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ONLINE APPENDIX for

“Corporate Strategy, Conformism, and the Stock Market”

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This appendix contains the proofs and additional analyses that we mention in paper but that we decided not to report there to preserve space. The appendix is organized as follows.

- Section A proves Corollary 2.
- Section B proves that the stock market equilibrium is unique in our model.
- Section C replicates the results in Tables 2 and 3 of the paper using stock return co-movement to measure differentiation instead of the text-based measure of product differentiation developed by Hoberg and Phillips (2015).
- Section D documents a negative association between a firm’s overall degree of product differentiation (or uniqueness) and the informativeness of its stock price.
- Section E reports firm-level tests instead of the firm-pair level tests presented in the paper.

A Proof of Corollary 2.

Case 1. First consider the case in which firm A chooses the common strategy. Consider a speculator who buys information about this strategy. The expected profit of the speculator in firm $j \in \{1, \dots, n\}$ if she learns that the common strategy is good is $\Pi_j(+1, G)$ given in eq.(20). By symmetry, the expected profit of the speculator in firm $j \in \{1, \dots, n\}$ if she learns that the common strategy is bad is $\Pi_j(-1, B) = \Pi_j(+1, G)$. Thus, the ex-ante expected gross profit of receiving information about the common strategy and trading on this information in incumbent firm j is:

$$\bar{\Pi}(\pi_c) = \frac{1}{2}\Pi_j(+1, G) + \frac{1}{2}\Pi_j(-1, B) = \Pi_j(+1, G) \quad (1)$$

$$= \frac{(1 - \bar{\pi}(n, \pi_c))}{2}(2\sigma_c - \gamma(\bar{r}(S_c, n) - \bar{r}(S_c, n + 1))), \quad (2)$$

where the last equality follows from eq.(20).

A speculator who is informed about the type of the common strategy can also use her information to speculate in the stock market of firm A . If she learns that the common strategy is good the speculator buys one share of stock A in equilibrium. In this case, the speculator can make a profit only if the order flow of all firms (including A) does not reveal that the common strategy is good, that is, if the stock price of firm A is $p_{A2}^M(S_c) = \gamma r(S_c, n + 1, G)/2$. This happens with probability $(1 - \bar{\pi}(n, \pi_c))$. In this case, if the manager privately learns the type of the strategy then he will implement the strategy because it is good. Otherwise the manager abandons the strategy. Thus, in this case, the speculator's expected return on her position is $\gamma r(S_c, n + 1, G) - p_A^M(S_c) = \gamma r(S_c, n + 1, G)/2$. Hence, the speculator's expected profit on buying one share of firm A when (i) firm A chooses the common strategy and (ii) this strategy is good is

$$\Pi_A(+1, G) = (1 - \bar{\pi}(n, \pi_c))\gamma r(S_c, n + 1, G)/2. \quad (3)$$

A similar reasoning yields $\Pi_A(-1, B) = \Pi_A(+1, G)$. Thus, the ex-ante expected gross profit of receiving information about the common strategy and trading on this information in the

stock market of firm A is:

$$\bar{\Pi}_A(\pi_c) = \frac{(1 - \bar{\pi}(n, \pi_c))\gamma}{2}(\bar{r}(S_c, n + 1) + \sigma_c - 1).$$

A speculator who receives information about the common strategy can profitably trade in all stocks of firms following this strategy. Thus, her total expected profit is:

$$\bar{\Pi}(n, \pi_c) = n\bar{\Pi}(\pi_c) + \bar{\Pi}_A(\pi_c). \quad (4)$$

It is immediate that $\bar{\Pi}(n, \pi_c)$ decreases with π_c and is equal to zero when $\pi_c = 1$. Thus, there is no equilibrium in which $\pi_c^* = 1$ if $C > 0$. Moreover, if $\bar{\Pi}(n, 0) > C$ then $\pi_c^* = 0$ cannot be an equilibrium since it would then be optimal for at least one speculator to buy information on the type of the common strategy. When $0 < C < \bar{\Pi}(n, 0)$, the equilibrium mass of speculators informed about the common strategy, $\pi_c^*(n)$, is such that $\bar{\Pi}(n, \pi_c^*(n)) = C$ so that a speculator is just indifferent between getting information or not. Moreover, this equation has a unique solution in $(0, 1)$ because $\bar{\Pi}(n, \pi_c)$ decreases with π_c . In this case, using eq.(2), (3), and (4), we deduce that $\pi_c^*(n)$, must be such that:

