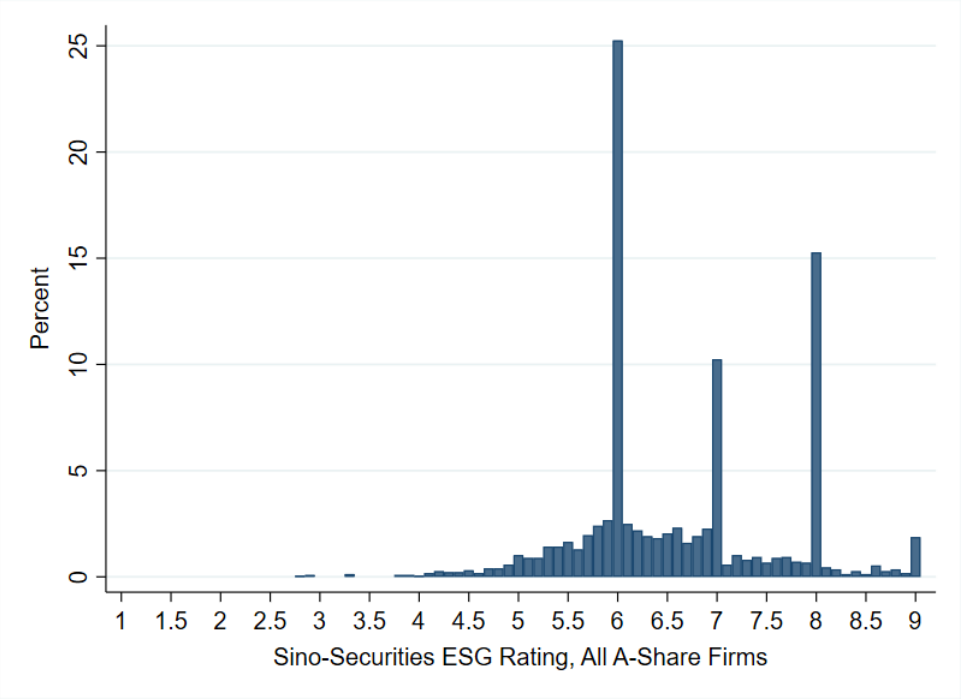
Sen, Sankar, and Chitra Bhanu Bhattacharya. 2001. “Does Doing Good Always Lead to Doing Better? Consumer Reactions to Corporate Social Responsibility.” *Journal of Marketing Research* 38 (2): 225-43.

Servaes, Henri, and Ane Tamayo. 2013. “The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness.” *Management Science* 59 (5): 1045-61.

Sethi, S. Prakash, Terrence F. Martell, and Mert Demir. 2017. “Enhancing the Role and Effectiveness of Corporate Social Responsibility (CSR) Reports: The Missing Element of Content Verification and Integrity Assurance.” *Journal of Business Ethics* 144: 59-82.

