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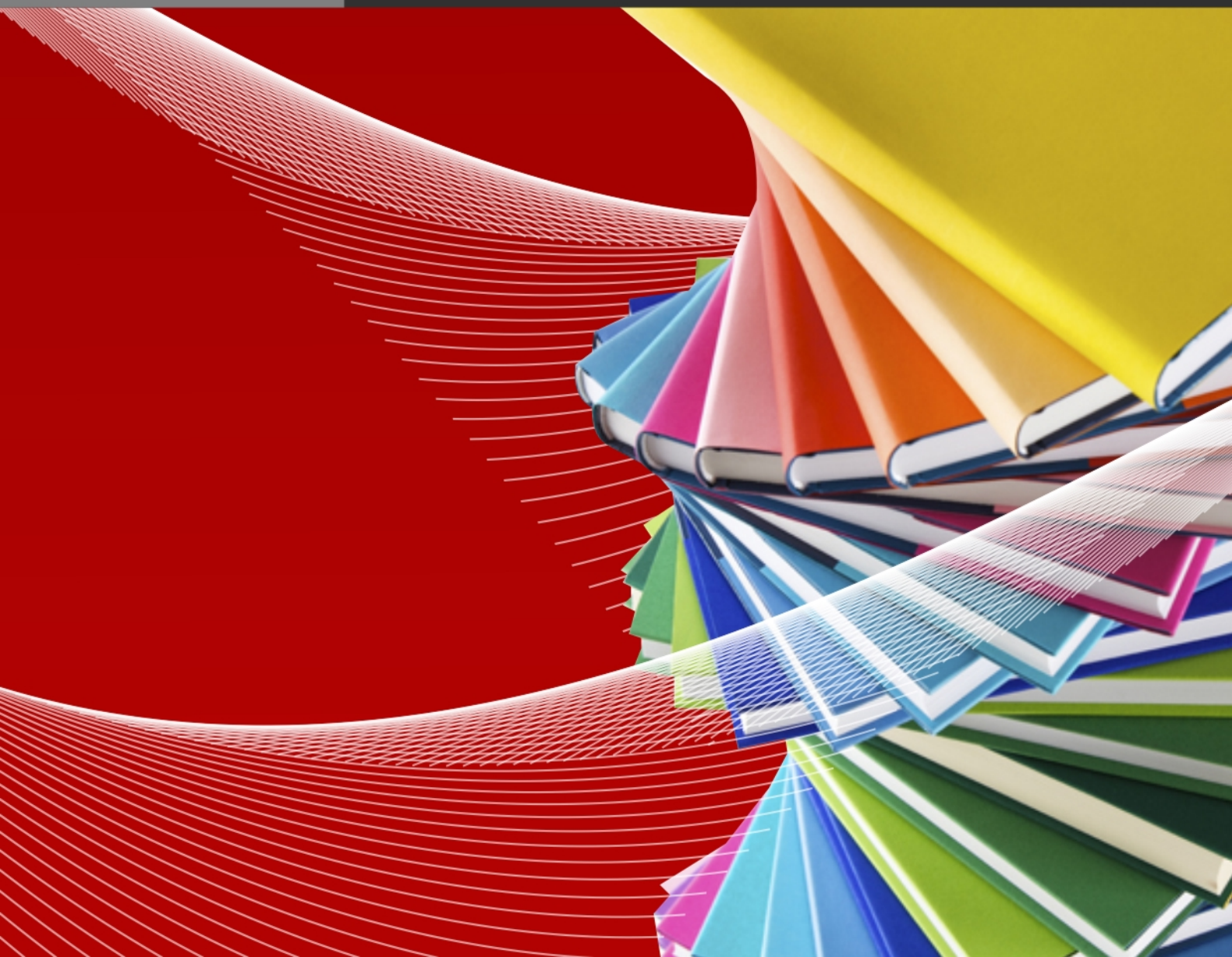

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CUSTOMER CONCENTRATION AND SHARE REPURCHASE

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Abstract

Prior studies document that customer concentration can influence both corporate risk and operating performance. On one hand, firms with greater uncertainties are less likely to make payout; however, on the other hand, firms with greater profitability are more likely to pay out. Thus, it is unclear how customer concentration affects corporate payout policy. This study extends the literature by examining the influence of customer concentration on corporate payouts. Specifically, I focus on how customer concentration affects corporate share repurchase and dividend decisions. I find that firms with concentrated customers are less likely to buy back shares and, if they buy back, they repurchase fewer amounts of shares. Furthermore, this effect is more pronounced in low maturity firms. The empirical results also document that the payment through share repurchase relative to dividends increases with customer concentration. This study sheds light on the role of customers in corporate payout decision.

Keywords: customer concentration; share repurchase; corporate payout

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1.Introduction

Customer is considered as one of the most common and direct stakeholders of a company. The relationship between customers and firms affects the corporate policy in many ways. Generally, if the sale to one customer over a supply firm's total sale is more than 10%, scholars regard that customer as a major customer of the supplier. In some countries, listed companies are required to reveal the information of major customers.

In prior researches, there are two different views about how the customer concentration will affect performances of supplier firms. In the Michael Porter's Five Forces Model, Michael Porter explains how and why the bargaining power of buyers will influence the competition environment of the company. Porter points out that if there are a few customers who buy most of goods or service of a company, and then it has the bargaining power over the company. As major customers have advantage to stress suppliers to provide benefits such as lowering prices, carrying extra inventory, and extending trade credit, the conventional view thinks that the relationship between major customer and suppliers is an impediment to the supplier firms' performances. However, recently another view is put forwarded, that the customer concentration achieves efficiency due to collaborate advertising and marketing efforts and the lower selling expenditures. Therefore, customer concentration benefits to the supplier firm performance.

Besides firms' performance, customer concentrations also impact firms' risk. Empirical evidence shows that customer concentrated firms face more operational risk than non-customer concentrated firms because of the longer term of customer credit period, the risk of bad debts, the risk of breaching of contract and so on. Therefore, it is probable that customer concentrated firms have to keep more cash on hand to meet the expected and unexpected needs. Under this condition, management is less likely to distribute cash to shareholders, and try to retain more cash in the company.

On the other hand, agency cost theory explains that because of the information asymmetry, shareholders want management to hold less free cash, in other words, to distribute free cash to shareholders as far as possible. Johnson, Kang, and Yi (2010) indicate that proprietary information of supplier firm is exposed to major customers, because of the close product-market relationship, which further enable major customers to monitor and certify the suppliers, as a result reducing the information asymmetry between the suppliers and their shareholders to a certain degree. Thus it is a substitution for corporate payout to ease the free cash flow problem.

In this paper, I explore how customer concentration influence corporate payout from two aspects, first, whether customer concentration affects the quantity of corporate payout, and because of all the factors above, it is controversial that whether there is a negative or positive relationship between customer concentration and corporate payout; second, how does the customer concentration influence corporate propensity of payout methods.

Distributing dividend and repurchasing share are the most common methods for

firms to distribute cash to shareholders. In the long run dividend policy is much more constant and easier affected by prior year dividend level, as dividend stands for a promise that management has made to the shareholders implicitly and is regarded as a signal for the firm's performance. Share repurchase is much more flexible. Managers can freely make the decision whether, when and how much to repurchase share. Besides, share repurchase have many other advantages, like sending good news to the stock price and concentrating shares. In customer concentrated firms, the benefits of share repurchase are more significant as the firms' bigger needs of free cash flow.

In this study, I chose two proxies to measure customer concentration. The first one is major customer sale percent (*MCS*), which is the sale to major customers over the supplier firm's total sale. The second one is major customer sale concentration *(MCC)*, which is the sales-based Herfindahl-Hirschman Index. *MCC* is calculated by summing the squares of the ratios of a supplier's sales to major customers over its total sale. The higher *MCS* and *MCC* are, the higher customer concentration is.

I use both Tobit and Logit models to conduct the analysis, testing the relationship between customer concentration and corporate payout. Here corporate payout refers to share repurchase, cash dividend and total payout that is the sum of dividend and share repurchase, respectively. I use the ratio of share repurchase over total payout to measure the company preference of payout methods to find whether customer concentration can influence the corporate propensity of payout methods. Results indicate that there is a significantly negative relationship between customer concentration and the quantity of corporate payout. And by testing the coefficient

between share repurchase ratio and customer concentration, I find there is a positive relationship between customer concentration and corporate propensity to repurchase shares.

Results suggest that customer concentrated firms are less likely to pay out, and share repurchase relative to dividend increases with the increasing of customer concentration.

