Corporate Strategy, Conformism, and the Stock Market*

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Abstract

Investors’ cost of producing information about a strategy common to many firms is less than the cost of producing information about unique strategies. Hence, stock prices convey more accurate signals about common strategies than unique strategies. This effect reduces managers’ incentive to differentiate their strategies when they rely on stock market information for their decisions. We show that this “conformity” effect is stronger for private firms than public firms. Thus, when a firm goes public, its incentive to choose a unique strategy is higher. Consistent with this implication, we find that firms increase the differentiation of their products after going public. This effect is stronger for firms that benefit less from learning from other firms’ stock prices, that is, firms in which managers are better informed or firms whose competitors’ stock prices are less informative.

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1 Introduction

A central tenet of strategic management is that firms should choose corporate strategies – the business in which they operate – that give them the strongest competitive advantage (e.g. Porter (1985)). This competitive advantage can be obtained by unique combinations of resources (e.g. through acquisition of new assets or restructuring), product differentiation, or lower costs (e.g. through innovations or technology adoption). According to this view, managers create value by choosing unique strategies, i.e., strategies that are different from those of other firms, and that others cannot easily replicate (e.g. Barney (1986)). Unique strategies, however, are more costly to evaluate by investors, which leads to less information production about the value of these strategies. When managers rely on stock market information to make their decisions, this effect reduces managers’ incentive to choose unique strategies.\footnote{For instance, Litov, Moreton, and Zenger (2012) find that firms with more unique strategies receive less analysts coverage.} Thus, managerial learning from the stock market induces conformism in strategic choices.

We formally derive this result in a model in which stock price informativeness and managers’ strategic decisions are jointly determined. In our model, the manager of one firm must either choose to implement a common strategy, already followed by several established public firms, or a unique strategy. The net present value of each strategy can be either high or low depending on a future state (e.g., consumers’ demand) that will determine whether the strategy is successful or not. The manager first announces his strategy, and has an option to abandon it based on future information. Then, he receives private information and observes stock market prices. At this stage, the manager can either abandon the strategy (if its expected net present value conditional on new information is negative) or proceed with it (if the expected net present value of the strategy is positive). The expected payoff of the unique strategy conditional on the manager’s private information is higher than that of the common strategy because uniqueness yields higher expected cash-flows. Thus, if the manager ignores stock market information (e.g., because his private information is perfect),
the manager always chooses the unique strategy because it maximizes the value of
his firm.

In contrast, when the manager relies on the stock market (in addition to his own
private information), he faces a trade-off between obtaining a higher payoff with the
unique strategy if the latter is successful, and receiving more accurate information
from the stock market about the chance of success of his strategy. Indeed, when the
manager chooses the unique strategy, his stock price is less informative about the net
present value of the strategy. This happens for two reasons. First, fewer investors
produce information about the unique strategy because the cost of information ac-
quisition for unique strategies is higher since (a) they are more difficult to evaluate
and (b) it cannot be amortized by trading in multiple stocks (the stocks of firms fol-
lowing the common strategy). Second, when a firm follows a unique strategy, market
makers for its stock cannot use information about trades (or prices) of other stocks
as a source of information.

Given this trade-off, there is a range of values for the parameters such that the
manager is better off choosing the common strategy while he would not in the absence
of stock market information. Thus, the reliance on the stock market pushes the
(value-maximizing) manager’s decision toward conformity. This “conformity effect”
becomes stronger when the benefit of obtaining information from the stock market
is higher for the manager, i.e., when his private information is less precise. It is also
stronger when (a) the number of investors producing information about the common
strategy increases, or (b) the number of investors who produce information about the
unique strategy decreases.

To provide empirical evidence on the conformity effect, we specifically examine
how firms modify their strategic choices when they transition from private to pubic.
To build our test, we first show theoretically that when a private firm goes public, it
has more incentive to choose the unique strategy. Indeed, investors have no incentive
at all to produce information about the unique strategy when a firm is private since
they cannot trade on this information. Thus, going public can only increase the
fraction of investors who chooses to produce information about the unique strategy, thereby weakening the conformity effect. Hence, the going public decision should increase the likelihood that a firm will switch from a common strategy to a unique strategy.

We test this novel prediction using a sample of 1,231 U.S. firms that go public from 1996 to 2011. To identify instances where a given firm moves from the common to the unique strategy, we focus on the degree of differentiation of its product offering compared to that of related (peer) firms. We identify the set of peers for each firm in our sample at the time of its IPO using Hoberg and Philipps (2014)’s Text-Based network Classification (TNIC). This classification is based on textual analysis of the product description sections in firms’ 10-Ks. For every pair of firms, Hoberg and Phillips (2014) define an index of product similarity based on the relative number of words that firms in each pair share in their product description. We use (one minus) this index to measure the extent of product differentiation between each firm-pairs.\(^2\)

For each going-public firm, we then measure the change in its differentiation vis-à-vis each of its established peers, measured at the time of the IPO and defined as firms that have been listed for more than five years. We track the change in differentiation within each pair over the five years following the IPO. To better isolate effects that are due to the IPO (and not general trend in differentiation or peers’ decisions to differentiate), we construct counterfactual firm-pairs that are made of established peers of peers of the IPO firm \(i\) that are not peers of firm \(i\).

Consistent with the model’s prediction, we find that going-public firms become significantly more differentiated in the years that follow their initial public listing. In particular, the average degree of product differentiation between a newly-public firm and an established peer increases significantly more over time compared to that observed for counterfactual pairs. Notably, this results is obtained using regressions that include firm-pair fixed-effects that control for time-invariant differences within

\(^2\)For instance the peers of firm \(i\) at a given point in time are firms for which the index of product similarity exceeds a pre-defined threshold. A decrease in this index of similarity for a firm \(i\) relative to one of its peers \(j\) indicates that the degree of differentiation increases between these two firms.
firm-pairs (e.g. age differences or geographical location) and time-varying control variables that could affect the evolution of firms’ differentiation choices over time (e.g. size or growth opportunities). In a similar vein, we find a significant decrease in the return co-movement between IPO firms and their established peers throughout the post-IPO period, which confirms that IPO firms distantiate from peers when becoming public.

Our model further suggests that the reduction of conformity should be larger for newly-public firms for which the informational cost of differentiation is smaller, that is, when the managers of going public firms are better informed, or when the stock prices of established peers are less informative. Our empirical analysis confirms these predictions. We find that the increase in product differentiation of IPO firms is larger for firms whose managers are better informed, as measured by proxies for the intensity and profitability of insider trading. In addition, IPO firms for which established peers’ stock prices are less informative (as proxied by the PIN measure or the size of price reactions to earnings surprises) appear to increase their degree of differentiation significantly more over time. In addition, the increase in differentiation is larger for firms whose peers receive less coverage by professional financial analysts. These cross-sectional results are consistent with the trade-off analyzed in our model: the (relative) informational cost associated with the unique strategy (i.e. product differentiation) is smaller when there is less production of information about the common strategy followed by established firms, thereby making the unique strategy relatively more valuable.

Our paper builds upon the growing literature on corporate decision making when managers learn information from the stock market (see Bond, Edmans, and Goldstein (2012) for a survey). In general, this literature has focused, both empirically or theoretically, on the effects of stock price information on real investment decisions by firms (see, for instance, empirical analyses in Chen, Goldstein, and Jiang (2007), Bakke and Whited (2010), Edmans, Goldstein, and Jiang (2012), or Foucault and Frésard (2012)). To our knowledge, our paper is first to analyze how managers can
control the extent they learn from stock prices through their strategic choices and how this affects differentiation decisions in product markets.\textsuperscript{3}

Our paper also adds to the literature that examines the connections between financial and product market decisions. Models analyzing the interplay between product market competition and firms’ capital structure do not consider the information produced by the stock market, nor its effect on firms’ product market strategies (e.g., Titman (1984), Brander and Lewis (1986), Maksimovic (1988), or Bolton and Scharfstein (1990)). Similarly, existing research that links product market characteristics to stock prices typically take the intensity of competition in product markets as given and analyze how (various dimension of) competition influences stock returns (e.g. Hou and Robinson (2006) or Bustamante (2015)) or informed investors’ trading decisions (e.g. Peress (2010) or Tookes (2008)). Our paper focuses on the reverse effect: How information produced in the stock market influences firms’ differentiation decisions, and ultimately shape industry structures.

Our findings are also related to the literature on IPOs and product market interactions. The theoretical literature on this question (e.g., Maksimovic and Pichler (2001), Spiegel and Tookes (2009), or Chod and Lyandres (2011)) analyzes the possible effects of IPOs on competitive interactions in the product market without considering a direct effect of the going-public decision on differentiation choices, as we propose in this paper. For instance, Chod and Lyandres (2011) shows that newly-public firms compete more aggressively with their rivals after going public because their owners can better diversify idiosyncratic risks in capital markets. However, their analysis and tests assume that industry definition – and the extent of differentiation among firms – is fixed before and after the IPOs.

Last, our paper is linked to the literature on conformism in managerial decisions.\textsuperscript{3} In our model, a firm manager learns information from his own stock price. In equilibrium, when the firm chooses the common strategy, its stock price is a sufficient statistic for the information in its peer stock price. Thus, implications of the model are identical if firms learn only from their own stock price or more generally from the stock price of all firms following the same strategy. Foucault and Frésard (2014) provide evidence that firms rely on their peers’ stock prices for their investment decisions.
This literature emphasizes reputations concerns (e.g., Scharfstein and Stein (1990), Brandenburger and Polak (1996), or Otto and Volpin (2015)) or herding (e.g., Hirshleifer (1993)) as factors pushing managers towards conformism. Our paper suggests another factor: Managers can learn more precise information from the stock market when they make strategic choices that are more similar to their peers, so that the payoffs of their decisions are more correlated with those of their peers.

The rest of the paper is organized as follows. In the next section, we describe the model used in our paper and show that a conformity bias in strategic choices arises when managers rely on stock market information for their decision. We also show that the going public decision should weaken this bias, which leads to our main prediction: going public firms should, on average, increase product differentiation after IPOs. We present the data used to test this prediction in Section 3. Section 4 reports the empirical findings and Section 5 concludes.

2 Model

At date 1, firm A must choose a “strategy”, denoted $S_A$. Firm A has two possible strategies, denoted $S_u$ or $S_c$. Strategy $S_u$ is a unique strategy whereas strategy $S_c$ is a common strategy, already chosen by $n$ other public firms. We denote by $n(S)$ the number of firms choosing strategy $S$. As strategy $S_u$ is unique, we have $n(S_u) = 1$ if $A$ chooses it and $n(S_u) = 0$ otherwise. Similarly, $n(S_c) = n$ if $A$ does not choose strategy $S_c$ and $n(S_c) = n + 1$, otherwise. We interpret a strategy as a differentiation choice. The unique strategy allows firm A to significantly differentiate its product from its competitors’ products while the common strategy, $S_c$, does not.

