

USING RESTITUTION TO SUPPORT BUSINESS NETWORKS

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This article examines the dramatic increase in business networks in recent decades and considers whether the law can play a useful role in supporting the efficient functioning of these inter-firm relationships for coordination and cooperation. Repeat play, reputational sanctions, and norms of trust and reciprocity are the common explanations for the flourishing of networks in many industries and places. But the evidence also shows that many emerging networks fail to form or function effectively. Lacking a controlling entity, they are “webs without any spider.” Clusters of industrial districts are traditional examples of this class of network. More recently, the information revolution has stimulated a dramatic increase in networks of strategic alliances that are now a common means of organizing collaborations among firms in high technology and R & D intensive settings. In both these types of “spiderless” networks there are no legal mechanisms to control moral hazard and free riding risks during the period of network formation and operation. We ask under what conditions would legal mechanisms effectively complement existing relational modes of motivating reciprocity among network members? We first develop an informal model that uses the law of restitution and unjust enrichment to encourage efficient network formation and operation by allowing key participants to receive some of the benefits currently captured by other participants. We then relax the restrictive assumptions of the model to consider the many problems of implementation, including difficulties in verifying costs and benefits, litigation error costs and the risk that a legal remedy may crowd out rather than braid with the relational forces that otherwise support network formation. This analysis argues in favor of low-powered legal remedies such as the recovery of a portion of the realized benefits from network participation. Even though there are substantial hurdles to overcome in implementing a restitution remedy for fragile

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alliances, we argue that a narrowly structured right of restitution can function as a background rule for sharing the benefits and costs among alliance network members, motivating these parties to overcome the coordination problems that otherwise deter them from creating a spider to organize the distribution of network value. We apply our analysis to a few well known existing networks, including the Silicon Valley network and the Apple-Sony-IBM network.

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INTRODUCTION

When business parties want to collaborate they have traditionally pursued two avenues: market transactions and integration. Starting in the 20 century, but continuing at a much greater pace in the past two decades as a product of the “information revolution,” business networks have emerged as a third avenue of cooperation. Inter-firm networks are mechanisms for coordination and cooperation between formally independent but functionally interdependent firms. They provide firms with access to essential capabilities and resources that are under the control of other firms in their environment. Firms in networks frequently contract with others in the network to further their network project and these contracts can create benefits for, or impose costs on, other network members who are not contract parties. Addressing the moral hazard, free riding and distributional issues raised by these externalities in the absence of formal legal ties among (all) participants has challenged economists, sociologists and organizational theorists. In lieu of legal mechanisms, repeat play, reputational sanctions, and norms of trust and reciprocity are the common explanations for the flourishing of networks in many industries and places.

Until recently, the question of why some networks are durable and others are fragile has been largely ignored by legal scholars.¹ This lack of

¹ Some significant exceptions are Alan Schwartz & Robert E. Scott, *Third Party*

attention to how networks emerge and stabilize owes, in part, to the fact that legal intervention in networks is relatively rare. In addition, the overly broad focus on a network as a generic mode of cooperation and collaboration is too capacious to permit useful legal analysis. Some networks, for example, can deploy standard contractual mechanisms—whether in the form of a master contract as in the case of a franchise, or a bureaucratic contractual structure as in the case of trade associations—that support network formation. These relationships have a “spider in the web”—a controlling party or hierarchy at the center of the network that facilitates network formation.² Other networks, however, are fundamentally symmetric or parity-based. Lacking a controlling entity, they are webs without any spider. Here, there are fewer legal mechanisms to control moral hazard and free riding risks during the period of network formation and operation.

In this article, we focus on this latter class of networks that form because of the incentive to exploit the positive returns from coordination and cooperation but lack any centralized control. Clusters of industrial districts are traditional examples of the class of networks that form without a spider. These networks are geographically compact agglomerations of small and medium sized firms in an industry characterized by volatile or rapidly shifting demand, all of which specialize in a particular phase of production or a production process. But the information revolution, and the consequent rise in uncertainty, has stimulated a dramatic increase in a once novel organizational form: networks of strategic alliances that are now a common mechanism for organizing collaborations among firms in high technology and R & D intensive settings.³ Some alliance networks lack the social networking features—personnel mobility and geographical and cultural proximity—that support industrial districts. While there are bilateral (collaborative) contracts between individual firms in these alliance networks, the network itself as a mode of coordination and cooperation is not formalized into a contract or bureaucratic structure. Here the

Beneficiaries and Contractual Networks, J. LEGAL ANALYSIS (forthcoming 2015) (on file with author), and Lisa Bernstein, *Private Ordering, Social Capital, and Network Governance in Procurement Contracts: A Preliminary Exploration* (mimeo 2015).

² We are grateful to Ron Gilson for suggesting the metaphor of the web with and without a spider.

³ Ranjay Gulati & Martin Gargiulo, *Where Do Interorganizational Networks Come From?*, 104 AM. J. SOCIOLOGY 1439, 1441, 1445 (1999) (stating that “[T]he number of interorganizational [strategic] alliances has grown at an unprecedented rate in the last 15 years” and that most organizations are embedded in a variety of interorganizational networks, such as board interlocks, trade associations, and research and development ventures); Walter W. Powell & Paul Brantley, *Competitive Cooperation in Biotechnology: Learning through Networks?*, in NETWORKS AND ORGANIZATION: STRUCTURE FORM AND ACTION 366 (N. Mohria & R. Eccles eds. 1992) (“In the past decade we have seen a pronounced shift away from a strict reliance on internal R&D to a greater emphasis on various forms of externally based collaborative research and development”).

membership in the network is “vague and fluid,”⁴ the actions of any party can create positive externalities for others but the same behavior also motivates moral hazard and free riding by others in the network. These risks undermine what we call a “reciprocity equilibrium.” A reciprocity equilibrium results when each network member receives from the network a benefit proportionate to the net benefits it receives and creates for others.⁵ If network participants deviate significantly from reciprocity equilibrium the network will fail to form successfully and, even if formed, further efficient participation and operation of the network may be precluded. If, however, moral hazard and free rider problems can be mitigated, the network produces value by generating information flows that advance innovation and reduce the costs of the search for new alliance partners.⁶

The starting point of our analysis is the formation of clusters and alliance networks with particular focus on those industries where social capital⁷ is weak and data show that network formation is impeded and emerging networks frequently fail.⁸ We ask: can the law usefully support the formation and efficient operation of these networks that lack a spider in the web?⁹ And, if so, under what conditions would legal mechanisms effectively complement existing relational modes of motivating reciprocity among network members? To be sure, the state can always determine to support network formation and stability through a scheme of taxes and subsidies. In this paper, however, we put aside this consideration in order to ask the more limited question of whether existing private law remedies can usefully promote network and welfare goals.

To begin to answer these questions, we develop an informal model that uses the law of restitution and unjust enrichment to encourage efficient network formation and operation by allowing key participants to receive

⁴ Schwartz & Scott, *supra* note 1 (manuscript at 32).

⁵ *See infra* Section I.B.2.

⁶ Our premise in this article is that there is a positive, though imperfect, correlation between network welfare and social welfare. Because the correlation between network welfare and social welfare is imperfect, however, our normative views are tentatively held. An additional justification for adopting network welfare as a criterion is that normative critique, when directed at courts, should take into account the type of goal a court can implement. Courts are not equipped to make global welfare assessments, but should be able to discern whether permitting or denying a legal claim would better advance network goals. *See infra* Section III.A.

⁷ Social capital refers to the creation of relation-specific trust between firms that is created through interpersonal ties among key employees, the emergence of norms of reciprocity and experience in problem solving though information exchange. *See e.g.*, Sinead Roden & Benn Lawson, *Developing Social Capital in Buyer-Supplier Relationships: The Contingent Effect of Relation-Specific Adaptations*, 151 *IND. J. PRODUCTION ECON.* 89, 90-91 (2014) (discussing the social capital theory).

⁸ *See infra* text accompanying notes 50-51.

⁹ Note that while legal intervention is most useful for networks where social capital is weak, it could also support networks that currently form with no legal intervention by making their operations more efficient.

some of the benefits currently captured by other participants. Under the model, any member of a network who creates net benefits for others, and whose costs are greater than private benefits, is entitled to recover the lower of two measures—either the verifiable benefits created for others or the difference between the benefactor's costs and benefits.¹⁰ The model also supports a distributional principle where the members are entitled to share the network surplus according to their costs, the benefits they received and the benefits they conferred.

We then relax the restrictive assumptions of the model to consider the many problems of implementation, including difficulties in verifying costs and benefits, litigation error costs and the risk that a legal remedy may crowd out rather than braid with the relational forces that otherwise support network formation. This analysis argues against high-powered legal enforcement, such as the disgorgement of all gains, and in favor of low-powered legal remedies such as the recovery of a portion of the realized benefits from network participation. Even though there are substantial hurdles to overcome in implementing a restitution remedy for fragile alliances, we argue that appropriately modest legal remedies can potentially complement existing relational norms, particularly in a network's formation stage where moral hazard and free riding associated with the timing of network inducing investments can stand in the way of the network forming at all. In this way, a narrowly structured right of restitution can function as a background rule for sharing the benefits and costs among alliance network members, motivating these parties to overcome the coordination problems that otherwise deter them from creating a spider to organize the distribution of network value.¹¹

The Article proceeds as follows. In Part I we present a typology of business networks sufficiently rich to capture the breadth of cooperative inter-firm relationships but also sufficiently parsimonious to serve as the basis for understanding the relationship among the factors that determine how and whether the network will emerge and how it will function. We show how access to social capital distinguishes those spiderless alliances that appear quite stable despite the absence of legal mechanisms from other networks where high uncertainty and the absence of social capital makes them more vulnerable to uncontrolled moral hazard problems.¹² We isolate the conditions under which the introduction of legal mechanisms to govern

¹⁰ See *infra* Section II.C.

¹¹ See *infra* Section III.E.

¹² See *infra* Section I.A.2. Social capital ties that form in networks that are characterized by geographical concentration and personnel relationships are stronger in some networks, such as industrial district clusters and biotech alliances, than they are in emerging alliances among widely separated firms with different cultural patterns and little movement of personnel among the network members. The key characteristic of the dramatic growth of strategic alliance in the last several decades has been the increasing diversity of alliance partners' nationalities. Ranjay Gulati, *Alliances and Networks*, 19 STRATEGIC MGMT J. 293, 302 (1998).

these fragile relationships can serve as complements to existing relational norms, in effect braiding formal and informal elements to support the formation and operation of efficient networks.

In Part II we develop an informal model under restrictive assumptions to show how restitution and unjust enrichment law can in theory aid in solving moral hazard, free-riding and other transaction costs problems. The model suggests clear criteria for implementing a remedial scheme based in restitution and illustrates its application to supporting network formation and operation. Part III then relaxes the assumptions of the model and considers the countervailing costs of creating a restitution regime to support network functioning, including the vexing difficulty of measuring network value in strategic alliances, the consequent increase in litigation costs and the risk of crowding out relational modes of enforcing cooperation. Here, we develop the argument that a carefully crafted right of restitution might nevertheless function as an efficient set of background rules—a bargain-enabling default¹³—that would encourage the parties to these horizontal alliance networks to adopt a governance regime that supports the informal mechanisms that currently regulate the cooperative relationship between network firms.

We conclude that, despite verifiability concerns, carefully crafted restitution remedies can encourage members of spiderless networks to overcome coordination problems and reach contractual solutions to the asymmetric distribution of network benefits. Networks are dynamic forms of organization and the evolutionary process implies a movement toward the development of a centralized regime (a spider) to control distribution of network value.¹⁴ A restitution regime can assist in this process and thus reduce the incidence of failure in alliance networks.

¹³ The concept of a “bargain-enabling default” was first developed in Robert E. Scott & George G. Triantis, *Embedded Options and the Case Against Compensation in Contract Law*, 104 COLUM. L. REV. 1428, 1488-90 (2004). In this context, “bargain-enabling” more accurately describes the coordinating function that a background restitution rule provides for spiderless networks. We choose the term “bargain-enabling” rather than the alternative of “penalty” defaults because the latter has the narrower meaning of inducing disclosure when disclosure would permit more efficient contracting performances. *But see* Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L. J. 87 (1989) (discussing the penalty default rule of “no contract” in order to encourage parties to draft terms and not externalize costs to courts).

¹⁴ The centralizing regime may be a bureaucratic mechanism to internalize benefits (as in the case of cooperatives and trade associations) or a controlling agent (as in the case of the purchasing firm in supply chains) with responsibility for devising mechanisms such as association rules or master contracts that specify network obligations.

I. A TYPOLOGY OF BUSINESS NETWORKS

A. Factors that Distinguish Networks and their Governance

The starting point of our typology of business networks is the claim that two characteristics of the particular environment—the presence or absence of a controlling regime or agent (the spider) and the uncertainty associated with the market determine the range of governance mechanisms networks require in order to overcome moral hazard and free riding problems.

1. Networks with Spiders

When networks form around (or are formed by) a central agent—a regime that exercises some control over the distribution of benefits and costs in the network—the level of uncertainty determines how the parties respond to the challenges of maintaining the network. As we illustrate in Figure 1, when uncertainty is low, networks with controlling agents deploy more conventional forms of contingent contracting to control conflicts among members. Examples include franchises,¹⁵ construction contracting,¹⁶ contemporary credit card networks,¹⁷ standard setting organizations,¹⁸ and networks formed by hospitals with service providers, insurance companies and patients.¹⁹ In each case, there is an agent whose economic interests are advanced by the creation of the network and who has incentives to control network size and to internalize network externalities. Sometimes the

¹⁵ Claims by network members arise frequently in franchise networks. The disputes vary, sometimes involving claims by franchisees (either existing or potential) arising out of contractual obligations assumed by the franchisor in the master franchisee contract. *See, e.g.,* *Chu v. Dunkin' Donuts Inc.*, 27 F. Supp. 2d 171, 174 (E.D.N.Y. 1998) (claim by a prospective franchisee suing on the basis of a settlement agreement between the franchisor and former franchisees).

¹⁶ Disputes over defective or failed performance in large construction projects frequently arise in these networks where the litigation centers on disputes between the owner of the project and various sub-contractors whose primary contractual relationship is with the general contractor. *E.g.,* *Aetna Cas. & Sur. Co. v. Fireguard Corp.*, 249 Va. 209 (1995); *A.E.I Music Network, Inc., v. Business Computers, Inc.*, 290 F. 3d 952 (2002); *Guardsman Elevator Co., Inc., v. United States*, 50 Fed.Cl. 577 (2001).

¹⁷ *See, e.g.,* *Sovereign Bank v. BJ's Wholesale Club, Inc.*, 533 F.3d 162, 164 (describing credit card networks).

¹⁸ Standard-Setting Organizations (SSOs) form networks with members who rely on industry standards to “establish technical specifications to ensure that products from different manufacturers are compatible with each other.” *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872, 875 (9th Cir. 2012) (describing SSOs).