This paper contributes to the following strands of literature. Previous studies explore how the customer relationship will influence corporate payout policy, but these studies are mainly about the dividend policy, and very little about share repurchase. Nowadays it is increasingly difficult to distinguish share repurchase from cash dividend when consider corporate payout policy. It cannot be complete and convincing if we do not take share repurchase into account when we study the corporate payout. Thus this paper focus on testing how the customer concentration will influence the total payout and taking share repurchase into consideration. On one side this paper supplies additional evidence to the relationship between customer concentration and scale of corporate payout.

In addition, this paper sheds light on the relationship between customer concentration and corporate propensity of payout methods. In recent years the scale of share repurchasing increases steadily. The substitute and complementary relationships between share repurchase and dividend draw plenty of attention. Which method do customer concentrated firms prefer to use, paying dividend or repurchasing share? In this paper, this question is explored.

This paper is organized as follows. Section 2 discusses literature review. Section 3 develops the main hypotheses. In section 4, I describe the sample and methodology. In section 5, descriptive statistics, main results and my analyses are presented. In section 6, I do some robust test. In section 7, I make the summary and conclude the paper.

2. Literature review

Previous studies explore how the relationship between a firm and its stakeholders has an influence on corporation's policies. Allen and Phillips (2000) point out with product market relationships, target and purchasing firms benefit from establishing long-term partial ownership positions, which leads to largest significant increases in targets' stock prices, and operating profitability. Increased transparency can have a negative effect on firm value, if the information about the firm affects the terms of transacting with its customers and employees. Then incentives of firms and stakeholders to invest to undertake relationships are reduced (Almazan, Suarez, and Titman, 2003). Additionally, corporate accounting conservatism (Hui, Klasa, Yeung, 2012), payout policies (Harry, Linda, and Skinner, 2008; Grullon & Michaely, 2002), finance policies (Campello & Gao, 2014; Dhaliwal, Judd, Serfling,and Shaikh, 2014), and corporate capital structure (Allen et al, 2000; Banerjee Dasgupta, and Kim, 2008; Cohen &Li, 2013) are also affected. These studies help us understand the significance of the stakeholder relationship.

Supplier-customer relationships are among the most important relationships between a firm and its stakeholders. Prior literature documents how customer concentration affects supplier firms in many aspects. Auditors are more likely to issue going concern modifications to clients that rely more heavily on major customers for sales (Dhaliwal, Michas, Naiker and Sharma, 2013). And Dhaliwal et al, (2014) find there is a positive association between concentrated customer base and a supplier's

risk as well as the cost of equity. In addition, corporate customer concentration is positively associated with tax avoidance (Henry, Gerald, Chong Wang and Hong Xie, 2014). Itzkowitz, J., (2013) addresses customer concentrated suppliers firms hold more cash than non-customer concentrated suppliers on average, and mostly accrue cash through issuance of stock rather than debt. Besides, Supplier-customer relationship also influences corporate reporting quality (Raman and Shahrur, 2008; Hui et al, 2012), cost of capital (Campello et al, 2014), suppliers' financial policy (Titman and Wessels, 1988; Banerjee et al, 2008; Itzkowitz, 2013), corporate capital structure (Banerjee et al 2008), and so on.

Early studies indicate that customer concentration affects firms' financial leverage and cash holding policies. Suppliers in durable goods industries use lower financial leverage to signal a lower likelihood of financial distress in the future, and thus help maintain the relationship with their major customers (Titman and Wessels, 1988; Shantanu, Dasgupta, and Kim, 2008). Banerjee et al. (2008) find that a supplier's debt ratio decreases as its reliance on customer increases. Itzkowitz (2013) documents that firms with customers concentration tend to hold more cash in order to mitigate the highly variable cash flows related to major customers dependency. In sharp contrast, due to the stability of the U.S. government, Cohen and Li (2013) predict and find that firms with governmental major customers hold less cash.

Literature also reports mixed results on how does customer concentration affect supplier firms' profitability. On one hand, research in operation management and marketing suggests that increasing customer concentration is beneficial to supplier

firms in decreasing marketing and administrative expenses as well as enhancing product distribution. Kalwani and Narayandas (1995) and Patatoukas (2012) show that suppliers can benefit from the operational efficiency and specialized expertise associated with selling to concentrated customers. Other research proposes that the production coordination of supply chain and information sharing benefit customer concentrated firms to achieve improvement in the working capital management. Moreover, case studies argue that cooperative relationships between supplier firms and their major customers promote the deployment of just-in-time (JIT) procurement systems (Kumar, 1996). For example, long-term relationships with major customers allow suppliers to cut down both selling and administrative expense, and manage their inventory efficiently (Kalwani and Narayandas, 1995). Patatoukas (2012) also documents efficiency gains to suppliers with concentrated customer bases.

On the other hand, the conventional view thinks that customer concentration is an impediment to the performance of suppliers firms. Holding bargaining power, major customer can set a range of requirements about the production and investment of suppliers. A shift of unfavorable terms like transaction price and credit period are also burdens and can cause heavy loss to suppliers firms (Ravenscraft, 1983; Balakrishnan, Linsmeier, and Venkatachalam, 1996; Gosman, 2004; Piercy and Lane, 2006). As the customers concentrated firms' sales depend on several major customers, the fluctuation of revenue is larger and the risk is higher compared to non-customer concentrated firms. These unfavorable agreements squeeze suppliers' profit margins and shift the liquidity risk to suppliers, resulting in lower profitability for suppliers.

Moreover, as Raman and Shahrur (2008) suggest, firms with major customers more tend to make relationship-specific investments, such as designing or developing specialized equipment or introducing a new inventory system for a particular customer. If the major customer goes out of business, these relationship-specific investments will lose value immediately. Consistent with these arguments, Dhaliwal et al. (2013, 2014) and Campello and Gao (2014) show that due to cash flow risk stemming from high dependency on major customers, suppliers are more likely to receive a going-concern audit opinion and experience a higher cost of capital.

The extant literature also indicates that customer concentration can be risky for a supplier firm. First, a supplier firm faces the risk of losing substantial future sales if a major customer becomes financially distressed or declares bankruptcy, switches to a different supplier, or decides to develop products internally. Second, a supplier faces the risk of losing anticipated cash flows from being unable to collect outstanding receivables if the customer goes bankrupt (Dhaliwal, D., Judd, J.S., Serfling, M.A., Shaikh, S.A., 2014).

Research on corporate payouts goes back a long way. Miller and Modigliani's dividend irrelevance theorem (1961) establishes that, in the absence of taxes and other frictions, firms cannot create value from payout policy over and above the value they generate by distributing all of the free cash flow generated by investment policy. So dividend versus repurchase choice is irrelevant. The two forms of payout are perfect substitute means of distributing cash to investors.

Myers and Majluf (1984) identify security valuation problems, which encourage

management to retain cash in the company. It holds the idea that firms should make no distributions until the probability of needing external funds is zero. The later pay dividend, the better. Agency costs theory is contrast to security valuation problems. Jensen (1986), Stulz (1990), La Porta et al. (2000), and many others propose that for investors dividend sooner is better, because cash accumulation inside the firm facilitates managerial abuse of resources. Managers have incentives to over-retain cash for themselves' interests while at the expense of outside investors. As managers prefer less payout and regular dividends indicate a stronger managerial commitment to distribute cash than do share repurchases, management is more likely to use share repurchase.

Then, a time-varying trade-off of the agency costs and financial flexibility benefits of retention explanations of payout policy. Payout policy relies, implicitly or explicitly, on a time-varying trade-off of the costs and benefits of corporate retention. Timing of payouts should roughly match free cash flow generation since cash accumulation fosters agency costs. That's why the mature firms make most payments. DeAngelo, DeAngelo & Stulz (2006) also argue that dividends tend to be paid by mature, established firms. Retention dominates distribution in young firms, as most young firms have limited resource but face relatively abundant investment opportunities. Conversely, mature firms are better candidates to pay dividends for the fewer attractive investment opportunities and higher profitability.

Studies document that both complementary effect and substitution effect can exist between dividends and share repurchase. When dividend increases, share repurchase

also increases. It is the complementary effect. With share repurchase increasing, dividend decreases, which is the substitution effect. Dividend reflecting payouts that managers expect to be permanent and share repurchase reflecting payout they expect to be transitory to some degree. Thus share repurchase is a discretionarily and flexible temporary payout method. Dividend makes an implicit promise for investors that it would continue to exist. Instead management make no commitment with repurchasing shares. More, firms can sell treasury shares or issue new shares to promptly counteract any discretionary capital payout to the extent they want (Haw, Ho, Hu & Zhang, 2013). Previous research distinguishes several incentives for share repurchases. Share repurchases can make a correction to the share price when the market undervalues it (Lie, 2005). Firms are able to acquire an optimal leverage ratio by distributing free cash flows. Besides, share repurchase can concentrate share ownership, which decreases the risk of hostile bid and defend against takeovers (Bagwell, 1991). It can also exploit the tax advantages (Lie & Lie, 1999).

