Dividend Policy and Merger Dynamics*

Paulo J. Pereira and Artur Rodrigues

CEF.UP and School of Economics and Management, University of Porto, Portugal.

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Abstract

This paper explores the interaction between dividend policy and mergers and acquisitions (M&A) in a dynamic setting. It examines the decisions faced by two firms regarding their dividend payout policy in the presence of a potential merger between them, under the risk of liquidation. The payout strategy (barrier or band) depends on the level of merger costs. One key finding of the paper shows that, contrary to previous literature on merger cooperative games, firms' bargaining power needs to be endogenous to produce a merger agreement.

Keywords: Payout Policy; Mergers and Acquisitions; Real Options.
JEL codes: G33; G34; G35.

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1 Introduction

A firm's payout policy, which includes decisions on dividends and share repurchases, is influenced by financial, strategic, and governance factors. Financial considerations such as profitability, liquidity, and leverage determine the firm's capacity to distribute cash. Strategic factors, such as market timing and managerial incentives, and governance factors, which align managerial and shareholder interests, also play key roles.

The existence of investment opportunities is another key factor influencing the firm's payout policy. In fact, the optimal payout policy for firms with growth options requires balancing dividend distribution and investment in growth opportunities, influenced by liquidity constraints, uncertainty, and cash balance. As shown by different authors, these factors shape the timing and scale of both payouts and growth investments. Décamps and Villeneuve (2007) investigate how a firm's dividend policy influences its investment decisions, especially when facing liquidity constraints. They identify situations where postponing dividend distribution to invest in future growth opportunities becomes optimal. They also find that uncertainty and liquidity shocks can create ambiguous effects on investment choices. Décamps et al. (2011) develop a dynamic model of a firm addressing cash holding, dividend payment, and equity issuance policies. The study demonstrates how market frictions influence cash holding decisions, which in turn shape issuance and dividend policies, corporate cash value, and stock price dynamics. Additionally, the authors explore the asymmetric volatility phenomenon, risk management policies, the countercyclicality of stock return volatility, and the impact of agency costs on stock return volatility. Hugonnier et al. (2015) introduce a model that jointly captures investment, financing, and cash management decisions, considering the lumpy nature of investments and the uncertainty firms face in accessing capital markets for financing. The study explicitly characterizes optimal policies, showing that the interaction between investment lumpiness and capital supply constraints may lead to locally convex firm value and suboptimal barrier strategies. As shown by Bolton et al. (2019), a firm's payout policy varies significantly between its growth and mature phases. During the growth phase, firms tend to pay out less, whereas in the mature phase, more profitable firms distribute higher payouts.

In this paper, we examine the relationship between dividend policy and mergers and acquisitions (M&A) within a dynamic framework, extending the concept of growth opportunities present in previous models to also include external growth. In particular, in our setting, two firms must decide whether to retain or distribute dividends while they consider the opportunity to merge, which enhances their combined capacity to generate future cash flows. The decisions regarding dividends and the merger are made under uncertainty.

To address this issue, we build on literature that focuses on dynamic M&A decisions, particularly those involving cooperative decision-making between merging firms.[1] Some

[1] Alternatively, as in Lambrecht (2004) and Morellec and Zhdanov (2005), the timing and terms of the

papers follow this approach. Alvarez and Stenbacka (2006) develop a real options model to determine the timing of takeovers and analyze the split of the resulting merger surplus. They show the link between the acquiring firm's bargaining power and the incentives for takeovers. Thijssen (2008) develop a model concerning mergers and takeovers between two firms facing different yet correlated uncertainties. It is posited that mergers not only result in efficiency improvements but also serve as a means of diversification. Finally, Lukas et al. (2019) study the entry into a market by means of M&A when different strategies are available to the acquirer (namely, friendly and hostile).

This paper sheds light on the relationship between dividend policy and merger dynamics. It investigates the strategic decisions of two firms concerning their dividend payout policies while considering the possibility of a merger, under the risk of liquidation. The chosen payout strategy (whether barrier or band) depends on the magnitude of merger costs. A key finding from the paper is that, contrary to prior literature on merger cooperative games, the bargaining power of firms becomes endogenous in shaping merger agreements.

The paper unfolds as follows: In Section 2, we develop the model for the firms' individual dividend policies, merging decision, and subsequent payout policy. Section 3 conducts a comparative statics analysis. Section 4 provides the conclusion.

2 Model

For setting our model, we build on Décamps and Villeneuve (2007). Consider firm $i \in \{1, 2, m\}$, where m denotes the firm resulting from the merger of 1 and 2, which is able to generate a continuous stream of cash flows subject to an industry-wide shock. This shock is modeled by an arithmetic Brownian motion, given by the following equation:

$$dX_i(t) = k_i \left(\mu dt + \sigma dW \right), \tag{1}$$

where k_i is a multiple representing, for instance, the capital stock, μ is the instantaneous risk-neutral drift, σ is the constant instantaneous volatility, and dW denotes the standard Wiener increment.

The merger of the two firms creates the new firm m with the following capital stock:

$$k_m = k_1 + k_2 + \omega, \tag{2}$$

where ω denotes the synergies created by the merger.

merger can be defined in sequential rounds.

2.1 The value and policies of the stand-alone firms

Let us begin by considering only the value and policies of the stand-alone firms. In this context, managers run the firm with the primary goal of serving shareholders' best interests, making decisions regarding the payout policy and potential liquidation.

Following the assumption made in Décamps and Villeneuve (2007), we consider that cash holdings generate no returns within the firm, and the liquidation value of the firm is zero. Consequently, this simplifies the model to the conventional framework of optimal dividends proposed by Jeanblanc-Picqué and Shiryaev (1995) and Radner and Shepp (1996).

The firm's cash reserves $C_i = \{C_i(t); t > 0\}$ evolve according to:

$$dC_i(t) = dX_i(t) - dL_i(t), \qquad C_i(0) = c_i, \tag{3}$$

where $L_i(t)$ corresponds to the cumulative dividend process, up to and including time t.

The company faces liquidation when its cash reserves drop to zero, due to successive negative cash-flow shocks.