Shapiro, Matthew D., and Joel Slemrod. 1995. “Consumer Response to the Timing of Income: Evidence from a Change in Tax Withholding.” *American Economic Review* 85 (1): 274-83.
Shapiro, Matthew D., and Joel Slemrod. 2003. “Consumer Response to Tax Rebates.” *American Economic Review* 93 (1): 381-96.
Shenzhen Xishima Data Technology Co., Ltd. 2012-2015. “China Stock Market & Accounting Research Database (CSMAR).” https://www.gtarsc.com/ (accessed March 1, 2021).
Sheriff, Aisha M., and P. Nagesh. 2007. “The Advertising Challenge: Understanding the Multifaceted Youth.” *ICFAI Journal of Consumer behavior* 2(4).
Sicherman, Nachum, George Loewenstein, Duane J. Seppi, and Stephen P. Utkus. 2016. “Financial Attention.” *Review of Financial Studies* 29 (4): 863-97.
Sino-Securities Index Information Service (Shanghai) Co., Ltd. 2012-2015. “Sino-Securities ESG Ratings.” https://chindices.com/esg-data.html (accessed March 1, 2021).
Stephens Jr, Melvin. 2008. “The Consumption Response to Predictable Changes in Discretionary Income: Evidence from the Repayment of Vehicle Loans.” *Review of Economics and Statistics* 90 (2): 241-52.
Stephens Jr, Melvin. 2003. “‘3rd of tha Month’: Do Social Security Recipients Smooth Consumption Between Checks?” *American Economic Review* 93 (1): 406-22.
Saliha, Theiri, and Ati Abdessatar. 2011. “The Determinants of Financial Performance: An Empirical Test Using the Simultaneous Equations Method.” *Economics and Finance Review* 10 (1): 1-19.
Tian, Zhilong, Rui Wang, and Wen Yang. 2011. “Consumer Responses to Corporate Social Responsibility (CSR) in China.” *Journal of Business Ethics* 101: 197-212.
Titman, Sheridan, KC John Wei, and Feixue Xie. 2004. “Capital Investments and Stock Returns.” *Journal of financial and Quantitative Analysis* 39 (4): 677-700.
Wang, Kun Tracy, and Dejia Li. 2016. “Market Reactions to the First-Time Disclosure of Corporate Social Responsibility Reports: Evidence from China.” *Journal of Business Ethics* 138: 661-82.
Wang, Xue, Feng Cao, and Kangtao Ye. 2018. “Mandatory Corporate Social Responsibility (CSR) Reporting and Financial Reporting Quality: Evidence from a Quasi-Natural Experiment.” *Journal of Business Ethics* 152: 253-74.
Xie, Yi. 2014. “The Effects of Corporate Ability and Corporate Social Responsibility on Winning Customer Support: An Integrative Examination of the Roles of Satisfaction, Trust and Identification.” *Global Economic Review* 43 (1): 73-92.
Yi, Yuyang, Zongyi Zhang, and Youliang Yan. 2021. “Kindness is Rewarded! The Impact of Corporate Social Responsibility on Chinese Market Reactions to the COVID-19 Pandemic.” *Economics Letters* 208: 110066.
Yu, Hongwei, Luqi Liao, Shiyu Qu, Debin Fang, Lianfa Luo, and Guangqin Xiong. 2021. “Environmental Regulation and Corporate Tax Avoidance: A Quasi-natural Experiments Study Based on China’s New Environmental Protection Law.” *Journal of Environmental Management* 296: 113160.
Jiahao, Zhang, Fan Wenyu, and Gao Yuan. 2022. “Environmental Judicial System Reform and Local Green Innovation: Evidence from Pilot Public Interest Litigation.” *Journal of Finance and Economics* 48 (10): 19-33.
Zhou, Fangzhao, Jichen Zhu, Yawei Qi, Jun Yang, and Yunbi An. 2021. “Multi-dimensional Corporate Social Responsibilities and Stock Price Crash Risk: Evidence from China.” *International Review of Financial Analysis* 78: 101928.

Panel A. Distribution of the average ESG rating, all A-share firms



Panel B. Distribution of the average ESG rating, sample firms

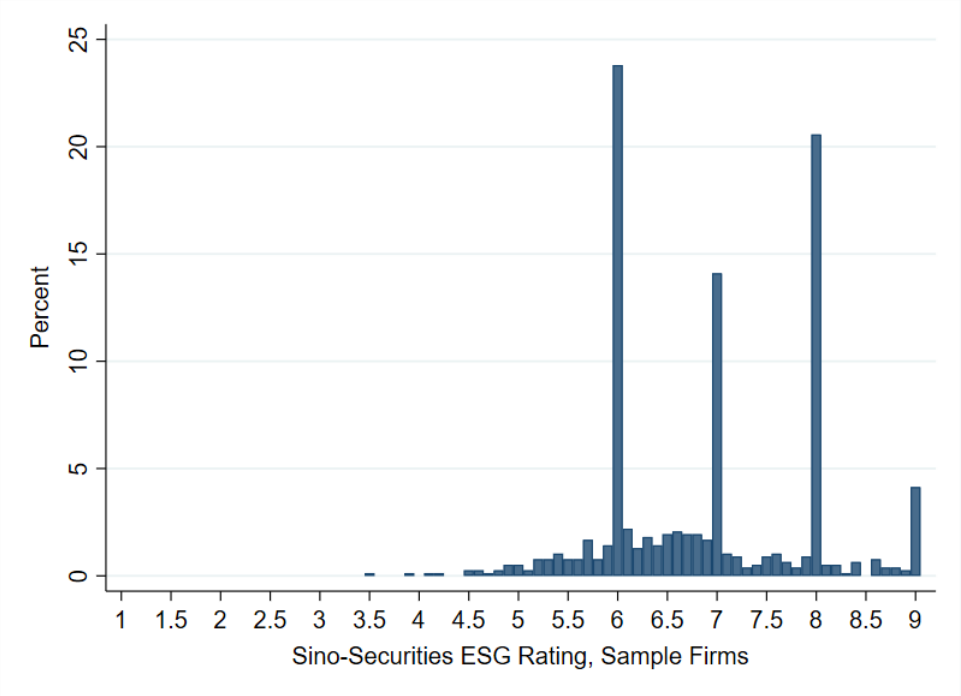


FIGURE 1—CROSS-SECTIONAL DISTRIBUTION OF SINO-SECURITIES ESG RATING

Notes: Panel A reports the cross-sectional distribution of the average ESG rating of all A-share firms covered by the Sino-Securities Index. We also calculate the average ESG rating of the listed firms in our sample and plot the distribution in Panel B. The average ESG rating of each firm is calculated as the time-series mean of the firm's quarterly ESG rating observed during our sample period.