Basic theories explored the underlying causes of different corporate payout policies from different aspects. Except for the introduced above, there are still some other theories like one bird in the hand is better than two birds in the forest, signal theory and so on, which explain the behaviors of firms to some degree.

Another factor that relates to corporate payout is the financial flexibility. Managers value financial flexibility. Management can increase its flexibility, by reducing dividends and conserving cash. Myers and Majluf (1984) report that keeping high cash balances is desirable to maximize the firm's financial flexibility. Cash

retention improves managers' ability to invest in projects that are conducive for shareholders in the long term but shareholders may not provide the capital (Blau, B. M., & Fuller, K. P. 2008).

Nowadays, increasing companies prefer repurchasing share to distribute cash to investors (Grullon & Michaely, 2002; Jagannathan, Stephens, Weisbach, 2000; Marcus & Martin, 2013) when they make payouts based on massive studies about dividend and stock buy-back (Baker & Wurgler, 2004; Fama & French, 2001). It is because dividend policy is more constant. Management does not want to change dividend policy frequently. Compared to dividend, share repurchase give mangers much more choices. Repurchasing shares is the new trend of corporate payouts (Grullon et al, 2002; Jagannathan, et al, 2000; Marcus et al, 2013).

3. Hypotheses development

3.1 Customer concentration, corporate risk and performance

Customer concentrated firms' sales mainly rely on several major customers. Prior literature indicates increasing customer concentration aggravates supplier firms' risk.

First, great positive coefficient existing between the performance of suppliers and major customers makes that the fluctuations of major customers' performance has a big influence on the suppliers'. A supplier faces the risk of losing substantial future sales if a major customer becomes financially distressed or declares bankruptcy, switches to a different supplier, or decides to develop products internally (Dhaliwal et al, 2014). It is difficult for the company to find another big customer in a short time. More, if customers go bankrupt, suppliers face the risk of losing anticipated cash flows from being unable to collect outstanding receivables. And the customer transfer cost for customer concentrated firms is also high, not only because of the large sunk cost that is invested to form the stable relationship between firms and major customers, but also because of the new investment resources to establish new relationships. Once some unexpected bad things happen, customer concentrated firms will suffer a lot.

Second, in customer concentrated firms, major customers usually have a great bargain power, and require more favorable terms in the business contracts, one of which is the credit term. Major customers are more likely to make full use of business

credits, extending the credit period as much as possible. Sometimes, in order to keep the buyer-supplier relationship, suppliers will extend credit periods on their own initiative too. This extending of credit period improves customers' liquidity of assets but at a cost of decreasing suppliers', and make a pressure on the operating cash flow of suppliers, which increases the liquidity risk of suppliers.

Third, the risk of loss of substantial future sale and anticipated cash flow for the major customers bankrupting or breaching of contract leads to a higher likelihood of future financial distress for supplier firms. Dhaliwal et al. (2013) find that auditors more tend to issue a going-concern audit opinion to suppliers relying more heavily on major customers for sales.

Research finds customer concentration influences corporate performance. However, there are two contrast views. Conventional views think because of the bargain power owned by major customers, supplier firms have to give concessions in the transactions with major customers, such as the extending of credit period, lowering of price and so on. Thus customer concentration is an impediment for the supplier firms' performance.

Another view thinks that customer concentration benefits to the supplier firms' performance. In most cases customer concentrated firms have more stable profits, because of the stable buyer-supplier relationship, which results in more stable sales. Instead of emphasizing on the fierce market competition and all kinds of sales promoting activities, suppliers pay more attention to the buyer-supplier relationship's building and maintaining. A good and lasting relationship between major customers

and supplier firms can promote the improvement of the working efficiency of supplier firms and enhancement of inventory management. Besides, it helps to decrease the advertisement expenses and other overhead cost. In this way supplier firm get a better and more stable performance.

3.2 Corporate risk, performance and payout

Dhaliwal, Judd, Serfling, and Shaikh's findings (2014) suggest the concentration and composition of a supplier's customer base significantly influence its financing cost. As customer concentration increases, the number of restrictive covenants and interest rate spreads featured in the bank loans are also increased. Customer concentration further lessens these loans' expiration. Customer concentration negatively affected the depth and duration of the relationship between firms and their banks. Customer concentrated firms bear negative consequences for corporate credit and high cost of equity cost (Murillo Campello and Janet Gao, 2014).

In addition, customers with relative bargaining advantages usually require greater conservatism in the supplier's financial reporting (Kai Wai Hui, Sandy Klasa, Eric Yeung, 2011). It is because the relationship between firms and customers is more like the contract relationship just like what between firms and creditors. If the suppliers have a much better performance, major customers cannot get a larger premium, but if the suppliers go bankruptcy, major customers would suffer a lot. That's why in order to protect their interest, major customers prefer the firms to be more conservative.

Titman, 1984, Grinblatt et al, 2002 report that the possibility of bankruptcy can

impose costs on a firm's non-financial stakeholders such as customers, suppliers and employees. Customers may be less likely to deal with a high financial levered firm. On one side, they perhaps incur some substantial lose once supplier firm goes broke. On the other side, firms with high financial leverage ratio may reduce standards of quality control to solve short run cash flow problems (Maksimovic & Titman,1991) .

Like what discussed above, there is a high operating risk in customer concentrated firms. To deal with the high operating risk, supplier firm need to conserve adequate cash inside. Ordinarily, firms can finance both externally and internally. External finance refers to equity finance and debt finance.

Overall, on one hand, customer concentrated firm needs more free cash flow to handle the risk raised by the concentration of sales. On the other hand, it faces a high cost of outside financing and is expected to maintain low finance leverage by major customers. Internal finance not only in a lower cost, but also more flexible and secured for the management. So the best financing way for the customer concentrated firms is the internal financing by accumulating retained earnings and distributing less cash to investors.

Thus from the point of corporate risk, customer concentrated firms are supposed to pay less. Nevertheless, from the point of corporate performance, a great many literature addresses that there is a positive relationship between corporate performance and payout, but it is still controversial that whether customer concentration is beneficial to the supplier firms' performance. As a result, how customer concentration affects corporate payout is still an empirical question.

3.3 Share repurchase vs. dividend

Nowadays, dividend and share repurchase are regarded as two main ways for companies to distribute cash to investors. Dividend scale has been increasing stably year by year since 1950. Share repurchase, however, was little used before 1980 and has been increasing significantly after that. Today most firms use share repurchase, and the scale is obvious over dividends (DeAngelo, DeAngelo and Skinner 2008).

Share repurchase has many advantages in distributing cash in the stand of management. First, share repurchase is much more financial flexible than dividend. Dividend makes an implicit promise for investors that it would continue to exist. Actually, most companies prefer paying dividends stably and increasingly. As stable and increasing dividend send a signal that company is in a good condition. If dividends decrease or disappear one year suddenly, a bad signal will be sent out and may result in the decreasing of the share price. But share repurchase dose not have those effects. Thus share repurchasing gives management more choices, both in the time and scale. When firms hold too much free cash, it can repurchase shares from market. And when firms need cash, it can resell the shares that it bought back.

Second, share repurchases can make a correction to the share price when the market undervalues it. When management thinks the share price on the market is significant below the intrinsic value, they can do the share repurchase. According to the signal theory, repurchasing share sends a message to the market that internal managers feel confident about future performance of the company. This is good news to the share price and will lead to the share price increasing.

Third, firms can use share repurchase to immediately offset any discretionary capital payout (Haw et al, 2013). When firms have surpluses, they can distribute cash to shareholders by dividends as well as share repurchases. Once dividends are distributed, firms have no ways to eliminate the capital payout effects, and dividends are treated as longer-term commitments. But when share repurchases are used, firms can offset the effects by selling offsetting treasury shares or issuing new shares.

Additionally, share repurchases can concentrate share ownership, which decreases the risk of hostile bid. And it helps to drive out the disloyal investors and reduce the fluctuation of share prices.

The benefits of repurchasing share are more significant in customer concentrated firms. Customer concentrated firms have to face more strict financing setting and need more flexible and sufficient cash to maintain a healthy financial leverage, for the high risk. Thus, the higher customer concentration is, the more risk firms face and the more likely that customer concentrated firms repurchase share relative to pay dividend.

Thus I put forward the following prediction that with the increasing of customer concentration, the payment through share repurchase relative to dividends also increases.

