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Legacy Anchoring in Reconfigured Inventor Teams and Subsequent New Domain Innovation Performance in Diversifying Public Firms

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Abstract

Innovation expansion into unfamiliar technological areas rarely depends on idea generation alone. Firms must decide who should staff the first projects in a new domain, how much responsibility should be given to newly recruited inventors, and whether experienced internal personnel should remain central once the firm moves outside its established knowledge base. Those staffing choices can shape not only the technical novelty of the resulting work but also its likelihood of becoming a commercially meaningful addition to the product portfolio. This paper examines whether new domain innovation performs better when new entrants are paired with well-connected internal inventors who can translate unfamiliar knowledge into the firm's existing routines and architectures. The analysis uses a panel of 214 publicly listed U.S. firms from 2011 to 2024 and identifies 1,184 firm-domain entry spells together with 4,936 patent teams attached to those entries. A legacy anchoring index is developed from inventor network centrality, prior within-firm patent histories, and the composition of each new-domain team. The evidence indicates that domain-entry patents created by mixed teams containing both entrants and internally central legacy inventors exhibit higher recombinant novelty, receive more forward citations, and are more likely to be followed by a product launch within twenty-four months than patents produced by entrant-only or incumbent-only teams. The pattern is not exaggerated. Relative to entrant-only teams, anchored mixed teams generate 6.3% more three-year citation-weighted impact and raise launch conversion probability by 5.8 percentage points. They also retain entrant inventors longer. The results remain stable under firm fixed effects, domain-entry matching, inverse probability weighting, and alternative definitions of new domains and inventor centrality.

1. Introduction

When firms move into a technological area where they possess little prior experience, the first practical problem is usually not abstract creativity but staffing. The organization must decide whether to rely on incumbents who understand internal routines but may lack frontier-specific expertise, to recruit outsiders who bring fresh knowledge but weak internal ties, or to assemble hybrid teams that combine both groups [1]. This decision is economically important because early projects in a new domain often shape the coding conventions, search routines, platform assumptions, and commercialization path of everything that follows. If the first teams are badly assembled, the firm can spend heavily on a promising area while creating knowledge that remains difficult to absorb or scale. If they are assembled more carefully, the same firm may convert a relatively small number of initial projects into a persistent new line of innovative activity.

The standard empirical proxies for innovation do not answer this staffing question directly. Patent counts, patent citations, R&D intensity, launch counts, and innovation-related disclosures indicate what firms produce or say, but they reveal less about how the people doing the work are arranged. Yet in unfamiliar domains, the organization of expertise is often decisive. New inventors may introduce tools, scientific references, and problem framings unavailable inside the firm. Long-tenured inventors may supply architecture memory, credibility with downstream functions, and the informal authority needed to move an

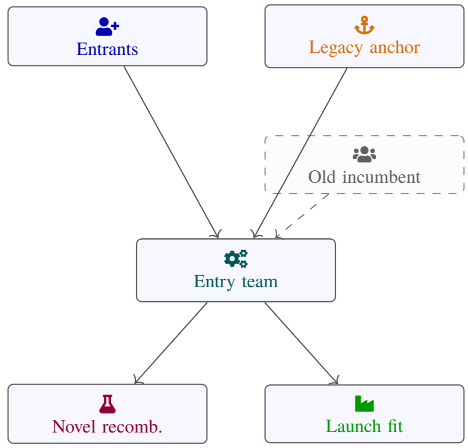

Figure 1: Core team architecture for a first move into a new technological domain.

uncertain project through internal review. A firm entering a new domain with only incumbents may remain locked into old heuristics. A firm entering with only outsiders may create elegant projects that remain loosely coupled to internal systems. What requires closer examination is whether a specific form of hybrid assembly performs better than either pure form.

This paper studies that question by focusing on legacy anchoring. The term refers to the presence, within a newly configured invention team, of internal inventors who are not merely experienced employees but well-connected carriers of the firm's accumulated technical and organizational memory [2]. These inventors have prior within-firm patenting histories and occupy central positions in the internal co-invention network. They are therefore distinct from ordinary incumbents. The empirical argument developed here is that such legacy anchors can make new-domain teams more effective when paired with entrant inventors who possess knowledge the firm did not previously hold. Anchors can translate unfamiliar technical approaches into the firm's design grammar, link the new effort to complementary assets, and reduce frictions with downstream engineering and commercialization units. Entrants, in turn, keep the team from merely reproducing the firm's historical search path.

The relevance of who holds technical knowledge rather than just how much knowledge is present is consistent with the broader point made by Cao et al. (2024b) [3], who show that specialized technical knowledge weakens the negative effect of incubator specialization on startups' R&D efficiency. Their result suggests that human capital composition changes the way knowledge environments operate, which is useful here because new-domain entry is also a problem of how specialized knowledge is embedded and protected inside a team. A firm does not simply enter a new area by increasing R&D spend. It enters by forming a temporary micro-organization whose members must combine distinct knowledge stocks without losing the advantages of either novelty or internal fit.

The paper examines publicly listed U.S. firms that file patents and disclose enough product activity to trace entries into new technological domains. A new domain entry is defined as the firm's first meaningful move into a patent class cluster absent from its own portfolio during the preceding six years. Once such an entry is identified, the analysis reconstructs the composition of the patent teams attached to that entry. Inventors are classified as entrants, legacy anchors, or non-anchor incumbents on the basis of their prior connection to the firm and their position in the firm's existing co-inventor network. The key explanatory variable is a legacy anchoring index that captures the extent to which a team actually joins entrants with internally central legacy inventors rather than merely containing a mix of old and new names.

Three outcomes are considered. The first is the recombinant novelty of the new-domain patents themselves, since the immediate purpose of entering a new domain is often to combine unfamiliar and familiar knowledge components in ways the firm could not previously achieve. The second is downstream commercialization, measured by whether the new domain produces a product or service launch within twenty-four months and by the revenue share associated with such launches where disclosure permits. The third is entrant persistence, because a team assembly choice that generates one good patent but drives away new knowledge holders may have weak long-

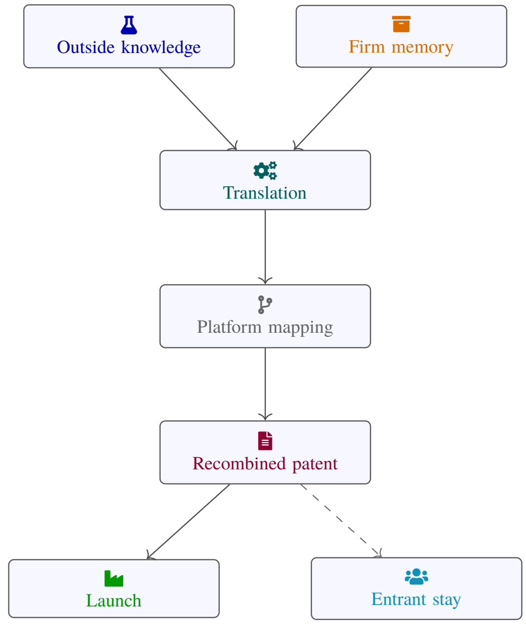

Figure 2: Mechanism linking anchored recombination to downstream outcomes.

run value. These outcomes are deliberately different. A staffing arrangement that looks favorable only on patent citations but not on commercialization or retention would tell a more limited story than one that performs across all three margins.

The approach is empirical from beginning to end. The central tests rely on firm and year fixed effects, firm-domain entry matching, and additional checks against selection into team composition. The paper does not assume that firms randomly mix entrants with legacy anchors. Strong firms may be more likely to do so, and more promising domains may attract such teams. For that reason, the models condition on prior firm innovation quality, acquisition intensity, R&D intensity, domain distance, product-market opportunity, and multiple indicators of pre-entry search conditions. Propensity weighting and matched-entry analyses further reduce the likelihood that the main results are artifacts of observable selection.

