ON DOUBLE CAREER CONCERN AND FINANCIAL TRADING

Abstract. Recent financial economics literature recognizes the importance of career concerns in contracts between investors and fund companies. I extend previous financial equilibrium models with reputational concerns, by allowing for an extra delegation process from fund companies to fund managers in a double career concern setup. As now more informed traders participate, two opposite effects on previous results emerge: whereas with exogenous contracts a higher trading volume arises, with endogenous contracts more demanding conditions are required to rule out a zero trading outcome.

Keywords: contract theory; career concern; financial equilibrium; volume trade; trade puzzle; mutual funds.

JEL Classification: D53, D86, G11, G12, G14, G23.

Introduction

One of the most remarkable puzzles in financial economics is the so-called trade puzzle. This puzzle concerns the inability of standard finance paradigm to account for (high) trade observed in financial markets under an environment with asymmetric information[1]. Given the increasing presence of institutional ownership in financial markets during the last fifty years, new explanations to this phenomenon have strongly hinged on the features of this class of investors.[2]

In particular, recent literature on financial economics has recognized the prominent role played by contracts signed by investors and fund companies. Among these works, that of Dasgupta *et al.* (2006, 2008) provides an especially interesting framework that explains the puzzle trade based mainly upon two elements. First, they consider the agency problems that emerge when the investor delegates his portfolio management to the fund company. In addition, due to the no observation of the fund manager's ability, they study contracts with implicit incentives given by reputational or career concerns. This setting predicts that the presence of career concerns induces uninformed fund managers to churn, i.e. to trade even when they face a negative expected return.[3] Noise trade given by churning makes prices to be non-fully informative, which yields a positive trading volume in the asset market.

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[1] Furthermore, this trading volume increases in financial crisis because the returns are significantly higher in this period (See Van Geyt *et al.* (2013).

[2] For instance, in the New York Stock Exchange, the percentage of outstanding corporate equity held by institutional investors has increased from 7,2% in 1950 to 49,8% in 2002 (NYSE Factbook (2003)).

[3] Churning can be defined as a situation that makes the account of a client excessively active by frequent purchases and sales primarily in order to generate commissions.

Dasgupta *et al.* (2006) treats fund companies and fund managers as the same entity, abstracting then from any agency problem between them. However, as Chevalier *et al.* (1999) document, the lack of aligned incentives resulting from this delegation process may become very important to the portfolio strategies followed by fund managers. In fact, their main results suggest that a complete discussion on the incentives facing by mutual funds must take into account not only the agency relationship between the investor and the mutual fund company, but also that involving the fund company and the fund manager.

Accordingly, the present paper takes the set-up of Dasgupta *et al.* (2006) as a benchmark model and studies the effects that this additional delegation can generate on the financial market's equilibrium. To this end, I assume however that fund companies are quite different from the individual investors characterized in the benchmark model, as they exhibit a *more* sophisticated technology for hiring fund managers. This assumption rests on the fact that fund companies can be seen as 'human resources firms', and thus, as compared to individual investors, they should have in average a better quality for detecting informed managers.

As the main contribution of this paper, I find that the inclusion of this extra delegation process delivers two *opposite* effects on the robustness of the trading volume results found by the previous literature. On the one hand, when contracts between market participants are *exogenous*, the proposed framework delivers a financial equilibrium with a higher participation of informed fund managers, which leads the overall trade to be *higher* than that characterized by the benchmark model. This allows predicting an increasing trade activity as long as institutional investors with intense delegation play an increasing role in financial markets. On the other hand, when contracts are allowed to be short-term and *endogenous*, conditions on transaction costs that ensure a churning equilibrium are more demanding, making thus more likely an outcome with zero trading volume to emerge.

This paper is also related to other models with career concerns, such as Borenstein *et al.* (2012), Guerrieri *et al.* (2012) and Scotti (2012). These papers are close to ours because they examine how career concerns can generate inefficiencies in market variables. However, in contrast to our paper, Borenstein *et al.* (2012) examines markets for a physical good (natural gas) in which career concerns reduce firm's incentives to undertake transactions, distorting market prices. On a similar line to ours, Guerrieri *et al.* (2012) and Scotti (2012) focus their studies on financial markets, showing that career concerns can either amplify the impact of financial shocks on bond prices (Guerrieri *et al.* (2012)) or lead to unprofitable trade by uninformed managers which increase the level of noise (Scotti (2012)). Nevertheless, neither of both works take into account the delegation process between fund company and fund manager.