4. Data and methodology

4.1 Sample description

My sample is based on firm-level data from 1998 to 2007 and from 2011 to 2014 in USA from Compustat Fundamentals Annual file. I start from 1998, as market value data is accessible from that year. I exclude 2008-2010 to eliminate the influence of financial crisis. I drop the data that either sale or dividend is negative. Prior studies (Dittmar 2000; Fama & French 2001; Fenn & Liang 2001) document that financial firms have different motives to repurchase share compared to non-financial firms. Thus I restrict the sample to non-financial firms, defined as firms with SIC code outside the intervals 6,000 - 6,999. Besides, I make sure all the firm-year have the descriptive data that the analysis needs. I winsor observations that are not within the 1st and the 99th percentile to prevent outliers and extreme values from distorting results. It results in basic sample of 55,757 firm year observations. Table 2 summarizes the sample distributions. In table 2, the data of 2014 is obvious less than previous years'. It is because when this research is done, some firms have not yet released their annual reports of 2014.

4.2 The measurement of customer concentration and corporate payout

I use two measures to proxy customer concentration. The first one is Major Customer Sale Percent, which is the ratio of sales to major customers scaled by total

sales (*MCS*). Information about sales to major customers is from the Compustat Historical Customer Segment files. If in a particular year a firm reports sales to several major customers respectively, I use the sum of the several sales as the major customer sales. The second measure is the Major Customer Sale Concentration *(MCC),* which is the sales-based Herfindahl-Hirschman Index calculated by summing the squares of the ratios of a supplier's sales to major customers scaled by its total sales. Larger values of *MCS* and *MCC* indicate a more concentrated customer base. I set *MCC* and *MCS* to zero if a firm does not have a major customer.

Dependent variables are corporate payout and ratio of share repurchase over total payouts. Corporate payout refers to share repurchase, cash dividend, total payouts, respectively. Share repurchase is the balance of repurchasing of common and preference share minus the repurchasing of preference share. Sum of cash dividend and share repurchase are considered as the total corporate payouts. Cash dividend, share repurchase and total payouts are dollar amount and the actual payout of that year rather than the announcement. They are scaled by the market value of equity. Ratio of share repurchase over the total payouts measures firms' propensity of share repurchase.

4.3 Empirical model

Following DeAngelo, DeAngelo, and Stulz (2006), I employ the following model to test my hypotheses.

$$Payout_t = \beta_0+\beta_1 SP_t+\beta_2 Size_t+\beta_3 MTB_t+\beta_4 SGR_t+\beta_5 Cash_t+\beta_6 ASR_t+ \quad (1)$$

$$\beta_7 Lev_t + \beta_8 ROA_t + \beta_9 Mat_t + + \beta_{10} CFR + \beta_{11} RD + \sum \eta_i Industry\ Dummies +$$

$$\sum \lambda_i Year\ Dummies + error\ term$$

Both Tobit and Logit models are used to conduct the analysis. In the Tobit model, dependent variable $Payout_t$ expresses corporate payout (*Rep_MV, Di_MV* and *T_MV)* and ratio of share repurchase (*RA*). In the Logit model, the dependent variable of $Payout_t$ is a dummy, which is equal to 1 if a firm distributes cash to shareholders in a given year and 0 otherwise. The major explanatory variable SP_t refers to *MCS* and *MCC* respectively.

$$MCS_{i,t} = \frac{\sum_{j=1}^{J} \text{Sale}_{i,j,t}}{Sale_{i,t}},$$

$$MCC_{i,t} = \sum_{j=1}^{J} (Sale_{i,j,t} / Sale_{i,t})^2,$$

Where $Sales_{i,j,t}$ ($Sales_{i,t}$) is supplier i's sales to major customer j (total sales) in year t. Larger values of *MCS* and *MCC* indicate a more concentrated customer base.

Besides, I control for the following firm characteristics that may affect payout policy in my analysis. I use the natural logarithm of firms' market value to measure firm size ($Size_t$). Firms with more growth opportunities have lower dividend payouts. Growth opportunities are proxied by both sales growth rate and market-to-book ratio. Market-to-book ratio is calculated as market value of a firm plus liability scaled by firm's total assets (MTB_t). Sales growth rate is the annual sales growth rate (SGR_t). I control for the level of cash holdings ($Cash_t$), which is cash holding scaled by total assets. I incorporate the annual stock return of the year (ASR_t), for the negative relationship between share repurchases and stock price performance (Stephens &

Weisbach, 1998). Jensen (1986) argues that debt reduces the cash flow available for managers' discretionary spending, as a result decreasing the agency costs of the free cash flow. I define Lev_t as total debts scaled by total assets in a given year. I include profitability measured by return on assets, which is equal to the income before extraordinary items scaled by total assets (ROA_t). Lots of literature finds mature firms make most of the payments. I use retained earning scaled by the equity as a proxy for a firms' maturity (Mat_t). Following Bates, Kahle, and Stulz (2009), I incorporate cash flow risk (*CFR*), which is proxied by industry cash flow volatility. Cash flow is measured as earnings before depreciation but after dividends, tax and interest, then divided by total assets. For each firm-year, standard deviation of cash flow for the previous five years is calculated, and at least three observations are available. Then I calculate the average of the firm cash flow standard deviation for each two-digit SIC code, and the results are the industry cash flow volatility. Research and development cost (*RD)* is also added. Further, I include year and industry (measured at 2-digit SIC code level) dummies. All the standard errors are clustered at the firm level. I present detailed descriptions of all variables in Table 1.

Besides, I replace *Rep_MV* (share repurchase scaled by market value) to 0, when *Rep_MV* is less than 1‰. It is because under this condition it is probable that firms buying back shares to distribute to its management. Moreover, I drop *Rep_MV* when it is more than 20%. *Rep_MV* more than 20% means in a given year a firm repurchases more than one fifth of its listed share. This situation often happens when there is an abnormal acquisition. And both situations above that *Rep_MV* is less than 1‰ or

more than 20% do not represent the corporate normal payout polices.

5. Empirical Results

5.1 Descriptive statistics

Table 3 presents descriptive statistics for corporate payout, customer concentration, and other firm characteristic control variables. The second column of table 3 reports the number of observations, which is are not all the same as the different data availability (eg. share repurchase and dividend). Considering the data adequacy and sufficiency, I make each payout ratio variable multiply 100. In other words, I set *Rep_MV* as share repurchase scaled by market value and then multiply 100, so do *Di_MV, T_MV, RA, Rep_AT, Di_AT, T_AT, Rep_S, Di_S* and *T_S*.

Variables contained in the table 3 are sorted into three groups, first, variables related to corporate payout, second, variables related to firm characteristics which are also the controlling variables, third, variables related to customer concentrations which are the major explanatory variables. In terms of corporate payouts and ratio measures, the means (medians) of *Rep_MV, Di_MV, T_MV, and RA* are 1.011 (0), 0.692 (0), 1.714 (0) and 53.305 (63.151) respectively. And the mean value of *MCS (MCC)* is 0.280 (0.102). The mean value of *MC* indicates that 57.1% firms have at least one major customer.

Table 4 reports the univariate evidence of the relationship between customer concentration and corporate payout levels by comparing corporate payout levels, corporate customer concentration levels and firm characteristics of firms with major

customers and firms without major customers. Results find that there are significant differences for most of variables in the two groups.

Table 5 reports the cross-sectional correlation matrix for variables used in the empirical tests. Measures of corporate customer concentration (i.e., *MCS* and *MCC*) are negatively related to the measures of corporate payout (i.e., *Rep_MV, Di_MV* and *T_MV*). And *MCC* positively related to share repurchase ratio (*RA*). These correlations roughly indicate that corporate payouts are negatively associated with the level of corporate customer concentration and positively associated with share repurchase ratio.

5.2 Customer concentration, corporate payout and share repurchase ratio

5.2.1 Customer concentration and corporate payout

Table 6 presents results of both Logit and Tobit regression that address the impact of customer concentration on corporate payout.

In the Logit model, the dependent variable is a dummy, which equals to 1 if there are share repurchases (cash dividend or total payout) in a given year, and 0 otherwise. I use the Logit to test whether there is a relationship between customer concentration and corporate payout, namely the probability.

$$Payout_t = \beta_0+\beta_1 SP_t+\beta_2 Size_t+\beta_3 MTB_t+\beta_4 SGR_{t-1}+\beta_5 Cash_t+\beta_6 ASR_t+\beta_7 Lev_t$$
$$+\beta_8 ROA_t+\beta_9 Mat_t+\beta_{10} CFR+\beta_{11} RD+\sum \eta_i Industry\ Dummies+ \quad (2)$$

$$\sum \lambda_I \, Year\ Dummies + error\ term$$

$Payout_t$ refers to *Rep_D, Di_D* and *T_D*.