The findings point to a clear but measured pattern. Teams that combine entrants with legacy anchors outperform entrant-only teams, incumbent-only teams, and mixed teams lacking a legacy anchor. They file patents with stronger recombinative structure, receive more forward influence, convert more often into launches, and retain entrant inventors longer. These effects are not so large as to suggest that staffing choice dominates everything else. They are instead persistent and moderate, which is exactly what would be expected if the staffing mechanism matters but operates alongside many other determinants of innovation success.

The paper differs from work that treats entry into a new technological domain as a problem of search breadth, R&D volume, or external acquisition alone. It asks a narrower and more organizational question: once the firm chooses to enter a new domain, which team structure helps the entry become technically useful, commercially real, and stable enough to support further work? That question has concrete relevance because firms often know surprisingly little about how to configure the first teams in areas where they lack internal precedent. The evidence assembled here suggests that the answer is not to exclude new hires, nor to hand them the project in isolation, nor to let incumbents absorb the domain by themselves [4]. The answer, more often than not, lies in pairing external novelty with internal carriers of organizational memory.

2. Staffing Unfamiliar Search

A firm entering a new knowledge area faces two coordination tasks at once. It must understand the new technical space well enough to avoid superficial copying, and it must connect that space to the firm's own routines, interfaces, constraints, and commercialization channels. These tasks frequently pull in different directions. External entrants often know the new space better than the firm's incumbents, especially when the domain entry follows scientific

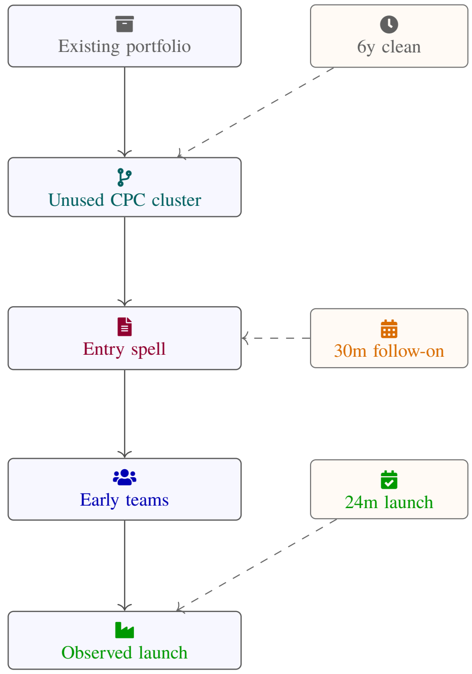

Figure 3: Tracing a firm-domain entry spell from first unfamiliar class use to market appearance.

change, platform convergence, or hiring from specialized competitors. Yet those entrants may not know how design approval is negotiated internally, how the firm's installed base constrains architecture choices, or which downstream units have veto power over transition from concept to product. Incumbents know those things, but may interpret the new domain through habits formed in older technical settings. The challenge is therefore not just to aggregate expertise but to organize it so that each type of knowledge remains useful.

This problem becomes sharper because new-domain entry is rarely a single act. The first patent or first prototype typically sits at the front of a sequence involving codification, internal interpretation, platform mapping, budgeting, and downstream respecification. A team composed solely of entrants may excel at frontier detection but struggle with internal transmission. A team composed solely of incumbents may diffuse internal coordination costs but reproduce old search templates when the new domain requires a break from those templates. Mixed teams are an obvious middle path, yet simple mixture is not enough. If the incumbent members of the team are peripheral or weakly connected inside the organization, the team may still lack a credible bridge into the firm's existing systems. A mixed team in name can thus remain unanchored in practice.

The legacy anchor concept addresses this distinction. A legacy anchor is an incumbent inventor whose role in the firm predates the new-domain move and whose internal network position makes that inventor more than a technical contributor. Such individuals often sit at the intersection of multiple development paths, have repeated copatenting ties, and understand which components or modules are reusable from prior projects. They also tend to carry more influence in evaluation settings where unfamiliar knowledge must be defended against internal skepticism. In a new-domain team, a legacy anchor can make the difference between a project that remains scientifically novel but organizationally awkward and one that becomes interpretable inside the firm's established decision channels.

The expected gains from anchoring are not purely internal. Entering a new domain often brings uncertain value consequences because the firm is investing in an area where it lacks a proven commercialization record. Cao et al. (2025) [5] show, in the context of environmental innovation, that the financial returns to innovation are shaped by firm-level characteristics such as reputation, effectiveness, and efficiency, as well as by market conditions. That finding is informative here because it implies that innovative effort does not yield a uniform payoff independently of how the firm is equipped to handle it. Legacy anchor-

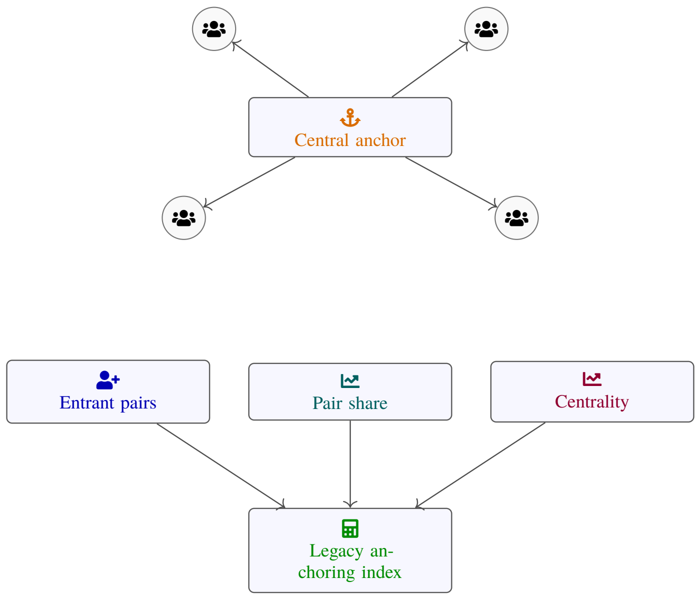

Figure 4: Construction logic for the legacy anchoring index.

ing can be understood as one such internal capability. It does not create frontier knowledge by itself, but it can determine whether the knowledge introduced by entrants becomes productive within the firm's own system rather than remaining detached from it.

The mechanism through which anchoring should affect new-domain performance is best understood as translation rather than control. Anchors do not simply supervise entrants. They translate between unfamiliar domain knowledge and the firm's accumulated technical memory. Translation occurs in several forms. First, anchors can identify which older components, code bases, manufacturing know-how, or supplier relationships remain useful and which should be abandoned [6]. Second, they can reduce friction with neighboring units that might otherwise see the new-domain project as incompatible with established platforms or quality requirements. Third, they can accelerate informal problem resolution because they already know whom to contact inside the organization when bottlenecks arise. None of these tasks appears directly in a patent count, yet each can affect whether a new-domain patent becomes influential and whether it eventually supports a launch.

There is a second mechanism operating through retention. Entrant inventors often join a firm because they expect not only research freedom but also organizational capacity to turn their ideas into enduring projects. If they encounter a setting in which their new-domain work is isolated from the firm's core technical structures, they may find the experience frustrating even when the formal project survives. A legacy anchor can raise the probability that the entrant's knowledge becomes embedded rather than stranded. Entrants who see their ideas translated into subsequent filings, shared technical language, or follow-on prototypes may be more likely to stay. This matters because new-domain entry often requires several rounds of recombination before commercially robust output appears. Losing the entrant after the first filing can therefore be costly even if the initial patent looks promising.

The distinction between anchored and unanchored mixture also helps explain why some mixed teams underperform despite having both old and new inventors on paper. When incumbents on the team lack internal centrality, they may contribute local technical knowledge but little organizational leverage. They cannot open interfaces efficiently, cannot broker between skeptical units, and cannot convincingly defend the relevance of a new domain to legacy product architectures. In such teams the entrants may still do most of the conceptual work, but the output remains weakly integrated. The result can be patents that appear novel but receive less subsequent reuse and are slower to connect to marketable products.