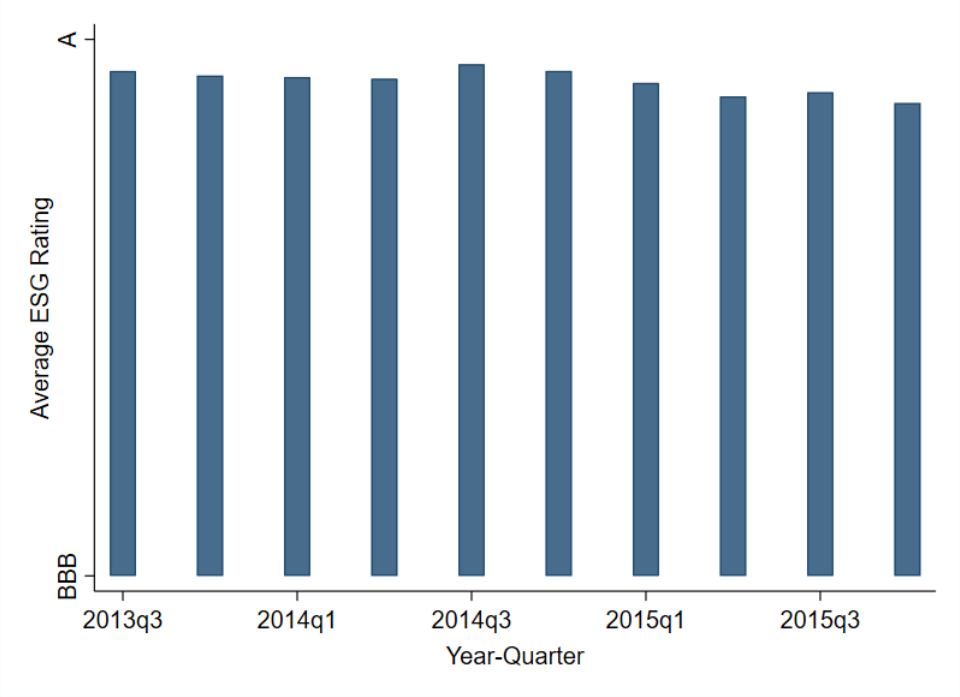


FIGURE 2—SINO-SECURITIES ESG RATING BY QUARTER

Notes: The figure shows the mean level of firms' ESG ratings by year-quarter. The sample period is the third quarter of 2013 to the fourth quarter of 2015.

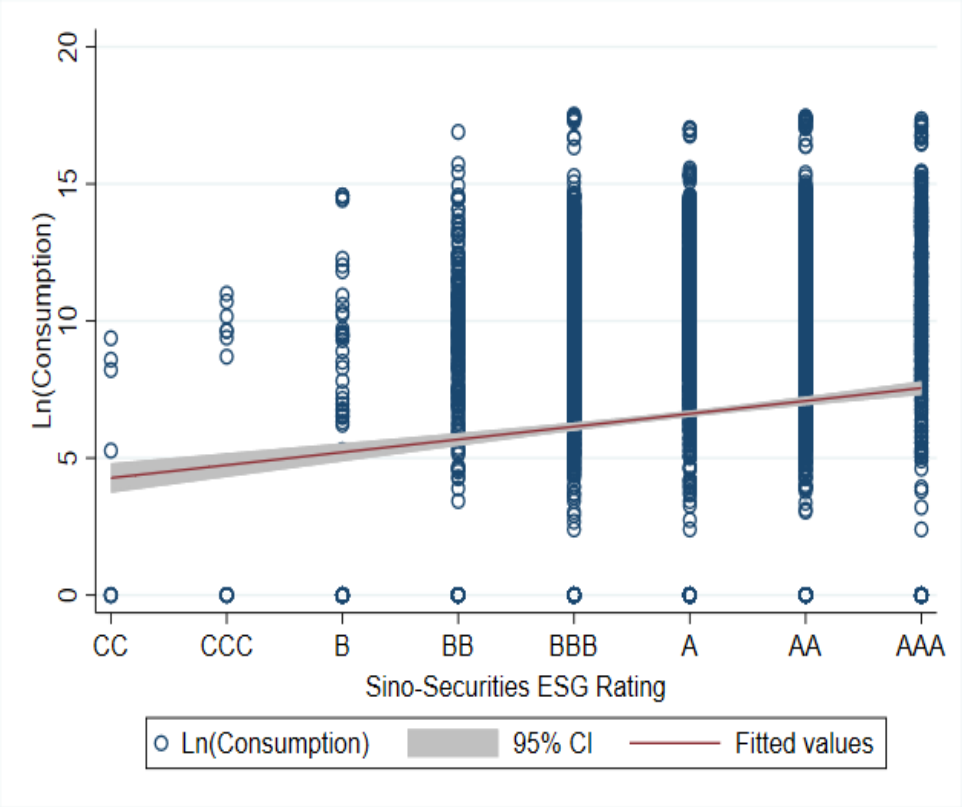


FIGURE 3—DISTRIBUTION OF SINO-SECURITIES ESG RATING AND CONSUMPTION

Notes: The figure presents the scatterplots of the log of consumption and firms' ESG ratings. The ESG ratings of the firms are plotted on the x-axis and the logarithm of the corresponding consumption is plotted on the y-axis for each quarter during the sample period. Each circle is plotted at the individual-firm-quarter level. The fitted linear relationship is represented by a solid line and the gray shadow denotes the 95% confidence interval.