Since the marginal cost of cash holdings is constant and the marginal benefit is decreasing, there exists a level c_i^* for cash reserves where the marginal cost equals the benefit of cash holdings, and it becomes optimal to pay dividends. Given that the marginal value of cash is strictly higher than one below the target, the firm only chooses liquidation if its cash holdings reach zero.

Denote by $V_i(c)$ the value of a firm. In the region $(0, c_i^*)$ in which the firm retains dividends, $V_i(c)$ satisfies the following ODE:

$$rV_i(c_i) = k_i \mu V_i'(c_i) + \frac{(k_i\sigma)^2}{2} V_i''(c_i). \tag{4}$$

Dividend policy

In line with standard dividend distribution models, dividends are paid as soon as cash reserves reach or exceed a dividend threshold c_i^*. This implies that:

$$V_i'(c_i^*) = 1, \tag{5}$$

for all $c > c_i^*$. At the dividend threshold c_i^*, the value of one dollar inside the firm equals its value outside. Since V_i is assumed to be twice continuously differentiable over $(0, \infty)$, the following super-contact condition also holds at the dividend threshold:

$$V_i''(c_i^*) = 0. \tag{6}$$

According to Equation (5), any excess of cash reserves above the dividend threshold

c_i^* is immediately distributed to shareholders, so that the marginal value of cash is equal to one. When cash reserves lie in $(0, c_i^*)$, no dividend activity takes place.

This leads us to the objective of determining the value function V_i and a threshold c_i^*, which solve the following system of equations:

$$V_i(c_i) = 0; \qquad c_i < 0, \tag{7}$$

$$V_i(0) = 0, \tag{8}$$

$$-rV_i(c_i) + k_i\mu V_i'(c_i) + \frac{(k_i\sigma)^2}{2} V_i''(c_i) = 0; \qquad 0 < c_i < c_i^*, \tag{9}$$

$$V_i(c_i) = c_i - c_i^* + \frac{k_i\mu}{r}; \qquad c_i \geqslant c_i^*. \tag{10}$$

The solution to the ODE (9) is:

$$V_i(c_i) = b_{1i}\, e^{\gamma_{1i}\, c_i} + b_{2i}\, e^{\gamma_{2i}\, c_i}, \tag{11}$$

where γ_{1i} and γ_{2i} are the roots of the characteristic equation:

$$\frac{(k_i\sigma)^2}{2}\gamma_i^2 + k_i\mu\gamma_i - r = 0. \tag{12}$$

Thus:

$$\gamma_{1i} = -\frac{k_i\mu}{(k_i\sigma)^2} - \sqrt{\left(\frac{k_i\mu}{(k_i\sigma)^2}\right)^2 - \frac{2r}{(k_i\sigma)^2}} < 0, \tag{13}$$

$$\gamma_{2i} = -\frac{k_i\mu}{(k_i\sigma)^2} + \sqrt{\left(\frac{k_i\mu}{(k_i\sigma)^2}\right)^2 - \frac{2r}{(k_i\sigma)^2}} > 0. \tag{14}$$

Using boundary conditions (5) and (6):

$$b_{1i} = \frac{\gamma_{2i}}{\gamma_{1i}(\gamma_{2i} - \gamma_{1i})} e^{-\gamma_{1i}c_i^*}, \tag{15}$$

$$b_{2i} = -\frac{\gamma_{1i}}{\gamma_{2i}(\gamma_{2i} - \gamma_{1i})} e^{-\gamma_{2i}c_i^*}, \tag{16}$$

and

$$V_i(c_i) = \frac{1}{\gamma_{1i}\gamma_{2i}} \left(\frac{\gamma_{2i}^2}{\gamma_{2i} - \gamma_{1i}} e^{\gamma_{1i}(c_i - c_i^*)} - \frac{\gamma_{1i}^2}{\gamma_{2i} - \gamma_{1i}} e^{\gamma_{2i}(c_i - c_i^*)} \right). \tag{17}$$

From (10), this implies $V_i(c_i^*) = \frac{k_i\mu}{r}$. Using the boundary condition (8):

$$c_i^* = \frac{2}{\gamma_{1i} - \gamma_{2i}} \log\left(-\frac{\gamma_{2i}}{\gamma_{1i}}\right) > 0. \tag{18}$$

2.2 The value of the firms with the option to merge

When facing the option to merge, firms must decide the payout policy along with the merger strategy (regarding the timing and terms of the merger), while facing potential liquidation.

As in Décamps and Villeneuve (2007) and Hugonnier et al. (2015), when the cost of a merger is not sufficiently high, it is optimal to follow the mentioned barrier strategy, where the firm retains earnings and proceeds with the merger if cash reserves reach some target level.

When the merger cost is sufficiently high, barrier strategies are no longer optimal. In other words, the firms optimally retain earnings and merge if cash reserves reach some target level, but if cash reserves fall to a critical level following a series of negative cash flow shocks, the firm abandons the option of financing the merger internally as it becomes too costly to accumulate enough cash to merge. At this point, the marginal value of cash drops to one, and it is optimal to make a lump-sum payment to shareholders. After making this payment, the firm again retains earnings.

With the option to merge and payment in stock, the evolution of cash reserves is described as follows:

$$dC_i^m(t) = dC_i(t)\mathbb{1}_{\{t<\tau_m\}} + \theta_i dC_m(t)\mathbb{1}_{\{t>\tau_m\}} - Y_i\mathbb{1}_{\{t=\tau_m\}}, \qquad C_i^m(0) = c_i;\ i \in \{1,2\}, \quad (19)$$

where τ_m is a stopping time representing the merger timing, θ_i is the share of firm i in the merged firm, Y_i are the fixed merger costs, and

$$C_m(\tau_m) = C_1(\tau_m) + C_2(\tau_m) - Y, \quad (20)$$

where $Y = Y_1 + Y_2$.

