Reputation Spillovers and Recovery Paths of Brand Alliances after Product Harm Crises in Consumer Packaged Goods Markets

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ABSTRACT

Brand alliances are usually evaluated when they are introduced, priced, and distributed, but their resilience is tested only when something goes wrong. Product harm episodes are especially demanding because they force consumers, retailers, and investors to decide whether the problem belongs to the product alone, to one partner brand, or to the alliance structure itself. This paper studies how brand alliances behave after recalls and related product harm crises by tracing immediate losses, cross-partner spillovers, and recovery over time. The analysis combines product-level scanner data, partner-level stock returns, and public recall records for consumer packaged goods markets over an extended period. Alliance crises are compared with matched nonallied harm episodes and with unaffected sibling products owned by the same firms. The results indicate that alliance products suffer larger initial demand losses than otherwise comparable single-branded harmed products, but the size and persistence of the loss depend on whether fault attribution is clear. When the source of the problem is difficult to assign, the penalty spreads more strongly across both partners and recovery becomes slower. Nonresponsible partners are not insulated from the event, although their losses are smaller when partner roles were visually and functionally distinct before the crisis. The evidence also shows that prominence imbalance magnifies contagion. Alliances dominated by one highly salient brand experience deeper reputational spillover to the stronger partner, while more balanced pairings distribute the loss more evenly and recover faster after corrective action. Product structure matters as well. Endorsement-oriented alliances show the largest ambiguity costs, whereas ingredient and composite alliances respond more favorably to targeted remediation and relaunch. The findings suggest that downside risk in brand alliances is shaped not only by defect severity but also by how clearly the alliance allocates responsibility before any crisis occurs.

KEYWORDS

1. Introduction

Brand alliances are commonly treated as expansion devices [1]. They open space for borrowed associations, shared visibility, category entry, and joint differentiation. That view is incomplete because it pays disproportionate attention to moments of launch and insufficient attention to moments of failure. Alliances combine brands not only in upside states but also in adverse states. Once the product is linked publicly to both partners, a defect, contamination event, labeling error, or safety withdrawal can force the market to decide how liability should be mentally allocated across the participating names. The result is an underexamined problem of downside transmission. The alliance does not merely combine assets. It also connects reputational balance sheets that may have to absorb negative information at

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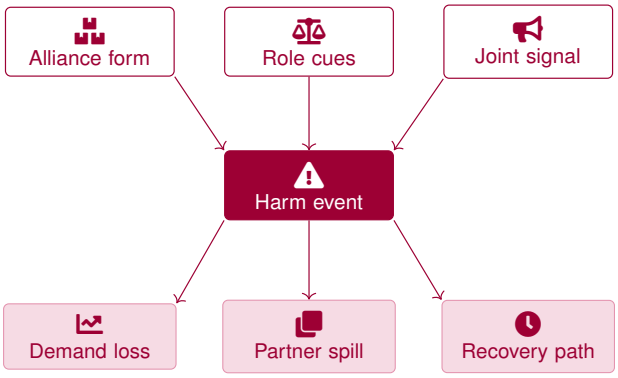

Figure 1 From alliance structure to crisis outcomes. The figure compresses the manuscript's main logic: precrisis role definition shapes how a product harm event converts into direct demand loss, cross-partner spillover, and the length of recovery.

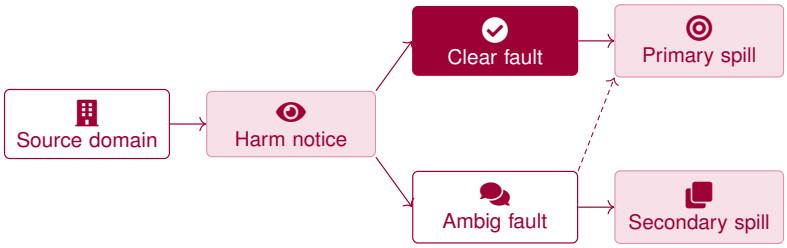

Figure 2 Attribution clarity changes contagion geometry. When fault assignment is clear, losses concentrate around the implicated side; when fault remains ambiguous, the shock diffuses across both alliance partners.

the same time.

A product harm crisis is analytically useful because it reveals whether the market understood the alliance as a clear division of roles or as a fused symbolic object. If responsibility is clearly tied to one component, one stage of production, or one partner's operational domain, the nonresponsible partner may experience only partial contagion. If the alliance had always been communicated as an inseparable pairing, the market may treat the defect as evidence that the entire joint promise was unreliable. That distinction matters at several levels. Investors revise expectations about future cash flows and coordination risk [2]. Retailers decide whether the harmed item deserves continued shelf support after relaunch. Consumers update beliefs about the affected product, about sibling products sold by the same manufacturer, and sometimes about the partner brand outside the harmed category. The same recall notice can therefore create several economic paths, depending on how the alliance had been structured and interpreted before the crisis.

Research on brand alliances has usually centered on favorable states of the world. The typical questions concern whether the alliance improves evaluations, whether it raises stock returns at announcement, or whether it supports premium pricing. Those questions remain important, but they do not describe the liability side of alliance architecture. An alliance that looks efficient under benign conditions may be fragile under blame. The borrowed association that helped the product gain attention can become a channel through which fault travels. At the same time, deeper collaboration is not necessarily worse. An alliance with substantively differentiated roles may experience a larger direct product penalty yet a smaller reputational spillover to the nonresponsible partner because the source of harm is easier to identify. The problem is therefore not reducible to whether the alliance is deep or shallow. The relevant issue is how the structure of the alliance interacts with fault attribution once negative information arrives.

This paper studies that interaction in consumer packaged goods markets by linking product harm episodes to product-level sales paths, partner-level stock responses, and category-level competitive outcomes [3]. The empirical design begins with alliance products that experienced a publicly observable harm episode requiring recall, withdrawal, or regulator-facing correction. It then builds matched comparisons in two directions. First, each alliance crisis is paired with comparable single-branded crisis episodes in the same broad categories. Second, unaffected sibling products belonging to the same partner firms are observed before and after the crisis, which allows the spillover beyond the harmed item to be estimated directly. This dual comparison is important. Relative to matched nonallied crises, one can ask whether alliances are intrinsically more vulnerable or merely more visible. Relative to sibling products, one can ask whether the loss stays inside the harmed SKU or diffuses across the broader brand portfolio.

The empirical focus rests on three outcomes. The first is the immediate response, measured through announcement-window abnormal stock returns for publicly traded partner firms and through the first eight weeks of product-level sales decline. The second is partner-specific contagion, measured as movement in unaffected sibling products of the primary and secondary brands. The third is recovery, measured as the time required for the harmed product to regain a substantial share of its precrisis base-

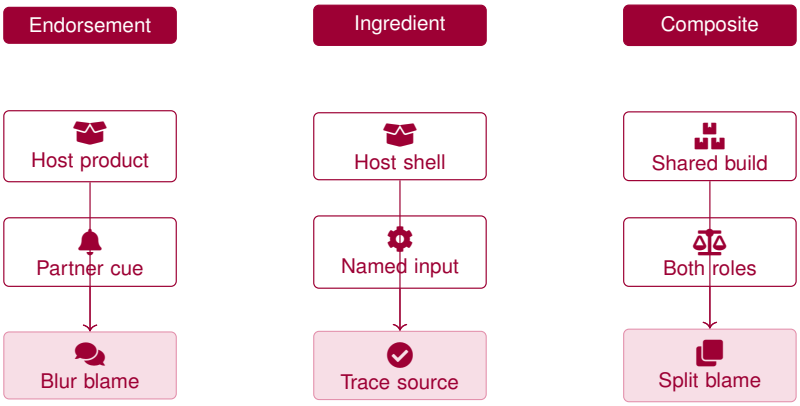

Figure 3 Alliance form changes blame separability. Endorsement structures create the greatest ambiguity, ingredient structures enable component-level tracing, and composite structures distribute responsibility more symmetrically across partners.