At date 2, the stock market opens, investors observe firms’ strategy, and trade (see below). At date 3, the manager of firm A decides to implement or not the strategy chosen at date 1, after observing stock prices at date 2 and receiving private information on the payoff of his strategy (see below). At date 4, the payoffs of all
firms are realized. Figure 1 describes the timing of the model.\footnote{While we focus on product differentiation strategies, the timing of the model resemble the evidence provided by Luo (2005) who document that firms announce an acquisition strategy, and then decide to implement or not the strategy (i.e. pursue the acquisition) based on the stock market reaction.}

If he abandons his strategy at date 4, the manager of firm A bears no cost but he cannot switch to a new strategy. Firm A’s payoff is then zero. If instead the manager of firm A chooses to implement his strategy, firm A must invest an indivisible amount (normalized to one). A strategy can be Good (G) or Bad (B) with equal probabilities. We denote by \( t_S \in \{G, B\} \), the type of strategy \( S \in \{S_u, S_c\} \) and by \( r(S, n(S), t_S) \) the return of strategy \( S \) per dollar invested. The return of a bad strategy is zero while the return of a good strategy is strictly positive. Thus, the expected net present value (NPV) of strategy \( S \) for firm A is:

\[
E(NPV(S, n(S), t_S)) = \frac{r(S, n(S), G)}{2} - 1 \quad \text{for} \quad S \in \{S_u, S_c\}. \tag{1}
\]

For the problem to be interesting, we assume that, in the absence of additional information, the expected NPV of both strategies for firm A is negative. That is:

\[
A.1 : r(S, n(S), G) \leq 2 \quad \text{for} \quad S \in \{S_u, S_c\}. \tag{2}
\]

Furthermore, we assume that the payoff of a good unique strategy is higher than that of a good common strategy for firm A. That is:

\[
A.2 : \lambda(n) \equiv \frac{r(S_u, 1, G) - 1}{r(S_c, n + 1, G) - 1} > 1, \tag{3}
\]

This assumption captures the notion that a differentiation strategy is a way for firm A to gain revenues if its strategy is a good one. We assume that \( \lambda(n) \) increase with \( n \): as more firms follow the common strategy, competition among these firms intensifies and the return of the common strategy decreases. For public firms following strategy \( S_c \), the implementation cost is sunk. These firms represent established firms who have
already decided to follow strategy $S_c$ and incurred corresponding investments in the past.

In the baseline version of the model, we assume that firm $A$ is public. Hence, the manager of firm $A$ has three potential sources of information when he decides or not to implement his strategy at date $3$. First, he privately observes a signal $s_m \in \{G, B, \emptyset\}$ about the type of his strategy. Specifically, $s_m = t_S$ with probability $\gamma$ or $s_m = \emptyset$ with probability $(1 - \gamma)$, where $\emptyset$ is the null signal corresponding to no signal. Thus, $\gamma$ measures the likelihood that the manager has full information about the type of his strategy. We refer to $s_m$ as “direct managerial information” and to $\gamma$ as the quality of this information. Second, the manager of firm $A$ observes the stock prices of public firms, denoted by $p_{j2}$ for $j \in \{1, ..., n\}$, and its own firm’s stock price.

Let $I$ be the manager’s decision at date $3$, with $I = 1$ if the manager of firm $A$ implements her strategy and zero otherwise. At date 3, for a given decision, $I$, the expected value of firm $A$ is:

$$V_{A3}(I, S_A) = I \times \mathbb{E}(\text{NPV}(S_A, t_{S_A}) | \Omega_3),$$

(4)

where $\Omega_3 = \{p_{12}, ..., p_{n2}, p_{A2}, s_m\}$ is the information set of the manager when he makes his decision at date $3$. Firm $A$ faces no financing constraints and, at date $3$, its manager makes the decision $I$ that maximizes $V_{A3}(I, S_A)$. We denote by $I^*(\Omega_3, S_A)$ the optimal decision of the manager at date $3$ given its information at this date.

At date 1, the manager has no information and the value of firm $A$ is therefore (by the Law of Iterated Expectations):

$$V_{A1}(S_A) = \mathbb{E}(I^*(\Omega_3, S_A) \times \text{NPV}(S_A, t_{S_A})).$$

(5)

The manager chooses his strategy, $S_A$, at date 1 to maximize $V_{A1}(S_A)$.

**The Stock Market.** There are three types of investors in the stock market: (i) a continuum of risk-neutral speculators, (ii) liquidity traders with an aggregate demand $z_j$, uniformly and independently distributed over $[-1, 1]$, for firm $j$, and (iii) risk neutral dealers.
Each speculator assesses strategies chosen by publicly listed firms and obtains a signal \( \hat{s}_i(S) \in \{G, B, \emptyset\} \) about the type of strategy \( S \). We assume that a fraction \( \pi_S \) of speculators receives a perfect signal (i.e., \( \hat{s}_i(S) = G \)) about strategy \( S \). Remaining speculators observe no signal about this strategy (\( \hat{s}_{ij} = \emptyset \) for these speculators).

After receiving her signal on strategy \( S \), a speculator can choose to trade one share of all stocks of firms following this strategy or not. We denote by \( x_i(\hat{s}_i(S)) \in \{-1, 0, +1\} \) the demand of speculator \( i \) for a firm following strategy \( S \) given her signal about this strategy.

Let \( f_j(S) \) be the order flow – the sum of speculators and liquidity traders’ net demand – for the stock of firm \( j \) when it follows strategy \( S_j \):

\[
f_j = z_j + x_j(S_j),
\]

where \( x_j = \int_0^1 x_i(\hat{s}_i(S)) \, di \) is speculators’ aggregate demand of stock \( j \). As in Kyle (1985), order flow in each stock is absorbed by dealers at a price such that they just break even given the information contained in the order flow. We assume that market makers observe the realizations of order flows in each market when they set their prices.\(^5\) Thus,

\[
p_{A2}(f_A(S_A)) = \mathbb{E}(V_{A3}(I^*(\Omega_3, S_A), S_A) \mid \Omega_2),
\]

and,

\[
p_{j2}(f_j(S_c)) = \mathbb{E}(r(S_c, n(S_c), t_{S_c}) \mid \Omega_2) \quad \text{for } j \in \{1, \ldots, n\},
\]

where \( \Omega_2 = \{f_1, \ldots, f_n, f_A\} \). Hence, using the Law of Iterated Expectations, the stock prices of firms \( A \) and \( j \in \{1, \ldots, n\} \) at date 0 are \( p_{A0}(I^*) = V_{A1}(S_A) \) and \( p_{j0}(f_j(S_c)) = \mathbb{E}(r(S_j, n(S_c), t_{S_c})) \), respectively. The change in price of stock \( j \) from date 0 to date 1 is denoted by \( \Delta p_j = p_{j1} - p_{j0} \).

**Equilibrium.** The stock price of firm \( A \) depends on the manager’s optimal decision, \( I^*(\Omega_3) \), which itself depends on the stock price of firm \( A \). Thus, in equilibrium,\(^5\) Alternatively, we could assume that market makers only observe the order flow in their own market. The main implications of the model are identical. The assumption that market makers observe all order flows slightly simplifies the presentation.
the manager’s optimal decision, \( I^*(\Omega_3) \), and the stock price of firm \( A \) are jointly determined. Formally, a stock market equilibrium for firm \( A \) is a set \( \{ x_A^*(\cdot), p_{A2}^*(\cdot), I^*(\cdot) \} \) such that (i) the trading strategy \( x_A^*(\cdot) \) maximizes the expected profit for each speculator, (ii) the policy \( I^*(\cdot) \) maximizes the expected value of firm \( A, V_{A3}(I, S) \), at date 3, given dealers’ pricing rule \( p_{A2}^*(\cdot) \), and (iii) the pricing rule \( p_{A2}^*(\cdot) \) solves (7) given that agents behave according to \( x_A^*(\cdot) \), and \( I^*(\cdot) \). The definition of a stock market equilibrium for established firms is similar, except that \( I^*(\cdot) \) plays no role.

2.1 The stock market and strategic conformity

As a benchmark, we first consider the case in which the manager does not have access to stock market information (or ignore it). In this case, it is immediate that the manager should implement his strategy at date 2 if he learns that the strategy is good and should do nothing otherwise. Thus, in this case, the expected value of firm \( A \) at date 1 is:

\[
V_{A1}^{\text{benchmark}}(S_A) = \gamma \left( r(S_A, n(S_A), G) - 1 \right).
\]

We deduce that \( V_{A1}^{\text{benchmark}}(S_u)/V_{A1}^{\text{benchmark}}(S_c) = \lambda(n) > 1 \). Hence, the manager optimally chooses the unique strategy in the benchmark case.

**Proposition 1 (benchmark)** When the manager of firm \( A \) does not use information from the stock market, he always chooses the unique strategy.

We now analyze how stock market information affects the choice of his strategy by firm \( A \). We first derive the equilibrium of the stock market when firm \( A \) chooses the common strategy. Let define \( p_H^A(S_A) = r(S_A, n(S_A), G) - 1, p_M^A(S_A) = 0 \), and \( p_M^A(S_A) = V_{A1}^{\text{benchmark}}(S_A) \). Observe that \( p_H^A(S_A) > p_M^A(S_A) > p_L^A(S_c) \).

**Lemma 1** When firm \( A \) chooses the common strategy, the equilibrium of the stock market at date 2 is as follows:

1. Speculator \( i \) buy one share of firm \( j \) if \( \hat{s}_i(S_c) = G \), sells one share of firm \( j \) if \( \hat{s}_i(S_c) = B \), and does not trade otherwise.
2. The stock price of an established firm is (i) \( p_j = r(S_c, n + 1, G) \) if the order flow of one stock (including stock A) is larger than \((1 - \pi_c)\), (ii) \( p_j = ((1 - \gamma/2)r(S_c, n, G) + \gamma r(S_c, n + 1, G))/2 \) if the order flow of all stocks (including stock A) belongs to \([- (1 - \pi_c), (1 - \pi_c)]\), (iii) \( p_j = 0 \) if the order flow of one stock (including stock A) is less than \((1 - \pi_c)\).

3. The stock price of firm A is (i) \( p^H_A(S_c) \) if the order flow of one stock (including stock A) is larger than \((1 - \pi_c)\), (ii) \( p^M_A(S_c) \) if the order flow of all stocks (including stock A) belongs to \([- (1 - \pi_c), (1 - \pi_c)]\), and (iii) \( p^L_A(S_c) \) if the order flow of one stock (including stock A) is less than \((1 - \pi_c)\).

4. The manager of firm A implements his strategy at date \( t = 2 \) if (a) his private managerial information indicates that the common strategy is good or (b) the stock price of firm A is \( p^H_A(S_c) \).