As I have three measures of corporate payout (*Rep_D, Di_D* and *T_D)* and two measures of corporate customer concentration (*MCS* and *MCC*), I obtain six sets of regression results. The primary explanatory variable is the level of customer concentration *SP*, proxied by *MCS* and *MCC. MCS* is measured as sales to major customers scaled by corporate net sales. And *MCC* is the summing the squares of the ratios of a supplier's sales to major customers scaled by its total sales. The first and second rows in table 6 examine separately the association of customer concentration (*MCS* and *MCC*) with corporate payout after controlling for other firm characteristics, year dummy and industry membership. Thereinto, columns (1) and (4) correspond to the two measures of corporate customer concentration and share repurchase. Columns (2) and (5) correspond to dividend, while columns (3) and (6) correspond to total payout.

Results demonstrate both *MCS* and *MCC* measures of customer concentration exhibit significantly negative coefficients. For example, in Panel B Column (3), the coefficient of *MCS* is -0.243, the standard error is 0.048, and the p value is less than 1%. Logit model results address that there is a negative and significant relationship between customer concentrations and corporate payouts. In other words, with the increasing of customer concentration, customer concentrated firms less make payout.

Then I investigate the empirical association between the level of customer concentration and corporate payout, namely the amount.

$$Rep\_MV_t = \beta_0+\beta_1 SP_t+\beta_2 Size_t+\beta_3 MTB_t+\beta_4 SGR_t+\beta_5 Cash_t+\beta_6 ASR_t+\beta_7 Lev_t+ \beta_8 ROA_t+\beta_9 Mat_t+\beta_{10} CFR+\beta_{11} RD+\beta_{12} Di\_MV_t+\sum\eta_i\, Industry\ Dummies +\sum\lambda_I\, Year\ Dummies\ +error\ term \quad (3)$$

$$Di\_MV_t = \beta_0+\beta_1 SP_t+\beta_2 Size_t+\beta_3 MTB_t+\beta_4 SGR_t+\beta_5 Cash_t+\beta_6 ASR_t+\beta_7 Lev_t+\beta_8 ROA_t +\beta_9 Mat_t++\beta_{10} CFR+\beta_{11} RD+\beta_{12} Rep\_MV_t+\sum\eta_i\, Industry\ Dummies\ + \sum\lambda_I\, Year\ Dummies\ +error\ term \quad (4)$$

$$T\_MV_t = \beta_0+\beta_1 SP_t+\beta_2 Size_t+\beta_3 MTB_t+\beta_4 SGR_{t-1}+\beta_5 Cash_t+\beta_6 ASR_t+\beta_7 Lev_t +\beta_8 ROA_t+\beta_9 Mat_t+\beta_{10} CFR+\beta_{11} RD+\sum\eta_i\, Industry\ Dummies+ \sum\lambda_I\, Year\ Dummies\ +error\ term \quad (5)$$

The dependent variable in equation (3) *Rep_MV* is proxied by cash paid for share repurchase on common stock and scaled by market value of equity. In equation (4) *Di_MV* is cash dividend paid in a year over corporate market value at the same fiscal year. In equation (5) dependent variable is corporate total payout to shareholders over corporate market value. In equation (4) and (5), I add the control variables *Di_MV* and *Rep_MV* respectively, because of the substitution and complementary relationship between share repurchase and dividends. All of the three dependent variables multiply 100, in order to have a more accurate test results.

Results indicate both measures of corporate customer concentration exhibit significantly negative coefficients, which is consistent with the Logit model results. For example, in table 6 column (3), the coefficient on *M*CS is -0.438 (standard error =

0.118), and p value is less than 1%. It means when *MCS* increases 1%, corporate total payout decreases 0.00438%. Regarding the firm-level variables, the coefficients on *MAT* are significantly positive at the 1% level across the six specifications, indicating that mature firms are more likely to distribute cash to shareholders. It is consistent with my argument that firms with higher maturity exhibit higher propensity to make payout. Other variables are generally consistent with predicted signs. The coefficients *on MTB* and *SGR* are negative and significant, supporting that firms with the high growth rate are less likely to make payout. Besides, results address that *SIZE* and *ROA* are positively and significantly associated with corporate payout, while *ASR* are negatively and significantly associated with corporate payout.

In summary, the results in table 6 and table 7 address that both *MCS* and *MCC* are negatively and significantly associated with corporate payout, indicating that customer concentrations are driving the negative association of corporate payout.

5.2.2 Customer concentration and share repurchase ratio

Table 8 presents results of regression that address the impact of customer concentration on corporate propensity of payout methods, which is my second hypothesis.

Both two measures of corporate customer concentration exhibit significantly positive coefficients. For example, in Column (1), the coefficient on *MCS* is 5.542 (standard error = 2.048), significantly positive at the 1% level, suggesting that highly customer concentrated firms are more likely to repurchase share. Regarding the controlling variables, coefficients on *LEV* are negative, suggesting that highly levered

firms are less likely to repurchase. And coefficients on *SIZE* are significantly positive, suggesting that big size firms are more likely to repurchase. Besides, results indicate *CASH* and *RD* are positively and significantly associated with share repurchase ratio, while *SGR* and *ROA* are negatively and significantly associated with share repurchase ratio.

5.2.3 Effect of firms' maturity

Early studies find that firms that have operated for a long time are more likely to distribute cash to their shareholders (DeAngelo et al, 2006). It is because on one side most mature firms have plenty of free cash flow on hand, and on the other side, mature firms do not have high growth rates. Thus I predict that the effect of customer concentration is more pronounced in firms, which are less maturity. To test my prediction, I partition the sample into high vs. low mature firms subsamples based on the mean of corporate maturity (*MAT*). *MAT* is the ratio of retained earning scaled by total equity. First row of Table 9 reports that the coefficients on *MCS* in the tobit model are 0.026 and -0.480 for the high and low subsamples in columns 1 and 2 (significant at not significant and 5% level), respectively. The coefficients for the high group are significantly less than that for the low group (at the 5% level). The difference between coefficients for the high group and the low group is 0.506 and the X^2 of the difference is 6.15 (significant at 5% level). The results are quite similar when I employ Tobit models (columns 5 - 6) and when *MCC* is the dependent variable (columns 3 - 4 and 7-8), which enhance the causality of my analysis. The results are consistent with the predictions.

6. Robust test

In this section, I conduct additional analyses to confirm the relation between customer concentration and corporate payout.

6.1 Alternative measures of dependent variables

In my main analysis, I use corporate payout over corporate market value as measures of corporate payout (*Rep_MV, Di_MV* and *T_MV)*. Market value is one of most common measures to eliminate firm size effect. And in this part, I use two more alternative measures, corporate total assets and corporate net sales as substitutes for corporate market value to enhance the validity of my analysis: share repurchase (dividend and total payouts) scaled by total assets (*Rep_TA, Di_TA* and *T_TA*), share repurchase (dividend and total payouts) scaled by net sales (*Rep_S, Di_S* and *T_S*).

In table 10 both measures of customer concentration *MCS* and *MCC* are negatively related to corporate payout (Share repurchase, Dividend and Total payout). E.g in Panel B, third row, column (1) the coefficient estimate between *MCS* and *T_S* is -0.549; the standard error is 0.202; and, the p-value is less than 1%. Results address that there is a negative relationship between customer concentration and corporate payouts, which strongly supports the prior test results.

6.2 Controlling for lagged dependent variables

In this section, I further examine whether the customer concentration is related to the change in a firm's corporate payout by adding a lagged payout ratio ($Rep\_MV_{t-1,}$

Di_MV_{t-1}, T_MV_{t-1}, Rep_D_{t-1}, Di_D_{t-1} and T_D_{t-1}) to the base line equation. The results of this analysis are presented in Panel C of Table 10. All the coefficients on the customer concentration (*MCS* and *MCC*) still enter the regression with negative and significant.

7. Conclusion

This study examines how the customer concentration dimension of a firm's business model relates to its payouts strategy. Prior studies address customer concentration influences many aspects of firms' policies, like corporate business model, corporate finance policies, corporate capital structure and so on. Considering the relationship between customer concentration and corporate payout, how does the customer concentration work on corporate payouts? One side, customer concentration increases supplier firms' operating risks as well as financial risks, which require supply firms retain more cash to cope with the risk. The bargain power that major customers have over the supplier firms makes major customers capable to get many favorable items during transactions with supply firms, which then harm supplier firms' interest. Thus, the conventional views hold that customer concentration is a restriction to supply firms' performance. While the new view in vogue argues that major customers can decrease agency costs and improve supplier firms' business efficiency and result in the better performance of supplier firms. As corporate payouts have a positive and significant relationship with corporate performance, the above factors make the relationship between customer concentration and corporate payout an empirical question.

