

The Effects of Corporate Governance and Product Market Competition on Payout Policy under Agency Problems and External Financing Constraints

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ABSTRACT

We examine the effects of corporate governance and product market competition on the payout policy when firms are subject to agency problems and external financing constraints. We find that corporate governance and competition affect corporate payout decisions. In particular, payout can be an outcome of or a substitute for both governance and competition among firms depending on the firms' agency costs of free cash flows and external financing costs. When examining both effects together, we find that product market competition subsumes corporate governance in relation to payout policy. Our results suggest that product market competition as a governance tool can be more effective than other monitoring mechanisms.

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I. INTRODUCTION

An important issue in relation to corporate governance and firm behavior is the impact of governance on corporate payout policy. La Porta et al. (2000) find that firms in countries where investor rights and legal protections are strong tend to pay higher dividends. Known as the outcome model, it essentially contends that effective governance induces firms to disgorge more cash to shareholders, thereby reducing agency costs of free cash flows. However, Hu and Kumar (2004) demonstrate that firms with entrenched managers are more likely to pay higher dividends. Gugler (2003) finds that state-controlled firms that are likely to exhibit higher agency costs have higher payout. Therefore, contrary to the outcome model, dividends are viewed as a substitute for external disciplinary mechanism to mitigate managerial incentive problems in the absence of effective governance.

Another strand of the literature focuses on product market competition as an external governance mechanism that can reduce manager and shareholder conflicts. Shleifer and Vishny (1997) argue that competition among firms reduces private benefits of managerial control. In a similar vein, Allen and Gale (2000) suggest that competitive forces can be an effective governance tool to identify and remove incompetent managers. Giroud and Mueller (2010) find that product market competition mitigates managerial slack and is therefore a substitute for corporate governance. Consistent with the above argument, Grullon and Michaely (2007) find that firms in more (less) competitive industries have higher (lower) payout. Nevertheless, Knyazeva and Knyazeva (2012) using non-US data report that firms with strong shareholder rights pay higher dividends in both competitive and concentrated industries.

In this paper, we bridge these two strands of the literature by examining the joint effects of corporate governance and product market competition on payout policy. If governance or competition alone is important for a firm's payout decision, a natural question that follows is the extent to which the interactions between competition among firms and their strength of governance influence corporate payout policy. Our investigation should lead to further understanding into the relative effectiveness of competition and corporate governance. In particular, we examine whether competition complements or substitutes corporate governance on corporate payout policy.

Furthermore, we take agency costs and external financing costs into consideration when examining the joint effects of governance and competition. Chae et al. (2009) find that these two types of costs are important as they affect the relationship between governance and payout policy. For example, firms may reduce payout in the presence of agency problems despite strong governance when facing external financing constraints. The scope of our paper is therefore broader and more in-depth than those of recent studies as we examine not only the effects of both governance and competition but also incorporating firms' agency problems and external financing constraints together. To our knowledge, this is the first study that accounts for all of these linkages.

Our empirical analysis yields the following results. First, we find that the relationship between corporate governance and payout changes depending on agency problems and external financing constraints. Under high agency costs of free cash flows, firms with strong governance tend to increase payout. However, when firms with strong governance encounter high external financing costs, they reduce cash dividends and stock repurchase even in the presence of high agency problems. Our findings therefore can be

explained by both outcome and substitution models.

Second, competition plays an important role in a firm's payout policy. Firms in less competitive (or more concentrated) industries exhibit lower payout, supporting the view that competition acts as an external governance mechanism. As these firms experience high agency costs of free cash flows, they tend to increase payout, suggesting that dividends are a substitute for governance. However, firms with agency problems in more concentrated industries reduce their total payout when facing external financing constraints, a relation that is consistent with the outcome model.

Most importantly, combining the effects of corporate governance and product market competition reveals that the latter plays a more influential role in a firm's payout decision. The importance of corporate governance appears to be absorbed by competition among firms. Therefore, similar to the results related to the effect of competition alone, firms in less competitive industries have lower payout. As these firms have high agency costs of free cash flows, they increase cash dividends and stock repurchases perhaps to mitigate conflicts between managers and shareholders. External financing constraints lower the payout of firms in less competitive industries despite the presence of agency problems.

Our results remain robust after using other proxies for corporate governance, competition, agency problems, financing constraints, and firm characteristics. In sum, the findings are consistent with Giroud and Mueller (2010) and Allen and Gale (2000), who suggest that competition is a substitute for corporate governance, and that it can be more effective than the market for corporate control and other monitoring mechanisms.

The remainder of the paper is organized as follows. Section II discusses the development of our hypotheses. Section III describes sample selection and data. Empirical results are reported in Section IV and Section V concludes the paper.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A. Agency Theory and Payout Decision

In light of the seminal work of Jensen and Meckling (1976) on agency theory, Easterbrook (1984) argues that a firm's payout behavior can be explained by the principal-agency conflicts between managers and shareholders. Firms pay dividends in return for raising external equity in the capital market where the cost of monitoring is lower, thereby mitigating agency costs for firms. This agency-cost based explanation is further extended by La Porta et al. (2000) who suggest that agency problems can be reduced by effective law enforcement on shareholder rights. It follows that payout can be related to external governance in which firms operate.

La Porta et al. (2000) formulate two agency-based models of payout policy: the outcome model and the substitute model. The former states that firms that operate in strong external governance pay higher dividends to reduce expropriation of free cash flows by managers. On the other hand, the latter hypothesizes that firms in weak governance pay higher dividends as a substitute for the lack of governance mechanisms. Higher payout may help firms to establish good reputation that in turn lowers the cost of raising external capital.