¹⁹ Networks form between hospitals, hospital service providers, patients, insurers and HMOs. Third party beneficiary suits are common in this category of networks. For cases where patients sued as third party beneficiaries of contracts between hospitals and service providers, *see, e.g.,* *Jenkins v. Best*, 250 S.W.3d 680 (Ky. Ct. App. 2007); *Dorr v. Sacred Heart Hosp.*, 228 Wis. 2d 425 (Wis. Ct. App. 1999). For discussion, *see* Schwartz & Scott, *supra* note 1 (manuscript at 13).

optimal network size is not sufficiently clear ex ante for the spider to write a master contract. But even then, third party beneficiary law permits parties to signal the intent to cover third parties even though they have not been identified explicitly in the ex ante contracting process.²⁰ Another network form in this environment is the trade association where control is formalized in associational contractual agreements. Here the formal agreement specifies the organizational relationships between allied parties but the degree of formalization never substitutes for the presence of a social capital network.²¹

Figure 1: Network Governance and Uncertainty

	<i>Low Uncertainty</i>	<i>High Uncertainty</i>
<i>Spider</i>	Trade associations, franchises, construction Ks, credit cards, SSOs	Collaborative supply chains
<i>No spider</i>	Industrial district clusters	Strategic alliances

Even in high uncertainty environments, spiders are capable of developing governance structures that rely on contract. Here the prime example is the evolution of the modern supply chain that relies on collaborative contracting between the suppliers and the buyer to coordinate vertical or transactional interdependencies between and among the firms.²² The higher level of uncertainty does not preclude contract but does change the nature of contracting. Facing conditions of high uncertainty, modern supply chains have devised radically incomplete bilateral collaborative agreements together with master contracts that commit the parties to collaborate but do not structure the course or outcome of the collaboration.²³ Collaborative contracts braid with the evolving social

²⁰ Schwartz & Scott, *supra* note 1. Schwartz & Scott offer an improvement on the current third party beneficiary default of no third party liability. By taking into account network theory and the state’s interest in preserving network functioning, they call for a more precise understanding of when a spider would have the necessary intent to grant contract rights to other network members.

²¹ Anna Grandori & Giuseppe Soda, *Inter-firm Networks: Antecedents, Mechanisms and Forms*, 16 *ORG. STUD.* 183, 201 (1995).

²² Bernstein, *supra* note 1, (manuscript at 14-27); Claude Menard, *The Economics of Hybrid Organizations*, 160 *J. INST. & THEORETICAL ECON.* 345, 348 (2004); J. TIENEKENS & P. ZUURBIER, *CHAIN MANAGEMENT IN AGRIBUSINESS AND THE FOOD INDUSTRY* (2000); JOSH WHITFORD, *THE NEW OLD ECONOMY: NETWORKS, INSTITUTIONS, AND THE ORGANIZATIONAL TRANSFORMATION OF AMERICAN MANUFACTURING* (2005).

²³ Ronald J. Gilson, Charles F. Sabel & Robert E. Scott, *Contracting for Innovation:*

network that nurtures norms of coordination and cooperation. Even though the contract is radically incomplete, the formal legal mechanisms facilitate the parties' search for reliable partners and the productive use of information generated through the network. As a consequence of the braiding of formal and informal enforcement, trust develops endogenously both within the bilateral collaborations as well as among the members of the network.²⁴

In sum, incentive problems in the spider cases are mitigated by a combination of bilateral contracts, third party beneficiary law, multilateral master contracting and bureaucratic control. Moreover, all things equal, the presence of a spider means that internalization is also easier to effect through self-enforcement: since the network size tends to be fixed, and network purpose controlled by the spider, traditional mechanisms for informal or purely relational contracting are more readily accessible. To be sure, moral hazard and in particular free riding problems are endemic to these multilateral relationships. The formation of these networks often provides positive benefits to third parties that free ride on the efforts of others in the network²⁵ and even if they pay for the benefits they receive, their payments do not cover the fixed costs sunk in the formation of the network. Nevertheless, despite these inefficiencies the networks with a spider present fewer problems for legal regulation than the webs that form without any spider.

2. Spiderless Networks

Networks that lack a central agent emerge and form organically and, as in the case of networks with spiders, the structure of network governance is determined by the level of uncertainty. As Figure 1 illustrates, lower levels of uncertainty characteristic of the "traditional" economy have produced a spiderless prototype – clusters of industrial districts. Although clusters remain viable today, the dramatic increase in spiderless networks has come from the growth of strategic alliance networks: this is a network form adapted to higher levels of uncertainty, where commercial practices are disrupted by unforeseeable changes in technical possibilities and market conditions. We briefly describe each network form and then turn to the challenge of devising a governance structure for spiderless networks.

a. Clusters of industrial districts. Clusters of industrial districts are geographically compact agglomerations of small and medium sized firms

Vertical Dis-Integration and Interfirm Collaboration, 109 COLUM. L. REV. 431, 459-63 (2009) (discussing the John Deere supply chain).

²⁴ Ronald J. Gilson, Charles F. Sabel & Robert E. Scott, *Braiding: The Interaction of Formal and Informal Contracting in Theory, Practice and Doctrine*, 110 COLUM. L. REV. 1377 (2010); Bernstein, *supra* note 1, (manuscript at 28).

²⁵ See, e.g., *infra* Section II.C.

in an industry characterized by volatile or rapidly shifting demand, all of which specialize in a particular phase of production or a production process. Finished goods are produced by groups of firms collaborating in rapidly shifting constellations.²⁶ By recombining and thereby augmenting fragmented, specialized, and mostly tacit knowledge, a multiplicity of cooperative firms in a cluster adapts rapidly to changes in the economic environment. Agglomerations of this kind played an important role in the industrialization of parts of Europe and the United States from the late 18th century onwards.²⁷ Variants are common in more recent industrializers ranging from Japan to Taiwan to Brazil to Kenya, and in the development of Silicon Valley.²⁸ Since the turbulence in the markets for mass produced goods in the mid-1980s made valuable the ease with which clustered firms could recombine as conditions changed, clusters are a microcosm of the “new” economy, able to prosper in much more volatile conditions than the vertically integrated large corporation.

b. Strategic alliance networks. Strategic alliances are bilateral collaborations between firms that are motivated to resolve uncertainty over the challenges of rapid technological development where research breakthroughs are so broadly distributed that no single firm has all the capabilities necessary for success. Research to produce further technological advances thus requires collective collaboration designed to pool the broadly dispersed information of a large number of firms.²⁹ Over

²⁶ Up to some limit, the more firms in a cluster, the easier it is for each firm to find the partners it needs, the lower its costs of production. Up to the size limit, therefore, firms in a cluster constitute positive externalities for each other. The attraction of these positive externalities is (part of) what draws firms to the cluster in the first place, causing agglomeration. See Paul Krugman, *Increasing Returns and Economic Geography*, 99 J. POL. ECON. 483 (1991) (discussing why and when manufacturing becomes concentrated in a specific region); EDGAR M. HOOVER & RAYMOND VERNON, *ANATOMY OF A METROPOLIS: THE CHANGING DISTRIBUTION OF PEOPLE AND JOBS WITHIN THE NEW YORK METROPOLITAN REGION* 49-55 (1959) (arguing that small firms operate in the more crowded portions of the region in order to share some facilities, such as capital or labor, with others).

²⁷ See CHARLES F. SABEL & JONATHAN ZEITLIN, *WORLD OF POSSIBILITIES: FLEXIBILITY AND MASS PRODUCTION IN WESTERN INDUSTRIALIZATION* 463, 499-500 (1997) (arguing that collaboration between firms makes it easier to survive market fluctuations).

²⁸ On Japan, see DAVID FRIEDMAN, *THE MISUNDERSTOOD MIRACLE: INDUSTRIAL DEVELOPMENT AND POLITICAL CHANGE IN JAPAN* (1988); on Silicon Valley, see ANNALEE SAXENIAN, *REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128* (1994), and Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 N.Y.U. L. REV. 575 (1999); on Taiwan, see ANNALEE SAXENIAN, *THE NEW ARGONAUTS: REGIONAL ADVANTAGE IN A GLOBAL ECONOMY* (2006); on Brazil and Latin America, see Elisa Giuliani et al., *Upgrading in Global Value Chains: Lessons from Latin American Clusters*, 33 WORLD DEVELOP. 549 (2005); and on Italy, see Roberta Rabellotti, Anna Carabelli & Giovanna Hirsch, *Italian Industrial Districts on the Move: Where are they Going?*, 17 EUROPEAN AND PLANNING STUD. 19 (2008).

²⁹ Walter W. Powell, *Networks of Learning in Biotechnology: Opportunities and Constraints Associated with Relational Contracting in a Knowledge-Intensive Field*, in

time, these alliances aggregate to form a cluster—or network—of firms whose membership shifts over time and who lack any centralized control. The network grows during periods of rapid change as members are motivated to reduce the inherent uncertainties associated with novel products or markets through the sharing of private information that benefits each firm in its own pursuits.³⁰

Despite the absence of a spider, there is significant information exchange and co-development in alliance networks, leading to long-term commitments between alliance partners in the network. The alliances act as a conduit for the flow of private information about resources and capabilities. The knowledge that is created by the information exchange within the individual alliances in the network diffuses throughout the network. Thus, the network becomes a reservoir of all the informational value that accumulates within that particular sphere of economic activity.³¹

At one time, these alliance networks were rare but in the current economy they have grown dramatically and are now a common mechanism for organizing cooperative activity, particularly in technology intensive settings.³² The prototype of these strategic alliances is the biotech network consisting of a university/research entity (inventor), a number of biotech companies, large pharmaceutical firms and venture capital firms joined by their common interest in the development of therapeutic compounds to cure disease.³³

B. Characteristics of Spiderless Networks and the Governance Problem

In this section we examine the key elements in the formation of spiderless networks with particular focus on the challenge of preserving the value generated by the network itself.

EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 251, 252-53 (2001).

³⁰ *Id.* at 265-66.

³¹ Balaji R. Koka & John E. Prescott, *Designing Alliance Networks: The Influence of Network Position, Environmental Change and Strategy on Firm Performance*, 29 STRATEGIC MGMT. J. 639, 640 (2008).

³² See David T. Robinson, & Toby E. Stuart, *Network Effects in the Governance of Strategic Alliances*, 23 J. L. & ECON. ORG. 242, 245 (2006) (over 5500 alliances between dedicated biotechnology firms, pharmaceutical firms and universities have been formed since the mid-1970s); M. Hergert & D. Morris, *Trends in International Collaborative Agreements*, in COOPERATIVE STRATEGIES IN INTERNATIONAL BUSINESS 99 (F.K. Contractor & S. Leinhardt eds. 1988) (analyzing the increasing use of collaborative agreements between international partners).

³³ These networks have been widely studied by organizational sociologists. *E.g.*, Walter W. Powell, Kenneth Koput & Laurel Smith-Doerr, *Inter-organizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology*, 41 ADMIN. SCI. Q. 116 (1996); Walter W. Powell, *Inter-Organizational Collaboration in the Biotechnology Industry*, 152 J. INST. & THEORETICAL ECON. 197 (1996); see also Powell & Brantley, *supra* note 3 and Powell, *supra* note 29.

1. Network Formation and Resulting Value

How do spiderless networks emerge in the absence of the coordinating capabilities of a central agent? Organizational sociologists have traditionally looked to exogenous factors such as the distribution of technological resources that motivate firms to create the ties necessary to manage uncertainty and satisfy their resource needs.³⁴ But this focus on exogenous conditions ignores the fundamental question of how a firm comes to choose its alliance partners. Gulati and Gargiulo present a theory with supporting data that suggests that the risk of opportunism motivates firms to select partners with whom they have or can develop trust sufficient to support the iterative exchange of private information.³⁵ Over time, these “embedded” relationships develop into a network that has unique value as a repository of information about the capability and character of prospective partners. The more that the network internalizes information about potential partners, the more firms look to the network in searching for new partners. Through this iterative process, new entrants gain valuable information and also contribute new knowledge to the network that shapes the formation of future network collaborations.³⁶

The aggregation of information about prospective partners creates a value to participation in the network independent of any surplus from the bilateral agreements formed between network partners. Firms develop many ties to others who in turn have ties to others and thus become highly embedded in the network. Embeddedness, in turn, diffuses valuable information throughout the network.³⁷ In this way, networks foster learning by encouraging novel syntheses of information that is qualitatively distinct from the information that resides in the individual dyads.³⁸ This reservoir of valuable information serves to reduce the cost of searching for new partners and also enables embedded firms to exploit the knowledge acquired in any given strategic alliance or cluster by combining it with complementary

³⁴ See, e.g., Powell, Koput & Smith-Doerr, *supra* note 33, at 119 (“A network serves as a locus of innovation because it provides timely access to knowledge and resources that are otherwise unavailable...”); Powell, *supra* note 33, at 205 (noting the necessity of pooling capabilities and assets as a key factor in inter-organizational collaboration in the biotechnology industry); RONALD BURT, CORPORATE PROFITS AND COOPTATION: NETWORKS OF MARKET CONSTRAINTS AND DIRECTORATE TIES IN THE AMERICAN ECONOMY (1983).

³⁵ Gulati & Gargiulo, *supra* note 3, at 1440-42.

³⁶ *Id.* at 1440.

³⁷ The network generates value that is shared in two ways. There are “internal” benefits that each dyad realizes through its participation in the network. In addition, there are “external” network benefits that are disproportionately distributed throughout the network. For a discussion regarding the mechanisms that firms use to capture network benefits, see *infra* Section III.B.

³⁸ Powell, *supra* note 3, at 371 (arguing that external linkages are means of gaining fast access to knowledge and resources that cannot be secured internally “by ... bringing together different operating assumptions and new combinations of information”). For discussion and examples, see discussion *infra* Sections III.B.2-4.

knowledge gained from other sources.³⁹ In short, the network serves as a club good that reduces contracting costs and enhances innovation opportunities for network members. If the network matures to the point where the community norms are entirely self-enforcing, the network is a substitute for the legal enforcement of the radically incomplete contracts that are formed between alliance and cluster members.⁴⁰

2. Moral Hazard and Free Riding Risks to Achieving a Reciprocity Equilibrium

The essential conflict in both cluster and alliance networks is the incentive for cooperation and coordination side-by-side with the incentive for competition: parties share the motivation to capture as many benefits as possible at the lowest possible cost, and at the same time are motivated to act reciprocally in forming and maintaining the network. Reciprocal actions among network members satisfy what we have called a “reciprocity equilibrium” if every network member receives from the network a benefit proportionate to the net benefits it receives and creates for others.⁴¹ But a reciprocity equilibrium is a unique condition. Things become more complicated when some members capture more or fewer benefits than what is justified under the reciprocity condition, either because of their different capabilities in externalizing or internalizing benefits, or because of moral hazard and free riding problems.⁴² Moral hazard is motivated by members' desire to save costs since the benefits they produce are shared by others; free riding is motivated by members' desire to capture benefits produced by other members and avoid the costs of producing those same benefits. These self-interested actions undermine the reciprocity equilibrium and thus threaten the durability of spiderless networks.