In this paper, I use multiple, comprehensive measures of customer concentration and corporate payout, and both Logit and Tobit models to conduct analysis. After the empirical test of 55,757 firm-years, I find that firms with a concentrated customer

base are more likely to have a lower level of corporate payout after controlling for firms' size, financial condition, growth rate, maturity and so on. There is a negatively significant relationship between customer concentration and corporate payouts. Analyses show that the effect of customer concentration on corporate payout is more pronounced in firms with low maturity. Moreover, I have study the relationship between customer concentration and corporate payout methods. Results find that the payments through share repurchase relative to dividends increases with customer concentration. Overall this study contributes significantly to understanding the relation between customer concentration base and corporate payout decisions.

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Table 1 Definition and Measures of Variables

Panel A: corporate payout variables

Variable	Code	Description
Share Repurchase to Market value of Equity	*Rep_MV*	Cash paid for share repurchases, scaled by market valuation of equity, and then multiply 100.
Dividends to Market value of Equity	*Di_MV*	Cash paid for dividends, scaled by market valuation of equity, and then multiply 100.
Total Payout to Market value of Equity	*T_MV*	Cash paid for share repurchase and dividends, scaled by market valuation of equity, and then multiply 100.
Share Repurchase to Total Payout	*RA*	Cash paid for share repurchases over cash paid for share repurchase and dividend, and then multiply 100.
Share Repurchase to Total Asset	*Rep_AT*	Cash paid for share repurchases, scaled by total asset, and then multiply 100.
Dividend to Total Asset	*Di_AT*	Cash paid for dividends, scaled by total asset, and then multiply 100.
Total Payout to Total Asset	*T_AT*	Cash paid for share repurchase and dividends, scaled by total asset, and then multiply 100.
Share Repurchase to Net Sales	*Rep_S*	Cash paid for share repurchases, scaled by net sales, and then multiply 100.
Dividend to Net Sales	*Di_S*	Cash paid for dividends, scaled by net sales, and then multiply 100.
Total Payout to Net Sales	*T_S*	Cash paid for share repurchase and dividends, scaled by net sales, and then multiply 100.
Share Repurchase Dummy	*Rep_D*	Equal to 1 if a firm repurchases shares in a given year, and 0 otherwise.
Dividend Dummy	*Di_D*	Equal to 1 if a firm pays dividends in a given year, and 0 otherwise.
Total payout Dummy	*T_D*	Equal to 1 if a firm repurchase share or pay dividends in a given year, and 0 otherwise.

Panel B: Firm characteristics variables

Variable	Code	Description
Firm Size	*SIZE*	The natural logarithm of total market capitalization in U.S. dollars at the end of the year.
Market to Book Ratio	*MTB*	The market value of equity plus the book value of total debt, divided by total assets.
Sales Growth	*SGR*	Annual sales growth rate.
Cash	*CASH*	Cash holdings scaled by total assets at the end of fiscal year.
Annual stock Return	*ASR*	Raw annual stock return;
Leverage Ratio	*LEV*	Total liabilities divided by total assets at the end of the year.
Return on Assets	*ROA*	Net income before extraordinary item scaled by total assets.
Maturity	*MAT*	Retained earnings scaled by book value of equity;

Cash flow risk	*CFR*	Cash flow to assets is measured as the earnings after interest, dividends, and tax but before depreciation scaled by the book value of assets. For each firm-year, the standard deviation of cash flow to assets is calculated for the previous five years. It is required that at least three observations be available for the calculation. Industry cash flow volatility is the average of the firm cash flow standard deviation for each two-digit SIC industry.
Research and Development	*RD*	Research and Development expense;

Panel C: Customer concentration variables

Variable	Code	Description
Major Customer Sale	*MCS*	Sales to major customer over corporate net sales;
Major Customer	*MC*	Equal to 1 if a firm has at least one major customer in a given year, and 0 otherwise.
Major Customer Sale Concentration	*MCC*	Sum of the squares of the ratios of a supplier's sales to major customers over its total sales.

Table 2 Sample Distribution

Fiscal year	Freq.	Percent	Cum.
1998	5,625	10.09	10.09
1999	5,371	9.63	19.72
2000	5,171	9.27	29
2001	5,029	9.02	38.01
2002	4,624	8.29	46.31
2003	4,355	7.81	54.12
2004	4,181	7.5	61.62
2005	3,940	7.07	68.68
2006	3,755	6.73	75.42
2007	3,532	6.33	81.75
2011	2,841	5.1	86.85
2012	2,756	4.94	91.79
2013	2,757	4.94	96.74
2014	1,820	3.26	100
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Total	55,757	100	

Table 3 Descriptive Statistics

This table reports descriptive statistics on firm characteristics. All variables are defined in Table 1.

Variables	N	Mean	Min	P25	P50	P75	Max	Std. Devi.
Corporate payout								
Rep_MV	55,757	1.011	0.000	0.000	0.000	0.421	13.552	2.476
Di_MV	54,616	0.692	0.000	0.000	0.000	0.355	11.220	1.702
T_MV	54,616	1.714	0.000	0.000	0.000	2.236	15.215	3.116
RA	24,458	53.305	0.000	0.000	63.151	100.000	100.000	44.292
Rep_AT	55,757	1.194	0.000	0.000	0.000	0.364	19.251	3.225
Di_AT	54,616	0.618	0.000	0.000	0.000	0.304	10.937	1.598
T_AT	54,616	1.826	0.000	0.000	0.000	1.773	21.403	3.836
Rep_S	55,757	1.453	0.000	0.000	0.000	0.377	27.916	4.255
Di_S	54,616	0.851	0.000	0.000	0.000	0.280	17.208	2.455
T_S	54,616	2.318	0.000	0.000	0.000	2.047	30.130	5.122
Rep_D	55,757	0.297	0.000	0.000	0.000	1.000	1.000	0.457
Di_D	55,757	0.299	0.000	0.000	0.000	1.000	1.000	0.458
T_D	55,757	0.459	0.000	0.000	0.000	1.000	1.000	0.498
Firm characteristics								
SIZE	55,757	4.953	-0.816	3.128	4.962	6.763	10.821	2.531
MTB	55,757	2.933	0.486	1.096	1.534	2.593	40.522	5.111
SGR	55,757	0.295	-0.865	-0.048	0.078	0.257	8.931	1.151
CASH	55,757	0.143	0.000	0.023	0.077	0.196	0.821	0.173
ASR	55,757	0.269	-0.942	-0.362	-0.026	0.349	10.831	1.477
LEV	55,757	0.736	0.052	0.308	0.511	0.716	10.871	1.260
ROA	55,757	-0.267	-7.938	-0.153	0.015	0.063	0.317	1.035
MAT	55,757	-0.753	-69.196	-1.008	0.213	0.759	58.948	12.226
CFR	55,757	2.502	0.065	0.711	1.602	2.477	10.551	2.570
RD	55,757	21.698	0.000	0.000	0.000	6.000	719.100	88.118
Customer concentration								
MCS	55,757	0.280	0.000	0.000	0.116	0.520	1.000	0.337
MC	55,757	0.571	0.000	0.000	1.000	1.000	1.000	0.495
MCC	55,757	0.102	0.000	0.000	0.012	0.127	0.934	0.182

Table 4 UnivDariate evidence of the relationship between customer concentration and corporate payot levels

This table provides univuariate evidence of the relationship between customer concentration and corporate payout levels. The sample is partitioned as firms with major customers (*MC*=1) and firms without major customers (*MC*=0). N denotes the number of firm-year observations. All variables are defined in Table 1.

Variables	Sample firms with MC=0			Sample firms with MC=1			Test of difference (p-value)
	N	Mean	Std. Deviation	N	Mean	Std. Deviation	
Corporate payout							
Rep_MV	23940	1.066	2.527	31817	0.969	2.436	0.00
Di_MV	23315	0.725	1.745	31301	0.667	1.669	0.00
T_MV	23315	1.806	3.199	31301	1.646	3.051	0.00
RA	10664	53.170	43.886	13794	53.409	44.604	0.68
Rep_AT	23940	1.230	3.240	31817	1.164	3.212	0.02
Di_AT	23315	0.646	1.638	31301	0.598	1.567	0.00
T_AT	23315	1.891	3.875	31301	1.774	3.801	0.00
Rep_S	23940	1.441	4.166	31817	1.433	4.238	0.82
Di_S	23315	0.877	2.502	31301	0.831	2.419	0.03
T_S	23315	2.332	5.069	31301	2.279	5.096	0.23
Rep_D	23940	0.306	0.461	31817	0.291	0.454	0.00
Di_D	23940	0.316	0.465	31817	0.287	0.452	0.00
T_D	23940	0.472	0.499	31817	0.450	0.497	0.00
Firm characteristics							
SIZE	23940	4.966	2.603	31817	4.943	2.475	0.30
MTB	23940	3.274	5.960	31817	2.677	4.347	0.00
SGR	23940	0.366	1.372	31817	0.241	0.947	0.00
CASH	23940	0.140	0.177	31817	0.145	0.169	0.00
ASR	23940	0.274	1.539	31817	0.266	1.428	0.51
LEV	23940	0.825	1.459	31817	0.669	1.081	0.00
ROA	23940	-0.342	1.222	31817	-0.210	0.863	0.00
MAT	23940	-0.563	12.653	31817	-0.896	11.893	0.00
CFR	23940	2.625	2.831	31817	2.410	2.351	0.00
RD	23940	17.995	80.702	31817	24.484	93.214	0.00
Customer concentration							
MCS	23940	0	0	31817	0.491	0.309	0.00
MC	23940	0	0	31817	1	0	0.00
MCC	23940	0	0	31817	0.180	0.211	0.00

