Money Doctors

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ABSTRACT

We present a new model of investors delegating portfolio management to professionals based on trust. Trust in the manager reduces an investor's perception of the riskiness of a given investment, and allows managers to charge fees. Money managers compete for investor funds by setting fees, but because of trust fees do not fall to costs. In equilibrium, fees are higher for assets with higher expected return, managers on average underperform the market net of fees, but investors nevertheless prefer to hire managers to investing on their own. When investors hold biased expectations, trust causes managers to pander to investor beliefs.

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It has been known since Jensen (1968) that professional money managers on average underperform passive investment strategies net of fees. Gruber (1996) estimates average mutual fund underperformance of 65 basis points per year; French (2008) updates this to 67 basis points per year. But such poor performance of mutual funds is only the tip of the iceberg. Many investors pay substantial fees to brokers and investment advisors, who then direct them toward the mutual funds that underperform (Bergstresser, Chalmers, and Tufano 2009, Chalmers and Reuter 2012, Del Guercio, Reuter and Tkac 2010, Hackethal, Haliassos, and Jappelli 2011). Once all fees are taken into account, some studies find two percent investor underperformance relative to indexation.[1] This evidence is difficult to reconcile with the view that investors are comfortable investing in a low fee index fund on their own, but nonetheless seek active managers to improve performance.

In fact, performance seems to be only part of what money managers seek to deliver. Many leading investment managers and nearly all registered investment advisors advertise their services based not on past performance but on trust, experience, and dependability (Mullainathan, Schwartzstein, and Shleifer 2008). Some studies of mutual funds note that investors hiring advisors must be obtaining some benefits apart from portfolio returns (Hortacsu and Syverson 2004). We take this perspective seriously, and propose an alternative view of money management, based on the idea that investors do not know much about finance, are too nervous or anxious to make risky investments on their own, and hence hire money managers and advisors to help them invest. Managers may have skills such as knowledge how to diversify or even ability to earn an alpha, but *in addition* they provide investors with peace of mind. We focus on individual investors, but similar issues apply to institutional investors (Lakonishok, Shleifer, and Vishny 1992).

Critically, we do not think of trust as deriving from past performance. Rather, trust describes confidence in the manager, based on personal relationships, familiarity, persuasive advertising, connections to friends and colleagues, communication and schmoozing. There are (at least) two distinct aspects of such confidence and trust. The first, stressed by Guiso, Sapienza, and Zingales (2004, 2008) and Georgarakos and Inderst (2011), sees trust as security from expropriation or theft. Another aspect of trust, emphasized here, has to do with reducing investor anxiety about taking risk. With US securities laws, most investors in mutual funds probably do not fear that their money will be stolen; rather, they want to be "in good hands."

We think of money doctors as families of mutual funds, registered investment advisors, financial planners, brokers, funds of funds, bank trust departments, and others who give investors confidence to take risks. Some investors surely do not need advice, and invest on their own, although research by Calvet, Campbell, and Sodini (2007) suggests that many such investors do not diversify properly. But many other investors, ranging from relatively poor employees asked to allocate their defined contribution pension plans (Chalmers and Reuter 2012) to millionaires hiring "wealth managers" rely on experts to help them invest in risky assets and thus earn higher expected returns. On their own, these investors would not have the time, the expertise, or the confidence to buy risky assets, and just leave their money in the bank.

In our view, financial advice is a service, similar to medicine. We believe, contrary to what is presumed in the standard finance model, that many investors have very little idea of how to invest, just as patients have a very limited idea of how to be treated. And just as doctors guide patients toward treatment, and are trusted by patients even when providing routine advice identical to that of other doctors, in our model money doctors help investors make risky investments and are trusted to do so even when their advice is costly, generic, and occasionally self-serving. And just as many patients trust *their* doctor, and do not want to go to a random doctor even if equally qualified, investors trust *their* financial advisors and managers.

We present a model of the money management industry in which the allocation of assets to managers is mediated by trust. We model trust as reducing the utility cost for the investor of taking risk, much as if it reduces the investor's subjective perception of the risk of investments. Critically, managers differ in how much different investors trust them: an investor who trusts a particular manager perceives returns on risky investments delivered by this manager as less uncertain than those delivered by a less trusted manager. We discuss alternative ways of modeling investor trust, but argue that ours is both natural and consistent with the data.

In particular, an investor would prefer to make a given investment with the manager he trusts most, enabling that manager to charge the investor a higher fee and still keep him. Even if managers compete on fees, these fees do not fall to costs, and substantial market segmentation remains. In fact, in our model fees are proportional to expected returns, with higher fees in asset classes with higher risk and return. Net of fees, investors consistently underperform the market, but experience less anxiety and earn higher expected returns than they would investing on their own. A very simple formulation based on trust thus delivers some of the basic facts about money management that the standard approach finds puzzling.[2]

In this framework, under rational expectations managers charge high fees but at the same time enable investors to take more risk. Investors are better off. There are no distortions in investment allocation between asset classes. Interesting issues arise, however, when investors do not hold rational expectations, and perhaps want to invest in hot asset classes or new products they feel will earn higher returns, such as internet stocks in the late 1990s. Empirical evidence supports the role of investor extrapolation in financial markets (e.g., Lakonishok, Shleifer and Vishny 1994, Hurd and Rohwedder 2012, Yagan 2012, Greenwood and Shleifer 2012). Would trusted money managers correct investors' errors, or pander to their beliefs? In our model, managers have a strong incentive to pander, precisely because pandering gets investors who trust the manager to invest more, and at higher fees. Trust-mediated professional money management does not work to correct investor biases. In equilibrium, money managers let investors chase returns by proliferating product offerings.

We also consider the dynamics of professional money management, including the possibility that over time funds flow to better performing managers (Chevalier and Ellison 1999). In this context, we ask whether professional managers have an incentive to pursue contrarian strategies and try to beat the market. We present a standard career concerns dynamic model in which managers have the ability to earn an alpha, and are rewarded for doing so by attracting fund flows, but augment this with considerations of trust. We find that the standard beneficial career concern incentives are significantly moderated by trust, because a manager must trade off the benefits of attracting future funds due to superior performance against the cost of discouraging current clients who want to invest in hot sectors such as internet stocks. Keeping the current clients might be more lucrative than trying to attract new ones when manager-specific trust is important. This is because manager-specific trust: i) allows managers to charge high fees in hot assets, and ii) reduces investor mobility to better performing managers. As an example, value managers during the internet bubble had a strong incentive to switch to "growth-at-the-right-price" and pander to their investors' desire to hold technology stocks, even when these managers understood that technology stocks were overpriced. Even with performance incentives, we thus see strong pressures to pander to client biases, modest flows of funds toward better-performing managers, and only a weak incentive to bet against market mispricing. This result has implications for the effectiveness of professional arbitrage, market efficiency, and stability of financial markets.

Our paper connects with several areas of research. Since Putnam (1993), economists have studied the role of trust in shaping economic and political outcomes (e.g., Knack and Keefer 1997, La Porta et al. 1997). In finance, this research was pursued most productively by Guiso, Sapienza, and Zingales (2004, 2008) who show that trust in institutions encourages individuals to participate in financial markets, whether by opening checking accounts, seeking credit, or investing in stocks. We take a related perspective, except that we stress the anxiety-reducing aspects of manager-specific trust, rather than trust in the system.

In addition to voluminous research on poor performance of equity mutual funds, some papers document net of fees underperformance by bond mutual funds (Blake, Elton and Gruber 1993, Bogle 1998) and hedge funds (Asness, Krail, and Liew 2001). An important finding of this work is that fees are higher in riskier (higher beta) asset classes, so that managers appear to be paid for taking market risk. One would not expect this feature in a standard model of delegated management, in which only superior performance – alpha – should be rewarded. Trust, however, naturally accounts for this phenomenon.

Following Campbell (2006), financial economists have considered the nature and the consequences of investment advice. Some of these studies suggest that investment advice is so poor that managers chosen by the advisors underperform the market even before fees. Gil-Bazo and Ruiz-Verdu (2009) find that the highest fees are charged by managers with the worst performance. This finding is consistent with a central prediction of our model that managers cater to investor biases. An audit study by Mullainathan, Noeth, and Schoar (2012) similarly finds that advisors direct investors toward hot sector funds, pandering to their extrapolative tendencies. In contrast, unbiased investment advice is ignored (Bhattacharya et al. 2012).

Our study of incentives in money management follows, but takes a different approach from, the traditional work on performance incentives (e.g, Chevalier and Ellison 1997, 1999). Two recent papers that address some of the issues we focus on here, but in the traditional context in which reputations are shaped entirely by performance, are Guerrieri and Kondor (2012) and Kaniel and Kondor (2012). Closer to our work are the papers by Inderst and Ottaviani (2009, 2012a, b), which focus on distorted incentives to sell financial products arising both from the difficulties of incentivizing salesmen to sell appropriate products and from actual kickbacks. Hackethal, Inderst, and Meyer (2011) find empirically that investors who rely more heavily on advice have a higher volume of security transactions and are more likely to invest in products which salesmen are incentivized to sell. Our focus is on the incentives of the money management organization itself when its clients' choices are mediated by trust.

Several papers ask whether agents have incentives to conform or be contrarian. Outside of finance, Prendergast (1993), Morris (2001), Canes-Wrone, Herron, and Schotts (2001), and Mullainathan and Shleifer (2005) present models in which agents pander to principals. In finance, a large literature starting with Scharfstein and Stein (1990) and Bikhchandani, Hirshleifer, and Welch

(1992) describes the incentives for herding and conformism. The novel feature of our model is its focus on trust as distinct from performance in shaping incentives.

In section I we present our basic model of trust and delegation. In section II, we solve the model and show that even the simplest specification delivers some of the basic facts about the industry. In section III we extend the model to the case of multiple financial products. In section IV we examine the incentives of managers to pander to investors with biased expectations both in a static context and in a dynamic model in which managers can earn an alpha if they pursue return maximizing strategies. Section V discussed some implications of our model.

I. The Basic Setup

There are two periods $t = 0,1$ and a mass 1 of investors who enjoy consumption at $t = 1$ according to a utility function that we specify below. At $t = 0$, each investor is endowed with one unit of wealth. There are two assets. The first asset is riskless (treasuries or bank accounts), and yields $R_f > 1$ at $t = 1$. The second asset is risky (e.g., equities or bonds): it yields an expected excess return R over the riskless asset, but has a variance of σ. The risky asset is in perfectly elastic supply and riskless borrowing is unrestricted. One can view this setup as a small open economy where the supply of assets adjusts to demand. We are thus looking at the portfolio choice problem by taking asset prices and expected returns as given.

At $t = 0$, each investor i invests shares x_i and $1 - x_i$ of his wealth in the risky and riskless asset, respectively. The investor can perfectly access the riskless asset but not the risky asset. The reason is that the risky asset requires management (e.g., to create a diversified portfolio) and the investor lacks the necessary expertise (or time). Without expert money managers, the investor cannot take risk. This implies, in particular, that even an index fund investment requires a manager or an advisor; the investor does not want to make it on his own.[3] The assumption of no homemade risk taking might seem too strong, but it enables us to show our results most clearly. It also sharpens the analogy to medicine, in which patients seek medical advice for all but the simplest and safest treatments. It is not critical to our findings that investors do not take risk on their own, but rather that they take more risk with a manager. Likewise, our results hold if some expert investors are not anxious to make risky investments on their own, and do so without investment advice. In this case, managers compete for the remaining investors who are anxious and do require investment advice.