Accordingly, the outcome model and the substitution model predict opposite relations between the governance mechanism and dividend payouts. Reconciling these two competing hypotheses, Chae et al. (2009) find that the relationship between

governance and a firm's payout decision can be changed conditional on agency problems and external financing constraints. For example, a firm with strong governance but high (low) external financing costs has lower (higher) payout in the presence of agency problems. They suggest that it is important to consider agency costs and external financing costs when examining the effect of governance on payout policy.

B. Product Market Competition and Payout Decision

Tracing back at least as early as Leibenstein (1966), product market competition is often argued to provide an alternative source of discipline for managers. Shleifer (1985) and Aghion et al. (1999) point out that inefficient managers in competitive industries are more likely to be discovered and 'weeded out' from firms when the relative firm performance benchmark is more apparent. Chevalier (1995) and Phillips (1995) highlight that increased competition tends to reduce 'slacking' or 'shirking'. As a result, competition increases management effort and firm efficiency that in turn improves firm performance. In a similar vein, Schmidt (1997) and Raith (2003) suggest that the threat of firm survival and the disutility from losing jobs strengthen managerial incentives in competitive industries. Coupled with improved information for comparability among managers, agency costs can be reduced as managerial behaviors are more aligned with shareholder interests. Allen and Gale (2000) further argue that product market competition can be more effective than market scrutiny (via external financing) and internal control measures as a tool for governance. Along with the reasoning that competition serves as a source of disciplinary force, Grullon and Michaely (2007) conclude that competitive forces induce managers to pay excess cash.

C. External Financing Constraints and Payout Decision

Recent studies pay particular attention to payout policy when firms are under external financing constraints. Chae et al. (2009) find that firms with financing constraints tend to pay lower dividends despite having strong governance and high agency costs of free cash flows. Bates et al. (2009) document that U.S. firms increased their cash-to-assets ratio from 1980 to 2006 because their cash flows had become riskier. Morellec and Nikolov (2009) suggest that this is especially the case for firms in competitive industries for holding more cash as a precautionary move to cover operating losses and avoid inefficient closure. Therefore, firms experiencing financing constraints tend to hold more cash to avoid high costs of funding and hedge for future uncertainty (see Han et al. (2007), Haushalter et al. (2007), and Denis and Sibilkov (2010)). Conversely, if firms exhibit agency problems without financing constraints, competitive forces that serve as an effective governance mechanism may induce firms to disgorge more cash to shareholders. It turns out that while higher dividends mitigate agency problems that arise from the conflict of interests between shareholders and managers, lower dividends help firms to hoard cash for precautionary needs in a competitive market. As a result, firms in competitive industries may have to weigh the benefits of agency cost reduction against the costs of financing constraints to reach an optimal payout strategy. Controlling for external financing constraints and agency costs of free cash flows may therefore provide a more complete picture on firms' payout behavior in relation to product market competition. Based on the discussions in the sub-sections above, Table 1 summarizes the effects of corporate governance and product market competition on payout decisions.

Table 1
Interrelationships among corporate governance, product market competition and corporate payout decisions

	Agency Problems	External Financing Constraints	Payout
Corporate governance	Yes	Yes	-
	Yes	No	+
Product Market Competition	Yes	Yes	-
	Yes	No	+

D. Corporate Governance Versus Product Market Competition

Given the important roles of corporate governance and competition in reducing agency problems, current debate has shifted to the question of whether competition substitutes or reinforces corporate governance in payout decision. Giroud and Mueller (2010 and 2011) demonstrate that corporate governance only matters in non-competitive industries. They show that weaker corporate governance leads to higher input costs, wages, and overhead costs. At the same time, weak governance firms experience lower firm value and stock returns, and a decline in operating performance, but only in non-competitive industries. Their findings suggest a substitute relationship between competition and corporate governance.

In contrast, Knyazeva and Knyazeva (2012) suggest that product market competition and corporate governance are complementary. They report that stronger shareholder rights protections are related to better firm performance only in competitive industries. They argue that competition strengthens the effect of shareholder rights because relative performance can be more readily compared and evaluated in competitive industries. It facilitates the detection of underperforming managers that may result in their dismissals. Therefore, shareholder rights are more effective in competitive industries. Despite the complementary relationship between shareholder rights protections and competition, Knyazeva and Knyazeva (2012) document that it does not necessarily apply to payout decision as firms with strong shareholder rights have higher payout in both competitive and less competitive industries.

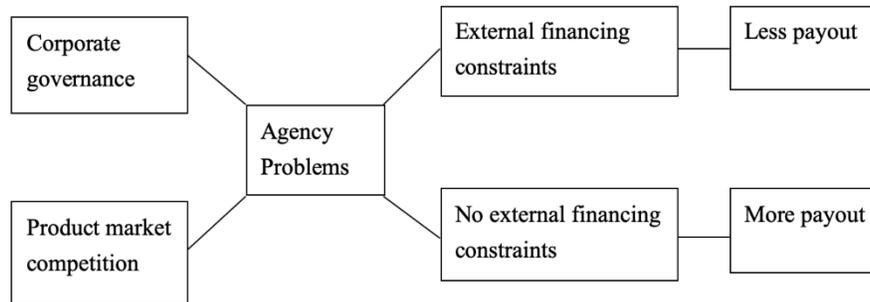
Recent studies that examine the interactions between corporate governance and competition, however, do not take into consideration of agency problems and external financing constraints of the firms. As discussed earlier, the relationship between governance and payout decision can change at different levels of agency costs and external financing costs. Failure to account for these two types of costs may potentially lead to incorrect inferences when examining the relationship among competition, corporate governance, and payout decision. Figure 1 summarizes the interrelationship among each of the key variables discussed above in relation to payout decisions. The hypotheses can be stated as follows:

H1: The relationship between corporate governance and payout policy is weaker for firms under agency problems and external financing constraints in competitive industries.