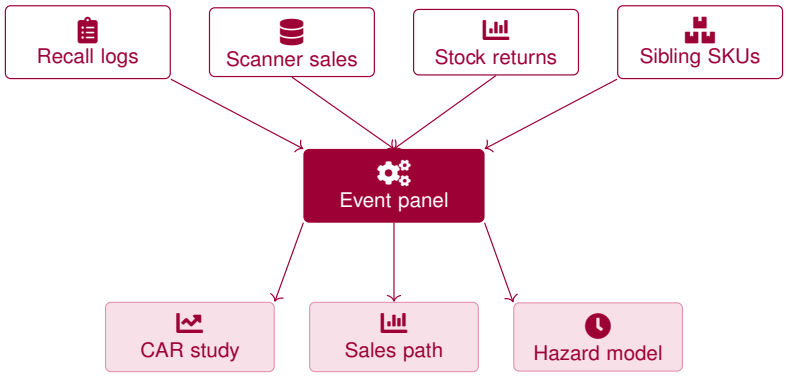

Figure 4 Integrated event construction. Public recall records, scanner data, stock returns, and unaffected sibling products are merged into a unified panel that supports abnormal-return estimation, dynamic sales tracing, and recovery-duration analysis.

line after corrective action, reformulation, or relaunch. These are distinct outcomes. An alliance can suffer a large immediate penalty yet recover quickly if the source of fault is obvious and the correction is credible [4]. Another can experience a modest first-week decline but persistent underperformance if the market remains uncertain about which partner failed and whether the alliance can be trusted again. Recovery is therefore not merely the opposite of impact. It is a separate process with its own determinants.

The crisis setting also makes role definition empirically meaningful. In a launch setting, the difference between a visible ingredient, a symbolic endorsement, and a more integrated product composition may influence valuations or consumer perceptions. Under harm, the same difference affects how blame travels. A microbial contamination linked to a named ingredient is not interpreted the same way as a packaging defect on a host product carrying a promotional licensed brand. Likewise, an undeclared allergen in a deeply integrated composite product is not interpreted the same way as a defect in a shallow endorsement line. Some alliance structures collapse distinctions between the partners. Others preserve them. As a result, crisis episodes reveal the hidden governance consequences of what otherwise looks like a marketing decision.

The study develops four central findings [5]. First, alliance products experience larger immediate demand contractions than matched single-branded harmed products. The gap is not overwhelming, but it is consistent and statistically precise. Second, contagion is strongly conditioned by attribution clarity. When the recall notice, media language, and product structure jointly make the fault source easy to infer, spillover to the nonresponsible partner is much smaller. When the source remains ambiguous, both partner firms and both partner product families absorb losses. Third, prominence imbalance matters. When one brand dominates the alliance signal, the stronger brand suffers a disproportionately large reputational spillover once a crisis occurs, even when that brand is not the operational source of the problem. Fourth, the path back differs by alliance form. Endorsement-oriented alliances face the strongest ambiguity penalty and the slowest normalization of consumer demand after recall. Ingredient and composite alliances show greater initial sensitivity to physical-harm severity, yet they recover more efficiently when the remediation can be tied credibly to a specific component or process.

The paper is organized as follows. The next section describes the crisis sample and the way alliance structures are coded for empirical use. The following section defines the principal variables, including fault-attribution clarity, prominence imbalance, remediation intensity, and partner-specific spillover exposure [6]. The fourth section presents the econometric design used for immediate impact, contagion, and recovery. The fifth section

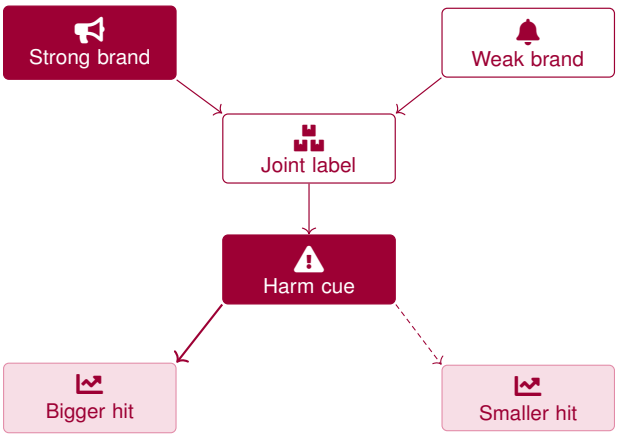

Figure 5 Prominence imbalance magnifies reputational asymmetry. When one partner carries most of the alliance signal before the crisis, the more salient brand can absorb a disproportionately large penalty after negative information arrives.

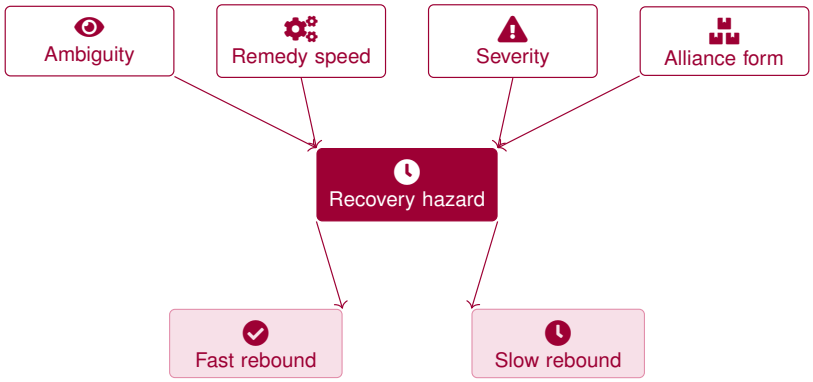

Figure 6 Recovery is governed by interaction effects rather than by a single damage measure. Ambiguity, remediation speed, event severity, and alliance form jointly shape whether the harmed product regains a meaningful share of its precrisis baseline quickly or remains stalled.

reports the main results. The sixth section examines heterogeneity in recovery, including the role of reformulation, partner communication, and the severity of physical risk. The final sections interpret the evidence and state the main implications for alliance design under downside risk.

2. Crisis Episodes and Sample Design

The empirical record was constructed from four sources that were merged at the event level. The first source was the universe of publicly observable product harm episodes affecting consumer packaged goods in the United States between 2004 and 2023. The second source was a launch history identifying whether the harmed product had been sold as a brand alliance rather than as a single-branded item. The third source was weekly scanner data on product-level sales and prices across food, drug, mass, and selected club channels. The fourth source consisted of partner-level stock return data, public filings, and event-timestamped news coverage. The goal was not to assemble every defect or complaint but to identify episodes serious enough to create a measurable market signal and a traceable adjustment path in both product demand and firm valuation.

The crisis sample begins with recalls, voluntary withdrawals, and regulator-facing corrections linked to contamination, undeclared allergens, foreign-object contamination, packaging failure with safety implications, mislabeling that materially altered risk, and formula instability producing removal from shelf. Quality disappointments without corrective action were excluded. So were purely reputational controversies unrelated to the product itself, because the paper is concerned with product harm episodes that force the market to reinterpret the alliance through a concrete failure of the marketed offer [7]. Each candidate event was manually reviewed to confirm whether the product was still on the market at the time of the episode, whether the timing of public disclosure was precise enough for stock and sales analysis, and whether the event affected a specific product line rather than an entire corporate portfolio in ways that would make identification impossible.

This filtering process yielded 194 alliance-related crisis episodes. The harmed items were associated with 127 primary-brand parents and 83 secondary-brand parents, with public return data available for at least one partner in 151 of the episodes and for both partners in 86. The crisis sample includes food, confectionery, beverages, frozen products, household consumables, and selected personal care items where alliance structure was visually and textually evident to consumers. To isolate the effect of alliance structure rather than category-specific crisis behavior, a matched set of 512 single-branded product-harm episodes

was built from the same period and similar categories. Matching required comparable harm type, category family, package form, calendar year, and a similar level of precrisis baseline sales. These matched crises serve as the main counterfactual for asking whether alliances are intrinsically more exposed than single-branded products facing analogous product-harm shocks.

A second comparison set was generated inside the partner portfolios. For each alliance crisis, unaffected sibling products belonging to the primary brand in the same broad category family were tracked for fifty-two weeks before and after the event. A parallel set of unaffected sibling products tied to the secondary brand in its main observed categories was also tracked. This structure makes it possible to observe not only what happens to the harmed product, but also whether the event spills into adjacent host products, into the partner brand's standalone business, or into neither. The sibling-product panel contains 3,486 primary-side SKUs and 2,119 secondary-side SKUs with adequate precrisis sales history [8].

Alliance structure was coded from package imagery, archived retailer listings, and launch descriptions. Here the structural distinctions matter because crisis propagation depends on how clearly the product signaled the role of each partner before the event occurred. Cao (2012) distinguished endorsement, ingredient, and composite forms of co-branding and also separated primary from secondary roles in ways that are operationally useful for crisis analysis [9]. That distinction is particularly valuable in the present setting because the market can assign blame more easily when one brand is visibly tied to an ingredient or identifiable component than when the secondary brand is attached mainly for promotional meaning. Following that logic, each harmed alliance product was coded into one of three categories. Endorsement alliances were those where the secondary brand mainly provided symbolic association or thematic identity and did not visibly alter the product's physical structure. Ingredient alliances involved a named and consumer-visible component traceable to the partner brand. Composite alliances involved substantive contribution by both brands to the final product configuration or formulation. These codes are not merely descriptive controls. They determine whether the consumer can plausibly separate the product failure from one partner's role.