To implement the risky investment $x_i > 0$ the investor hires one of two managers, A or B (for simplicity he cannot hire both). Delegation requires investor trust. We introduce trust in the standard model of portfolio choice where investors have mean variance preferences. We first describe our formal assumptions and then discuss them. We capture investor i's lack of trust toward manager j = A, B by a parameter $a_{i,j} \geq 1$ that multiplies the investor's baseline risk aversion. That is, the cost to an investor i of bearing one unit of risk with manager j is given by $a_{i,j}/2$. This idea is formalized by assuming that each investor i has the following quadratic utility function:

$$u_{i,j}(c) = \mathbb{E}(c) - \frac{a_{i,j}}{2}\mathrm{Var}(c).$$

The investor's baseline risk aversion is normalized to ½. His effective risk aversion in delegating to manager j is equal to $a_{i,j}/2 \geq 1/2$. We can view $a_{i,j}$ as the anxiety suffered by investor i for bearing risk with manager j. In this setup, the assumption of no own risk taking boils down to $a_{i,i} = \infty$: the investor i is extremely anxious when investing on his own. Investor i suffers less anxiety if he delegates his risky investment to his most trusted manager.

Half of the investors trust A more than B, the other half trust B more than A. The anxiety suffered by investor i for bearing risk with his most trusted manager is equal to a. The anxiety suffered by the same investor for bearing risk with his least trusted manager is equal to a/τ_i, where $\tau_i \in [0,1]$. That is, an "A-trusting" investor i suffers anxiety $a_{i,A} = a$ with manager A and $a_{i,B} = a/\tau_i$ with manager B; a "B-trusting'' investor i suffers anxiety $a_{i,A} = a/\tau_i$ with manager A and $a_{i,B} = a$ with manager B. Parameter τ_i captures the relative trust of investor i in his *less* trusted manager, measuring the extent to which the two managers are substitutes from the standpoint of investor i. An investor with $\tau_i = 1$ sees the two managers as perfect substitutes. An investor with $\tau_i < 1$ views his less trusted manager as an imperfect substitute for the more trusted one. When $\tau_i = 0$, the investor suffers infinite anxiety when investing with his less trusted manager, just as he would taking risk on his own.

Investors vary in how much they trust one manager more than the other. In particular, in the population of investors τ_i is uniformly distributed on $[1 - \theta,\ 1]$ for both A- and B-trusting investors. Parameter $\theta \in [0,1]$ captures the dispersion of trust in the population: the higher is θ, the more investors trust one manager a lot more than the other. At $\theta = 0$, investors are homogenous in the sense that they trust the two managers equally: this will be the benchmark case of Bertrand competition. With dispersion in trust levels, managers have some market power with respect to investors who trust them more, and optimally charge positive fees even in a competitive market. Trust is permanent and does not depend on or change with returns.

In sum, in our model attitudes toward risk are shaped by four parameters. The first is baseline risk aversion, normalized to ½, which captures the investor's preference over "neutral" bets (as elicited using lotteries in a lab experiment). The second parameter is the investor's anxiety $a_{i,i} = \infty$ of taking *financial* risk on his own, reflecting the investor's lack of confidence in his own financial expertise, which may come from his uncertainty/ambiguity over the distribution of returns. The third parameter $a < \infty$ captures the reduction in anxiety experienced by the investor when he takes financial risk with his most trusted manager. This captures the comfort created by the trusted manager's expertise, reflected for instance by a tighter perceived distribution of asset returns. The last parameter is the dispersion θ in the trust that investors have in different managers. A higher θ increases the anxiety experienced by the average investor when switching from his more to his less trusted manager.[4]

Two final comments are in order. First, this specification is very different from the standard approach to the delegation problem, in which investors seek advice to achieve a better risk return combination rather than to gain some comfort or confidence in taking risk. Second, we chose to model trust in a manager as a parameter capturing the extra risk the investor is willing to bear to earn an extra unit of return. This specification most accurately captures the idea that we seek to formalize, namely that trust in the managerial expertise tightens the distribution of returns perceived by the investor, making it less costly for him to take risk. We view anxiety reduction in risk taking as a central function of delegated money management.

Of course, other conceptions of trust, and thus other modeling choices are possible. One possibility is to assume that trust acts as an additive utility boost that the investor experiences from hiring his most trusted manager. In this formulation, trust is disconnected from risk taking, implying that trusted managers will be hired even to invest in the riskless asset. In Appendix B we formally compare this model to our setup. While this model does deliver the key prediction of negative market adjusted returns from professional management, it does not yield other key predictions of our model, such as higher fees on riskier investment products and the high-powered incentives to pander due to the sharing of perceived expected returns. Trust can also be modeled as providing a multiplicative boost to the net expected return (R - f) that the investor obtains by delegating to a manager. This model is formally equivalent to the anxiety-reduction mechanism in that trust increases the risk the investor is willing to bear to earn an extra return. Of course, the interpretation of the two models is very different.

At t = 0, the two money managers compete in fees to attract clients. Each manager j = A, B optimally chooses what fee f_j to charge per unit of assets managed.[5] Based on the fees simultaneously set by managers, each investor optimally decides how much to invest in the risky asset and under which manager. At t = 1, returns are realized and distributed to investors.

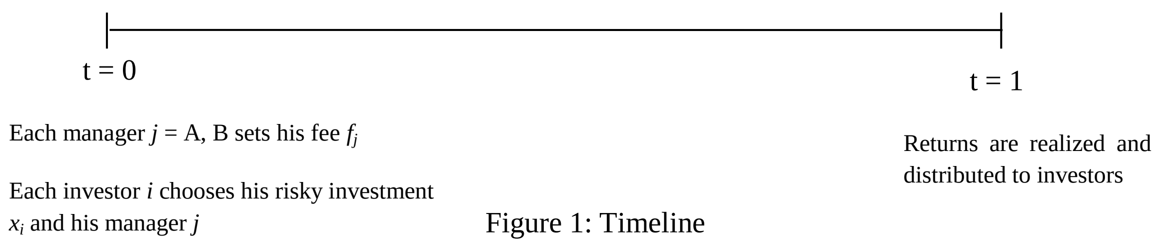

Figure 1: Timeline

II. Equilibrium Fees and the Size of Money Management

A. The Investor's Portfolio Problem

The expected utility of an investor *i* delegating to manager j an amount $x_{i,j}$ of risky investment is equal to:

$$U_{ij}(x_{i,j}, f_j) \equiv R_f + x_{i,j}(R - f_j) - \frac{a_{i,j}}{2} x_{i,j}^2 \sigma.$$

The investor's excess return net of the management fee is equal to $R - f_j$. By investing in the riskless asset, the investor obtains no excess return and pays no fees.

Suppose that investor i has hired manager j. Given the fee f_j, the investor who hires manager *i* chooses a portfolio $\hat{x}_{i,j}$ maximizing $U(\hat{x}_{i,j}, f_j)$. This portfolio is given by:

$$\hat{x}_{i,j} = \frac{(R - f_j)}{a_{i,j}\sigma}. \quad (1)$$

The optimal portfolio is riskier ($\hat{x}_{i,j}$ is higher) if the investor hires a more trusted manager (having lower $a_{i,j}$). This effect plays a critical role in determining the fee structure. The utility obtained by investor *i* under manager *j* is then equal to:

$$U_{ij}(\hat{x}_{i,j}, f_j) = R_f + \frac{(R - f_j)^2}{2a_{i,j}\sigma}.$$

The investor chooses A over B provided $U(\hat{x}_{i,A}, f_A) \geq U(\hat{x}_{i,B}, f_B)$, which is equivalent to:

$$\frac{a_{i,B}}{a_{i,A}} \geq \frac{(R - f_B)^2}{(R - f_A)^2}. \quad (2)$$

The investor chooses manager A over manager B provided the investor's relative trust for A is sufficient to compensate for the relative excess return (net of fee) expected under B. Because of constant absolute risk aversion, higher variance σ of investment reduces overall risk taking but not the choice between A and B. That choice is pinned down only by the differential anxiety and excess return obtained by the investor with the two managers.

B. Management Fees and Risk Taking

Denote by $x_{i,j}^{*}$ the optimal amount invested by i under manager j after a manager is optimally selected in light of equation (2), where $x_{i,j}^{*} = 0$ if the investor hired manager $-j$. Then, at a fee structure (f_A, f_B), the profit of money manager *j* charging f_j is given by:

$$\pi_j(f_A, f_B) = f_j \cdot \int_i x_{i,j}^{*}\, di\,, \tag{3}$$

which is the product of the fee f_j and assets under management. The profits of manager *j* depend on his competitor's fee f_{-j} via the assets under management.

Let us derive the profits of A. If A charges a higher fee than B, namely if $f_A \geq f_B$, then the right hand side of Equation (2) is above one. Manager A does not attract any B trusting investors (for whom $a_{i,B}/a_{i,A} < 1$); he can only attract some A-trusting ones. These are the A-trusting investors who have sufficiently low trust in B that they prefer to stick with A despite the higher fee, and they are identified by the condition $\tau_i \leq (R - f_A)^2/(R - f_B)^2$. In this case, assets under A's management are given by:

$$\frac{(R - f_A)}{a\sigma} \cdot \int_{1-\theta}^{\max[1-\theta,(R-f_A)^2/(R-f_B)^2]} \frac{1}{2\theta}\, d\tau. \tag{4}$$

Expression (4) is the product of the wealth invested by each of the A-trusting investors times the measure of them that chooses manager A. When $f_A \geq f_B$, the profits of manager A are the management fee f_A times the wealth under management in Equation (4).

Consider now the case in which A charges a lower fee than B, namely $f_A < f_B$. Because the right hand side of Equation (2) is below one, manager A attracts all A-trusting investors as well as some B-trusting investors. The latter investors are those with sufficiently high trust in A, namely with $\tau_i \geq (R - f_B)^2/(R - f_A)^2$. By Equation (1), each B-trusting investor places under A's management only a fraction τ_i of the wealth invested under A by A-trusting investors. In this case, assets under A's management are given by:

$$\frac{(R-f_A)}{a\sigma}\cdot\left[\frac{1}{2}+\int_{\max[1-\theta,\ (R-f_B)^2/(R-f_A)^2]}^{1}\tau\cdot\frac{1}{2\theta}d\tau\right]. \quad (5)$$

Expression (5) is the sum of the assets invested by A-trusting investors plus the assets invested by the B-trusting investors who found it optimal to switch to A. When $f_A > f_B$, the profits of A are equal to the product of the management fee f_A and the assets under management in (5).

Putting this together, for any (f_A, f_B), the profits $\pi_A(f_A, f_B)$ of manager A are given by:

$$\begin{cases} f_A\cdot\frac{(R-f_A)}{a\sigma}\cdot\frac{\max[1-\theta,(R-f_A)^2/(R-f_B)^2]-(1-\theta)}{2\theta} & if\ \ f_A\geq f_B \\ f_A\cdot\frac{(R-f_A)}{a\sigma}\cdot\left[\frac{1}{2}+\frac{1-\max[1-\theta,(R-f_B)^2/(R-f_A)^2]^2}{4\theta}\right] & if\ \ f_A< f_B \end{cases}. \quad (6)$$

The profit of manager A increases in the fee charged by B, since a higher f_B reduces investors' net excess return under B, thus increasing A's clientele. In contrast, a higher f_A exerts an ambiguous effect on the profits of A: on the one hand it increases the surplus extracted by the manager, on the other hand it reduces assets under management (by reducing both investment by his clients on the intensive margin and the size of his clientele on the extensive margin).