$$(1 - \bar{\pi}(n, \pi_c^*(n))) = \frac{2C}{n(2\sigma_c - \gamma(\bar{r}(S_c, n) - \bar{r}(S_c, n + 1))) + \gamma(\bar{r}(S_c, n + 1) + \sigma_c - 1)}, \quad (5)$$

when firm A chooses the common strategy at date 1 and $0 < C < \bar{\Pi}(n, 0)$.

Case 2. Now suppose that firm A chooses the unique strategy and consider a speculator who buys information on the type of this strategy. The ex-ante expected profit of this speculator can be computed as for a speculator who buys information on the common strategy. The only difference is that the speculator can only use her information to speculate in the stock market of firm A (the firm choosing the unique strategy). Following the same steps as when firm A follows the common strategy, we deduce that the speculator's expected profit if she buys information on the unique strategy is:

$$\bar{\Pi}_A(\pi_u) = \frac{(1 - \pi_u)\gamma}{2}(\bar{r}(S_u, 1) + \sigma_u - 1). \quad (6)$$

Following the same step as in Case 1, we deduce that if $C \geq \bar{\Pi}_A(0)$, we have $\pi_u^* = 0$ and if $0 < C < \bar{\Pi}_A(0)$ then π_u^* solves $\bar{\Pi}_A(\pi_u^*) = C$, i.e. (using eq.(6)):

$$(1 - \pi_u^*) = \frac{2C}{\gamma(r(S_u, 1) + \sigma_u - 1)}. \quad (7)$$

Now, suppose that $C < \frac{(1-\bar{\pi}(n, \pi_c))}{2}(2\sigma_c - \gamma(\bar{r}(S_c, n) - \bar{r}(S_c, n+1)))$ so that $C < \bar{\Pi}(n, 0)$. This condition implies that $\pi_c^* > 0$ and therefore $\bar{\pi}(n, \pi_c^*) > 0$. If $C \geq \bar{\Pi}_A(0)$, we have $\pi_u^* = 0$ and then $\bar{\pi}(n, \pi_c^*) > \pi_u^*$ for any n . If $C < \bar{\Pi}_A(0)$, then π_c^* and π_u^* solve eq.(5) and eq.(7), respectively. We have $\pi_u^* \leq \bar{\pi}(n, \pi_c^*)$ iff $(1 - \pi_u^*) \geq (1 - \bar{\pi}(n, \pi_c^*))$. Using eq.(5) and (7), we deduce that this is the case if and only if:

$$\gamma(r(S_u, 1) + \sigma_u - 1) \leq n(2\sigma_c - \gamma(\bar{r}(S_c, n) - \bar{r}(S_c, n+1))) + \gamma(\bar{r}(S_c, n+1) + \sigma_c - 1), \quad (8)$$

i.e., if and only if $n > \bar{n}$ where:

$$\bar{n} = \frac{\gamma(\bar{r}(S_u, 1) - \bar{r}(S_c, n+1) + \sigma_u - \sigma_c)}{(2\sigma_c - \gamma(\bar{r}(S_c, n) - \bar{r}(S_c, n+1)))}.$$

B Equilibrium Uniqueness

We show that when firm A chooses the common strategy, the stock market equilibrium given in Lemma 1 is the unique equilibrium of our model. We omit the analysis of the case in which firm A chooses the unique strategy (Lemma 2) because the proof that the stock market equilibrium is unique in this case as well follows exactly the same steps.

