Corporate Payout Policy and Product Market Competition

by

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Abstract

This paper investigates whether product market competition affects managers' decision to distribute cash to shareholders. Using industry concentration ratios from the Census of Manufacturers, we find that firms in more competitive industries have significantly higher payout ratios than firms in less competitive markets. Further, we find that firms with large amounts of cash and low investment opportunities are all the more likely to disgorge cash when they are in competitive industries and much less so when they are in concentrated industries. These results are consistent with the notion that the disciplinary forces of competition induce managers to payout excess cash.

1. Introduction

It has been argued in the economic literature that intense product market competition provides corporate managers with incentives to be efficient. One of the main rationales for this argument is that the disciplinary forces of intense competition rapidly remove incompetent managers from the market. This is an old idea that was even recognized by Adam Smith (1776) in the Wealth of Nations, who wrote that "monopoly…is a great enemy to good management." Other examples include Hicks (1935), who acknowledges that "the best of all monopoly profits is a quite life," and Caves (1980), who comments that economists seem to have a "vague suspicion that competition is the enemy of sloth." More recently, several theoretical papers try to formalize this idea by examining the potential channels through which competition can have an effect on managerial incentives (see, for example, Holmstrom (1982), Hart (1983), Nalebuff and Stiglitz (1983), Scharfstein (1988), Hermalin (1992), Schmidt (1997), Aghion, Dewatripont, and Rey (1999), and Raith (2003)). Allen and Gale (2000) conclude that competition among firms may be a more effective corporate governance mechanism than either the market for corporate control or monitoring by institutions.

Several recent empirical studies seem to support this idea that competition incentivizes managers to be more efficient and more aligned with shareholders. For example, Graham, Kaplan, and Sibley (1983) find that airlines experienced significant productivity improvements after the deregulation of their industry in 1978. Nickell (1996) documents that total factor productivity growth among a sample of U.K. firms is positively correlated with proxies for competition intensity. Berger and Hannan (1998) find a strong negative relation between cost efficiency and measures of market power in the U.S. banking industry. Griffith (2001) provides evidence that an increase in product market competition leads to increases in productivity,

especially among those firms in which managers are less aligned with shareholders. Guadalupe and Pérez-González (2005) find evidence that the private benefits of managerial control, a measure of the magnitude of the conflict between managers and shareholders, decrease with the intensity of product market competition. Grinstein and Palvia (2006) report that bank managers in less competitive markets are more likely to extract additional rents from shareholders without their consent through executive loans.

In this paper, we investigate whether this link between product market competition and managerial incentives has any implications for corporate payout policy. There are several potential reasons why product market competition and payout policy might be related. Perhaps the most important is the interaction between competition and agency conflicts. For example, it has been established in the literature that agency considerations play a significant role in payout decisions (see, for example, Lie (2000), Grullon and Michaely (2004), and DeAngelo, DeAngelo, and Stulz (2006)). Thus, it is possible that product market competition, through its effect on agency conflicts, may be an important determinant of the decision to pay out excess cash to shareholders

Similar to La Porta, Lopez de Silanes, Schleifer, and Vishny (2000) (henceforth LLSV), we argue that product market competition can potentially have two opposing effects on payout policies. One possibility is that firms pay dividends because competition exerts pressure on managers to distribute cash to their shareholders by increasing the risk and the cost of overinvesting (e.g., higher probability of liquidation, greater transparency). The main idea here is that intense competition can affect corporate payouts in similar ways as a strong legal system by creating conditions that pressure managers to pay out rather than invest in non-profitable investments (the "outcome" model). Alternatively, payout policy can be a substitute for

competition: managers use dividends as a substitute for the external disciplinary factors to establish a good reputation in the capital markets to be able to raise capital on better terms ("substitution" model).

Using the Herfindahl-Hirschman Index (HHI) from the Census of Manufacturers as a proxy for product market competition, we find that firms in less concentrated industries have significantly higher payout ratios and a higher probability of distributing cash to their shareholders than firms in more concentrated industries. These results hold even after controlling for other factors that have been documented to affect corporate payout policy, such as size, profitability, growth opportunities, firm age, leverage, and volatility. Moreover, we find that the effect of concentration levels on corporate payouts is not only statistically significant, but also economically significant. For example, we find that moving from the smallest HHI quintile to the largest HHI quintile reduces the average dividend yield by 40% and the average total payout yield by 35%. We find that this effect is even stronger after controlling for firm characteristics and time trends.

Although the previous results seem to support the predictions of the "outcome" model, it is possible that firms in more concentrated markets pay lower dividends because they need to hoard cash to fend off predatory behavior from competitors. Fortunately, these two explanations have different predictions regarding the effect of cash levels and growth opportunities on the relation between competition and corporate payouts. According to the "outcome" model, competition affects corporate payout policy by increasing the risk and the cost of overinvesting. Therefore, if this hypothesis is true, then the negative relation between the HHI and payouts should be stronger among those firms that are more likely to overinvest (e.g., firms with high cash levels and low growth opportunities). According to the predation hypothesis, however, the

negative relation between the HHI and payouts should be stronger among those firms with low cash levels and more investment opportunities. The reason for this is that predation is more likely to occur against firms that are more likely to pass profitable investment opportunities due to financial constraints (see, for example, Haushalter, Klasa, and Maxwell (2006)).

Consistent with the implications of the "outcome" model, our empirical findings indicate that the effects of product market competition are stronger among those firms that have higher potential agency problems of free cash flows. This is an important result because it suggests that the link between product market competition and corporate payout policy documented in this paper is mainly driven by agency considerations, and not by predatory behavior.

There are significant disagreements in the literature on what the interaction of payout policies and corporate governance is. Using data from several countries with different levels of investor protection, LLSV (2000) test the implications of the outcome and substitution hypotheses. Consistent with the empirical predictions of the "outcome" model, they find that firms in countries with strong minority shareholder rights tend to pay higher dividends. Michaely and Roberts (2006) examine dividend policies of private firms with dispersed ownership and low investor protections (e.g., no market for corporate control) to dividend policies of public firms, which have better corporate governance mechanisms such as market for corporate control, more public monitoring and tighter reporting. They find that public firms pay higher dividends and that their dividends are more sensitive to investment opportunities relative to private firms, consistent with the outcome hypothesis.

However, several recent papers argue that firms use dividend payments to reduce agency costs that are caused by poor governance, and that dividends are used as a substitute for good corporate governance. Officer (2006) uses firms with large boards, CEO/Chairman duality, and

low ownership by insiders and institutional investors as a proxy for poor governance, and John and Knyazeva (2006) use the Ishii, Gompers, and Metrck (2003) index as a proxy for external governance. Further, Grinstein and Michaely (2005) find that firms with high institutional holding generally pay lower dividends.

Overall, our results complement and extend existing evidence by looking at a novel and perhaps more precise measure of corporate governance (Allen and Gale, 2000). The higher payouts in more competitive industries suggest that intense product market competition appears to have induced management to disgorge cash. These findings are important for several reasons. First, they lend further support the idea that corporate payouts are the outcome of external disciplinary forces. Second, they underscore the importance of agency conflicts in the determination of corporate payout policy. Finally, they provide another example of how product market competition can have a significant effect on corporate financial decisions.

The paper is organized as follows. Section 2 discusses the theoretical arguments linking corporate payout policy to product market competition. Section 3 describes the sample selection procedure, defines the variables, and provides summary statistics. Section 4 investigates the empirical relation between industry concentration levels and corporate payout policy. In Section 5, we investigate whether agency theory can explain the relation between product market competition and corporate payout policy documented in this paper. Section 6 concludes the paper.

2. The Link between Corporate Payout Policy and Product Market Competition

In this section, we discuss several potential channels through which product market competition can affect managers' decision to distribute cash to their shareholders. Building on the work of LLSV, we explain how corporate payouts could be the outcome of intense product

market competition or, alternatively, a substitute for competition. Further, we explain how potential predatory behavior in less competitive markets can affect corporate payout policy.

2.1. Outcome Model

Under our version of the "outcome" model, managers in highly competitive markets distribute more cash to their shareholders because they are more likely to be penalized by the disciplinary forces of competition if they mishandle the resources of the firm. This idea is based on the assumption that competition increasing the risk and the costs of overinvesting for managers. Theoretically, there are two main arguments that seem to justify this assumption.