If speculators have negative information, they optimally sell stocks and therefore the largest possible realization of the order flow in this case is less than \((1 - \pi_c)\). Thus, when the demand for one stock is higher than \((1 - \pi_c)\), it reveals that speculators have positive information about the type of the common strategy. Thus, the stock price of all firms, including firm A, adjust to their highest possible level. The high realization of its stock price signals to the manager of firm A that the common strategy is good. Hence, the manager optimally implements the strategy. Symmetrically, when the demand in one stock is weak (less than \(-(1 - \pi_c)\)), it reveals that speculators have negative information about the type of the common strategy. Thus, the stock price of all firms, including firm A, adjust to their lowest possible level. The manager deduces (whether he receives private information or not) that the strategy is bad and he does implement the strategy. In the intermediate case, when the order flow for each stock belongs to \([- (1 - \pi_c), (1 - \pi_c)]\), the order flow does not contain information (its realizations are equally likely when the strategy is good or when the strategy is bad). Thus, stock prices do not contain information. Hence, the manager of firm A implements his strategy only if he receives a positive private signal and does not
otherwise, as he does in the benchmark case.

Using eq.(5), the value of firm A at date 1 is:

\[ V_{A1}(S_c) = (\Pr(I^* = 1 | t_{S_c} = G)(r(S_c, n + 1, G) - 1) - \Pr(I^* = 1 | t_{S_c} = B))/2. \quad (9) \]

From the last part of Lemma 1, we deduce that:

\[
\Pr(I^* = 1 | t_{S_c} = G) = \gamma + (1 - \gamma) \Pr(p_{A1} = p_H^1(S_c) | t_{S_c} = G).
\]

Thus, stock market information increases the likelihood that the manager of firm A will implement the strategy chosen at date 1 when it is good. Indeed, conditional on the strategy being good, the manager will implement the strategy either when (i) he receives managerial information (as in the benchmark case) or (ii) if its stock price at date 1 is high (i.e., (equal to \( p_H^1(S_c) \)) when his private signal is uninformative.

Using the fact that the demand from liquidity traders is uniformly and independently distributed across stocks, we deduce that:

\[ \Pr(p_{A1} = p_H^1(S_c) | t_{S_c} = G) = \pi_c(n) \stackrel{def}{=} 1 - (1 - \pi_c)^{n+1} \]

As the number of firms following the common strategy increases, the likelihood that stock prices reveal the type of the common strategy increases. This explains why \( \pi_c(n) \) increases with \( n \).

When the common strategy is bad, speculators sell all stocks. Accordingly, the order flow in each stock is at most \( (1 - \pi_c) \) and therefore the stock price of firm A has a zero probability of being high. Moreover, if the manager receives private information, this information will indicate that the strategy is bad and the manager will therefore not implement the strategy. Thus, the likelihood that the manager of firm A implements a bad strategy is zero: \( \Pr(I^* = 1 | S_c = B) = 0 \). We deduce from eq.(9) that the expected value of firm A at date 1 is:

\[ V_{A1}(S_c) = \frac{(\gamma + (1 - \gamma)\pi_c(n))}{2}(r(S_c, n + 1, G) - 1). \quad (11) \]

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\(^6\)To see this, observe that, \( \Pr(p_{A1} = p_H^1(S_c) | t_{S_c} = G) = \Pr(\cup_{j=1}^{z_j}(f_j) \geq (1 - \pi_c) | S_c = G) = 1 - \Pr(\cap_{j=1}^{z_j}(f_j) < (1 - \pi_c) | S_c = G) \) according to Lemma 1. As \( f_j = z_j + \pi_c \) when \( t_{S_c} = G \), we deduce that \( \Pr(p_{A1} = p_H^1(S_c) | t_{S_c} = G) = 1 - \Pr(\cap_{j=1}^{z_j}(z_j) < (1 - 2\pi_c)) = 1 - (1 - \pi_c)^{n+1} \), where the last equality from the fact that the \( z_j \)s are uniformly and independently distributed.
Now consider the case in which firm A chooses the unique strategy. The equilibrium of the stock market is then as follows.

**Lemma 2** When firm A chooses the unique strategy, the equilibrium of the stock market at date 2 is as follows:

1. Speculator \( i \) buy one share of firm \( j \) if \( \hat{s}_i(S_c) = G \), sells one share of firm \( j \) if \( \hat{s}_i(S_c) = B \), and does not trade otherwise.

2. The stock price of an established firm is (i) \( p_j = r(S_c, n + 1, G) \) if the order flow in the stock of one established firm is larger than \( (1 - \pi_c) \), (ii) \( p_j = r(S_c, n, G) / 2 \) if the order flow of all stocks of established firms belongs to \([- (1 - \pi_c), (1 - \pi_c)]\), (iii) \( p_j = 0 \) if the order flow in the stock of one established firm is less than \( (1 - \pi_c) \).

3. The stock price of firm A is (i) \( p_A^H(S_u) \) if the order flow in stock A is larger than \( (1 - \pi_u) \), (ii) \( p_A^N(S_u) \) if the order flow in stock A belongs to \([- (1 - \pi_u), (1 - \pi_u)]\), and (iii) \( p_A^L(S_A) \) if the order flow in stock A is less than \( (1 - \pi_u) \).

4. The manager of firm A implements his strategy at date \( t = 2 \) if (a) his private managerial information indicates that the common strategy is good or (b) the stock price of firm A is \( p_A^H(S_u) \).

When firm A chooses the unique strategy, market makers in firm A cannot learn information from trades in stocks of established firms. Thus, the stock price of firm A only depends on the order flow in this stock. Accordingly the probability that the manager of firm A will implement its strategy when it is good depends only on the fraction of speculators informed about the unique strategy, \( \pi_u \). This probability is:

\[
\Pr(I^* = 1 \mid t_{S_u} = G) = \gamma + (1 - \gamma) \Pr(p_{A1} = p_A^H(S_u) \mid t_{S_u} = G) = \gamma + (1 - \gamma)\pi_u.
\]

Then proceeding as in the case in which firm A chooses the common strategy, we deduce that the expected value of the firm at date 1 when it chooses the unique strategy is:
\[ V_{A1}(S_u) = \frac{(\gamma + (1 - \gamma)\pi_u)}{2} (r(S_u, 1, G) - 1). \]  

(12)

Observe that, for a given strategy, the expected value of firm A when it uses stock market information is higher than when it ignores it if \( \gamma < 1 \) \( (V_{A1}(S_A) \geq V_{A1}^{\text{benchmark}}(S_A)) \) for \( S_A \in \{S_c, S_u\} \), with a strict inequality if \( \gamma < 1 \). The reason is that stock market information complements managerial information and therefore enhances the manager’s ability to make value enhancing decisions. The next proposition states our main result.

**Proposition 2** If \( \pi_u < \pi_c(n) \) then firm A optimally chooses the common strategy at date 1 if \( \lambda(n) < \tilde{\lambda}(\gamma, \pi_u, \pi_c(n)) \) and chooses the unique strategy if \( \lambda(n) > \tilde{\lambda}(\gamma, \pi_u, \pi_c(n)) \), where \( \tilde{\lambda}(\gamma, \pi_u, \pi_c(n)) = \frac{(\gamma + (1 - \gamma)\pi_u)}{(\gamma + (1 - \gamma)\pi_u)} > 1 \). If \( \pi_u > \pi_c(n) \) then firm A always chooses the unique strategy.

The proposition shows that when the manager of a firm relies on the stock market as a source of information, its incentive to differentiate is weakened. Indeed, there is a set of values for the parameters \( (\pi_u < \pi_c(n) \) and \( \lambda(n) < \tilde{\lambda}(\gamma, \pi_u, \pi_c(n)) \) such that it chooses the common strategy while it does not when it ignores stock market information (see Proposition 1). We label this the *conformity* effect. The intuition is as follows. When firm A follows the unique strategy, the stock price of firm A reveals the type of firm A’s strategy with probability \( \pi_u \) while when firm A follows the common strategy, the stock price of firm A reveals the type of the strategy with probability \( \pi_c(n) \). Thus, if \( \pi_u < \pi_c(n) \), the stock market is more informative about the value of its strategy if firm A does not differentiate. In this case, the manager of firm A faces a trade-off: differentiation yields a larger payoff if the strategy is good but the manager receives a less informative signal from the stock market about the type of his strategy. He is therefore less likely to pursue the strategy when it should indeed be pursued. If \( \lambda(n) < \tilde{\lambda}(\gamma, \pi_u, \pi_c(n)) \), the latter effect dominates the former and the manager is better off not differentiating. If \( \pi_u > \pi_c(n) \), there is no trade-off since differentiation brings both a larger payoff if the manager’s strategy is good and is associated with a more informative stock market.
Intuitively, the case in which $\pi_u < \pi_c(n)$ is more plausible for two reasons. First, $\pi_c(n)$ increases with the number of established firms. Thus, even if $\pi_c$ is small, $\pi_c(n)$ can be large if many firms follow the common strategy. Second, speculators can use information about the common strategy in all stocks of firms following this strategy. Thus, for a fixed cost of producing information, they benefit from economies of scale in choosing to produce information about the common strategy. This effect should naturally lead to a larger fraction of informed speculators in stocks following the common strategy, i.e., $\pi_c > \pi_u$.\footnote{In unreported tests, we confirm this intuition using the proxies for uniqueness and price informativeness defined in the empirical section below.}

It is easily seen that $\lambda(\gamma, \pi_u, \pi_c(n))$ decreases with $\gamma$ and goes to one when $\gamma$ goes to one. Indeed, when the manager has more precise private information, he needs to rely less on stock market information. Hence, the information gain of following the common strategy is smaller. This information gain is also smaller (larger) when $\pi_u (\pi_c(n))$ is higher so that $\lambda(\gamma, \pi_u, \pi_c(n))$ decreases with $\pi_u$ and increases with $\pi_c(n)$. Observe as well that when $\gamma$ goes to zero and $\pi_u$ go to zero, $\lambda(\gamma, \pi_u, \pi_c(n))$ become infinitely large. In these cases, firm A chooses the common strategy even if the increase in payoff with a successful unique strategy is very large.

2.2 Specific empirical implications: private and public Status

Proposition 2 indicates that the stock market can induce conformity in strategic choices because such conformity enables managers to obtain more precise information from the stock market and thereby to make more efficient strategic decisions. Directly testing the conformity effect is challenging because one would need to identify exogenous variation of $\pi_u$. For instance, an exogenous increase of $\pi_u$ will lowers $\lambda(\gamma, \pi_u, \pi_c(n))$ and thus will increases the likelihood that a given firm following a common strategy shifts to a more unique strategy. Yet, by design, $\pi_u$ cannot be observed as long as a firm follows a common strategy. To circumvent this problem and derive predictions that can be tested in the data, we focus our attention on firm A’s
public status. By definition, $\pi_u = 0$ when firm $A$ is private. However, even when $A$ is private $\pi_c$ is different from zero because the manager of $A$ can use information from observing the stock prices of established firms. If firm $A$ goes public and shifts to a unique strategy then $\pi_u > 0$ as its stock will attract some trading from informed investors, even if it chooses the unique strategy. All else equal, going public represents a positive shock on $\pi_u$. According to the model, the going-public decision should therefore increase firm $A$’s incentive to differentiate is strategy.