H2: The relationship between corporate governance and payout policy is stronger for firms under agency problems and external financing constraints in competitive industries.

Figure 1

The joint effects of corporate governance and product market competition on corporate payout decisions



III. DATA AND VARIABLE DEFINITIONS

Our sample is obtained from Compustat, RiskMetrics, and U.S. Census of Bureau from 1990 to 2009. The financial information about sample firms is collected from Compustat. The anti-takeover provisions created by Gompers et al. (2003) for firm-level governance for the years 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006 are from RiskMetrics. We remove firms in financial and utility industries in our final sample since the operations of firms in these industries are subject to different regulations and their financial statements may pose different analytical problems than those of regular firms. After excluding data with missing observations, our final sample consists of 2,714 firms and 18,821 firm-year observations over the period of 1990-2009. Table 2 presents the distribution of sample firms by year.

As Grullon and Michaely (2004) report that share repurchases have become more prevalent in the U.S. and U.S. firms are increasingly substituting dividends for share repurchases, we use both dividends and total payouts (dividends and share repurchases) scaled by firm's total assets or sales to measure dividend payout ratios. The total assets and sales used in scaling payouts are 1-year lagged terms since dividends and share repurchases declared during a particular financial year are related to the information from financial reports in the previous year.

We use two measures for corporate governance for robustness checks. Known as the G-index, Gompers et al. (2003) use the sum of scores from 24 anti-takeover provisions to create an index to measure a firm's shareholder protection. A firm with higher G-index is said to have weak governance. The other governance measure, the E-index, is developed by Bebehuk et al. (2009) who find that six anti-takeover provisions are sufficient to measure shareholder protection, i.e., staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, supermajority requirements for mergers, and charter amendments to summarize the level of shareholder right. The E-index is therefore more parsimonious than the G-index. We take the reciprocals of the abovementioned two governance measures ($CG1=1/E\text{-index}$ and $CG2=1/G\text{-index}$) to estimate corporate governance. A higher CG score indicates a stronger governance measure for the firm.

Table 2
Sample distribution by year

Year	N	Percent
1990	146	0.78%
1991	1,012	5.38%
1992	988	5.25%
1993	992	5.27%
1994	1,057	5.62%
1995	1,094	5.81%
1996	1,154	6.13%
1997	1,162	6.17%
1998	1,243	6.60%
1999	1,179	6.26%
2000	1,062	5.64%
2001	965	5.13%
2002	876	4.65%
2003	869	4.62%
2004	851	4.52%
2005	847	4.50%
2006	870	4.62%
2007	863	4.59%
2008	858	4.56%
2009	733	3.89%
Total	18,821	100.00%

Regarding product market competition measures, we calculate the Herfindahl index and the four-firm concentration ratios for each industry according to Ali et al. (2009). The information collected from the Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) from the U.S. Census of Bureau in 1992, 1997, 2002, and 2007 (SIC for the years 1992-1997 and NAICS for the years 2002-2007) is used to calculate two competition estimates.

We also use two measures for agency problems based on Fenn and Liang (2001) and Chae et al. (2009). The former is defined as net operating cash flow (operating income after depreciation minus capital expenditure) scaled by total assets while the latter is earnings before interests, taxes, depreciation, and amortization scaled by total assets. Denis and Sibilkov (2010) suggest that firms can be classified as constrained if they do not have long-term debt rating and their debt is outstanding in that year. Thus, we define a firm with external financing constraints as one with long-term debt not rated by Standard & Poor's (S&P) or its debt is in default. Alternatively, Morellec and Nikolov (2009) categorize a firm as financially constrained if its credit rating is either missing or rated as non-investment grade. We use this proxy as another measurement for external financing constraints. Although there are other proxies for financing constraints such as dividends payout and firm size, we do not incorporate these measures because they are either inappropriate or highly correlated with the dependent variable in our study.

Our control variables include most common firm characteristics such as leverage, firm size, and profitability. We use two measures for each of these variables according to Brown and Caylor (2009), Grullon and Michaely (2007), and Chae et al. (2009). Table 3 defines each of these variables for subsequent empirical analyses.

Table 3
Variable definitions

Variables	Definition
Payouts	
DIV _t / ASSETS _{t-1}	Cash dividends at period t/total assets at period t-1
DIV _t / SALES _{t-1}	Cash dividends at period t/total sales at period t-1
TPAY _t / ASSETS _{t-1}	(Cash dividends at period t + stock repurchases at period t)/total assets at period t-1
TPAY _t / SALES _{t-1}	(Cash dividends at period t + stock repurchases at period t)/total sales at period t-1
Corporate governance	
CG1	1/E-index, where E index is developed by Bebchuk et al. (2009)
CG2	1/G-index, where G index is developed by Gompers et al. (2003)
Agency costs	
FCF1	(Earnings before interests, taxes, depreciation, and amortization)/total assets
FCF2	(Operating income before depreciation - capital expenditures)/total assets
DFCF1	Dummy variable equals one if FCF1 exceeds sample median of FCF1 and zero otherwise, where FCF1 is (Earnings before interests, taxes, depreciation, and amortization)/book value of assets
DFCF2	Dummy variable equals one if FCF2 exceeds sample median of FCF2 and zero otherwise, where FCF2 is (Operating income before depreciation - capital expenditures)/total assets
External financial constraints	
DEFC1	Dummy variable equals one if a firm's credit score rated by S&P is missing or belongs to non-investment grade, and zero otherwise
DEFC2	Dummy variable equals one if companies do not have long term debt rated by S&P long term senior debt rating, and zero otherwise
Competition	
CONC1	Herfindahl Index based on Ali et al. (2009)
CONC2	Four-firm concentration ratio based on Ali et al. (2009)
Control variables	
LEV1	Long term debt / book value of equity
LEV2	Long term debt / book value of total assets
SIZE1	Natural log of total assets
SIZE2	Natural log of sales
PROFIT1	Income before extraordinary item / (book value of equity + deferred tax)
PROFIT2	Net income / book value of equity