The first argument is related to the threat-of-liquidation hypothesis (see, for example, Schmidt (1997) and Aghion, Dewatripont, and Rey (1999)). The main idea here is that if a firm in a highly competitive industry starts investing in negative NPV projects, then it would become less competitive (e.g., raising prices to subsidize the bad projects), and consequently, more likely to be driven out of the market. Thus, to avoid liquidation and the loss of their jobs, managers in more competitive markets will tend to avoid negative NPV projects, thus making dividends and share repurchases more appealing to them.

The second argument is related to the yardstick competition hypothesis (see, for example, Holmstrom (1979, 1982), Nalebuff and Stiglitz (1983) and Shleifer (1985)). Under this hypothesis, product market competition reduces asymmetric information and monitoring costs by generating greater opportunities for outsiders to benchmark the performance of a firm to the performance of its competitors. Therefore, according to this argument, intense competition could make overinvestment riskier and more costly for management by increasing the likelihood that outsiders will identify and replace those managers who are destroying value. Interestingly, recent empirical studies seem to support this idea. For example, De Fond and Park (1999) and

Fee and Hadlock (2000) find that CEO turnover is higher in more competitive industries. Further, Kruse and Rennie (2006) finds that poorly performing firms operating in highly competitive markets are more likely to become a takeover target.

Empirically, the "outcome" model has two major implications. First, it predicts a negative relation between industry concentration levels and corporate payouts. Second, it predicts that this negative relation between concentration levels and payouts should be stronger among firms with severe agency problems of free cash flows. The main rationale for the latter prediction is that if competition affects corporate payout policy by increasing the risk and the cost of overinvesting, then its effect on payouts should be stronger among those firms that are more likely to overinvest. We empirically test this implication by examining whether the relation between the HHI and corporate payouts is stronger among firms with high cash levels and few investment opportunities.

2.2. Substitution Model

Under our version of the "substitution" model, managers in less competitive markets pay dividends and repurchase shares to mitigate the potential agency costs generated by the lack of competitive pressure from the product market. According to recent theoretical arguments, managers may rationally do this to establish a reputation for treating shareholders well so they can raise capital at favorable terms in the future (LLSV) or to maximize the value of their holdings in the firm (Gomes (2000)).

Our version of the "substitution" model is based on the assumption that firms in less competitive markets face higher agency costs associated with free cash flows. One potential reason for this is that these firms have the ability to generate extraordinary rents, which allows managers to have access to more free cash flows (see Shleifer and Vishny (1997)). Another

potential reason is that managers in less competitive markets are more likely to overinvest because they are less susceptible to the disciplinary forces of product market competition. For example, since value-destroying managers in less competitive markets have more slack to subsidize negative NPV projects, they are more likely to avoid liquidation than similar managers in more competitive industries. In addition, bad managers in more concentrated industries are less likely to be identified and replaced by outsiders because there are fewer opportunities to benchmark their performance.

In terms of empirical implications, the "substitution" model predicts that corporate payouts should be positively correlated with industry concentration levels because managers use dividends and share repurchases as a substitute for intense competition. However, this model does not provide clear predictions on how the magnitude of potential agency problems should affect the positive relation between concentration levels and corporate payouts. On the one hand, if managers use corporate payouts to establish a reputation as good managers to raise capital on better terms in the future (LLSV), then the positive relation between concentration levels and payouts should be stronger among firms with high growth opportunities and low free cash flows because these are the firms that are most likely to access the capital markets in the future. On the other hand, if managers use corporate payouts to mitigate the agency costs of free cash flows so they can maximize the value of their holdings in the firm (Gomes (2000)), then we should expect a stronger positive correlation between concentration levels and payouts among firms with severe agency costs of free cash flows. The main rationale for this is that the benefits of reducing potential agency problems are larger among this type of firms.

2.3. Predation Hypothesis

It is possible that product market competition and payout policy may interact for strategic consideration such as predation. For example, an implication of Bolton and Scharfstein (1990) is that firms will tend to hoard more cash so that they are better able to fend off potential predatory behavior.[1] Since this behavior is unlikely to be effective in competitive markets not only because prices are equal to marginal costs, but also because there is no gain from having n-1 firms instead of n firms in the market, predatory risk is higher in less competitive markets. Thus, the major prediction of the predation hypothesis is that payouts should be lower in more concentrated industries.

Note that the predation hypothesis and the "outcome" model generate similar predictions regarding the relation between product market competition and corporate payouts. However, we try to distinguish these two explanations by examining the effect of cash levels and growth opportunities on the relation between competition and corporate payouts. As discussed above, the "outcome" model predicts that the negative relation between the HHI and payouts should be stronger among firms with high cash levels and low growth opportunities (free cash flow argument). However, the predation hypothesis predicts the opposite. It predicts that the negative relation between the HHI and payouts should be stronger among those firms with low cash levels and more investment opportunities. This follows from the idea that predation is more likely to occur against firms that are more likely to pass profitable investment opportunities due to financial constraints (see, for example, Haushalter, Klasa, and Maxwell (2006)).

3. Sample Selection, Variable Definitions, and Descriptive Statistics

3.1. Sample Selection

Our initial sample consists of all the firms operating in any of the industries covered by the Census of Manufacturers (SIC code interval 2011-3990). This census reports the results

[1] Bolton and Scharfstein (1990) original argument is about debt, but it also holds for dividends (and repurchases).

from a survey held every five years in which all manufacturing firms in the U.S. are asked to provide information on their number of employees, payroll, and total output. Using this information, the U.S. Census calculates several summary statistics, including the Herfindahl-Hirschman index (HHI) that we use in this paper.

Since the HHIs are only reported every five years, we assume that the indexes stay constant until the results from a new survey are available. For example, we use the HHIs reported in 1987 for the observations in years 1987, 1988, 1989, 1990, and 1991. This approach is unlikely to bias our empirical results because the HHI does not experience large changes over time. For example, the probability that an industry in the smallest HHI quintile moves to the largest HHI quintile (or vice versa) over a period of 5 years is virtually zero.[2]

From our initial sample of manufacturing firms, we then select those observations that satisfy the following criteria: (1) the firm appears on the CRSP/Compustat merged files, and (2) the firm has available information on both dividends and share repurchases. This selection process generates a final sample of 67,827 firm-year observations and 3,011 firms over the period 1972 to 2001. This is a relatively large sample considering that it only contains manufacturing firms.

3.2. Variable Definitions

3.2.1. Proxy for Industry Concentration

Following Aggarwal and Samwick (1999), Allayanis and Ihrig (2001), Campello (2005), MacKay and Phillips (2005), Akdoğu and MacKay (2006), and Haushalter, Klasa, and Maxwell (2006), among others, we use the Herfindahl-Hirschman Index (HHI) from the Census of Manufacturers as a proxy for product market competition. The U.S. Census calculates this index

[2]In a robustness test, we find that our empirical results are unaffected if we only use the observations from the years in which the U.S. Census Bureau reports the HHIs.

by summing up the squares of the individual market shares for the 50 largest firms in the industry. If the industry has less than 50 firms, then the U.S. Census uses the total number of firms in the industry. Since in most industrial groups the largest 50 firms capture most of the market, this index is a reasonable proxy for the overall level of industry concentration. In this paper, we use three-digit SIC HHIs to mitigate the effect of industry misclassification when we match the U.S. Census data to the Compustat data. However, our main empirical results are unaffected if we instead use four-digit SIC HHIs.

As pointed out by several authors, the concentration measures reported by the Census of Manufacturers are more meaningful than the ones derived from Compustat data because the former measures are constructed using both private and public firms while the latter measures only use public firms.[3] In a recent empirical study, Ali, Klasa, and Yeung (2006) show that this difference between these two measures seems to significantly bias the HHI derived from Compustat data. For example, consistent with the idea that in more concentrated markets there should be fewer and larger firms, these authors find that the HHI reported in the Census of Manufacturers is negatively correlated with the total number of firms in the industry and positively correlated with average firm size. However, they do not find these results when they use the HHI derived from Compustat data. Surprisingly, they find that industries classified as concentrated using the Compustat HHI tend to be populated by smaller firms. These findings are important because they raise serious concern about the use of Compustat concentration measures as proxy for industry concentration. This is the main reason why we perform our empirical tests using the HHI from the Census of Manufacturers.