To formalize this intuition, suppose first that firm $A$ is private. In this case, if firm $A$ chooses the unique strategy then it cannot obtain information from the stock market. Thus, its expected value at date 1 is identical to that in the benchmark case (or to the case in which $\pi_u = 0$):

$$V_{A1}^{\text{private}}(S_u) = V_{A1}^{\text{benchmark}}(S_u).$$

(13)

If instead, firm $A$ chooses the common strategy then it can learn from the stock price of the $n$ established public firms. In particular, if the stock price of these firms is high then the manager of firm $A$ can infer that the common strategy is good and therefore he will choose to implement the common strategy in this case, even if he does not receive managerial information. Thus proceeding as in the case in which firm $A$ is public, we deduce that the expected value of firm $A$ when it is private and when it chooses the common strategy is:

$$V_{A1}^{\text{private}}(S_c) = V_{A1}(S_c) = \frac{(\gamma + (1 - \gamma)\pi_c(n-1))}{2} r(S_c, n+1, G) - 1).$$

(14)

The only difference with the expression obtained when firm $A$ is public (eq.(7)) is that $\pi_c(n-1)$ replaces $\pi_c(n)$. In choosing its strategy, firm $A$ faces the same trade-off when it is private and when it is public. However, as it does not get information from its own stock price, firm $A$ is more likely to choose the common strategy when private. The next proposition establishes this result formally.

**Proposition 3** When firm $A$ is private, it optimally chooses the common strategy at date 1 if $\lambda(n) < \lambda^{\text{private}}(\gamma, \pi_c(n-1))$ and chooses the unique strategy if $\lambda^{\text{private}}(\gamma, \pi_c(n-1))$, where $\lambda^{\text{private}}(\gamma, \pi_c(n)) = \frac{(\gamma + (1 - \gamma)\pi_c(n-1))}{\gamma}$.
If $\pi_u > \frac{\gamma (\pi_c(n) - \pi_c(n-1))}{\gamma + (1 - \gamma) \pi_c(n-1)}$ then $\hat{\lambda}^{\text{private}}(\gamma, \pi_c(n)) > \hat{\lambda}(\gamma, \pi_u, \pi_c(n))$. In this case, if $\lambda(n) \in [\hat{\lambda}(\gamma, \pi_u, \pi_c(n)), \hat{\lambda}^{\text{private}}(\gamma, \pi_c(n))]$ then firm $A$ will shift from the common strategy to the unique strategy when it goes public. The reason is that when firm $A$ is public, its manager can obtain information from its own stock price even if it chooses the unique strategy. Thus, the informational loss associated with choosing the unique strategy is smaller than when firm $A$ is private, which tilts the managers’ decision in choosing the unique strategy. For values of $\lambda$ outside the interval $[\hat{\lambda}(\gamma, \pi_u, \pi_c(n)), \hat{\lambda}^{\text{private}}(\gamma, \pi_c(n))]$, firm $A$ has no incentive to change its strategy when it becomes public. If $\lambda > \hat{\lambda}^{\text{private}}(\gamma, \pi_c(n))$, it chooses the unique strategy whether private or public and if $\lambda < \hat{\lambda}(\gamma, \pi_u, \pi_c(n))$, it chooses the common strategy whether public or private. Thus, we obtain the following implication.

**Corollary 1** If $\pi_u > \frac{\gamma (\pi_c(n) - \pi_c(n-1))}{\gamma + (1 - \gamma) \pi_c(n-1)}$ then firm $A$ will switch from the common strategy to the unique strategy when it goes public when $\lambda(n) \in [\hat{\lambda}(\gamma, \pi_u, \pi_c(n)), \hat{\lambda}^{\text{private}}(\gamma, \pi_c(n))]$ and keeps the same strategy otherwise.

When $\pi_u < \frac{\gamma (\pi_c(n) - \pi_c(n-1))}{\gamma + (1 - \gamma) \pi_c(n-1)}$ then $\hat{\lambda}^{\text{private}}(\gamma, \pi_c(n)) < \hat{\lambda}(\gamma, \pi_u, \pi_c(n))$. In this case, if firm $A$ changes its strategy when it goes public then it will switch from the unique to the common strategy. The reason is that by adopting the common strategy, firm $A$ increases by $\pi_c(n) - \pi_c(n-1) = \pi'_c(1 - \pi_c)$. This effect however becomes quickly small as $n$ increases and never operates if $\pi_u > \frac{1}{4}$. Thus, Corollary 1 describes the most plausible scenario and is our main testable implication.

### 2.3 Testing the model: discussion

Based on the predictions above, our main test examines whether and how firms switch strategies when they go public. Two related issues arise when we want to take the model to the data. First, we need an observable metric to identifies whether firm $A$ chooses the unique ($S_u$) or the common strategy ($S_c$). Second, we need the ability to observe strategies both when firm $A$ is private and public to measure how it changes its strategy following its IPO. To address the first issue, we rely on product
differentiation to identify firm $A$ strategic choices as well as the set of established public firms following the common strategies. Suppose that we observe that firm $A$ goes public at some point. Let $B$ be a firm from the set $J$ of established public firms that offer product or services that resemble that of $A$ (i.e. $B$ represents one of the $n$ established firms that follow the common strategy). Let $\Delta_{A,B}(s_A, \lambda_A)$ be the degree of product differentiation of firm $A$ vis-à-vis $B$ when firm $A$ has ownership status $k_A \in \{\text{private, public}\}$ and type $\lambda_A$ represents the gain of being differentiated for $A$ (i.e. the extra value of choosing the unique strategy over the common strategy as defined in the model). The type $\lambda_A$ is not observable. We posit that an increase in $\frac{1}{n} \sum \Delta_{A,B}(k_A, \lambda_A)$ after going public corresponds to a situation where firm $A$ moves from the common to the unique strategy – firm $A$ becomes more differentiated.

To address the second issue we exploit the time dimension. Indeed, to empirically identify whether firm $A$ modifies its strategic choice when going public we would ideally like to observe both $\Delta_{A,B}(\text{private}, \lambda_A)$ and $\Delta_{A,B}(\text{public}, \lambda_A)$ and compute:

$$\Gamma_{A,B}(\lambda_A) = \Delta_{A,B}(\text{public}, \lambda_A) - \Delta_{A,B}(\text{private}, \lambda_A), \tag{15}$$

the difference in differentiation between firms $A$ and $B$ when firm $A$ with type $\lambda_A$ is public and when it is private. This would allow us to empirically measure the overall change of differentiation when firm $A$ transitions from private to public ($\Gamma_A(\lambda_A) = \frac{1}{n} \sum \Gamma_{A,B}(\lambda_A)$), and examine how $\Gamma_A(\lambda_A)$ varies with the key parameters of the model: The private information of the firm $A$’s manager ($\gamma$ in the model), and the informativeness of firm $B$’s stock price ($\pi_c$ in the model). While we do not observe $\Delta_{A,B}(\text{private}, \lambda_A)$ (see below), we can measure product differentiation between publicly traded firms over time.\(^8\) Define the event time variable $\tau = 0, 1, \ldots, k$ as the public age of firm $A$ since its IPO, with $\tau = 0$ being the year of its IPO. We then assume that $\Delta_{A,B}(\text{private}, \lambda_A)$ can be proxied using the degree of product differentiation between $A$ and $B$ measured at the time of firm $A$’s IPO, or $\Delta_{A,B,\tau=0}(\text{public}, \lambda_A)$. We then estimate $\Gamma_A(\lambda_A)$ by looking at the evolution of $\Delta_{A,B,\tau}(\text{public}, \lambda_A)$ over $\tau$.

\(^8\)Indicate that other IPO papers make the same assumption (e.g. Lyandres, Spiegel, etc.)
We can do so by specifying a linear regression of the form:

\[
\Delta_{A,B,\tau}(public, \lambda_A) = \lambda_A + \eta_A \times \tau \quad \text{for all } B,
\]  

(16)

where the coefficient \( \eta_A \) measures the average change of product differentiation between firms \( A \) and the set of firms \( B \) over time, controlling for \( A \)'s type (\( \lambda_A \)). To wit, \( \eta_A \) is the empirical counterpart of \( \Gamma_A(\lambda_A) \). To render eq.(16) estimable, we replace the unobserved \( \lambda_A \) with a firm fixed effect, add a normally distributed error term, create a large panel dataset that stacks \( \Delta_{A,B,\tau}(public, \lambda_A) \) for a large number of IPO firms equivalent to \( A \), and public firms \( B \), and create a set of counterfactual pairs.\(^9\) We describe below the sample construction and detail the econometric implementation of eq.(16).

3 Data and Methodology

3.1 Measuring strategic choices

To measure the degree of product differentiation between two firms (\( \Delta_{i,j} \)), we rely on the Text-Based Network Classification (TNIC) developed by Hoberg and Phillips (2014). This classification is based on textual analysis of the product description sections of firms’ 10-K (Item 1 or Item 1A) filed every year with the Securities and Exchange Commission (SEC). The classification covers the period 1996-2011.\(^{10}\) For each year, Hoberg and Phillips (2014) compute a measure of product similarity (\( \rho_{i,j} \)) for every pair of firms by parsing the product descriptions from their 10-Ks. This measure is based on the relative number of product words that two firm share in their product description, and ranges between 0% and 100%. Intuitively, the more common words two firms use in describing their products, the closer they are in the product market space, or equivalently the less differentiated they are.

\(^9\)Note that by capturing \( \lambda_A \) with a firm fixed effect we implicitly assume that the gain of being differentiated is fixed for a given firm around its IPO.

\(^{10}\)This limitation arises because TNIC industries require the availability of 10-K in electronically readable format.
Hoberg and Phillips (2014) then define, for each year, each firm $i$’s set of peers to include all firms $j$ with pairwise similarity scores relative to $i$ above a pre-determined threshold (equal to 21.32%).\footnote{This threshold is chosen to generate set of product market peers with the same fraction of pairs as 3-digit SIC industries.} This represents the TNIC network of firm pairwise similarity. Unlike standard industry definitions, the TNIC network does not require relations between firms to be transitive. Each firm has its own distinct set of peers, that can change over time as firms modifies their product ranges, innovate, and enter new markets. Following Hoberg and Phillips (2014), we use the similarity score ($\rho_{i,j}$) for each pair in the TNIC network as the basis to measure the intensity of product differentiation of IPO and established firms. We simply define the degree of product differentiation between any two firms $i$ and $j$ (in the TNIC network) in year $t$ as
\[
\Delta_{i,j,t} = 1 - \rho_{i,j,t}.
\]

As as alternative way to measure strategic differentiation, we rely on stock return co-movement between two firms ($\beta_{i,j}$). The idea is that the stock return of firms following a unique strategy should be unrelated to that of other firms (i.e., firms following the common strategy). On this ground, we rely on stock return co-movement between firms in a pair to capture the extent to which their strategies are related. To obtain this measure, we estimate for each firm-pair-year the following specification:
\[
\begin{align*}
    r_{i,w,t} = & \beta_0 + \beta_{m,t}r_{m,w,t} + \beta_{i,j,t}r_{j,w,t} + \nu_{i,w,t}, \\
\end{align*}
\]
where $r_{i,w,t}$ is the (CRSP) return of firm $i$ in week $w$ of year $t$, $r_{m,w,t}$ is the return of the market (CRSP value-weighted index), and $r_{j,w,t}$ is the return of firm $j$. The estimate of $\beta_{i,j,t}$ thus measures the return co-movement between firms $i$ and $j$ in year $t$. We conjecture that increased differentiation leads to lower return co-movement.\footnote{Consistent with this claim, the correlation between $\Delta_{i,j}$ and $\beta_{i,j}$ is -0.29 across all firm-pair-years of our sample.}
3.2 Initial public offerings

We obtain the name, CRSP identifier, and filing date of firms going public from the IPO database assembled by Jay Ritter.\(^\text{13}\) We restrict our attention to the IPOs during the 1996-2011 period. The sample includes IPOs with an offer price of at least $5.00, and excludes American Depositary Receipts (ADRs), unit offers, closed-end funds, Real Estate Investment Trusts (REITs), partnerships, small best efforts offers, and stocks not listed on CRSP (CRSP include Amex, NYSE and NASDAQ stocks). We further restrict the sample to exclude non-financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4000 and 4999), firms that are not present in the TNIC network, firms without any TNIC peers on their IPO year, firms that are listed for less than one year, and firms with missing information on total assets in COMPUSTAT. The final IPO sample comprises 1,214 going public firms.