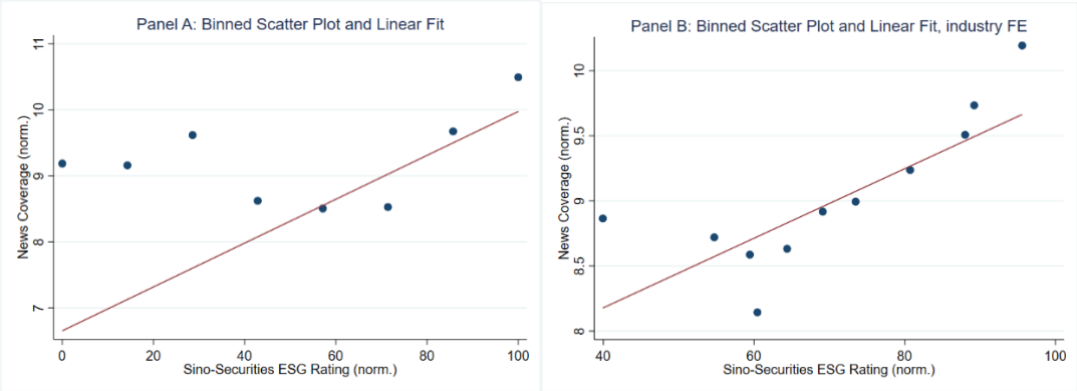


FIGURE 4—NEWS COVERAGE AND SINO-SECURITIES ESG RATING

Notes: This figure shows the correlation between firms' ESG ratings and firm-related news coverage at the quarter level. The news coverage is proxied by the number of news reports obtained from the CSMAR database. Panel A shows a binned scatter plot including a linear fit. Panel B shows the same plot after partialling out industry fixed effects. The number of news reports and the ESG ratings are each normalized to lie within the interval [0, 100] over the sample period (third quarter of 2013 to fourth quarter of 2015).

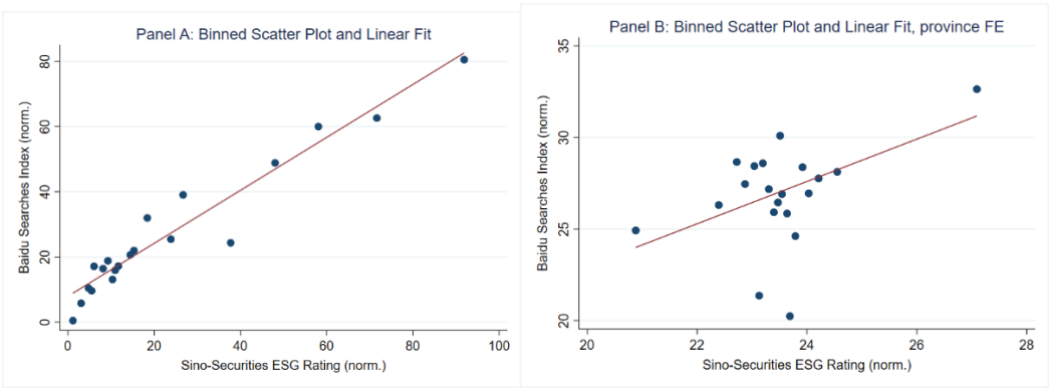


FIGURE 5—BAIDU SEARCH INDEX AND SINO-SECURITIES ESG RATING

Notes: These figures show the correlation between the Baidu Search Index for the term "corporate social responsibility" and the mean of the Sino-Securities ESG ratings at the province-quarter level. Panel A shows a binned scatter plot including a linear fit. Panel B shows the same plot after partialling out province fixed effects. The Baidu Search Index and the ESG ratings are each normalized to lie within the interval [0, 100] over the sample period (third quarter of 2013 to fourth quarter of 2015).