3.2.2. Measures of Corporate Payouts

[3]Another advantage of using the concentration measures reported by the Census of Manufacturers is that they are less likely to suffer from a selection bias. The reason for this is that firms are required by federal law to respond to the survey supplied by the U.S. Census (Title 13 of the U.S. Code).

Using data from Compustat, we construct the following six measures of corporate payouts: dividends and total payouts scaled by lagged total sales (item 12), dividends and total payouts scaled by lagged total assets (item 6), and dividends and total payouts scaled by the lagged market value of equity (item 24 times item 199). Dividends (DIV) are equal to the total dollar amount of dividends declared on the common stock of a company during a year (item 21). Total payouts (TPAY) are defined as dividends plus share repurchases (item 115). We construct measures of total payouts because there is evidence that share repurchases have become an important payout method for many firms (see, for example, Grullon and Michaely (2004) and Boudoukh et al (2005)). Finally, to mitigate the effect of outliers, we exclude from our analyses all observations where the payout ratios are greater than one.

3.2.3. Control Variables

Following the literature on corporate payout policy, we control for the following firm characteristics in our empirical analyses:

- Maturity: Our proxies for the level of firm maturity are the market value of equity (MV) and the age of the firm (AGE). MV is defined as the total number of common shares outstanding (Compustat item 25) times the closing stock price at the end of the fiscal year (item 199). AGE is the time (in years) from the firm's CRSP listing date.
- Investment Opportunities: We use the market-to-book ratio (M/B) and the sales growth rate (GS_5YR) as proxies for investment opportunities. M/B is equal to the book value of assets (item 6) plus the market value of equity (MV) minus the book value of equity (item 60) scaled by the book value of assets. GS_5YR is the five-year growth rate in total sales (item 12).

- Risk: Our proxy for risk is the volatility of stock returns (RETVOL). RETVOL is the standard deviation of monthly stock returns over a one-year period.
- Profitability: We use the return on assets (ROA) as a proxy for the level of profitability of the firm. ROA is the operating income before depreciation (item 13) scaled by the book value of assets.
- Leverage: We define leverage (DEBT/ASSETS) as long-term debt (item 9) plus short-term debt (item 44) scaled by the book value of assets.

To mitigate the effect of outliers, M/B, ROA, and GS_5YR are winsorized at the 1% and the 99% of their empirical distribution. Further, since there is evidence that corporate payout policy in the U.S. has significantly changed over the last three decades (see, for example, Fama and French (2001) and Grullon and Michaely (2002)), we also include year dummies in our regressions to control for any time trends.

Given the well documented fact that large, stable, profitable, old firms with low investment opportunities are more likely to distribute cash to their shareholders than are other types of firms, we expect the coefficients of MV, AGE, and ROA to have a positive sign, and the coefficients of M/B, GS_5YR, and RETVOL to have a negative sign. However, the coefficient of DEBT/ASSETS could be positive or negative depending on whether firms treat leverage as a substitute for payouts or as a complement to payouts.

3.2.4. Descriptive Statistics

Table 1 reports summary statistics for the firms in our sample. This table shows that the average sample firm has a dividend yield (DIV/MV) equal to 1.75% and a total payout ratio (TPAY/MV) equal to 2.97%. These payout ratios are very similar to the ones reported in Grullon and Michaely (2002). Further, the average firm in our sample is almost 12 years old and

it has a market value of equity (MV) of $1.2 billion, a market-to-book ratio (M/B) equal to 1.8, a debt-to-asset ratio (DEBT/ASSETS) equal to 19.4%, and a return on assets (ROA) of 5%. Interestingly, the characteristics of the average firm in our sample are very similar to the characteristics of the average firm in Compustat (not reported in a table). Thus, it seems that our sample is not biased toward a particular type of firm. Finally, Table 1 also shows that that there are large cross-sectional differences in payout ratios and firm characteristics. This large dispersion in both dependent and independent variables should improve the power of our empirical tests to detect any effect of concentration levels on corporate payouts.

4. The Relation Between Industry Concentration Levels and Corporate Payout Policy

In this section, we investigate whether product market competition affects manager's decision to distribute cash to their shareholders. We do this by examining the unconditional and conditional cross-sectional relation between the HHI and corporate payouts, and by examining the effect of the HHI on the probability of paying out cash.

4.1. Unconditional Relation between Industry Concentration Levels and Payout Ratios

In this sub-section, we examine the unconditional relation between payout ratios and HHI by partitioning the sample into quintiles based on the HHI. The results from this analysis are reported in Table 2. Consistent with the predictions of the "outcome" model and the predation hypothesis, this table shows that firms in the lowest HHI quintile have higher average payout ratios than firms in the highest HHI quintile. Note that the differences in average payout ratios between the lowest and the largest HHI quintiles are statistically different from zero at the 1% level for all our measures of corporate payouts.

One striking feature of the results in Table 2 is that they are economically large. For example, the average dividend yield (DIV/MV) for firms in the lowest HHI quintile is 42%

larger than the one for firms in the highest HHI quintile. Moreover, the average total payout yield (TPAY/MV) for firms in the lowest HHI quintile is 35% larger than the one for firms in the highest HHI quintile. In general, these findings are important because they suggest that the negative relation between concentration levels and payout ratios documented in this paper is nontrivial.

Finally, Table 2 shows that the proportion of firms distributing cash to their shareholders is significantly higher for firms in the lowest HHI quintile than for firms in the largest HHI quintile. We find that approximately 50% (62%) of the observations in the lowest HHI quintile have positive dividends (total payouts). In contrast, we find that only 37% (51%) of the observations in the highest HHI quintile have positive dividends (total payouts). This finding seems to support the idea that firms in more competitive markets have a higher propensity to pay dividends and/or repurchase shares than firms in less competitive markets. Overall, the empirical evidence in this sub-section is consistent with the predictions of the "outcome" model and the predation hypothesis.

4.2. Conditional Relation between Industry Concentration Levels and Payout Ratios

To ensure that the negative relation between industry concentration levels and corporate payout ratios documented in the previous sub-section is not spurious, we control for other factors that have been shown to explain the cross-sectional differences in payout ratios. We do this by regressing scaled measures of dividends and total payouts on the HHI, size (MV), market-to-book ratio (M/B), return on assets (ROA), debt-to-total assets ratio (DEBT/ASSETS) , age of the firm (AGE), five-year growth rate in total sales (GS_5YR), stock return volatility (RETVOL), and year dummies.

Since our measures of corporate payouts are truncated at zero and one, we estimate the regression coefficients using a two-sided Tobit model. Following Petersen (2006), we control for possible cross-sectional dependence in the residuals by adjusting the standard errors for within-firm correlation, and control for any time series dependence by including time dummies. We do not include firm-fixed effects in our panel data regressions because the HHIs do not change much over time.

Table 3 shows estimates of regressions relating scaled dividends to the HHI and other control variables. In Panel A we report the results from regressions that assume a linear relation between the HHI and dividend payouts. In Panel B we report the results from specifications that allow for possible non-linearities in the relation between the HHI and dividend payouts. We try to capture these potential non-linearities by using dummy variables based on HHI quintiles. Corroborating the empirical findings in the previous sub-section, Table 3 shows that dividend payout ratios are negatively correlated with industry concentration levels even after controlling for firm characteristics and time trends. While Panel A shows that the coefficient of the HHI is negative and statistically significant, Panel B shows that the coefficient of the dummy variable for the firms in the largest HHI quintile (DUMHHI5) is more negative than the coefficients of the other HHI quintile dummies.

Surprisingly, we find that the conditional effect of the HHI on dividend payout ratios is stronger than the unconditional effect. For example, according to our unconditional analysis (see Table 2), the differences in the average dividends-to-sales ratio, the average dividends-to-assets ratio, and the average dividend yield between the firms in the highest HHI quintile and the firms in the lowest HHI quintile are equal to -0.50%, -0.38%, and -0.64%, respectively. However,

these differences increase to -0.79%, -0.78%, and -0.81%, respectively, when we control for other factors (see Panel B of Table 3).