IV. EMPIRICAL RESULTS

A. Summary Statistics

Table 4 presents the summary statistics of sample firms. Among the four payout ratios we measure, there appears to be little difference in the average payout scaled by either total assets or sales. For the dividend payout, the average DIV/ASSETS and DIV/SALES are 0.0187 and 0.0182, respectively. Adding share repurchases to dividends, the average total payout of TPAY/ASSET and TPAY/SALES are 0.0419 and 0.0418, respectively. As expected, the average total payout is substantially higher than the average dividend

payout as Grullon and Mihcaely (2004) point out that share repurchases have become a common tool for distributing earnings back to shareholders. The variability in total payout is, however, higher than that in dividend payout, confirming that share repurchases are more discretionary and therefore less sticky than cash dividends.

For governance measures, the average CG1 based on the E-index and CG2 based on the G-index are 0.50 and 0.11, respectively. The difference in the average CG measures is due to the different number of anti-takeover provisions used in constructing the respective index. As discussed earlier, CG1 (Bebchuk et al., 2009) consists of 6 anti-takeover provisions compared to 24 anti-takeover provisions for CG2 (Gompers et al., 2003).

Using two measures of free cash flows (FCF1 and FCF2) as proxies for agency costs, the average FCF1 and FCF2 are 0.1485 and 0.0936, respectively. These two measures are similar to those obtained by Chae et al. (2009). There also appears to be large variations in both FCF measures as measured by their standard deviations, suggesting that firms may experience relatively high variability in agency conflicts between managers and shareholders.

Interestingly, the average sample firm tends to experience financing constraints as defined by both measures DEFC1 and DEFC2. Furthermore, the median of one in both DEFC1 and DEFC2 indicates that more than half of the sample firms are classified as having external financing constraints. It is therefore important to factor these constraints when examining a firm's payout decisions.

Given that the two measurements for product market competition (CONC1 and CONC2) differ substantially, it is not surprising that their averages look quite different. A closer look at the standard deviations of both estimates that appear to be large relatively to their respective means suggests that the intensity of competition is likely to vary substantially across industries. A large distribution in competition levels should provide a robust analysis for the impact of competition on payout decisions.

Among firm characteristics used for control variables, the average leverage (LEV1 and LEV2) of 0.4345 (debt/equity) and 0.1486 (debt/assets) appear to be low. The average sample firm size of 6.3998 and 6.4710 measured by natural log of total assets and sales (SIZE1 and SIZE2), respectively, are moderate. With median that is close to its respective mean, it suggests that firm size measures are not skewed by large firms and are more symmetrically distributed. Our sample firms appear to be profitable with the average profitability of 0.1038 (PROFIT1) and 0.1115 (PROFIT 2). Since there are a few firms in our sample that generate large negative net incomes, we winsorize them at the 1% and 99% levels to reduce the effect of the outliers.

1. Free cash flows and external financing constraint

We report the preliminary results of payout decisions by firms under different free cash flows and external financing constraints. Table 5 shows that firms with high free cash flows (DFCF1=1) have higher average dividend and total payouts than those with low free cash flows (DFCF1=0). This result is robust regardless how we measure payout. Since free cash flows are often viewed as a proxy for agency costs, it can be interpreted as firms with high agency costs tend to pay larger dividends and repurchase more shares to lower the conflict of interests between managers and minority shareholders.

Table 4
Summary statistics of the sample firms

Variable	Mean	Median	Std. Dev.	Min	Max	N
Payouts						
DIV _t / ASSETS _{t-1}	0.0187	0.0124	0.0279	0.0000	0.9443	18,821
DIV _t / SALES _{t-1}	0.0182	0.0109	0.0290	0.0000	0.7901	18,821
TPAY _t / ASSETS _{t-1}	0.0419	0.0238	0.0535	0.0000	0.9443	18,821
TPAY _t / SALES _{t-1}	0.0418	0.0219	0.0614	0.0000	0.8751	18,821
Corporate governance						
CG1	0.5031	0.3333	0.2744	0.1667	1.0000	4,686
CG2	0.1171	0.1000	0.0461	0.0556	0.5000	5,401
Agency costs						
FCF1	0.1485	0.1435	0.0849	-0.5088	0.9053	18,800
FCF2	0.0936	0.0919	0.0854	-0.5212	0.8349	18,575
External financing constraints						
DEFC1	0.5006	1.0000	0.5000	0.0000	1.0000	18,821
DEFC2	0.8813	1.0000	0.3234	0.0000	1.0000	18,821
Competition						
CONC1	698.0357	541.0000	540.0173	13.1000	2999.0000	9798
CONC2	39.3010	37.9000	16.9991	3.6000	97.8000	10,168
Firm characteristics						
LEV1	0.4345	0.2613	0.7085	0.0000	32.7024	18,794
LEV2	0.1486	0.1307	0.1333	0.0000	0.7108	18,794
SIZE1	6.3998	6.2567	2.1429	0.4272	13.0814	18,821
SIZE2	6.4710	6.3762	2.0527	-2.5770	13.0354	18,821
PROFIT1	0.1038	0.1087	0.1589	-6.2957	1.7380	17,939
PROFIT2	0.1115	0.1165	0.1668	-6.2957	1.7380	18,807