TABLE 1— DESCRIPTIVE STATISTICS

	Obs	Mean	SD	Min	Max
Panel A: Consumption					
C_t (Quarterly Consumption)	4,609,708	421	4,516	0	2,430,910
P_t (Number of Purchases)	4,609,708	0.407	2.35	0	1,611
Panel B: Consumer characteristics					
Male	289,928	0.555	0.497	0	1
Married	289,928	0.702	0.458	0	1
Age	289,928	36.5	8.41	18	60
Bachelor Degree or Above	289,928	0.553	0.497	0	1
Panel C: Firm characteristics					
FC	6,236	313,765	2,423,231	0	40,931,808
ESG	6,236	6.94	1.12	2	9
Size (million)	6,236	42,842	174,868	1,356	3,123,786
BM	6,236	0.658	0.242	0.137	1.13
EDR	6,236	0.498	0.205	0.069	0.927
Capex Ratio	6,236	0.051	0.043	0.000	0.217
Sales Growth Rate	6,236	0.094	0.294	-0.588	2.54
ROA	6,118	0.025	0.029	-0.052	0.138
ROE	6,133	0.048	0.056	-0.173	0.249
Sales per Share	6,144	5.49	6.58	0.088	45.6
ROE Growth Rate	5,585	-0.183	1.42	-16.6	6.51

Notes: This table summarizes the consumption, firm characteristics, and consumers characteristics in our sample. The sample period covers the third quarter of 2013 to the fourth quarter of 2015. Panel A reports consumers' quarterly consumption and the number of purchases from each firm. Both variables are measured quarterly and reported at the individual-firm-quarter level. Panel B reports the demographic information of the consumers in our final sample. Panel C reports firm characteristics for the firms included in our main sample. All firm characteristics are measured quarterly, except *Capex Ratio*, which is measured annually. *Quarterly Consumption* and *Number of Purchases* measure the spending amount and number of purchases made by consumers in each quarter and firm, respectively. *Male* is a dummy variable that equals one if the consumer is male, and zero otherwise. *Married* is a dummy variable that equals one if the consumer is married, and zero otherwise. *Age* is the age at which a consumer enters the sample. *Bachelor Degree or Above* is a dummy variable that equals one if the consumer has a bachelor degree or above, and zero otherwise. *FC* represents the aggregated consumption for each firm during quarter *t*. *ESG* denotes the corporate ESG rating using the Sino-Securities Index, which is the key independent variable of interest. *Size* is the market value of equity. *BM* represents the book-to-market ratio. *EDR* represents the equity-to-debt ratio. *Capex Ratio* represents the ratio of capital expenditure scaled by total assets. *Sales Growth Rate* represents the sequential growth rate of sales. The definitions of all of the variables are provided in Table A.1.

TABLE 2—CONSUMPTION RESPONSE TO FIRMS' ESG RATINGS

	Dependent variable: $Ln(C_t)$	
	(1)	(2)
ESG_{t-1}	0.049	0.049
	(0.003)	(0.003)
$Ln(Size_{t-1})$	0.142	0.142
	(0.012)	(0.012)
BM_{t-1}	0.273	0.273
	(0.021)	(0.021)
EDR_{t-1}	-0.532	-0.532
	(0.032)	(0.032)
$Capex\ Ratio_{t-1}$	-1.024	-1.024
	(0.081)	(0.081)
$Sales\ Growth\ Rate_{t-1}$	0.001	0.001
	(0.013)	(0.013)
Constant	-0.638	-0.638
	(0.141)	(0.141)
Consumer FEs	NO	YES
Firm FEs	YES	YES
Quarter FEs	YES	YES
Cluster	Individual	Individual
Observations	4,609,582	4,609,272
R-squared	0.014	0.080

Notes: This table examines the effect of one-quarter-lagged firms' ESG ratings on consumption, specifically the OLS estimates of the fixed effects model in Eq. (1). The dependent variable C_t captures consumers' quarterly consumption amount on each firm in quarter *t*. We calculate the log of C_t as ln (C_t + 1) to include zero-consumption cases. The main independent variable, ESG_{t-1}, is firms' ESG ratings obtained from the Sino-Securities Index in quarter *t*-1. All specifications include firm fixed effects and year-quarter fixed effects, and individual fixed effects are added in column (2). We control for the following firm characteristics: firm size, book-to-market ratio, equity-to-debt ratio, capital expenditure/total assets, and sales growth rate. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 3—CONSUMPTION RESPONSE TO ESG PROFILE OF FIRMS