The structure of this paper is as follows. Section 2 presents a model with two-sided career concerns contracts between fund companies and fund managers. The next section characterizes the churning equilibrium, and discusses its implications for the trade puzzle when contracts are either exogenously or endogenously set. Finally, Section 4 contains the conclusions of the paper.

2. The Model

Consider a two-period economy. The market trades an Arrow security, which has liquidation value $v = 0$ or 1 with the same probability of occurrence. This value is revealed at time t and independent across periods. There are a large pool of ex-ante identical fund companies and fund managers.[4] All of them are risk-neutral.

In the first period, one of the fund companies is employed at random by the investor, a single risk-neutral principal. Likewise, this fund company may hire one fund manager and, if so, at the end of the first period she may decide to retain him, hire a challenger of average quality from the pool, or not to hire. Her decision is based on the net return obtained by the fund manager. In the same way, in period 2, the investor decides to renew the incumbent fund company or hire a new one as she can attempt to infer the ability of the fund company from the trading outcome.

Therefore, in this environment, two kinds of principal-agent contracts are observed: the first one between the investor and the fund company, and the second one between the fund company and the fund manager. In addition, both agency relationships are characterized by reputational or career concerns. This is because present actions taken by both fund companies and fund managers affect their chances of being retained, and thereby, their future compensations.

The fund company can be of two types: talented or untalented. This is represented by $\eta \in \{u,t\}$, where u and t denote an untalented and a talented company respectively with $\Pr(\eta = t) = \zeta$. Similarly, the fund manager can be of two types: good or bad, represented by $\theta \in \{b,g\}$ where b and g denote a bad and a good manager respectively so that $\Pr(\theta = g) = \gamma$. Ex ante, all types are unknown to fund companies, fund managers and the investor, and are independent of v.

Fund managers interact with a large number of risk-neutral short-lived competitive uninformed market makers (hereafter traders). Half of them operate in $t = 1$, the other half operate in $t = 2$. Fund managers can issue market orders (a_t) to buy one unit of the asset ($a_t = 1$), to sell one unit ($a_t = 0$) or not to trade ($a_t = \emptyset$). The traders sets ask (p_t^a) and bid (p_t^b) prices equal to the expected value of v conditional on the observed order history. The bid-ask spread $p_t^a - p_t^b$ may be positive, with $p_t^a \in \left[\frac{1}{2}, 1\right]$ and $p_t^b \in \left[0, \frac{1}{2}\right]$.

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[4] Throughout the paper, we refer to the principal as she and the agent as he. Notice that the fund company is the agent in the relationship with the investor and the principal in the labor contract with the manager.

Since fund managers are free to choose one of the market markers at random, they are then subject to Bertrand competition. Moreover, for simplicity I assume that traders do not know whether they are in period 1 or 2.

Before contracting, fund companies observe a signal τ on manager's type. Talented companies observe an informative signal that reveals the true type of the manager. In contrast, untalented companies have access to a noisy signal that does not improve their beliefs on the manager's type. Formally, we have that

$$\tau(\eta,\theta) = \begin{cases} \theta & \text{if } \eta = t \\ \emptyset & \text{if } \eta = u \end{cases}$$

Based upon this information, fund companies make a decision $e_t \in \{0,1\}$, where $e_t = 1$ ($e_t = 0$) corresponds to hiring (not to hiring) the manager. Whereas untalented fund companies choose good (bad) fund managers with probability γ (with probability $1-\gamma$), talented fund companies *only* choose good fund managers. The last assumption deserves an additional comment because it means that fund companies are quite different from the individual investor. In fact, this implies that whereas untalented fund companies match a good fund manager with probability γ (as individual investors in Dasgupta's model), talented fund companies can improve on this, by matching good managers with probability larger than γ (in this case 1).[5] This important assumption is based upon the idea that fund companies have more sophisticated technologies for hiring fund managers than an individual investor, as they are 'human resources firms'. Thus, it is plausible to model this phenomenon by assuming that the quality of this hiring technology depends on the type (talented or untalented) of the company.