As expected, Table 3 shows that dividend payout ratios are positively correlated with MV, AGE, and ROA, and negatively correlated with M/B, GS_5YR, and RETVOL. Moreover, there is evidence that dividends are negatively related to leverage (DEBT/ASSET). In general, these results are consistent with the stylized fact that large, stable, profitable, old firms with low investment opportunities pay more dividends.

Finally, since it is possible that firms may be substituting share repurchases for dividends (see, for example, Grullon and Michaely (2002)), we replicate the previous analyses using total payouts (dividends plus share repurchases) instead of dividends. The results from this analysis are reported in Table 4. Similar to the findings using dividends, Panel A shows that total payouts ratios are negatively correlated with the HHI. Further, the results in Panel B indicate that the firms in the most concentrated industries have the lowest total payout ratios. Note that DUMHHI5 has the most negative coefficient of all the HHI quintile dummies.

As in the case of dividends, the evidence in Table 4 indicates that the conditional relation between the HHI and total payouts is stronger than the unconditional one. For example, the unconditional differences in the average total-payout-to-sales ratio, the average total-payout-to-assets ratio, and the average total payout yield between the firms in the highest and the lowest HHI quintiles are equal to -0.27%, -0.43%, and -0.94%, respectively (see Table 2). In contrast, Panel B of Table 4 shows that, after controlling for confounding factors, these differences significantly increase to -1.04%, -1.04%, and -1.29%, respectively. Given that the average firm in our sample has a total-payout-to-sales ratio equal to 1.97%, a total-payout-to-assets ratio equal

to 2.21%, and a total payout yield equal to 2.97%, it is clear that the results in Table 4 are not economically trivial.

4.3. The Effect of Industry Concentration Levels on the Decision to Distribute Cash

As we discussed earlier, there is evidence that firms in less concentrated markets have higher propensity to disgorge cash than firms in more concentrated markets. However, since these findings are based on an unconditional analysis, it is possible that these results may not hold after controlling for potential confounding effects. In this sub-section, we further investigate this issue by examining in a multivariate framework the effect of industry concentration levels on the probability of distributing cash to shareholders.

In Table 3 we report estimates of logistic regressions relating the decision to distribute cash to shareholders to the HHI and control variables. Panel A shows the results from the linear specification while Panel B reports the results from the non-linear specification. Consistent with the findings from the univariate analysis, we find that the probability of a firm having positive dividends or positive total payouts declines with the HHI even after controlling for other factors.

The results in Table 3 also indicate that the economic magnitude of the effect of product market competition on the probability of paying out cash is large. For example, Panel B shows that moving from the lowest HHI quintile to the highest HHI quintile reduces the probability of paying dividends by 15% and the probability of paying dividends and/or repurchasing shares by 11%. Overall, the evidence in this sub-section indicates that the propensity to distribute cash to shareholders is higher among firms facing more competition.

5. The Effect of Potential Free Cash Flow Problems on the Relation between Industry Concentration Levels and Corporate Payout Policy

The results in the previous section suggest that corporate payouts are the outcome of the disciplinary forces of product market competition. However, it is possible that firms in more

concentrated markets tend to hoard cash (e.g., pay less dividends) to fend off predatory behavior from competitors. To distinguish these two explanations, we examine the effect of cash levels and investment opportunities on the relation between product market competition and corporate payout policy.

As discussed earlier, if the "outcome" model is true, the negative relation between the HHI and payouts documented in the previous section should be stronger among firms with high cash levels and low growth opportunities. The main reason for this is that if competition affects payout by increasing the risk and the cost of overinvesting, then its effect on payouts should be stronger among those firms that are more likely to overinvest. On the other hand, since predation is more likely to occur against firms that are more likely to pass profitable investment opportunities due to financial constraints, the predation hypothesis predicts that the negative relation between the HHI and payouts should be stronger among firms with low cash levels and high growth opportunities.

In this section, we examine this issue by estimating regressions relating corporate payouts to the HHI and other control variables on sub-samples partitioned based on whether a firm has high or low potential free cash flow problems. A firm is classified as having high free cash flow problems (High FCF) if its level of cash at t-1 is in the largest tercile of the empirical distribution and its five-year growth rate in total sales is in the lowest tercile of the empirical distribution. Similarly, a firm is classified as having low free cash flow problems (Low FCF) if its level of cash at t-1 is in the smallest tercile of the empirical distribution and its five-year growth rate in total sales is in the highest tercile of the empirical distribution.

Table 6 shows that the negative relation between dividend payout ratios and the HHI is completely driven by the firms with high free cash flows. Note that the effect of the HHI on

dividend payout ratios for the firms with high free cash flows (see columns 1, 3, and 5) is order of magnitudes larger than the one for firms with low free cash flows (see columns 2, 4, and 6). Table 7 shows similar results using total payout ratios.

Finally, Table 8 reports the estimates from logistic regressions relating the decision to distribute cash to shareholders to the HHI and control variables on sub-samples partitioned based on potential free cash flow problems. Once again, we find that the effect of product market competition on the decision to disgorge cash is stronger among those firms that are more likely to overinvest (High FCF). In general, the results in this section supports the predictions of the "outcome" model. However, they are inconsistent with the implications of the predation hypothesis.

6. Conclusion

Our study extends the work of LLSV by arguing that product market competition can be viewed as an additional external disciplinary factor. Based on the idea that competition can exert pressure on managers to distribute cash to their shareholders by increasing the risk and the cost of overinvesting, we argue that corporate payouts could be the result of product market competition or, alternatively, a substitute for competition.

The results in this paper seem to support the idea that corporate payouts are the outcome of the disciplinary forces of product market competition. We find that corporate payouts are negatively correlated with the industry concentration levels even after controlling for potential confounding effects. Moreover, consistent with the implications of agency theory, we find that the effect of product market competition on payouts is stronger among those firms that are more likely to overinvest.

Overall, our results complement the empirical results in LLSV. While they find evidence suggesting that a strong legal system exerts pressure on corporate managers to distribute excess cash to their shareholders, we find that intense product market competition appears to have similar effects. These findings are important because they further suggest that agency problems play an important role on managers' decision to distribute cash to shareholders.

References

Alchiam, Armen, 1950, Uncertainly, Evolution and Economic Theory, *The Journal of Political Economy*, 58, 211-221.

Caves, Richard E., 1980, "Industrial Organization, Corporate Strategy, and Structure," *Journal of Economic Literature* 18, 64-92.

Hicks, John R., 1935, "Annual Survey of Economic Theory: The Theory of Monopoly," *Econometrica* 3, 1-20.

Allen, Franklin, and Douglad Gale, 2000, Corporate Governance and Competition, published in Corporate Governance: Theoretical and Empirical Perspectives edited by X. Vives, Cambridge University Press, 23-94.

Grinstein, Yaniv and Ajay Palvia, 2006, Executive loans, corporate governance, and firm performance –evidence from banks, Working paper, Cornell University.

John, Kose, and Anzhela Knyazeva, 2006, Payout policy, agency conflicts and corporate governance, Working Paper, NYU.

Table 1
Summary Statistics

This table reports the summary statistics for the sample firms. To be included in the sample, the observation must satisfy the following criteria: the firm's financial data is available on Compustat; the firm operates in an industry covered by the Census of Manufacturers (SIC code interval 2011-3990); the firm has available information on dividends and share repurchases. DIV is the total dollar amount of dividends declared on the common stock. REPO is the expenditure on the purchase of common and preferred stocks. TPAY is the total payout of the firm (DIV plus REPO). SALES are to total sales. MV is the market value of common stock. ASSETS is equal to the total book value of assets. AGE is the time (in years) from the firm's CRSP listing date. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers. ROA is the operating income before depreciation scaled by total assets. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. All the payout measures have been truncated at one. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. The sample period is from 1972 to 2001.