	Dependent variable: $Ln(C_t)$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ESG_t	0.030						0.012
	(0.003)						(0.003)
ESG_{t-1}		0.049					0.031
		(0.003)					(0.003)
ESG_{t-2}			0.044				0.027
			(0.003)				(0.003)
ESG_{t-3}				0.000			
				(0.003)			
ESG_{t-4}					0.004		
					(0.003)		
ESG_{t-5}						-0.002	
						(0.003)	
$Ln(Size_{t-1})$	0.150	0.142	0.148	0.150	0.150	0.149	0.144
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
BM_{t-1}	0.312	0.273	0.290	0.349	0.349	0.350	0.249
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
EDR_{t-1}	-0.554	-0.532	-0.538	-0.589	-0.585	-0.589	-0.510
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
$Capex\ Ratio_{t-1}$	-0.983	-1.024	-0.969	-0.956	-0.951	-0.957	-1.021
	(0.081)	(0.081)	(0.080)	(0.080)	(0.080)	(0.081)	(0.081)
$Sales\ Growth\ Rate_{t-1}$	0.000	0.001	-0.029	-0.030	-0.031	-0.030	0.002
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Constant	-0.611	-0.638	-0.681	-0.393	-0.422	-0.375	-0.808
	(0.141)	(0.141)	(0.142)	(0.143)	(0.142)	(0.144)	(0.142)
Consumer FEs	YES	YES	YES	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES	YES	YES	YES
Quarter FEs	YES	YES	YES	YES	YES	YES	YES
Cluster	Individual	Individual	Individual	Individual	Individual	Individual	Individual
Observations	4,609,393	4,609,272	4,609,139	4,606,949	4,599,429	4,590,757	4,609,139
R-squared	0.080	0.080	0.080	0.080	0.080	0.080	0.080

Notes: This table examines the effect of firms' (lagged) ESG ratings on consumption, specifically the OLS estimates of the fixed effects model in Eq. (1). The dependent variable C_t captures consumers' quarterly consumption amount on each firm in quarter *t*. We calculate the log of C_t as ln (C_t + 1) to include zero-consumption cases. The main independent variable, *ESG*, is firms' ESG ratings obtained from the Sino-Securities Index. This table displays the effect of contemporaneous ESG ratings (column 1) as well as up to five quarterly lags of ESG ratings (columns 2–6). In column (7), we jointly include the ESG ratings for the current quarter and the previous two quarters in the regression. All specifications include individual, firm, and year-quarter fixed effects and control for the following firm characteristics: firm size, book-to-market ratio, equity-to-debt ratio, capital expenditure/total assets, and sales growth rate. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 4—THE EFFECT OF CONSUMPTION ON FIRMS' PROFITABILITY

	ROA_t	ROE_t	$ROE\ Growth_t$	$Sales\ per\ Share_t$
	(1)	(2)	(3)	(4)
$Ln(FC_t)$	0.001	0.001	0.011	0.082
	(0.000)	(0.000)	(0.006)	(0.029)
$Ln(Size_t)$	0.009	0.019	0.121	1.514
	(0.002)	(0.002)	(0.015)	(0.251)
BM_t	-0.025	-0.049	-0.037	2.778
	(0.003)	(0.007)	(0.127)	(0.714)
EDR_t	-0.071	-0.062	-1.093	6.074
	(0.007)	(0.019)	(0.238)	(1.382)
$Capex\ Ratio_t$	0.062	0.124	0.432	2.901
	(0.018)	(0.033)	(0.682)	(2.821)
$Sales\ Growth\ Rate_t$	0.014	0.036	1.017	1.849
	(0.004)	(0.008)	(0.231)	(0.620)
Constant	-0.015	-0.083	-1.009	-14.137
	(0.012)	(0.016)	(0.145)	(3.009)
Industry FEs	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES
Cluster	Industry	Industry	Industry	Industry
Observations	6,124	6,132	5,595	6,141
R-squared	0.305	0.233	0.053	0.322

Notes: This table examines the effect of consumption on firms' profitability, specifically the OLS estimates of the fixed effects model in Eq. (2). The four dependent variables, ROA_t, ROE_t, $ROE\ Growth_t$ and $Sales\ per\ Share_t$, are proxies for firms' profitability. The main independent variable, FC_t, denotes firms' aggregated consumption, which is calculated as the credit card spending of its consumers in quarter *t*. All specifications include industry and year fixed effects and control for the following firm characteristics: firm size, book-to-market ratio, equity-to-debt ratio, capital expenditure/total assets, and sales growth rate. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the industry level.

TABLE 5—NEWS COVERAGE, ESG, AND CONSUMPTION

	Dependent variable: $Ln(C_t)$	
	(1)	(2)
ESG_{t-1}	-0.005	0.038
	(0.014)	(0.003)
$Ln(Numer\ of\ News_{t-1})$	-0.052	
	(0.028)	
$ESG_{t-1} * Ln(Numer\ of\ News_{t-1})$	0.014	
	(0.004)	
$Higher\ News\ Coverage_{t-1}$		-0.111
		(0.020)
$ESG_{t-1} * Higher\ News\ Coverage_{t-1}$		0.020
		(0.003)
Firm characteristic controls	YES	YES
Consumer FEs	YES	YES
Firm FEs	YES	YES
Quarter FEs	YES	YES
Cluster	Individual	Individual
Observations	4,609,272	4,609,272
R-squared	0.080	0.080