The alliance sample divides into 79 endorsement crises, 68 ingredient crises, and 47 composite crises. Endorsement crises were common in snack lines, seasonal products, and youth-facing packaged goods where entertainment or cultural property played a salient role. Ingredient crises were concentrated in items where a named input, flavor system, or additive was visible to consumers [10]. Composite crises were more frequent in frozen products, dessert collaborations, and certain household products where both brands shaped the product substance. The crisis types also differ by likely attribution. Undeclared allergen cases and microbial contamination were more prevalent in ingredient and composite alliances, while packaging and statement-related errors were more common in endorsement lines. This heterogeneity is useful because it allows the effect of crisis severity to be separated from the effect of alliance form.

The harmed episodes were timestamped at three moments rather than one. The first moment is public disclosure, used for stock-return analysis. The second is the first week of observable scanner disruption, used to anchor product-level demand analysis. The third is the first week in which a corrective action became commercially visible, such as relisting, reformulation, or relaunch. Because some episodes generate public disclosure before distribution disappears and others disappear from shelf before formal recall language appears, this tripartite timing prevents misalignment between capital-market and product-market responses. It also allows recovery to be measured from a common operational point rather than from the date of disclosure alone.

The crisis records further include a coded severity scale. Severity is not defined only by official class. It also incorporates the breadth of affected lots, the physical risk implied by the event, the number of retail banners listing the withdrawal, and the duration of shelf absence in the first month [11]. This scale ranges from low-scope label correction to high-scope contamination or safety removal. The coding was performed independently by trained coders using public notices and trade reports. The purpose is to prevent structural effects from being confused with simple differences in how dangerous the event was.

A related variable captures attribution clarity. Some crisis notices make the source of fault fairly obvious. Others do not. A microbial issue tied to a named ingredient supplier can be understood differently from a broad statement that a jointly branded line is under investigation. Attribution clarity was therefore coded from the text of notices, public explanations from the partner firms, and the product's visible architecture. A high-clarity event is one in which the likely fault domain is easily tied to a component, stage, or partner role. A low-clarity event is one in which the notice does not reveal whether the problem arose in manufacturing, formulation, packaging, licensing oversight, or another domain visible to consumers only through the general alliance label. This variable later proves central because ambiguity changes how far the crisis travels beyond the harmed item.

The data also include a prominence imbalance measure that captures how unevenly the alliance signal was distributed across the partners before the crisis [12]. The measure is built from household penetration, search salience, package prominence, and category presence. A large value indicates that one brand was doing most of the visible work in the alliance. This matters because blame can travel toward the more salient brand even when the operational source of the failure lies elsewhere. In addition, the secondary partner's alliance saturation was measured by counting how many distinct active collaborations visibly used that partner's brand in the market during the prior year. This variable captures whether the borrowed association was scarce or diffuse at the time of the crisis.

An important feature of the sample is that not all harmed alliance products were discontinued permanently. Some returned after reformulation, relabeling, or selective lot replacement. Others did not return. The scanner panel is therefore long enough to distinguish immediate damage from long-run disappearance. Recovery is not defined as full return to precrisis sales. Instead

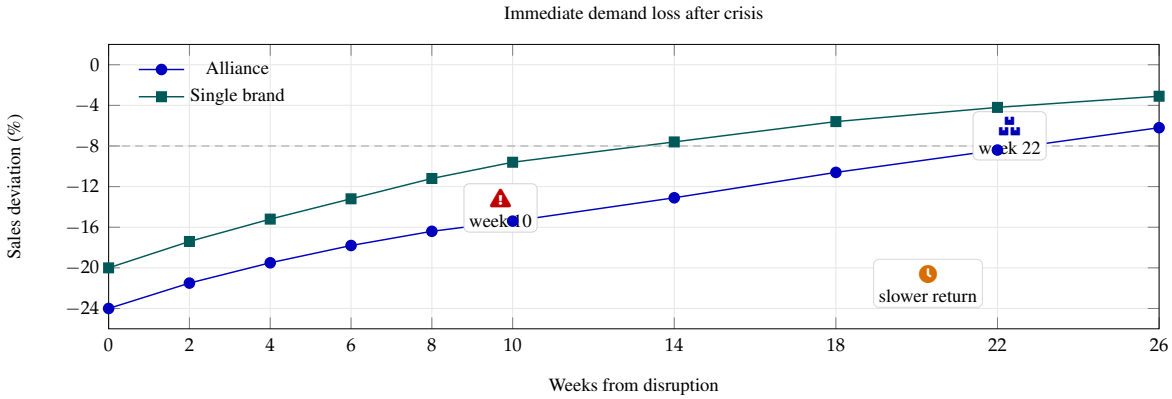

Figure 7 Dynamic demand loss for harmed products. The week-10 and week-22 thresholds follow the manuscript directly: alliance products remain below −15% through week 10 and below −8% through week 22, while matched single-branded harmed products cross above −8% by week 14. Intermediate points are interpolated to render the path smoothly.

Figure 8 Sibling-product spillovers by partner side and category distance. The paper reports average first-eight-week declines of 4.6% for primary-brand siblings and 2.9% for secondary-brand siblings, with ambiguity widening and extending the spillover, especially for secondary products outside the harmed category family. The distance split shown here is a compact reconstruction of that reported pattern.

the main recovery threshold is regaining 80% of precrisis baseline within a moving eight-week average. This threshold avoids declaring recovery too early because of temporary spikes induced by relaunch support. Alternative thresholds are used later for robustness [13].

The final sample structure supports three complementary comparisons. Alliance crises can be compared with matched nonallied crises in the same broad product space. Harmed alliance products can be compared with unaffected sibling products of the same partner firms. Partner firms can be compared within the same alliance event when both are publicly traded. That combination is unusually informative because it allows direct product damage, cross-partner contagion, and partner-specific capital-market response to be estimated inside a unified crisis framework rather than in separate datasets that do not talk to one another.

3. Variables and Empirical Expectations

The crisis framework requires variables that do more than record that something bad happened. They must describe how the alliance was likely to be interpreted when the bad news arrived. Four constructs are central: attribution clarity, prominence imbalance, remediation intensity, and partner-specific exposure. Attribution clarity has already been described as the degree to which the fault source can be mentally assigned to one partner role or one production domain. Prominence imbalance captures how unevenly the alliance's symbolic weight was distributed before the crisis. Remediation intensity captures how concretely and how quickly the firms responded after disclosure. Partner-specific exposure describes how much of the nonharmed portfolio was vulnerable to spillover because it shared the harmed brand cue.

The sales outcomes are measured at multiple horizons [14]. Immediate demand loss is the log deviation of weekly sales from a product-specific precrisis baseline estimated over the previous twenty-six weeks. Spillover to sibling products is defined analogously but uses unaffected SKUs belonging to the same brand family or partner family. Recovery duration is the number of weeks from commercial disruption until the product reaches a sustained 80% of baseline sales. Capital-market outcomes are measured with cumulative abnormal returns in narrow windows around disclosure and in a wider postdisclosure window that captures continued news flow when the episode unfolds over several days.

Partner-specific exposure needs to be represented symmetrically because the alliance connects two brands whose assets may not be valued equally by the market. Cao and Yan (2017) showed that each partner's brand value can affect not only its own alliance return but also the return accruing to the other partner, and that value differentials as well as prior exploitation of the secondary brand can weaken those gains [15]. In the crisis setting, the same logic implies that the nonresponsible partner is not neutral simply because it did not cause the fault. A high-value partner that dominates the alliance signal may absorb a larger reputational loss because consumers and investors attach more of the joint promise to that brand. Conversely, a heavily exploited secondary brand may have weaker marginal signaling power and therefore transmit a different pattern of contagion than a scarce and carefully used partner brand. The empirical design therefore includes both prominence imbalance and partner saturation as exposure variables rather than assuming that only the harmed manufacturing side matters.