	Mean	Std. Dev.	5th	Median	95th	N
Payout Measures						
DIV(t) / ASSETS(t-1)	1.23%	3.05%	0	0	4.67%	63,561
DIV(t) / SALES(t-1)	1.03%	2.84%	0	0	4.05%	62,509
DIV(t) / MV(t-1)	1.75%	3.07%	0	0	6.68%	55,378
TPAY(t) /ASSETS(t-1)	2.21%	5.09%	0	0.45%	8.83%	63,512
TPAY(t) / SALES(t-1)	1.97%	5.28%	0	0.37%	7.94%	62,386
TPAY(t) / MV(t-1)	2.97%	5.67%	0	1.09%	9.98%	55,330
Firm Characteristics						
MV	1,119.7	7,559.6	2.0	49.1	3,539.2	59,214
ASSETS	1,092.4	6,924.9	2.1	55.2	3,670.6	67,790
AGE	11.7	14.3	0	7	46	67,827
M/B	1.8	1.7	0.5	1.2	4.8	56,702
DEBT/ASSETS	0.194	0.178	0	0.163	0.537	66,028
HHI	720.6	548.0	290	560	1,800	67,827
ROA	0.050	0.344	-0.452	0.126	0.300	67,647
GS_5YR	0.111	0.183	-0.123	0.092	0.405	47,500
RETVOL	0.144	0.096	0.054	0.122	0.305	50,142

Table 2
The Relation between Product Market Competition and Corporate Payout Ratios: Univariate Analysis

This table presents a comparison of average payout ratios across quintiles based on the three-digit SIC Herfindahl-Hirschman Index (HHI) from the Census of Manufacturers. DIV is the total dollar amount of dividends declared on the common stock. REPO is the expenditure on the purchase of common and preferred stocks. TPAY is the total payout of the firm (DIV plus REPO). SALES are to total sales. MV is the market value of common stock. ASSETS is equal to the total book value of assets. All the payout measures have been truncated at one. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	HHI Quintiles					
	Lowest	2	3	4	Highest	Difference (Highest-Lowest)
DIV(t) / ASSETS(t-1)	1.46%	1.39%	1.20%	1.14%	0.96%	-0.50% [a]
DIV(t) / SALES(t-1)	1.15%	1.27%	1.05%	0.91%	0.77%	-0.38% [a]
DIV(t) / MV(t-1)	2.18%	1.79%	1.64%	1.59%	1.54%	-0.64% [a]
TPAY(t) /ASSETS(t-1)	2.38%	2.30%	2.30%	2.12%	1.95%	-0.43% [a]
TPAY(t) / SALES(t-1)	1.94%	2.21%	2.21%	1.82%	1.67%	-0.27% [a]
TPAY(t) / MV(t-1)	3.61%	2.97%	2.87%	2.77%	2.67%	-0.94% [a]
Proportion of Firms with DIV > 0	50.28%	43.57%	42.30%	39.13%	37.23%	-13.05%
Proportion of Firms with TPAY > 0	61.59%	54.51%	55.75%	52.10%	50.89%	-10.70%
Average HHI	319.8	430.7	561.3	772.9	1,513.1	1,193.6 [a]

Table 3
The Relation between Product Market Competition and Dividend Payouts

This table reports estimates of regressions relating scaled dividends to the Herfindahl-Hirschman Index and other control variables. DIV is the total dollar amount of dividends declared on the common stock. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. DUMHHI2, DUMHHI3, DUMHHI4, and DUMHHI5 are dummy variables for firms in the second, third, fourth, and fifth HHI quintiles, respectively. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. All the payout measures have been truncated at one. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Since the dependent variables are truncated at zero and one, we estimate the regression coefficients using a two-sided Tobit model. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Specifications assuming a linear relation between dividend payouts and the HHI

	Dependent Variable					
	DIV(t)/ SALES(t-1)	DIV(t)/ SALES(t-1)	DIV(t)/ ASSETS(t-1)	DIV(t)/ ASSETS(t-1)	DIV(t)/ MV(t-1)	DIV(t)/ MV(t-1)
Intercept	-0.0436[a]	-0.0038	-0.0473[a]	-0.0016	-0.0429[a]	-0.0061[b]
	(0.0031)	(0.0024)	(0.0031)	(0.0024)	(0.0027)	(0.0030)
HHI	-0.0512[a]	-0.0282[a]	-0.0512[a]	-0.0214[a]	-0.0337[a]	-0.0141[c]
	(0.0092)	(0.0066)	(0.0097)	(0.0069)	(0.0100)	(0.0085)
log (MV)	0.0092[a]	0.0049[a]	0.0090[a]	0.0039[a]	0.0101[a]	0.0062[a]
	(0.0005)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0004)
log (M/B)	-0.0181[a]	0.0014	-0.0179[a]	0.0045[b]	-0.0429[a]	-0.0277[a]
	(0.0020)	(0.0016)	(0.0017)	(0.0019)	(0.0016)	(0.0015)
ROA	0.1186[a]	0.0881[a]	0.1602[a]	0.1216[a]	0.1404[a]	0.1249[a]
	(0.0070)	(0.0065)	(0.0095)	(0.0094)	(0.0071)	(0.0075)
DEBT/ASSETS	-0.0301[a]	-0.0214[a]	-0.0387[a]	-0.0294[a]	-0.0269[a]	-0.0185[a]
	(0.0038)	(0.0034)	(0.0035)	(0.0029)	(0.0035)	(0.0035)
log (1+ AGE)	0.0039[a]	0.0022[a]	0.0047[a]	0.0032[a]	0.0052[a]	0.0039[a]
	(0.0005)	(0.0006)	(0.0005)	(0.0006)	(0.0005)	(0.0007)
GS_5YR		-0.0426[a]		-0.0471[a]		-0.0451[a]
		(0.0056)		(0.0050)		(0.0044)
RETVOL		-0.1795[a]		-0.1914[a]		-0.2073[a]
		(0.0140)		(0.0145)		(0.0137)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	54,236	38,657	54,972	38,729	51,672	38,605

Table 3 (continued)

Panel B: Specifications assuming a non-linear relation between dividend payouts and the HHI

	Dependent Variable					
	DIV(t)/ SALES(t-1)	DIV(t)/ SALES(t-1)	DIV(t)/ ASSETS(t-1)	DIV(t)/ ASSETS(t-1)	DIV(t)/ MV(t-1)	DIV(t)/ MV(t-1)
Intercept	-0.0414[a]	-0.0031	-0.0444[a]	-0.0003	-0.03969[a]	-0.0041
	(0.0030)	(0.0024)	(0.0029)	(0.0024)	(0.0027)	(0.0030)
DUMHHI2	-0.0014	-0.0003	-0.0026	-0.0010	-0.0028[b]	-0.0019
	(0.0013)	(0.0011)	(0.0016)	(0.0014)	(0.0014)	(0.0013)
DUMHHI3	-0.0047[a]	-0.0032[a]	-0.0054[a]	-0.0037[a]	-0.0044[a]	-0.0035[a]
	(0.0014)	(0.0012)	(0.0017)	(0.0015)	(0.0014)	(0.0013)
DUMHHI4	-0.0090[a]	-0.0059[a]	-0.0094[a]	-0.0055[a]	-0.0079[a]	-0.0056[a]
	(0.0014)	(0.0012)	(0.0018)	(0.0015)	(0.0015)	(0.0014)
DUMHHI5	-0.0145[a]	-0.0078[a]	-0.0160[a]	-0.0079[a]	-0.0134[a]	-0.0081[a]
	(0.0015)	(0.0013)	(0.0019)	(0.0015)	(0.0016)	(0.0015)
log (MV)	0.0092[a]	0.0049[a]	0.0090[a]	0.0040[a]	0.0102[a]	0.0063[a]
	(0.0005)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0004)
log (M/B)	-0.0174[a]	0.0015	-0.0172[a]	0.0045[b]	-0.0423[a]	-0.0276[a]
	(0.0020)	(0.0016)	(0.0017)	(0.0019)	(0.0016)	(0.0015)
ROA	0.1165[a]	0.0867[a]	0.1576[a]	0.1199[a]	0.1373[a]	0.1225[a]
	(0.0069)	(0.0064)	(0.0093)	(0.0091)	(0.0070)	(0.0075)
DEBT/ASSETS	-0.0312[a]	-0.0223[a]	-0.0397[a]	-0.0302[a]	-0.0277[a]	-0.0193[a]
	(0.0038)	(0.0034)	(0.0035)	(0.0029)	(0.0035)	(0.0035)
log (1+ AGE)	0.0038[a]	0.0023[a]	0.0046[a]	0.0033[a]	0.0053[a]	0.0039[a]
	(0.0005)	(0.0006)	(0.0005)	(0.0006)	(0.0005)	(0.0007)
GS_5YR		-0.0413[a]		-0.0457[a]		-0.0435[a]
		(0.0055)		(0.0049)		(0.0044)
RETVOL		-0.1758[a]		-0.1875[a]		-0.2031[a]
		(0.0138)		(0.0142)		(0.0135)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	54,236	38,657	54,972	38,729	51,672	38,605