The profits of manager A increase in the risky asset's gross excess return: a higher R encourages any investor to put more money under management, which increases the preference of A-trusting investors for A. Indeed, manager A allows these investors to take more risk than manager B by reducing their anxiety, which is particularly valuable when the excess return is high. Second, a higher dispersion of trust θ exerts an ambiguous effect on profits: it increases them when A offers a lower net return than B ($f_A \geq f_B$), but decreases them otherwise.

By the same logic, at any (f_A, f_B), the profit $\pi_B(f_A, f_B)$ of manager B is equal to:

$$\begin{cases} f_B\cdot\frac{(R-f_B)}{a\sigma}\cdot\left[\frac{1}{2}+\frac{1-\max[1-\theta,(R-f_A)^2/(R-f_B)^2]^2}{4\theta}\right] & if\ \ f_A\geq f_B \\ f_B\cdot\frac{(R-f_B)}{a\sigma}\cdot\frac{\max[1-\theta,(R-f_B)^2/(R-f_A)^2]-(1-\theta)}{2\theta} & if\ \ f_A< f_B \end{cases}, \quad (7)$$

The properties of (7) are analogous to those just discussed in the case of Equation (6).

Given profits $\pi_A(f_A, f_B)$ and $\pi_B(f_A, f_B)$, a competitive equilibrium in pure strategies is a Nash Equilibrium in which each manager j optimally sets his fee f_j by taking his competitor's equilibrium fee f_{-j}^* as given. Formally, an equilibrium is a profile of fees (f_A^*, f_B^*) such that:

$$f_A^* \in argmax_{f_A} \;\; \pi_A(f_A, f_B^*)$$
$$f_B^* \in argmax_{f_B} \;\; \pi_B(f_A^*, f_B).$$

There is a unique symmetric competitive equilibrium in our model, characterized below. All proofs are collected in Appendix A.

PROPOSITION 1: *In the unique, symmetric, equilibrium of the model, fees are equal to:*

$$f_A^* = f_B^* = \left(\frac{\theta}{1+\theta}\right) \cdot \frac{R}{2}. \tag{8}$$

Each investor delegates his portfolio to his most trusted manager and the total value of assets under management (which is equally split between A and B) is given by:

$$\int_i \left(x_{i,A}^* + x_{i,B}^*\right) di = \left(\frac{2+\theta}{1+\theta}\right) \cdot \frac{R}{2a\sigma}. \tag{9}$$

The fee charged by each manager is a constant fraction of the expected excess return *R* (above the riskless rate). Intuitively, the manager extracts part of the expected surplus *R* that he enables the investor to access. The equilibrium fee does not depend on *a*: the ability of a manager to extract rents from his trusting clients does not depend on their level of anxiety, but on the *increase* in their anxiety when they switch managers. Parameter θ captures exactly this point: in fact the fraction of excess return extracted by the manager increases in θ. When $\theta = 0$, all investors trust the two managers equally, so competition between identical managers drives equilibrium fees to zero. In contrast, when $\theta > 0$, fees are positive. Now investors bear an anxiety cost of leaving their more trusted manager, which allows him to charge them a positive fee. However, investors take more risk with their more trusted manager than with the less trusted one (or on their own). At the maximal dispersion of trust ($\theta = 1$), the two managers have huge market power and extract 1/4 of the excess return from their investors. The model predicts that fees should be higher in sectors where dispersion of trust is higher, perhaps owing to the absence of a market index or of established measures of risk. Higher variance σ exerts only a second order effect on investor utility, so fees are independent of it.

In our model, management fees are not a compensation for abnormal returns (alpha) but rather a way to share the risk premium between the investor and the manager. The gross return of the managed portfolio equals the market excess return R, but the net return exhibits a negative alpha once fees are netted out. The model thus immediately delivers the most fundamental fact about delegated portfolio management, namely that professional managers on average earn negative market-adjusted returns net of fees. The reason is that investors are willing to pay for anxiety reduction rather than for alpha.

The size of the money management industry (see Equation (9)) increases in the excess return R, decreases in the general level of distrust or anxiety a, and decreases in the dispersion of trust θ. A higher R increases the surplus generated by the risky investment, which increases risk taking. At the same time, an increase in R increases fees, which decrease risk taking. The former effect dominates, so that higher excess return R boosts the size of the industry.[6]

A higher general level of trust (a lower a) increases the size of the industry, bringing more assets out of the mattresses and into the financial system, a finding documented empirically by Guiso, Sapienza, and Zingales (2004, 2008). Even though the overall level of trust does not affect equilibrium fees, it shapes the extent of financial intermediation in the economy. More differentiated trust across managers, as captured by a higher θ, increases their market power and management fees, and thus reduces the size of the industry. Conditional on investors' trust in their preferred money manager, assets under management are too small owing to management fees.

To consider welfare implications, we compute the change in investor welfare that occurs when trusted money managers are made available, relative to a world in which delegation is not possible.

COROLLARY 1: *The presence of money managers improves investors' welfare relative to a world in which everyone invests on his own. The social benefit of money management is equal to:*

$$\frac{R^2}{8a\sigma}\left(\frac{2+\theta}{1+\theta}\right)^2.$$

The benefit of money management is to increase risk taking. This benefit is larger the higher is the expected return per unit of risk R/σ*, the lower is average anxiety experienced with the most trusted manager* a*, and the lower is* θ*.*

The basic model might thus shed light on the central finding of the literature on financial advice, namely that many investors seek it despite extremely high cost and poor investment performance (Bergstresser et al. 2009, Chalmers and Reuter 2012, Del Guercio et al. 2010). In our view, investors see themselves as better off with the advice than without it since advice alleviates their anxiety about risk and enables them to take more risk. Chalmers and Reuter (2012) actually show empirically that, among the investors predicted based on their demographic characteristics to use financial advisors, those who actually use them hold portfolios with higher betas (.4 higher) than those who do not use advice. As investors are increasingly asked to choose how to allocate their savings, rather than participate in, say, defined benefit plans, they need to make choices about risky investments or just put money in the bank. Financial advice in our model helps them take risk, even when it is generic (or worse). With positive expected returns to risk taking, advice makes investors better off.

The welfare analysis in Corollary 1 views investor trust in managers as a legitimate source of utility (e.g., reflecting the manager's true tighter distribution on asset returns). One might object to this assumption, arguing that trust is at least in part illusory due to the investors' misplaced confidence in the manager's expertise. Even in this case, however, the presence of money managers may improve investors' "objective" welfare. Although blind trust may distort investment decisions (sometimes inducing too much risk taking), it still allows investors to access a risky asset with a higher expected return and experience lower anxiety than they could on their own. A full discussion of this case is beyond the scope of this paper.

III. Multiple Financial Products

So far, we allowed money managers to offer investors a single, well diversified, risky portfolio (e.g., the S&P 500). In reality, institutions such as mutual fund families, financial planners, funds of funds, and brokerage firms offer a broad range of assets and sector-specific investment options and investors individually choose how much to invest in each of them. To understand this practice, we allow money managers to break down their product line into specialized asset classes and then let investors choose between them. These asset classes are also portfolios assembled by the manager - so trust is still important - but they individually are not fully diversified (e.g., they consist of only industrial or high-tech stocks). In this setting, we ask two questions. First, does fee setting by money managers distort investors' mix of different sector-specific funds? Second, how do optimal fees depend on sector-specific risk and return?

The formal structure works as follows. There are two uncorrelated risky assets, 1 and 2. Asset z = 1, 2 yields excess return R_z with variance σ_z. There is a positive relationship between risk and expected return. In particular, asset 1 has a lower risk and expected return than asset 2, namely $R_2 \geq R_1$ and $\sigma_2 \geq \sigma_1$. Let $x_{z,i}$ be the wealth invested by a generic investor i in asset z = 1, 2. We then have:

LEMMA 1: *For any total amount* $(x_{1,i} + x_{2,i})$ *of risky investment, investors' optimal portfolio places a relative share* $\frac{x_{1,i}}{x_{2,i}} = \left(\frac{R_1}{\sigma_1}\right) / \left(\frac{R_2}{\sigma_2}\right)$ *of wealth in asset 1 relative to asset 2.*

This optimal portfolio represents the normative benchmark of our analysis, under the assumptions of rational expectations and no management fees. In this respect, we can view the excess return R and the variance σ of the risky asset in the previous section as those delivered by the optimal portfolio of Lemma 1.

Money managers offer assets 1 and 2 separately, and at different fees, to investors. At t = 0, each manager j = A, B optimally sets the fees $(f_{1,j}, f_{2,j})$ for investing in asset 1 and 2, respectively. Given fees $(f_{1,j}, f_{2,j})$, each investor i decides whether to invest in asset z = 1, 2 under manager A or B and how much to invest in each asset. By so doing, investors choose - in a decentralized fashion - the composition of their portfolios. Managers affect portfolios via the equilibrium fee structure $(f_{1,j}, f_{2,j})$. We assume that investors correctly perceive the return of different assets, but relax this assumption in Section IV.

Denote by $x_{i,j,z}$ investor i's risk taking in asset z = 1, 2 under manager j = A, B. Given the management fee $f_{z,j}$, the analysis of Section II implies that an investor who has hired manager j to invest in asset class z will choose:

$$\hat{x}_{i,j,z} = \frac{(R_z - f_{z,j})}{a_{i,j}\sigma_z}. \tag{10}$$

The investor places more wealth in the asset having the highest expected excess return (net of fees) per unit of risk. The analysis of Section II immediately implies that a generic investor i delegates his investment in asset z to manager A (rather than B) when:

$$\frac{a_{i,B}}{a_{i,A}} \geq \frac{(R_z - f_{z,B})^2}{(R_z - f_{z,A})^2}, \tag{11}$$

namely when the relative trust of investor i in manager A is sufficient to compensate for the relative expected excess return promised by B on risky asset z.

Define $x^*_{i,j,z}$ as the optimal investment after (11) is taken into account. Then, at t = 0, money managers set their fees $(f_{1,A}, f_{2,A}, f_{1,B}, f_{2,B})$. The profit of money manager j is equal to:

$$\pi_j(f_{1,A}, f_{2,A}, f_{1,B}, f_{2,B}) = f_{1,j} \cdot \int_i \ x^*_{i,j,1} + f_{2,j} \ \cdot \int_i \ x^*_{i,j,2}, \tag{12}$$

which is the sum of the fees obtained from assets under management in the two risky assets.

Given the additive objective function in (12), manager A maximizes the sum of two profit functions – one for asset 1, the other for asset 2 – each of which is identical to that in Equation (6), but defined for a different return-variance configuration. The same principle holds for manager B, whose overall profit function adds two asset-specific versions of Equation (7). By solving for the Nash equilibrium of this game, we can characterize the market equilibrium:

PROPOSITION 2: *In the unique, symmetric, competitive equilibrium fees are given by:*

$$f_{z,A}^{*} = f_{z,B}^{*} = \left(\frac{\theta}{1+\theta}\right) \cdot \frac{R_z}{2}. \tag{13}$$

Investors take risk only with their most trusted manager and they select asset shares:

$$\frac{x_{i,j,1}^{*}}{x_{i,j,2}^{*}} = \frac{R_1/\sigma_1}{R_2/\sigma_2}, \qquad for\ all\ i, j. \tag{14}$$

The total amount of assets managed (equally split between A *and* B*) is equal to:*

$$\int_i \sum\nolimits_{z=1,2} \left(x_{i,A,z}^{*} + x_{i,B,z}^{*}\right) di = \left(\frac{2+\theta}{1+\theta}\right) \cdot \sum\nolimits_{z=1,2} \frac{R_z}{2a\sigma_z}. \tag{15}$$

From equation (13), it is clear that money managers extract a fixed share of the expected return above the riskless rate of any asset they offer to investors. As a consequence, our model accounts for the fact that money managers charge higher unit fees for investing in asset classes with higher risk and higher expected return. For example, Bogle (1998) finds that higher expense ratio bond funds tend to offset their higher fees by taking both more credit risk and more duration risk. This is exactly the prediction of our model under the reasonable assumption that higher risk entails higher expected return. Our model further predicts that the link between fees and returns should be steeper when trust dispersion θ is higher. Perhaps this prediction might shed light on incentive fees in hedge funds and private equity funds, where trust plays such a fundamental role in mediating investments.