Step 1. We first show that, in any equilibrium, informed speculators' trading strategy is such that $x_{ij}(G) = +1$, $x_{ij}(B) = -1$, and $x_{ij}(\emptyset) = 0$. Let $\mu_j(\hat{s}(S_c))$ be a speculator's estimate of firm j 's payoff when her signal is $\hat{s}(S_c) \in \{\emptyset, G, B\}$. To shorten notations, let $\beta(G) = \Pr(I^* = 1 | s_m = \emptyset, t_{S_c} = G)$ and $\beta(B) = \Pr(I^* = 1 | s_m = \emptyset, t_{S_c} = B)$. For incumbent firms, we have:

$$\mu_j(G) = (\gamma + (1 - \gamma)\beta(G))r(S_c, n+1, G) + (1 - \gamma)(1 - \beta(G))r(S_c, n, G), \quad (9)$$

$$\mu_j(B) = (1 - \gamma)\beta(B)r(S_c, n+1, B) + (1 - \gamma)(1 - \beta(B))r(S_c, n, B). \quad (10)$$

As $r(S_c, n, G) > r(S_c, n + 1, G) > r(S_c, n, B) > r(S_c, n + 1, B)$ (Assumption A.4), we deduce from eq.(9) and eq.(10) that $\mu_j(G) > \mu_j(B)$. An uninformed speculator has no information about the type of the common strategy. Thus, her valuation for an incumbent firm must be equal to the unconditional expected payoff of this firm, or, by the Law of Iterated Expectations: $\mu_j(\emptyset) = \mathbb{E}(\tilde{p}_{j2})$ for $j \in \{1, \dots, n\}$.

The expected profit of a speculator with signal $\hat{s}(S_c)$ is:

$$\Pi_j(x_{ij}, \hat{s}(S_c)) = x_{ij} \times (\mu_j(\hat{s}(S_c)) - \mathbb{E}(\tilde{p}_{j2} | \hat{s}(S_c))), \text{ for } j \in \{1, \dots, n\}.$$

Thus, $\Pi_j(x_{ij}, \emptyset) = 0$. Hence, $x_{ij} = 0$ is optimal if a speculator receives the signal $\hat{s}(S_c) = \emptyset$. Equilibrium stock prices must be such that $\mu_j(B) \leq \tilde{p}_{j2} \leq \mu_j(G)$. Otherwise, there would exist cases in which the market maker of firm j is willing to buy (resp., sell) the asset at price strictly larger than the largest (smallest) possible valuation of the asset by an informed speculator. Such transactions would result in an expected loss, violating the condition that market makers expect zero profit on each transaction in equilibrium. We deduce that:

$$\mu(B) \leq \mathbb{E}(\tilde{p}_{j2} | \hat{s}(S_c)) \leq \mu(G), \quad (11)$$

for $S_c \in \{G, B\}$. Thus, in any equilibria, $x_{ij}(G) = +1$ and $x_{ij}(B) = -1$ are weakly dominant strategies for informed speculators and these strategies are strictly dominant if the inequalities in eq.(11) are strict. This must be the case since $\pi_c < 1$. Indeed, suppose not (to be contradicted) and let $\hat{\pi}_c < \pi_c$ be the fraction of informed speculators who trade when they receive an informative signal. Then, as explained in the text, realizations of orders flows such $-1 + \hat{\pi}_c < f_{\min}$ and $f_{\max} < 1 - \hat{\pi}_c$ are such that trades are completely uninformative. Thus, $p_{j2} = \mathbb{E}(\tilde{p}_{j2})$ when $-1 + \hat{\pi}_c < f_{\min}$ and $f_{\max} < 1 - \hat{\pi}_c$. The probability of this event is not zero since $\hat{\pi}_c < \pi_c < 1$. This implies that there exist realizations of p_{j2} strictly within $\mu(B)$ and $\mu(G)$. Thus, $\mu(B) < \mathbb{E}(\tilde{p}_{j2} | \hat{s}(S_c)) < \mu(G)$, is a contradiction. Thus, in any equilibria, $x_{ij}(G) = +1$ and $x_{ij}(B) = -1$ for $j \in \{1, \dots, n\}$ are strictly dominant strategies for informed speculators.

For firm A , one can show in the same way that in any equilibria, $x_{iA}(G) = +1$ and $x_{iA}(B) = -1$ is a strictly dominant strategy for informed speculators while $x_{iA}(\emptyset) = 0$

is weakly dominant. The only difference is that the expressions for $\mu_A(G)$ and $\mu_j(B)$ are different from those given in eq.(9) and eq.(10).

Step 2. In step 1, we have shown that, in any equilibria, it must be the case that informed speculators buy all stocks (including A) if they learn that the common strategy is good and sell all stocks if they learn that the common strategy is bad. Moreover, in any equilibria, speculators who receive no signal optimally do not trade.