3.3 Econometric specification

To implement Equation (16) and empirically measure the evolution of differentiation for IPO firms, we first need to identify the set of established firms for each newly public firm. We select, for each IPO firm \( A \), the set of TNIC peers on the year of firm \( A \)’s IPO \((\tau = 0)\). We label this set, whose size varies by IPO firm, as the initial peers. To best map the model’s structure, we consider only established peers, defined as peers that have been publicly listed for at least five years on firm \( A \)’s IPO year.\(^\text{14}\) Then, we track the product differentiation between the IPO firm \( A \) and each of its initial peer \( B \) over the five year that follows the IPO year (\( \Delta_{A,B,\tau} \) with \( \tau = 0, \ldots, 5 \)). If a peer \( B \) leaves the set of initial peers (i.e. is no longer in firm \( A \)’s TNIC network) in a given year \( \tau \) (where \( \tau > 0 \)), we set \( \Delta_{A,B,\tau} \) equals to one (i.e., perfectly differentiated).

Arguably, the degree of differentiation between any two firms \( A \) and \( B \) reflects their joint product market strategies. Hence an increase of \( \Delta_{A,B,\tau} \) following firm \( A \)’s IPO might indicate that \( A \) differentiates from \( B \), but also that \( B \) differentiates

\(^{13}\)We thank Jay Ritter for sharing this data with us.

\(^{14}\)Note that while this choice is arbitrary, all our results are robust of we define established firms as firms that have been listed for more than 3 years.
from A, or that both firms (independently) increase their product differentiation. In addition, a change in the degree of differentiation post IPO could also be observe if differentiation naturally change for every firm over their life-time.

To better measure the situation where the IPO firm A differentiates from the established firm B and to capture general differentiation patterns, we construct the following counterfactual sample. For each initial peer firm B (of the IPO firm A), we select its set of peers firms on the year of the firm A’s IPO (τ = 0) that are not in the set of initial peers of the firm A, and that have been publicly listed for at least five years on the IPO year. These are the initial established peers of the peer of A that are not themselves peers of A. We label such peers of peers as B'. Among this set, we select the three peers of peers B' that exhibit similar levels of product differentiation with B, than B with the IPO firm A, such that $E(\Delta_{B,B'}) \approx \Delta_{A,B}$ for any pair A, B. We then track the product differentiation between the IPO firm A and B' over five years ($\Delta_{B,B',\tau}$ with $\tau = 0, ..., 5$).

We combine together the pairs made of an IPO firms and their initial peers (A,B), with all the counterfactual pairs (B,B'). For every actual or counterfactual pair and event-time year, we compute differentiation $\Delta$ and label the former set of pairs as treated pairs, and the latter set as counterfactual pairs. To estimate the extent to which IPO firms change their product differentiation after they become publicly listed, we consider the following baseline linear specification:

$$\Delta_{i,j,\tau,t} = \eta_0 + \eta_1(Treated_{i,j,\tau,t}) + \alpha_{i,j} + \delta_t + \beta X_{i,j,\tau,t} + \epsilon_{i,j,\tau,t},$$  \hspace{1cm} (18)

where the subscripts $i$ and $j$ represent respectively a pair of firms, $t$ represents calendar time, and $\tau$ represent event time ($\tau = 0, ..., 5$). The unit of observation is at the firm-pair-time level. The variable Treated is an indicator variable that equals one if a pair includes an IPO firm and a peer (i.e., a pair (A,B)), and zero otherwise (if a pair includes a peers of an IPO firm and of of its peer – a pair (B,B')). The firm-pair fixed effects ($\alpha_{i,j}$) capture any time-invariant firm-pair characteristics (e.g. firms’ intrinsic

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15 As we did for the pairs of firms (A,B), if a peer of peer B' leaves the set of initial peers (i.e. is no longer in firm B's TNIC network) in a given year $\tau$ (where $\tau > 0$), we set $\Delta_{B,B',\tau}$ equals to one.
gain from differentiation $\lambda$) and the (calendar) time fixed effects ($\delta_i$) absorbs any common time-specific factor such as IPO booms or waves of product differentitation.\footnote{Note the the inclusion of firm pair fixed effects instead of firm $i$ fixed effects deliver (mechanically) the same results.}

The vector $X$ includes several time-varying firm-pair characteristics (e.g. difference in total assets between firms $i$ and $j$). We allow the error term ($\varepsilon_{i,j,t}$) to be correlated within pairs and we correct the standard errors as in Petersen (2009).

In estimating equation (18), we are interested in the coefficient $\eta_1$. Indeed, $\eta_0$ measures the average within-pair change of differentiation for all pairs over time, and $\eta_0 + \eta_1$ measures the average within-pair change of differentiation for treated pairs. In the spirit of a difference-in-differences estimation, $\eta_1$ measures the average relative change of differentiation between an IPO firm and an established peer, compared to a change occurring in similar counterfactual pair. As defined in equation (16) $\eta_1$ is the empirical counterpart of $\Gamma_A(\lambda_A)$. We use estimates of $\eta_1$ to test the main implications of the model: Newly-public firms are more likely to move from the common ($S_c$) to the unique strategy ($S_u$) implying $\eta_1 > 0$.

Table 1 presents descriptive statistics for the sample we use for the estimations. Panel A indicates that for $\tau = 0$ the sample comprises 1,231 distinct IPO firms ($A$), 2,678 distinct established peers ($B$), and 2,961 distinct peers of peers ($B'$). The average (public) age of peers and peers of peers is 13.535 and 14.304 respectively. Unsurprisingly, IPO firms are smaller than their established peers, and have higher market-to-book ratio. Peers and peers of peers are overall similar in terms of age, size, and market-to-book ratio. The average degree of product differentiation ($\Delta_{i,j}$) and return co-movement ($\beta_{i,j}$) are roughly similar across the three sets of firms at $\tau = 0$ (by construction). Panels B and C report pair level information for $\tau = 0$ and pair-year level information across $\tau = 0, \ldots, 5$. There are 122,195 pairs (633,745 pair-year observations) in the sample, separated into 31,427 treated pairs (139,101 pair-years) and 90,768 counterfactual pairs (494,644 pair-years). On average, we observe a given
(treated or counterfactual) pair for 4.55 years post IPO.

4 Empirical Findings

4.1 The conformity-decreasing effect of IPOs

Table 2 presents estimates for various specifications of Equation (18). The first column reports a baseline specification that includes only the event time variable \( \tau \) as explanatory variable, together with firm and calendar year fixed effects. The coefficient on \( \tau \) is positive and significant, indicating that the average degree of product differentiation in a given firm pair \( (\Delta_{i,j}) \) increases over time for all (treated and counterfactual) pairs. The economic magnitude of our estimate is non-trivial: The average within-pair level of differentiation increases by 0.147% per year, equivalent to a 0.735% increase over our five years window.\(^{17}\)

[Insert Table 2 about Here]

More important for our purpose, we observe in column (2) that the coefficient on the interaction term \( \tau \times Treated \) is also positive and significant (0.026 with a t-statistic of 4.732). IPO firms appear to differentiate significantly more from their initial product market peers over time compared to counterfactual (established) firms. The point estimate indicates that the increase of differentiation for newly public firms with their initial peers is about 20% larger than that observed for counterfactual pairs. This finding is new, and consistent with the model’s main prediction that (newly public) firms have higher likelihood to reduce conformity and select the unique strategy after going public as they can benefit from an additional informative signal coming from their own stock price. Of course, as predicted by the model, not all firms shift their strategy when becoming public. Nevertheless, our estimates suggest a average positive shift towards less conformity in our sample of 1,214 IPO firms.

In the remaining columns of Table 2, we check the robustness of our findings to changes in the baseline specification. In column (3), we control for differences in

\(^{17}\)Because we evaluate changes in differentiation among TNIC pairs that are by construction the closest pairs in terms of product offerings, our estimates likely represents a lower bound.
size, age, and market-to-book ratios in each firm-pair and observe similar results. In columns (4) we constrain the sample to include only firm-pairs for which we have non-missing observations for at least three years in the post-IPO period. In columns (5) and (6) we alter the construction of counterfactual pairs by taking five matches instead of three in column (5), and by matching on size difference instead of product differentiation in column (6). Our conclusion remains unchanged.

[Insert Figure 2 about Here]

Figure 2 displays the pattern of differentiation for treated and counterfactual firm-pairs in event time. We construct this figure by replacing the event-time variable \( \tau \) in Equation (18) by a set of event-time dummy variables \( (D_\tau) \) and their interaction with \( Treated \).\(^{18} \) In line with the results presented in Table X, Figure 1 confirms the larger increase in product differentiation among treated pairs. For each \( \tau \), we observe that \( \eta_{1,\tau} > 0 \). Moreover, the effect of IPO on differentiation appears to be increasing over time, as the gap between treated and counterfactual pairs is widening over time \( (\eta_{1,\tau}) \).

[Insert Table 3 about Here]

Table 3 presents the results when we measure differentiation using return comovement among firm-pairs \( (\beta_{i,j}) \) instead of product differentiation \( (\Delta_{i,j}) \). The results are largely similar. Column (1) reveals a negative coefficient on \( \tau \) indicating an overall decrease in return co-movement between firm-pairs over time. In line with a move towards the unique strategy post IPO, we observe in column (2) a negative and significant coefficient on \( \tau \times Treated \). The stock return of newly public firms becomes less correlated with that of their initial peers over time after they become publicly listed. The remaining columns of Table 3 confirm the robustness of this result.