Interestingly, optimal fees do not distort portfolios: investors mix the two assets as in Lemma 1 (see Equation (16)). This is because the manager extracts the same fraction of the expected return from both asset classes, without affecting their relative expected returns. Total fees do not change relative to the case in which managers offer just the portfolio of Lemma 1. These results change when investors misperceive the expected returns of different assets.

IV. Biased Expectations of Asset Returns and Pandering

We next investigate a model in which investors do not hold rational expectations regarding the relative returns of asset classes, but money managers do. Investors might extrapolate returns on some assets and chase categories that previously performed well, or seek to invest in new products. Extrapolation has been discussed extensively in behavioral finance with respect to both individual securities and markets (Lakonishok, Shleifer, and Vishny 1994, Barberis, Shleifer, and Vishny 1998) and mutual funds (Frazzini and Lamont 2008).

We capture this idea by assuming that investors believe that the excess return of asset z is $R_{z,e}$, where subscript e denotes investors' expectation. Beliefs are erroneous whenever $R_{z,e} \neq R_z$ for at least one asset z = 1, 2. The perception of variances is correct. We focus on the case in which investors invert the ranking of expected returns, namely $R_{1,e} \geq R_{2,e}$. We refer to asset 1 as the "hot asset" and asset 2 as the "cold asset". This implies that asset 2 is actually the one in which the investment is most profitable (with extrapolative expectations, this is due to mean reversion). The best strategy from the investor's viewpoint is contrarian.

By allowing for investor misperceptions we can ask one critical question: do money managers find it profitable to pander to investor tastes, or do they choose fee structures that correct investor errors? Answering this question may allow us to address what appears to be the empirically relevant possibility of investment advisors underperforming passive strategies even before fees (Malkiel 1995, Gil-Bazo and Ruiz-Verdu 2009, Del Guercio, Reuter, and Tkac 2010), as well as to study the determinants of product proliferation in the money management industry. We address this issue in two steps. To begin, we study the incentives to pander by assuming that managers face only the one period problem considered so far. The analysis of Section IV.A highlights the basic incentive for managers to pander in that model. Section IV.B extends the basic model by having money managers operate and compete for two periods. This allows us to incorporate into our setup the conventional view that managers have an incentive to act as contrarians in order to establish a reputation for being skilled. This extension allows us to directly compare the short run incentive of managers to pander with the mitigating long run incentive to establish a reputation.

A. Investors' Misperceptions, Product Proliferation and Pandering with Short Horizons

The setup here is the same as in our previous analysis, except that now investors misperceive excess returns. To gauge the implication of this change, it suffices to note that risk taking by investors in Equation (10) and their choice of manager in Equation (11) are shaped by the perceived return $R_{z,e}$ of asset z and not by its true return R_z. As a consequence, management fees are equal to a constant fraction of investors' perceived return:

$$f^*_{z,A} = f^*_{z,B} = \left(\frac{\theta}{1+\theta}\right) \cdot \frac{R_{z,e}}{2}, \tag{16}$$

and investors allocate their wealth across assets according to their perceived returns, namely:

$$\frac{x^*_{i,j,1}}{x^*_{i,j,2}} = \frac{R_{1,e}/\sigma_1}{R_{2,e}/\sigma_2}.$$

In this situation, the following property holds:

COROLLARY 2: *In the unique, symmetric, equilibrium prevailing when managers offer the two assets separately, fees are higher for investing in the hot asset than in the cold asset and investors place too much wealth in the hot asset relative to the benchmark of Lemma* 1.

Because managers optimally extract a constant fraction of an asset's perceived expected return, total fees are higher for "hot" assets, such as growth stocks as compared to value stocks, or specialty funds compared to diversified funds, but investors still want to disproportionally invest in them. Money managers maximize their profits by encouraging, or at least not discouraging, investors to take excessive risks in hot asset classes. In this sense, competition incentivizes money managers to pander to investors' biases rather than to correct them.[7]

Money managers could correct investor misperceptions by setting a sufficiently high fee in the hot asset class that investors choose to hold the two assets in the proportions dictated by Lemma 1. Equivalently, money managers could directly offer investors the optimal portfolio of Lemma 1 rather than the two assets separately. The above analysis shows that money managers do not have the incentive to do so. To see why, consider the managers' equilibrium profits. Given the perceived returns $(R_{1,e}, R_{2,e})$, a manager's equilibrium profit is proportional to the average squared perceived return across the two assets:

$$\frac{1}{2}\sum_{z=1,2}\frac{R_{z,e}^2}{\sigma_z}. \tag{17}$$

A manager's profits are quadratic in expected returns $R_{z,e}$. Intuitively, a higher perceived expected return increases profits by both: i) increasing the fee charged by the manager, and ii) increasing the asset base over which the fee is collected. Equation (17) implies that the manager benefits from the investor chasing hot asset classes. The losses caused by under-investment in cold assets are more than offset by the gains in hot assets.

Corollary 2 might help account for a great deal of evidence mentioned in the introduction about poor performance of mutual funds, their high fees, and the negative relationship between performance and fees. Poor performance in our model results from investing in overvalued assets, which investors prefer when they form extrapolative expectations. Such a portfolio allocation in turn enables managers or advisors to charge higher fees. In fact, in our model higher fees are precisely a consequence of managers pandering to investor preference for assets that are overvalued. The model thus accounts for the findings of Gil-Bazo and Ruiz-Verdu (2009) and Del Guercio, Reuter, and Tkac (2010). It is also consistent with the evidence of Mullainathan, Noeth, and Schoar (2012) that advisors direct investors toward hot sector funds.

Both the proliferation of investment options and the prevalence of fund families naturally arise in our model. Mutual fund families can be interpreted as a vehicle to harness trust and increase profits across multiple asset classes (Massa 2003). Proliferation of investment options within asset classes helps raise demand for risky assets (and fees) from trusting investors who chase returns. The same interpretation would apply to private wealth management firms with extensive in-house portfolio capabilities. A trusted advisor has a strong incentive to offer a wide range of products to his clients, who can then move funds around while paying the advisor's fees.

B. Investor Extrapolation and Pandering by Money Managers with Long Horizons

Conventional wisdom holds that managers benefit from investing in undervalued assets because doing so allows them to earn superior returns, establish a reputation for being skilled, and attract clients. This consideration is absent from our static setup. We now introduce this motivation for contrarianism into our model. To do so, we allow managers to earn a positive alpha and attract funds. We show how trust limits the effectiveness of this force: when θ is higher, the incentive for pandering over contrarianism is stronger, and money doctors are more likely to pander to investors' biases than they are when θ is lower.[8]

There are three periods $t = 0, 1, 2$ and two generations of one period lived investors, one born at $t = 0$, the other born at $t = 1$. We assume that managers select portfolios for their clients, rather than using fees to direct portfolio selection. Pandering is thus equivalent to the manager tilting his portfolio towards the hot asset class. At the cost of greater complexity, we could have continued with the more decentralized framework of the previous sections.

At $t = 0$, each manager sets a portfolio and a fee for the first generation of investors, who choose which manager to hire. At $t = 1$, investors belonging to the new generation are born, update their beliefs on each manager's ability based on interim returns, and choose managers. Returns do not affect trust, so the distribution of trust among investors toward A and B is the same at $t = 0$ and $t = 1$. The realized return of asset $z = 1, 2$ at $t = 1, 2$ under manager $j = A, B$ is given by:

$$\tilde{R}_{z,j,t} = R_z + V_j + \epsilon_{j,t}. \tag{18}$$

In (18), R_z is the excess return of asset class z, V_j is the additional expected return arising from the ability of manager j, and $\epsilon_{j,t}$ is a serially uncorrelated shock capturing the manager's luck. Managers and investors are symmetrically uninformed about V_j, which is normally distributed with mean zero and variance v at t = 0. The distribution of luck $\epsilon_{j,t}$ is also normal, with mean zero and variance η.

In Equation (18), all volatility in returns is manager-specific. As a consequence, there is no motive for diversifying portfolios across assets z = 1, 2. We could add a diversification motive to the model, but at the cost of added complexity. In this setup, the optimal strategy is to invest only in the undervalued asset 2. A pandering manager, however, invests only in the overvalued asset 1. This outcome would arise in the one-period model of Section IV.A. Denote by ω_j the portfolio share that manager *j* invests in asset class 1. The manager charges a fee equal to $\varphi_j R_j$, where φ_j is the fee per unit of return. Expressing fees in this way renders the model more tractable. None of our previous results change under this reformulation.

To solve the model, consider how investors assess managerial ability after observing portfolio returns at t = 1. An investor attributes any difference between the expected and realized return $\tilde{R}_{j,1}$ to skill or luck according to Bayesian updating.[9] As a consequence, at t = 0, manager *j* knows that his assessed ability at t = 1 is normally distributed with mean:

$$\mathbb{E}\tilde{V}_j = \left[\omega_j(R_1 - R_{1,e}) + (1 - \omega_j)(R_2 - R_{2,e})\right]\left(\frac{v}{v + \eta}\right), \tag{19}$$

and variance v. The manager can inflate his assessed ability (he can boost $\mathbb{E}\tilde{V}_j$) by investing more in the *undervalued* asset 2. Doing so earns an abnormal expected return $(R_2 - R_{2,e})$ that leads investors to upgrade their estimates of managerial skill.[10] This is the classic motive for contrarianism: it allows the manager to build a favorable reputation. However, this motive conflicts with the incentive to pander described in Section III.

The timeline of the model is as follows. Denote by (φ_j, ω_j) the fee and portfolio chosen by the manager at t = 0, and by (φ'_j, ω'_j) the fee and portfolio chosen by the manager at t = 1. The sequence of events in our model is graphically represented in Figure 2.