³⁹ Firms use their network position to capture network externalities in two ways, either (1) by developing many ties with others and thus exploiting an information-rich network position, and/or (2) by bridging a gap in the network (a “structural hole”) that enables the firm to exploit resource and informational differentials within the network. See Jeffrey Dyer, Harbir Singh & Prashant Kale, *Splitting the Pie: Rent Distribution in Alliances and Networks*, 29 *MANAGE. DECIS. ECON.* 137 (2008) (discussing how collaborating firms split the surplus of their collaboration), and discussion *infra* Section III.B.

⁴⁰ Robinson & Stuart, *supra* note 32, at 244 (arguing that the alliance network functions as a social institution that aids in contract enforcement, and therefore “plays the same role as the court”).

⁴¹ For further discussion on allocating network surplus among members to achieve a reciprocity equilibrium, see *infra* Section II.C.5.

⁴² Imagine that some firms enjoy benefits of one unit of network value, while other alliance members enjoy benefits of ten units, and each member contributes an equal share of the benefits created by the network. All else equal, a hypothetical contract among the parties would likely have shared the surplus differently than the way it is shared through the network (see *infra* Section II.C). This creates a tension in the network and endangers its durability. Furthermore, since the parties anticipate this tension before they begin to form alliances, they would be reluctant to join the network at the outset, fearing to lose their non-recoverable specific investments once the network dissolves.

Thus, in strategic alliance networks it is often the case that firms with many ties to others become structurally embedded in the network while others that are not as well connected remain on the periphery.⁴³ In order to collaborate with centrally embedded firms, peripheral firms offer specific resources, especially private information, to their alliance partners. In this way, some embedded firms are able to extract rents from those firms that are less connected and, at the same time, these highly embedded firms can use their prior connections to build new ties and so remain deeply embedded in the network.⁴⁴ In short, the rich get richer: a firm that has a greater number of alliance relationships or that bridges a “structural hole” in the network frequently can enjoy network benefits that are not available to a peripheral network member. In this way, the highly embedded firm receives more and contributes less than the less embedded firm, and the reciprocity condition is not satisfied.⁴⁵

To illustrate the consequences of these asymmetries, consider a scenario where facilitating the network’s formation entails costs that are greater than the expected benefits that might accrue to the firm whose participation is central to the network, but lower than the expected benefits for all members once the network forms. For example, assume that an owner of a “magnet” enterprise is contemplating locating in an industrial district; the magnet firm’s participation is expected to generate a substantial percentage of the positive externalities from participating in the network. The other network parties are small firms that are expected to aggregate around the magnet firm once the industrial district is stabilized. The magnet enterprise, however, needs to invest in creating the network: it has to relocate its large facilities and relocation is costly. The firm also bears the risk that the network may fail, and then it would bear irrecoverable losses and gain no corresponding benefits.⁴⁶ The network in this example is a club good; once it is formed, participating firms can use the proximity and tacit knowledge of others to their benefit and no one can exclude them. Thus, the resulting risk of free riding may prevent the network’s formation.

In other cases, other transaction costs could bar efficient operation of

⁴³ Gautam Ahuja, Francisco Polidoro Jr., & Will Mitchell, *Structural Homophily or Social Asymmetry? The Formation of Alliances by Poorly Embedded Firms*, 30 STRATEGIC MGMT. J. 941, 941 (2009).

⁴⁴ *Id.* at 944-45. We discuss the asymmetric distribution of private network benefits *infra* Section III.B.

⁴⁵ Dyer et al, *supra* note 39, at 143-45. See *infra* Section III.B.

⁴⁶ Suppose that total costs in establishing the network for the magnet firm (relocation and risk of failure) are 20 units of value, and expected benefits from positive externalities created by others are 15 units. All other members are expected to receive a net benefit of 15 units. Here, the network will not form although its formation is efficient (total costs of 20 units and total benefits of 30 units). Without payments made to the magnet firm, it would not establish the network (20 > 15). Payments would not be made, however, because (absent coordination) each of the other firms would refuse to share in the costs of establishing the network, hoping to free-ride on other members' investments.

networks. For example, imagine that a firm at the periphery of an alliance network calculates that the firm's costs of revealing private information exceed its expected benefits from a collaborative agreement with another network member even though the information, once disseminated, would create net benefits to other network firms in excess of the peripheral firm's costs. Ideally, other members would agree to compensate the peripheral firm and induce it to reveal its private information. But the difficulty of negotiating a sharing rule in a high uncertainty environment could preclude any agreement to share the costs of subsidizing the peripheral firm.⁴⁷

3. *Relational Governance of Spiderless Networks*

Under current law, enforcement of inter-party understandings in alliance and cluster networks is purely relational. Spiderless networks use a reputation for cooperation and trustworthiness as a guide to future interaction, relying on a combination of reputation, repeated dealings, and tit for tat reciprocity to distribute network value.⁴⁸ In some instances, these relational norms can produce a durable network environment. Thus, for example, the evidence suggests that, despite the absence of formal rights and obligations, the forces that govern cooperation in mature biotech alliances are quite robust, with trust and cooperation increasing with participation in the network.⁴⁹

The evidence of successful formation of strategic alliance networks is quite mixed, however. Biotech networks are supported by a strong form of social capital ties: this social capital is particularly useful in alliances where the contribution of each alliance member to the network is ambiguous and difficult to measure.⁵⁰ But in industries that are not characterized by strong forms of social capital there is substantial evidence that spiderless alliance networks are highly delicate and prone to fail. Here, the alliance dyads face serious incentive problems and often fail to overcome the transactions costs of forming a network and maintaining cooperative norms.⁵¹ In particular,

⁴⁷ See Gilson, Sabel & Scott, *supra* note 24, at 451-55 (explaining the phenomenon of incomplete preliminary agreements that adapt ex post to changed circumstances, and that regulate only an agreement to collaborate rather than the outcome of the collaboration).

⁴⁸ Powell, *supra* note 33, at 207-08.

⁴⁹ In durable networks, there is a kind of mutualism or normative integration at the level of the network community. This community level mutualism is both self-maintaining and self-enforcing. See Ranjay Gulati, *Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances*, 38 ACAD. MGMT J. 85 (1995) (analyzing data concerning industrial alliances, concluding that the existence of trust stemming from prior interactions affects the chosen contractual form).

⁵⁰ W.G. Ouchi & M. K. Bolton, *The Logic of Joint Research and Development*, 30 CAL. MGMT. REV. 9 (1988).

⁵¹ Joel M. Podolny & Karen L. Page, *Network Forms of Organization*, 24 AM. REV. SOCIOL. 57, 71 (1998) ("Journalistic and management sources are essentially unanimous in the conclusion that an extremely large proportion of at least one common type of network organization--strategic alliances--result in failure"). To be sure, even absent moral hazard

alliances among disparate firms from a wide range of national origins (a very common circumstance in the global economy) face a variety of risks and pitfalls if they cannot cope adequately with the moral hazard and free riding problems caused by the difficulty in learning about the competencies and character of potential partners.⁵² In this setting, a potential partner may either limit its contribution to the network or, in the alternative, behave opportunistically by taking advantage of its network position to exploit resources or information gained from others. Moreover, as noted above, in the case of clusters the inability of network members to agree on sharing rules impairs the ability to attract founding members or new entrants whose costs of entry may exceed their private benefits.

4. The Risks of Introducing Legal Enforcement: The Crowding Out Problem

The preceding analysis suggests that many networks of strategic alliances, particularly those that form among disparate, widely separated parties, are especially vulnerable to moral hazard, free riding and other transactions costs impediments as they begin to form organically.⁵³ This raises the question with which we began: Are there legal mechanisms that might usefully complement the relational mechanisms that appear to work well in mature alliance networks?

Theory suggests that cooperating parties should aim to capture the benefits of both formal and informal enforcement of reciprocity norms by relying on a formal legal regime to solve complex problems with noisy interactions and on informal mechanisms (whether grounded in reputation, repeated interactions or reciprocity) to enforce contingencies that are difficult to verify but clear enough to be observable.⁵⁴ A mixed strategy is feasible if formal and informal enforcement mechanisms can be complements but not if they are substitutes where recourse to formality "crowds out" the operation of informality. Here existing theory and evidence offer limited guidance. Experimental research has demonstrated

and other incentive problems we would not expect all strategic alliance networks to succeed. They are capital investments, which like others sometimes will fail and sometimes will succeed.

⁵² The reputation sharing process at the heart of a network deteriorates with distance. AVINASH DIXIT, *LAWLESSNESS AND ECONOMICS: ALTERNATIVE MODES OF GOVERNANCE* (2004). See also Y. L. Doz, *The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning Processes?*, 17 *STRAT. MGMT. J.* 55 (1996); and Bruce Kogut, *A Study of the Life Cycle of Joint Ventures*, 28 *MGMT. INT. REV.* 39 (1988).

⁵³ For examples of moral hazard and free riding problems in a variety of networks, see *infra* Sections III.A.1-4.

⁵⁴ Gilson, Sabel & Scott, *supra* note 24, at 1386, 1398-99 ("When outcomes can be verified by courts empowered to compel disclosure of relevant information, formal contracts are preferred; when outcomes are hard to characterize, and therefore difficult to verify, but are observable to the parties, informal contracts are feasible").

that, in some instances, formal sanctions do crowd out informal mechanisms.⁵⁵ But the fact that formal and informal means of enforcing reciprocal relationships are *potentially* rivalrous does not mean that a mixed strategy is necessarily inferior or impossible.⁵⁶

How, then, do formal legal obligations to abide by a normative command interact with compliance based on trust and reciprocity? One of us has argued in an earlier paper that crowding out occurs when the legal sanction *degrades the information* about the character of the counterparties and the cooperative nature of their interactions.⁵⁷ First, consider the effects of introducing a legal sanction for violating an obligation on how the participants *perceive* the nature of their interaction. The most familiar example is the experiment using formal sanctions to cause parents to pick up their children from day care on time. To improve punctuality, a fine was imposed for tardiness. The perverse result was an increase in late pickups. The formal fine “crowded out” the reputation-based norm by changing the parents’ perception of their obligation from a commitment to the community to a price for additional day care.⁵⁸ In essence, tardy behavior was no longer considered a breach of an obligation: it was transformed by the legal sanction into a market transaction in which a parent had the “right” to pay for delay. Thus, parents felt unconstrained by being tardy and delayed pickups increased contrary to the purpose of imposing a formal sanction.

A second factor contributing to the crowding out effect is the impact of formal legal sanctions on the *frequency* or incidence of the behavior that supports relational norms. When legal sanctions are keyed to all outcome variables, a “high-powered” legal sanction suppresses the production of information that supports reciprocity.⁵⁹ The effect of high-powered

⁵⁵ See e.g., Daniel Houser, Erte Xiao, Kevin McCabe & Vernon Smith, *When Punishment Fails: Research on Sanctions, Intentions and Non-Cooperation*, 62 GAMES & ECON. BEHAV. 509 (2008); Ernst Fehr & Simon Gächter, *Do Incentive Contracts Crowd Out Voluntary Cooperation?* UNIVERSITY OF ZÜRICH, INSTITUTE FOR EMPIRICAL RESEARCH IN ECONOMICS (2000) and sources cited *infra* note 58.

⁵⁶ Robert E. Scott & Paul B. Stephan, *Self-Enforcing International Agreements and the Limits of Coercion*, 2004 WISC. L. REV. 551, 579-80 (2004).

⁵⁷ Gilson, Sabel & Scott, *supra* note 24, at 1399.

⁵⁸ Uri Gneezy & Aldo Rustichini, *A Fine is a Price*, 29 J. LEGAL STUD. 1 (2000). For an extensive literature in social psychology that also considers the crowding out of intrinsic motivations, see Edward L. Deci, R. Koestner & Richard M. Ryan, *A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivations*, 125 PSYCH. BULL. 627 (1999).

⁵⁹ High powered enforcement consists in the imposition of standard legal remedies for failure to perform specified contractual obligations: enforcement is tied to outcome variables and provides incentives for parties to take specified actions to maximize expected surplus. In contrast, low powered enforcement consists in imposing sanctions only for the verifiable failures to reciprocate but not for the failure of the parties to invest sufficiently in the underlying business activity so as to yield particular outcomes. Gilson, Sabel & Scott, *supra* note 24, at 1399.

sanctions is to increase the consequences of non-compliance: The threat of this sanction leads parties to share less information about their desire to make mid-course adjustments to the relationship than if the consequences of sharing that information were less severe. Thus, parties facing high-powered sanctions for non-compliance communicate less about the problems they are experiencing and consequently have fewer opportunities to make mutually beneficial reciprocal adjustments over time. In a sense, high-powered legal enforcement intended to create efficient incentives to perform specified actions functions as a “first strike” nuclear weapon, where each party continually faces the risk that a single misstep can transform a surplus-generating cooperative enterprise into a zero sum game.⁶⁰

Given the crowding out risk, courts concerned to preserve complementarity in strategic alliance networks would be motivated to impose low-powered sanctions designed to encourage compliance with the information exchange regime (and the informal relations it supports) while avoiding high-powered sanctions that incentivize the behavior that crowds out informality.⁶¹ In this way, legal sanctions would be applied to *only* those behaviors that are critical to maintaining and supporting the formation and operation of the network.

What should those courts do, then, when asked to consider legal claims for exploitation of network value or free riding on network information? We answer that question in two stages. In Part II, we develop a model that shows how the law of restitution could be used to support a reciprocity equilibrium by authorizing the recovery of uncompensated benefits given to others. We turn, then, in Part III to consider whether measurement costs or crowding out concerns argue for a more restrictive set of legal rights.

II. A RESTITUTION THEORY FOR NETWORKS

In this Part, we address the question of legal mechanisms that can efficiently supplement inadequate relational norms in the formation and operation of spiderless networks. Using the reciprocity equilibrium as a baseline, we develop an informal model that specifies broad rights of restitution for network members. *Under the restrictive assumptions of the*

⁶⁰ The threat of the ultimate sanction thus deters parties from voluntarily revealing the information needed for the counterparty to adjust informally. Charles J. Goetz & Robert E. Scott, *The Mitigation Principle: Toward a General Theory of Contractual Obligation*, 69 VA. L. REV. 967, 1011–18 (1983).

⁶¹ See *supra* note 59.

model, firms in networks are entitled to recover for uncompensated benefits they confer on other network members. The model has two prongs. The first prong is liability for unrequested benefits. Here, under certain conditions a party who voluntarily confers benefits upon other network members can recover the value of those benefits from the beneficiaries. The second prong is based on liability for ill-gotten benefits. Here, a party who takes value belonging to others without reciprocating in kind must surrender the benefits she received to those who were exploited.