Overall we find that newly public firms increase their degree of differentiation post-IPO. This finding is new, and consistent with the model’s main prediction that, all else equal, firms have higher likelihood to reduce conformity and select the unique

\(^{18}\)Specifically, we estimate \( \Delta_{i,j,\tau,t} = \alpha_{i,j} + \sum_{\tau=0}^{5} \eta_{0,\tau} D_{i,j,\tau} + \sum_{\tau=0}^{5} \eta_{1,\tau}(D_{i,j,\tau} \times Treated_{i,j,\tau}) + \delta_{t} + \varepsilon_{i,j,\tau,t} \)
strategy ($S_u$) after going public as they can benefit from an additional informative signal coming from their own stock price. Of course, as predicted by the model, not all firms shift their strategy when becoming public. Nevertheless, our estimates suggest a significant average shift towards less conformity and more differentiation in our sample of 1,214 IPO firms.

4.2 Cross-sectional contrasts

To provide further evidence in support of the model’s prediction, we study how the change in product differentiation varies across IPO firms. In the model, the reduction of conformity following an IPO is predicted to larger for firms for which the loss of stock price information associated with the unique strategy is smaller. This arises when managers have better private information (i.e., $\gamma$ is high), or when the stock prices of established peers that follow the common strategy are less informative (i.e., $\pi_c(n)$ is low). On this ground, we examine how the observed changes in product differentiation post-IPO varies with empirical measures of (1) managerial information, and (2) informed trading. To this end, we augment the baseline specification as follows:

\[ \Delta_{i,j,\tau,t} = \eta_0 \tau + \eta_1 (\tau \times Treated_{i,j,\tau,t}) + \eta_2 (\tau \times Treated_{i,j,\tau,t} \times \phi_{i,j}) + \ldots \]  

(19)

where $\phi_{i,j}$ represents a proxy for one of the model’s parameters ($\gamma$ or $\pi_c(n)$). Equation (19) enables us to decompose the change in differentiation for IPO firms into an unconditional component and a component that depends linearly on the interacted variable of interest ($\phi_{i,j}$).

4.2.1 Private information of managers

We first consider proxies the private information of the managers ($\gamma$). Following Chen, Goldstein, and Jiang (2007) and Fresard and Foucault (2014) we use the trading activity of firms’ insiders and the profitability of their trades. We posit that managers should be more likely to trade their own stock and make profit on these trades if they
possess more private information, when $\gamma$ is larger.\footnote{For instance, Fahlenbrach and Stulz (2009) report that large increases in insider ownership is associated with increase in firm value.}

We measure the trading activity ($Insider_i$) of IPO firm $i$'s insiders in year $t$ as the number of shares traded (buys and sells) by its insiders during that year divided by the total number of shares traded for stock $i$ in year $t$. The profitability of insiders' trades in firm $i$ in year $t$ ($InsiderAR_i$) is measured by the average one month market-adjusted returns of holding the same position as insiders for each insider's transaction.\footnote{The average value of $InsiderAR$ is 0.75\% in our sample of IPO firms and is significantly different from zero at the 1\%-level. This finding supports the notion that insiders have private information and is in line with findings on the profitability of insiders' trades in the literature (for recent evidence, see Seyhun (1998), or Ravina and Sapienza (2010)).} We then aggregate each variable by taking its average value over the 5-year period following the IPO. We obtain corporate insiders' trades from the Thomson Financial Insider Trading database.\footnote{This database contains all insider trades reported the the SEC. Corporate insiders include those who have "access to non-public, material, insider information" and required to file SEC forms 3, 4, and 5 when they trade in their firms stock.} As in other studies (e.g., Beneish and Vargus (2002), or Peress (2010)), we restrict our attention to open market stock transactions initiated by the top five executives (CEO, CFO, COO, President, and Chairman of the Board).\footnote{Arguably owners typically sells large stakes upon public listing (e.g. Helwege, Pirinsky and Stulz (2007)). This could potentially jeopardize the value of using insider trade to measure managers' information. To adress this issue we separately consider the number shares bought or sold divided by the total number of shares traded instead of all transaction. Interestingly our results only hold for buys, but not for sells.} Finally, we use CRSP to compute the total number of shares traded (turnover) in each stock and market-adjusted returns on insiders' positions.

Table 4 presents estimates for equation (19) when $\phi_i = Insider_i$ and $\phi_i = InsiderAR_i$. In columns (1) and (2), we find that the coefficient ($\eta_2$) on the triple interaction between $\tau$, $Treated$ and the proxies for $\gamma$ is positive and significant at the 5\%-level, while the coefficient on $\tau \times Treated$ remains positive and significant. The increase in product differentiation ($\Delta_{ij}$) following the IPO is thus statistically larger when managers are more informed. We find a similar pattern when we focus
on return co-movement ($\beta_{i,j}$) in columns (3) and (4). The increase in differentiation post-IPO (i.e., the decrease of $\beta_{i,j}$) increases significantly with the intensity of insider trading (but not with the profitability of insiders’ trades). The finding reported in Table 4 are in line with the model, because informed managers are less sensitive to the information contained in the stock prices of peers. As a result they are more likely to switch to the unique strategy after the IPO when they receive some information from their own stock price ($\pi_u > 0$).

### 4.2.2 Price informativeness of established firms

Next, we examine how the change in product differentiation of newly-public firms varies with measures of the informativeness of established peers’ stock prices. We use three variable as proxies for $\pi_c(n)$. First, we follow Chen, Goldstein and Jiang (2007) and consider the probability of informed trading, $PIN$, measure developed by Easley, Kiefer, and O’Hara (1996, 1997) and Easley, Hvidkjaer, and O’hara (2002). The $PIN$ measure is based on a structural market microstructure model in which trades can come from noise traders or from informed traders. It measures the probability that trading in a given stock comes from informed traders. Similar to Chen, Goldstein, and Jiang (2007), because $PIN$ provides a direct estimate of the probability of informed trading, we posit that it is positively linked to the amount of private information reflected in stock prices. We use data on the (annual) $PIN$ measure computed using the Venter and De Jongh’s (2004) method. The data is provided and discussed by Brown and Hillegeist (2007) and covers the period 1996-2010.

Our second proxy for the informativeness of prices relies on the sensitivity of stock prices on earnings news using the “earnings response coefficients” or $ERC$ (e.g. Ball and Brown (1968). Following the accounting literature, we conjecture that informative stock prices should better and more timely incorporate relevant information about future earnings. Hence, earnings news of firms with informative prices should

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23 As noted earlier, if managers are perfectly informed or not not rely on the stock market ($\gamma = 1$), they should always choose the unique strategy. In this case, going public should have no effect on their strategic choices.

24 See http://scholar.rhsmith.umd.edu/sbrown/pin-data
trigger a lower price response (lower ERC). We compute ERC for each firm-year as the average of the three-day window absolute market-adjusted stock returns over the four quarterly announcement periods.

Our third proxy focuses on the coverage from professional financial analysts received by peer firms. More coverage is typically associated with improved informational environment. Indeed, analysts gather information about the value of business strategies, and provide value-adding information (e.g. Healy and Palepu (2001)) that has a significant effect on stock prices (e.g. Womack (1996) and Barber, Lehavy, McNichols, and Trueman (2006)). Hence, we argue that firms covered by more analysts benefit from more information about the value of their strategy.

Table 5 presents estimates for equation (19) when $\phi_{i,j} = PIN_j$, $\phi_{i,j} = ERC_j$, and $\phi_{i,j} = Coverage_j$. We aggregate each proxy by taking its average value over the 5-year period following the IPO (of firm $i$). Columns (2) to (3) present results for our measure of product differentiation ($\Delta_{i,j}$). Across the three proxies $\phi_{i,j}$, we find that the increase in product differentiation for IPO (relative to counterfactual pairs) is significantly smaller when the stock price of peer firms is more informative. The same results emerge when we look at stock return co-movement. With the exception of analyst coverage, we observe a smaller decrease in $\beta_{i,j}$ when the established of newly-public firms have more informative prices. These cross-sectional results confirm the model’s prediction, according to which the benefit of choosing the unique strategy is lower when the ability to obtain information about the common strategy is higher. Our results indicate that higher price informativeness of peer firms accentuate conformism in choosing strategies.

5 Conclusion
Appendix

Proof of Proposition 1: Directly follows from the argument in the text.

Proof of Lemma 1: We show that the strategies described in Lemma 1 form an equilibrium.

Speculators’ strategy. Let \( \Pi(x_{ij}, \hat{s}_{ij}) \) be the expected profit of a speculator who trades \( x_{ij} \in \{-1, 0, +1\} \) shares of firm \( j \) when his signal is \( \hat{s}_{ij}(S_j) \). First, consider an informed speculator who observes \( \hat{s}_{ij} = G \) for \( j \in \{1, ..., n\} \). If he buys stock \( j \), his expected profit is:

\[
\Pi(+1, G) = E(r(S_c, \tilde{n}, G) - \tilde{p}_{j1} | \hat{s}_j = G, x_{ij} = 1),
\]

where \( \tilde{n} = n \) if firm A abandons its strategy and \( \tilde{n} = n + 1 \) if firm A implements the common strategy. Given equilibrium prices and the manager of firm A’s decision to abandon or not its strategy, we obtain:

\[
\Pi(+1, G) = E(r(S_c, \tilde{n}, G) - \tilde{p}_{j1} | \hat{s}_j = G, x_{ij} = 1) = \Pr(-1 + \pi_c < \sum_{j=1}^{n+1} f_j < 1 - \pi_c | \hat{s}_j = G, x_{ij} = 1) \times (\gamma r(S_c, n + 1, G) + (1 - \gamma) r(S_c, n, G))/2.
\]

because \( \Pr(\cup_{j=1}^{n+1} f_j < -1 + \pi_c | \hat{s}_j = G, x_{iB} = 1) = 0 \) and, if \( \cup_{j=1}^{n+1} f_j > 1 - \pi_c \) then the price of asset \( j \) reflects the correct value of asset \( j \). When \( \hat{s}_{ij} = G \), the informed speculator expects other informed speculators to buy the asset and uninformed speculators to stay put. Hence, using equation (6), he expects \( f_j = z_j + \pi_j \).

We deduce that

\[
\Pr(-1 + \pi_c < \sum_{j=1}^{n+1} f_j < 1 - \pi_c | \hat{s}_j = G, x_{ij} = 1) = 1 - \pi(n).
\]

Thus,

\[
\Pi(+1, G) = (1 - \pi(n)) \times (\gamma r(S_c, n + 1, G) + (1 - \gamma) r(S_c, n, G))/2 > 0.
\]

If instead, the speculator sells, his expected profit is:

\[
\Pi(-1, G) = E(-(r(S_c, \tilde{n}, G) - \tilde{p}_{j1}) | \hat{s}_j = G, x_{ij} = -1) = -(1 - \pi(n)) \times (\gamma r(S_c, n + 1, G) + (1 - \gamma) r(S_c, n, G)) < 0.
\]
where we have used the fact that each speculator’s demand has no impact on aggregate speculators’ demand since each speculator is infinitesimal. Thus, the speculator optimally buys stock \( j \) when he knows that the common strategy is good. A symmetric reasoning shows that the speculator optimally sells stock \( j \) when he knows that the common strategy is bad. Similarly, we can proceed in the same way to show that a speculator optimally buys stock \( A \) if he knows that the common strategy is good and sells it if he knows that the common strategy is bad.