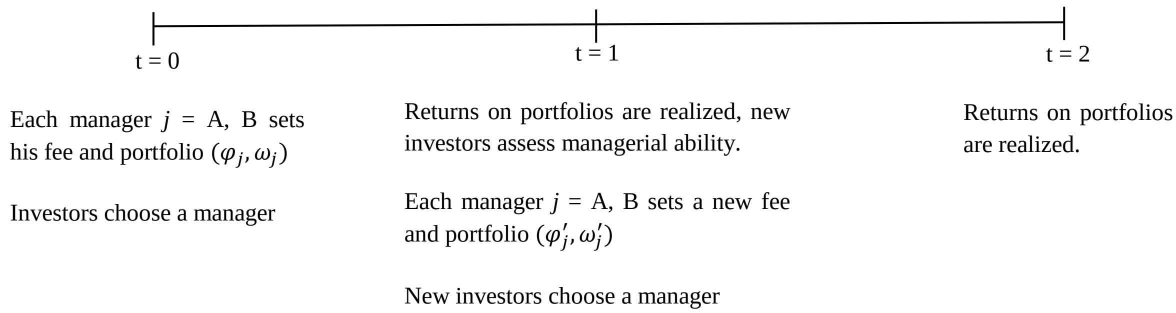

Figure 2: Timeline of the model with managerial skill

We solve the model backwards, starting with the equilibrium in the final period t = 1. After the returns $(\tilde{R}_{A,1}, \tilde{R}_{B,1})$ on initial portfolios are realized, investors form average ability assessments $(\tilde{V}_A, \tilde{V}_B)$. Given these assessments, each manager assembles a new portfolio ω'_j and sets a fee φ'_j. Critically, differences in assessed ability imply that – holding portfolios constant – the more able manager delivers a higher expected excess return than the less able one, looking more attractive to investors. *Ceteris paribus*, then, at t = 1 the manager who is believed to be more skilled attracts more clients and makes higher profits. Proposition 3 formally proves this property for a linear approximation around the symmetric state $\tilde{V}_A = \tilde{V}_B = 0$. We use this approximation because the combination of heterogeneity in managerial ability at t = 1 and the nonlinearity of fund flows implies that equilibrium fees cannot be solved for in closed form.[11]

PROPOSITION 3: *In equilibrium, at t = 1 both managers invest in the hot asset class, namely set* $\omega^*_j(\tilde{V}_A, \tilde{V}_B) = 1$ *for all* $(\tilde{V}_A, \tilde{V}_B)$. *A more skilled manager sets higher fees and makes higher profits. In particular, for given posterior average abilities* $(\tilde{V}_A, \tilde{V}_B)$, *the linear approximation of managerial fees at t* = 1 *around* (0, 0) *is given by*:

$$\varphi^*_j(\tilde{V}_A, \tilde{V}_B) R_{1,e} = \left(\frac{\theta}{1+\theta}\right) \cdot \frac{R_{1,e}}{2} + \rho_j(\theta)\tilde{V}_j - \rho_{-j}(\theta)\tilde{V}_{-j}, \tag{20}$$

where $\rho_j(\theta)$, $\rho_{-j}(\theta)$ *are positive coefficients. The corresponding linear approximation of profits at* t = 1 *around* (0,0) *is given by*:

$$\pi_j(\tilde{V}_A, \tilde{V}_B) = \frac{R_{1,e}}{2a\sigma'}\{\gamma_0(\theta) + \gamma_1(\theta)\tilde{V}_j - \gamma_2(\theta)\tilde{V}_{-j}\}, \quad (21)$$

where $\gamma_1(\theta)$, $\gamma_2(\theta)$ *are also positive coefficients*.

At t = 1 all managers invest in the hot asset class 1. This is not surprising. In the last period, both managers pander because they see no reputational gain from being contrarian. [12]

In Equation (20), a manager perceived to be more talented can set higher fees. Because of this and of attracting more clients, he makes higher profits, as shown by Equation (21). In contrast, a manager facing a more able competitor must cut his fee in order not to lose too many clients, and thus earns lower profits. The sensitivity of profits to managerial ability depends on trust. First, higher trust allows the talented manager to extract more from his trusting client. Second, higher trust reduces the pool of clients a manager can gain.

In light of this analysis, consider managers' optimal strategy at t = 0. At t = 0, managers choose a fee and a portfolio (φ_j, ω_j) to maximize their expected discounted profits, where the discount factor is equal to $\delta \in [0,1]$. Because the performance of a manager's portfolio affects his assessed ability, there is a link between a manager's choice of ω_j at t = 0 and the manager's payoff at t = 1. This creates an inter-temporal tradeoff. On the one hand, there is a benefit from pandering at t = 0: by increasing ω_A, the manager attracts more clients and charges a higher fee, increasing current profits. On the other hand, there is a cost of pandering: by investing in the hot asset, such manager reduces his future perceived ability and profits.

To characterize the equilibrium at t = 0, we exploit the linearization of Proposition 3 and simplify the algebra by assuming that the extent of misperception is the same across the two asset classes, equal to $\Delta = R_{1,e} - R_1 = R_2 - R_{2,e}$.[13] We can now establish:

PROPOSITION 4: *In equilibrium, manager j either behaves as a full panderer* ($\omega_j = 1$) *or as a full contrarian* ($\omega_j = 0$). *Pandering by both managers* ($\omega_A = \omega_B = 1$) *is an equilibrium provided*:

$$\delta < \frac{a}{v\left(R_2 - R_{2,e}\right)}\left(\frac{2v\eta + \eta^2}{v + \eta}\right)^2 \cdot m(\theta), \qquad (22)$$

where $m(\theta)$ *increases in* θ. *Since* $m(0) = 0$, *in the absence of manager-specific trust* (*i.e., when* $\theta = 0$) *there is never an equilibrium in which both managers pander.*

Proposition 4 is the key result of this section. It is precisely the presence of manager-specific trust that allows an equilibrium in which both managers pander. When manager-specific trust is strong (θ is sufficiently high) investor mobility is low. This implies, first, that the manager can charge high fees by pandering to his clients at $t = 0$, extracting some of the return they expect. Second, when θ is high the manager does not benefit much from contrarianism: even if he earns a higher return, he is unable to attract many new clients. By reducing the extent to which managers gain market share based on their ability, trust reduces the manager's incentive to bet against investors' beliefs and thus favors a pandering equilibrium.

Let us contrast this outcome with that arising when there is no manager specific trust, namely $\theta = 0$. In this case, if both managers pander, Bertrand competition among them squeezes their $t = 0$ profits to zero. In this situation, there is no cost to either manager from deviating to contrarianism. Even if contrarianism causes a manager to lose current clients, it does not reduce his current profits, which are zero anyway! On the other hand, contrarianism increases future profits by improving the manager's assessed ability. Hence, in the absence of trust (i.e., $\theta = 0$), the classic motive for contrarianism is strong, and there is no equilibrium in which both managers pander.

Even if manager specific trust is present ($\theta > 0$), the incentive to pander depends on the horizon of managers. The more managers discount future profits (i.e., the lower is δ), the more likely is a pandering equilibrium. Likewise, pandering is more likely to arise when investors are more bullish about the hot sector (i.e., when $R_{1,e}/R_{2,e}$ is higher).

To sum up, the model says that when fees/profits are low, money managers have the incentive to gain market share in the future by investing in undervalued assets today. When in contrast fees/profits are high, money managers have the incentive to exploit their current market power by pandering to investors' beliefs. These different equilibrium configurations have important social welfare implications. Because the return in the cold sector is higher than in the hot one (i.e., $R_2 > R_1$), managers behaving as "benevolent doctors" facilitate desirable financial intermediation, while panderers "abuse" investor trust, reducing social welfare.

V. Implications

An important message of Section IV is that, in many circumstances, managers have a strong incentive to pander to their investors' beliefs. The incentive for contrarianism is much weaker than it would be if clients were foot-loose. In situations when investor beliefs are misguided, and highly correlated across investors, money managers pursue similar strategies pandering to these misguided beliefs, while dividing the market based on the trust of their clients.

This message has a number of significant implications. First, it suggests that the forces of arbitrage in financial markets might be weaker than one might have thought. Previous research has focused on the limits of arbitrage because arbitrage is risky, or because arbitrageurs have limited access to capital (e.g., DeLong et al. 1990, Shleifer and Vishny 1997). Here we show that, in effect, professional money managers who are perfectly capable of arbitrage themselves turn into noise traders, because doing so brings them higher fees from their trusting investors. With massive amounts of investor wealth guided by such trust relationships, capital following noise trading strategies is increased, and arbitrage capital correspondingly diminished. In equilibrium, markets become more volatile.

Second, when many investors seek a particular hot product, such as internet stocks or bonds promising a higher yield without extra risk, competing money managers cater to their demands and help destabilize prices. The technology bubble in the US saw mutual funds shifting into technology stocks, and even so-called “value investors” turning to “growth-at-the-right-price” strategies, which essentially amounted to chasing the bubble. More recently, prime money market funds shifted into short term “safe” liabilities of financial institutions yielding higher rates than Treasury bills. We have not modeled endogenous price determination here, but one can see how such investment strategies can be destabilizing. In particular, as more money managers cater to investor beliefs, prices of securities investors favor will tend to rise, which will only encourage these strategies in the short run, as well as improve managerial reputations (see Barberis and Shleifer 2003). The long run in which contrarianism pays becomes even longer and less attractive from the viewpoint of profit-maximizing managers.

In conclusion, however, we should not forget the central point of trust-mediated money management, namely that it enables investors to take risks, and earn returns, that they might otherwise not obtain. There are surely significant distortions in portfolio allocation, which are inevitable when investors exhibit psychological biases. Despite these distortions, financial advice and money management represent an important service. The growth of the financial industry, described most recently by Philippon (2012) and Greenwood and Scharfstein (2012), might first and foremost reflect the growing demand for this service as investor wealth and trust in markets have increased over time.

References

Asness, Clifford, Robert Krail, and John Liew, 2001, Do hedge funds hedge? *Journal of Portfolio Management* 28, 6–19.

Barberis, Nicholas, and Andrei Shleifer, 2003, Style investing, *Journal of Financial Economics* 68, 161–199.

Barberis, Nicholas, Andrei Shleifer, and Robert Vishny, 1998, A model of investor sentiment, *Journal of Financial Economics* 49, 307–343.

Basak, Suleyman, and Domenico Cuoco, 1998, An equilibrium model with restricted stock market participation, *Review of Financial Studies* 11, 309–341.

Bergstresser, Daniel, John Chalmers, and Peter Tufano, 2009, Assessing the costs and benefits of brokers in the mutual fund industry, *Review of Financial Studies* 22, 4129–4156.

Berk, Jonathan, and Richard Green, 2004, Mutual fund flows and performance in rational markets, *Journal of Political Economy* 112, 1269–1295.

Bhattacharya, Utpal, Andreas Hackethal, Simon Kaesler, Benjamin Loos, and Steffen Meyer, 2012, Is unbiased financial advice to retail investors sufficient? Answers from a large field study, *Review of Financial Studies* 25, 975–1032.

Bikhchandani, Sushil, David Hirshleifer, and Ivo Welch, 1992, A theory of fads, fashion, custom, and cultural change as information cascade, *Journal of Political Economy* 100, 992–1026.

Blake, Christopher, Edwin Elton, and Martin Gruber, 1993, The performance of bond mutual funds, *Journal of Business* 66, 370–403.

Bogle, John, 1998, Bond funds: Treadmill to oblivion? Speech before the Fixed Income Analysts Society, Inc. March 18.

Calvet, Laurent, John Campbell, and Paolo Sodini, 2007, Down or out: Assessing the welfare costs of household investment mistakes, *Journal of Political Economy* 115, 707–747.

Campbell, John, 2006, Household finance, *Journal of Finance* 61, 1553–1604.

Canes-Wrone, Brandice, Michael Herron, and Kenneth Shotts, 2001, Leadership and pandering: A theory of executive policymaking, *American Journal of Political Science* 45, 532–550.

Carlin, Bruce, 2009, Strategic price complexity in retail financial markets, *Journal of Financial Economics* 91, 278–287.

Chalmers, John, and Jonathan Reuter, 2012, What is the impact of financial advisors on retirement portfolio choices and outcomes?, Working paper.

Chevalier, Judith, and Glenn Ellison, 1997, Risk taking by mutual funds as a response to incentives, *Journal of Political Economy* 105, 1167–1200.

Chevalier, Judith, and Glenn Ellison, 1999, Career concerns of mutual fund managers, *Quarterly Journal of Economics* 114, 389–432.

Cuoco, Domenico, and Ron Kaniel, 2011, Equilibrium prices in the presence of delegated portfolio management, *Journal of Financial Economics* 101, 264–296.

Dasgupta, Amil, and Andrea Prat, 2006, Financial equilibrium with career concerns, *Theoretical Economics* 1, 67–93.