The same logic suggests that incumbent-only teams should do relatively well on internal process discipline but less well on domain-level originality. They understand the firm's architecture but may enter the new domain by extending familiar problem framings. As a result, they may produce technically competent but less unusual

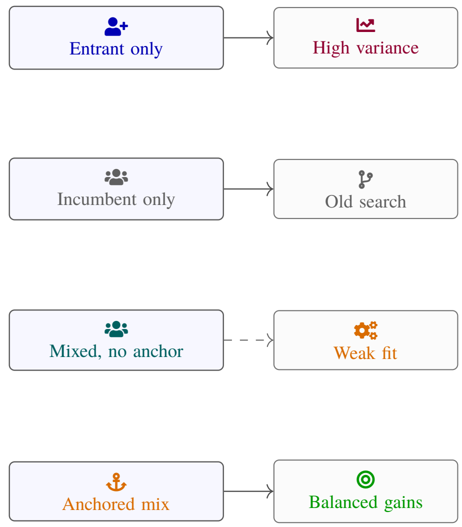

Figure 5: Expected comparison across alternative team archetypes.

combinations of classes, references, or solution components. Entrant-only teams, by contrast, may generate high-variance outputs. Some will be highly original, but many will fail to connect to internal commercialization routines or even to the firm's own subsequent patent trajectory [7]. Anchored mixed teams should be less volatile because they combine frontier access with internal transmission.

Another reason anchored mixing should matter is that firms entering a new domain often face internal evaluation ambiguity. The organization may be uncertain whether the new domain belongs under an existing platform, a new business line, or a peripheral experiment. Resource requests, prototype escalation, and product roadmapping therefore depend not only on technical merit but also on whether the project is legible to actors outside the original invention group. Cao et al. (2023) [8] show that capital market participants use innovation potential to soften negative interpretations of insider selling in IPO settings, which underscores a broader point: under uncertainty, observers rely on innovation-related cues to infer future quality. Inside firms, managers behave similarly. They rely on who is attached to a new-domain project and what that attachment implies for the credibility of the initiative. A legacy anchor can increase that credibility without reducing the entrant's contribution to novelty.

The final theoretical element concerns the outward-facing perception of innovative initiatives. Firms sometimes announce domain moves, platform shifts, or science-based pushes before commercial proof exists. When outsiders evaluate such moves, they do not look only at the idea category. They also look at the surrounding signals of governance and participant choice. Cao et al. (2024a) [9] show that investors respond differently to marketing ideation crowdsourcing contests depending on contest design choices involving people and task scope. The implication for the present setting is not that inventors are publicly judged in the same way as contest participants. It is that innovation initiatives are interpreted partly through the structure of the people assembled to carry them. A new-domain initiative staffed by a team that visibly joins credible internal carriers with new domain specialists may therefore be easier for external audiences and internal sponsors alike to treat as a serious strategic move rather than a detached experiment.

These arguments produce three empirical expectations. The first is that new-domain patents filed by anchored mixed teams should display stronger recombinant novelty and higher forward influence than those filed by entrant-only, incumbent-only, or mixed-unanchored teams. The second is that anchored teams should convert more frequently into launches and yield a larger share of subsequent sales from the entry domain where disclosed. The third is that entrant inventors in anchored teams should remain with the firm longer because their knowledge is more likely to become embedded in follow-on work. None of these expectations requires the legacy anchor to dominate the team. In fact, the proposed advantage arises from pairing rather than substitution. The anchor supplies translation and internal reach, while the entrant supplies domain expansion. The empirical question is whether that pairing leaves a measurable trace in the data.

3. Tracing Domain Entry Episodes

The empirical analysis begins by identifying episodes in which a firm enters a technological domain that is new to its own recent history. The sample frame includes U.S. publicly listed firms between 2011 and 2024 in software, electronic components, instruments, industrial machinery, specialty chemicals, communications equipment, medical devices, and selected business services with patenting and product development activity. Financial firms, utilities, media content businesses, and sectors where patenting does not map cleanly to product development are excluded. The initial universe contains 467 firms. Firms are retained if they have at least four consecutive years of financial data, identifiable patent assignees, and enough product or service disclosure to observe whether a new technological entry later reaches market form. After removing firms with insufficient inventor histories, missing annual reports, or ambiguous assignee continuity following major restructuring, the final panel contains 214 firms.

A domain entry spell is defined at the firm-by-domain-by-year level. Domains are constructed from clustered CPC subclasses using a two-step procedure. First, patent classes are grouped into broader knowledge clusters with stable semantic and citation overlap. Second, each firm's prior six-year patent history is examined. A firm is coded as entering a domain in year t when it files a patent application in a domain cluster absent from its own portfolio during years $t-6$ through $t-1$ and when the entry is not merely the result of an acquired patent family that never becomes active inside the firm. To avoid coding accidental or opportunistic filings as true entries, the spell is retained only if the firm produces at least one follow-on application in the same cluster within thirty months or publicly discloses a product or technology initiative linked to the cluster [10]. This rule prevents the domain-entry dataset from being dominated by one-off speculative filings [11].

The resulting database includes 1,184 firm-domain entry spells and 4,936 patent teams attached to the first thirty months of those entries [12]. The median spell contains three patent applications in the observation window, though the distribution is right-skewed. About one-quarter of entries generate only one or two applications, while a smaller subset quickly produces large sequences of follow-on patents. The median domain distance from the firm's existing portfolio, measured by cosine dissimilarity in the vector of cited prior classes, is 0.42. This indicates that many entries are neither trivial extensions nor complete leaps into unrelated science. They are, more often, moves into neighboring but unfamiliar technological territory.

The inventor histories are reconstructed from patent records using disambiguated inventor identifiers. An inventor is classified as an entrant to firm i in year t if the inventor appears on a focal team during the entry spell and had no patent assigned to firm i in the previous five years. Entrants include both inventors recruited from other organizations and first-time patenting inventors entering the firm's inventive workforce. An inventor is classified as an incumbent if the inventor patented with the firm during the previous five years. Among incumbents, a legacy anchor is identified when two conditions hold simultaneously: the inventor has at least four prior firm-assigned patent families and the inventor's eigenvector centrality in the firm's pre-entry co-inventor network is above the firm-year median. This classification is intentionally conservative. It excludes long-tenured inventors who remained peripheral and recent inventors who have not yet accumulated sufficient embeddedness to serve as organizational bridges.

This distinction matters empirically [13]. Roughly 31% of the new-domain teams contain at least one legacy anchor, 28% contain incumbents but no anchor, 24% are entrant-only, and 17% are incumbent-only. Team size averages 3.4 inventors. Entrant-only teams are slightly smaller on average than anchored mixed teams, but not dramatically so. Anchored mixed teams are more common in larger firms and in domains that are technologically adjacent rather than fully distant, although the overlap is imperfect. Several firms repeatedly enter new domains with entrant-only teams, while others almost always include anchors. This within-firm variation is one reason the fixed-effects design is informative.

A major advantage of the domain-entry framework is that it focuses attention on a narrow organizational problem. The question is not whether anchored teams are better for all innovation. Established domains often reward specialist depth, modular continuity, or repeated cooperation among incumbents. New-domain entry is different because it involves uncertainty about how novel knowledge should be absorbed. By restricting attention to entry spells, the analysis compares staffing choices under a common strategic task. This reduces the risk that the results simply reflect the general superiority of one team form across all innovative work.

Product and service launches linked to the entry domains are identified using firm press releases, archived product pages, investor presentations, industry databases, and earnings transcripts. A launch is matched to a domain entry when the technical language, component references, or product functionality correspond to the domain's patent cluster and when the timing follows the focal entry spell. To avoid counting routine maintenance updates as commercialization, the launch must include a material feature set, architecture revision, or new service capability connected to the entry domain [14]. For 143 firms, the analysis can also estimate the subsequent revenue share associated with entry-domain launches from segment disclosures, product family commentary, or explicit recent-product revenue statements. These observations form a narrower but economically useful subsample.