However, the relationship between free cash flows and governance mechanisms is mixed. Using CG1 (E-Index) as a proxy for governance measures, firms with higher (lower) free cash flows are associated with stronger (weaker) governance (0.5095 vs. 0.4938). The results are different when CG2 (G-index) is considered. That is, the average CG2 for firms with higher free cash flows is 0.1156 compared to 0.1192 for firms with lower free cash flows. However, unlike the stark difference in payout between firms of high and low free cash flows, the differences in governance measures between these two types of firms do not appear to be economically significant. Richardson (2006) suggests that the difference in the results between the two governance measures can be related to some governance provisions that mitigate agency problems more than others do.

On the relationship with competition, we use two estimates for industry concentration according to Ali et al. (2009). A lower industry concentration measure indicates more intense competition than a higher counterpart does. As shown in Table 5, both concentration scores, CONC1 and CONC2, are negatively related to free cash flows, suggesting that more (less) competition is related to higher (lower) free cash flows. This relationship is consistent with Morellec et al. (2009), Han et al. (2007), Haushalter et al. (2007), and Denis and Sibilkov (2010), who find that firms facing more competition tend to hold more cash for precautionary needs and hedge for future uncertainty.

As expected, firms with higher free cash flows are also characterized with lower leverage (LEV1 and LEV2), bigger firm size (SIZE2), and higher profitability (PROFIT1 and PROFIT2) than firms with lower free cash flows.

Table 5
Mean comparison by agency costs of free cash flows and external financing constraints

Variable	Total	DFCF1=1	DFCF1=0	<i>t</i> -test		DEFC1=1	DEFC1=0	<i>t</i> -test
Dividend payouts								
DIV _{<i>t</i>} /ASSETS _{<i>t-1</i>}	0.0187	0.0242	0.0133	-27.242	***	0.0176	0.0267	14.457 ***
DIV _{<i>t</i>} /SALES _{<i>t-1</i>}	0.0182	0.0226	0.0138	-21.144	***	0.0168	0.0279	17.088 ***
TPAY _{<i>t</i>} /ASSETS _{<i>t-1</i>}	0.0419	0.0575	0.0266	-41.447	***	0.0403	0.0533	10.760 ***
TPAY _{<i>t</i>} /SALES _{<i>t-1</i>}	0.0418	0.0545	0.0293	-28.837	***	0.0399	0.0554	11.236 ***
Corporate governance								
CG1	0.5031	0.5095	0.4938	-1.922	**	0.5109	0.4738	-3.764 ***
CG2	0.1171	0.1156	0.1192	2.771	***	0.1199	0.1060	-9.036 ***
Agency costs								
		+++						
FCF1	0.1485	0.2022	0.0961	-110.000	***	0.1469	0.1605	7.131 ***
FCF2	0.0936	0.1545	0.0327	-140.000	***	0.0921	0.1043	6.285 ***
Competition								
CONC1	698.0357	675.7606	719.7984	4.039	***	693.5830	733.1368	2.292 **
CONC2	39.3010	39.0246	39.5660	1.606		38.8431	42.8119	7.541 ***
Firm characteristics								
LEV1	0.4345	0.3686	0.4988	12.650	***	0.4082	0.6299	13.957 ***
LEV2	0.1486	0.1323	0.1645	16.669	***	0.1430	0.1902	15.788 ***
SIZE1	6.3998	6.3985	6.4011	0.080		6.0695	8.8526	63.502 ***
SIZE2	6.4710	6.5500	6.3939	-5.219	***	6.1550	8.8171	63.392 ***
PROFIT1	0.1038	0.1714	0.0388	-61.459	***	0.0981	0.1477	13.450 ***
PROFIT2	0.1115	0.1817	0.0430	-62.665	***	0.1043	0.1645	16.099 ***

In the presence of higher external financing constraints (DEFC1=1), firms are more likely to pay out less in dividends and share repurchases. Consistent with Chae et al. (2009), financing constraints appear to be an influential determinant of corporate payout policy. It is also important to note that higher (lower) financially constrained firms are related to stronger (weaker) governance (CG1 and CG2) but lower (higher) free cash flows (FCF1 and FCF2). It suggests that firms with lower credit rating or less credit worthiness are likely to require stronger governance mechanisms for market scrutiny to raise external capital.

Firms that experience financing constraints are also associated with intense competition. For example, the average CONC1 of 693.58 for firms under higher financing constraints (DEFC1=1) is less than 733.13 for firms with lower financing constraints (DEFC1=0). It indicates that firms facing more competition (i.e., lower concentration score) are likely to have lower credit rating and therefore less ability to raise external funds. It follows that firms under external financing constraints tend to be smaller firms (SIZE and SIZE2) and have lower leverage (LEV1 and LEV2) and profitability (PROFIT1 and PROFIT2).

For robustness checks, we run Wilcoxon's rank sum test to examine the median differences of the determinants discussed above. Table 6 presents the comparisons in median sorted by free cash flows and financing constraints. Overall, the results are consistent with those reported in Table 5. In particular, firms with high free cash flows but lower financing constraints tend to pay higher dividends and repurchase more stocks. Similarly, firms in more competitive environments (CONC1) are likely to experience higher financing constraints (DEFC1=1) and higher free cash flows (DFCF1=1).