Dasgupta, Amil, Andrea Prat, and Michela Verardo, 2011a, The price impact of institutional herding, *Review of Financial Studies* 24, 892–925.

Dasgupta, Amil, Andrea Prat, and Michela Verardo, 2011b, Institutional trade persistence and long term equity returns, *Journal of Finance* 66, 635–653.

De Long, Bradford, Andrei Shleifer, Lawrence Summers, and Robert Waldmann, 1990, Noise trader risk in financial markets, *Journal of Political Economy* 98, 703–738.

Del Guercio, Diane, Jonathan Reuter, Paula Tkac, 2010, Broker incentives and mutual fund market segmentation, NBER Working paper 16312.

Frazzini, Andrea, and Owen Lamont, 2008, Dumb money: Mutual fund flows and the cross-section of returns, *Journal of Financial Economics* 88, 299–322.

French, Kenneth, 2008, Presidential address: The cost of active investing, *Journal of Finance* 63, 1537–1573.

Gabaix, Xavier, and David Laibson, 2006, Shrouded attributes, consumer myopia, and information suppression in competitive markets, *Quarterly Journal of Economics* 121, 505–540.

Georgarakos, Dimitris, and Roman Inderst, 2011, Financial advice and stock market participation, European Central Bank Working paper 1296.

Gil-Bazo, Javier, and Pablo Ruiz-Verd, 2009, The relation between price and performance in the mutual fund industry, *Journal of Finance* 64, 2153–2183.

Greenwood, Robin, and David Scharfstein, 2012, The growth of modern finance, *Journal of Economic Perspectives*, forthcoming.

Greenwood, Robin, and Andrei Shleifer, 2012, Expectations of returns and expected returns, mimeo, Harvard University.

Gruber, Martin, 1996, Another puzzle: The growth in actively managed mutual funds, *Journal of Finance* 51, 783–810.

Guerrieri Veronica, and Péter Kondor, 2012, Fund managers, career concerns and asset price volatility, *American Economic Review* 102, 1986–2017.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2004. "The Role of Social Capital in Financial Development," *American Economic Review* 94(3): 526–556.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales, 2008, Trusting the stock market, *Journal of Finance* 63, 2557–2600.

Hackethal, Andreas, Michael Haliassos, and Tullio Jappelli, 2012, Financial advisors: A case of babysitters?, *Journal of Banking and Finance* 36, 509–524.

Hackethal, Andreas, Roman Inderst, Steffen Meyer, 2011, Trading on advice, Working paper.

Hortacsu, Ali, and Chad Syverson, 2004, Product differentiation, search costs, and competition in the mutual fund industry: A case study of the S&P 500 index funds *Quarterly Journal of Economics* 119, 403–456.

Hurd, Michael, and Susann Rohwedder, 2012, Stock price expectations and stock trading, NBER Working paper 17973.

Inderst, Roman, and Marco Ottaviani, 2009, Misselling through agents, *American Economic Review* 99, 883–908.

Inderst, Roman, and Marco Ottaviani, 2012a, Competition through commissions and kickbacks, *American Economic Review* 102, 780–809.

Inderst, Roman, and Marco Ottaviani, 2012b, Financial advice, *Journal of Economic Literature* 50, 494–512.

Jensen, Michael, 1968, The performance of mutual funds in the period 1945-1964, *Journal of Finance* 23, 389–416.

Kaniel, Ron, and Péter Kondor, 2012, The delegated lucas tree, *Review of Financial Studies*, forthcoming.

Knack, Stephen, and Philip Keefer, 1997, Does social capital have an economic payoff? A cross-country investigation, *Quarterly Journal of Economics* 112, 1251–1288.

Lakonishok, Josef, Andrei Shleifer, and Robert Vishny, 1992, The structure and performance of the money management industry, *Brookings Papers on Economics Activity* 1992: 339–391.

Lakonishok, Josef, Andrei Shleifer, and Robert Vishny, 1994, Contrarian investment, extrapolation, and risk, *Journal of Finance* 49, 1541–1578.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1997, Trust in large organizations, *American Economic Review* 87, 333–338.

Malkiel, Burton, 1995, Returns from investing in equity mutual funds 1971 to 1991, *Journal of Finance* 50, 549–572.

Massa, Massimo, 2003, How do family strategies affect fund performance? When performance-maximization is not the only game in town, *Journal of Financial Economics* 67, 249–304.

Morris, Stephen, 2001, Political correctness, *Journal of Political Economy* 109, 231–265.

Mullainathan, Sendhil, Markus Noeth, and Antoinette Schoar, 2012, The market for financial advice: An audit study, NBER Working paper 17929.

Mullainathan, Sendhil, and Andrei Shleifer, 2005, The market for news, *American Economic Review* 95, 1031–1053.

Mullainathan, Sendhil, Joshua Schwartzstein, and Andrei Shleifer, 2008, Coarse thinking and persuasion, *Quarterly Journal of Economics* 123, 577–620.

Philippon, Thomas, 2012, Has the U. S. finance industry become less efficient? On the theory and measurement of financial intermediation, Working paper, New York University.

Prendergast, Canice, 1993, A theory of 'yes men', *American Economic Review* 83, 757–770.

Putnam, Robert, 1993, *Making Democracy Work* (Princeton University Press, Princeton, NJ).

Scharfstein, David, and Jeremy Stein, 1990, Herd behavior and investment, *American Economic Review* 80, 465–479.

Shleifer, Andrei, and Robert Vishny, 1997, The limits of arbitrage, *Journal of Finance* 52, 35–55.

Yagan, Danny, 2012, Why do individual investors chase stock market returns? Evidence of belief in long-run market momentum, mimeo, Harvard University.

Appendix A. Proofs

Proof of Proposition 1: Consider the expressions for $\pi_A(f_A, f_B)$ and $\pi_B(f_A, f_B)$ in Equations (8) and (9). For any $\theta \geq 0$, in equilibrium we must have:

$$\frac{R-f_A}{R-f_B} \in \left[\sqrt{1-\theta}, \frac{1}{\sqrt{1-\theta}}\right], \quad \text{(A1)}$$

otherwise only one manager makes zero profits. This manager could cut his fee and make some positive profits as well. This condition alone implies that when $\theta = 0$ the unique equilibrium features $f_A^* = f_B^* = 0$. When $\theta > 0$, the equilibrium must be inside the above interval and satisfy the managers' first order conditions. When $f_A \geq f_B$ these first order conditions are:

$$f_A: \qquad (R - 2f_A) \cdot \left[\left(\frac{R-f_A}{R-f_B}\right)^2 - (1-\theta)\right] - 2f_A \left(\frac{R-f_A}{R-f_B}\right)^2 = 0, \quad \text{(A2)}$$

$$f_B: \qquad (R - 2f_B) \cdot \left[\frac{1}{2} + \frac{1 - \left(\frac{R-f_A}{R-f_B}\right)^4}{4\theta}\right] - \frac{f_B}{\theta}\left(\frac{R-f_A}{R-f_B}\right)^4 = 0.$$

These two equations cannot be jointly satisfied for $f_A > f_B$. To see this, set $y \equiv \left(\frac{R-f_A}{R-f_B}\right)$ and solve the above first order conditions for f_A and f_B as a function of y. Next, impose the condition $f_A > f_B$. This identifies a quadratic equation in y that cannot be satisfied for $\left(\frac{R-f_A}{R-f_B}\right) > \sqrt{1-\theta}$. As a consequence, the only possible equilibrium featuring $f_A \geq f_B$ is symmetric, namely $f_A^* = f_B^*$. It is straightforward to check that in that equilibrium Equation (8) of Proposition 1 is met. When $f_A \leq f_B$, the same argument shows that $f_A^* = f_B^*$ is the only equilibrium satisfying the above first order conditions. In this symmetric equilibrium, the second order conditions are also met (i.e. managers' objective functions are locally concave).

Proof of Corollary 1: Without managers, investors do not obtain any excess return. With money managers, each investor invests $x = \frac{R}{2a\sigma}\left(\frac{2+\theta}{1+\theta}\right)$ at excess expected return *R* under his most trusted manager. With quadratic utility, the aggregate welfare gain is given in Corollary 1.

Proof of Lemma 1: Given investment x_i, the optimal mixture $(x_{1,i}, x_{2,i})$ of assets 1 and 2 solves:

$$max_{x_{1,i},x_{2,i}} \left[R_1 x_{1,i} + R_2 x_{2,i}\right] - \frac{a}{2}\left[\sigma_1 x_{1,i}^2 + \sigma_2 x_{2,i}^2\right], \quad \text{(A3)}$$

subject to $x_{1,i} + x_{2,i} = x_i$. The first order conditions of the problem are given by:

$$R_z - a\sigma_z x_{z,i} = \lambda \quad for\ z = 1,2, \quad \text{(A4)}$$

where λ is the Lagrange multiplier attached to the constraint $x_{1,i} + x_{2,i} = x_i$. It is easy to see that the above first order conditions are satisfied at the portfolio of Lemma 1.

Proof of Proposition 2: Because investors separately choose the manager to invest in a specific asset and the amount to invest, the profit of each manager *j* is separable in the two assets and equal to $\pi_j(f_{1,A}, f_{1,B}) + \pi_j(f_{2,A}, f_{2,B})$. Managers thus compete in the two assets separately and, for each of those, equilibrium fees and investments follow from Proposition 1, yielding Equations (13), (14), and (15).

Proof of Corollary 2: The equilibrium under investors' misperception is found by replacing in Proposition 2 the true return of asset z with investors' expected return. The properties described in Corollary 2 then follow.

Proof of Proposition 3: Suppose that at t = 1 investors assess average abilities to be $(\tilde{V}_A, \tilde{V}_B)$. Then, at policies $(\varphi_A, \varphi_B, \omega_A, \omega_B)$, manager maximizes the objective function:

$$\begin{cases} \varphi_A(1-\varphi_A)\cdot\frac{R_A^2}{a\sigma_A'}\cdot\left[\frac{R_A^2}{R_B^2}\cdot\frac{(1-\varphi_A)^2}{(1-\varphi_B)^2} - (1-\theta)\right] & if\ \ \varphi_A \geq z_1\varphi_B + z_2 \\ \varphi_A(1-\varphi_A)\cdot\frac{R_A^2}{a\sigma_A'}\cdot\left[2\theta + 1 - \frac{R_B^4}{R_A^4}\cdot\frac{(1-\varphi_B)^4}{(1-\varphi_A)^4}\right] & if\ \ \varphi_A < z_1\varphi_B + z_2 \end{cases}. \quad \text{(A5)}$$

where $R_A = \omega_A R_{1,e} + (1-\omega_A)R_{2,e} + \tilde{V}_A$, $\sigma_A' = \frac{v\eta}{(v+\eta)} + \eta$, $z_1 = R_B/R_A$, and $z_2 = (R_A - R_B)/R_A$.