The information structure of the fund manager is as follows. At time t a fund manager receives a signal s which can take three values, 0, 1, or $\emptyset$. This signal reveals privately him his true type as it is determined as follows

$$s(v,\theta) = \begin{cases} v & \text{if } \theta = g \\ \emptyset & \text{if } \theta = b \end{cases}$$

In order to make a difference between trading and not trading, there exists a cost of trading $\varepsilon > 0$ paid by the fund manager.

The net return on investment obtained by the fund manager at time t is denoted by χ_t, and is defined by

$$\chi_t(a, p_t^a, p_t^b, v, \varepsilon) = \begin{cases} v - p_t^a - \varepsilon & \text{if } a = 1 \\ p_t^b - v - \varepsilon & \text{if } a = 0 \\ 0 & \text{if } a = \emptyset \end{cases}$$

[5] As we will see in the next section, this assumption is key to obtain a larger amount of informed traders participating in the market, and thereby, a higher bid-ask spread.

Untalented fund companies form a posterior belief about the fund manager's type based upon net returns yield by the portfolio, which is observed at the end of period 1. Similarly, the investor updates her belief about the fund company's type based on the same information. All of this is formalized by the posterior probabilities $\Pr(\theta = g|\chi_t)$ and $\Pr(\eta = t|\chi_t)$.

All contractual arrangements between the investor, fund companies and fund managers are exogenously set out.[6] Furthermore, I model payoffs to fund companies and fund managers using a simple linear compensation structure. Accordingly, given the net return χ_t, fees charged by the fund company to the investor correspond to $\rho_t = \delta\chi_t + \mu$. Similarly, the payment from the fund company to the manager is given by $\pi_t = \alpha\chi_t + \beta$. I assume that α and $\delta \in (0,1)$, and β and $\mu \in (0,\infty)$.[7]

In overall terms, I model contracts by assuming that in both agency relationships the principal substitutes explicit and implicit incentives, as most of the career concern literature does. Specifically, it is assumed that the principal offers a mix of both incentives: (i) a linear contract (explicit incentives) and (ii) a continuation or replacement at the end of the period 1 (implicit incentives). This is then the complete compensation structure the principal uses to address the asymmetric information problem related to the agent's ability.

In the particular case of investors and fund companies, two main reasons why contracts between them take a simple form can be provided. First, there is evidence suggesting that SEC regulations induce even simpler payment schemes for fund companies, as these regulatory issues seem to enforce most funds to charge fees that are indeed independent of performance (see Elton *et al.* (2003)). Second, as Ippolito (1992), and Chevalier *et al.* (1997) have documented, a well-recognized stylized fact in the delegated management industry is that investors shift their money towards funds that exhibit a good performance in the recent past. This provides then a rationale for the assumption of allowing the investor to renew or not her relationship with the fund company, as this device can be understood as a means of modelling career concern incentives of fund companies.

In the case of the agency relationship between fund companies and fund managers, there is also empirical evidence that can justify a mixed contractual structure. As Chevalier *et al.* (1999) suggest, career incentives seem to be very relevant for the fund managers' compensation scheme. Their results are thus

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[6] Talented fund companies may implement both signaling and screening devices through fees depending on performance. In the first case, they could separate themselves from untalented companies, and in the second case, they could implement a self-selection mechanism between good and bad managers. However, regulation issues and stylized facts indicate that in the real world portfolio management industry is addressed by a combination of explicit and implicit incentives.

[7] Since both ρ_t and π_t depend on χ_t, the compensation scheme considers the possibility of a penalty whenever χ_t is negative and sufficiently low.

consistent with firing being the consequence of fund companies updating their beliefs about manager's abilities over time.

Lastly, the total investor's payoff is given by[8]

$$\sum_{t=1}^{2}(\chi_t - \rho_t).$$

3. The Results

The next statement characterizes a churning equilibrium in which both fund companies and fund managers always trade in the first period.

Proposition 1. *For α, δ, and ε low enough, there exists an equilibrium in which:*

(i) The investor retains the fund company if the portfolio's return is satisfactory (positive) and replaces him otherwise.