Table 6
Median comparison by free cash flows and external financing constraints

Variable	Total	DFCF1=1	DFCF1=0	Wilcoxon test	DEFC1=1	DEFC1=0	Wilcoxon test
Dividend payouts							
DIV _t /ASSETS _{t-1}	0.0124	0.0172	0.0097	-28.074 ***	0.0113	0.0212	27.646 ***
DIV _t /SALES _{t-1}	0.0109	0.0143	0.0085	-22.047 ***	0.0094	0.0217	31.531 ***
TPAY _t /ASSETS _{t-1}	0.0238	0.0372	0.0164	-46.042 ***	0.0222	0.0364	19.185 ***
TPAY _t /SALES _{t-1}	0.0219	0.0318	0.0157	-37.703 ***	0.0202	0.0365	22.941 ***
Corporate governance							
CG1	0.3333	0.3333	0.3333	-1.607	0.3333	0.3333	-4.047 ***
CG2	0.1000	0.1000	0.1111	1.864	0.1111	0.0909	-11.657 ***
Agency costs							
FCF1	0.1435	0.1876	0.1010	-99.059 ***	0.1419	0.1548	8.876 ***
FCF2	0.0919	0.1379	0.0484	-118.028 ***	0.0903	0.1006	7.640 ***
Competition							
CONC1	541.0000	529.9000	551.0000	2.146 **	541.0000	553.0105	4.675 ***
CONC2	37.9000	37.0000	38.7000	1.186	37.3000	41.0000	6.889 ***
Firm characteristics							
LEV1	0.2613	0.2046	0.3273	17.692 ***	0.2236	0.4699	26.741 ***
LEV2	0.1307	0.1093	0.1519	16.323 ***	0.1189	0.1825	21.044 ***
SIZE1	6.2567	6.3254	6.1669	-1.574	5.9179	8.7082	57.095 ***
SIZE2	6.3762	6.5180	6.2295	-6.509 ***	6.0798	8.6651	57.476 ***
PROFIT1	0.1087	0.1561	0.0584	-82.645 ***	0.1058	0.1377	15.461 ***
PROFIT2	0.1165	0.1646	0.0626	-83.167 ***	0.1118	0.1553	19.216 ***

Before conducting a multivariate regression analysis of payout policy on different governance measures, agency problems, financing constraints, and firm characteristics, we estimate the correlations between these variables. Table 7 shows that for most pairs, the correlations are largely low and do not generally pose multicollinearity problems, suggesting that firm characteristics and governance measures adequately capture various dimensions of the governance practices of the sample firms. The only exception is the low correlation (0.50) between free cash flows (DFCF1) and profitability (PROFIT1), because a higher correlation is expected since firms with high profitability tend to have higher free cash flows.

Table 7
Correlations between explanatory variables

	CG1	DFCF1	DEFC1	CONC1	LEV1	SIZE1	PROFIT 1
CG1	1.00						
DFCF1	0.03	1.00					
DEFC1	0.00	-0.09	1.00				
CONC1	0.08	-0.06	0.04	1.00			
LEV1	-0.14	-0.22	0.19	0.01	1.00		
SIZE1	-0.04	-0.01	-0.05	0.14	0.27	1.00	
PROFIT 1	0.03	0.50	-0.16	-0.04	-0.19	0.12	1.00

2. The interrelationship among payouts, internal governance, and competition

Sequel to the univariate results of corporate governance and competition among firms, we now examine their impacts on payout policy in the presence of agency problems and external financing constraints. We begin the multivariate analysis with the effect of corporate governance (CG) and then investigate how payouts are affected by CG in the presence of agency problems (DFCF) by adding the interaction term (CG*DFCF). Based on the discussions in Section II, incorporating agency problems proxied by free cash flows should affect the impact of governance on payouts.

Furthermore, we include an additional interaction, CG*DFCF*DEFC, to address changes in payout decisions when firms exhibit external financing constraints (DEFC). We also control for industry effect, year fixed effect, and firm characteristics such as leverage (LEV), firm size (SIZE), and profitability (ROE). Following Bring (1994), we standardize CG, DFCF, DEFC, CG*DFCF, and CG*DFCF*DEFC, to allow for direct comparisons on the economic significance between these regression coefficients. We repeat the same estimation process for product market competition (CONC).

Finally, we examine the joint effects of CG and CONC on payout under the influence of agency problems and external financing conditions. We therefore add a final interaction term, CONC*CG*DFCF*DEFC in the multivariate regression settings. The joint test of CG and CONC can be summarized in the following equation,

$$\begin{aligned} \text{Payouts}_{i,t} = & \alpha + b_1 \text{CONC}_{i,t} + b_2 \text{CONC}_{i,t} * \text{CG}_{i,t} + b_3 \text{CONC}_{i,t} * \text{CG}_{i,t} * \text{DFCF}_i \\ & + b_4 \text{CONC}_{i,t} * \text{CG}_{i,t} * \text{DFCF}_i * \text{DEFC}_i + \text{firm characteristics} + \sum_{j=1}^m \gamma_j \text{DI}_j + \sum_{k=1}^n \text{DY}_k + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where $\text{Payouts}_{i,t}$ is the payouts for firm i at time t , $\text{CONC}_{i,t}$ is the product market competition, $\text{CG}_{i,t}$ is the corporate governance measure, DFCF_i is the dummy variable of free cash flows, DEFC_i is the dummy variable for external financing constraints, *firm characteristics* are control variables of leverage, firm size, and profitability, DI_j is the dummy variable for industry j , DY_k is the dummy variable for year k , and $\varepsilon_{i,t}$ is the error term. To address the potential bias in the standard errors of a panel data due to residuals correlated across firms and time, we estimate robust standard errors clustered by both firm and year according to Thompson (2011) and Petersen (2009).