**The manager’s decision at date 3.** Now consider the investment policy for the manager of firm \( A \) given equilibrium prices. If the manager receives managerial information, he just follows his signal since this signal is perfect. Hence, in this case, he implements the common strategy if \( s_m = G \) and he does not if \( s_m = B \). If he receives no managerial information (\( s_m = \emptyset \)), the manager relies on stock prices. If he observes that \( p_{A2} = p_A^H \), the manager deduces that \( f_j > 1 - \pi_c \) for at least one firm and infers that \( t_{S_c} = G \). The reason is that \( f_j > 1 - \pi_c \) if and only if speculators buy stock \( j \), i.e., if \( t_{S_c} = G \). In this case, the manager optimally implements the common strategy. If instead the manager observes that \( p_{A2} = p_A^L(S_c) \) then the manager deduces that \( f_j < -1 + \pi_c \) for at least one firm and he infers that \( t_{S_c} = B \). In this case, the manager optimally abandons his strategy.

Finally if he observes \( p_{A2} = p_A^M(S_c) \) then the manager deduces that \(-1 + \pi_c \leq f_j \leq 1 - \pi_c \) for all firms (including firm \( A \)). In this case, the stock market does not affect the manager’s priors since trades are uninformative. Hence, if the manager has no private information, he does not invest since he expects the NPV of the common strategy to be negative (Assumption A.1). In sum:

\[
I^* (\Omega_3, S_c) = \begin{cases} 
1 & \text{if } s_m = G \\
1 & \text{if } \{s_m, p^*_{A1}\} = \{\emptyset, p_A^H\} \\
0 & \text{otherwise},
\end{cases}
\]

as claimed in the last part of Lemma 1.

**Equilibrium prices.** Now consider equilibrium stock prices. We must check that equilibrium conditions (7) and (8) are satisfied by the equilibrium prices given in the
lemma, i.e., these prices satisfy:

\[ p_{A2}(f_A(S_c)) = E(V_{A3}(I^*(\Omega_3, S_c), S_c) \mid \Omega_2), \quad (21) \]

and

\[ p_{j2}(f_j(S_c)) = E(r(S_c, n(S_c), t_{S_c}) \mid \Omega_2) \text{ for } j \in \{1, \ldots, n\}, \quad (22) \]

where \( I^*(\Omega_3, S_c) \) is given by (20) and \( n(S_c) = n + 1 \) if \( I^* = 1 \) and \( n(S_c) = n \) if \( I^* = 0 \). We check that the prices given in the second and third part of Lemma 1 satisfy these conditions.

Suppose first that \( f_j \geq (1 - \pi_c) \) for at least one firm \( j \). In this case, investors’ net demand in stock \( j \) reveals that the common strategy is good, i.e., \( t_{S_c} = G \). Moreover, the stock price of firm \( A \) is \( p^H_A \) according to the conjectured equilibrium. Hence, \( I^* = 1 \). We deduce that:

\[ E(V_{A3}(I^*(\Omega_3, S_c), S_c) \mid \Omega_2) = r(S_c, n + 1, G) - 1 \text{ if } \exists j \in \{1, \ldots, n, A\} \text{ s.t. } f_j \geq (1 - \pi_c), \]

which is equal to \( p^H_A \). Hence, for \( \exists j \in \{1, \ldots, n, A\} \) s.t. \( f_j \geq (1 - \pi_c) \), Condition (21) is satisfied. Moreover, we deduce that:

\[ E(r(S_c, n(S_c), t_{S_c}) \mid \Omega_2) = r(S_c, n + 1, G) \text{ if } \exists j \in \{1, \ldots, n, A\} \text{ s.t. } f_j \geq (1 - \pi_c), \]

which is equal to the stock price of firm \( j \neq A \). Thus, in this case, Condition (22) is satisfied as well.

Now suppose that \( \exists j \in \{1, \ldots, n, A\} \) s.t. \( f_j \leq (1 - \pi_c) \). In this case, investors’ net demand in stock \( j \) reveals that the common strategy is bad, i.e., \( S_c = B \). Moreover, the stock price of firm \( A \) is \( p^L_A \) according to the conjectured equilibrium. Hence, the manager never implements his strategy in this case (if he receives private managerial information, he will directly observes that \( S_c = B \) and otherwise he infers it from the stock price of firm \( A \)). Hence, we deduce that:

\[ E(V_{A3}(I^*(\Omega_3, S_c), S_c) \mid \Omega_2) = 0 \text{ if } \exists j \in \{1, \ldots, n, A\} \text{ s.t. } f_j \geq (1 - \pi_c), \]

which is equal to \( p^L_A \). Hence, if \( \exists j \in \{1, \ldots, n, A\} \) s.t. \( f_j \leq (1 - \pi_c) \), Condition (21) is satisfied. Moreover, we deduce that:

\[ E(r(S_c, n(S_c), t_{S_c}) \mid \Omega_2) = r(S_c, n, G) \text{ if } \exists j \in \{1, \ldots, n, A\} \text{ s.t. } f_j \geq (1 - \pi_c), \]
which is equal to the stock price of firm $j \neq A$ when $\exists j \in \{1, ..., n, A\}$ s.t. $f_j \leq (1 - \pi_c)$. Thus, in this case, Condition (22) is satisfied as well.

Last, consider the case in which $-1 + \pi_c \leq f_j \leq 1 - \pi_c$ for all firms (including A). In this case the investors’ demand for stock A is uninformative about the common strategy, that is $\Pr(S_c = G \mid -1 + \pi_c \leq \cap_{j=1}^{n+1} f_j \leq 1 - \pi_c) = \frac{1}{2}$. Moreover, the stock price of firm A is $p_A^M$ according to the conjectured equilibrium. Hence, the manager of firm A will implement the common strategy ($I^* = 1$) if and only if he receives a signal that the common strategy is good, just as in the benchmark case. We deduce that,

$$E(V_{A3}(I^*(\Omega_3, S_c), S_c) \mid \Omega_2) = V_{A1}^{Benchmark},$$

which is equal to $p_A^M$. Hence, if $-1 + \pi_c \leq f_j \leq 1 - \pi_c$ for all stocks, Condition (21) is satisfied. Moreover, we deduce that:

$$E(r(S_c, n(S_c), t_{S_c}) \mid \Omega_2) = r(S_c, n, G) \text{ if } \exists j \in \{1, ..., n, A\} \text{ s.t. } f_j \geq (1 - \pi_c),$$

which is equal to the stock price of firm $j \neq A$ when $-1 + \pi_c \leq f_j \leq 1 - \pi_c$ for all stocks. Thus, in this case, Condition (22) is satisfied as well.

**Proof of Lemma 2:** The proof of Lemma 2 follows the same steps as the proof of Lemma 1 and is therefore omitted for brevity.

**Proof of Proposition 2:** Firm A will choose the unique strategy iff $V_{A1}(S_u) > V_{A1}(S_c)$. The proposition follows by replacing $V_{A1}(S_u)$ and $V_{A1}(S_c)$ by their expressions given in (11) and (12).

**Proof of Proposition 3:** When firm A is private, it will choose the unique strategy iff $V_{A1}^{private}(S_u) > V_{A1}^{private}(S_c)$. The proposition follows by replacing $V_{A1}^{private}(S_u)$ and $V_{A1}^{private}(S_c)$ by their expressions given in (13) and (14).

**Proof of Corollary 1:** Using the expressions for $\hat{\lambda}(\gamma, \pi_u, \pi_c(n))$ and $\hat{\lambda}^{private}(\gamma, \pi_c(n))$, we obtain that $\hat{\lambda}(\gamma, \pi_u, \pi_c(n)) < \hat{\lambda}^{private}(\gamma, \pi_c(n))$ iff $\pi_u > \frac{\gamma(\pi_c(n) - \pi_c(n-1))}{\gamma + (1 - \gamma)\pi_c(n-1)}$. Thus under this condition, a firm for which $\hat{\lambda}(\gamma, \pi_u, \pi_c(n)) < \lambda(n) < \hat{\lambda}^{private}(\gamma, \pi_c(n))$ chooses the common strategy if it is private but the unique strategy if it is public.
References


Table 1: Descriptive Statistics

This table reports the summary statistics of the main variables used in the analysis. We present the number of observation and mean. All variables are defined in the text. In Panel A, we present the statistics for firm-level observations (IPO firms, established peers of IPO firms, and established peers of peers of IPO firms). In Panel B, we present statistics for average firm-pair level observations. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). In Panel C, we present statistics for average firm-pair-year level observations. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). Peers and Peers of Peers are defined using the TNIC industries developed by Hoberg and Phillips (2014). We define established peers as public firms that have been listed for more than 5 years. We track pairs over five years following each IPO, so that the event time variable $\tau = 0, 1, 2, 3, 4, \text{ or } 5$. The sample period is from 1996 to 2011.

<table>
<thead>
<tr>
<th>$\tau=0$</th>
<th>Panel A: Firm-level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IPO firms</td>
</tr>
<tr>
<td>N</td>
<td>1,231</td>
</tr>
<tr>
<td>Age</td>
<td>0.000</td>
</tr>
<tr>
<td>$\Delta_{i,j}$</td>
<td>0.974</td>
</tr>
<tr>
<td>$\beta_{i,j}$</td>
<td>0.085</td>
</tr>
<tr>
<td># of Peers</td>
<td>86.128</td>
</tr>
<tr>
<td>log(A)</td>
<td>4.987</td>
</tr>
<tr>
<td>MB</td>
<td>3.480</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\tau=0$</th>
<th>Panel B: Pair-level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treat=1</td>
</tr>
<tr>
<td>N</td>
<td>31,427</td>
</tr>
<tr>
<td>$\Delta_{i,j}$</td>
<td>0.967</td>
</tr>
<tr>
<td>$\beta_{i,j}$</td>
<td>0.109</td>
</tr>
<tr>
<td>Age$<em>{i}$-Age$</em>{j}$</td>
<td>-13.164</td>
</tr>
<tr>
<td>log(A)$<em>{i}$-log(A)$</em>{j}$</td>
<td>-0.969</td>
</tr>
<tr>
<td>MB$<em>{i}$-MB$</em>{j}$</td>
<td>1.089</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All $\tau$</th>
<th>Panel C: Pair-year-level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treat=1</td>
</tr>
<tr>
<td>N</td>
<td>139,101</td>
</tr>
<tr>
<td>$\Delta_{i,j}$</td>
<td>0.972</td>
</tr>
<tr>
<td>$\beta_{i,j}$</td>
<td>0.121</td>
</tr>
<tr>
<td>Age$<em>{i}$-Age$</em>{j}$</td>
<td>-13.265</td>
</tr>
<tr>
<td>log(A)$<em>{i}$-log(A)$</em>{j}$</td>
<td>-0.847</td>
</tr>
<tr>
<td>MB$<em>{i}$-MB$</em>{j}$</td>
<td>0.426</td>
</tr>
<tr>
<td>$\tau$</td>
<td>4.037</td>
</tr>
</tbody>
</table>
This table presents the results from estimations of equation (17). The dependent variable is the degree of product differentiation between firm i and j. The unit of observation is a firm-pair-year. The sample includes pairs where one firm (firm i) is an IPO firm and the other firm (firm j) is an established peer, and pairs where one firm (firm i) is a peer of an IPO firm and the other firm (firm j) is a peer of firm i than is not a peer of the IPO firm. We identify peers using the TNIC network developed by Hoberg and Phillips (2014) and defined established peers as public firms that have been listed for more than 5 years. We select peers of peers using a matching procedure as defined in Section 3. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). We track pairs over five years following each IPO, so that the event time variable \( \tau = 0, 1, 2, 3, 4, \) or 5. The control variables include the difference in size and market-to-book ratio between firms in each pair. The sample period is from 1996 to 2011. The control variables are divided by their sample standard deviation to facilitate economic interpretation. Columns (1) to (3) present baseline estimations. In column (4) we constrain the sample to include only firm-pairs for which we have non-missing observations for at least three years. In column (5) we consider 5 matches to construct counterfactual pairs instead of 3. In column (6) we consider differences in size matches to construct counterfactual pairs instead of product differentiation. The standard errors used to compute the \( t \)-statistics (in squared brackets) are adjusted for heteroskedasticity and within-firm-pair clustering. All specifications include firm-pair and calendar year fixed effects. Symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