Notes: This table examines how the effect of firms' ESG ratings on consumption is affected by news coverage. The dependent variable C_t captures consumers' quarterly consumption amount on each firm in quarter *t*. We calculate the log of C_t as ln (C_t + 1) to include zero-consumption cases. We re-estimate Eq. (1) by including the measure of firms' news coverage and the interaction term of news coverage and ESG ratings into the regression. In column (1), the variable $Ln(Numer\ of\ News)$ represents the logarithm of the number of news reports on firms in quarter *t*-1. In column (2), we calculate the median of the number of news reports on firms at the industry-quarter level, where the variable $Higher\ News\ Coverage_{t-1}$ equals one if the number of news reports on the firm is above the median, and zero otherwise. All specifications include individual, firm, and year-quarter fixed effects and control for the firms' characteristics. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 6—HETEROGENEITY: BY CONSUMER CHARACTERISTICS

	Dependent variable: $Ln(C_t)$			
	(1)	(2)	(3)	(4)
ESG_{t-1}	0.060	0.063	0.038	0.045
	(0.004)	(0.004)	(0.004)	(0.004)
$ESG_{t-1} * Male$	-0.018			
	(0.004)			
$ESG_{t-1} * Married$		-0.019		
		(0.004)		
$ESG_{t-1} * Below\ Median\ Age$			0.022	
			(0.004)	
$ESG_{t-1} * Bachelor\ Degree\ or\ Above$				0.009
				(0.004)
Constant	-0.645	-0.638	-0.635	-0.639
	(0.141)	(0.141)	(0.141)	(0.141)
Firm characteristic controls	YES	YES	YES	YES
Consumer FEs	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES
Quarter FEs	YES	YES	YES	YES
Cluster	Individual	Individual	Individual	Individual
Observations	4,609,262	4,609,272	4,609,272	4,609,272
R-squared	0.080	0.080	0.080	0.080

Notes: This table examines the heterogeneity in the effect of firms' ESG ratings on consumption by consumer characteristics. The dependent variable C_t captures consumers' quarterly consumption amount on each firm in quarter *t*. We calculate the log of C_t as ln (C_t + 1) to include zero-consumption cases. The main independent variable, ESG_{t-1}, is the firms' ESG ratings in quarter *t*-1. *Male* is a dummy variable that equals one if the consumer is male, and zero otherwise. *Married* is a dummy variable that equals one if the consumer is married, and zero otherwise. *Below Median Age* is a dummy variable that equals one if the consumer is older than the median age, which equals 36 in our sample, and zero otherwise. *Bachelor Degree or Above* is a dummy variable that equals one if the consumer has a bachelor degree or above, and zero otherwise. All specifications include individual, firm, and year-quarter fixed effects and control for the firms' characteristics. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 7—HETEROGENEITY: BY TYPE OF SPENDING

	Dependent variable: $Ln(C_t)$	
	Essential Consumption	Non-Essential Consumption
	(1)	(2)
ESG_{t-1}	0.019	0.031
	(0.003)	(0.002)
Constant	-0.930	-0.012
	(0.096)	(0.104)
Firm characteristic controls	YES	YES
Consumer FEs	YES	YES
Firm FEs	YES	YES
Quarter FEs	YES	YES
Cluster	Individual	Individual
Observations	4,594,020	4,594,020
R-squared	0.165	0.117

Notes: This table examines the heterogeneity in the effect of firms' ESG ratings on consumption by spending type. We use the Merchant Category Codes in the credit card transaction records to categorize consumption into essential and non-essential consumption. The dependent variable C_t captures consumers' quarterly consumption amount on each firm in quarter t. We calculate the log of C_t as ln (C_t + 1) to include zero-consumption cases. The main independent variable, ESG_{t-1}, is firms' ESG ratings in quarter t-1. All specifications include individual, firm, and year-quarter fixed effects and control for the firms' characteristics. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is the third quarter of 2013 to the fourth quarter of 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 8—DID ANALYSIS USING THE PIL PILOT PROGRAM

	Dependent variable: $Ln(C_t)$			
	(1)	(2)	(3)	(4)
$ESG\ Shock * 1_{[-1m]}$			0.014	0.014
			(0.017)	(0.017)
$ESG\ Shock * 1_{[0m]}$		0.044	0.045	0.045
		(0.015)	(0.015)	(0.015)
$ESG\ Shock * 1_{[post]}$	0.051	0.052	0.053	
	(0.009)	(0.010)	(0.010)	
$ESG\ Shock * 1_{[1m]}$				0.057
				(0.015)
$ESG\ Shock * 1_{[2m]}$				0.001
				(0.017)
$ESG\ Shock * 1_{[3m]}$				0.030
				(0.016)
$ESG\ Shock * 1_{[4m]}$				0.071
				(0.016)
$ESG\ Shock * 1_{[5m]}$				0.104
				(0.016)
Constant	0.165	0.165	0.161	0.166
	(0.148)	(0.148)	(0.148)	(0.148)
Firm characteristic controls	YES	YES	YES	YES
Consumer FEs	YES	YES	YES	YES
Month FEs	YES	YES	YES	YES
Cluster	Individual	Individual	Individual	Individual
Observations	3,265,629	3,265,629	3,265,629	3,265,629
R-squared	0.145	0.145	0.145	0.145