The panel is merged with accounting, ownership, analyst, and market data [15]. Controls include firm size, leverage, cash holdings, R&D intensity, advertising intensity, acquisition intensity, capital intensity, analyst coverage, institutional ownership, prior stock return, return on assets, and year indicators. Because firms sometimes enter domains in response to mergers or licensing deals, the data track major acquisitions, licensing announcements, and alliance intensity. The domain-entry models include controls for these events so that anchored team effects are not simply capturing cases where the firm bought both the domain and the people associated with it.

Descriptive patterns are informative before formal estimation begins [16]. Entrant-only teams display the highest variance in subsequent citations. Some produce very influential patents, but many remain isolated from the firm's later portfolio [17]. Incumbent-only teams convert to follow-on patents quickly but show lower average class-recombination novelty. Mixed teams without a legacy anchor sit between these patterns. Anchored mixed teams perform most consistently across novelty, citations, and launch conversion. They are not universally best in every raw tabulation, but they dominate the other team forms more often than would be expected if staffing composition were irrelevant.

One might suspect that the legacy anchor classification simply captures team quality because central inventors are likely to be better inventors in general. Two aspects of the design help address this concern. First, the team measures distinguish legacy anchors from ordinary incumbent quality by focusing on within-firm network position before the new-domain project begins. Second, the regressions control for team-level prior inventor quality, including average prior citation influence of all members. The anchor effect therefore does not reduce to the presence of strong inventors alone [18]. It is about whether the strong incumbent is also embedded in the firm in a way that makes translation and integration possible.

The domain-entry sample is necessarily more selective than a broad patent panel, but that selectivity is desirable. The aim is not to characterize all inventive activity performed by public firms. The aim is to isolate a recurrent managerial challenge: who should be placed on the first teams when the firm moves into an area it does not already know well? A carefully bounded sample allows that question to be addressed more directly than would a larger but less focused database.

4. Team Measures and Statistical Design

The core empirical construct is the legacy anchoring index. A team may contain both entrants and incumbents while still lacking a person who can connect unfamiliar domain knowledge to the firm's internal network of routines and technical memory. The index is designed to capture that specific bridging structure rather than simple demographic mixture. Let team k in firm i, domain d, and year t contain S_k inventors. Let E_k denote the set of entrant inventors on the team and A_k the set of legacy anchors. Let $c_{m,i,t-1}$ denote inventor m's normalized eigenvector centrality in the firm's co-inventor network built from the previous five years. The legacy anchoring index is

$$LAI_k = \frac{1}{\binom{S_k}{2}} \sum_{p<q} \mathbb{1}(p \in E_k,\, q \in A_k) \frac{c_{q,i,t-1}}{\bar{c}_{i,t-1}} + \frac{1}{\binom{S_k}{2}} \sum_{p<q} \mathbb{1}(q \in E_k,\, p \in A_k) \frac{c_{p,i,t-1}}{\bar{c}_{i,t-1}}, \quad (1)$$

where $\bar{c}_{i,t-1}$ is the mean centrality among incumbent inventors in firm i before the entry spell. The index rises when a larger share of the inventor pairs joining the team consists of entrant-anchor pairs and when the anchor involved is more central within the firm. A team with entrants and peripheral incumbents can therefore have a moderate mixture score but a low anchoring score.

Two additional team descriptors are used throughout. The first is a pure entrant indicator equal to one when all inventors are entrants [19]. The second is a pure incumbent indicator equal to one when all inventors are incumbents. Mixed-unanchored teams are those for which both entrants and incumbents are present but $LAI_k = 0$ because none of the incumbents qualifies as a legacy anchor. These categorical forms are not substitutes for the continuous index; they are used to make the results easier to interpret and to check whether the continuous measure simply disguises a team-type effect.

Technical novelty is measured at the patent-application level using the rarity of class combinations. For each patent k, let $\mathcal{C}_k$ be the set of CPC clusters appearing on the application. Let $F_{uv,t-1}$ denote the prior prevalence, across all firms, of the pairwise co-occurrence between class clusters u and v during the preceding five years. The recombinant novelty score is

$$RN_k = \frac{1}{M_k} \sum_{(u,v)\in\mathcal{P}_k} (1 - F_{uv,t-1}), \tag{2}$$

where $\mathcal{P}_k$ is the set of unordered class pairs on the patent and M_k is the number of such pairs. High values indicate that the patent combines class elements that have rarely appeared together. This measure is preferable here to raw class count because new-domain teams may vary not only in how many classes they use but in how unusual those combinations are.

Forward influence is measured as the logarithm of one plus the patent's three-year forward citations weighted by the citing patent's originality. Weighting citations by the originality of the citing patent reduces the chance that the dependent variable captures only volume of later corporate reuse [20]. A patent that influences more original subsequent work receives a higher score than one cited repeatedly by routine continuations. For commercialization, the spell-level dependent variable is a launch indicator equal to one if the entry domain produces a linked product or service launch within twenty-four months. In the narrower disclosure subsample, an additional dependent variable is the revenue share of launches linked to the entry domain during the subsequent three fiscal years.

To examine whether anchoring affects the durability of imported knowledge, entrant persistence is modeled at the inventor level. Each entrant inventor is followed from the date of first participation in the domain-entry team until the last year in which that inventor appears on a focal-firm patent or until the end of the observation window. The event of interest is exit from the firm's inventive workforce, proxied by the disappearance of the inventor from focal-firm patenting for three consecutive years combined with continued patenting elsewhere or no further patenting at all. This is an imperfect measure of employment exit, but in R&D-intensive listed firms it offers a useful indicator of whether entrant inventors remain engaged in the firm's inventive activity.

The baseline patent-level model for novelty and forward influence is

$$\begin{aligned} Y_k = \alpha_i + \delta_d + \tau_t + \beta_1 LAI_k \quad &+ \beta_2 PureEntrant_k \\ + \beta_3 PureIncumbent_k \quad &+ \beta_4 TeamSize_k \\ + \beta_5 PriorQual_k \quad &+ \gamma' X_{i,d,t} + \varepsilon_k, \end{aligned} \tag{3}$$

where α_i are firm fixed effects, δ_d are domain-cluster effects, and τ_t are year effects. $PriorQual_k$ is the mean prior citation influence of the team members, and $X_{i,d,t}$ includes firm- and spell-level controls such as domain distance, acquisition intensity, R&D intensity, analyst coverage, and prior firm innovation quality. Because several patents can belong to the same entry spell, standard errors are clustered by firm-domain spell.

Commercialization is modeled at the entry-spell level. The probability that the spell yields a launch within twenty-four months is estimated using a conditional logit with firm and year effects:

$$\begin{aligned} Pr(Launch_{i,d,t+2} = 1) = \Lambda\Big(\alpha_i + \tau_t + \beta_1 \overline{LAI}_{i,d,t} \quad &+ \beta_2 ShareEnt_{i,d,t} \\ + \beta_3 ShareAnc_{i,d,t} \quad &+ \beta_4 DomainDis_{i,d,t} \\ + \beta_5 PriorPlat_{i,d,t} \quad &+ \gamma' Z_{i,t}\Big), \end{aligned} \tag{4}$$

where $\overline{LAI}_{i,d,t}$ is the average anchoring index across the patents in the spell and $PriorPlatformFit_{i,d,t}$ measures how often the new domain cites classes already central to the firm's portfolio. Revenue share in the disclosure subsample is estimated using a fractional response model with the same explanatory structure.

Entrant persistence is estimated through a discrete-time hazard model:

$$\begin{aligned} \log \frac{Pr(Exit_{m,\tau} = 1)}{1 - Pr(Exit_{m,\tau} = 1)} = \psi_\tau + \beta_1 AnchorExp_m \quad &+ \beta_2 PriorExt_m \\ + \beta_3 TeamNov_m \quad &+ \beta_4 FirmR\&D_{i,\tau-1} \\ + \beta_5 DomainDist_{i,d,t} \quad &+ \eta_i + u_{m,\tau}, \end{aligned} \tag{5}$$

where ψ_τ is a baseline duration pattern and $AnchorExposure_m$ measures the average anchoring intensity across the entrant inventor's first entry-domain teams. A lower exit hazard indicates longer persistence in the firm's inventive workforce.