Table 4
The Relation between Product Market Competition and Total Payouts

This table reports estimates of regressions relating scaled total payouts to the Herfindahl-Hirschman Index and other control variables. TPAY is the total payout of the firm [the total dollar amount of dividends declared on the common stock plus the expenditure on the purchase of common and preferred stocks]. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. DUMHHI2, DUMHHI3, DUMHHI4, and DUMHHI5 are dummy variables for firms in the second, third, fourth, and fifth HHI quintiles, respectively. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. All the payout measures have been truncated at one. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Since the dependent variables are truncated at zero and one, we estimate the regression coefficients using a two-sided Tobit model. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Specifications assuming a linear relation between total payouts and the HHI

	Dependent Variable					
	TPAY(t)/ SALES(t-1)	TPAY(t)/ SALES(t-1)	TPAY(t)/ ASSETS(t-1)	TPAY(t)/ ASSETS(t-1)	TPAY(t)/ MV(t-1)	TPAY(t)/ MV(t-1)
Intercept	-0.0394[a]	-0.0056[b]	-0.0379[a]	-0.0042	-0.0379[a]	-0.0089[a]
	(0.0023)	(0.0028)	(0.0022)	(0.0028)	(0.0025)	(0.0036)
HHI	-0.0675[a]	-0.0496[a]	-0.0610[a]	-0.0380[a]	-0.0565[a]	-0.0394[a]
	(0.0102)	(0.0083)	(0.0103)	(0.0086)	(0.0123)	(0.0111)
log (MV)	0.0104[a]	0.0060[a]	0.0091[a]	0.0044[a]	0.0108[a]	0.0067[a]
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
log (M/B)	-0.0103[a]	0.0078[a]	-0.0063[a]	0.0115[a]	-0.0408[a]	-0.0299[a]
	(0.0017)	(0.0019)	(0.0016)	(0.0021)	(0.0015)	(0.0018)
ROA	0.0693[a]	0.0794[a]	0.1074[a]	0.1298[a]	0.0929[a]	0.1260[a]
	(0.0067)	(0.0082)	(0.0070)	(0.0103)	(0.0066)	(0.0098)
DEBT/ASSETS	-0.0437[a]	-0.0364[a]	-0.0492[a]	-0.0414[a]	-0.0268[a]	-0.0193[a]
	(0.0042)	(0.0042)	(0.0036)	(0.0035)	(0.0042)	(0.0046)
log (1+ AGE)	0.0042[a]	0.0023[a]	0.0051[a]	0.0039[a]	0.0071[a]	0.0053[a]
	(0.0006)	(0.0007)	(0.0006)	(0.0007)	(0.0007)	(0.0008)
GS_5YR		-0.0362[a]		-0.0435[a]		-0.0461[a]
		(0.0055)		(0.0046)		(0.0052)
RETVOL		-0.1559[a]		-0.1648[a]		-0.1719[a]
		(0.0112)		(0.0105)		(0.0120)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	54,137	38,632	54,943	38,728	51,648	38,595

Table 4 (continued)

Panel B: Specifications assuming a non-linear relation between total payouts and the HHI

	Dependent Variable					
	TPAY(t)/ SALES(t-1)	TPAY(t)/ SALES(t-1)	TPAY(t)/ ASSETS(t-1)	TPAY(t)/ ASSETS(t-1)	TPAY(t)/ MV(t-1)	TPAY(t)/ MV(t-1)
Intercept	-0.0374[a]	-0.0053[c]	-0.0350[a]	-0.0031	-0.0341[a]	-0.0070[c]
	(0.0024)	(0.0029)	(0.0023)	(0.0029)	(0.0026)	(0.0037)
DUMHHI2	-0.0033[b]	-0.0016	-0.0046[b]	-0.0024	-0.0051[a]	-0.0032[c]
	(0.0017)	(0.0015)	(0.0017)	(0.0015)	(0.0019)	(0.0019)
DUMHHI3	-0.0042[a]	-0.0022	-0.0055[a]	-0.0034[b]	-0.0061[a]	-0.0040[b]
	(0.0016)	(0.0015)	(0.0017)	(0.0015)	(0.0019)	(0.0019)
DUMHHI4	-0.0106[a]	-0.0073[a]	-0.0105[a]	-0.0065[a]	-0.0112[a]	-0.0081[a]
	(0.0017)	(0.0015)	(0.0019)	(0.0017)	(0.0020)	(0.0020)
DUMHHI5	-0.0162[a]	-0.0104[a]	-0.0169[a]	-0.0104[a]	-0.0184[a]	-0.0129[a]
	(0.0017)	(0.0015)	(0.0019)	(0.0017)	(0.0021)	(0.0020)
log (MV)	0.0104[a]	0.0060[a]	0.0091[a]	0.0045[a]	0.0108[a]	0.0068[a]
	(0.0004)	(0.0004)	(0.0003)	(0.0004)	(0.0004)	(0.0004)
log (M/B)	-0.0099[a]	0.0078[a]	-0.0059[a]	0.0115[a]	-0.0404[a]	-0.0299[a]
	(0.0017)	(0.0019)	(0.0016)	(0.0021)	(0.0015)	(0.0018)
ROA	0.0690[a]	0.0791[a]	0.1068[a]	0.1292[a]	0.0918[a]	0.1249[a]
	(0.0066)	(0.0082)	(0.0069)	(0.0102)	(0.0065)	(0.0097)
DEBT/ASSETS	-0.0448[a]	-0.0374[a]	-0.0502[a]	-0.0423[a]	-0.0278[a]	-0.0203[a]
	(0.0042)	(0.0042)	(0.0036)	(0.0035)	(0.0042)	(0.0046)
log (1+ AGE)	0.0041[a]	0.0023[a]	0.0050[a]	0.0040[a]	0.0071[a]	0.0054[a]
	(0.0005)	(0.0007)	(0.0006)	(0.0007)	(0.0007)	(0.0009)
GS_5YR		-0.0356[a]		-0.0426[a]		-0.0449[a]
		(0.0055)		(0.0046)		(0.0052)
RETVOL		-0.1525[a]		-0.1613[a]		-0.1673[a]
		(0.0111)		(0.0104)		(0.0118)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	54,137	38,632	54,943	38,728	51,648	38,595

Table 5
The Relation between Product Market Competition and the Decision to Distribute Cash to Shareholders

This table reports estimates of logistic regressions relating the decision to distribute cash to shareholders to the Herfindahl-Hirschman Index and other control variables. DUMDIV is a dummy variable that is equal to 1 if the firm pays dividends, 0 otherwise. DUMTPAY is a dummy variable that is equal to 1 if the firm pays dividends and/or repurchases shares. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. DUMHHI2, DUMHHI3, DUMHHI4, and DUMHHI5 are dummy variables for firms in the second, third, fourth, and fifth HHI quintiles, respectively. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Specifications assuming a linear relation between the decision to distribute cash and the HHI