The main empirical expectations are stated here in terms of sign and shape rather than as stylized verbal propositions. The first expectation is that alliance crises generate larger direct de-

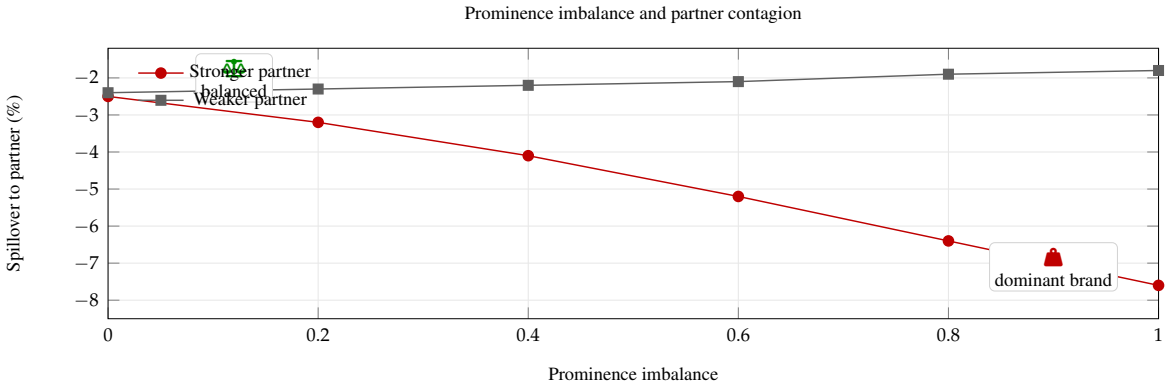

Figure 9 Prominence imbalance magnifies spillover to the stronger partner. The manuscript reports that alliances dominated by one highly salient brand impose deeper reputational spillover on that stronger partner, whereas balanced pairings distribute loss more evenly. Exact coefficient values are not stated in the excerpt, so the plotted slopes are schematic but directionally faithful.

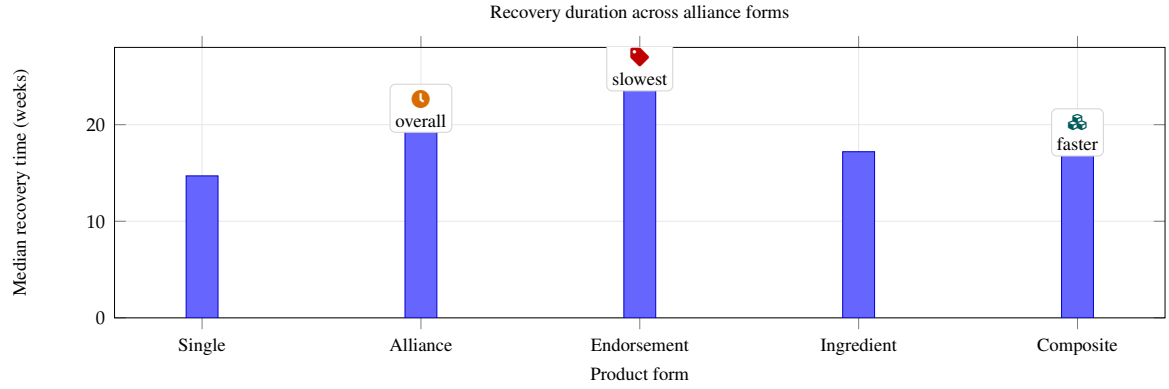

Figure 10 Median recovery time to regain 80% of precrisis baseline. These values are stated directly in the manuscript excerpt: 14.7 weeks for matched single-branded harmed products, 19.4 weeks for alliance products overall, 24.1 for endorsement alliances, 17.2 for ingredient alliances, and 16.9 for composite alliances.

mand losses than matched nonallied crises when crisis severity is held constant. The reason is not that alliances are physically riskier [16]. It is that the joint label raises the informational surface of the event. More cues are damaged at once, and the product's differentiation story becomes temporarily untrustworthy. The second expectation is that attribution clarity reduces cross-partner contagion. When the market can identify which side of the alliance failed, the harmed product may still suffer heavily, but the unaffected partner portfolio should be better protected. The third expectation is that prominence imbalance increases the loss borne by the more salient partner, regardless of whether that partner was the operational source of the defect. The fourth expectation is that faster and more concrete remediation should matter more in ingredient and composite alliances than in endorsement alliances because the source of correction is easier to connect to the experienced product.

To formalize these ideas, let the crisis shock for event e be denoted by a scalar severity term ω_e, and let the alliance interpretability vector be $\mathbf{z}_e = [a_e, s_e, q_e, r_e]^\top$, where a_e is attribution clarity, s_e is prominence imbalance, q_e is structural depth, and r_e is remediation intensity. Direct product loss and spillover loss are then treated as distinct but related functions of ω_e and $\mathbf{z}_e$. The key empirical question is not whether ω_e matters. It clearly does. The question is whether the same physical-harm shock produces different economic paths depending on how the alliance had been organized and interpreted in the market before the crisis.

A useful intermediate construct is the crisis transmission matrix, which links the source domain of fault to the two partner portfolios. Let $\mathbf{u}_e$ denote a source vector indicating whether the harm likely originated in primary manufacturing, partner component, shared formulation, or ambiguous domain. The observed losses across the harmed product, primary siblings, and secondary siblings can be written as

$$\mathbf{L}_e = \mathbf{M}_e \mathbf{u}_e + \boldsymbol{\epsilon}_e, \tag{1}$$

where $\mathbf{M}_e$ is a crisis transmission matrix whose entries are determined by alliance structure, prominence imbalance, and attribution clarity. A large off-diagonal element indicates strong contagion from the source domain to the nonsource side [17]. While $\mathbf{M}_e$ is not observed directly, the event-study and product-panel estimators recover its implications by tracking where losses appear after disclosure. This representation is useful

Figure 11 Recovery hazard as remediation intensity rises. The paper reports that a one-standard-deviation increase in remediation intensity raises the recovery hazard by roughly 22%, with the effect strongest for ingredient and composite alliances and much weaker when crisis attribution is unclear. The high-clarity line is anchored on that reported +22% effect; the low-clarity slope visualizes the stated negative interaction.

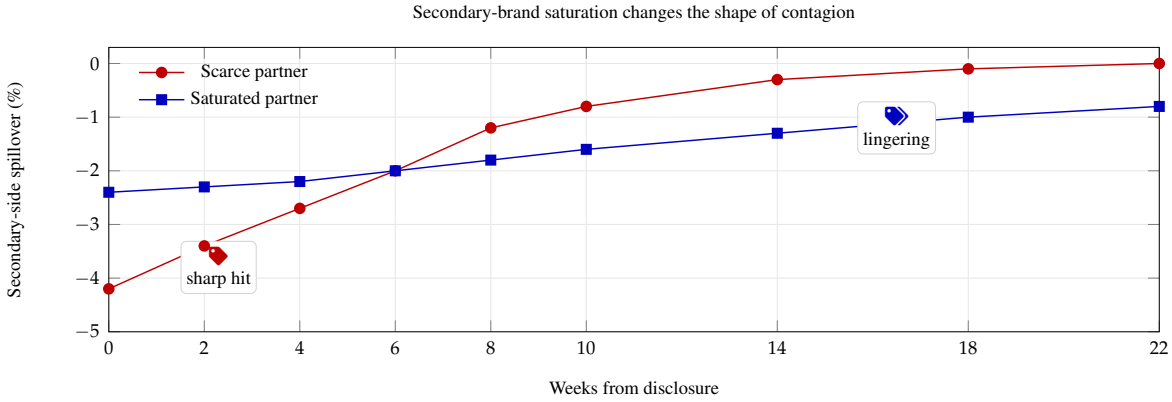

Figure 12 Secondary-partner alliance saturation changes the time profile of spillover. The manuscript reports a smaller immediate percentage drop but greater persistence when the secondary brand had many active visible collaborations before the crisis. The coordinates here are a stylized rendering of that reported "flatter but more lingering" pattern.

because it emphasizes that crises do not simply damage the harmed item. They also redistribute negative information across the connected reputational system.

Remediation intensity is measured from public and commercial actions rather than from press release length alone. The variable combines elapsed time to visible corrective action, specificity of the stated remedy, whether physical relaunch occurred under the same label or under modified packaging, and whether the response was coordinated across both partners or unilateral. A vague promise to investigate is not treated the same way as immediate lot replacement, formula clarification, and retailer-facing communication linked to the visible product structure. The coding matters because recovery in product-harm events depends not only on what firms say but on whether the market can see how the problem was addressed.

An additional expectation concerns unaffected sibling products. Spillover should be strongest for products that share the harmed brand cue in the same or closely adjacent category and weaker for distant categories where the connection is more abstract. This is not novel in principle, but the alliance setting adds a twist. If the crisis hits an alliance where the secondary brand was functioning mainly as an endorsement or thematic cue, spillover to the secondary brand's standalone portfolio may be driven more by symbolic contagion than by usage-based inference. In ingredient and composite settings, spillover should depend more on whether the defect could plausibly recur in the partner's other products. The empirical models therefore distinguish within-category, adjacent-category, and distant-category siblings.