On the other hand, manager B maximizes the objective function:

$$\begin{cases} \varphi_B(1-\varphi_B)\cdot\frac{R_B^2}{a\sigma_B'}\cdot\left[2\theta + 1 - \frac{R_A^4}{R_B^4}\cdot\frac{(1-\varphi_A)^4}{(1-\varphi_B)^4}\right] & if\ \ \varphi_A \geq z_1\varphi_B + z_2 \\ \varphi_B(1-\varphi_B)\cdot\frac{R_B^2}{a\sigma_B'}\cdot\left[\frac{R_B^2}{R_A^2}\cdot\frac{(1-\varphi_B)^2}{(1-\varphi_A)^2} - (1-\theta)\right] & if\ \ \varphi_A < z_1\varphi_B + z_2 \end{cases}. \quad \text{(A6)}$$

In the above objective functions, managers maximize the perceived return on their portfolio. As a result, at t = 1 they set $\omega_A = \omega_B = 1$, investing in the hot asset. Consider now how fees are set, starting with the case where $\varphi_A \geq z_1\varphi_B + z_2$. This can only occur when $R_A \geq R_B$, which corresponds to $\tilde{V}_A \geq \tilde{V}_B$. We later discuss what happens when the reverse inequality holds, namely when $\tilde{V}_A < \tilde{V}_B$. If $\varphi_A \geq z_1\varphi_B + z_2$, the managers' first order conditions are:

$$\varphi_A: \qquad (1-2\varphi_A)\cdot\left[\frac{R_A^2}{R_B^2}\cdot\frac{(1-\varphi_A)^2}{(1-\varphi_B)^2}-(1-\theta)\right]-2\varphi_A\frac{R_A^2}{R_B^2}\cdot\frac{(1-\varphi_A)^2}{(1-\varphi_B)^2}=0, \tag{A7}$$

$$\varphi_B: \qquad (1-2\varphi_B)\left[2\theta+1-\frac{R_A^4}{R_B^4}\cdot\frac{(1-\varphi_A)^4}{(1-\varphi_B)^4}\right]-4\varphi_B\frac{R_A^4}{R_B^4}\cdot\frac{(1-\varphi_A)^4}{(1-\varphi_B)^4}=0.$$

These conditions identify two equations $F_A(\varphi_A,\varphi_B,R_A,R_B)=0$ and $F_B(\varphi_A,\varphi_B,R_A,R_B)=0$. As we cannot characterize the equilibrium in closed form, we linearize the solution of the two above first order conditions around the symmetric equilibrium where $\tilde{V}_A=\tilde{V}_B=0$, which is the symmetric equilibrium studied in Proposition 1. Around (0,0), we have that $\varphi_j(\tilde{V}_A,\tilde{V}_B)\cong \varphi_j(0,0)+\frac{\partial\varphi_j}{\partial R_A}\tilde{V}_A+\frac{\partial\varphi_j}{\partial R_B}\tilde{V}_B$, for *j* = A, B. Proposition 1 showed that $\varphi_j(0,0)=\theta/2(1+\theta)$. To find $\frac{\partial\varphi_j}{\partial R_k}$, we must compute, at $\tilde{V}_A=\tilde{V}_B=0$ (i.e., at returns $R_A=R_B=R_{1,e}$), the 2 by 2 matrix:

$$H(R_{1,e})=\begin{pmatrix}\partial F_A/\partial\varphi_A & \partial F_A/\partial\varphi_B\\ \partial F_B/\partial\varphi_A & \partial F_B/\partial\varphi_B\end{pmatrix}, \tag{A8}$$

which linearizes the first order conditions at $\tilde{V}_A=\tilde{V}_B=0$. We then have, for all *j* = A ,B:

$$H(R_{1,e})\cdot\begin{pmatrix}\frac{\partial\varphi_A}{\partial R_j}\\ \frac{\partial\varphi_B}{\partial R_j}\end{pmatrix}=-\begin{pmatrix}\frac{\partial F_A}{\partial R_j}\\ \frac{\partial F_B}{\partial R_j}\end{pmatrix}. \tag{A9}$$

After some tedious algebra, one can see that:

$$H(R_{1,e})=\begin{pmatrix}-2\cdot\frac{4-\theta+\theta^2}{2+\theta} & 4\cdot\frac{1-\theta}{2+\theta}\\ 8\cdot\frac{1+2\theta}{2+\theta} & -4\cdot\frac{4+7\theta+\theta^2}{2+\theta}\end{pmatrix}. \tag{A10}$$

Additional algebra shows that:

$$\frac{\partial F_A}{\partial R_A}=-\frac{\partial F_A}{\partial R_B}=\frac{2}{R_{1,e}}\frac{1-\theta}{1+\theta},\quad \frac{\partial F_B}{\partial R_A}=-\frac{\partial F_B}{\partial R_B}=-\frac{4}{R_{1,e}}\frac{1+2\theta}{1+\theta}. \tag{A11}$$

By using these expressions, and by solving the respective linear system, we find that:

$$\frac{\partial\varphi_A}{\partial R_A} = -\frac{\partial\varphi_A}{\partial R_B} = \frac{(1-\theta)(2+\theta)}{R_{1,e}(1+\theta)} \cdot \frac{(2+3\theta+\theta^2)}{[(4-\theta+\theta^2)(4+7\theta+\theta^2)-4(1-\theta)(1+2\theta)]} > 0,$$
$$\frac{\partial\varphi_B}{\partial R_A} = -\frac{\partial\varphi_B}{\partial R_B} = -\frac{(1+2\theta)(2+\theta)}{R_{1,e}(1+\theta)} \cdot \frac{(2+\theta+\theta^2)}{[(4-\theta+\theta^2)(4+7\theta+\theta^2)-4(1-\theta)(1+2\theta)]} < 0. \quad \text{(A12)}$$

Thus, around (0,0) managerial fees increase in own ability and drop in the competitor's ability. By using the same procedure one can check that these properties also hold for $\tilde{V}_A < \tilde{V}_B$. The only difference when $\tilde{V}_A < \tilde{V}_B$ the above expression for $\frac{\partial\varphi_A}{\partial R_A}$ holds for $\frac{\partial\varphi_B}{\partial R_B}$ while $\frac{\partial\varphi_B}{\partial R_A}$ holds for $\frac{\partial\varphi_A}{\partial R_B}$. As a result of these computations, for any deviation of abilities from (0,0) it is possible to define coefficients $\rho_j(\theta) = \frac{\partial\varphi_j}{\partial R_j}$ and $\rho_{-j}(\theta) = \frac{\partial\varphi_j}{\partial R_{-j}} = -\frac{\partial\varphi_j}{\partial R_j}$ so that Equation (20) holds.

Consider now the linearization of profits. Using the envelope theorem, the total variation of manager k = A, B profits after a marginal increase in R_j, for j = A , B, is equal to $\frac{\Delta\pi_k}{\Delta R_j} = \frac{\partial\pi_k}{\partial\varphi_{-k}} \cdot \frac{\partial\varphi_{-k}}{\partial R_j} + \frac{\partial\pi_k}{\partial R_j}$. After some algebra, one can find that when $\tilde{V}_A > \tilde{V}_B$:

$$\frac{\Delta\pi_A}{\Delta R_A} = \frac{R_{1,e}}{a\sigma'} \cdot \frac{\theta}{1+\theta}\left[R_{1,e}\frac{\partial\varphi_B}{\partial R_A} + \frac{2+\theta}{2(1+\theta)}\right]$$
$$\frac{\Delta\pi_A}{\Delta R_B} = \frac{R_{1,e}}{a\sigma'} \cdot \frac{\theta}{1+\theta}\left[R_{1,e}\frac{\partial\varphi_B}{\partial R_B} - \frac{2+\theta}{2(1+\theta)}\right] \quad \text{(A13)}$$

By plugging in the above equations the change in fees, we find $\frac{\Delta\pi_A}{\Delta R_A} > 0$, $\frac{\Delta\pi_A}{\Delta R_B} < 0$ and $\frac{\Delta\pi_B}{\Delta R_B} > 0$ and $\frac{\Delta\pi_B}{\Delta R_A} < 0$. The same properties are found to hold for $\tilde{V}_A < \tilde{V}_B$. Thus, for any deviation $(\tilde{V}_A, \tilde{V}_B)$ from (0,0) one can find the coefficients $\gamma_j(\theta) = \frac{\Delta\pi_j}{\Delta R_j}$, $\gamma_{-j}(\theta) = \frac{\Delta\pi_j}{\Delta R_{-j}}$ of Equation (21).

Proof of Proposition 4: Begin with the case with is no trust, namely $\theta = 0$. In this case, Bertrand competition among money managers prevails and we do not need the linearization of Proposition 3 to find the equilibrium. Suppose that in equilibrium managers pander ($\omega_A = \omega_B = 1$). In this equilibrium, managers make zero profits at t = 0. At t = 1, the manager with higher assessed ability captures the entire market while the other makes zero profits.

Consider now the outcome attained at t = 1 by manager A. When $\tilde{V}_A > \tilde{V}_B$, he captures the full market. If $\tilde{V}_A \leq R_{1,e} + 2\tilde{V}_B$, the fee A can charge is restricted by what investors can obtain with manager B. Manager A charges a fee $f_A = \tilde{V}_A - \tilde{V}_B$ so that investors are just indifferent (but they all invest with A). At this fee, the manager's profit is proportional to $(R_{1,e} + \tilde{V}_B)(\tilde{V}_A - \tilde{V}_B)$. If instead $\tilde{V}_A > R_{1,e} + 2\tilde{V}_B$, manager A is so talented that he can act as a monopolist. As a result, he charges a fee $f_A = \left(R_{1,e} + \tilde{V}_A\right)/2$ and his profit is proportional to $\left(R_{1,e} + \tilde{V}_A\right)^2/4$. Thus, when $\theta = 0$ the future expected profit of manager A are proportional to:

$$\delta W_A(\omega_A, \omega_B) = \tag{A14}$$

$$\delta \cdot \int_{-\infty}^{+\infty} \left[\int_{\tilde{V}_B}^{R_{1,e}+2\tilde{V}_B} (R_{1,e} + \tilde{V}_B)(\tilde{V}_A - \tilde{V}_B) + \int_{R_{1,e}+2\tilde{V}_B}^{+\infty} \frac{(R_{1,e} + \tilde{V}_A)^2}{4} \right] h\left(\tilde{V}_A, \tilde{V}_B | \omega_A, \omega_B\right) d\tilde{V}_A d\tilde{V}_B,$$

where $h\left(\tilde{V}_A, \tilde{V}_B | \omega_A, \omega_B\right)$ is the $t = 0$ (normal) distribution of average abilities at $t = 1$ conditional on managers choosing portfolios ω_j for j = A, B at $t = 0$. Given statistical independence of managerial skills, this distribution is the product of two densities $h\left(\tilde{V}_j | \omega_j\right)$ for j = A, B. We can express the problem of the manager at $t = 0$ as follows. Denote by $\pi_j(\varphi_A, \varphi_B, \omega_A, \omega_B)$ the profit of manager j at $t = 0$ and and by $\pi_j\left(\tilde{V}_A, \tilde{V}_B\right)$ the manager's equilibrium profits at $t = 1$ when the assessed abilities are $(\tilde{V}_A, \tilde{V}_B)$. At $t = 0$, then, the manager's optimal strategy solves:

$$\max_{\varphi_j, \omega_j} \; \pi_j(\varphi_A, \varphi_B, \omega_A, \omega_B) + \delta \iint \pi_j\left(\tilde{V}_A, \tilde{V}_B\right) h\left(\tilde{V}_A | \omega_A\right) h\left(\tilde{V}_B | \omega_B\right) d\tilde{V}_A d\tilde{V}_B. \tag{A15}$$

By virtue of linearization, we replace the double integral in the above expression by the expression for $W_A(\omega_A, \omega_B)$ that we just calculated. Since the profit of manager A increases in $\tilde{V}_A$, the manager wishes to boost as much as possible his assessed ability at $t = 1$. As a result, full pandering is never an equilibrium. If $\omega_A = \omega_B = 1$, the above expression is not just the expected profit at t = 1 but the entire profit that A can obtain across the two periods. As a result, both managers gain by deviating to contrarianism $\omega_j = 0$. By so doing, they do not lose any current profit (which is zero anyway), but boost future profits.