(ii) A talented fund company always both hires good managers and retains them. An untalented fund company hires at random managers, and retains the incumbent manager if and only if the portfolio's return is satisfactory (positive).

(iii) A good fund manager always trades. A bad fund manager churns if t = 1, and he does not trade if t = 2.

(iv) Traders set prices

$$\hat{p}_t^a = \frac{1}{2}(1 + \hat{\gamma})\ and\ \hat{p}_t^b = \frac{1}{2}(1 - \hat{\gamma})$$

where

$$\hat{\gamma} = \frac{2\zeta + (1-\zeta)\gamma(2 + \frac{1}{2}(1-\gamma)).}{1 + \zeta + (1-\zeta)\gamma(1 + \frac{1}{2}\ (1-\gamma)).}$$

A formal proof of this proposition (and also Corollary 1 below) can be found in Portilla (2009). Here I only provide the intuition behind the results, with a special interest on findings different from those of Dasgupta *et al.* (2006).

First, note that Proposition 1 characterizes a churning equilibrium in which all managers trade in the first period. While the good manager trades according to his private information on the asset value, the bad one randomizes between buying and selling.

The investor knows that a successful trade in the first period ($\chi_1 > 0$) may stem from a talented fund company (which only hires good managers) or an untalented one. In the second case, this positive return may result from a good manager (with probability γ) or from a churning bad manager with good luck (with probability

[8] We assume a zero discounting rate.

$(1-\gamma)/2$). All of this suggests her that it is more likely that a successful trade comes from a talented fund company. Consequently, she makes an upward adjustment of her belief on a talented company when she observes $\chi_1 > 0$ so that the posterior becomes higher than the prior, i.e.

$$\Pr(\eta = t|\chi_1 > 0) \geq \zeta.$$

Equivalently, the investor knows that an unsuccessful trade in the first period $(\chi_1 < 0)$ can only be attributed to an untalented company. In addition, I assume that she believes that no-trade (an event out of the equilibrium path) can also only be associated to an untalented fund company. Based upon this structure of beliefs, the investor retains the first-period fund company if she observes a positive return, and replaces it otherwise.

Since a talented fund company knows perfectly the type of the manager, she only hires good ones. As a consequence, she always observes positive returns and retains the manager. In contrast, an untalented fund company cannot perfectly associate a positive return to a good manager. However, she knows that it is more likely that a successful trade comes from a good manager than a bad one. Accordingly, she also makes an upward adjustment on her posterior when positive returns are observed so that

$$\Pr(\theta = g|\chi_1 > 0) \geq \gamma.$$

Given this structure of beliefs, an untalented fund company retains a manager only if a successful trade is observed at the first period.

A good manager always obtains positive returns whenever transaction costs are low enough ($\varepsilon < \hat{\varepsilon}$).[9] Since he knows the true liquidation value of the asset, he always trades correctly and sells or buys according to prices that lie between 0 and 1. Given the structure of beliefs of the game, he knows that his continuation is ensured.

At first period, a bad manager has two alternatives: no-trade or churn. On the one hand, if he does not trade, he makes a zero return and thereby, he is revealed as a bad manager. As a result, he is replaced for sure. On the other hand, although a bad manager yields a negative expected return $(\hat{\varepsilon} - 1/2 - \varepsilon)$ when churning, his chance of being retained is 50%. Given a linear compensation structure, a sufficient condition for the bad manager to prefer churning is the fact that the pay-for-performance sensitivity (the parameter α) be lower than the fixed payment (the parameter β). This occurs because in that case the benefits from being retained (the

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9 Donde $\hat{\varepsilon} \equiv \frac{1}{2}(1-\hat{\gamma})$.

second-period fixed payment) overcome the costs of churning (a first-period penalty coming from a negative expected return).

Traders cannot distinguish if a market order comes from a good manager or a bad manager who churns at the first-period. The price is then based on the probability that the order is made by a good manager conditional on observing such an order. This probability corresponds to

$$\hat{\gamma} = \Pr(\theta = g | a \in \{0,1\}) = \frac{2\zeta + (1-\zeta)\gamma(2 + \frac{1}{2}(1-\gamma))}{1 + \zeta + (1-\zeta)\gamma(1 + \frac{1}{2}(1-\gamma))}$$

It can be verified that the posterior is larger than the prior, i.e., $\hat{\gamma} > \gamma$. The source of this fact is two-fold. First, as discussed above, while good managers are always retained, bad ones may be replaced. Second, even if a bad manager is not replaced, he does not trade in the second period.