	DUMDIV				DUMTPAY			
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Intercept	-2.69[a]		-0.80[a]		-0.97[a]		0.01	
	(0.11)		(0.19)		(0.08)		(0.15)	
HHI	-2.78[a]	-0.65[a]	-1.51[b]	-0.37[b]	-2.44[a]	-0.57[a]	-2.11[a]	-0.39[a]
	(0.61)	(0.14)	(0.71)	(0.17)	(0.44)	(0.10)	(0.54)	(0.10)
log (MV)	0.78[a]	0.18[a]	0.63[a]	0.15[a]	0.57[a]	0.13[a]	0.50[a]	0.09[a]
	(0.03)	(0.01)	(0.03)	(0.01)	(0.02)	(0.003)	(0.02)	(0.004)
log (M/B)	-2.07[a]	-0.48[a]	-1.21[a]	-0.30[a]	-1.25[a]	-0.29[a]	-0.95[a]	-0.18[a]
	(0.08)	(0.02)	(0.10)	(0.03)	(0.05)	(0.01)	(0.07)	(0.01)
ROA	6.89[a]	1.60[a]	6.50[a]	1.60[a]	2.44[a]	0.57[a]	3.58[a]	0.67[a]
	(0.28)	(0.06)	(0.35)	(0.09)	(0.18)	(0.04)	(0.27)	(0.05)
DEBT/ASSETS	-1.41[a]	-0.33[a]	-1.15[a]	-0.28[a]	-1.53[a]	-0.35[a]	-1.68[a]	-0.31[a]
	(0.18)	(0.04)	(0.22)	(0.05)	(0.13)	(0.03)	(0.17)	(0.03)
log (1+ AGE)	0.42[a]	0.10[a]	0.35[a]	0.08[a]	0.31[a]	0.07[a]	0.24[a]	0.04[a]
	(0.03)	(0.01)	(0.05)	(0.01)	(0.02)	(0.005)	(0.04)	(0.01)
GS_5YR			-2.06[a]	-0.51[a]			-1.11[a]	-0.21[a]
			(0.21)	(0.05)			(0.14)	(0.03)
RETVOL			-15.20[a]	-3.74[a]			-8.20[a]	-1.52[a]
			(0.61)	(0.16)			(0.43)	(0.09)
Year Dummies	Yes		Yes		Yes		Yes	
N	55,766		38,739		55,766		38,739	

Table 5 (continued)

Panel B: Specifications assuming a non-linear relation between the decision to distribute cash and the HHI

	DUMDIV				DUMTPAY			
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Intercept	-2.55[a]		-0.73[a]		-0.86[a]		0.05	
	(0.12)		(0.19)		(0.09)		(0.16)	
DUMHHI2	-0.12	-0.03	0.01	0.002	-0.16[b]	-0.04[b]	-0.06	-0.01
	(0.09)	(0.02)	(0.10)	(0.03)	(0.07)	(0.02)	(0.09)	(0.02)
DUMHHI3	-0.22[a]	-0.05[a]	-0.20[c]	-0.05[c]	-0.16[b]	-0.04[b]	-0.11	-0.02
	(0.09)	(0.02)	(0.10)	(0.03)	(0.07)	(0.02)	(0.09)	(0.02)
DUMHHI4	-0.58[a]	-0.13[a]	-0.49[a]	-0.12[a]	-0.43[a]	-0.10[a]	-0.38[a]	-0.07[a]
	(0.10)	(0.02)	(0.11)	(0.03)	(0.07)	(0.02)	(0.09)	(0.02)
DUMHHI5	-0.90[a]	-0.19[a]	-0.62[a]	-0.15[a]	-0.68[a]	-0.16[a]	-0.56[a]	-0.11[a]
	(0.10)	(0.02)	(0.11)	(0.03)	(0.07)	(0.02)	(0.09)	(0.02)
log (MV)	0.79[a]	0.18[a]	0.63[a]	0.15[a]	0.57[a]	0.13[a]	0.50[a]	0.09[a]
	(0.03)	(0.01)	(0.03)	(0.01)	(0.02)	(0.003)	(0.02)	(0.004)
log (M/B)	-2.03[a]	-0.47[a]	-1.20[a]	-0.29[a]	-1.25[a]	-0.29[a]	-0.95[a]	-0.18[a]
	(0.08)	(0.02)	(0.10)	(0.03)	(0.05)	(0.01)	(0.07)	(0.01)
ROA	6.81[a]	1.59[a]	6.44[a]	1.58[a]	2.45[a]	0.57[a]	3.59[a]	0.67[a]
	(0.28)	(0.06)	(0.36)	(0.09)	(0.18)	(0.04)	(0.27)	(0.05)
DEBT/ASSETS	-1.51[a]	-0.32[a]	-1.25[a]	-0.31[a]	-1.59[a]	-0.37[a]	-1.75[a]	-0.32[a]
	(0.18)	(0.04)	(0.23)	(0.06)	(0.13)	(0.03)	(0.17)	(0.03)
log (1+ AGE)	0.42[a]	0.10[a]	0.36[a]	0.09[a]	0.31[a]	0.07[a]	0.24[a]	0.05[a]
	(0.03)	(0.01)	(0.06)	(0.01)	(0.02)	(0.005)	(0.04)	(0.01)
GS_5YR			-1.98[a]	-0.49[a]			-1.08[a]	-0.20[a]
			(0.21)	(0.05)			(0.14)	(0.03)
RETVOL			-14.90[a]	-3.65[a]			-8.00[a]	-1.48[a]
			(0.61)	(0.15)			(0.43)	(0.09)
Year Dummies	Yes		Yes		Yes		Yes	
N	55,766		38,739		55,766		38,739	

Table 6
The Effect of Potential Free Cash Flow Problems on the Relation between Product Market Competition and Dividend Payouts

This table reports estimates of regressions relating scaled dividends to the Herfindahl-Hirschman Index and other control variables estimated on sub-samples partitioned based on whether a firm has high or low potential free cash flow problems. A firm is classified as having high free cash flow problems (High FCF) if its level of cash at t-1 is in the largest tercile of the empirical distribution and its five-year growth rate in total sales is in the lowest tercile of the empirical distribution. Similarly, a firm is classified as having low free cash flow problems (Low FCF) if its level of cash at t-1 is in the smallest tercile of the empirical distribution and its five-year growth rate in total sales is in the highest tercile of the empirical distribution. DIV is the total dollar amount of dividends declared on the common stock. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. All the payout measures have been truncated at one. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Since the dependent variables are truncated at zero and one, we estimate the regression coefficients using a two-sided Tobit model. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Dependent Variables					
	DIV(t)/ SALES(t-1)		DIV(t)/ ASSETS(t-1)		DIV(t)/ MV(t-1)	
	High FCF	Low FCF	High FCF	Low FCF	High FCF	Low FCF
Intercept	-0.0376[b]	-0.0181[b]	-0.0259[b]	-0.0118[c]	-0.0497[a]	-0.0131[c]
	(0.0161)	(0.0089)	(0.0119)	(0.0063)	(0.0167)	(0.0076)
HHI	-0.0087[a]	-0.0009	-0.0086[a]	-0.0001	-0.0103[a]	-0.0002
	(0.0029)	(0.0010)	(0.0024)	(0.0013)	(0.0033)	(0.0015)
log (MV)	0.0061[a]	0.0072[a]	0.0044[a]	0.0064[a]	0.0066[a]	0.0081[a]
	(0.0012)	(0.0015)	(0.0009)	(0.0011)	(0.0011)	(0.0011)
log (M/B)	-0.0047	-0.0070[b]	0.0022	-0.0023	-0.0242[a]	-0.0285[a]
	(0.0048)	(0.0036)	(0.0041)	(0.0032)	(0.0056)	(0.0045)
ROA	0.1482[a]	0.0842[a]	0.1584[a]	0.0820[a]	0.1939[a]	0.1025[a]
	(0.0233)	(0.0248)	(0.0209)	(0.0145)	(0.0335)	(0.0189)
DEBT/ASSETS	-0.0946[a]	0.0176	-0.0857[a]	0.0017	-0.0779[a]	0.0085
	(0.0159)	(0.0130)	(0.0106)	(0.0070)	(0.0139)	(0.0084)
log (1+ AGE)	0.0140[a]	-0.0005	0.0114[a]	0.0004	0.0151[a]	0.0020
	(0.0031)	(0.0015)	(0.0023)	(0.0012)	(0.0032)	(0.0015)
GS_5YR	0.0132	-0.0537[a]	0.0213	-0.0573[a]	0.0225	-0.0729[a]
	(0.0262)	(0.0168)	(0.0198)	(0.0148)	(0.0243)	(0.0285)
RETVOL	-0.2247[a]	-0.1074[a]	-0.1819[a]	-0.1268[a]	-0.1916[a]	-0.1544[a]
	(0.0678)	(0.0272)	(0.0523)	(0.0281)	(0.0628)	(0.0285)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	4,047	3,981	4,065	3,990	4,055	3,975