It follows that in any equilibria, order flows reveal that the common strategy is good if $f_{\max} > 1 - \pi_c$, that it is bad if $f_{\min} < -1 + \pi_c$, and contain no information if $-1 + \pi_c < f_{\min}$ and $f_{\max} < 1 - \pi_c$. All these events have a strictly positive probability when $0 < \pi_c < 1$. This feature has implications for equilibrium stock prices. Consider the determination of the price in stock A . Any equilibrium prices of stock A when $f_{\max} > 1 - \pi_c$ (denoted p_A^H) must satisfy Condition (5), i.e.,

$$\begin{aligned} p_A^H &= \mathbb{E}(V_{A3}(I^*(\Omega_3, S_A), S_A) \mid f_{\max} > 1 - \pi_c), \\ &= (\gamma + (1 - \gamma)\Pr(I^* = 1 \mid s_m = \emptyset, p_A = p_A^H))(r(S_c, n + 1, G) - 1), \end{aligned}$$

where, for the second line, we have used the facts that (i) $f_{\max} > 1 - \pi_c$ reveals that $t_{S_c} = G$ and (ii) therefore, market makers must anticipate that if he has private information, the manager will implement his strategy. When $-1 + \pi_c < f_{\min}$ and $f_{\max} < 1 - \pi_c$, any equilibrium price of stock A (denoted p_A^M) must satisfy (Condition (5) again):

$$\begin{aligned} p_A^M &= \mathbb{E}(V_{A3}(I^*(\Omega_3, S_A), S_A) \mid -1 + \pi_c < f_{\min} \text{ and } f_{\max} < 1 - \pi_c), \\ &= \gamma(r(S_c, n + 1, G) - 1)/2 + (1 - \gamma)\Pr(I^* = 1 \mid s_m = \emptyset, p_A = p_A^M)(\bar{r}(S_c, n + 1) - 1), \end{aligned}$$

where, for the second line, we have used the facts that if $-1 + \pi_c < f_{\min}$ and $f_{\max} < 1 - \pi_c$ then (i) market makers have no information on the type of the common strategy but (ii) they know that if the manager has no private information, he will base his decision on the observation that the stock price of firm A is p_A^M . When $f_{\min} < -1 + \pi_c$, any equilibrium

price of stock A (denoted p_A^L) must satisfy (Condition (5) again):

$$\begin{aligned} p_A^L &= \mathbb{E}(V_{A3}(I^*(\Omega_3, S_A), S_A) \mid f_{\min} < -1 + \pi_c), \\ &= (1 - \gamma)\Pr(I^* = 1 \mid s_m = \emptyset, p_A = p_A^L)(\bar{r}(S_c, n + 1) - 1), \end{aligned}$$

where, for the second line, we have used the facts that (i) $f_{\min} < -1 + \pi_c$ reveals that $t_{S_c} = B$ and (ii) therefore, market makers must anticipate that if he has private information, the manager will not implement his strategy. As $\bar{r}(S_c, n + 1) - 1 < 0$ (Assumption A.3) and $\gamma > 0$, we deduce that, in any equilibria, $p_A^H > p_A^M > p_A^L$.

Thus, in any equilibria, there are at least three different realizations for the equilibrium price, one for each possible range of order flows, i.e., (i) $f_{\max} > 1 - \pi_c$, (ii) $-1 + \pi_c < f_{\min}$ and $f_{\max} < 1 - \pi_c$ and (iii) $f_{\min} < -1 + \pi_c$. There cannot be more realizations. Indeed, suppose that this is not the case (to be contradicted). This implies that there are at least two realizations of order flows in the same range that leads to two different prices (e.g., for $f_{\max} > 1 - \pi_c$, there are two different realizations of f_{\max} that leads to two different equilibrium stock prices). This is not possible since these two prices have exactly the same informational content (they reveal in which range are the realizations of the order flows that lead to these prices) and should therefore lead to exactly the same decisions for the manager of firm A . As a result, the expected value of firm A must be the same for these two prices and therefore market makers' zero profit condition (Condition (5)) imposes that these prices are identical.