Interestingly, the posterior in my model is greater than the posterior resulting from that of the benchmark model as

$$\hat{\gamma} > \gamma \frac{5-\gamma}{(2+3\gamma-\gamma^2)} = \hat{\gamma}_{D\&P},$$

where $\hat{\gamma}_{D\&P}$ denotes the posterior in Dasgupta *et al.* (2006). This is due to the fact that my framework generalizes the environment studied by these authors as I also incorporate the possibility of *talented* fund companies that *only* hire *good* managers.

As a result, in this modified model traders set equilibrium prices that yield a *greater* bid-ask spread. To see that, note that the bid-ask price is given by

$$\hat{p}_t^a - \hat{p}_t^b = \hat{\gamma}.$$

From this, it is clear that the bid-ask spread inherits all the properties of posterior probability, and thus, the result follows. Thus, the bid-ask price is larger than the Dasgupta's one for all $\gamma \in [0,1)$ and $\zeta > 0$. Otherwise, they are equal. This property is illustrated in Figure 1, which shows that, as long as $\zeta > 0$ (i.e., there exists talented fund companies), my model delivers a higher bid-ask spread.[10]

This fact delivers results that are stronger than those of previous literature in terms of average trading (see Corollary 1 below).

[10] Figure 1 is constructed assuming that ζ = .5.

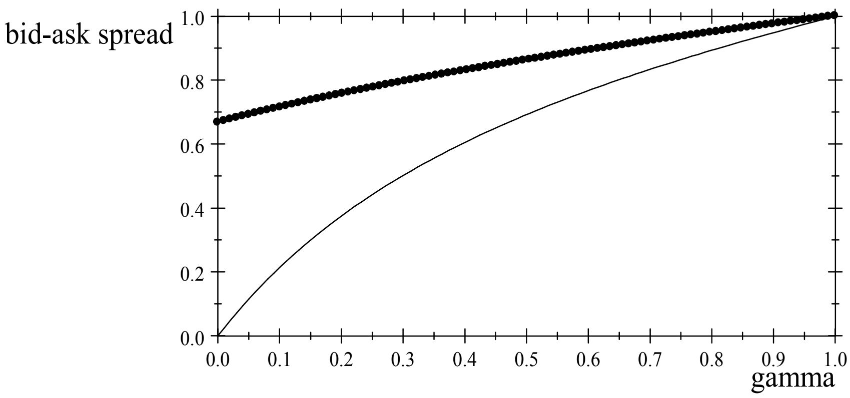

Fig. 1. Bid-ask spread with ζ = .5 (dotted line), and Dasgupta *et al.* (2006) (solid line).

In addition, note that since the posterior probability of facing a good manager is increasing with the proportion of talented fund companies, the bid-ask spread does so (see Figure 2).

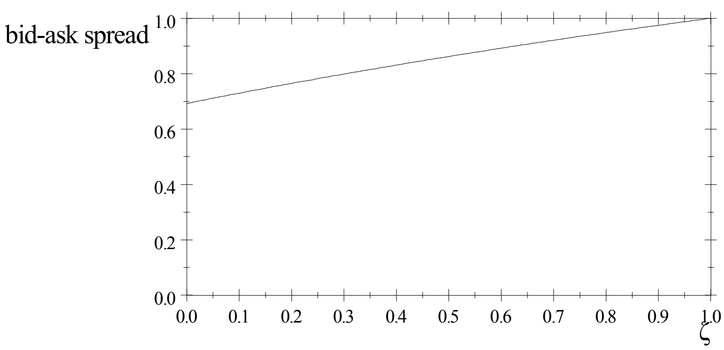

Fig. 2. Bid-ask spread and proportion of talented fund companies assuming

$\gamma = .5.$

4. Comparative Statics of Trading Volume

The main implication of Proposition 1 is the contribution to explaining the trade puzzle. Trading volume corresponds to the expected number of assets traded as average in the two-period horizon. Thus, it is the average of the probability that a trade takes place at $t = 1$ and the probability that a trade takes place at $t = 2$. From Proposition 1, I compute in the next corollary the trading volume for the churning equilibrium.