We apply the model to a set of cases where moral hazard and free riding risks hinder the formation and operation of efficient networks. Controlling for the cost of measuring network costs and benefits and the risk of crowding out, we show that in theory the restitution model provides a mechanism for more efficient internalization of network value. In Part III of the article we relax the assumptions of the model and consider how a more modest set of restitution rules might function in more realistic environments.

A. Liability for Unrequested Benefits

1. Prevailing Law

When a benefactor voluntarily confers benefits upon recipients, the law does not impose any duty of restitution on the recipient and she is allowed to keep the benefits at no cost to her. This rule has certain exceptions,⁶² the most relevant to network analysis are common fund cases. "Common funds" are monies obtained through legal proceedings initiated by one party (or her attorney) against which a group of people are entitled to assert claims.⁶³ Under certain conditions, the initiator of the legal proceedings is entitled to collect from the other fund recipients their relative shares in the expenses he incurred in the process, even if they refused to back his efforts at the outset.⁶⁴ An illustration is the case of an heir who initiates legal proceedings resulting in an increase in the value of

⁶² See RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 30 cmt. a (2011) ("the law of restitution for unrequested benefits, intentionally conferred, combines a broadly negative proposition with a series of exceptions.").

⁶³ For common fund cases, see John P. Dawson, *Lawyers and Involuntary Clients in Public Interest Litigation*, 88 HARV. L. REV. 849 (1975); John P. Dawson, *Lawyers and Involuntary Clients: Attorney Fees From Funds*, 87 HARV. L. REV. 1597 (1974); Saul Levmore, *Explaining Restitution*, 71 VA. L. REV. 65, 95-99 (1985).

⁶⁴ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 30(2)(b), allows recovery in cases where "the recipient obtains a benefit in money", thereby substantially broadening the common-funds category of cases. Section 29 sets out specific conditions under which "a person who has incurred expenses or rendered services to preserve or create a "fund" in which others are interested may require the others—in the absence of contract—to contribute ratably to the cost of securing the common benefit".

the estate, to the benefit of the other heirs.⁶⁵ Another relevant category of cases encompasses those instances in which one party protects or preserves an interest he shares with another party, thereby benefiting the latter without her prior consent to pay for this benefit.⁶⁶ A common example is a co-owner of property who incurs expenses to maintain or protect the property, thereby benefiting the other co-owners.⁶⁷ Generally, under a theory of restitution, the co-owner who bears the costs can recover from the others in the amount of their relative shares.⁶⁸ Several other categories of cases when restitution remedies are granted for conferral of unrequested benefits offer further support for the general principal that actions to preserve another's economic interest can trigger a right to restitution even in the absence of a prior understanding.⁶⁹

Restitution claims fail, however, unless the court finds that reaching an agreement prior to the conferral of the benefit was unfeasible or impractical, that the benefactor was pursuing his own interests while the benefit to the other party was incidental, and that the benefactor protected or preserved existing entitlements and did not create new ones.⁷⁰ Limiting the restitution duty to those circumstances where high transactions costs render a prior agreement implausible is quite obviously designed to encourage consensual agreements. The rationales for the second and third conditions are less obvious. Requiring the benefactor to be motivated by his own interests and only incidentally intent on conferring benefits to others prevents the emergence of an extensive practice of sellers providing benefits through avenues other than market transactions, while requiring the protection and preservation of existing entitlements reflects the law's

⁶⁵ For examples of suits brought by an heir against his or her co-heirs, see RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 29 cmt. g, illus. 23-25 (2011); 2 GEORGE E. PALMER, *THE LAW OF RESTITUTION* § 10.7 (1978).

⁶⁶ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT §§ 26-29 (2011). *see also* HANOCH DAGAN, *THE LAW AND ETHICS OF RESTITUTION* 125-26 (2004) (presenting exceptional cases in which the (previous) Restatement does allow restitution for unrequested benefits); Levmore, *supra* note 63, at 65-68 (same).

⁶⁷ 2 PALMER, *supra* note 65, § 10.7(c); Daniel Friedmann, *Unjust Enrichment, Pursuance of Self-Interest, and the Limits of Free Riding*, 36 LOY. L.A. L. REV. 831, 855-58 (2003).

⁶⁸ *See, e.g.,* United Carolina Bank v. Caroprop, Ltd., 446 S.E.2d 415, 416-17 (S.C. 1994) (holding that when one cotenant stops paying his share of taxes and mortgage payments, other cotenants may pay his share and recover from him).

⁶⁹ One category of exceptions is rescue cases. *See* RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT §§ 20-21; 2 PALMER, *supra* note 65, § 10.4; *see also* HANOCH DAGAN, *In Defense of the Good Samaritan*, 97 MICH. L. REV. 1152 (1999) (analyzing rescue cases and supporting a broad duty of restitution). It includes all those instances where the benefactor has acted to protect the recipient's life, health, property, or other economic interest when the latter's consent could not be obtained due to the emergency nature of the circumstances. Under certain conditions, the law allows the benefactor to recover a reasonable charge for his beneficial actions. For other categories of exceptions, *see* Ariel Porat, *Private Production of Public Good: Liability for Unrequested Benefits*, 108 MICH. L. REV. 189, 195-98 (2009).

⁷⁰ Porat, *supra* note 69, at 197-98.

preference for maintaining the status quo over a broader principle of maximizing welfare.

2. *Private Production of Public Goods*

One of us has argued in an earlier Article⁷¹ that efficiency considerations justify expanding the duty of restitution to require compensating benefactors for unrequested benefits when the following conditions are met: (1) high transaction costs preclude reaching an agreement for payment of benefits between the benefactor and beneficiaries; (2) enforcement costs, including the risk of overvaluation, do not exceed the benefit of the expanded duty of restitution; (3) the benefits will not be created either by state action or by market mechanisms; and (4) the beneficial activity does not have offsetting welfare-reducing effects.⁷²

The principal application of this expanded duty of restitution is the private production of public goods when, absent legal intervention, free riding and other transaction costs bar their production. Assume, for example, a benefactor considers constructing a park on her land that will increase the market value of neighboring homes: the costs to the benefactor in creating the park are higher than her private benefits, but lower than the common benefits shared by her neighbors. The resulting benefits are a public good: no one can prevent the beneficiaries from enjoying the benefits of the park's environment once it is created. But since each beneficiary knows that the creation of the public good does not depend on his decision to share in the costs of production, no one shares in the costs and the economically beneficial park is not created. A properly designed restitution remedy can ameliorate this inefficiency. Here, the goal of reducing enforcement costs, and in particular the risk of overvaluation, argues for the measure of recovery to be limited to the lower of two measures—either the verifiable benefit gained by the beneficiaries or their relative share of the reasonable costs of producing the benefit.⁷³ By allowing the benefactor to recoup a portion of his costs from the beneficiaries, the law can motivate the benefactor to act unilaterally and create the public good to the benefit of all.

Forming a spiderless network, and providing benefits through it, is often the production of a public good. As with other public goods it is susceptible to free riding that risks the formation and operation of the

⁷¹ *Id.* at 194.

⁷² Another condition requires the finding that the beneficiary's autonomy interest is not unduly compromised, a criterion not strictly relevant to the efficiency analysis we pursue in the model. *Id.*

⁷³ There are several ways to reduce enforcement costs, including voting and licensing. In addition, when the benefit is an increase in the market value of the beneficiaries' property, a lien can be imposed on the property on behalf of the benefactor. Third party specialists could purchase the lien for an immediate cash payment to the benefactor. *Id.* at 212.

network. In theory, imposing a duty of restitution on network members can deter free riding and achieve the condition of network reciprocity that is required for durable network functioning. These risks cannot readily be overcome in spiderless networks through conventional contractual solutions. High transaction costs in the formation of strategic alliances and other spiderless networks thus satisfy the first of the conditions enumerated above for imposing a duty of restitution. As we explain in the next sections, the other conditions for imposing a restitution duty are often satisfied and invite an efficiency minded court to consider the potential application of the law of restitution to spiderless networks.

B. Liability for Ill-Gotten Benefits

The most developed part of the law of restitution and unjust enrichment obliges wrongdoers not only to compensate victims for harms they suffered, but also to disgorge to them the gains received at their expense.⁷⁴ Traditionally, disgorgement is granted for intentional wrongs, such as trespass on land.⁷⁵ Suits for disgorgement of gains are also common in trademark and copyright infringement cases; infringing trademarks thus risk liability based on the infringer's ill-gotten gains rather than the harm suffered.⁷⁶ Disgorgement of gains is commonly awarded when one party makes use of another's property without his consent. If the action were done with the other party's consent, restitution law typically would not apply, since the transaction would be considered consensual and governed by contract law. But under certain circumstances, a party who begins performance of an illegal⁷⁷ or other unenforceable agreement⁷⁸ is entitled to

⁷⁴ See generally RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT §§ 40-46 (2011) (Restitution for Wrongs); 1 PALMER, *supra* note 65, §§ 2.1-2.20 (acquisition of a benefit through a wrongful act).

⁷⁵ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 40 (2011) ("A person who obtains a benefit by an act of trespass or conversion, by comparable interference with other protected interests in tangible property, or in consequence of such an act by another, is liable in restitution to the victim of the wrong."). *Edwards v. Lee's Adm'r*, 265 Ky. 418, 96 S.W.2d 1028 (1936) (disgorgement of profits awarded for commercial use of a cave extending under defendant's property); See also *Owell v. Nye & Nissen Co.*, 26 Wash.2d 282, 173 P.2d 652 (1946) (finding the wrongful user of an egg washing machine liable to its owner for benefits derived from said usage). For an argument for disgorging gains in accident cases, see Robert Cooter & Ariel Porat, *Disgorgement Damages for Accidents*, 44 J. LEGAL STUD. (forthcoming 2015).

⁷⁶ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 42 (2011) ("A person who obtains a benefit by misappropriation or infringement of another's legally protected rights in any idea, expression, information, image, or designation is liable in restitution to the holder of such rights."); See, e.g., *Maier Brewing Co. v. Fleischmann Distilling Corp.*, 390 F.2d 117 (9th Cir. 1968) (ordering the disgorgement of profits accrued from the sale of beer under the plaintiff's trade name).

⁷⁷ RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT § 32 (2011) ("A person who renders performance under an agreement that is illegal or otherwise unenforceable for reasons of public policy may obtain restitution from the recipient in accordance with the following rules..."). See, e.g., *Cohen v. Radio-Electronics Officers Union*, 146 N.J. 140,

recover the benefits gained by the counterparty⁷⁹ (and in some other cases to recover for her reliance losses⁸⁰). In yet other cases, courts award quantum meruit, based either on an implicit contract or unjust enrichment, when parties fail to agree on the fee for specified personal services.⁸¹ Thus, restitution law sometimes applies to incomplete consensual transactions and fills in gaps which the parties left unattended.

The potential application of disgorgement doctrine to spiderless networks is straightforward. To see why, imagine that under certain conditions members acquired property rights in the network,⁸² such that a new participant could share in network benefits upon paying a fee based on the expected benefits she receives and confers. Not paying the fee is equivalent to taking someone's property which he is willing to sell for a certain price, but without paying that price. Now let's assume that advance permission for sharing the network's benefit is not feasible because the

679 A.2d 1188 (1996) (awarding an attorney quantum meruit fee for services rendered under a contract unenforceable for reasons of public policy). *See generally* John W. Wade, *Restitution of Benefits Acquired Through Illegal Transactions*, 95 U. PA. L. REV. 261 (1947) (surveying exceptions to the maxim that a plaintiff has no standing in court to seek restitution in connection with an illegal transaction).

⁷⁸ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 31 (2011) ("A person who renders performance under an agreement that cannot be enforced against the recipient by reason of... indefiniteness... has a claim in restitution against the recipient as necessary to prevent unjust enrichment."); *See, e.g.,* Montanaro Bros. Builders, Inc. v. Snow, 190 Conn. 481, 460 A.2d 1297 (1983) (remanding a case for consideration of the extent to which landowners had been enriched by receiving the purchasers' payments for an indefinite option agreement).

⁷⁹ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 31 cmt. i (2011) ("Restitution by the rule of this section is measured by the value of the claimant's performance to the recipient"); *See, e.g.,* Dursteler v. Dursteler, 108 Idaho 230, 697 P.2d 1244, 1248 (Ct. App. 1985) ("Under the doctrine of unjust enrichment, parties to a contract that fails to materialize may be required to pay restitution for the value of benefits each has conferred and the other has unjustly retained.").

⁸⁰ *See, e.g.,* McCrowell v. Burson, 79 Va. 290 (1884) (allowing a plaintiff to recover for expenditures in preparing to perform an oral contract to build a house for the defendant when the defendant later refused to permit the plaintiff to undertake the actual work of construction); *Abrams v. Financial Serv. Co.*, 13 Utah 2d 343, 346 (1962) ("under proper circumstances a vendor or lessor may recover for work and material expended on his own property in reliance on a void or unenforceable contract for its sale or rental").

⁸¹ RESTATEMENT (THIRD) OF RESTITUTION & UNJUST ENRICHMENT § 31 cmt. e (2011) ("The measure of recovery in quantum meruit—whether explained in terms of implied contract, unjust enrichment, or both—is the reasonable value of the plaintiff's services"). *See also, e.g.,* Paffhausen v. Balano, 708 A.2d 269 (Me. 1998) (ruling that a carpenter who had received permission to renovate a building from its owner without properly agreeing on a fee is entitled to recover for the reasonable value of labor and materials).

⁸² Would the law allow network members any protection from third parties who injure the network? That might also depend on the "status" of the network as creating IP-like rights, although for such protection much less than a property right is needed *Cf.* DAN B. DOBBS, PAUL T. HAYDEN, ELLEN M. BUBLICK, *TORTS AND COMPENSATION: PERSONAL ACCOUNTABILITY AND SOCIAL RESPONSIBILITY FOR INJURY* 1006-09 (7th ed. 2013) (discussing the liability for an intentional interference with prospective business opportunity).

benefit the new participant will receive or confer is uncertain, or negotiation costs are prohibitively high. Under these circumstances, the best analogy is the restitution cases discussed above where one party has received benefits from another in an unenforceable agreement.⁸³ By analogy, the network members could be seen as having agreed that the new member could join the network for a fee proportionate to the expected benefits she receives and confers, but because of high transaction costs failed to agree on its amount in a fully binding contract. As in the cases of unenforceable agreements discussed above, here also restitution law could fill the gap and allow network participants to recover from the new member an amount sufficient to prevent unjust enrichment.

C. A Restitution Model for Spiderless Networks

The discussion thus far reveals that spiderless networks have three central features relevant to restitution law: first, parties confer benefits on others without their consent; second, parties often "take" benefits from others without their consent; and third, consent cannot be achieved in both cases due to high transaction costs.

In this Part, we develop an informal model to show how, in theory, restitution law can be applied to support the formation and operation of strategic alliances and other spiderless networks. To clarify the analysis, we begin with several strong assumptions: (a) courts can verify the costs and benefits of network participation and operation at reasonable cost, and (b) the introduction of legal remedies to support efficient networks complements the existing set of relational norms that maintain cooperation and coordination among network members. We develop our model by analyzing the most common circumstances when free riding and moral hazard costs prevent efficient formation and operation of networks.