It is also plausible that the same crisis affects capital-market and product-market outcomes differently [18]. Investors care about future cash flows, litigation, and partner governance. Consumers care about the immediate trustworthiness of the product and nearby brand cues. A nonresponsible partner might suffer only a modest sales spillover in its own categories yet receive a larger stock-market penalty if the crisis reveals governance weakness in how it chooses or monitors alliances. Conversely, a partner might experience strong short-run sales spillover but smaller financial-market damage if the crisis is clearly bounded and corrected. The paper therefore does not assume that sales and returns are mechanically aligned. It estimates them jointly but interprets them separately.

The final expectation concerns shape rather than sign. Recovery is not assumed to be linear. Some alliance products

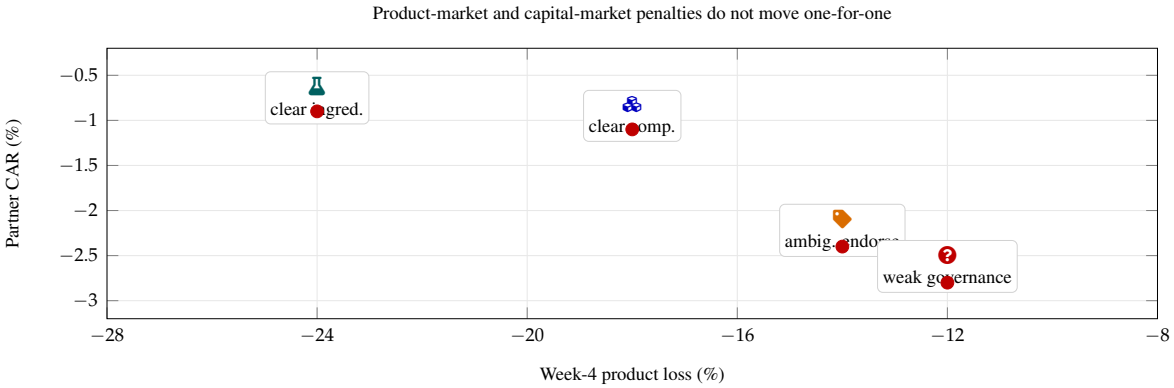

Figure 13 Schematic comparison of product-market loss and partner stock-market penalty. The manuscript notes that some severe ingredient crises generate larger product sales collapses but limited nonresponsible-partner stock penalties when fault is easy to localize, while some lower-severity endorsement crises create comparatively larger stock-market penalties because the event raises doubts about alliance screening and symbolic discipline. Exact pairwise coordinates are not provided in the excerpt, so this panel is intentionally schematic.

Table 1 Summary of Crisis Sample Composition

Category	Count	Percentage	Notes
Total Alliance Crises	194	100%	2004–2023 period
Endorsement Alliances	79	40.7%	Symbolic role dominant
Ingredient Alliances	68	35.1%	Named component present
Composite Alliances	47	24.2%	Joint formulation
Matched Single-brand Crises	512	–	Benchmark sample

show sharp initial loss followed by a plateau, while others begin to recover quickly and then stall. A flexible duration model is therefore more appropriate than a constant-rate assumption. Recovery is treated as a function of both the initial impact and the clarity of the repair path. An endorsement alliance with ambiguous blame may never find a clear repair path, because the product never had a substantive rationale strong enough to separate the defect from the borrowed association. An ingredient alliance tied to a corrected component may recover more quickly once the consumer can see which part changed [19]. The data are rich enough to distinguish those shapes.

4. Estimation Strategy

The empirical design uses three linked estimators. The first examines partner-level abnormal returns around public disclosure. The second traces product-level sales losses and sibling spillovers through local projections in weekly scanner panels. The third models time to recovery with a semiparametric duration approach. The estimators share common event-level covariates but answer different questions. Stock returns capture valuation response by capital markets. Scanner panels capture product demand and intra-portfolio contagion. Recovery duration captures whether the harmed alliance can regain a commercially meaningful portion of its precrisis baseline.

For partner-level stock response, the core specification is

$$\begin{aligned} CAR_{f,e} = {} & \alpha_f + \tau_e + \beta_1 Harm_e \\ & + \beta_2 Harm_e \times Ambig_e \\ & + \beta_3 Harm_e \times Gap_e \\ & + \beta_4 Harm_e \times Role_{f,e} \\ & + X_{f,e}^{\top}\gamma + \varepsilon_{f,e}, \end{aligned} \tag{2}$$

where $CAR_{f,e}$ is the cumulative abnormal return for firm f in event e, $Harm_e$ indicates the crisis event, $Ambig_e$ is low attribution clarity, Gap_e is prominence imbalance, and $Role_{f,e}$ identifies whether the observed firm is the primary or secondary partner. Firm fixed effects α_f absorb persistent return behavior, and event effects τ_e capture common disclosure timing. The interaction structure is designed to reveal whether ambiguity and partner imbalance change how much of the crisis is capitalized into each partner's valuation [20]. Because some episodes affect both parents at once, standard errors are clustered by event and firm.

The logic behind the asymmetric interaction is informed by the broader economics of unequal partner quality. Yan and Cao (2017) analytically showed that brand-quality differences can shift the value of alliance formation unevenly, with the stronger partner becoming more sensitive when the gap is large [21]. In a crisis setting, the parallel implication is that negative information need not distribute proportionally. A dominant

Table 2 Average Stock Market Reaction to Crisis Events

Firm Type	Mean CAR (%)	High Clarity	Low Clarity
Primary Partner	-2.11	-1.67	-2.58
Secondary Partner	-1.29	-0.61	-1.86
Single-brand Firms	-1.46	-1.12	-1.73
Difference (Alliance vs Single)	-0.65	–	–

Table 3 Initial Sales Decline After Crisis

Product Type	Avg Decline (%)	Adjusted Decline	Rank
Endorsement Alliances	-27.9	-25.3	Highest
Ingredient Alliances	-22.4	-20.1	Medium
Composite Alliances	-20.8	-18.7	Lower
Single-brand Products	-16.5	-15.2	Lowest

partner can lose more because its brand carried more of the alliance promise ex ante. The stock-return equation therefore allows the same event to load differently on the two partner firms rather than treating the alliance as a single undifferentiated exposure.

The product-panel estimator traces dynamic effects after commercial disruption. Let $y_{i,m,t+h}$ denote log sales of product or sibling SKU i in market m at horizon h weeks from the crisis onset. The local projection form is

$$\begin{aligned}\Delta y_{i,m,t+h} = {} & \mu_i + \lambda_{m,t+h} + \theta_h Affected_i \\ & + \phi_h Affected_i \times Ambig_e \\ & + \psi_h Affected_i \times Gap_e \\ & + \rho_h Affected_i \times Form_e \\ & + W_{i,m,t}^{\top}\delta_h + \nu_{i,m,t+h},\end{aligned} \tag{3}$$

where $Affected_i$ marks harmed products or exposed siblings, $Form_e$ identifies endorsement, ingredient, or composite structure, and $W_{i,m,t}$ contains price, promotion, category demand, and retailer concentration controls. Product fixed effects μ_i absorb time-invariant product quality, while market-by-week effects $\lambda_{m,t+h}$ absorb local demand shocks. Estimating $\theta_h, \phi_h, \psi_h,$ and ρ_h at successive horizons allows the entire loss and rebound path to be observed without imposing a common dynamic shape. Separate panels are run for harmed alliance products, primary-brand siblings, and secondary-brand siblings.

This dynamic specification serves two purposes. First, it allows immediate impact and medium-run contagion to be estimated in the same framework. Second, it lets the role of ambiguity appear over time [22]. If ambiguity only affects the first week, it is a transient communication problem. If ambiguity affects losses for many weeks, it means the market remained uncertain about where the fault belonged and continued to penalize the connected brands. The local projections show that distinction more transparently than a single pre-post average.

A third estimator examines recovery time. Let T_i denote the week in which harmed product i first regains at least 80% of its precrisis baseline and sustains that level for four consecutive weeks. The hazard of recovery is

$$\begin{aligned}h_i(u) = h_0(u)\exp\Big(&\eta_1 Ambig_i + \eta_2 Gap_i \\ &+ \eta_3 Ingred_i + \eta_4 Comp_i \\ &+ \eta_5 Remedy_i + \eta_6 Severity_i \\ &+ \eta_7 Ambig_i \times Remedy_i \\ &+ Z_i^{\top}\kappa\Big),\end{aligned} \tag{4}$$

where $h_0(u)$ is an unspecified baseline hazard and Z_i contains precrisis brand strength, category growth, private-label pressure, and retailer concentration. A negative coefficient delays recovery. The interaction between ambiguity and remediation intensity is important because fast corrective action may matter little when consumers still cannot tell which side of the alliance has actually been repaired.