Since the results of corporate governance and competition are robust with both sets of proxies as defined in Table 3, we report the results in Table 8 based on the first set of estimates. Consistent with Chae et al. (2009) and Jiraporn and Ning (2006), Panel A shows that corporate governance (CG) is negatively and statistically related to dividend payouts and total payouts for 6 out of the 8 models. These results may appear to support the substitution hypothesis. However, when we consider agency costs of free cash flows (DFCF) with the interaction term, $\text{CG} * \text{DFCF}$, firms with stronger (weaker) governance tend to pay higher (lower) cash dividends and repurchase more (less) stocks. As shown in Panel A, the sum of both coefficients b_1 and b_2 is positive and significant. The results are therefore consistent with the prediction of the outcome model.

Adding the interaction term, $\text{CG} * \text{DFCF} * \text{DEFC}$, for firms with external financing constraints ($\text{DEFC}=1$), we find that firms have lower payouts. It indicates that in the presence of agency costs, firms with higher external financial constraints may have little choice but to reduce payouts to shareholders. As a result, external financing constraints change the relationship between governance and payouts ($b_1 + b_2 + b_3 = -0.026 < b_1 + b_2 = 0.230$) just as agency problems affect payouts. Comparing the economic significance of coefficients, it is interesting to note that agency costs of free cash flows ($\text{CG} * \text{DFCF}$) is slightly more influential than external financing constraints ($\text{CG} * \text{DFCF} * \text{DEFC}$).

Panel B of Table 8 presents the results of the relationship between product market competition and payout. We find that firms in higher (lower) concentrated industries (CONC) are associated with lower (higher) payouts. Consistent with Grullon and Michaely (2007), competition serves as a disciplinary force that induces managers to pay more excess cash. It appears that payout is an outcome of stronger competition.

In the presence of agency problems, one would expect that the positive relationship between competition and payout to be stronger according to the outcome model but weaker based on the substitution model. Given that the interaction term, $\text{CONC} * \text{DFCF}$, is positive in all of the 8 models reported in Panel B and reverses the relationship between industry concentration and payout ($b_1 + b_2 > 0$ compared to $b_1 < 0$), dividends can become a substitute for external governance in the presence of high agency conflicts.

Table 8

The effects of corporate governance and competition on corporate payout under agency problems and external financing constraints

Parameter	$\text{DIV}_t / \text{ASSETS}_{t-1}$		$\text{DIV}_t / \text{SALES}_{t-1}$		$\text{TPAY}_t / \text{ASSETS}_{t-1}$		TPAY/SALES	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A. Corporate governance</i>								
Intercept	3.786*** (2.86)	-0.138 (-1.45)	3.157*** (2.92)	-0.612*** (-6.63)	2.575*** (2.89)	0.274** (2.51)	2.031*** (2.90)	-0.244** (-2.35)
CG (b1)	-0.075*** (-5.88)	-0.038*** (-2.72)	-0.001 (-0.07)	0.026 (1.53)	-0.135*** (-8.97)	-0.068*** (-3.91)	-0.036** (-2.10)	0.005 (0.26)
CG*DFCF (b2)	0.304*** (16.73)	0.213*** (9.25)	0.239*** (11.37)	0.168*** (6.41)	0.615*** (27.24)	0.443*** (14.29)	0.480*** (18.15)	0.357*** (11.60)
CG*DFCF*DEFC (b3)	-0.255*** (-20.55)	-0.229*** (-17.13)	-0.243*** (-17.79)	-0.207*** (-14.03)	-0.520*** (-33.82)	-0.494*** (-30.68)	-0.453*** (-26.19)	-0.416*** (-23.67)
Control variables	NO	YES	NO	YES	NO	YES	NO	YES
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
Adj. R-square	0.27	0.30	0.22	0.27	0.33	0.38	0.25	0.28
Coefficient tests								
b1+b2	0.230 (0.00)	0.174 (0.00)	0.238 (0.00)	0.194 (0.00)	0.480 (0.00)	0.376 (0.00)	0.444 (0.00)	0.362 (0.00)
b1+b2+b3	-0.026 (0.00)	-0.055 (0.00)	-0.005 (0.00)	-0.012 (0.00)	-0.040 (0.00)	-0.119 (0.00)	-0.009 (0.00)	-0.054 (0.00)
<i>Panel B. Competition</i>								
Intercept	0.059 (1.13)	-0.200*** (-2.91)	0.152** (2.37)	-0.373*** (-4.47)	-0.052 (-1.33)	-0.114** (-2.17)	0.098** (1.97)	-0.228*** (-3.56)
CONC (b1)	-0.098*** (-8.56)	-0.060*** (-5.11)	-0.064*** (-6.21)	-0.043*** (-3.72)	-0.096*** (-8.47)	-0.036** (-3.13)	-0.036*** (-2.85)	-0.003 (-0.23)
CONC*DFCF (b2)	0.343*** (20.22)	0.255*** (13.19)	0.314*** (15.80)	0.232*** (10.67)	0.601*** (31.68)	0.479*** (22.64)	0.470*** (21.79)	0.376*** (16.26)
CONC*DFCF*DEFC (b3)	-0.275*** (-20.85)	-0.265*** (-18.34)	-0.276*** (-18.17)	-0.257*** (-15.96)	-0.539*** (-36.90)	-0.530*** (-35.63)	-0.465*** (-29.09)	-0.445*** (-27.86)
Control variables	NO	YES	NO	YES	NO	YES	NO	YES
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
Adj. R-square	0.13	0.17	0.13	0.17	0.27	0.32	0.21	0.25