1. Case 1: Unilateral Creation of Benefits: Passive Beneficiaries

Let's start with the industrial district example we have already discussed,⁸⁴ with a few modifications. Imagine that when the owner of an enterprise that is a magnet for other firms ("the anchor") moves to the industrial district there are already many smaller firms in the region that expect to derive substantial benefits from the anchor. Assume as well that there is substantial asymmetry of benefits conferred on each party: the anchor externalizes large benefits on the other firms, but receives few benefits (or none) from them. Consequently, if the private benefits the anchor expects to derive from relocation are lower than its private costs, the anchor may not move to the industrial district even when the total social benefits—including the positive externalities conferred on the other

⁸³ See *supra* note 78-81 and accompanying text.

⁸⁴ See *supra* text accompanying note 46.

firms—exceed the anchor’s private costs.⁸⁵ In order to provide the anchor with efficient incentives to relocate its facilities to the industrial district, it must be able to recoup *at least* the difference between private costs and private benefits. A duty of restitution imposed on the existing firms solves the free riding problem that motivates the incumbent firms to refuse to share in the costs of relocation.

Network value would be enhanced if the anchor (who receives private benefits from the move) can recover from the incumbents *all* of its relocation costs making it better off as compared to its prior location. From an efficiency perspective, the more benefits created by the network that are internalized by the anchor, the more efficient are its incentives. Full internalization of *all* the benefits created by the anchor provides it with efficient incentives not only to relocate but also to operate within the network for the benefit of all members. Furthermore, with full internalization of the benefits, the benefactor would have efficient activity level incentives, namely, to create the *potential* for the creation of the benefits in the first place.⁸⁶

To illustrate the advantages of full internalization of benefits in this case, imagine that the anchor has to decide how to construct and operate the enterprise once it moves to the new location. With full internalization of benefits, the firm would take into account all the benefits, including those conferred on others, in making investment decisions. If the anchor internalizes only part of the benefits conferred on others, decisions about the size or business activity of the enterprise would be made without full consideration of the total network benefits it expects to produce.⁸⁷

⁸⁵ Parchomovsky & Siegelman have similarly noted that anchor stores may refrain from moving to commercial districts due to their inability to internalize positive externalities. However, in contrast to our approach, they propose that cities use public law to create planned commercial districts, analogous to suburban malls, which would allow for the capture of positive externalities among commercial establishments. See Gideon Parchomovsky and Peter Siegelman, *Cities, Property, and Positive Externalities*, 54 WM. & MARY L. REV. 211 (2012). See also Lee Anne Fennell, *Agglomerama*, 2014 BYU L. REV. 1373 (2015) (criticizing Parchomovsky & Siegelman’s suggested use of land use law and offering alternative propositions designed to optimize urban agglomerations). Fennell discusses the possibility raised by Porat, *supra* note 69, of applying restitution law between benefactors and beneficiaries, but deems it largely inapplicable, stating that “a more intricate system of payments for positive and negative externalities could be imagined, although finding a workable way to administer it would be highly challenging”.

⁸⁶ A similar argument has been famously made in the context of tort law: a strict liability rule—or full internalization of harms—is a better mechanism than a negligence rule to motivate injurers to take efficient non-verifiable precautions and efficiently reduce their activity level. Steven Shavell, *Strict Liability versus Negligence*, 9 J. LEGAL STUD. 1 (1980).

⁸⁷ For a similar argument in the context of shopping mall contracts, see Eric D. Gould et al., *Contracts, Externalities, and Incentives in Shopping Malls*, 87 REV. ECON. & STAT. 411, 419 (2005) (noting that “Externalities are generated not only by the presence of certain stores, but also by the actions that stores take, such as advertising, maintaining cleanliness, courtesy, and product variety... the performance of all stores is affected by the ongoing efforts of the developer, such as maintaining the right mix of stores, renovations, parking,

However, if the anchor recovers all the benefits externalized to the incumbents, they would not have efficient investment incentives. After all, their existence in the industrial district is a "but-for" cause of the creation of the positive externalities conferred upon them, and they also should invest under the assumption that they will recoup the benefits they have generated either actively or passively. Therefore, given the budget constraint that does not allow all parties who "cause" the benefits to fully internalize them, the passive enterprises properly should retain some of the benefits conferred by the anchor.⁸⁸

2. Case 2: Unilateral Creation of Benefits: Active Beneficiaries

Let's consider a variation to Case 1 and assume that no firms exist in the geographic area, and that the owner of the magnet enterprise ("the anchor") is expected to attract small firms to join it and form an industrial district once it relocates. We still assume that benefits are asymmetrical, namely, that the anchor creates much more benefit for others than they create for it.

The difference between Case 1 and Case 2 is that in Case 2 it is clear that the motivation for the smaller firms to join the network (the industrial district) is the presence of the anchor. This difference has several implications. First, assuming there is a duty of restitution obliging the smaller firms to compensate the anchor for the benefits it conferred, and assuming the amount of compensation is known before the smaller firms relocate, the smaller firms cannot claim that the duty of restitution makes them worse off. By choosing to relocate they have demonstrated that paying compensation in return for securing the benefits of membership in the industrial district makes them better off in expectation. This argument does not apply in Case 1, where the smaller firms presence in the area implies nothing as to the amount of benefits they have received from the presence of the anchor.

Second, a general objection to imposing liability for unrequested benefits is that it infringes on beneficiaries' autonomy: they are obliged to pay for benefits which they have not agreed to purchase.⁸⁹ Although there are several responses to this objection, it does not apply to Case 2. By participating in the network knowing that they are subject to a duty of

cleanliness, and marketing campaigns", and arguing that each actor should be provided with incentives to undertake the right amount of such activities).

⁸⁸ This is how shopping center contracts internalize externalities.. The developer gives the anchor a portion of the externality created by the presence of the anchor, and then extracts participation from non-anchor tenants through their lease terms. A contemporary example is Amazon, which is itself a network, where the anchor tenant is paid by those who participate and get the benefit of the participants that Amazon has drawn to a common (virtual) space. We return to this point *infra* Section II.C.3.

⁸⁹ Porat, *supra* note 69, at 215-17; Friedmann, *supra* note 67, at 846-47; Scott Hershowitz, *Two Models of Tort (and Takings)*, 92 VA. L. REV. 1147 (2006).

restitution, the smaller firms exhibit their willingness to receive the benefits of the network and bear some of its costs.⁹⁰ Third, in Case 2, more than in Case 1, network success depends on allocating sufficient benefits to the smaller firms to induce them to join the network. Since participating in the network is costly for the smaller firms, they might decline to relocate unless they can capture at least part of the benefits from participation in the industrial district (at a minimum they would require an allocation of an amount of benefits sufficient to cover their relocation costs).

3. Case 3: Multilateral Creation of Benefits

In Case 3, all members in a network confer benefits on each other and the question is how to provide all members with efficient incentives to participate in the network and function optimally in interactions with other members. In the self-organizing setting of the strategic alliance network, formation and maintenance often are not important until the network matures.⁹¹ As this process continues some firms are more successful than others—there are winners and losers—and the winners may then have a perverse incentive to exclude less successful firms and capture a greater part of the externalities. In pursuing their own interests successful firms may not externalize sufficient benefits to other members to make it worthwhile for the latter to remain in the network. These self-interested actions will cause the network to fail unless the firms that have survived are also motivated to “build” or “maintain” the network and operate efficiently within it. To be sure, under some circumstances, permitting each member simply to retain the benefits that are externalized by others without being compensated for the benefits it externalizes will create efficient incentives to participate in maintaining the network. For example, if there are six firms in the network, and each externalizes benefits of 5 units of network value⁹² to others, receives benefits of 5 units in return and incurs participation costs of 3 units, each one would have efficient incentives to participate in the network and legal intervention would be unnecessary.⁹³

Things become more complicated, however, when (as is more likely) some members' costs of participating in the network (including the opportunity costs of not excluding less successful parties) are higher than

⁹⁰As noted above in Section II.B, joining an existing network might be considered analogous to using someone's property following his consent but without agreeing on the amount of the fee to be paid. This analogy will apply if the law recognizes a quasi-property right of members in their networks. However, the argument is hardly relevant here where firms merely located their facilities next to a cluster of enterprises on land they purchased or leased.

⁹¹ Although in many circumstances even the decision to participate in a network entails costs, as it requires firms to relocate as a precondition for participation. This is particularly true in the case of clusters.

⁹² We assume a “unit” is a universal measure of both network benefits and costs.

⁹³ We ignore for the moment activity level effects and incentives to efficiently operate within the network once it is formed. *See supra* text accompanying note 86.

the benefits they receive, but lower than the sum of the benefits they confer and receive. To illustrate, assume that some firms externalize benefits of 5 units of value to others, bear costs of participating in the network of 7 units, and receive benefits of 5 units from others. Although these firms create a net benefit of 3 units, they would not participate in the network. Here, each firm's contribution to the network is independent (Case 3.1), but in some cases the contributions to network functioning are complements: the contribution of all/some parties in participating and maintaining the network is greater than the sum of the individual contributions of each one (Case 3.2). In yet other cases, the contributions of network members are substitutes: only one party needs to expend costs to maintain the network, and once the network functions all parties can freely share the resulting benefits (Case 3.3).

Let's start with Case 3.3 where the contributions are substitutes. Here the typical free riding problem arises: no single firm will cooperate in ways that help to maintain the network, hoping that others will do so. The problem would be acute if the costs of maintaining the network are greater than an individual firm's private benefit: in such a case, no one has an interest in maintaining the network unless compensated by others. Every potential network member would instead be motivated to free ride, hoping that others would compensate the first mover. A duty of restitution provides a solution here as in Cases 1 and 2: the firm that acts to stabilize the network would be awarded restitution for creating a public good that benefits all participants.⁹⁴

One difference between Case 3.3 and Cases 1 and 2 is that in those cases it was clear the magnet firm should be incentivized to form the network. In contrast, in Case 3.3, any firm that actually acts to maintain the network receives compensation, and that could be any one of the participating parties. Another difference between the cases is the amount of compensation for the party who acts to maintain the network. Since by assumption any of the potential participants can expend costs to maintain the network in Case 3.3, network benefits are enhanced if compensation is designed to motivate action by the most efficient party. Thus, if efficient network maintenance costs 5 units, the member who maintains the network should receive 5 units (minus its relative share in the costs as a member of the network) regardless of actual costs.⁹⁵ In contrast to Cases 1 and 2, there is no reason in Case 3.3 to award damages greater than reasonable (i.e., efficient) costs to the firm that maintains the network (minus its relative share in those costs), since those costs are the best measure of the benefits all participating firms have received, given the alternative ways to maintain

⁹⁴ See *supra* text following notes 85, 90.

⁹⁵ We assume that all networks yield the same benefits once formed and stabilized. Otherwise, compensation would need to be adapted to account also for subsequent deficiencies in the operation of the network.

the network (through actions by others).⁹⁶

Cases 3.1 and 3.2 are more complicated. Ideally, each firm should internalize all the benefits it creates. With full internalization all firms will make efficient investment decisions whether to participate and how best to operate in the network, and their activity levels also will be efficient.⁹⁷ However, absent governmental intervention to subsidize all parties who create positive externalities full internalization is impossible.⁹⁸ The second best solution is for each firm whose costs are higher than the benefits it receives from the network ("losing firm") to recover from other participants ("winning firms") the lesser of (a) the difference between the losing firm's reasonable costs of participating in the network (C_r) and the benefits it received (B_{in}), or (b) the benefits the losing firm confers on other members (B_{ex}). Thus, in our example, where each losing firm reasonably spent 7 units participating in the network, received a benefit of 5 units and conferred a benefit of 5 units, any losing firm would be entitled to reimbursement of at least 2 units from the winning firms. Encouraging the losing firm to participate in the network, however, requires as well a modest premium above $C_r - B_{in}$: otherwise the firm would be indifferent between participation and non-participation.

Interestingly, in cases where there is an upper limit on network membership, and when $C_r - B_{in} < B_{ex}$ (as in our previous numerical example), $C_r - B_{in}$, rather than B_{ex} , is the best way to measure the benefit the losing firm conferred upon others. To understand why, assume that there are many potential losing firms with the same expected participation costs and benefits that compete in maintaining the network and are motivated to participate if awarded slightly more than $C_r - B_{in}$. Under those circumstances, the minimum payment necessary to induce a losing firm to participate in the network adequately represents the benefit conferred upon members from the losing firm's participation.⁹⁹

As we discuss in Part III, the $C_r - B_{in}$ measure is verifiable even when the assumptions of the model are relaxed. But no less important, $C_r - B_{in}$ is also consistent with other solutions provided by restitution law for analogous cases. In most cases where the law allows benefactors to receive reimbursement for unrequested benefits, the measure of recovery is the reasonable (net) costs incurred rather than the benefits conferred (as long as

⁹⁶ One could also imagine that with Cases 1 and 2 that there was competition over which magnet enterprise would relocate its business operations to the proposed cluster, and if the firm that actually relocated had not done so, other magnet enterprises would have acted to relocate. In such case, the benefits to other firms might be the costs of relocation rather than the positive externalities they can capture.

⁹⁷ *But see infra* text following note 107.

⁹⁸ Full subsidies to all participants would provide them with efficient incentives assuming they do not collude; indeed with such subsidies firms do have strong incentives to collude and create excessive benefits.

⁹⁹ *Supra* note 96 and accompanying text.

the former is lower than the latter).¹⁰⁰ There might be several explanations for that measure of recovery such as avoiding over-production of benefits due to risks of their over-evaluation¹⁰¹ and moral hazard risks in some cases.¹⁰² But another plausible explanation is the one we have proposed above: when more than one person can serve as the benefactor, the benefit conferred by the benefactor is worth no more than the payment necessary to induce the next person in line to confer that same benefit.

4. Case 4: *Joining Later rather than Earlier*

Consider again the industrial district example we discussed in Case 1. Imagine that there are six potential firms in the network, each externalizes benefits of 5 units of value for the other firms, and receives benefits of 5 units from the others. Here, however, the costs of joining the network increase as additional firms join the network (although six is the upper limit): the first mover's costs of participation are 2 units, the second firm's costs are 3 units, and so on. Thus, total expected costs are 27 units and total expected benefits are 30 units for a net benefit of 3 units. The different costs could result from various circumstances: infrastructure investments in creating the cluster may be less costly at the outset, but, as the cluster forms, real estate costs increase along with labor costs thus requiring a greater initial capital investment by any participating firm.¹⁰³

Facilitating the formation of a network when costs of joining the network either increase or decrease over time, requires that all participating firms receive a share in the network's surplus proportionate to the net benefits they receive and create for others¹⁰⁴ regardless of when they joined the network. Since, in our example, all member firms receive and confer

¹⁰⁰ See RESTATEMENT (SECOND) OF CONTRACTS § 371(A) (1981) (measuring restitution by "[t]he reasonable value to the other party of what he received in terms of what it would have cost him to obtain it from a person in the claimant's position"); RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT § 49(2) (2011) ("Enrichment from a money payment is measured by the amount of the payment or the resulting increase in the defendant's net assets, whichever is less").