The problem is therefore to maximize the present value of future dividends by choosing the firm's payout L and merger (τ_m) policies, that is:

$$V_i^m(c) = \sup_{L_i^m, \tau_m} \mathbb{E}\left[\int_0^{\tau_l} e^{-rt} dL_i^m(t)\right], \quad (21)$$

where

$$dL_i^m(t) = \begin{cases} dL_i(t) & t < \tau_m, \\ \theta_i dL_m(t) & t \geqslant \tau_m, \end{cases} \qquad i \in \{1,2\}. \quad (22)$$

Knowing the initial cash holdings $C_1(0)$ and $C_2(0)$, we can express all firm values as a function of the sum of the two firms' cash holdings, for instance $c = c_1 + c_2$, using:

$$c_1(c) = C_1(0) + \frac{k_1}{k_1 + k_2}\big(c - C_1(0) - C_2(0)\big), \tag{23}$$

$$c_2(c) = C_2(0) + \frac{k_2}{k_1 + k_2}\big(c - C_1(0) - C_2(0)\big), \tag{24}$$

$$c_m(c) = c. \tag{25}$$

When the two firms have the option to merge, it is assumed that they cooperatively determine the timing and terms of the merger. One approach to modeling the outcome is to assume that the firms define these terms and timing in sequential rounds, as in Lambrecht (2004) and Morellec and Zhdanov (2005). However, in this paper, the outcome is modeled as the result of a Nash bargaining game, following the approaches in Alvarez and Stenbacka (2006), Thijssen (2008), and Lukas et al. (2019).

It is assumed that, after the merger, each firm holds an equity stake θ_i in the new firm m. The equityholders of each firm give up their stand-alone value $V_i(c_i)$ and receive a stake in the new venture, after paying an irreversible merger cost Y_i.

We apply the asymmetric Nash bargaining solution to solve for the firms' optimal shares in the new venture, represented by the following optimization problem:

$$\sup_{0<\theta<1} \Big[\big(\theta V_m(c_m(c) - Y) - V_1(c_1(c))\big)^{\eta} \big((1-\theta) V_m(c_m(c) - Y) - V_2(c_2(c))\big)^{1-\eta} \Big], \tag{26}$$

where η and $(1 - \eta)$ represent the bargaining power of firm 1 and 2, respectively. The terms $V_1(c_1(c))$ and $V_2(c_2(c))$ are each firm's disagreement point (i.e., the value of the firms without the option to merge).

The solution for the maximization problem (26) is:

$$\theta(c) = \frac{V_1(c_1(c))}{V_m(c_m(c) - Y)} + \eta \left(\frac{V_m(c_m(c) - Y) - V_1(c_1(c)) - V_2(c_2(c))}{V_m(c_m(c) - Y)} \right), \tag{27}$$

yielding the following share for each firm:

$$\begin{aligned} \Theta_1(c) &= \theta V_m(c_m(c) - Y) \\ &= V_1(c_1(c)) + \eta\big(V_m(c_m(c) - Y) - V_1(c_1(c)) - V_2(c_2(c))\big), \end{aligned} \tag{28}$$

$$\begin{aligned} \Theta_2(c) &= (1-\theta) V_m(c_m(c) - Y) \\ &= V_2(c_2(c)) + (1-\eta)\big(V_m(c_m(c) - Y) - V_1(c_1(c)) - V_2(c_2(c))\big). \end{aligned} \tag{29}$$

The valuation of each firm holding the option to merge within the retention and waiting-to-merge region is given by:

$$V_i^m(c) = b_{1i}^m \, e^{\gamma_{1i} \, c_i(c)} + b_{2i}^m \, e^{\gamma_{2i} \, c_i(c)}. \tag{30}$$

Two possible strategies may arise, depending on the merger costs: (i) the barrier strategy, where the firm retains profits and merges once cash reserves reach a certain target level; or (ii) the band strategy, where the optimal strategy includes an intermediate dividend payout region. We start with the barrier strategy.

Barrier strategy The constants b^m_{1i}, b^m_{2i}, and the merger threshold $\hat{c}_i$ are found using the following boundary conditions:

$$V_i^m(\tilde{c}) = V_i(c_i(\tilde{c})), \tag{31}$$

$$V_i^m(\hat{c}_i) = \Theta_i(\hat{c}_i), \tag{32}$$

$$V_i^{m\prime}(\hat{c}_i) = \Theta_i'(\hat{c}_i), \tag{33}$$

where $\tilde{c} = \max[\tilde{c}_1, \tilde{c}_2]$ and $\tilde{c}_i = C_1(0) + C_2(0) - \frac{k_1+k_2}{k_i} C_i(0)$ denotes the level of total cash holdings c when firm i is liquidated ($C_i = 0$).

Using boundary conditions (31) and (32), we can write:

$$V_i^m(c) = L(c, \tilde{c}, \hat{c}_i)\, V_i\big(c_i(\tilde{c})\big) + H(c, \tilde{c}, \hat{c}_i)\, \Theta_i(\hat{c}_i), \tag{34}$$

where

$$L(c, c_l, c_h) = \frac{e^{\gamma_{1i}\, c_i(c) + \gamma_{2i}\, c_i(c_h)} - e^{\gamma_{1i}\, c_i(c_h) + \gamma_{2i}\, c_i(c)}}{e^{\gamma_{1i}\, c_i(c_l) + \gamma_{2i}\, c_i(c_h)} - e^{\gamma_{1i}\, c_i(c_h) + \gamma_{2i}\, c_i(c_l)}}, \tag{35}$$

$$H(c, c_l, c_h) = \frac{e^{\gamma_{1i}\, c_i(c_l) + \gamma_{2i}\, c_i(c)} - e^{\gamma_{1i}\, c_i(c) + \gamma_{2i}\, c_i(c_l)}}{e^{\gamma_{1i}\, c_i(c_l) + \gamma_{2i}\, c_i(c_h)} - e^{\gamma_{1i}\, c_i(c_h) + \gamma_{2i}\, c_i(c_l)}}. \tag{36}$$

The merger threshold is obtained using the smooth-pasting condition in (33).