<table>
<thead>
<tr>
<th>Dependent Variable: Product Differentiation (( \Delta_{ij} ))</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \tau )</td>
<td>0.147*** 0.142*** 0.142*** 0.130*** 0.135*** 0.146***</td>
<td>[62.907] [57.389] [57.331] [50.524] [70.914] [55.948]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \tau \times \text{Treat} )</td>
<td>0.027*** 0.026*** 0.014** 0.035*** 0.021***</td>
<td>[4.824] [4.736] [2.501] [6.461] [3.763]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \log(A)_i - \log(A)_j )</td>
<td>-0.024*** -0.014** -0.020*** -0.070***</td>
<td>[-3.718] [-2.068] [-3.771] [-10.108]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( M_{B_i} - M_{B_j} )</td>
<td>-0.007*** -0.004** -0.007*** -0.002</td>
<td>[-3.350] [-2.044] [-4.350] [-0.825]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair Fixed Effects (( \alpha_{ij} ))</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects (( \delta_t ))</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs.</td>
<td>633,745</td>
<td>633,745</td>
<td>633,745</td>
<td>558,680</td>
<td>943,223</td>
<td>638,986</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.729</td>
<td>0.729</td>
<td>0.729</td>
<td>0.712</td>
<td>0.714</td>
<td>0.770</td>
</tr>
</tbody>
</table>
Table 3: Differentiation post-IPO: Return Co-movement ($\beta_{ij}$)

This table presents the results from estimations of equation (17). The dependent variable is return co-movement between firm $i$ and $j$. The unit of observation is a firm-pair-year. The sample includes pairs where one firm (firm $i$) is an IPO firm and the other firm (firm $j$) is an established peer, and pairs where one firm (firm $i$) is a peer of an IPO firm and the other firm (firm $j$) is a peer of firm $i$ than is not a peer of the IPO firm. We identify peers using the TNIC network developed by Hoberg and Phillips (2014) and defined established peers as public firms that have been listed for more than 5 years. We select peers of peers using a matching procedure as defined in Section 3. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). We track pairs over five years following each IPO, so that the event time variable $\tau = 0, 1, 2, 3, 4, \text{ or } 5$. The control variables include the difference in size and market-to-book ratio between firms in each pair. The sample period is from 1996 to 2011. The control variables are divided by their sample standard deviation to facilitate economic interpretation. Columns (1) to (3) present baseline estimations. In column (4) we constrain the sample to include only firm-pairs for which we have non-missing observations for at least three years. In column (5) we consider 5 matches to construct counterfactual pairs instead of 3. In column (6) we consider differences in size matches to construct counterfactual pairs instead of product differentiation. The standard errors used to compute the t-statistics (in squared brackets) are adjusted for heteroskedasticity and within-firm-pair clustering. All specifications include firm-pair and calendar year fixed effects. Symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>controls</td>
<td>&gt;3yrs</td>
<td>M-5</td>
<td>M-size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\tau$</td>
<td>-0.003***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.003***</td>
<td>-0.002***</td>
<td>-0.000</td>
</tr>
<tr>
<td>$\tau \times \text{Treat}$</td>
<td>-0.002**</td>
<td>-0.001*</td>
<td>-0.001**</td>
<td>-0.001*</td>
<td>-0.004***</td>
<td></td>
</tr>
<tr>
<td>$\log(A_i) - \log(A_j)$</td>
<td>-0.016***</td>
<td>-0.017***</td>
<td>-0.016***</td>
<td>-0.016***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{MB}_i - \text{MB}_j$</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.002***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-1.284]</td>
<td>[-1.250]</td>
<td>[-0.700]</td>
<td>[-6.656]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{Pair Fixed Effects (} \alpha_{ij} \text{)}$</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>$\text{Year Fixed Effects (} \delta_t \text{)}$</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs.</td>
<td>618,811</td>
<td>618,811</td>
<td>618,811</td>
<td>545,005</td>
<td>921,058</td>
<td>624,325</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.261</td>
<td>0.261</td>
<td>0.261</td>
<td>0.246</td>
<td>0.259</td>
<td>0.262</td>
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</tbody>
</table>
Table 4: Differentiation post-IPO: Managerial Information (λ)

This table presents the results from estimations of equation (18). The dependent variable is the degree of product differentiation (columns (1) and (2)) or return co-movement (columns (3) and (4)) between firm i and j. The unit of observation is a firm-pair-year. The sample includes pairs where one firm (firm i) is an IPO firm and the other firm (firm j) is an established peer, and pairs where one firm (firm i) is a peer of an IPO firm and the other firm (firm j) is a peer of firm i than is not a peer of the IPO firm. We identify peers using the TNIC network developed by Hoberg and Phillips (2014) and defined established peers as public firms that have been listed for more than 5 years. We select peers of peers using a matching procedure as defined in Section 3. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). We track pairs over five years following each IPO, so that the event time variable τ = 0, 1, 2, 3, 4, or 5. The control variables (unreported) include the difference in size and market-to-book ratio between firms in each pair. The sample period is from 1996 to 2011. φ represents proxies for managerial information of the IPO firm i (Insider and InsiderAR). The proxies φ are divided by their sample standard deviation to facilitate economic interpretation. The standard errors used to compute the t-statistics (in squared brackets) are adjusted for heteroskedasticity and within-firm-pair clustering. All specifications include firm-pair and calendar year fixed effects. Symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

<table>
<thead>
<tr>
<th>Dep. Variable:</th>
<th>Prodot Differentiation (Δ, )</th>
<th>Return Co-movement (β, )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insider, InsiderAR,</td>
<td>Insider, InsiderAR,</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>τ</td>
<td>0.142***</td>
<td>-0.002***</td>
</tr>
<tr>
<td></td>
<td>[57.440]</td>
<td>[-5.862]</td>
</tr>
<tr>
<td>τ x Treat</td>
<td>0.020***</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>[3.574]</td>
<td>[-1.028]</td>
</tr>
<tr>
<td>τ x Treat x φ</td>
<td>0.022***</td>
<td>-0.002***</td>
</tr>
<tr>
<td></td>
<td>[5.407]</td>
<td>[-3.061]</td>
</tr>
<tr>
<td>Control Variables</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pair Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs.</td>
<td>633,745</td>
<td>618,811</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.729</td>
<td>0.261</td>
</tr>
</tbody>
</table>
Table 5: Differentiation post-IPO: Peers’ Price Informativeness ($\pi_i$)

This table presents the results from estimations of equation (18). The dependent variable is the degree of product differentiation (columns (1) to (3)) or return co-movement (columns (4) to (6)) between firm i and j. The unit of observation is a firm-pair-year. The sample includes pairs where one firm (firm i) is an IPO firm and the other firm (firm j) is an established peer, and pairs where one firm (firm i) is a peer of an IPO firm and the other firm (firm j) is a peer of firm i than is not a peer of the IPO firm. We identify peers using the TNIC network developed by Hoberg and Phillips (2014) and defined established peers as public firms that have been listed for more than 5 years. We select peers of peers using a matching procedure as defined in Section 3. Pairs that include an IPO firm are treated pairs (Treat=1) and pairs without an IPO firm are counterfactual pairs (Treat=0). We track pairs over five years following each IPO, so that the event time variable $\tau = 0, 1, 2, 3, 4, \text{or} 5$. The control variables (unreported) include the difference in size and market-to-book ratio between firms in each pair. The sample period is from 1996 to 2011. $\phi$ represents proxies for the (average) price informativeness of peer firm j (PIN, ERC, and Coverage). The proxies $\phi$ are divided by their sample standard deviation to facilitate economic interpretation. The standard errors used to compute the t-statistics (in squared brackets) are adjusted for heteroskedasticity and within-firm-pair clustering. All specifications include firm-pair and calendar year fixed effects. Symbols ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

<table>
<thead>
<tr>
<th>Dep. Variable:</th>
<th>Produt Differentiation ($\Delta_{ij}$)</th>
<th>Return Co-movement ($\beta_{ij}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\phi$</td>
<td>PIN$_i$</td>
<td>ERC$_i$</td>
</tr>
<tr>
<td>$\tau$</td>
<td>0.146***</td>
<td>0.136***</td>
</tr>
<tr>
<td>$\tau \times$ Treat</td>
<td>0.093***</td>
<td>-0.266***</td>
</tr>
<tr>
<td>$\tau \times$ Treat $\times$ $\phi$</td>
<td>-0.022**</td>
<td>0.073***</td>
</tr>
</tbody>
</table>

Control Variables: Yes Yes Yes Yes Yes Yes
Pair Fixed Effects: Yes Yes Yes Yes Yes Yes
Year Fixed Effects: Yes Yes Yes Yes Yes Yes

Obs. 577,179 569,191 633,745 573,554 567,106 618,811
Adj. $R^2$ 0.736 0.735 0.729 0.273 0.266 0.261
Figure 2: Differentiation post-IPO: Product Differentiation ($\Delta_{ij}$)

This figure displays the pattern of differentiation for treated and counterfactual firm-pairs in event time. We construct this figure by replacing the event-time variable $\tau$ in Equation (16) by a set of event-time dummy variables and their interaction with Treated. The solid line plots the estimated coefficients for the treated pairs (Treat=1), while the dotted line plots the estimated coefficients for the counterfactual pairs (Treat=0). The sample period is from 1996 to 2011. The specification includes firm-pair and calendar year fixed effects.