For the sibling-product spillover analysis, a structured difference-in-differences design is embedded inside the local projections. Unaffected siblings of the primary brand are compared with matched products from the same brand family not exposed to the harmed alliance, while analogous comparisons are built for the secondary brand. This nested design reduces the risk that broad brand-level advertising or unrelated corporate actions are mistaken for crisis spillover. In addition, placebo windows preceding the event are estimated to verify that affected and control siblings were not diverging before disclosure [23]. The placebo coefficients are close to zero, which supports the identifying assumption that the postcrisis divergence is driven by the event rather than by preexisting trend differences.

Because product-harm episodes differ in severity, a severity

Table 4 Spillover Effects on Sibling Products

Sibling Type	Avg Impact (%)	High Clarity	Low Clarity
Primary Brand (Same Category)	-4.6	-3.1	-6.2
Secondary Brand (Same Category)	-2.9	-1.0	-4.5
Secondary (Distant Category)	-1.2	0.0	-2.3
Control Products	0.0	0.0	0.0

Table 5 Recovery Duration Across Alliance Types

Alliance Type	Median Weeks	Fast Recovery Cases	Slow Recovery Cases
Endorsement	24.1	Low	High
Ingredient	17.2	Moderate	Moderate
Composite	16.9	High	Moderate
Single-brand	14.7	High	Low

control alone may not be sufficient. The design therefore includes matched-event weighting, where each alliance crisis is weighted by its similarity to nonallied crises on category, harm type, baseline size, and public-notice scope. This weighted comparison ensures that the alliance coefficient is not driven by the fact that certain kinds of harm episodes appear more often in categories where alliances are concentrated. The results remain stable under unweighted and weighted estimators, but the weighted version is the preferred one because it improves overlap in the crisis comparison sample.

The estimators also distinguish direct product loss from reputation spillover by using a role-specific exposure map. Let $E_{ij} = 1$ if sibling product j shares the primary brand with harmed item i, $E_{ij} = 2$ if it shares the secondary brand, and $E_{ij} = 0$ otherwise. The spillover coefficients are estimated separately by exposure type and category distance. This allows the same crisis to reduce sales in primary-side adjacent products while leaving secondary-side distant products unaffected, or vice versa. The ability to separate these paths is one of the main advantages of the combined scanner and alliance-structure data.

A final equation summarizes the crisis transmission matrix discussed earlier. For event e, let $\mathbf{y}_{e,h}$ be the vector of cumulative losses at horizon h for the harmed product, primary siblings, and secondary siblings. The reduced-form propagation can be written as

$$\begin{aligned}\mathbf{y}_{e,h} = \mathbf{A}_h \mathbf{s}_e + \mathbf{B}_h \mathbf{z}_e \\ + \mathbf{C}_h \left(\mathbf{s}_e \otimes \mathbf{z}_e\right) + \mathbf{u}_{e,h},\end{aligned} \tag{5}$$

where $\mathbf{s}_e$ is a source-domain indicator vector, $\mathbf{z}_e$ is the alliance-interpretability vector, and $\otimes$ denotes the Kronecker product. The matrices $\mathbf{A}_h$, $\mathbf{B}_h$, and $\mathbf{C}_h$ are estimated indirectly through stacked seemingly unrelated regressions. This representation is helpful because it makes explicit that the crisis source and the alliance architecture jointly determine where losses travel [24]. The model is not introduced to claim structural completeness. Its purpose is to organize the reduced-form evidence around a coherent propagation system.

Taken together, these estimators permit a layered reading of the same event. One can see how capital markets interpreted the crisis, how consumers and retailers adjusted demand for the harmed product, how nearby products attached to each partner were affected, and how long it took for the harmed item to regain commercial footing. The next section reports the results in that sequence.

5. Empirical Results

The average alliance crisis generated a negative and statistically significant response in both capital markets and product markets, but the magnitudes were neither uniform nor mechanically linked. In the stock-return sample, the mean three-day abnormal return for primary partner parents was -2.11%, while the corresponding mean for secondary partner parents was -1.29%. The matched nonallied crisis sample showed a mean return of -1.46% for the affected single-brand parent firms. Thus alliance crises appear somewhat more punitive in financial-market terms, although the difference is not so large that one could attribute it to the mere presence of two names. What matters is how the two names were connected and how the crisis was explained. Once attribution clarity and prominence imbalance enter the model, the excess penalty attached to alliance crises is concentrated in a particular subset of events rather than being universal.

Attribution ambiguity accounts for much of the difference. In high-clarity crises, where the source of fault could be inferred quickly from the notice and the visible product architecture, the primary partner's mean three-day abnormal return was -1.67% and the secondary partner's was -0.61% [25]. In low-clarity crises the corresponding figures were -2.58% and -1.86%. The secondary-side change is particularly striking because it

Table 6 Effect of Attribution Clarity and Remediation

Condition	Recovery Speed	Spillover	Interpretation
High Clarity + Strong Remedy	Fast	Low	Clear repair path
High Clarity + Weak Remedy	Moderate	Low	Partial confidence
Low Clarity + Strong Remedy	Slow	High	Ambiguity persists
Low Clarity + Weak Remedy	Slowest	Highest	Severe uncertainty

Table 7 Impact of Prominence Imbalance

Imbalance Level	Primary Loss (%)	Secondary Loss (%)	Spillover Pattern
Low	-1.8	-1.2	Balanced
Medium	-2.3	-1.3	Slight skew
High	-3.0	-1.4	Dominant brand hit
Extreme	-3.5	-1.5	Strong asymmetry

indicates that the nonresponsible partner does not simply escape once its operational innocence is established internally. The public must be able to infer that innocence from what it can see. When it cannot, the alliance functions as a fused reputational object and both sides absorb the penalty. This result survives firm fixed effects, event clustering, and controls for severity and notice scope.

Prominence imbalance then shapes how the ambiguity penalty is distributed. In alliances where one brand clearly dominated the package, the communication, and precrisis salience, the stronger partner absorbed a larger share of the market-value loss than the weaker partner, even when the operational source of the crisis lay elsewhere. Moving from the twenty-fifth to the seventy-fifth percentile of prominence imbalance increased the dominant partner's abnormal return loss by approximately 0.73 percentage points. The weaker partner's loss increased only slightly. This pattern is consistent with the view that market participants capitalize not only operational responsibility but also symbolic liability. The more a brand appears to own the promise of the product, the more of the crisis it ends up owning in the eyes of investors.

Product-level sales response shows a related but not identical pattern. Harmed alliance products experienced an average sales decline of 23.8% over the first four postcrisis weeks relative to their precrisis baseline, compared with 16.5% for matched single-branded harmed products [26]. The raw gap therefore stands at 7.3 percentage points. After adjusting for severity, harm type, category, retailer concentration, and precrisis trend, the estimated alliance penalty remains at 5.1 percentage points. This is the first direct indication that alliances are more fragile under product-harm conditions than otherwise comparable single-branded products. Yet the gap is not uniform across structures. Endorsement alliances show the largest adjusted first-month decline at roughly 27.9%. Ingredient alliances lose 22.4%, and composite alliances 20.8%. These differences narrow slightly once the harm type is controlled more finely, but the ordering remains.

The structure of the decline helps explain why the initial gap emerges. Endorsement alliances are especially vulnerable to ambiguity. In many of them the secondary brand had been serving mainly as a borrowed symbolic cue. Once the product enters crisis, that cue no longer clarifies anything. Instead it widens the set of associations potentially contaminated by the event [27]. Ingredient and composite alliances often suffer more from physical harm severity, but they also offer a clearer map of what failed. A named component can be removed or corrected. A shared formulation can be reformulated. A purely endorsed identity is harder to repair because the failure is less easy to pin to a concrete product layer. The sales path seems to reflect this difference.

The local projections reveal that the alliance penalty is front-loaded but persistent. For harmed alliance products, the average weekly sales deviation remains below -15% through week ten and below -8% through week twenty-two. Matched single-branded harmed products recover somewhat more quickly, crossing above the -8% threshold by week fourteen. The gap between alliance and nonallied crises is smallest when the event is high severity but high clarity, and largest when the event is moderate severity but low clarity. This is informative because it suggests that interpretive uncertainty can be as economically costly as physical severity over the medium run. A severe but well-explained recall damages sales sharply but creates a relatively understandable repair path. A less severe but poorly attributed event can keep consumers away longer because they do not know which part of the joint promise remains compromised.