Figure 1 depicts the value functions for the barrier strategy. For Firm 2 (Figure 1(b)), it shows its stand-alone value (V_2) and the corresponding threshold for payout ($c(c_2^*)$). V_2^m represents the value of Firm 2 with the option to merge. The additional value created by the option to merge is $V_2^m - V_2$, which goes to zero as cash reserves go to zero, since the option to merge disappears if the firm is liquidated. For $c_2 > 0$ (and smaller than $\hat{c}$), the firm accumulates cash (i.e., does not distribute dividends) while waiting to merge at $\hat{c}$. After merging, the new firm sets its optimal payout policy, distributing dividends whenever cash reserves exceed $c_m^* + Y$ (when measured at the pre-merger cash level[2]).

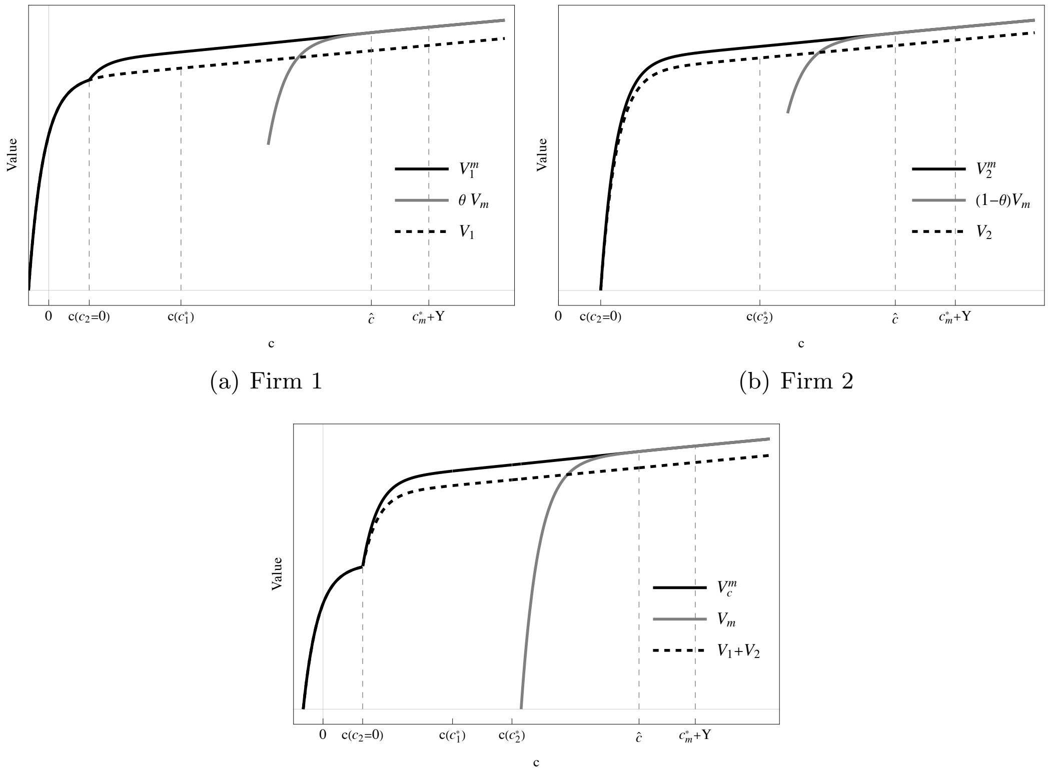
A similar conclusion applies to Firm 1 (Figure 1(a)), although for c below $c(c_2 = 0)$, the option to merge has disappeared for Firm 1 because Firm 2 has been liquidated. In that case, Firm 1's value and dividend policy revert to the stand-alone case (i.e., it distributes dividends whenever cash reserves exceed $c(c_1^*)$).

The central planner's perspective is shown in Figure 1(c). All the previously mentioned regions are present: for cash reserves below c ($c_2 = 0$), Firm 1 remains in the market,

[2] At the merger, Y is spent, and after that the threshold for payout is c_m^*.

whereas Firm 2 has already been liquidated (eliminating the option to merge). If cash reserves continue to decline, Firm 1 will eventually liquidate as well. In the absence of an option to merge, the central planner's payoff is simply $V_1 + V_2$. With the option, combined cash is retained until the merger trigger $\hat{c}$ is reached; then, after the merger, the firm pays dividends for cash reserves larger than c_m^*.

A key outcome is that, unlike previous literature, the way the merger surplus is shared must adjust for an agreement on the timing. The central planner's trigger (i.e., the first-best solution) is only achieved for a specific level of bargaining power. In other words, there exists an η such that both firms' triggers match that of the central planner (see Figure 2).



(a) Firm 1

(b) Firm 2

(c) Central Planner

Figure 1: Firms' value: barrier strategy

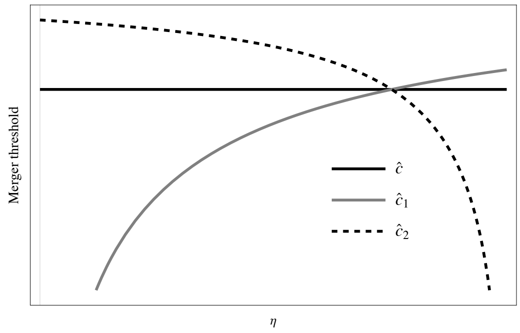


Figure 2: Merger thresholds: barrier strategy

Band strategy The constants b_{1i}^m, b_{2i}^m, and the merger threshold $\hat{c}_i$ and the low threshold $\underline{c}_i$ are determined using the following boundary conditions:

$$V_i^m(\underline{c}_i) = V_i(c_i(\underline{c}_i)), \tag{37}$$

$$V_i^{m'}(\underline{c}_i) = V_i'(c_i(\underline{c}_i)), \tag{38}$$

$$V_i^m(\hat{c}_i) = \Theta_i(\hat{c}_i), \tag{39}$$

$$V_i^{m'}(\hat{c}_i) = \Theta_i'(\hat{c}_i). \tag{40}$$

Using boundary conditions (37) and (39), we write:

$$V_i^m(c) = L(c, \underline{c}_i, \hat{c}_i)\, V_i\big(c_i(\underline{c}_i)\big) + H(c, \underline{c}_i, \hat{c}_i)\, \Theta_i(\hat{c}_i). \tag{41}$$