Corollary 1. *The average trading volume in the churning equilibrium is given by*

$$w = \frac{2 + 3\gamma - \gamma^2}{4} + \frac{\zeta(1 - \gamma(1 + \frac{1-\gamma}{2}))}{2}.$$

Some properties of the average trading volume are the following. First, it is positive even when the proportion of good managers tends to zero. This results from the presence of a churning equilibrium, which guarantees that the financial market equilibrium is not fully informative. Second, the average trading volume is increasing with the prior of both good managers (γ) and talented fund companies (ζ). This is consistent with the previous results related to the bid-ask spread. Third, my model delivers a trade volume that is *higher* than the benchmark model's one for all $\gamma \in [0,1)$ and $\zeta > 0$, and equal otherwise. This is true as it can be verified that

$$w = w_{D\&P} + \frac{\zeta(1 - \gamma(1 + \frac{1-\gamma}{2}))}{2}$$

where

$$w_{D\&P} = \frac{2 + 3\gamma - \gamma^2}{4}$$

is the average trading in Dasgupta *et al.* (2006). This fact is also illustrated by Figure 3.

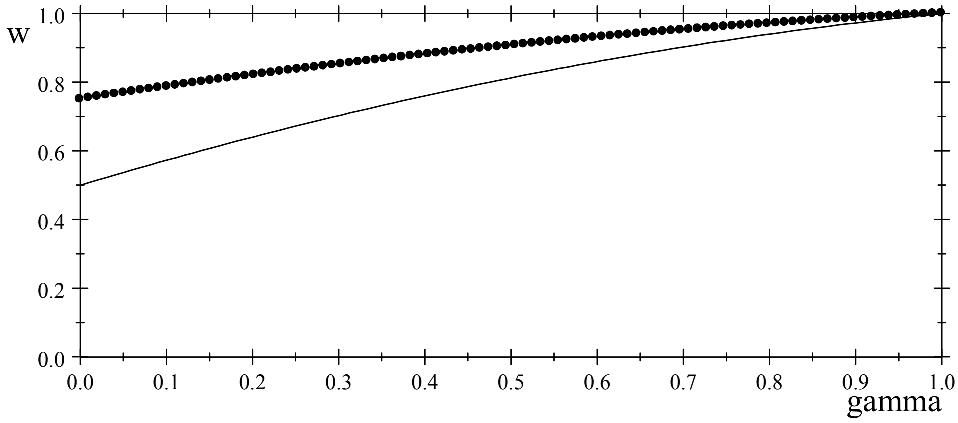

Fig. 3. Average trading volume with $\zeta = .5$ (dotted line), and Dasgupta *et al.* (2006) (solid line).

Let us provide some intuition on why do I get a higher trading volume than previous works. First, the incorporation of talented fund companies allows improving the hiring technology of individual investors, as they can match with good managers with probability larger than γ (in this case 1). As a consequence, while in Dasgupta *et al.* (2006) the measure of informed delegated traders at $t = 1$ is γ (the measure of informed fund managers), in my framework that measure is $\zeta + (1 - \zeta)\gamma > \gamma$, where ζ is the measure of talented fund management companies. In addition, in both Dasgupta *et al.* (2006) and the present paper, it is verified that: (i) everyone trades at $t = 1$, (ii) only informed fund managers trade at $t = 2$, and (iii) informed fund managers are always retained if hired at $t = 1$. As a result, since the measure of informed fund managers at $t = 1$ is higher in my model, the overall trade ends up being higher as well.

So far I have considered *exogenous* linear contracts between the three classes of market participants considered in the model. I now move on to find out how robust the results found in terms of volume trade are when contracts between fund companies and fund managers are *endogenously* determined. The starting point for this analysis is Dasgupta *et al.* (2006), who show that, with endogenous short-term contracts, a positive volume trade is still possible as long as the transaction costs ε and the measure of informed fund managers γ are sufficiently *low*. As discussed above, since in my framework the proportion of informed fund managers is *higher* (as $\zeta + (1 - \zeta)\gamma > \gamma$) than previous works, it seems interesting to explore if this fact can weaken Dasgupta's conclusions in terms of trading volume.