Notes: This table examines the effect of the PIL pilot program on consumption, specifically the OLS estimates of the fixed effects model in Eq. (3). The sample consists solely of consumers who make purchases from only one firm, to mitigate the overlap effect of different firms. We consider the firms registered in 73 cities in the pilot program as the treatment group and firms registered in non-pilot cities in the same provinces as the control group. $ESG\ Shock$ is the exogenous variation to the firms' ESG performance in the event. In column (1), the $1_{[post]}$ dummy equals one for the event month and post-event months. In column (2), we include the $1_{[0m]}$ dummy for the event month, and the $1_{[post]}$ dummy only represents the post-event months. In columns (3) and (4), we include the $1_{[-1m]}$ dummy representing the month before the event. Specifically in column (4), we show the dynamic effects of the PIL pilot program on consumption. All specifications include individual and year-month fixed effects and control for the firms' characteristics. All control variables are lagged by one quarter (one year for variables measured annually). All variables are defined in more detail in appendix Table A.1. The sample period is June 2013 to December 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 9—DID ANALYSIS USING THE FIRST RELEASE OF A CSR REPORT

	Dependent variable: $Ln(C_t)$		
	(1)	(2)	(3)
$CSR\ Score * 1_{[-1m]}$			-0.001
			(0.005)
$CSR\ Score * 1_{[0m]}$		0.003	0.003
		(0.005)	(0.005)
$CSR\ Score * 1_{[post]}$	0.011	0.012	0.012
	(0.003)	(0.003)	(0.003)
Constant	0.239	0.239	0.239
	(0.002)	(0.002)	(0.002)
Consumer FEs	YES	YES	YES
Month FEs	YES	YES	YES
Cluster	Individual	Individual	Individual
Observations	154,349	154,349	154,349
R-squared	0.022	0.022	0.022

Notes: This table examines the effect of the first release of firms' CSR reports on consumption, specifically the OLS estimates of the fixed effects model in Eq. (4). The sample consists solely of consumers who make purchases from only one firm, to mitigate the overlap effect of different firms, and retains consumers with spending records on firms that released their first CSR report between June 2013 and December 2015. $CSR\ Score$ is the exogenous variation in the firms' ESG performance, which is based on how many aspects of the CSR report are disclosed, and it ranges from 1 to 10. In column (1), the $1_{[post]}$ dummy equals one for the event month and post-event months. In column (2), we include the $1_{[0m]}$ dummy for the event month, and the $1_{[post]}$ dummy only represents the post-event months. In column (3), we include the $1_{[-1m]}$ dummy representing the month before the event. All specifications include individual and year-month fixed effects. The sample period is June 2013 to December 2015. Standard errors are reported in parentheses and are clustered at the individual level.

TABLE 10—ROBUSTNESS TESTS

	$Ln(P_t)$		$Ln(C_t)$	
			Active card holders	
	Number of purchases	Alternative ESG	Consumption records in at least 15 months	Consumption records in at least 20 months
	(1)	(2)	(3)	(4)
ESG_{t-1}	0.008	0.163	0.038	0.042
	(0.000)	(0.009)	(0.004)	(0.004)
Constant	-0.191	-3.561	-0.682	-0.873
	(0.024)	(0.594)	(0.166)	(0.186)
Controls	YES	YES	YES	YES
Consumer FEs	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES
Year FEs	NO	YES	NO	NO
Quarter FEs	YES	NO	YES	YES
Cluster	Individual	Individual	Individual	Individual
Observations	4,609,272	937,706	3,335,823	2,617,446
R-squared	0.168	0.257	0.096	0.103

Notes: This table reports the results of four robustness tests for the baseline finding on ESG ratings. Column (1) presents the results when we consider consumers' quarterly number of purchases as the dependent variable. We calculate the log of P_t as ln (P_t + 1) to include zero-consumption cases. In column (2), we replace the firms' ESG ratings with the annual ESG ratings obtained from Hexun.com. Accordingly, all control variables in column (2) are lagged by one year and we use the value from the fourth quarter of the previous year for variables measured quarterly. The samples in columns (3) and (4) only include active card holders. In column (3), we retain consumers with monthly spending records in at least 15 of the 31 months during the sample period. In column (4), we retain consumers with monthly spending records in at least 20 of the 31 months during the sample period. All control variables are lagged by one quarter (one year for variables measured annually). Standard errors are reported in parentheses and are clustered at the individual level.