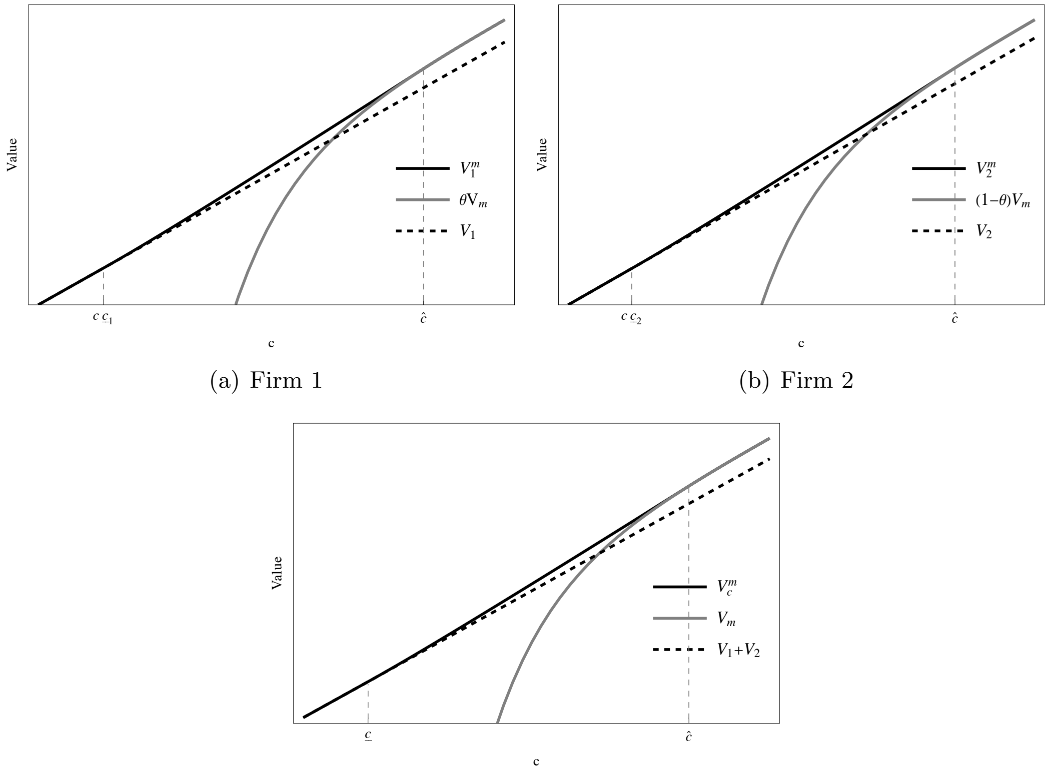
The merger threshold $\hat{c}_i$ and the low threshold $\underline{c}_i$ are then found using (38) and (40).

Figure 3 illustrates the thresholds for the band strategy, which occurs only when merger costs are sufficiently high. In this (less likely) scenario, Firms 1 and 2 retain earnings whenever the accumulated cash is between $c(\underline{c}_i)$ (for $i \in \{1, 2\}$) and the merger threshold $\hat{c}$. Should the accumulated cash of Firm i fall below $c(\underline{c}_i)$ due to negative profits, the firm enters a region where the optimal policy is to distribute dividends (Figures 3(a) and 3(b)). Figure 3(c) highlights these regions from the central planner's perspective. As with the barrier strategy, bargaining power remains endogenous to achieving an agreement under the band strategy, implying that the central planner's trigger is matched only when both firms' triggers align with the central planner's (see Figure 4).

3 Comparative statics

In this section, we perform a comparative statics analysis of several key variables in our model, using the base-case parameters presented in Table 1.

Figure 5 shows the effects of the synergy factor (ω). We see a non-monotonic effect of



(a) Firm 1

(b) Firm 2

(c) Central Planner

Figure 3: Firms' value: band strategy

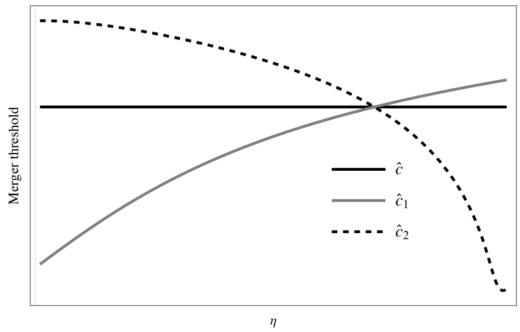


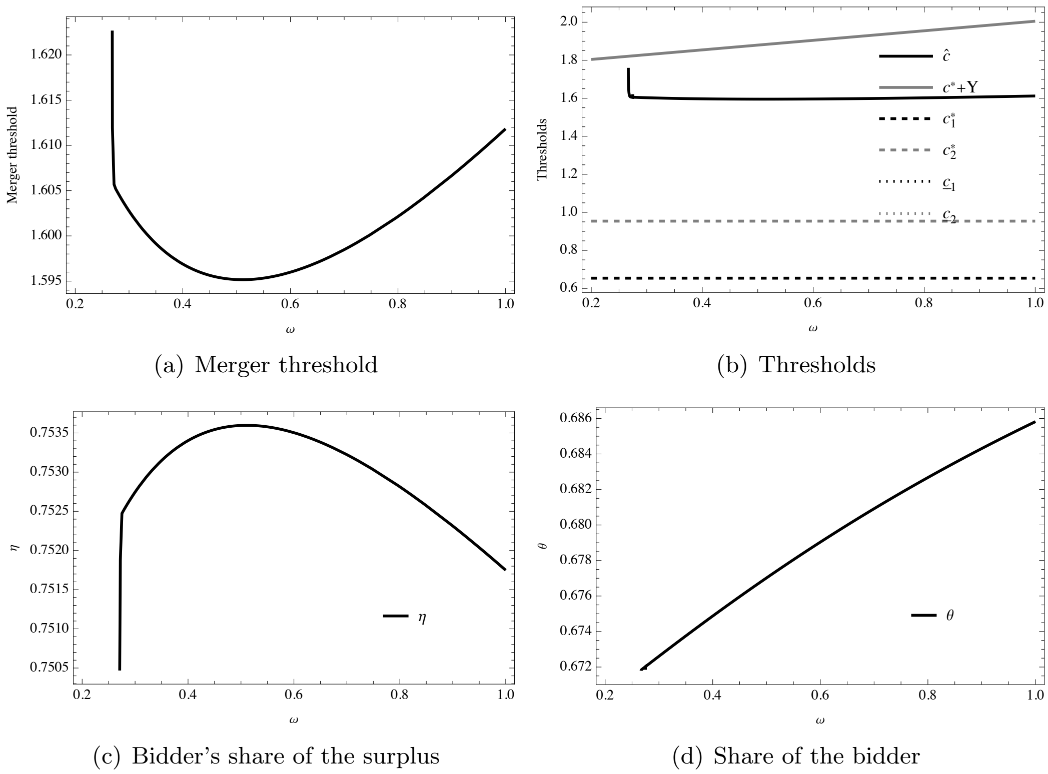
Figure 4: Merger thresholds: band strategy