Table 5 Pearson Correlations

	Rep_MV	*Di_MV*	*T_MV*	*RA*	*Rep_AT*	*Di_AT*	*T_AT*	*Rep_S*	*Di_S*	*T_S*	*Rep_D*	*Di_D*	*T_D*
Di_MV	0.082***												
T_MV	0.841***	0.602***											
RA	0.536***	-0.538***	0.152***										
Rep_AT	0.782***	0.035***	0.645***	0.480***									
Di_AT	0.102***	0.757***	0.489***	-0.431***	0.169***								
T_AT	0.704***	0.339***	0.747***	0.247***	0.916***	0.544***							
Rep_S	0.682***	0.021***	0.557***	0.448***	0.826***	0.112***	0.746***						
Di_S	0.048***	0.709***	0.421***	-0.434***	0.080***	0.822***	0.400***	0.103***					
T_S	0.589***	0.353***	0.662***	0.177***	0.724***	0.479***	0.811***	0.882***	0.552***				
Rep_D	0.143***	0.644***	0.471***	-0.798***	0.136***	0.613***	0.373***	0.091***	0.549***	0.340***			
Di_D	0.628***	0.119***	0.564***	0.842***	0.568***	0.177***	0.553***	0.525***	0.104***	0.485***	0.232***		
T_D	0.457***	0.451***	0.611***	.	0.414***	0.430***	0.528***	0.382***	0.385***	0.503***	0.700***	0.728***	
SIZE	0.206***	0.182***	0.263***	-0.079***	0.283***	0.260***	0.348***	0.255***	0.239***	0.328***	0.379***	0.322***	0.415***
MTB	-0.090***	-0.109***	-0.132***	0.051***	-0.006	-0.041***	-0.023***	-0.007	-0.043***	-0.026***	-0.121***	-0.122***	-0.177***
SGR	-0.068***	-0.068***	-0.092***	-0.024***	-0.053***	-0.059***	-0.069***	-0.038***	-0.039***	-0.051***	-0.067***	-0.092***	-0.109***
CASH	-0.063***	-0.135***	-0.124***	0.178***	-0.006	-0.069***	-0.034***	0.027***	-0.059***	-0.006	-0.194***	-0.087***	-0.173***
ASR	-0.065***	-0.071***	-0.091***	-0.006	-0.035***	-0.041***	-0.047***	-0.028***	-0.033***	-0.040***	-0.054***	-0.065***	-0.080***
LEV	-0.070***	-0.046***	-0.080***	-0.086***	-0.064***	-0.058***	-0.078***	-0.062***	-0.048***	-0.074***	-0.077***	-0.118***	-0.145***
ROA	0.110***	0.107***	0.146***	-0.027***	0.098***	0.110***	0.129***	0.073***	0.087***	0.103***	0.152***	0.165***	0.222***
MAT	0.032***	0.036***	0.046***	-0.016**	0.034***	0.041***	0.047***	0.024***	0.029***	0.034***	0.047***	0.044***	0.057***
CFR	-0.066***	-0.052***	-0.081***	-0.010	-0.056***	-0.033***	-0.060***	0.006	0.009**	0.011**	-0.068***	-0.085***	-0.110***
RD	0.095***	0.050***	0.103***	0.034***	0.161***	0.120***	0.187***	0.193***	0.106***	0.212***	0.114***	0.152***	0.134***
MCS	-0.030***	-0.014***	-0.032***	-0.008	-0.023***	-0.025***	-0.030***	-0.002	0.009**	0.004	-0.044***	-0.044***	-0.046***
MC	-0.019***	-0.017***	-0.025***	0.003	-0.010**	-0.015***	-0.015***	-0.001	-0.009**	-0.005	-0.031***	-0.016***	-0.017***
MCC	-0.038***	-0.040***	-0.053***	0.018***	-0.027***	-0.036***	-0.038***	-0.007*	-0.007*	-0.009**	-0.072***	-0.061***	-0.081***

Table 5 Pearson Correlations (Continued)

	SIZE	MTB	SGR	CASH	ASR	LEV	ROA	MAT	CFR	RD	MCS	MC
MTB	-0.108***											
SGR	-0.023***	0.118***										
CASH	-0.104***	0.196***	0.062***									
ASR	0.020***	0.168***	0.075***	0.096***								
LEV	-0.270***	0.673***	0.015***	-0.030***	0.002							
ROA	0.320***	-0.678***	-0.093***	-0.128***	0.002	-0.709***						
MAT	0.040***	0.101***	-0.015***	-0.103***	-0.028***	0.176***	-0.085***					
CFR	-0.010**	0.097***	0.067***	0.144***	0.023***	0.072***	-0.111***	-0.021***				
RD	0.365***	-0.010**	-0.031***	-0.001	-0.022***	-0.039***	0.059***	0.013***	0.056***			
MCS	-0.006	-0.002	-0.022***	0.063***	0.010**	-0.015***	0.007*	-0.011***	0.011***	0.045***		
MC	-0.004	-0.058***	-0.054***	0.016***	-0.003	-0.061***	0.064***	-0.013***	-0.041***	0.036***	0.722***	
MCC	-0.057***	0.073***	0.023***	0.104***	0.016***	0.039***	-0.059***	-0.011***	0.047***	0.011***	0.824***	0.488***

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6 Customer Concentration and Corporate Payout

This table presents results of Logit regressions of corporate payout on measures of Major Customer Sale and Customer Sale *MCC*, respectively. All variables are defined in Table 1. All specifications are estimated with standard errors clustered by firm and year and industry (measured at 2-digit SIC code level) fixed effects included. Standard errors are in parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels (two-tailed), respectively.

Logit Model						
	Rep_D	*Di_D*	*T_D*	*Rep_D*	*Di_D*	*T_D*
	(1)	(2)	(3)	(4)	(5)	(6)
MCS	-0.095**	-0.352***	-0.254***			
	(0.047)	(0.063)	(0.048)			
MCC				-0.136	-0.642***	-0.449***
				(0.087)	(0.122)	(0.087)
SIZE	0.271***	0.341***	0.358***	0.271***	0.339***	0.358***
	(0.010)	(0.013)	(0.010)	(0.010)	(0.013)	(0.010)
MTB	-0.102***	-0.082***	-0.107***	-0.101***	-0.080***	-0.106***
	(0.013)	(0.013)	(0.012)	(0.013)	(0.013)	(0.012)
SGR	-0.329***	-0.101***	-0.193***	-0.328***	-0.098***	-0.191***
	(0.033)	(0.019)	(0.019)	(0.034)	(0.019)	(0.019)
CASH	0.187	-1.426***	-0.501***	0.188	-1.416***	-0.492***
	(0.115)	(0.158)	(0.109)	(0.115)	(0.158)	(0.109)
ASR	-0.105***	-0.057***	-0.089***	-0.105***	-0.057***	-0.090***
	(0.012)	(0.012)	(0.010)	(0.012)	(0.012)	(0.010)
LEV	-0.345***	0.200***	0.077**	-0.345***	0.198***	0.076**
	(0.072)	(0.034)	(0.035)	(0.072)	(0.034)	(0.035)
ROA	0.556***	0.110**	0.204***	0.555***	0.108**	0.202***
	(0.091)	(0.048)	(0.046)	(0.091)	(0.048)	(0.046)
MAT	0.011***	0.005***	0.008***	0.011***	0.005***	0.008***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
CFR	-0.072***	-0.045	-0.054*	-0.072***	-0.045	-0.054*
	(0.028)	(0.036)	(0.029)	(0.028)	(0.036)	(0.030)
RD	0.001***	-0.001**	0.000	0.001***	-0.001**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Di_D	0.519***			0.521***		
	(0.037)			(0.037)		
Rep_D		0.536***			0.537***	
		(0.037)			(0.037)	
Constant	-2.082***	-1.945***	-0.844***	-2.102***	-1.984***	-0.868***
	(0.349)	(0.421)	(0.151)	(0.349)	(0.416)	(0.151)

IND&YEAR	Included	Included	Included	Included	Included	Included
Cluster by	Firm	Firm	Firm	Firm	Firm	Firm
Pseudo R^2	0.1610	0.2208	0.1896	0.1610	0.2207	0.1895
N	55739	55674	55673	55739	55674	55673

Table 7 Customer Concentration and Corporate Payout

This table presents results of Tobit regressions of corporate payout on measures of Major Customer Sale and Customer Sale *MCC*, respectively. All variables are defined in Table 1. All specifications are estimated with standard errors clustered by firm and year and industry (measured at 2-digit SIC code level) fixed effects included. Standard errors are in parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels (two-tailed), respectively.