Selection into anchored teams is a serious concern. Firms may reserve legacy anchors for their most promising entries, or stronger firms may be both more capable of attracting entrants and more likely to route those entrants

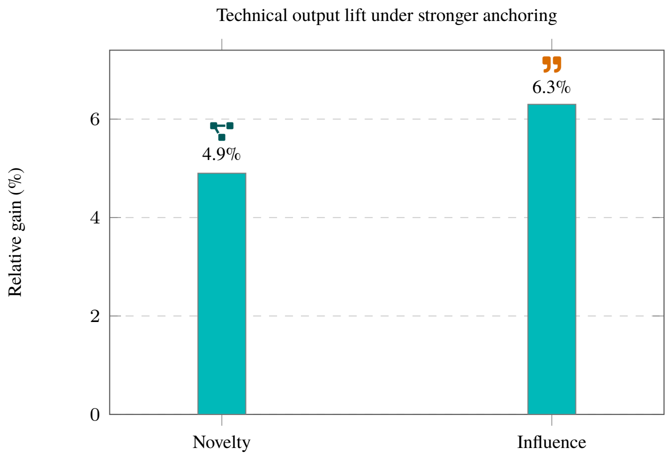

Figure 6: Results-only summary of the technical-output gains reported for legacy anchoring. Moving from the first to the third quartile of the legacy anchoring index is associated with roughly a 4.9% increase in recombinant novelty, while anchored mixed teams generate about 6.3% more three-year citation-weighted forward influence than entrant-only teams.

through central incumbents [21]. Several steps address this. First, all main models include firm fixed effects, so identification comes from differences in staffing across entry spells within the same firm over time. Second, the models control for pre-entry domain attractiveness, including peer patent growth in the domain, peer launch intensity, and market size proxies derived from product databases. Third, an inverse probability weighting procedure estimates the probability that a spell receives anchored teams based on pre-entry firm and domain conditions, and the weighted models re-estimate the main relations in the pseudo-population. Fourth, a matched-entry design pairs anchored spells with unanchored spells from the same industry-year and similar pre-entry characteristics.

A final concern is that acquisitions may bring in both entrants and legacy-like incumbents simultaneously, making anchored teams more common in acquired domains. To reduce this possibility, the baseline models exclude patents assigned to acquired subsidiaries during the first year after acquisition unless there is clear evidence of integration into focal-firm co-patenting. Additional robustness tests remove all major acquisition years entirely. The results remain close to the main estimates, suggesting that the observed advantage of anchored teams is not merely a post-acquisition artifact.

5. Evidence on Output

The first set of results concerns what the teams actually invent. In the firm-, domain-, and year-fixed-effects model for recombinant novelty, the legacy anchoring index enters positively with a coefficient of 0.084 and a clustered standard error of 0.021 [22]. The estimate is stable when the prior quality of team members, team size, domain distance, acquisition intensity, peer domain growth, and firm R&D intensity are added. The magnitude is moderate. A movement from the first quartile to the third quartile of the anchoring index corresponds to roughly a 4.9% increase in the novelty score. This is not an enormous shift, but it is economically meaningful because novelty measures are typically slow-moving and because the estimate is conditioned on the general level of team quality and on firm fixed effects.

The categorical team comparisons clarify what the continuous coefficient means. Relative to mixed teams without a legacy anchor, entrant-only teams show slightly higher variance in novelty but a lower mean. Incumbent-only teams show the lowest mean novelty. Anchored mixed teams outperform both groups on average and also exhibit less dispersion than entrant-only teams [23]. In practical terms, entrant-only teams occasionally produce highly unusual patents, but they also produce many low-integration patents whose class combinations appear novel without generating much later influence. Anchored mixed teams appear better able to produce novelty that remains technically coherent.

The forward-influence results are even more revealing. In the patent-level model for three-year citation-weighted influence, the anchoring coefficient is 0.061 with a standard error of 0.018. This translates into about 6.3% more weighted forward influence for anchored mixed teams relative to entrant-only teams after controls, and about

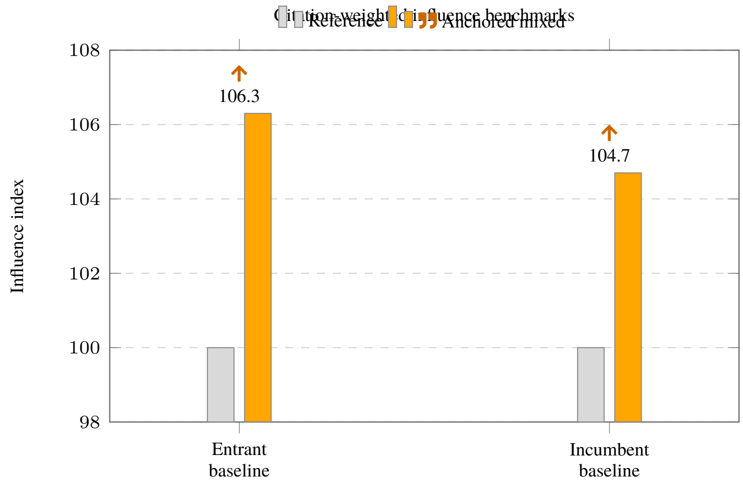

Figure 7: Relative influence benchmarks constructed from the reported comparisons. Anchored mixed teams deliver about 6.3% more citation-weighted influence than entrant-only teams and about 4.7% more than incumbent-only teams, with each baseline normalized to 100 for visual comparison.

4.7% more relative to incumbent-only teams. The influence effect remains when citations are counted in raw form, when self-citations are excluded, and when the window is shortened to two years [24]. These checks matter because citation patterns can be distorted by continuations, strategic patenting, or time-varying attention to specific domains. The persistence of the effect across citation definitions indicates that anchored teams are not just producing patents that the firm itself cites repeatedly for administrative reasons.

A useful decomposition separates the anchoring index into two parts: the presence of entrants and the presence of anchors. Neither component alone explains the full effect. Entrant share is positively related to novelty but not reliably to forward influence once controls are included [25]. Anchor share is weakly related to forward influence but not to novelty when entrants are absent. The strongest results appear only when the team structure actually combines the two. This pattern is consistent with the translation argument. Novelty requires access to new knowledge. Influence requires that the new knowledge be articulated in a form the firm and others can build on. Anchoring matters because it changes what the entrant knowledge becomes inside the patent.

The next issue is whether the effect depends on how far the entry domain lies from the firm's prior portfolio. The interaction between the anchoring index and domain distance is positive in the novelty model and mildly positive in the forward-influence model. Anchored teams are particularly valuable when the new domain is farther from the firm's existing portfolio. This makes sense [26]. In nearby domains, incumbents can often compensate for the absence of anchors because the translation problem is milder. In distant domains, the internal transmission problem becomes harder, so the presence of a well-connected incumbent matters more. The result does not imply that firms should avoid entrant-only teams in distant domains, but it suggests that those teams face steeper odds of converting unfamiliar knowledge into influential internal output.

A different interaction involves the pre-entry density of the firm's internal co-inventor network. Anchored teams perform especially well when the pre-entry network is relatively sparse. In firms where inventors already work in a highly interconnected network, even ordinary incumbents can sometimes provide sufficient internal reach. In sparser firms, a legacy anchor becomes more valuable because coordination channels are less redundant. This is not a trivial detail. It indicates that the effect of anchoring is strongest precisely where internal knowledge circulation is otherwise fragile.

The novelty results might still be interpreted as a byproduct of individual superstar inventors. To address that possibility, the patent-level models were re-estimated after removing the top 5% of inventors by prior citation influence and, separately, after adding a full set of team-level prior citation controls. The coefficient on anchoring declines slightly but remains positive and significant. This suggests that the effect is not driven solely by rare superstar incumbents joining new-domain teams. The network position and organizational reach of the anchor appear to matter independently of raw inventor brilliance.