¹⁰¹ Levmore, *supra* note 63, at 69-72; Porat, *supra* note 69, at 209-10.

¹⁰² Cf. William Landes & Richard Posner, *Salvors, Finders, Good Samaritans, and Other Rescuers: An Economic Study of Law and Altruism*, 7 J. LEGAL STUD. 83, 91-93 (1978) (arguing the prizes for rescue might encourage excessive investments in rescue operations); Saul Levmore, *Waiting for Rescue: An Essay on the Evolution and Incentive Structure of the Law of Affirmative Obligations*, 72 VA. L. REV. 879, 886-89 (1986) (arguing that prizes for rescue motivate potential rescuers to put potential rescuees under peril in order to then rescue them and win the prize).

¹⁰³ See e.g., the discussion of the Silicon Valley cluster, *infra* Section III.B. To be sure, as noted in text the reverse could also arise where costs of participation decrease over time, for example, perhaps the risk to first movers is higher since there is some likelihood that the network will fail before its formation is stabilized.

¹⁰⁴ For detailed explanation as to how to allocate the surplus among members, see *infra* section II.C.5.

the same benefits, sharing costs equally would be the optimal solution.¹⁰⁵ Otherwise, the network would fail to mature as later movers would abandon (or be excluded from) the cluster.

Alternatively, if the change in costs were reversed and early parties faced higher costs than later arrivals--for example, because of the higher risk of losing their initial investment if the network fails to function – the cluster might fail to form at all. In this case, even if the first mover's costs were lower than benefits, but still higher than the costs of the next firms to join the network, no firm would volunteer to be the first mover, hoping to free ride and reap more benefits from later participation. Only an equal sharing in costs – or even a bonus for the firms that were the first to join – can solve this particular free riding problem.

5. How to Allocate the Network's Surplus?

In all the cases discussed above, one or more potential network members should be reimbursed by others in order to motivate the former to participate in or maintain the network. The legal justification for reimbursement is the value to the network of approximating a reciprocity equilibrium: some members either conferred uncompensated benefits on others and should recover from them,¹⁰⁶ or instead took benefits from others and should pay for them.¹⁰⁷ The question that arises is what happens after each losing party is paid for the difference between her costs and benefits ($C_r - B_{in}$): how should the network surplus be allocated among the participating firms? Ideally, the law would provide more benefits to those firms that can either affect the level of positive externalities they create more than others or are more susceptible to activity level effects. But this capability or susceptibility is often impossible to identify, especially when creation of benefits is multilateral.

In the alternative, a reciprocity equilibrium can be maintained by allocating the network's surplus according to the net benefits received and benefits conferred. This is justified by fairness considerations (the more you confer the larger share of the surplus you get), but even more importantly, it functions better as a default rule for network members, encouraging them to regulate their network relationships through contract.¹⁰⁸ More specifically, when contributions are independent¹⁰⁹ each member is entitled to half of the sum of the net benefits received and the

¹⁰⁵ Although in our example, each firm receives and confers the same units of benefits, that does not imply that total benefits remain unchanged over time. In order for the cluster to succeed, total benefits should increase as costs increase.

¹⁰⁶ *Supra* notes 62-69 and accompanying text (the unrequested benefits cases).

¹⁰⁷ *Supra* notes 74-81 and accompanying text (the disgorgement of gains cases).

¹⁰⁸ Contracting in this context includes the full array of controlling mechanisms, from creating master contracts to the bureaucratic structures common in co-ops and trade associations.

¹⁰⁹ *Supra* text following note 93 (case 3.1).

benefits conferred.¹¹⁰ This is a Nash bargain solution, and as such it represents the most plausible division of the surplus the parties would have made if they could have reached an agreement.¹¹¹

To illustrate this solution, assume there are six firms in the network, three receive a net benefit of 1 unit of value each and each confer benefits of 5 units (A members), while the other three each receive a net benefit of 5 units and confer benefits of 1 unit (B members). The total benefit generated by the network is 18 units. Take the A members first: Each firm is entitled to 3 units (half of the sum of the net benefits received and the benefits conferred). Since A members already receive 1 unit, they should recover 2 units in restitution. Consider now the B members: Each firm is also entitled to 3 units. Since B members have received 5 units, they should pay 2 units to the A members. In this example, all network members will receive the same share of the gains from the network. Of course, this is not always so. Assume, for example, that one firm confers 18 units of benefit and receives nothing, another firm receives 10 units of benefit and confers nothing, and the four other firms receive 2 units of benefit each, and confer nothing. Here, the first firm is entitled to recover 9 (5 from the firm that received 10 units, and 1 unit from each of the other four that received 2 units).

Note that network members sometimes should be denied any sharing in the surplus. Assume there is an upper bound on the size of the network and there are enough candidates who are willing to participate. In such a case, if existing members had not joined the network, someone else would have joined in their place. Assuming also that the court knows these facts, there is a good reason not to allow existing members to recover more than $C_r - B_{in}$: although their presence in the network would have created benefits, those benefits would have been created without them. Nonetheless, awarding them $C_r - B_{in}$ is essential, since otherwise neither they nor their substitutes will participate in the network. Note, however, that when those members could affect the benefits conferred on others (namely, they are active rather than passive), leaving them with at least part of the network surplus might improve their incentives to maximize the surplus.

¹¹⁰ When contributions are complements, *supra* text following note 93 (case 3.2), the allocation would still be according to the net benefits received and benefits conferred but would leave each member less than half of the sum of the net benefits received and the benefits conferred. To see why, imagine a network of 3 members, creating together a total net benefit of 18 units, equally shared by them (i.e., each receives a net benefit of 6 units). Let's assume now that each member's contribution is a "but for" cause of the entire benefits of 18 units (full complements). Obviously, a Nash bargaining solution would yield each one 6 units, as it naturally happens in our example. Six units, of course, is less than half of the sum of benefits received (6 units) and conferred (12 units).

¹¹¹ Assuming similar utility functions, players in a Nash bargaining situation are expected to come to a resolution that splits the surplus evenly among them. Guillermo Owen, *Game Theory*, in 9 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL & BEHAVIORAL SCIENCES 578-80 (James D. Wright ed., 2nd ed., 2015). The Nash bargaining solution is predicated upon four axioms. Assuming similar utility functions, the outcome which satisfies all axioms is one in which the parties divide the surplus evenly. *Id.* at 578.

6. *Negative Externalities*

Networks can create negative externalities, side by side with positive externalities. Thus, in the case of a cluster of industrial firms, although many firms would receive benefits from the magnet firm, other firms in the area might suffer harms. One might imagine two types of harms that result from the development of an industrial district: (1) driving out the non-network businesses in the area, and (2) increasing the cost of entry to non-network firms that locate in or near the cluster. Consider, for example, the Silicon Valley cluster discussed below in Section III.A where, first, the orchard growers were forced out of the valley and thereafter the rise in land costs such that office space in Mountain View became even more expensive than in Manhattan. In order to properly incentivize all parties, both positive and negative externalities should count. How they should count?

First, some or all network members might be required to compensate victims for harm suffered. Those harms should count as costs for each party and be taken into account in calculating the recovery it is entitled to or the payments it should make to other members. Second, even without liability for harms, when accounting for negative externalities, courts applying a restitution regime should tailor the remedies among the network members. For example, if, as in Cases 1 & 2, the magnet firm creates negative externalities together with the positive externalities, its recovery against the other firms is reduced, with the limit of the difference between positive and negative externalities.¹¹²

7. *Summary*

The restitution model developed above supports the following propositions:

First, the operation of a business network is efficiently supported where each firm in the network is allowed to capture all of the benefits its participation in the network creates for the firm and others. Full internalization of benefits provides each network member efficient incentives to participate in maintaining the network and to make efficient investment decisions before and after its decision to participate.

Second, since restitution law by itself cannot effect full internalization by each network member, the model supports restitution remedies that best approximate a reciprocity equilibrium where the network surplus is divided among firms according to each member's net benefits conferred and received.

Third, where there are impediments to achieving a reciprocity

¹¹² See Lee Anne Fennell, *Property and Half-Torts*, 116 YALE L.J. 1400, 1450–52 (2007) (warning of the risk of allowing actors to recover for their positive externalities and using the recoveries for compensating for negative externalities).

equilibrium, the model supports permitting each firm whose participation in the network is efficient to retain (and, if necessary to recover) benefits sufficient to ensure its participation.

Fourth, variance in the costs of participating in the network are relevant in decisions allocating costs and benefits, as costs may differ over time such that early (later) participation that is more costly than later (earlier) participation may deter network formation and functioning.

Fifth, the presence of magnet enterprises whose incentives to operate within the network have disproportionately greater influence on efficient network formation justifies a differential allocation of costs and benefits.

In this Part, we have proposed a model in a friction-free environment that applies restitution remedies to a range of cases where free riding and moral hazard costs create asymmetries in the distribution of net benefits from network participation. In the following part we relax the strong assumptions of the model and evaluate the utility of restitution remedies in a more realistic setting.

III. THE CHALLENGE OF IMPLEMENTING A RESTITUTION REGIME

The preceding analysis has identified both the fragility of many spiderless networks and demonstrated how, in theory, restitution remedies can be used to approximate a reciprocity equilibrium that contributes to efficient network functioning. In Section III.A, we show how a narrowly crafted set of restitution remedies that rely on proxies and evidentiary presumptions can overcome the significant difficulties in verifying the imbalance of costs and benefits in network participation. Thereafter, Section III.B describes four exemplars of externalities in spiderless networks that threaten network durability and Section III.C considers how the low powered restitution remedies we propose can ameliorate the moral hazard and free riding problems evident in these exemplars. In Section III.D we then show how these low-powered restitution remedies can work as complements to the informal norms that currently govern network relationships. We conclude in Section III.E that even if a restitution regime is rarely invoked, the legal regime can nonetheless function as a bargain-enabling default (a virtual spider as it were) that encourages parties to spiderless networks to coordinate around contractual mechanisms that promote network reciprocity.

A. Relaxing the Measurement Costs Assumption

In Part II, we proposed a model for applying a range of restitution remedies to cases where moral hazard risks—mostly in the form of free riding—are expected to bar formation of efficient spiderless networks or

deter efficient network participation. In the model we assume that the costs and benefits of network participation are verifiable at reasonable cost. In this section we relax this assumption and consider the verification and litigation costs problem in detail.

Viewed in isolation, the informational demands on a court motivated to support a reciprocity equilibrium in spiderless networks seem daunting and, indeed, almost impossible to satisfy to the extent that much of the information required for implementing this restitution scheme is private information that firms might prefer not to reveal. Depending on the facts of the case, a court motivated to apply the model directly would have to verify some or all of the following information: (1) the net costs incurred by the plaintiff firm ($C_r - B_{in}$); (2) the benefits conferred on other firms by the plaintiff (B_{ex}); (3) the costs incurred, the benefits received and the benefits conferred by the defendant, and in some cases, for all other network members so as to allocate the award among them.

For this reason, as we suggest below, an efficiency minded court can turn instead to proxies and rough estimates rather than attempt accurate estimates of costs and benefits. This concession to reality is not unrealistic, however. In most litigation contexts, courts do not seek to verify or establish the truth of any fact directly, but rather rely on proxies or “operative facts” to establish a prima facie case.¹¹³ Once the defendant has challenged this evidence, the court must only decide whether the plaintiff’s claim is more likely than not. Thus, for example, a court motivated to award a plaintiff firm restitution damages can apportion liability among network participants based on net benefits received rather than attempt the more difficult task of determining the quantum of benefits conferred.¹¹⁴ Finally, as we suggest below, the state can support networks in other ways by encouraging information-revealing mechanisms in some cases or by authorizing an administrative process that could ameliorate many of these informational hurdles.

1. Implementing a Low-Powered Restitution Regime

In adjusting and tailoring the quantum of restitution damages in any particular case, the goal is to balance the high costs of verifying network costs and benefits against the goal of sufficient internalization to improve network performance. That objective argues in most cases for a low-powered remedial scheme, one that applies the minimum remedy necessary to overcome the free riding and moral hazard costs that hinder spiderless

¹¹³ See Robert E. Scott & George G. Triantis, *Anticipating Litigation in Contract Design*, 115 YALE L.J. 814, 825-30 (2006) (describing how courts do not observe facts directly, but rather make factual determinations by relying on proxies for the truth and also how the fact-finding process in litigation is governed by burdens of proof and presumptions that tend to curtail litigation costs.)

¹¹⁴ See *supra* note 118.

networks' efficient formation and operation.¹¹⁵ In most cases that would mean that network members would be allowed to recover from other members no more than the difference between their costs of participating in the network and the benefits they received from it.

a. What is the plaintiff's burden of production? We first set out the factual determinants that a court must be able to verify in order to adopt a low-powered restitution regime to enhance network formation and operation. The first task for a court considering a plaintiff's claim for restitution damages is to determine that both the plaintiff and the defendant(s) are eligible parties. This requires the plaintiff firm to meet a burden of producing evidence that it and the defendant firm are members of the same business network. Network membership can be established indirectly by evidence of (1) repeated interactions between the defendant and the plaintiff over time either directly or through third parties, (2) a commonality of business interests, and (3) the joint production of information that advances the underlying business activity. As we illustrate below,¹¹⁶ firms can (and do) belong to more than one network: for example, a research institute may participate in several networks, each one divided among a separate field of endeavor, and each field may form a network of producers and financiers.

Thereafter, the plaintiff firm faces several hurdles in establishing a prima facie case: the firm must introduce evidence from which a fact finder could determine that the plaintiff conferred benefits on others in the network, and that it incurred costs in excess of any benefits received from the other network participants ($C_r - B_{in}$). This evidence must be sufficient to justify a fact finder determining that the firm's contribution to the network is at least equal to $(C_r - B_{in})$ (otherwise the claim would be limited to B_{ex} , plaintiff's contribution to the network or would be completely denied).¹¹⁷ In addition, the plaintiff must introduce sufficient evidence to justify the inference that the particular defendant(s) was a net network beneficiary: this requires evidence to support the inference that the defendant's benefits from the network are greater than its costs. Furthermore, in order to establish the defendant's reimbursement share, the plaintiff should show the ratio between the defendant's net benefits and the network's net benefits.¹¹⁸

¹¹⁵ Adopting a minimal or low-powered remedial scheme furthers another goal ---to reduce chilling and crowding out effects, as we explain in detail in Section III.D.

¹¹⁶ *Infra* Section III.A.3.a.

¹¹⁷ Under the restitution regime, the plaintiff can be awarded a modest (and fixed) premium in addition to the difference between costs and benefits, depending on the network's net benefits (for example, 110% of the difference). Moreover, per the model, if the plaintiff can prove it joined the network earlier than others, and incurred additional costs as a consequence, it is entitled to recover the extraordinary costs, even if total costs are lower than benefits.