In sum, in any equilibria, there are exactly three possible realizations, p_A^H, p_A^M, p_A^L for the equilibrium stock price of firm A when $0 < \pi_c < 1$, such that $p_A^H > p_A^M > p_A^L$. We can proceed in a similar way to show that in any equilibria, there are exactly three possible realizations of equilibrium stock prices for incumbent firms and they must be such that $p_j^H > p_j^M > p_j^L$.

Step 3. Suppose that the manager does not receive private information at date 3. It follows from Step 2 that when he observes $p_A = p_A^H$, the manager of firm A can infer that $t_{S_c} = G$. Thus, $I^* = 1$ if $p_A = p_A^H$. If $p_A = p_A^L$, the manager of firm A can infer that $t_{S_c} = B$. It follows from A.2 that $I^* = 0$. If $p_A = p_A^M$, the beliefs of the manager of firm A are equal to his unconditional beliefs. Hence, A.3 implies that $I^* = 0$.

In sum, in any equilibria, the manager and speculators must behave as described in Parts 1 and 4 of Lemma 1. Moreover, in any equilibria, there are only three possible realizations for stock prices for each firm when $0 < \pi_c < 1$: (i) one when $f_{\max} > 1 - \pi_c$, (ii) one when $-1 + \pi_c < f_{\min}$ and $f_{\max} < 1 - \pi_c$, and (iii) one when $f_{\min} < -1 + \pi_c$. These conditions, combined with Conditions (6) and (5), uniquely pin down equilibrium stock prices for all firms. Thus, the equilibrium in Lemma 1 is unique.

C Stock Return Co-movement

As an alternative measure of strategic differentiation, we use stock return co-movement. The idea is that stock returns of firms that follow less differentiated strategies should co-move more.¹ We compute co-movement, denoted $\beta_{i,j}$, between every two firms i and j in the TNIC network. Specifically, we estimate for each firm-pair-year the following specification:

$$r_{i,w,t} = \beta_0 + \beta_{m,t}r_{m,w,t} + \beta_{i,j,t}r_{j,w,t} + \nu_{i,w,t} , \quad (12)$$

where $r_{i,w,t}$ is the (CRSP) return of firm i in week w of year t , $r_{m,w,t}$ is the market return (CRSP value-weighted index), and $r_{j,w,t}$ is the return of firm j . Hence, the estimate of $\beta_{i,j,t}$ measures the return co-movement between firms i and j in year t , after controlling for i and j exposure to market wide changes in prices. We interpret a higher value of $\beta_{i,j,t}$ as indicating that firms i and j follow less differentiated strategies.²

[Insert Tables IA.1 and IA.2 about here]

Table IA.1 replicates the baseline results of Table 2 (in paper). We obtain similar results when we measure differentiation between firms i and j using return co-movement ($\beta_{i,j}$) between these firms. Column (1) reveals a negative coefficient on τ indicating an overall decrease in return co-movement between firm-pairs over time. Moreover, in column (2), we

¹Note that this is the case in the model. The stock returns of firms that follow the common strategy are perfectly positively correlated. In contrast, the stock return of firm A and the stock return of established firms are uncorrelated if firm A follows the unique strategy.

²Consistent with this interpretation, the correlation between $\Delta_{i,j}$ and $\beta_{i,j}$ is -0.29 across all firm-pair-years of our sample.

report a significantly negative coefficient on $\tau \times Treated$, which confirms that treated firms become relatively more differentiated after their IPOs. The remaining columns corroborate the robustness of this result.

Table IA.2 report the results of the cross-sectional tests based on proxies for managers' private information (γ) and peers' stock prices informativeness ($\bar{\pi}(n, \pi_c)$) when we rely on co-movement to measure differentiation. In columns (1) and (2), we observe that the increase in differentiation post-IPO increases significantly with the intensity of insider trading, but not with the profitability of insiders' trades. Columns (3) to (6) 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, with the exception of analyst coverage where we observe a smaller decrease in $\beta_{i,j}$ when the established peers of newly-public firms have more informative prices.

D Differentiation and Prices Informativeness

The "conformity effect" highlighted by our model partly relies on the conjecture that the informativeness of the stock market about the common strategy is higher than the informativeness of the stock market about the unique strategy (Corollary 1). We provide empirical evidence that supports this claim by looking at the correlation between the uniqueness of a firm's product (i.e. its overall differentiation) and the informativeness of its stock price.