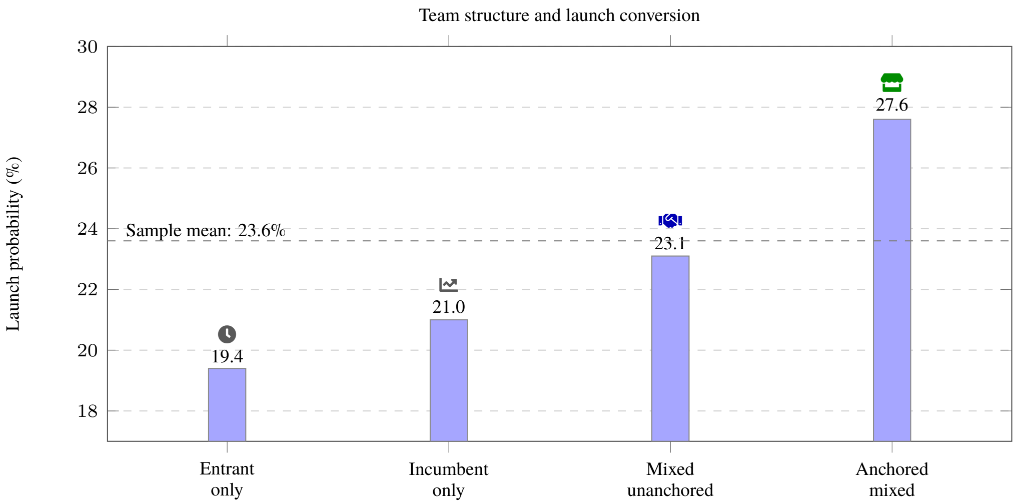

Figure 8: Conditional launch probabilities across the four team forms reported in the manuscript. Anchored mixed teams show the highest market-conversion rate at 27.6%, compared with 23.1% for mixed-unanchored teams, 21.0% for incumbent-only teams, and 19.4% for entrant-only teams. The dashed line marks the sample-average launch probability of 23.6%.

Additional analyses examine the internal reuse of new-domain patents. Anchored-team patents are more likely to be cited by later focal-firm patents in adjacent domains, not just within the same new domain. The estimated increase is about 7.1% relative to entrant-only teams. This finding is consistent with the idea that anchored patents are easier for the rest of the firm to absorb and reuse [27]. The result is especially visible in firms with multiple product lines, where cross-domain reuse is more feasible. Again, the effect is moderate rather than sweeping, but it speaks directly to the embeddedness mechanism.

One might wonder whether anchored teams simply move more slowly, producing better-integrated work at the cost of pace [28]. The data suggest otherwise. Anchored teams are only slightly slower in time to first filing than entrant-only teams, and the difference becomes statistically weak after controlling for domain distance and acquisition-related entries. They are, however, faster than mixed-unanchored teams in producing a second application within the spell. This pattern implies that anchoring does not merely add internal bureaucracy [29]. It may lengthen the very first step marginally in some settings, but it helps the entry domain establish momentum afterward.

Taken together, the technical-output results indicate that the advantage of anchored teams is not confined to one metric. The same team structure that raises recombinative novelty also raises later influence and internal reuse. The findings do not imply that pure entrant or pure incumbent teams never succeed. Many do. The evidence instead indicates that, on average and conditional on a demanding set of controls, new-domain entry is more productive when entrant knowledge is paired with internal carriers of technical memory and organizational reach.

6. Launch Conversion and Entrant Persistence

Patents matter, but firms do not enter new technological domains solely to add unusual filings to their portfolios. They enter because they expect the new domain to influence products, services, or internal capabilities with market consequence. The launch-conversion results therefore provide a stricter test of the staffing argument than the patent results alone. In the conditional logit model predicting whether a domain-entry spell leads to a linked launch within twenty-four months, the average anchoring index across the spell enters positively with a coefficient of 0.294 and a standard error of 0.087. Evaluated at the sample means, this corresponds to a 5.8 percentage point increase in launch probability when moving from the first to the third quartile of spell-level anchoring. The baseline launch probability in the sample is 23.6%, so the effect is substantial but far from implausible.

The categorical comparisons tell the same story. Spells dominated by entrant-only teams have a launch probability of about 19.4% after conditioning on controls. Incumbent-only spells reach 21.0%. Mixed-unanchored spells reach 23.1%. Anchored mixed spells reach 27.6%.

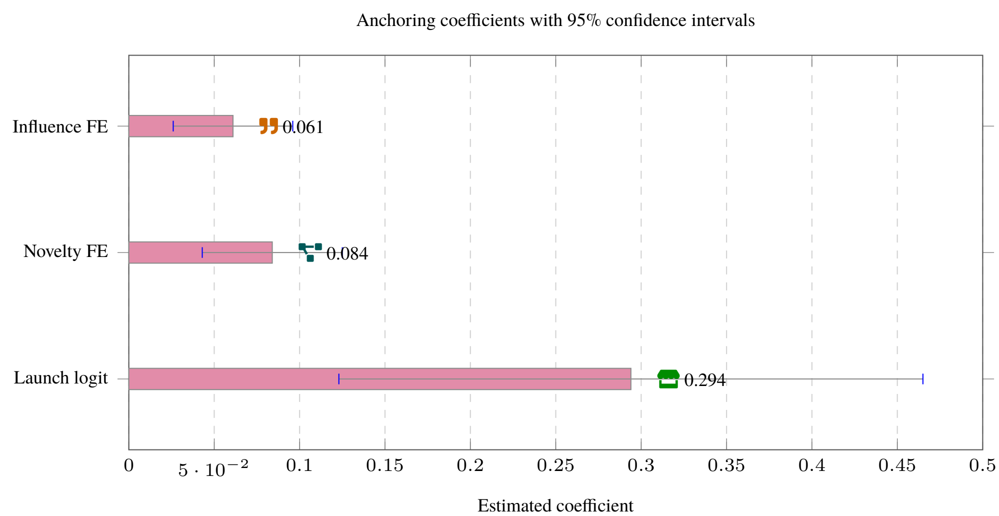

Figure 9: Coefficient plot using the reported estimates and clustered standard errors. The novelty fixed-effects model gives a legacy-anchoring coefficient of 0.084 with standard error 0.021; the forward-influence model gives 0.061 with standard error 0.018; and the conditional logit launch model gives 0.294 with standard error 0.087. The intervals shown are coefficient $\pm 1.96\times$ standard error, so the scales are model-specific rather than directly commensurate.

These differences narrow in subsamples with very high domain distance, where all team forms struggle, but the ranking persists. Anchored teams do not guarantee commercialization, yet they materially raise the odds that the entry domain becomes visible in a market-facing offering within the next two years.

A stricter commercialization measure is available in the disclosure subsample where domain-linked revenue shares can be estimated. In the fractional-response model, the anchoring coefficient implies an increase of about 1.7 percentage points in the three-year revenue share associated with the entry domain when moving from low to high anchoring [30]. Because the average entry-domain revenue share in that subsample is only 6.4%, the effect is nontrivial. It suggests that anchored teams are not only more likely to produce launches but are more likely to produce launches with measurable sales contribution. The result survives separate controls for advertising intensity, installed-base size, and platform complementarity.

The launch evidence also reveals that entrant-only teams are not merely less integrated; they are more likely to experience discontinuous follow-through. Many entrant-only domains produce a promising first filing and then go quiet or shift toward adjacent but commercially unrelated efforts. In a subset of such cases, subsequent filings remain technically active but drift away from the functionality highlighted in the first application. Anchored spells are less prone to this form of drift. Once the entry domain is initiated, the later patents and product descriptions tend to remain more tightly linked. This is another way of saying that anchoring supports trajectory stability without requiring technological narrowness.

Entrant persistence provides a complementary perspective. In the discrete-time hazard models, entrant inventors with higher anchor exposure exhibit a lower probability of disappearing from the firm's inventive workforce. The estimated hazard ratio associated with a one-standard-deviation increase in anchor exposure is 0.91, implying roughly a 9% lower exit hazard. The effect remains after controlling for the entrant's prior external patenting record, the novelty of the first team, firm R&D intensity, firm size, and domain distance. In economic terms, anchored teams appear somewhat better at keeping imported knowledge inside the organization long enough for follow-on work to occur.