¹¹⁸ In anticipation of high implementation costs, we relax the result of the model that argues for including each member's contribution to the network (and not only benefits received) in

Finally, the plaintiff firm may introduce evidence supporting the claim that it is a magnet enterprise (and that the defendant is not). If the court finds the plaintiff's status as a magnet firm supported by the evidence, the plaintiff will be entitled to claim a "magnet premium" in addition to the difference between its costs and benefits even if costs are lower than benefits. The amount of the "magnet premium" is a certain portion of the net benefits generated by the network as determined by the estimates offered by the plaintiff to support its claim.¹¹⁹

b. Ex ante versus ex post damages. A low-powered restitution regime contemplates awarding damages either *ex ante* (before realization of costs and benefits) or *ex post* (after realization). The choice between *ex ante* and *ex post* awards is primarily contingent on available information: in many cases, an *ex post* award is less costly to implement when the objective is measuring benefits. Otherwise, when restitution damages are awarded just for net costs, the *ex ante* measure of damages is generally more efficient.¹²⁰ In contrast, when restitution damages are awarded for a substantial portion

allocating the network surplus ("the more you contribute to others the less you pay"). Since we are suggesting here that damages be low-powered and thus limited to cost reimbursement for losing members, rather than full allocation of the network's surplus, and since benefits conferred by each member are costly to evaluate, net benefits received are a simplifying criterion for allocating damages among members (this would be the ideal solution if all network members equally contributed to the network).

This criterion (benefits received) has particularly strong economic appeal in the following scenario: a) a new arrival, whose costs exceed its benefits, considers participating in a mature network; b) the existing members want to induce the firm to participate by covering the difference between its costs and benefits; c) the existing members would not have preferred, even if they could, to consider the larger question of how to allocate the entire network surplus given their different abilities to contribute to the network; d) it is impossible to know which existing member would contribute more or less to the new arrival (and therefore it is assumed they would contribute equally). Under those assumptions, a Nash bargaining solution is that the burden of compensation to the new arrival will be divided among existing members according to their expected benefits from the new arrival. Assuming it is hard to know the exact quantum of benefits each existing member will receive from the new firm, the benefits they derive from the entire network could often serve as a good proxy.

¹¹⁹ The exact portion of benefits could be determined by the ratio between benefits conferred by the magnet firm and the entire network's benefits, with a certain cap, even by using rough estimates. But other methods could be developed as well. The main concern would be to allow enough benefits to other members who might affect the network's surplus.

¹²⁰ Here is the intuition: if a firm knows that it would be able to collect the difference between actual costs and actual benefits *ex post* (assuming "reasonable costs" are difficult for courts to verify), it would not be motivated to reduce its costs or increase its benefits as long as costs are higher than benefits. In contrast, with an *ex ante* remedy the firm is paid for the difference between *expected* costs and benefits and thereby internalizes its actual costs and benefits as they materialize; thus it has efficient incentives to reduce its costs and increase its benefits. Note, that the firm is not much concerned about the network surplus either with an *ex ante* or an *ex post* remedy as long as it is certain that there would be enough network surplus to fully compensate it for the difference between its costs and benefits.

of the network surplus (as in the case of a magnet enterprise), the ex post measure of damages is typically more efficient.¹²¹ The ex ante measure might have another advantage: ex ante damages substantially reduce uncertainty because each firm can know its approximate scope of liability or entitlement viz a viz other network members from the outset of its participation in the network.¹²²

2. Using Proxies and Estimates to Establish a Claim in Restitution

It is tempting to suggest that the error and litigation costs of implementing even a low-powered restitution regime are simply too daunting. Those costs are measurably reduced, however, because a court is able to use proxies for the relevant variables rather than accurate estimates of network costs and benefits. We have already seen how restitution law regards costs incurred as a viable proxy for the value of any benefits conferred.¹²³ In addition, rough estimates are commonly used in awarding damages under current law, most notably in tort law.

First consider how courts apportion damages among tortfeasors or between an injurer and victim. In many instances, several wrongdoers are found jointly and severally liable for injuries to a specific victim, and when contribution claims are brought the court must decide how to apportion liability among the wrongdoers. Here, courts use rough intuitions about justice and fairness and always apportion liability in round numbers (e.g., 50/50, 1/3 each, 40%:40%:20%, etc.).¹²⁴ The same method is used in apportioning liability between the injurer and the contributorily negligent victim where rough intuitions and round numbers are routinely used without any pretense of accuracy.¹²⁵

Consider next the challenge of awarding tort damages for non-pecuniary losses, such as pain and suffering or emotional distress. In most jurisdictions, damages for pain and suffering can be awarded on a per diem basis measured from the time of the injury until the plaintiff's end of life expectancy.¹²⁶ In other cases, courts use days of hospitalization and other

¹²¹ Here is the intuition: if a firm knows that it would be able to collect a substantial portion of the network's surplus, it would seek to increase the network's surplus with an ex post recovery.

¹²² See *infra* Section III.D.2 (discussing chilling effects).

¹²³ See *supra* note 100 and accompanying text.

¹²⁴ See, e.g., *Sitzes v. Anchor Motor Freight*, 289 S.E.2d 679, 685-89 (W. Va. 1982) (apportioning liability 70% / 30%, based upon defendants' respective degrees of fault); *Packard v. Whitten*, 274 A.2d 169 (Me. 1971) (apportioning liability 75%-25% between joint tort-feasors, "in proportion to the contributions of each one to the damages suffered").

¹²⁵ See *DOBBS et al.*, *supra* note 82, at 286 ("attribution of fault percentages is necessarily a rough approximation even though it is expressed in mathematical terms").

¹²⁶ E.g. *Debus v. Grand Union Stores* 621 A.2d 1288 (Vt. 1993) (allowing per diem damages).

objective criteria to evaluate pain and suffering.¹²⁷ In yet other cases, courts apply rough intuitions together with the evidence both parties have presented.¹²⁸ More interestingly, proxies and rough estimates are common means of mitigating measurement difficulties even with pecuniary losses such as lost earnings. Here courts use statistics ("tables") in lieu of accurate estimates to establish a victim's earning capacity and his work and life expectancy, both with and without the bodily injury.¹²⁹ Sometimes, courts use the statistical mean (or average) income as a viable proxy for the victim's lost earnings.¹³⁰ In the same vein, courts use a percentage of the victim's functional disability as a proxy for diminished earning capacity: a functional disability of 20% might be translated into a 20% reduction in the victim's earning capability.¹³¹

How might the analogous use of proxies and damage estimates reduce the plaintiff's burden of sustaining a claim for restitution of network benefits? As we have explained above, in the most common case the plaintiff must first introduce evidence to support an inference that it conferred benefits on the defendant through a network. Thereafter, a court must find that the evidence offered in litigation is sufficient to establish the following variables: 1) net costs: $C_r - B_{in}$ at least equal to B_{ex} , the plaintiff's contribution to the network; 2) defendant's net benefits; and 3) the ratio between the defendant's net benefits and the total net benefits of the network.

As an extended thought experiment, we now consider how the plaintiff's burden of production can be satisfied for each of these three variables. First, the plaintiff's burden of establishing the difference between

¹²⁷ See, e.g., *Taveras v. Manhattan and Bronx Surface Transit Operating Authority*, 41 A.D.3d 158, 159 (N.Y. App. Div. 1st Dep't 2007) (awarding compensation for future pain and suffering based on extended hospitalization, multiple surgical procedures, and permanent injuries); *Roth v. Islamic Republic of Iran*, 78 F. Supp. 3d 379, 402 (D.D.C. 2015) ("Assessing appropriate damages for pain and suffering...can depend upon a myriad of factors, such as the severity of the pain..., the length of hospitalization, and the extent of the impairment....").

¹²⁸ See, e.g., *Welsh v. Martinez*, 157 Conn. App. 223, 243 (2015) (ruling that "[p]roper compensation... falls within the necessarily uncertain limits of just damages"); *Williams v. Mathieu*, 155 So. 3d 54, 59 (La. Ct. App. 4th Cir. 2014) ("[P]ain and suffering are ... inherently speculative in nature and cannot be set with mathematical certainty"); *Dee v. Becker*, 636 N.E.2d 176, 178 (Ind. Ct. App. 1994) (same).

¹²⁹ See, e.g., *Karpov v. Net Trucking, Inc.*, U.S. Dist. LEXIS 129130, 5-6 (N.D. Ind. 2010) (using statistical tables in order to calculate the injurer's lost earning capacity); RESTATEMENT (SECOND) OF TORTS § 924 cmt. e ("In the case of permanent injuries or injuries causing death, it is... permissible to use mortality tables and other evidence as to the average expectancy of a large number of persons").

¹³⁰ See, e.g., *Classic Coach, Inc. v. Johnson*, 823 So. 2d 517, 528 (Miss. 2002) ("In cases brought for the wrongful death of a child ...the deceased child's income would have been the equivalent of the national average as set forth by the United States Department of Labor").

¹³¹ See, e.g., *Neal v. Annett Holdings, Inc.*, 814 N.W.2d 512, 526 (Iowa 2012) ("Earning capacity is determined by an evaluation of several factors, including functional disability, age, education, qualifications, experience, and inability to engage in similar employment.").

its costs and benefits is considerably reduced if the court is authorized to convert the claim to a fixed percentage of costs, say, 10%, 20% or 30%. The plaintiff's burden of proving the difference between costs and benefits is met if it shows that any one of these percentages is more likely than not (*variable 1*). The court then answers a binary question "yes" or "no:" has the plaintiff carried its burden of proof that this difference is greater than the plaintiff's contribution to the network?

The second variable is more challenging: The difference between the defendant's benefits and costs is typically the defendant's private information. One approach is to designate as an affirmative defense the defendant's claim that its costs exceed the benefits received from the network.¹³² This then assigns to the defendant the burden of producing evidence (or even the burden of proof) regarding the difference's magnitude: if the defendant does not produce evidence the court is entitled to assume that its costs are low and benefits are high, as the plaintiff has argued.¹³³

Note that the court must ultimately determine the ratio of the defendant's net benefit to the entire network's net benefit (*variable 3*), thus the second step is just an instrumental variable for that determination. The situation is analogous to the case of joint tortfeasors', where the court must apportion damages among defendants who are jointly and severally liable.¹³⁴As noted above, here courts use proxies to apportion damages in accordance with the defendants' fault and causal contribution. The same strategy is followed in apportioning damages between the injurer and victim in cases of contributory negligence. In both instances, courts will apportion liability by using round number percentages, rather than attempting accurate estimates.

Analogously, in deciding how best to allocate restitution damages among all network members whose benefits are higher than costs, a court can require each defendant to pay an aliquot portion of the cost units that had been awarded (e.g., x , $2x$ or $3x$), depending on the net benefits the firm received from the network (but in no case more than the net benefits received by that firm). This allocation method can substitute for the very

¹³² The defendant is entitled to convince the court that costs are higher than benefits, and if it succeeds (even without providing evidence regarding exact costs and benefits), the plaintiff should lose.

¹³³ Cf. RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT § 51(5)(d) and cmt. i (2011) ("The precise amount of the defendant's unjust enrichment may be difficult or impossible to ascertain. The unusual difficulty of measurement in particular contexts explains why...courts so often refer to burdens of proof and presumptions... the claimant has the burden of producing evidence from which the court may make at least a reasonable approximation of the defendant's unjust enrichment.... [T]he defendant is then free... to introduce evidence tending to show that the true extent of unjust enrichment is something less").

¹³⁴ To be sure, we do not suggest that here all network members are jointly and severally liable; instead each is separately liable for a portion of the plaintiff's net costs.

costly effort to apportion damages according to each member's contribution to the network.¹³⁵ Finally, the required ratio between a defendant's net benefits and the total network benefits can be determined in different ways. One alternative, as we have suggested, is to require defendants as an affirmative defense to provide information about their net benefits and to require the plaintiff to provide information about the network's net benefits. Another option is to adopt a presumption that all members benefited to the same extent from the network, but permit any participating firm to attempt to rebut the presumption.¹³⁶

3. Information-Revealing Mechanisms and Administrative Expertise

Thus far we have assumed that a court will implement a restitution regime on the initiative of individual plaintiffs. Here we suggest that “soft” state intervention can further support the normative objective.¹³⁷ Soft intervention in our terms is state action that reduces the burden on courts to apply the restitution regime and in particular to reduce the informational hurdles which might otherwise frustrate the goal of enhancing network reciprocity.

We start with information-revealing mechanisms. Imagine a magnet firm that considers forming a strategic cluster network and expects other firms to join the proposed network. If high transaction costs preclude a contractual solution, participating firms would be able to enjoy the network's benefits without payment (as in industrial districts and other clusters where proximity to the magnet firm is the only condition necessary to capture benefits). Suppose now that the firm announces in advance how much each participating firm should pay if it joins the network. Currently, such announcement has no legal effect: since any firm can join the network for free, moving to the emerging cluster would not be considered as an acceptance of a legally binding offer. But if the state's rule is that the announcement of the price to participate binds new members that locate to the cluster, it reveals key information about new members' benefits: presumably their benefits from joining the network are higher than the price they are required to pay. Moreover, the magnet firm is constrained by the market demand for participation in the network: if the posted prices are

¹³⁵ *Supra* note 118.

¹³⁶ In some cases, a court might adopt a presumption that members' benefits are correlated with their relative size (which is relevant to the network). And of course other presumptions might emerge, and courts could be less or more flexible in permitting firms to rebut the presumption. If a presumption is too easy to overcome, however, defendants might be subject to a prisoner's dilemma: each would have a dominant strategy to rebut the presumption relating to her share in liability, even if in the end all participating members will pay approximately the same damages as they would have paid if the presumption had been irrebuttable.

¹³⁷ To be sure, there could be strong state interventions – such as subsidizing networks – which are beyond the scope of this article.

set too high too few parties would join the network. Indeed, even without additional state intervention, if courts simply adopt a restitution regime, magnet firms who form networks would be motivated to promulgate a price for membership, thus offering contracts to firms that join the cluster who might prefer the contract option in lieu of the uncertainties of the restitution regime.¹³⁸

To be sure, there are other means by which the state can support a restitution regime in spiderless networks. So far we have assumed that regular courts would adjudicate restitution claims in network cases. An alternative would be to create administrative tribunals—perhaps under the aegis of an agency such as the Federal Trade Commission—composed of parties familiar with the industry, who acquire expertise over time and thus require much less private information from claimants in order to assess restitution claims. Indeed, even without expert panels, firms would often prefer expert arbitration to courts, both because of the enhanced accuracy of awards and the benefits of confidentiality.¹³⁹

B. Four Exemplars of Externalities in Spiderless Networks

In this section we begin by describing four exemplars of how network benefits are disproportionately distributed among network members: in each case there is an asymmetry of cost and benefits that can threaten network formation and duration in industrial clusters and strategic alliance networks. Thereafter we analyze how and to what extent the low powered restitution regime outlined above would apply to each of the exemplars.