Table 7
The Effect of Potential Free Cash Flow Problems on the Relation between Product Market Competition and Total Payouts

This table reports estimates of regressions relating scaled total payouts to the Herfindahl-Hirschman Index and other control variables estimated on sub-samples partitioned based on whether a firm has high or low potential free cash flow problems. A firm is classified as having high free cash flow problems (High FCF) if its level of cash at t-1 is in the largest tercile of the empirical distribution and its five-year growth rate in total sales is in the lowest tercile of the empirical distribution. Similarly, a firm is classified as having low free cash flow problems (Low FCF) if its level of cash at t-1 is in the smallest tercile of the empirical distribution and its five-year growth rate in total sales is in the highest tercile of the empirical distribution. TPAY is the total payout of the firm [the total dollar amount of dividends declared on the common stock plus the expenditure on the purchase of common and preferred stocks]. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. All the payout measures have been truncated at one. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Since the dependent variables are truncated at zero and one, we estimate the regression coefficients using a two-sided Tobit model. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Dependent Variables					
	TPAY(t)/ SALES(t-1)		TPAY(t)/ ASSETS(t-1)		TPAY(t)/ MV(t-1)	
	High FCF	Low FCF	High FCF	Low FCF	High FCF	Low FCF
Intercept	-0.0171	-0.0306[a]	-0.0107	-0.0271[a]	-0.0360[a]	-0.0405[a]
	(0.0133)	(0.0079)	(0.0105)	(0.0063)	(0.0143)	(0.0106)
HHI	-0.0111[a]	-0.0021[c]	-0.0095[a]	-0.0016	-0.0157[a]	-0.0041[b]
	(0.0036)	(0.0012)	(0.0029)	(0.0015)	(0.0043)	(0.0021)
log (MV)	0.0060[a]	0.0079[a]	0.0033[a]	0.0066[a]	0.0054[a]	0.0087[a]
	(0.0013)	(0.0011)	(0.0010)	(0.0008)	(0.0013)	(0.0010)
log (M/B)	0.0002	-0.0100[a]	0.0131[b]	-0.0057[c]	-0.0234[a]	-0.0437[a]
	(0.0057)	(0.0030)	(0.0052)	(0.0034)	(0.0055)	(0.0056)
ROA	0.1327[a]	0.0614[a]	0.1640[a]	0.0863[a]	0.1769[a]	0.1318[a]
	(0.0229)	(0.0269)	(0.0200)	(0.0255)	(0.0228)	(0.0279)
DEBT/ASSETS	-0.0615[a]	0.0087	-0.0678[a]	-0.0004	-0.0367[c]	0.0174
	(0.0197)	(0.0118)	(0.0124)	(0.0089)	(0.0173)	(0.0114)
log (1+ AGE)	0.0085[a]	0.0009	0.0091[a]	0.0024[c]	0.0139[a]	0.0056
	(0.0031)	(0.0015)	(0.0022)	(0.0013)	(0.0032)	(0.0020)
GS_5YR	-0.0515	-0.0219[a]	-0.0174	-0.0290[a]	-0.0462	-0.0319[a]
	(0.0359)	(0.0086)	(0.0241)	(0.0085)	(0.0351)	(0.0122)
RETVOL	-0.2085[a]	-0.0442	-0.1796[a]	-0.0714[a]	-0.1791[a]	-0.1124[a]
	(0.0399)	(0.0301)	(0.0327)	(0.0284)	(0.0403)	(0.0308)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	4,038	3,980	4,065	3,990	4,055	3,975

Table 8
The Effect of Potential Free Cash Flow Problems on the Relation between Product Market Competition and the Decision to Distribute Cash to Shareholders

This table reports estimates of logistic regressions relating the decision to distribute cash to shareholders to the Herfindahl-Hirschman Index and other control variables estimated on sub-samples partitioned based on whether a firm has high or low potential free cash flow problems. A firm is classified as having high free cash flow problems (High FCF) if its level of cash at t-1 is in the largest tercile of the empirical distribution and its five-year growth rate in total sales is in the lowest tercile of the empirical distribution. Similarly, a firm is classified as having low free cash flow problems (Low FCF) if its level of cash at t-1 is in the smallest tercile of the empirical distribution and its five-year growth rate in total sales is in the highest tercile of the empirical distribution. DUMDIV is a dummy variable that is equal to 1 if the firm pays dividends, 0 otherwise. DUMTPAY is a dummy variable that is equal to 1 if the firm pays dividends and/or repurchases shares. HHI is the three-digit SIC Herfindahl-Hirschman Index from the Census of Manufacturers scaled by 10,000. M/B is the market-to-book ratio [(book value of assets + market value of equity - book value of equity) / book value of assets]. ROA is the operating income before depreciation scaled by total assets. DEBT/ASSETS is equal to long-term debt plus short-term debt scaled by total assets. AGE is the time (in years) from the firm's CRSP listing date. GS_5YR is the five-year growth rate in total sales. RETVOL is the standard deviation of monthly stock returns. M/B, ROA, and GS_5YR have been winsorized at the 1% and the 99% of the empirical distribution. Standard errors adjusted for within-firm correlation are reported in parentheses below coefficient estimates. Superscripts a, b, and c denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	DUMDIV				DUMTPAY			
	High FCF		Low FCF		High FCF		Low FCF	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Intercept	-0.49		-1.16[b]		0.23		-0.96[b]	
	(0.49)		(0.54)		(0.43)		(0.42)	
HHI	-4.71[a]	-1.03[a]	-0.79	-0.20	-4.48[a]	-1.00[a]	-1.86[b]	-0.37[b]
	(1.37)	(0.30)	(1.11)	(0.28)	(1.09)	(0.24)	(0.92)	(0.18)
log (MV)	0.41[a]	0.09[a]	0.79[a]	0.19[a]	0.34[a]	0.08[a]	0.61[a]	0.12[a]
	(0.05)	(0.01)	(0.07)	(0.02)	(0.04)	(0.01)	(0.05)	(0.01)
log (M/B)	-0.61[a]	-0.13[a]	-1.44[a]	-0.36[a]	-0.68[a]	-0.15[a]	-1.61[a]	-0.32[a]
	(0.19)	(0.04)	(0.25)	(0.06)	(0.14)	(0.03)	(0.19)	(0.04)
ROA	5.22[a]	1.14[a]	5.19[a]	1.29[a]	2.71[a]	0.60[a]	3.50[a]	0.70[a]
	(0.70)	(0.15)	(0.93)	(0.23)	(0.46)	(0.10)	(0.77)	(0.16)
DEBT/ASSETS	-3.25[a]	-0.71[a]	0.088	0.02	-2.63[a]	-0.59[a]	-0.52	-0.10
	(0.53)	(0.12)	(0.50)	(0.12)	(0.38)	(0.08)	(0.40)	(0.08)
log (1+ AGE)	0.54[a]	0.12[a]	0.29[b]	0.07[b]	0.27[a]	0.06[a]	0.33[a]	0.07[a]
	(0.11)	(0.03)	(0.14)	(0.03)	(0.10)	(0.02)	(0.10)	(0.02)
GS_5YR	3.60[a]	0.79[a]	-4.77[a]	-1.19[a]	1.77[a]	0.39[a]	-1.73[a]	-0.35[a]
	(0.92)	(0.20)	(0.68)	(0.17)	(0.64)	(0.14)	(0.37)	(0.07)
RETVOL	-14.31[a]	-3.13[a]	-9.84[a]	-2.45[a]	-6.90[a]	-1.54[a]	-5.56[a]	-1.11[a]
	(2.11)	(0.41)	(1.37)	(0.34)	(1.17)	(0.27)	(1.02)	(0.21)
Year Dummies	Yes		Yes		Yes		Yes	
N	4,065		3,990		4,065		3,990	