Coefficient tests								
b1+b2	0.245 (0.00)	0.195 (0.00)	0.250 (0.00)	0.190 (0.00)	0.505 (0.00)	0.443 (0.00)	0.434 (0.00)	0.373 (0.00)
b1+b2+b3	-0.030 (0.00)	-0.070 (0.00)	-0.026 (0.00)	-0.067 (0.00)	-0.035 (0.00)	-0.087 (0.00)	-0.031 (0.00)	-0.072 (0.00)
<i>Panel C. Competition and corporate governance</i>								
Intercept	5.095** (2.55)	4.484** (2.27)	3.455*** (2.98)	2.343** (2.07)	3.493*** (2.73)	3.584*** (2.74)	2.320*** (2.89)	1.948** (2.40)
CONC (b1)	-0.093*** (-4.10)	-0.084*** (-3.47)	-0.149*** (-6.50)	-0.154*** (-6.31)	-0.059** (-2.03)	-0.043 (-1.38)	-0.119*** (-3.37)	-0.102*** (-2.76)
CONC*CG (b2)	-0.062** (-2.46)	-0.031 (-1.07)	0.005 (0.23)	0.009 (0.36)	-0.157*** (-3.96)	-0.065 (-1.49)	-0.012 (-0.26)	0.021 (0.42)
CONC*CG*DFCF (b3)	0.203*** (7.94)	0.126*** (3.90)	0.217*** (7.01)	0.151*** (4.36)	0.578*** (13.14)	0.427*** (7.83)	0.538*** (8.98)	0.415*** (6.55)
CONC*CG*DFCF*DEFC (b4)	-0.165*** (-11.15)	-0.156*** (-9.23)	-0.181*** (-8.83)	-0.156*** (-7.27)	-0.463*** (-15.73)	-0.453*** (-15.56)	-0.459*** (-11.64)	-0.426*** (-11.27)
Control variables	NO	YES	NO	YES	NO	YES	NO	YES
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
Adj. R-square	0.28	0.31	0.24	0.30	0.27	0.34	0.24	0.27
Coefficient tests								
b1+b2	-0.155 (0.00)	-0.115 (0.00)	-0.144 (0.00)	-0.145 (0.00)	-0.216 (0.00)	-0.108 (0.02)	-0.131 (0.00)	-0.081 (0.01)
b1+b2+b3	0.048 (0.00)	0.011 (0.00)	0.073 (0.00)	0.007 (0.00)	0.362 (0.00)	0.319 (0.00)	0.407 (0.00)	0.334 (0.00)
b1+b2+b3+b4	-0.117 (0.00)	-0.145 (0.00)	-0.108 (0.00)	-0.150 (0.00)	-0.101 (0.00)	-0.135 (0.00)	-0.051 (0.00)	-0.092 (0.00)

Under both agency problems ($DFCF=1$) and external financing constraints ($DEFC=1$), firms in more concentrated industries tend to reduce payouts ($CONC*DFCF*DEFC < 0$). This perhaps is not surprising, as financially constrained firms may need to hoard cash and reduce payouts accordingly. It is important to note that controlling for external financing constraints just as for agency problems substantially affects a firm's payout behavior. Failure to incorporate agency costs and external financing costs may lead to a misspecification on the relationship between governance, product market competition, and payout decisions.

Finally, we investigate the joint effects of corporate governance and competition under agency problems and financing constraints. Panel C of Table 8 shows that industry concentrations remain negatively related to payout ratios. This relationship, however, is not affected when we add the interaction term, $CONC*CG$, for the effect of corporate governance. In other words, corporate governance appears to have little impact on payout when competition is considered. Our results are therefore consistent with Grullon and Michaely (2007), and Giroud and Mueller (2010) who argue that competition is a substitute for corporate governance, but contradict Knyazeva and Knyazeva (2012) who suggest that corporate governance complements competition.

The results for agency costs of free cash flows ($CONC*CG*DFCF > 0$) and external financing constraints ($CONC*CG*DFCF*DEFC < 0$) in Panel C of Table 8 are also consistent with those for competition alone as reported in Panel B. Specifically, firms in more concentrated industries have higher payout in the presence of higher agency costs but lower payout when encountering higher financing costs. These relationships hold with or without the effect of corporate governance. On the other hand, corporate governance seems to only matter as shown in Panel A when it is considered alone. Our overall results are supportive of Giroud and Mueller (2011) who also find that governance proxy, on average, is not significant when competition is accounted for.

V. CONCLUSION

This paper extends the extant literature of payout policy by examining the joint impacts of corporate governance and product market competition under the influence of agency problems and external financing constraints. We confirm that both corporate governance and product market competition alone are important in a firm's payout decisions. However, the nature and the extent of the impact depend on agency problems and external financing constraints faced by the firms. In particular, these constraints imposed on firms can reverse the relationship among governance, competition, and payout decisions. Therefore, payout decisions can be an outcome of or a substitute for governance.

More importantly, we find that the importance of product market competition subsumes the effect of corporate governance as an effective disciplinary force in mitigating conflicts between managers and shareholders. These results are consistent with Allen and Gale (2000) and Giroud and Mueller (2011), who suggest that competition as a governance tool is more effective than the market for corporate control or other monitoring mechanisms. It follows that the best policy in strengthening governance for firms does not necessarily introduce more regulatory rules but perhaps facilitate more industry competitiveness.

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