Spillover to unaffected sibling products is economically meaningful and sharply asymmetric [28]. Primary-brand siblings in the same broad category family decline by an average of 4.6% in the first eight weeks after the crisis. Secondary-brand

Table 8 Role of Alliance Structure in Crisis Response

Structure	Attribution Ease	Spillover Risk	Recovery Potential
Endorsement	Low	High	Low
Ingredient	High	Moderate	High
Composite	Moderate	Moderate	High
Hybrid Cases	Variable	Variable	Variable

Table 9 Moderating Effects of Category and Retail Factors

Factor	Effect on Decline	Effect on Recovery	Notes
Retail Concentration	Increases	Slows	Strong in endorsements
Private Label Share	Neutral	Slight slowdown	Weak effect
Category Growth	Reduces	Speeds up	demand
Shelf Contribution Pre-crisis	Reduces	Speeds up	Retailer support

siblings decline by 2.9% on average. These mean effects are not trivial given that the products themselves were not recalled. However, the spillovers are highly contingent. In high-clarity crises the secondary-side spillover falls close to zero outside the harmed category family, while in low-clarity crises it remains negative even in distant categories where the secondary brand appears alone. The primary-side spillover is generally stronger because the primary brand is usually closer to the harmed production domain, but it too becomes much larger under ambiguity. The market appears to use clarity as a filter for deciding whether the problem belongs to one product, one partner, or the alliance relationship more broadly.

Category distance moderates these spillovers in intuitive but not trivial ways. Within-category sibling products of the primary brand show the largest losses, as expected. Adjacent-category secondary-brand products show a smaller but still detectable decline when the alliance had been highly salient and the crisis notice was vague. Distant-category secondary products show little reaction under clear attribution but a persistent negative drift under ambiguity. This last result matters because it indicates that low-clarity crises can reshape perceptions of the partner brand beyond the logical scope of the defect. The loss is no longer about technical recurrence alone [29]. It becomes a judgment about what the partner brand was doing in the alliance and whether that judgment can still be trusted.

Recovery duration results reinforce the same story. The median time required for harmed alliance products to regain 80% of their precrisis baseline was 19.4 weeks. For matched single-branded harmed products the comparable median was 14.7 weeks. Once severity and category conditions are controlled, alliance products still exhibit a longer median recovery time by about 3.8 weeks. Yet the average again conceals strong structural variation. Endorsement alliances have the slowest recovery, with a median of 24.1 weeks. Ingredient alliances recover in 17.2 weeks, and composite alliances in 16.9 weeks. When high attribution clarity and strong remediation are both present, ingredient and composite alliances often recover at least as quickly as matched single-branded harmed products. In other words, alliances are not doomed to recover slowly. They recover slowly when the market cannot see how the failure maps onto the structure of the product and the partners.

Remediation intensity has a large and statistically precise effect. A one-standard-deviation increase in remediation intensity raises the recovery hazard by roughly 22% [30]. The effect is strongest for ingredient and composite alliances and much weaker for endorsement ones. This difference is consistent with the logic of visible repair. In an ingredient alliance, substituting or correcting a named component is legible to the market. In a composite alliance, reformulation and relaunch under coordinated partner communication can also be legible. In a shallow endorsement alliance, even active remediation may leave the consumer unsure what exactly changed, because the alliance signal was not rooted in a clear physical contribution to begin with.

One of the more interesting findings concerns the interaction of ambiguity and remediation. In low-clarity crises, strong remediation still helps, but much less than in high-clarity crises. The interaction term is negative and sizeable. Fast action does not fully offset the damage caused by unclear responsibility. This is a practical result. Firms can respond rapidly and still recover slowly if their alliance had been organized in a way that made responsibility hard to infer. Crisis management therefore does not begin after disclosure [31]. It begins earlier, in the way the alliance is specified and presented to the market before any defect occurs.

The secondary partner's prior alliance saturation also matters. When the secondary brand had been used across many active visible collaborations before the crisis, secondary-side spillover was smaller in immediate percentage terms but more persistent in duration. The likely interpretation is that a heavily used

partner brand carries weaker incremental symbolic force in any single alliance, which reduces the first-week shock, yet it also has a thinner reserve of distinctiveness, which slows reputational normalization. This pattern is especially visible in endorsement alliances where the partner's visible role is mainly symbolic. Scarcity of the borrowed brand seems to make crisis contagion sharper but shorter, whereas saturation makes it flatter and more lingering.

Capital-market and product-market results are related but not redundant. In some high-severity ingredient crises, the harmed product's sales collapse was larger than average, yet the nonresponsible secondary partner's stock return penalty was limited because the market quickly understood where the fault lay and how it could be corrected. In some lower-severity endorsement crises, the product-level decline was moderate, but the secondary partner's stock return penalty was surprisingly large because the event created doubt about alliance screening and symbolic discipline. This divergence confirms that investors price governance exposure and brand stewardship, not only near-term sales loss. Product data alone would miss that dimension.

Additional estimates examined whether the harmed alliance gained any recovery support from category conditions. Two patterns emerge [32]. First, retailer concentration slows recovery in endorsement alliances more than in ingredient or composite ones, likely because concentrated buyers are less willing to keep shelf space on products whose repair path is not concrete. Second, categories with lower private-label penetration show somewhat faster normalization across all alliance forms, though the effect is modest after controls. These category interactions do not overturn the primary structural findings. They mainly show that alliance architecture matters even after ordinary retail conditions are taken into account.

The matched nonallied crises provide a useful benchmark here. Many single-branded harmed products also recover slowly, and severe crises damage them substantially. The distinctive feature of alliance crises is not that they are catastrophic in every case. It is that the downside is more strongly conditioned by interpretive architecture. Single-branded products generally do not need the consumer to parse roles across two firms. Alliance products do. That additional interpretive step becomes economically consequential once the product fails.

6. Recovery Paths and Boundary Conditions

The previous section established that alliance crises are more damaging on average and that ambiguity, prominence imbalance, and structural form shape both spillover and recovery. The remaining question is what kinds of postcrisis actions modify these patterns and where the boundaries of the findings lie [33]. Recovery is not a single act. It is a sequence involving withdrawal, explanation, technical correction, retailer reacquisition, and consumer reacceptance. The same alliance can fail at one stage and succeed at another. This section therefore examines recovery in greater detail, focusing on relaunch decisions, communication asymmetry between partners, and whether crisis effects differ when the product had been especially valuable before the shock.

A useful starting point is to remember that brand alliances often create value under normal launch conditions. Cao and Sorescu (2013) documented positive stock-market responses to cobranded product introductions and found that factors such as consistency, exclusivity, and innovativeness strengthened those responses, while all three major structural forms of cobranded products could add value [34]. The crisis evidence in the present paper does not contradict that result. Instead it identifies a neglected asymmetry between upside and downside. The same alliance features that support launch value do not automatically govern crisis resilience. What matters after harm is not merely whether the alliance was positively received when introduced, but whether its responsibility structure can still be understood when the product fails. A launch can be attractive because the labels work well together. A recovery depends on whether the fault can be detached from the entire symbolic combination [35].

Relaunch under unchanged branding performs differently from relaunch with visible packaging or formula revision. Products that returned to shelf under materially revised packaging, even when the brand names were unchanged, recovered faster than those that reappeared in nearly identical form. The effect is strongest in ingredient and composite alliances, where visible product revision can plausibly signal technical correction. Endorsement alliances benefit less from this strategy because the packaging change often lacks a convincing link to the source of the original failure. In those cases, the consumer may interpret revised packaging as cosmetic rather than substantive. The scanner data show that visible reformulation cues and clarified labeling reduced the postrelaunch discount rate needed to restore movement, whereas cosmetic revision alone did not.

Communication asymmetry between partners also matters. Some crises featured coordinated statements from both firms. Others featured silence from one side or statements that differed in specificity and timing. Coordinated communication is associated with faster recovery only when the message clearly assigns operational responsibility and describes the remedy concretely. Purely synchronized reassurance without assignment of responsibility adds little. In fact, in low-clarity endorsement crises, coordinated but vague messages are associated with slower recovery than one-sided but precise operational correction from the responsible partner. This suggests that symmetry of voice is less important than clarity of content [36]. Alliance partners do not help themselves by appearing equally concerned if they do not also make the source and the fix easier to understand.