Consider now the possibility for both managers to act as contrarians, again when $\theta = 0$. By being contrarian, the two managers make zero profits in this period. If manager A deviates to pandering (i.e. he sets $\omega_A = 1$) he can attract the entire market at t = 0. The optimal fee is equal to $f_A^* =$

$min(R_{2,e}-R_{1,e}, R_{2,e}/2)$, and the resulting gain in $t = 0$ profits is equal to $\frac{f_A^*(R_{2,e}-f_A^*)}{a(v+\eta)}$. Manager A then sees no benefit of deviating to pandering when the above gain is smaller than the second period cost. This is equivalent to:

$$\delta > \frac{(2v\eta+\eta^2)}{(v+\eta)^2} \frac{f_A^*(R_{2,e}-f_A^*)}{[W_A(0,0)-W_A(1,0)]} . \tag{A16}$$

Under the above condition, the unique equilibrium prevailing for $\theta = 0$ is full contrarianism.

Consider the case in which there is trust, namely $\theta > 0$. We now look for conditions under which a pandering equilibrium with $\omega_A = \omega_B = 1$ emerges. In such an equilibrium, using the linearized profits of Equation (25), the expected profit of manager A at t = 1 is:

$$\mathbb{E}\pi_A = \frac{R_{1,e}}{2a\sigma'}\Big\{\gamma_0(\theta) + \gamma_A(\theta)\big[\omega_A(R_1 - R_{1,e}) + (1-\omega_A)(R_2 - R_{2,e})\big]\left(\frac{v}{v+\eta}\right) - \gamma_{-A}(\theta)\big[\omega_B(R_1 - R_{1,e}) + (1-\omega_B)(R_2 - R_{2,e})\big]\left(\frac{v}{v+\eta}\right)\Big\} \tag{A17}$$

By contrast, at t = 0 the profit of the manager at full pandering is equal to:

$$\frac{\theta^2(2+\theta)}{2(1+\theta)^2} \cdot \frac{R_{1,e}^2}{a(v+\eta)}. \tag{A18}$$

If manager A deviates to contrarianism, he loses his t = 0 profit but gains $\frac{R_{1,e}}{2a\sigma'}\gamma_A(\theta)(R_2 - R_{2,e})\left(\frac{v}{v+\eta}\right)$ in the future. By substituting in the profit gain the condition for $\gamma_A(\theta)$ obtained in the case where $\tilde{V}_A \geq \tilde{V}_B$ (which would be on average true after a deviation to contrarianism), pandering remains an equilibrium provided:

$$\delta < \frac{a}{v(R_2-R_{2,e})}\left(\frac{2v\eta+\eta^2}{v+\eta}\right)^2 \frac{\theta(12+20\theta+9\theta^2+6\theta^3+\theta^4)}{(10+15\theta+6\theta^2+4\theta^3+\theta^4)} \tag{A19}$$

Denote the ratio of polynomials on the left hand side by $m(\theta)$. Then, after some tedious algebra one can check that $m'(\theta) > 0$.

Appendix B. Trust as an Additive Boost to Utility

In this setup, managers are rewarded not for helping investors to take risk, but more generally for helping them invest. Formally, delegating to the manager acts as an additive boost to the investor's utility. To see how this works, suppose that investor i delegates to manager j investments $(x_{i,j}^s, x_{i,j}^r)$ in the safe and risky asset, respectively. In addition, the same investor makes safe and risky investments $(x_{i,i}^s, x_{i,i}^r)$ on his own, where we have that $x_{i,j}^s + x_{i,j}^r + x_{i,i}^s + x_{i,i}^r = 1$. Then, the utility of investor i is given by:

$$U_i\left(x_{i,j}^s, x_{i,j}^r, x_{i,i}^s, x_{i,i}^r, f_j\right) = \tag{B1}$$

$$x_{i,j}^s\left(R_f + a_{i,j} - f_j\right) + x_{i,j}^r\left(\hat{R} + a_{i,j} - f_j\right) +$$

$$+x_{i,i}^s\left(R_f + a_{i,i}\right) + x_{i,i}^r\left(\hat{R} + a_{i,i}\right)$$

$$-\frac{\left(x_{i,j}^r + x_{i,i}^r\right)^2}{2}\sigma.$$

Here $\hat{R}$ is the expected return of the risky asset. Parameter $a_{i,j} \geq 0$ captures the utility boost obtained by the investor when hiring manager j. Parameter $a_{i,i}$ is the utility obtained by the investor from investing on his own. When $a_{i,j} \gg a_{i,i}$ for all i and j = A, B the investor never invests on his own. Consistent with our previous analysis, this is the case we consider here. As in our basic setup, the critical choice for the investor is whether to hire manager A or B.

Formally, in this case we have that $x_{i,i}^s = x_{i,i}^r = 0$ and thus $x_{i,j}^s = 1 - x_{i,j}^r$. The utility of the investor is then given by:

$$U_i\left(x_{i,j}^r, f_j\right) = \left(R_f + a_{i,j} - f_j\right) + x_{i,j}^r R - \frac{\left(x_{i,j}^r\right)^2}{2}\sigma, \tag{B2}$$

where R is (as in our basic setup) the expected excess return of the risky asset. The optimal investment in the risky asset is given by $\hat{x}_{i,j} = R/\sigma$, and the indirect utility experienced by investor i when delegating to manager j is given by:

$$U_{i,j}(\hat{x}_{i,j}, f_j) \equiv R_f + \frac{R^2}{2\sigma} + a_{i,j} - f_j. \tag{B3}$$

The investor chooses A over B provided $U(\hat{x}_{i,A}, f_A) \geq U(\hat{x}_{i,B}, f_B)$, which is equivalent to:

$$\tilde{\tau}_i \equiv a_{i,A} - a_{i,B} \geq f_A - f_B \,. \tag{B4}$$

Investor i chooses manager A when the extra utility boost he obtains from doing so is larger than the extra fee charged by A.

Suppose that $\tilde{\tau}_i$ is distributed in the population of investors according to a c.d.f $H(\tau)$. Investors with $\tilde{\tau}_i > 0$ are A-trusting, investors with $\tilde{\tau}_i < 0$ are B-trusting. We assume that this distribution has zero mean (i.e., $\int \tau dH(\tau) = 0$), so that there is no systematic preference for either manager and that $H(\tau)$ is symmetric around zero.

Then, the profits earned by money managers A and B are respectively given by:

$$\pi_A(f_A, f_B) = f_A[1 - H(f_A - f_B)]. \tag{B5}$$

$$\pi_B(f_A, f_B) = f_B H(f_A - f_B). \tag{B6}$$

Given the assumed symmetry of $H(\tau)$, the Nash equilibrium is symmetric ($f_A^* = f_B^* = f^*$) and the equilibrium fee is identified by the first order condition:

$$1 - H(0) - f^* H^{'}(0) = 0 \tag{B7}$$

$$\Rightarrow \; f^* = \frac{1}{2H^{'}(0)},$$

provided the second order condition $2H^{'}(0) + \left[H^{''}(0)/2H^{'}(0)\right] > 0$ is met.

As an example, suppose that τ is normally distributed, so that $H(\tau)$ is the c.d.f of the normal distribution. We denote the variance of such distribution as $\hat{\theta}$. The mapping with parameter θ is clear. The utility drop experienced by the average investor when switching to his less preferred manager is equal to $\mathrm{E}(\tau|\tau \geq 0) = \int_0^{+\infty} \tau \cdot \frac{e^{-\frac{\tau^2}{2\hat{\theta}}}}{\sqrt{2\pi\hat{\theta}}} \cdot d\tau$ which increases in variance $\hat{\theta}$, as in our main model. The heterogeneity of investors also increases in $\hat{\theta}$. With this normal distribution we have that the second order condition is satisfied and equilibrium fees are equal to:

$$f^* = \sqrt{\frac{\pi\hat{\theta}}{2}}. \tag{B8}$$

In the case where trust generates an additive utility boost, managers can charge positive fees, and these fees increase in the dispersion $\hat{\theta}$ of investors' trust across the two managers.

There are two important differences between this model and ours. First, since the manager is not helping the investor to take risk, fees do not reflect a sharing of expected market return, in the sense that f^* is independent of the expected return (and thus implicitly of the risk f^*) of different asset classes. Second, and related, the incentives for money managers to pander are weaker in this model, precisely because money managers cannot charge higher unit fees for placing investors into hot asset classes with higher perceived returns.

[1] Berk and Green (2004) argue that low net of fee alphas result from competition among investors for access to more skilled managers, who charge higher fees. This theory is challenging to reconcile with negative average after-fee performance, with large fees many investors pay to brokers and advisors who help choose funds, and with the evidently negative relationship between fees and gross-of-fees performance (e.g., Gil-Bazo and Ruiz-Verdu 2009).

[2] Monopoly power in undifferentiated goods is also present in the models of Carlin (2009) and Gabaix and Laibson (2006). In these models, firms create irrelevant complexity to obfuscate the homogeneity of their goods, and thus to extract surplus from the less informed consumers.

[3] A similar assumption is made in the models of Basak and Cuoco (1998) and Cuoco and Kaniel (2011).

[4] Because investors end up hiring their most trusted managers, one should view parameter a as capturing the overall trust that investors have in managers. In turn, θ captures the dispersion of trust across the two managers. A higher θ increases both the average mistrust in the less trusted manager and the heterogeneity across investors in the substitutability between the two managers.

[5] This fee structure is consistent with widespread market practice. Performance fees would not be useful in this model when investors hold rational expectations, because there are no agency conflicts between investors and managers. Performance fees may be useful when investors hold biased expectations of return. Even in that case, which we study in Section

IV, we keep the fee structure unchanged to focus on a non-price market mechanism: the manager's reputational concern.

[6] Potentially, assets under management may be higher than the initial wealth of investors. This occurs when the expected excess return R is so high that investors wish to lever up by setting $x_{i,j}^{*} > 1$.

[7] Inderst and Ottaviani (2009) obtain a similar result in a very different model, where employees of financial intermediaries sell inappropriate products because they are given distorted incentives by their firms.

[8] Dasgupta and Prat (2006) show that career concerns may sometimes induce portfolio managers to trade excessively, contrary to the interest of their clients. Our model alternatively stresses the conventional, positive, view of career concerns. See also Dasgupta, Prat, and Verardo (2011a, b).

[9] Here we simplify the analysis by assuming that investors do not update their beliefs about assets 1 and 2. Formally, the investor has a concentrated prior on asset returns. We could allow the investor to update both on managerial ability and on excess return, but this would greatly complicate the analysis.

[10] Again, this logic goes through under the alternative assumption that upon observing an unexpectedly high return investors upgrade their beliefs about both managerial ability and the return of the asset in which the manager's portfolio is intensive. In this case, the algebra is substantially more complex. The real restriction in our analysis concerns the naivete of investors, who are assumed not to infer anything about asset quality when seeing the manager's portfolio choices at $t = 0$.

[11] It is typically hard to find closed form solutions for imperfect competition games with asymmetric players. Linearization is a good approximation provided the variance v of ability is low. In this case, the curvature of fund flows (and thus of managerial profits) has a negligible impact on the equilibrium.

[12] Not much would change if we allowed investor perceptions to vary: at t = 1 all managers would invest in whatever asset is expected by investors to yield the highest return.

[13]Unlike the profit function at t = 1, that at t = 0 is not linearized. This is akin to focusing on cases where hot and cold sectors bring sharply different returns (i.e., $R_{1,e} - R_{2,e}$ and Δ are large), so that linearization is not viable at t = 0. We thus capture the case in which investor misperception is large relative to updating of ability.