Tobit Model						
	Rep_MV	*Di_MV*	*T_MV*	*Rep_MV*	*Di_MV*	*T_MV*
	(1)	(2)	(3)	(4)	(5)	(6)
MCS	-0.233*	-0.572***	-0.438***			
	(0.134)	(0.114)	(0.118)			
MCC				-0.359	-1.080***	-0.802***
				(0.249)	(0.229)	(0.224)
SIZE	0.837***	0.472***	0.793***	0.837***	0.470***	0.791***
	(0.026)	(0.023)	(0.024)	(0.026)	(0.023)	(0.024)
MTB	-0.301***	-0.162***	-0.301***	-0.300***	-0.158***	-0.298***
	(0.033)	(0.035)	(0.034)	(0.033)	(0.034)	(0.034)
SGR	-0.767***	-0.361***	-0.663***	-0.766***	-0.355***	-0.659***
	(0.085)	(0.050)	(0.061)	(0.085)	(0.051)	(0.061)
CASH	0.515	-2.378***	-0.876***	0.520	-2.356***	-0.859***
	(0.341)	(0.329)	(0.308)	(0.341)	(0.330)	(0.308)
ASR	-0.335***	-0.258***	-0.384***	-0.335***	-0.259***	-0.385***
	(0.036)	(0.030)	(0.031)	(0.036)	(0.030)	(0.031)
LEV	-0.009	0.243**	0.198*	-0.009	0.242**	0.198*
	(0.139)	(0.106)	(0.112)	(0.139)	(0.106)	(0.112)
ROA	0.852***	1.228***	1.080***	0.850***	1.220***	1.077***
	(0.169)	(0.209)	(0.157)	(0.169)	(0.208)	(0.157)
MAT	0.030***	0.016***	0.028***	0.030***	0.016***	0.028***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
CFR	-0.003	-0.021	-0.013	-0.001	-0.016	-0.010
	(0.150)	(0.106)	(0.116)	(0.150)	(0.105)	(0.116)
RD	0.001	-0.000	0.001	0.001	-0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Di_MV	0.179***			0.180***		
	(0.024)			(0.024)		
Rep_MV		0.080***			0.080***	
		(0.010)			(0.010)	
Constant	-6.629***	-3.325***	-3.398***	-6.668***	-3.397***	-3.452***
	(1.026)	(0.675)	(0.751)	(1.026)	(0.667)	(0.749)

IND&YEAR	Included	Included	Included	Included	Included	Included
Cluster by	Firm	Firm	Firm	Firm	Firm	Firm
Pseudo R^2	0.0661	0.1091	0.0739	0.0661	0.109	0.0738
N	54616	54616	54616	54616	54616	54616

Table 8 Customer Concentration and Share Repurchase Ratio

This table presents results Tobit regressions of share repurchase ratio on measures of Major Customer Sale and Customer Sale *MCC*. All variables are defined in Table 1. All specifications are estimated with standard errors clustered by firm and year and industry (measured at 2-digit SIC code level) fixed effects included. Standard errors are in parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels (two-tailed), respectively.

Tobit Model		
	RA	
	(1)	(2)
MCS	5.542***	
	(2.048)	
MCC		11.653***
		(4.015)
SIZE	0.911**	0.927**
	(0.421)	(0.421)
MTB	0.156	0.123
	(0.427)	(0.427)
SGR	-3.518***	-3.597***
	(0.844)	(0.845)
CASH	41.686***	41.392***
	(5.145)	(5.155)
ASR	-0.779	-0.762
	(0.518)	(0.519)
LEV	-7.902***	-7.915***
	(2.365)	(2.365)
ROA	-4.607**	-4.595**
	(2.062)	(2.058)
MAT	0.118	0.118
	(0.086)	(0.086)
CFR	1.954	1.886
	(1.918)	(1.907)
RD	0.014**	0.014**
	(0.006)	(0.006)
Constant	15.290	16.164
	(12.147)	(12.009)
IND&YEAR	Included	Included
Cluster by	Firm	Firm
Pseudo R^2	0.0199	0.0199
N	24458	24458

Table 9 Firms' maturity, Customer Concentration and Corporate Payout

This table presents the regression results from the two sub-samples partitioned on the mean of firms' maturity. All variables are defined in Table 1. All the control variables are included. All specifications are estimated with standard errors clustered by firm and year and industry (measured at 2-digit SIC code level) fixed effects included. Standard errors are in parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels (two-tailed), respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Tobit Model		Logit Model		Tobit Model		Logit Model	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
Panel A: *Rep_MV*								
MCS	0.026	-0.480**	-0.016	-0.166**				
	(0.168)	(0.210)	(0.066)	(0.065)				
difference	0.506		0.15					
X^2	6.15		4.85					
P	**		**					
MCC					0.260	-0.634*	0.047	-0.214*
					(0.329)	(0.374)	(0.127)	(0.118)
difference					0.894		0.261	
X^2					5.21		3.89	
P					**		**	
Pseudo R^2	0.0663	0.0519	0.1792	0.1024	0.0663	0.0518	0.1792	0.1022
N	27354	27262	27334	27228	27354	27262	27334	27228
Panel B: *Di_MV*								
MCS	-0.368***	-0.732***	-0.337***	-0.281***				
	(0.119)	(0.224)	(0.088)	(0.082)				
difference	0.364		-0.056					
X^2	4.56		0.61					
P	**							
MCC					-0.596**	-1.316***	-0.588***	-0.472***
					(0.259)	(0.416)	(0.181)	(0.151)
difference					0.72		-0.116	
X^2					4.30		0.62	
P					**			
Pseudo R^2	0.1016	0.0968	0.2392	0.1408	0.1015	0.0967	0.2388	0.1406
N	27354	27262	27700	27948	27354	27262	27700	27948
Panel C: *T_MV*								
MCS	-0.179	-0.566***	-0.193***	-0.236***				
	(0.140)	(0.187)	(0.074)	(0.060)				
difference	0.387		0.043					

X^2	5.11		0.44					
P	**							
MCC					-0.118	-0.955***	-0.290**	-0.373***
					(0.288)	(0.337)	(0.141)	(0.106)
difference					0.837		0.083	
X^2					6.18		0.45	
P					**			
Pseudo R^2	0.0735	0.0543	0.2459	0.1006	0.0735	0.0543	0.2457	0.1004
N	27354	27262	27702	27964	27354	27262	27702	27964

Table 10 Robustness tests

Panel A presents the regression results using alternative measures dependent variable: share repurchase to total assets ratio (*Rep_TA*), dividend to total asset ratio (*Di_TA*), total payouts to total asset ratio (*T_TA)*. Panel B presents the regression results using share repurchase to net sale ratio (*Rep_S*), dividend to net sale ratio (*Di_S*), total payouts to net sale ratio (*T_S)* respectively. Panel C presents the results after controlling lagged dependent variables. All specifications are estimated with standard errors clustered by firm and year and industry (measured at 2-digit SIC code level) fixed effects included. Standard errors are in parentheses. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels (two-tailed), respectively.

	MCS		*MCC*	
	Tobit Model	Logit Model	Tobit Model	Logit Model
	(1)	(2)	(3)	(4)
Panel A: Alternative measures of payout based on total asset				
Rep_TA	-0.288*		-0.408	
	(0.174)		(0.322)	
Di_TA	-0.634***		-1.057***	
	(0.114)		(0.230)	
T_TA	-0.613***		-0.943***	
	(0.150)		(0.281)	
Panel B: Alternative measures of payout based on net sale				
Rep_S	-0.360		-0.411	
	(0.231)		(0.434)	
Di_S	-0.718***		-1.112***	
	(0.172)		(0.346)	
T_S	-0.549***		-0.713*	
	(0.202)		(0.386)	
Panel C: Controlling for lagged dependent variables				
Rep	-0.227**	-0.106**	-0.319	-0.092
	(0.112)	(0.043)	(0.209)	(0.081)
Di	-0.340***	-0.232***	-0.603***	-0.370***
	(0.069)	(0.063)	(0.149)	(0.125)
T	-0.328***	-0.217***	-0.567***	-0.299***
	(0.089)	(0.045)	(0.175)	(0.082)