We measure the overall differentiation of a given firm i in a given year t (present in the TNIC network) as the average (or median) value of $\Delta_{i,j,t}$ across all peers j , which we label as $\Delta_{i,t}$. To measure the relationship between differentiation and price informativeness we estimate the following specifications. For the three proxies of price informativeness for which we have firm-year observations (PIN, ERC, and Coverage), we estimate the following model:

$$\pi_{i,t} = \delta_0 + \delta_1 \Delta_{i,t} + \delta_2 \log(A_{i,t}) + \delta_3 MB_{i,t} + \delta_4 Age_{i,t} + \eta_t + \varepsilon_{i,t} \quad (13)$$

where $\pi_{i,t}$ is one of the proxy for the stock price informativeness of firm i used in Section 4.2.2 (PIN, ERC, and Coverage), A is firm i 's total assets, MB its market-to-book ratio,

and *Age* its public age (i.e., time since its IPO). The η_t s are year-fixed effects.

For the proxy taken from Bai, Philipon, and Savov (2014) – where we do not have a firm-year level measure – we instead estimate the following interacted specification:

$$\frac{E_{i,t+k}}{A_{i,t}} = \theta_0 + \theta_1 MB_{i,t} + \theta_2 (MB_{i,t} \times \Delta_{i,t}) + \theta_3 \frac{E_{i,t}}{A_{i,t}} + \eta_t + \varepsilon_{i,t} \quad (14)$$

where $E_{i,t+k}$ is firm i 's earnings in year $t+k$. We focus on three horizons k : one-, two-, and year-year ahead earnings ($k = 1, 2, 3$).

[Insert Table IA.3 about Here]

Table IA.3 reports the results of these estimations. Panel A confirms that overall differentiation is negatively related to price informativeness. This relationship holds across all specifications, and is statistically significant in five out of six estimations. Firms that have more differentiated products appear to have notably less informative stock prices. This result also appears in Panel B. We observe negative and significant coefficients on the interaction term $MB_{i,t} \times \Delta_{i,t}$ across all specifications, indicating that the current stock prices of more differentiated firms have a *lower* ability to forecast future earnings – they are less informative.

E Firm-level Tests

Using the same measure of overall firm differentiation ($\Delta_{i,t}$), we estimate the baseline specification (17) (in the paper), but focus on firm-year observations instead of firm-year-pair observations. To do so, we compute $\Delta_{i,t}$ for each IPO firms and their initial established peers over the five years post-IPO ($\tau = 0, 1, \dots, 5$), selected as described in the paper. We assign IPO firms to the treated group, and their initial established peers in the non-treated group, and estimate the following specification:

$$\Delta_{i,\tau,t} = \alpha_i + \eta_0 \tau + \eta_1 (\tau \times Treated_{i,\tau,t}) + \delta_t + \beta X_{i,\tau,t} + \varepsilon_{i,\tau,t} \quad (15)$$

where the subscripts i refers to firm i , t is calendar time, and $\tau \in \{0, \dots, 5\}$ is event-time (i.e., the time elapsed since the entry of firm i in the sample). The firm fixed effects (α_i) control for any time-invariant firm characteristics, and the calendar time fixed effects (δ_t) control for common time-specific factors affecting the level of differentiation across all firms.³ The vector X controls for time-varying characteristics of firm i , namely its size (measured by total assets) and market-to-book ratios. We allow the error term ($\varepsilon_{i,\tau,t}$) to be correlated within pairs. By design, for every IPO firm we have several non-treated established firms. We estimate eq.(15) on a sample that includes all firm-year observations (for all IPO and established firms), and also on a restricted sample that eliminates duplicated established firms (i.e., a firm that can be a peer of several IPO firm in a given calendar year).

[Insert Table IA.4 about Here]

Table IA.4 present the results of the firm-level tests. Similar to the results we obtain using firm-pairs, we see that the coefficients on $\tau \times Treated$ are positive and significant. This indicates that IPO firms increase their overall degree of differentiation in the five years that follow their IPO significantly more than their established peers. Notably, we remark that the coefficients on τ are positive and mostly significant. Overall, firms become more differentiated – more unique – over their lifetime.

³Using firm i fixed effects instead of pair fixed effects yield qualitatively similar results.