The stock-return data reveal a similar boundary condition. Secondary partners suffer the largest abnormal return penalties not simply when they are linked to a crisis, but when they appear unable to distinguish their role from that of the primary partner. In some cases, the secondary partner's explicit clarification of its limited operational role reduced the valuation penalty even while the harmed product's sales remained weak. The market seems willing to separate governance responsibility from technical responsibility when communication enables that separation. This is another example of product and firm outcomes diverging. A product can remain commercially damaged while one partner begins to repair its corporate valuation by making its

role legible.

A second boundary condition concerns precrisis alliance salience. Products with exceptionally high precrisis visibility suffered steeper immediate declines because more consumers were exposed to the negative information. Yet their recovery rates were not uniformly worse. Highly salient ingredient and composite alliances often recovered better than low-salience endorsement alliances once remediation was concrete. Salience therefore cuts in two directions. It increases immediate exposure, but it can also increase the reach of corrective information when the correction is legible [37]. This pattern would be missed in a model that treated visibility only as a liability amplifier.

There is also evidence that retailer reacquisition is easier when the harmed alliance had delivered category growth before the crisis rather than merely shifting share within the category. For a subset of events where precrisis category contribution could be estimated, products that had increased total category sales prior to the crisis regained distribution faster after correction than products that had functioned mainly as share takers. Retailers appear more willing to restore shelf support when the alliance had previously demonstrated category-expansion value. This factor remains significant even after controlling for brand strength and severity. The implication is that precrisis strategic contribution can become a buffer in adverse states. A product that had earned its space by growing the aisle is treated differently from one that had merely borrowed attention.

The relationship between crisis severity and recovery also shows a nonlinear pattern. Low-severity events recover quickly almost by definition. Extremely severe events recover slowly even when clearly attributed. The most interesting zone is the middle of the distribution, where severity alone does not determine the path. In this zone, alliance architecture becomes especially consequential [38]. Moderate-severity endorsement crises often recover more slowly than equally severe ingredient crises because the technical problem is easier to explain than the symbolic contamination of a shallowly integrated alliance. This result underscores that recovery is partly a communication problem, but not in the superficial sense of message volume. It is a communication problem rooted in the prior structure of the product.

The role of prominence imbalance remains strong in all of these specifications. A dominant partner brand does not simply serve as a powerful anchor at launch; it also becomes a large target under crisis. Products with strong imbalance required more retailer support to regain distribution, and the dominant partner's unaffected siblings recovered more slowly from spillover losses. This is consistent with a market-learning mechanism. Consumers appear to use the most salient brand as the principal inference object, so that brand carries a larger burden once negative information enters. Balanced alliances, by contrast, distribute both credit and blame more evenly. Their direct product recovery is not always faster in the first weeks, but their broader partner portfolios appear less distorted by the crisis.

Several supplementary analyses tested whether these findings might reflect broader corporate distress rather than event-specific alliance dynamics. Excluding episodes accompanied by earnings announcements, executive turnover, or concurrent product line rationalization did not alter the main coefficients materially. Restricting the stock-return sample to firms with no other major public disclosures in the event window yielded similar results [39]. Likewise, restricting the scanner sample to products in chains with stable assortment plans did not remove the ambiguity and form effects. These checks increase confidence that the observed patterns are not artifacts of unrelated corporate or retail turbulence.

The final boundary condition concerns the possibility of permanent decoupling. Some harmed alliance products returned under modified formulation but with one partner removed. These cases are rare but informative. Products that dropped the secondary brand after crisis generally recovered faster in volume than those that returned under the same alliance label when the original structure had been endorsement oriented and low clarity. In ingredient and composite cases, decoupling did not produce the same advantage and sometimes slowed recovery, likely because removing the partner also removed a substantive part of the product logic. This asymmetry again points to the distinctive fragility of shallow symbolic alliances under harm. When the partner brand had contributed mainly borrowed meaning, that meaning becomes easier to discard after failure. When the partner brand had contributed product substance, decoupling may solve one problem while creating another.

7. Implications for Alliance Design under Downside Risk

The evidence implies that alliance design should be evaluated with a crisis lens long before any crisis occurs. Most managerial discussions of brand alliances revolve around complementarity, promotional upside, and possible premium support. Those are legitimate considerations, but the present results suggest that firms should also ask a more severe question: if this product fails in a visible way, will the market know what each partner was responsible for, and will the repair path be legible? The answer depends less on legal contracting than on how the product was actually presented to consumers and retailers [40].

One implication concerns partner visibility. A highly salient partner can strengthen the launch, yet it also creates a larger reputational surface that will absorb blame later. This does not mean that firms should equalize all alliances artificially. It means that extreme salience imbalance should be understood as a liability multiplier in adverse states. The stronger brand can carry the product into the market, but it can also carry the crisis farther than the operational facts alone would justify. Designers of alliance packaging and communication therefore face a genuine trade-off between immediate signaling power and downside containment.

A second implication concerns role legibility. When the alliance asks the consumer to process two brands as a fused promise without preserving any observable distinction in their contribution, it becomes difficult to contain blame when the product fails. By contrast, when a partner's role is visible, whether through ingredient contribution, functional component, or clearly divided formulation logic, the market has a map for

assigning responsibility. This does not necessarily reduce the direct loss to the harmed product, but it can reduce spillover to the nonresponsible partner and accelerate recovery once correction occurs. In that sense, alliance transparency is not only a consumer-education issue. It is a risk-containment device [41].

A third implication concerns the use of scarce partner brands. Secondary brands that are spread across many visible collaborations may experience a different crisis profile from selectively deployed partners. The results here suggest that saturation softens the immediate shock but lengthens the normalization period. Managers using partner brands across multiple alliances should therefore distinguish between first-order launch benefits and second-order erosion of interpretive reserve. A partner brand that appears everywhere may no longer carry enough distinctiveness to recover quickly after negative association enters the system.

The findings also imply that crisis communication should be evaluated against precrisis structure rather than treated as a generic best-practice exercise. Vague joint reassurance is not enough. Firms benefit when the communication matches the visible architecture of the product and the actual source of the defect. Ingredient and composite alliances can often support such matching because the corrective action can be tied to a named component or formulation layer. Endorsement alliances have a harder task. Their best defense may not be louder communication but more selective alliance use to begin with, precisely because repair is difficult once the borrowed cue becomes contaminated.

Another implication concerns portfolio planning. If a partner brand is going to be used in multiple alliances, firms should consider whether its role is mostly symbolic or mostly substantive [42]. Substantive roles may expose the partner to more direct scrutiny when harm occurs, but they also create clearer repair paths. Purely symbolic roles may look safer in benign settings and yet prove harder to defend under blame because the market lacks a concrete logic for separating the partner from the failure. That asymmetry is visible in the recovery results and should influence how firms think about the balance between endorsement and integration.

Retailers are likely to react similarly. A buyer deciding whether to restore shelf support after a recall is not reading the legal contract between alliance partners. The buyer sees the product, the notices, the correction, and the category economics. The present evidence suggests that buyers are more willing to support products whose correction is visible and whose precrisis category contribution had been real. This means that an alliance's precrisis commercial quality becomes part of its crisis insurance. Products that merely borrowed attention and shifted share internally are more exposed when the aisle must decide whether they deserve a second life.

8. Conclusion

This paper examined how brand alliances behave when product harm forces the market to allocate blame and reassess trust. The evidence indicates that alliance products experience larger initial demand losses than matched single-branded harmed products and that the difference is shaped less by the physical harm alone than by the interpretive structure of the alliance. When responsibility is clear, contagion to the nonresponsible partner is limited and recovery improves. When responsibility is ambiguous, losses spread across both partners and linger [43]. Prominence imbalance further redistributes those losses toward the more salient brand. Structural form matters as well. Endorsement-oriented alliances are the most vulnerable to ambiguity and the slowest to normalize, while ingredient and composite alliances are better positioned to convert corrective action into visible recovery.

These findings suggest that downside risk in brand alliances is not an exogenous shock layered onto an otherwise neutral design. It is partly built into the way the alliance allocates visibility, role definition, and repairability before any crisis occurs. Some alliances are easier to celebrate at launch but harder to defend under blame. Others are more exposed to direct product scrutiny yet easier to restore once the source of failure is corrected. The difference lies in whether the market can see what each partner contributed and what exactly has been fixed.

A practical reading follows from that point. Brand alliances should be designed with attribution in mind, not only fit or publicity. A product can benefit from borrowed association in normal times and still carry avoidable ambiguity in adverse times. The most resilient alliances appear to be those that make contribution structure legible enough to support targeted correction without dissolving the product's value proposition. In that sense, the crisis setting reveals a deeper property of alliance quality: not simply how well two brands combine when everything works, but how intelligibly they separate when something fails [44].

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