synergies on the merger threshold and on the fraction of the surplus accrued to the bidder (Figures 5(a) and 5(c)). One is the mirror image of the other. As ω increases from its minimum possible value, the merger threshold decreases, so the η required to align the interests of both firms with the central planner's increases. Interestingly, after a certain level of ω, the opposite effect takes place: the merger threshold increases, and the fraction of the surplus received by the bidder decreases. Figure 5(d) shows that the bidder's share

Table 1: The base-case parameter values.

Parameter	Description	Value
c_1	Current level of C_1	0.4
c_2	Current level of C_2	0.1
k_1	Capital stock of firm 1	2
k_2	Capital stock of firm 2	1
ω	Synergy factor	0.5
Y	Merger fixed costs $(Y_1 + Y_2)$	1
r	Risk-free interest rate	0.06
μ	Risk-neutral drift rate	0.2
σ	Volatility	0.1

in the merged firm (θ) increases with synergies. Finally, aside from the impact on $\hat{c}$, ω does not affect the other thresholds (Figure 5(b)).



(a) Merger threshold

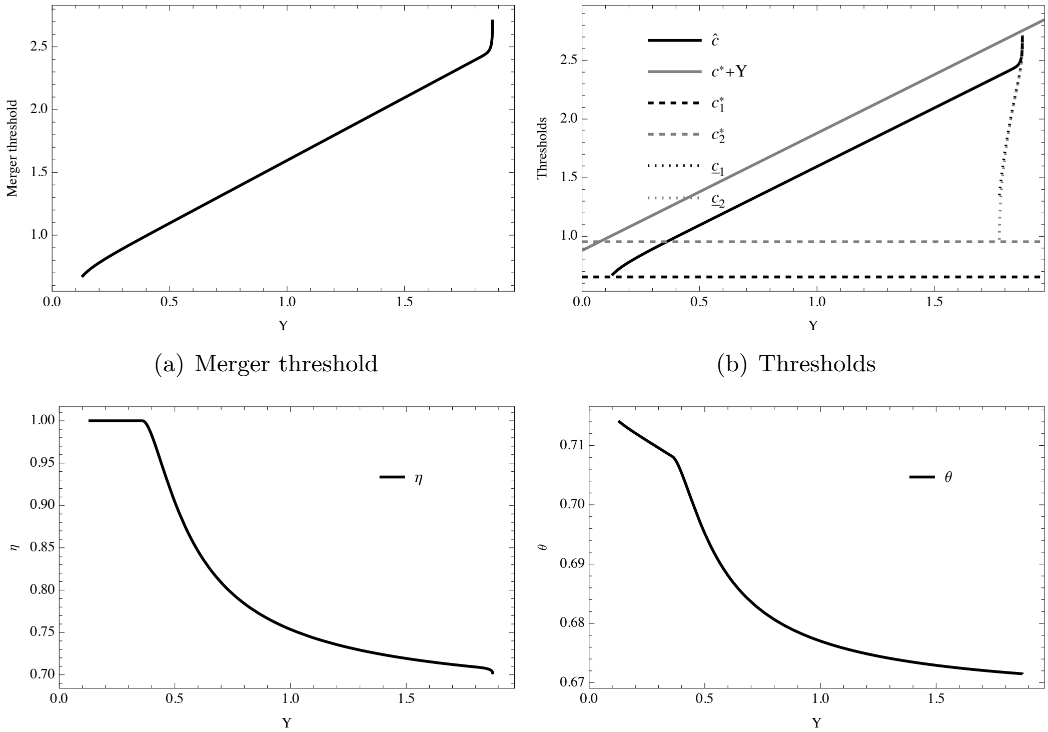
(b) Thresholds

(c) Bidder's share of the surplus

(d) Share of the bidder

Figure 5: The effect of the synergy (ω)

Figure 6 shows the effects of merger costs (Y). As costs increase, the merger timing is delayed (see 6(a)), while the bidder's share of the surplus and the bidder's share in the merged firm both decline (Figures 6(c) and 6(d)). Interestingly, the band strategy emerges for larger values of Y (although only over a limited interval), where the thresholds $\underline{c}_1$ and $\underline{c}_2$ appear.