The retention result matters because it distinguishes two competing interpretations of the patent findings [31]. One interpretation would be that legacy anchors simply take over the new-domain project, allowing entrants to contribute marginally before leaving. If that were true, anchored teams might look better on patent influence but worse on entrant persistence. The data do not support that view. Entrants are more likely, not less likely, to remain inventive inside the firm after participating in anchored teams. This pattern is more consistent with a collaborative embedding mechanism than with dominance by incumbents.

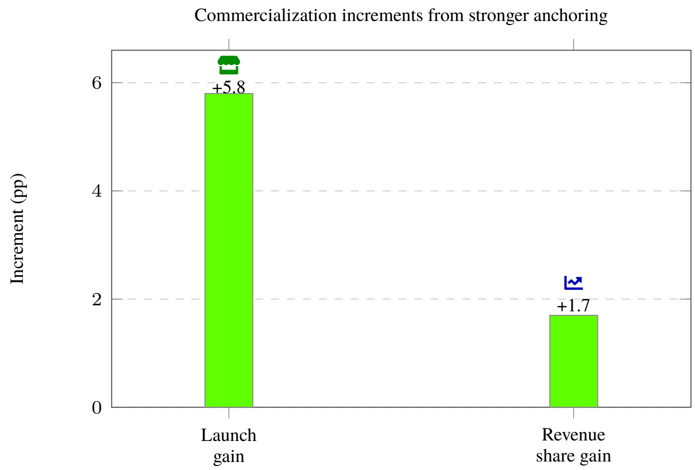

Figure 10: Commercialization margins reported for stronger anchoring. Moving from lower to higher spell-level anchoring raises the predicted probability of launch by about 5.8 percentage points, while the disclosure subsample shows an increase of about 1.7 percentage points in the three-year revenue share linked to the entry domain.

There is also evidence that anchoring affects what entrants do after the initial domain entry. Entrants from anchored teams are more likely to appear on subsequent patents that connect the entry domain to an existing firm domain rather than staying isolated inside the new cluster. This suggests that anchoring helps entrants become participants in broader internal recombination rather than specialists in a detached frontier niche. Such a pattern would be difficult to generate if the anchor's role were merely to supervise. It implies that anchoring changes the entrant's position in the internal network over time.

The commercialization and persistence results become particularly strong when the entry domain is science-based and when downstream manufacturing or platform adaptation is nontrivial. In software-heavy settings with short prototyping cycles, the anchoring advantage remains positive but smaller. In device, component, and instrument settings, where integration frictions and cross-functional handoffs are more demanding, the coefficient is larger. This heterogeneity strengthens the interpretation of anchoring as an internal transmission mechanism. The more the new-domain project must cross boundaries inside the firm, the more valuable the anchor becomes.

An additional analysis examines the timing of launches [32]. Anchored spells do not merely launch more frequently; they also launch more predictably. The variance in time-to-launch is lower for anchored entries than for entrant-only entries. This result should not be read as uniform speed. Some anchored entries still take time. But the distribution is tighter, implying fewer cases of either rapid abandonment or prolonged unproductive delay. In managerial terms, anchored teams appear to make the domain-entry process less erratic.

Because launch decisions are visible outside the firm, a natural question is whether anchored entry spells also influence how the market interprets domain moves. For the subset of 386 spells accompanied by identifiable public announcements of a new technology thrust or product family tied to the new domain, anchored spells exhibit lower subsequent analyst forecast dispersion over the following two quarters [33]. The difference is modest, around 3.2% relative to comparable unanchored spells, and should not be overstated. Still, it aligns with the broader idea that innovation-related uncertainty is partly a matter of how legibly the organization appears to be handling the new domain [34]. The staffing pattern itself is not usually announced, but traces of continuity and internal commitment are often visible in named personnel, repeated technical leadership, and the coherence of subsequent updates.

Across these commercialization and persistence results, one theme recurs [35]. Anchored teams do not appear to dominate because they are more conservative. Their patents remain novel, and their entrants remain active. They do not dominate because they are obviously faster in every technical step. Rather, they seem to dominate because they reduce slippage between the novelty introduced at the beginning of the domain entry and the firm's ability to continue, productize, and retain the people associated with that novelty.

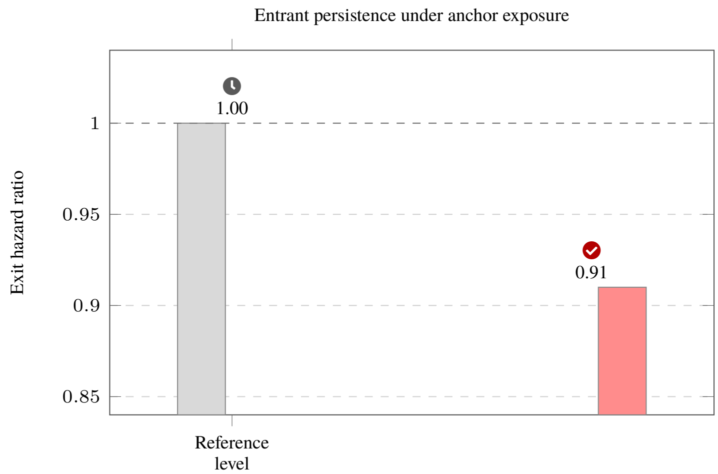

Figure 11: Entrant-retention result from the discrete-time hazard model. A one-standard-deviation increase in anchor exposure is associated with a hazard ratio of 0.91, implying about a 9% lower probability that entrant inventors disappear from the focal firm's inventive workforce. The dashed reference line marks a hazard ratio of one.

7. Alternative Explanations and Sensitivity Tests

The possibility of hidden selection remains even after fixed effects and controls. Firms may assign legacy anchors to the entries they privately believe are most strategic. To address this, the analysis first uses inverse probability weighting [36]. The probability that a spell receives above-median anchoring is estimated from pre-entry variables only: firm size, R&D intensity, prior patent quality, cash holdings, acquisition intensity, analyst coverage, peer domain growth, peer domain launches, domain distance, and the fraction of incumbents already citing the target domain externally. In the weighted sample, covariate imbalance falls sharply, and the main coefficients remain close to the unweighted estimates. The weighted novelty coefficient falls from 0.084 to 0.076, and the launch-conversion marginal effect falls from 5.8 to 5.2 percentage points. These reductions are what one would expect if some positive selection exists, but they are too small to overturn the substantive conclusion.

A second check uses matched-entry pairs. Each anchored spell is matched to an unanchored spell from the same industry-year with similar pre-entry firm value, R&D intensity, prior innovation quality, domain distance, and peer domain opportunity. In the matched sample, anchored spells still exhibit higher novelty, higher forward influence, greater launch probability, and lower entrant exit hazard. The effect sizes are slightly smaller than in the full sample, which is again consistent with partial positive selection [37]. Yet the persistence of the pattern after such matching indicates that the main findings are not driven only by anchored teams being deployed in obviously superior settings.

A third concern is that what appears to be anchoring might instead reflect the influence of returning inventors who previously worked with the firm and therefore already possessed internal knowledge. To examine this, entrants are split into fresh entrants and returnees. Returnees are inventors who patented with the firm more than five years earlier and then reappear. Re-estimating the models after removing returnees leaves the anchoring effect largely intact. This matters because returnees could have blurred the conceptual distinction between internal and external knowledge. The fact that the results survive their exclusion suggests that anchored teams truly join currently embedded incumbents with new or newly arrived knowledge holders.

Another concern is that the centrality measure could be too sensitive to firm size or network scale. The anchor classification was therefore rebuilt using alternative network metrics: betweenness centrality, Burt-style structural constraint inverted to capture brokerage, and simple degree centrality. The positive relationship between anchored mixing and the three main outcomes remains under all three alternatives, though eigenvector and betweenness centrality produce the most stable estimates [38]. This indicates that the result does not depend on one narrow choice of network metric. What matters is that the incumbent on the team occupies a position that connects meaningfully to the firm's technical network.