To perform this exercise, I assume that there are two classes of short-lived fund companies. At period 1, fund companies offer a short-term contract b_1 to fund managers, which can depend on all observable variables at the end of this period (but it cannot depend on the expectation of variables realized at $t = 2$). At period 2, new fund companies observe the return obtained in the previous period, and decide if to retain the incumbent manager or to hire a challenger. Also, these fund companies offer a short-term contract b_2 to managers. Thus, the contract b_t can be understood as a compensation scheme that specifies the manager's payment for each of three possible results at period *t*: success, failure, or no trade. Lastly, let us assume that $\bar{\rho} > 0$ represents the minimum payment required by fund managers to accept the fund company's offer in each period.

The following statement characterizes the condition under which the volume trade is positive with endogenous short-term contracts.

Proposition 2. *Consider the endogenous and short-term contracts described above, and the following inequality*:

$$\varepsilon < \frac{\bar{\rho} - \zeta - (1-\zeta)\gamma}{2} \equiv \bar{\varepsilon}. \quad (1)$$

If this condition is satisfied, then there exists a churning equilibrium essentially similar to that characterized in Proposition 1, in which $b_t^* = (\bar{\rho}, \bar{\rho}, \bar{\rho})$ *for* $t = 1,2$, *and the volume trade is positive.*

Note that in the benchmark model, the condition to rule out a zero volume trade outcome can be re-written as

$$\varepsilon < \frac{\bar{\rho} - \gamma}{2} \equiv \bar{\varepsilon}_{D\&P}. \quad (2)$$

Hence, by combining conditions (1) and (2), the next corollary follows directly.

Corollary 2. *For a given* γ *and* $\bar{\rho}$, *it cannot be ruled out that*

$$\bar{\varepsilon} < \varepsilon < \bar{\varepsilon}_{D\&P},$$

and thus, that there were no churning equilibrium and the volume trading were zero.

This corollary then emphasizes the idea that when contracts are allowed to be endogenous, the conditions that ensure a positive volume trade in my framework are more demanding. In other words, whether the transactions costs are high enough, the incorporation of an extra delegation process implies that it is more likely that a zero trade volume emerges as an outcome than in the Dasgupta's model.

Therefore, the inclusion of career concerned fund companies with a better hiring technology has two *opposite* effects on the robustness of the prior research conclusions on trading volume. Whereas these results are strengthened when exogenous contracts are considered, they are by contrast weakened when short-term contracts are allowed to be endogenous.

5. Concluding Remarks

This paper extends and generalizes the model of financial equilibrium proposed by Dasgupta *et al.* (2006), by adding an extra stage of portfolio management delegation: one from fund companies to fund managers. In this agency relation, both players are reputational concerned, i.e., they face a positive probability of being fired if their first-period performance (measured in terms of the managed portfolio return) is not satisfactory for the principal (the investor or the fund company, respectively). Moreover, it is assumed that fund companies exhibit, in average terms, a better technology for hiring fund managers than investors, as they are 'human resources firms'.

This double-sided career concern setup delivers two opposite results on the conclusions obtained by previous research on trading volume. First, when contracts are exogenous, the new framework allows a churning equilibrium to emerge in which *more* informed fund managers participate, and thus, overall trading volume becomes *higher*. As a consequence, the analysis strengthens previous explanations to the trade puzzle based on reputational concerns. In contrast, when contracts are short-term and endogenous, more participation of informed traders leads to more demanding conditions on transaction costs to be met in order to ensure a positive trade volume. Thus, it cannot be ruled out situations in which both models predict results diametrically different on the overall activity of financial markets.

Finally, it is worthy to stress that my model provides results consistent with two stylized facts observed in financial markets during the last decades. First, the increasing participation of institutional investors has been accompanied by increasing trade volumes (Dow *et al.* (1997)). Second, the expanding of delegated portfolio management has led to a higher trading activity (Cuoko *et al.* (2001); Chevalier *et al.* (1997); Chevalier *et al.* (1999)).

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