(a) Merger threshold

(b) Thresholds

(c) Bidder's share of the surplus

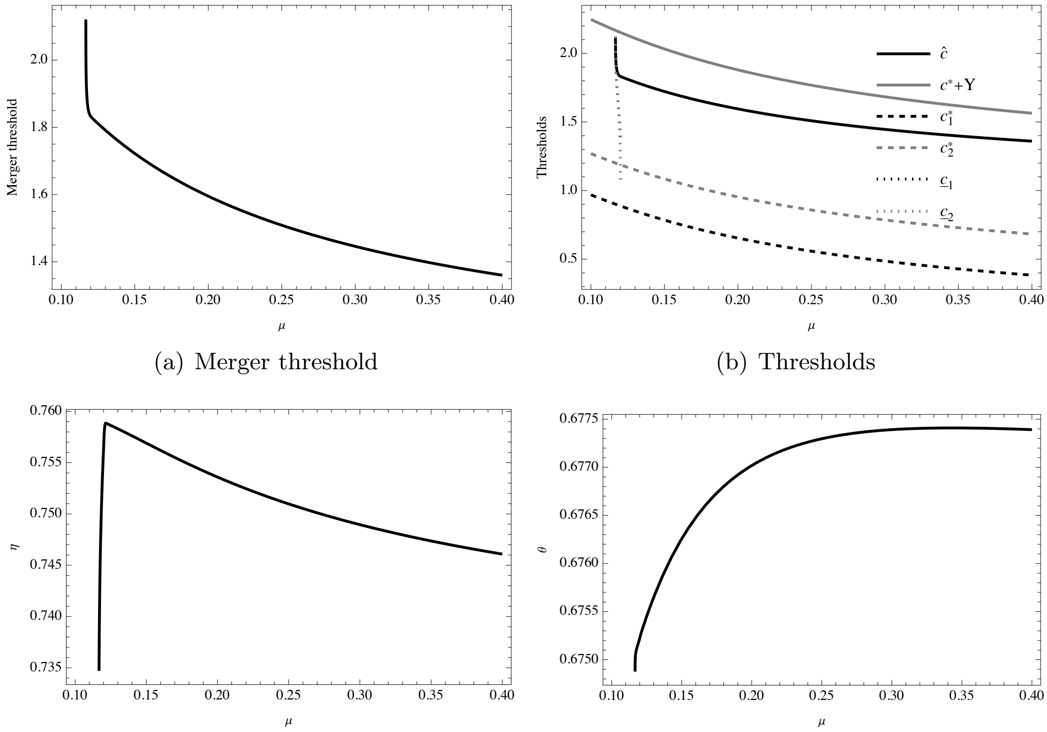
(d) Share of the bidder

Figure 6: The effect of merger cost (Y)

The influence of the drift rate (μ) is depicted in Figure 7. As the drift increases, the merger threshold decreases, indicating that the merger occurs sooner. Simultaneously, the bidder's share of the surplus decreases, while the bidder's share in the merged firm increases (see Figures 7(a), 7(c), and 7(d)). This reflects a shift in the balance of power between the firms during the merger process. Additionally, all other relevant thresholds decrease as the drift rate increases, further affecting the merger timing and terms (7(b)).

Figure 8 shows the effects of volatility (σ). As volatility increases, the merger trigger also increases, indicating that the merger requires a higher level of accumulated cash. The effect of σ on the bidder's shares (both η and θ) exhibits an inverted U-shape: initially, as volatility rises, both η and θ increase, but beyond a certain point, further increases in volatility reduce both shares. Additionally, the other relevant triggers all increase with volatility, highlighting the broader influence of market uncertainty on the merger process.

Next, we analyze the impact of relative cash holdings in Figure 9. We see that relative cash holdings have no effect on the merger threshold or any other relevant thresholds in the model (Figures 9(a) and 9(b)). However, an increase in relative cash for the bidder



(a) Merger threshold

(b) Thresholds

(c) Bidder's share of the surplus

(d) Share of the bidder

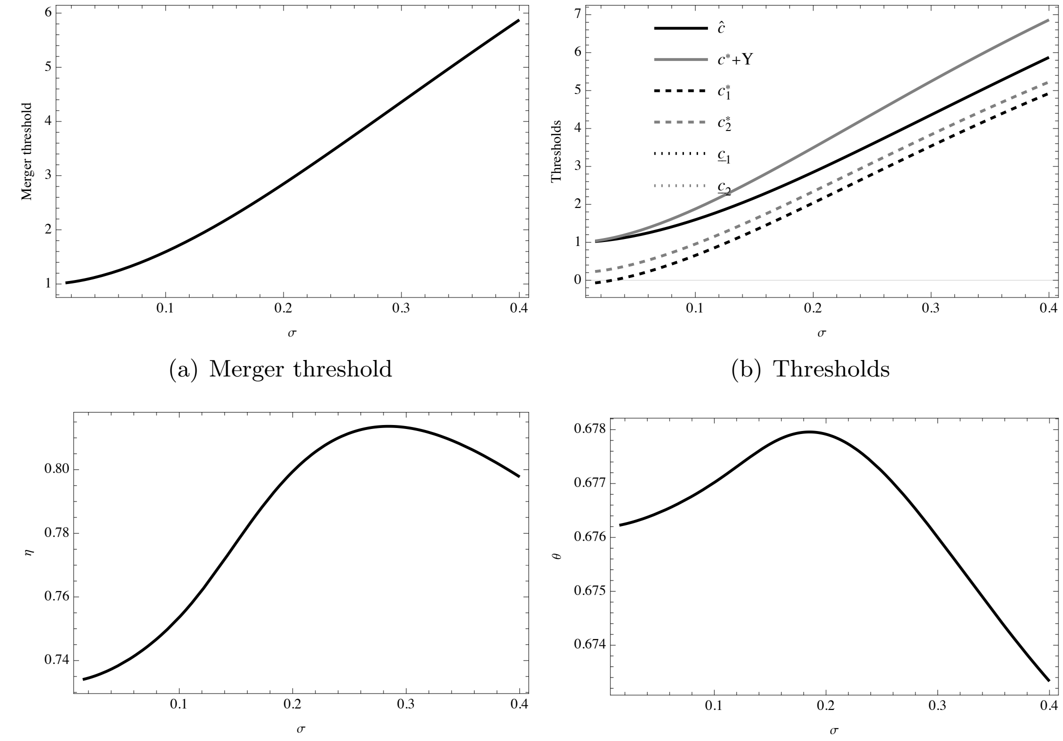
Figure 7: The effect of the drift rate (μ)

leads to higher values of both η and θ, reflecting an increased share of the surplus and a larger portion of the merged firm for the bidder (Figures 9(c) and 9(d)). Thus, while relative cash holdings do not influence the merger timing or conditions, they do play a central role in shaping the distribution of benefits between the merging parties.