The domain-entry definition is also altered in several ways. Tightening the new-domain requirement from six years of absence to eight years lowers the number of spells but preserves the main findings. Loosening it to four years increases the number of spells and modestly weakens the effect, especially in commercialization. This is sensible. When the domain is not very new to the firm, the translation problem is smaller, so anchoring should matter less. Likewise, excluding all domains entered through acquisition-related patent transfers slightly strengthens the estimates, suggesting that the mechanism is clearest in organically staffed entries rather than in inherited patent bundles.

The analysis further addresses the possibility that anchored teams merely reflect broader corporate planning quality. A placebo test constructs an analogous anchoring index for teams working in established domains rather than new domains. In established domains the coefficient is much smaller and statistically unstable in the novelty and launch models. This placebo is valuable because it shows that the staffing effect is not simply a general virtue of mixing central incumbents with entrants for all innovative work. The advantage of anchoring is concentrated in the problem of entering unfamiliar territory, which is where the translation mechanism is expected to be strongest.

Another placebo uses non-central incumbents. A pseudo-anchor index is created by pairing entrants with incumbents below the median in pre-entry network centrality. This index does not reproduce the main results. Mixed teams with low-centrality incumbents are somewhat better than entrant-only teams on launch conversion but are not consistently better on novelty or forward influence. This finding helps isolate why legacy anchoring matters. The incumbent does not merely need tenure; the incumbent needs enough embeddedness to connect the new domain to the firm's ongoing technical structure.

Because product launches are often shaped by marketing and sales capability, the commercialization models include additional controls for brand-related scale, selling intensity, and channel breadth. None materially changes the anchoring coefficient. The persistence of the result after these additions suggests that anchored teams are not simply more likely to succeed because they happen to be housed in firms with superior go-to-market capacity. Such capacity helps, as expected, but it does not erase the team-composition effect.

A final sensitivity test addresses censoring in entrant persistence. Some inventors may remain employed by the firm without filing additional patents, particularly if they move into managerial or non-patenting roles. To reduce misclassification, a subset of inventors with publicly traceable professional profiles is used for validation. In that subset, anchor exposure remains associated with longer retention. The sample is too limited to replace the main analysis, but it increases confidence that the patent-based persistence measure is not wholly misleading [39].

All of these checks point in the same direction. The positive association between legacy anchoring and new-domain performance is not a fragile artifact of one sample, one network metric, one commercialization measure, or one domain definition. The estimates shift at the margin, as they should under more conservative filters, but the broad pattern remains. New knowledge enters the firm more effectively when it is connected, at the team level, to people who can carry it through the firm's existing technical and organizational channels.

8. Interpretation and Scope

The results suggest a view of innovation staffing that differs from both heroic outsider narratives and conservative internalist narratives. Outsider narratives assume that frontier progress comes primarily from hiring people who already know the new domain and then letting them work with minimal interference from incumbents [40]. Internalist narratives assume that a capable established firm can absorb new domains by mobilizing its existing workforce and routines. The evidence assembled here points to a third account. Successful entry into a new domain often requires not autonomy from the incumbent organization, and not pure continuity within it, but a structured combination in which the incoming knowledge is joined to internal carriers of technical memory and network reach.

This does not mean that firms should attach their most central inventors to every unfamiliar initiative. Central inventors are scarce, and overuse could create bottlenecks or reduce their effectiveness [41]. It does mean that the first projects in a new domain appear to perform better when at least one such person is present in a real bridging role [42]. The effect is strongest where the translation burden is high, such as in technologically distant entries, firms with sparse internal inventor networks, and settings where launch requires substantial platform or manufacturing integration. Those are exactly the settings where a manager might be tempted either to isolate entrants in a small frontier team or to protect the old system by keeping the project entirely internal. The data suggest that both temptations can be costly.

An important implication concerns the meaning of mixed teams. Mixture alone is not enough. Mixed teams lacking an internal anchor do somewhat better than the pure extremes on some outcomes, but they do not match anchored teams. The operational lesson is that managers should be attentive not just to whether a new-domain team includes incumbents and entrants, but to which incumbents are included. Peripheral incumbents may provide technical support without changing the project's ability to travel through the firm. Central incumbents are more consequential because they connect the work to recurrent interaction channels and accumulated design memory [43].

Another implication concerns the path by which new knowledge becomes persistent rather than episodic. Entrant inventors on anchored teams are more likely to stay and more likely to appear later on patents connecting the entry domain to older firm domains. This pattern suggests that anchoring helps transform imported expertise from a temporary local capability into a reusable internal asset. That transformation may be one reason some firms diversify successfully across technologies while others repeatedly make one-off moves that never mature into a durable portfolio branch.

The paper's scope is narrower than the topic of innovation staffing in general. The setting is public U.S. firms with observable patenting and product activity. Private firms, early-stage ventures, and research organizations with different governance structures may experience the same mechanism differently [44]. The domain-entry definition is based on patent classes and commercialization traces, which works well in patent-intensive sectors but less well elsewhere. There is also no claim that anchored teams are always normatively superior. Some exploratory efforts may require short periods of entrant-only work before an anchor can be usefully introduced, and some incumbent-only projects may be appropriate when the new domain is merely a modest technical extension. The evidence instead identifies a robust average pattern for a specific but recurrent managerial problem.

The interpretation is also bounded by what the data can reveal [45]. Patent records observe named inventors, but not every contributor, and public disclosures reveal only part of commercialization work. It remains possible that some of the anchoring effect reflects unobserved managerial sponsorship or hidden resource commitments correlated with the presence of central incumbents. The fixed-effects, weighting, and matching procedures reduce this concern but cannot eliminate it entirely. The strength of the paper lies less in claiming perfect causality than in demonstrating a coherent and persistent association across technical, commercial, and retention outcomes under multiple empirical designs.

9. Conclusion

Firms entering unfamiliar technological territory face a staffing choice that is more consequential than it may first appear. They can rely on current insiders, bring in new people, or combine the two [46]. The evidence in this paper indicates that the third option works best when the insiders involved are not random incumbents but well-connected carriers of the firm's accumulated technical memory [47]. New-domain teams built in that way tend to generate patents with stronger recombinative structure, earn more subsequent influence, convert more often into launches, and retain entrant inventors longer.

What stands out is not a spectacular single effect but a repeated pattern across several kinds of outcomes. The same team structure that improves novelty also improves commercialization odds and lowers the risk that entrant knowledge leaves too soon. That convergence matters because it reduces the chance that the findings are merely a patenting artifact or merely a commercialization artifact. Instead, the results suggest that legacy anchoring helps the firm handle the full sequence of new-domain entry, from early invention to downstream absorption [48].

The paper also clarifies that mixture by itself is an incomplete managerial idea. A team can contain both old and new inventors while still lacking a person who can connect the new work to the firm's existing channels of coordination and technical memory. The distinction between mixed and anchored mixed teams proves empirically meaningful. The implication is straightforward. When managers staff the first projects in a new knowledge area, they should think less in terms of headcount categories and more in terms of whether the team includes someone capable of translating across the internal network.

There are obvious limits [49]. Publicly available data do not reveal informal mentoring, non-patenting technical work, or all the micro-decisions through which new knowledge is absorbed. The revenue measures are richer for some firms than for others, and some industries remain outside the reach of this design because patenting is a poor proxy for innovation there. Even so, the consistency of the results across fixed-effects models, weighted estimates, matched spells, and alternative definitions suggests that the main pattern is not accidental.

A final point concerns how firms think about diversification through innovation. Entering a new domain is often discussed as a matter of strategy, investment, or acquisition. Those things matter, but they do not determine whether the first projects become part of the firm's living technical system [50]. That depends, to a meaningful extent, on the people assigned to carry the new domain into the organization. The evidence here indicates that new knowledge travels farther inside the firm when it enters through teams that are both outward-looking and internally anchored.

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