Figure 10 illustrates the influence of the relative size of the firms. The merger trigger remains unaffected by the relative sizes, leaving the timing unchanged. However, the stand-alone payout triggers are affected: as the relative size of Firm 1 increases, c_1^* rises, while c_2^* decreases. This reflects a shift in payout policies based on firm size. Furthermore, both η and θ increase with the relative size of Firm 1, indicating that a larger Firm 1 captures a bigger share of the surplus and a higher stake in the merged firm.

4 Conclusion

This paper investigates the relationship between dividend policy and mergers and acquisitions (M&A) within a dynamic framework. It analyzes the decisions of two firms regarding their dividend payout policies while considering the possibility of a merger, under the risk of liquidation. A key finding challenges traditional results in the literature on merger co-



(a) Merger threshold (b) Thresholds

(c) Bidder's share of the surplus (d) Share of the bidder

Figure 8: The effect of volatility (σ)

operative games, revealing that firms' bargaining power is not predetermined but instead becomes endogenous, playing a central role in achieving a merger agreement. Furthermore, the choice of a payout strategy, whether a barrier or band approach, is influenced by the scale of merger costs.

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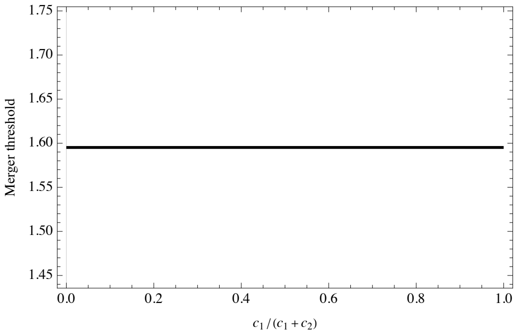
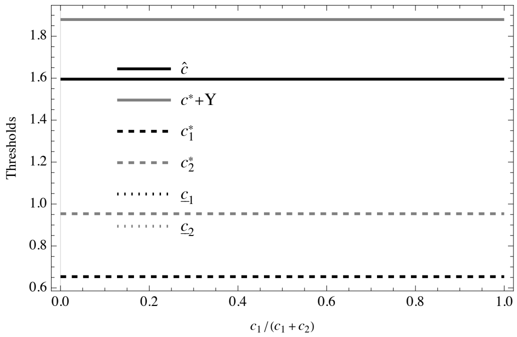
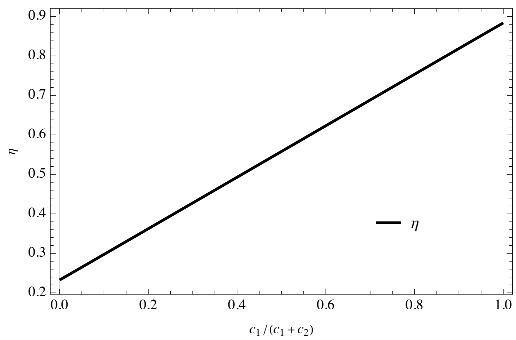


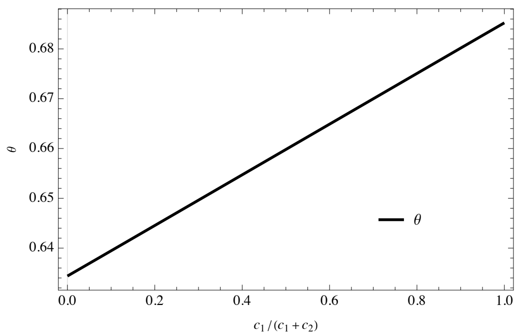
(a) Merger threshold



(b) Thresholds



(c) Bidder's share of the surplus



(d) Share of the bidder

Figure 9: The effect of relative cash holdings

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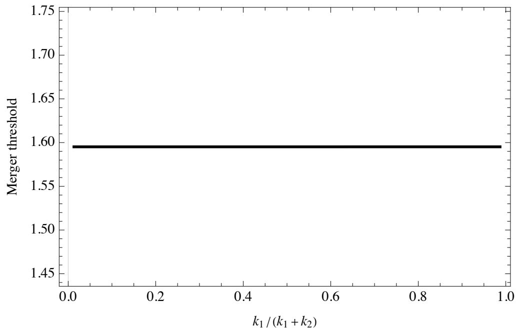
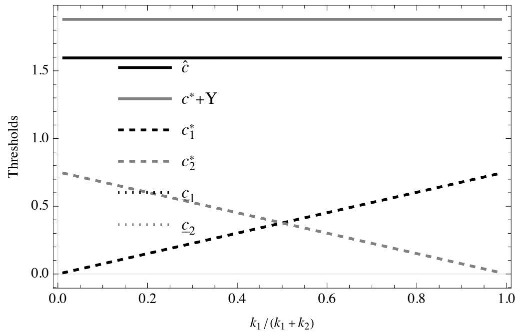
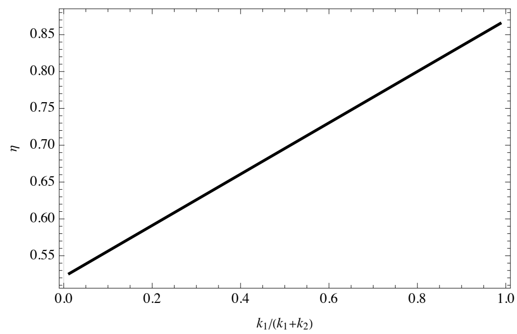


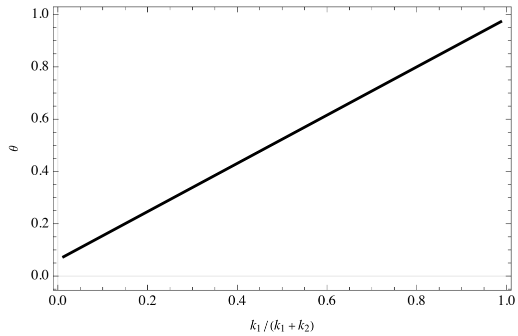
(a) Merger threshold



(b) Thresholds



(c) Bidder's share of the surplus



(d) Share of the bidder

Figure 10: The effect of relative size

Appendices

A Proofs

TO BE ADDED