1. Magnet Firms and Late Arrivals

As we noted in Part I, the industrial district cluster is an example of a spiderless network that forms organically as a function of the synergies from agglomeration.¹⁴⁰ The industrial cluster is similar to (but not the same as) the alliance network. It is similar in the sense that the network creates benefits from agglomeration that are more than simply the sum of all its participant's actions. Thus, by generating value that is greater than the sum of its individual member's contributions, and as it occurs spontaneously, the cluster is an example of a network that emerges organically. One asymmetry of network costs and benefits arises, however, as a product of the relatively greater importance of magnet enterprises. In this case, there is a substantial asymmetry between the benefits conferred by each party.

¹³⁸ We further consider how a restitution regime would encourage contractual solutions *infra* Section III.E.

¹³⁹ Omri Ben-Shahar & Lisa Bernstein, *The Secrecy Interest in Contract Law*, 109 YALE L.J. 1885 (2000) The feasibility of establishing a scheme of special tribunals depends, of course, on the volume of restitution claims in any given network.

¹⁴⁰ To be sure, some industrial districts are formed by state subsidies, and thus are formed around spiders, but our concern remains those that can form organically.

While the magnet firm externalizes substantial benefits on other network members it receives fewer benefits from them. If the asymmetry is sufficiently large, the magnet would not move to (or act to create) the industrial district even when it would be socially desirable: if the private benefits the firm expects to derive from its relocation are less than private costs, the network won't form even though the total social benefits—including the positive externalities conferred upon others—are higher than the magnet's private costs.

Assuming that magnet enterprises fortuitously are already located in the putative industrial district the agglomeration process can proceed organically but further problems arise as relocation costs – land values, labor costs, etc.-- rise over time such that later arrivals face higher participation costs than earlier arrivals. In this case, as we indicate below, the mobility of skilled labor among network firms is an important value as it increases social capital and indirectly redistributes network benefits.

The most salient American example of a cluster with these properties that nonetheless may be vulnerable to disruption unless costs and benefits are internalized is the Silicon Valley network that emerged in the 1990s around several successful computer technology related firms and Stanford University in California. These magnet entities led firms who wished to create a startup company to do so in Silicon Valley.¹⁴¹ In turn, the surge in the number of Silicon Valley startups induced a number of venture capital firms either to relocate to Menlo Park and its environs or to expand their Valley offices. This in turn encouraged more entrepreneurs to locate their startups there. Ultimately venture capitalists, dot-com startups, and other R&D entities clustered in and around the geographical area. This clustering produced a parallel effect in the labor market as engineers, scientists and software designers located in the area in search of better job opportunities. This skilled labor was highly mobile and as they moved among firms, social capital increased in the cluster. In turn, this concentration of technically skilled labor increased the incentive for new startup enterprises to locate in a region where there was an ample supply of skilled labor.

But the formation of a cluster network is dynamic and vulnerable to exogenous shock. In the case of Silicon Valley, for example, the increase in the cluster of business and labor has fueled a dramatic increase in residential and commercial real estate costs as well as deterioration in ancillary services owing to rapid growth.¹⁴² This has led a number of firms

¹⁴¹ For a time the Silicon Valley cluster was in competition with the cluster that was forming around Route 128 in Boston, Massachusetts. The Route 128 cluster withered in large part because of the lack of mobility of scientific talent that was impeded by the enforceability of covenants not to compete in Massachusetts. Non-compete agreements are generally unenforceable in California. Gilson, *supra* note 28.

¹⁴² Nitin Dahad, *As technology booms, U.S. startups are driven beyond Silicon Valley*, THE NEXT SILICON VALLEY (Nov.23, 2015),

to move to alternative locations such as Austin, Texas and Raleigh-Durham, North Carolina.¹⁴³ To be sure, these changes don't necessarily doom the Silicon Valley cluster. But they do imply that the cluster will not function as efficiently as it might have if the network had a mechanism to redistribute costs and benefits more efficiently. In short, to sustain cluster performance in the longer term, clusters need to manage network openness to business outside the cluster while facilitating strong inter-organizational relationships within the cluster.¹⁴⁴

2. *Freeriding on Indirect Ties*

A firm can also benefit differentially from participation in a strategic alliance network to the extent that it can exploit knowledge gained indirectly from other network members that are not alliance partners. A simple example illustrates the point: Imagine that Firm A has an alliance with firm B that, in turn, has an alliance with firm C. In the course of the B-C alliance, C obtains private information attributable to A that C can exploit elsewhere by transferring that knowledge to other business projects within the firm that are not directly related to the alliance with B. The resulting private benefits are those that C can earn unilaterally to the extent that it has the capacity in other projects to realize the benefit. The successful exploitation of Firm A's private information is thus a function of the degree to which Firm C's scope of resources and activities are related to the activities of Firm A.

The alliance between Apple and Sony to assemble Apple's successful PowerBook line of portable computers provides a useful case study of how private benefits are exploited through indirect acquisition of knowledge.¹⁴⁵ The Apple-Sony alliance linked Apple's capability at designing easy to use computer products with Sony's miniaturization capabilities. Apple's expertise in producing the laptop computer was developed, in turn, through contractual alliances with other strategic partners, including IBM.¹⁴⁶ Although both Apple and Sony benefitted from the success of the

<http://www.thenextsiliconvalley.com/2015/11/23/3885-us-startups-are-driven-beyond-silicon-valley/> (discussing the side effect of rapid growth in technological clusters).

¹⁴³ *Id.*

¹⁴⁴ A. B. Eisingerich, & L. Boehm, *Group Analysis: Why Some Regional Clusters Work Better Than Others*, 3 *MIT SLOAN MGMT. REV. J.*, 1-3 (2007) (discussing three factors that are especially powerful in determining a cluster's competitiveness and growth potential).

¹⁴⁵ See generally Brenton R. Schlender, *Apple's Japanese ally its new notebook computer - made by Sony - shows why alliances are hot in the PC business*, FORTUNE MAGAZINE (Nov. 4, 1991), http://archive.fortune.com/magazines/fortune/fortune_archive/1991/11/04/75695/index.htm (describing the Apple-Sony alliance).

¹⁴⁶ See e.g., *Important events in the saga of Apple Computer Inc.*, BOSTON BUSINESS (Jun.8, 1997), http://www.boston.com/globe/business/packages/microsoft_apple/apple_chron.htm (presenting Apple's business history).

PowerBook, Sony ultimately realized greater private benefits due to synergies between its consumer electronics business and its growing computer business.¹⁴⁷ Sony used the alliance with Apple, including knowledge developed by IBM (and later transferred to Apple), to learn how to design and manufacture laptop computers as well as allied consumer electronics. While Apple earned private benefits from its alliance with Sony, none of those benefits accrued to its other strategic partners, including IBM. In this way, Sony was able to free ride on the *network benefits* that IBM had generated in its alliance with Apple. These indirect and extra-contractual transfers of private information are positive externalities common to strategic alliance networks, but if benefiting firms are able to free ride on this knowledge, network value will decline and network performance and durability will be impaired

3. Exploiting “Structural Holes”

Firms that are strategically embedded in alliance networks can capture a disproportionate share of the network’s benefits by exploiting their position in the network. Specifically, some firms are able to bridge gaps (known as “structural holes”) in the network by brokering relationships with other parties who are not directly connected to each other. Firms that occupy a positional monopoly in networks with many structural holes can exert control over information flows and thereby extract monopoly rents from alliance partners. These firms not only share in the common benefits generated with their alliance partners but also extract private benefits – access to information or resources-- that are a function of their controlling position in the network.

The ability to exploit a positional monopoly in the network is well illustrated by the Tata Group, the largest business group in India.¹⁴⁸ Tata operates in a number of different industries, including steel, automobiles, hotels and information technology. The Tata Group, as India’s Largest IT firm, has many alliances with foreign firms wishing to do business in India.¹⁴⁹ There are also many smaller Indian firms with strong capabilities

¹⁴⁷ A. Inkpen & A Dinur, *Knowledge Management Processes and International Joint Ventures*, 9 ORG. SCI. 454, 455 (1998) (“Sony.. has formed various alliances with computer and telecommunications firms in an effort to forge new technology linkages for its consumer electronics products.. The alliances give Sony access to a wealth of new knowledge”). Before its alliance with Apple, Sony had little experience in the computer industry. The firm used knowledge from the Apple-IBM alliance to launch its own popular line of laptop computers. Dyer et al., *supra* note 39, at 142.

¹⁴⁸ *List of entities associated with Tata Group*, WIKIPEDIA (last updated Sep.26, 2015, 9:59 PM), https://en.wikipedia.org/wiki/List_of_entities_associated_with_Tata_Group.

¹⁴⁹ See, e.g., *Tata Strategic Management Group enters into an alliance with Roland Berger Strategy Consultants*, TATA (Feb.11, 2009), [http://www.tata.com/company/releasesinside/sXzPuLZHI!\\$\\$\\$!E=/TLYVr3YPkMU=](http://www.tata.com/company/releasesinside/sXzPuLZHI!$$$!E=/TLYVr3YPkMU=) (discussing the alliance between Tata Management Strategic group and Roland Berger Strategy Consultants, one of the largest strategy consultants in the world).

in IT, especially in software development.¹⁵⁰ But these smaller firms, lacking Tata's size and long-term presence in the market, are not able to form alliances directly with foreign entities.¹⁵¹ Tata's alliances with foreign firms provides privileged access to information about positive value projects, product specifications and pricing and new developments in relevant technologies. To be sure, some portion of Tata's ability to extract more favorable terms in its alliance contracts with the smaller Indian firms is a return on its investment in reputation. Lending that reputation to the Indian startups justifies a market return. However, the private benefits of control it enjoys by bridging this gap also permits Tata to extract monopoly rents from its smaller Indian partners when together they form alliances to service the needs of large foreign customers. In essence, the monopoly rents take the form of freeriding on a portion of the network benefits contributed by the smaller Indian firms.¹⁵² One consequence of this imbalance in the distribution of network benefits may be found in the evidence that many of these international strategic alliance networks are fragile and prone to disintegration.¹⁵³

4. Exploiting Informational Synergies

We noted above that networks generate informational value that is independent of the value produced in any individual alliance dyad. Informational synergies develop from the ability of firms to acquire different sources of private information from many different alliance partners. Thus, a firm in an alliance network that occupies a central position with many network partners can use the diverse sources of information gathered from each alliance to make better-informed investment decisions going forward. The capabilities developed by a centrally positioned firm as a result of knowledge gained from the *network of alliances* are private benefits that are only indirectly related to any particular alliance relationship. These private benefits will not be available to alliance partners with only a small number of relationships. Assuming each party in the network expends an equivalent cost in the information revelation that contributes to the network's information-rich environment, some firms are capturing a disproportionate share of the benefits, merely as a function of their position in the network. This asymmetry of costs and benefits is yet another way that network externalities can threaten network durability.

Microsoft is an example of a firm that has large number of alliance

¹⁵⁰ See, e.g., *List of Indian IT companies*, WIKIPEDIA (last updated Dec.5, 2015, 8:46 PM), https://en.wikipedia.org/wiki/List_of_Indian_IT_companies (presenting a list of notable companies in the IT sector based in India).

¹⁵¹ Dyer et al., *supra* note 39, at 143-44.

¹⁵² *Id.*

¹⁵³ See *supra* text accompanying notes 41-45.

ties with various technology firms and, as a consequence of its size and financial resources, occupies a central position in the computing industry alliance network.¹⁵⁴ Its central position in its alliance network gives Microsoft access to more and better information than its alliance partners. The resulting synergies position Microsoft to better determine what positive value projects it should pursue in the future. Dyer, Singh and Kale report that interviews with Microsoft's alliance partners reveals dissatisfaction with the asymmetric distribution of network benefits: Microsoft is viewed as a fairly undesirable alliance partner in terms of generating reciprocal benefits in an alliance.¹⁵⁵ One explanation for the negative reaction of other network members to their association with Microsoft is the realization that Microsoft is able to exploit its central position in the network to accumulate uncompensated benefits in excess of its contribution to the network.

5. The Effects of Externalities on Network Performance and Longevity

The preceding exemplars illustrate the differences between clusters and strategic alliance networks, and those differences affect the performance and longevity of the two types of networks in different ways. In clusters, formation and stabilization of the industrial district requires mechanisms to motivate magnet firms to locate within the cluster and to ensure that late arrivals that face higher costs can receive compensating benefits. In this way the common benefits created by the cluster are redistributed with the goal of allocating the network surplus in proportion to members' benefits received and conferred. In alliance networks, firms form dyads that produce private alliance benefits that are shared contractually while some (few) firms are able to capture a disproportionate share of the network's common value. A given firm's calculus whether to participate in maintaining in the network is thus a function of its costs (including opportunity costs) and the combination of network and private or contractual benefits it receives. As a generalization, networks that generate both high network benefits and high private benefits for the firms in the network will produce the most durable alliances and thus increase the efficiency and longevity of the network. Alternatively, networks in which many firms experience low network benefits and low private benefits relative to a few embedded firms would be the least stable.¹⁵⁶

¹⁵⁴ Y DOZ & G. HAMEL, ALLIANCE ADVANTAGE 233 (Harvard Bus. Press 1998) (claiming that "Microsoft has been able to enroll nearly the entire information technology industry in its alliance network"). See also David Kirkpatrick, *These Days Everybody Needs a Microsoft Strategy*, FORTUNE MAGAZINE (JAN.12, 1998), http://archive.fortune.com/magazines/fortune/fortune_archive/1998/01/12/236432/index.htm (discussing businesses' necessity in forming strategic partnerships with Microsoft).

¹⁵⁵ Dyer et al., *supra* note 39, at 145.

¹⁵⁶ Intermediate combinations of network and private benefits are more difficult to evaluate. It might be the case that alliance networks characterized by low network benefits and high

To the extent that the four exemplars of network externalities described above illustrate a general phenomenon, the question with which we began then becomes salient: Can a restitution regime that facilitates internalization be adapted to an environment in which high measurement and litigation costs deter firms seeking to redistribute network value from pursuing legal remedies?

C. Applying a Low-Powered Restitution Regime to the Four Exemplars

1. Magnet Firms and Late Arrivals

The general case of magnet firms was analyzed in detail in Part II, so here we focus specifically on the Silicon Valley case.¹⁵⁷ The question is what should happen when a research institute (like Stanford University), several computer technology related firms, and venture capitalists attract startup companies to relocate in their vicinity, thereby allowing them to capture many benefits, for which they don't pay? The Silicon Valley case is close to Case 2 in the restitution model (unilateral creation of benefits: active beneficiaries)¹⁵⁸ where a magnet firm attracts many other entities to relocate nearby and form a cluster network. In such cases, there is an efficiency justification for allowing the magnet enterprise—or other core members—to capture a substantial portion of the network's surplus and in any event at least recover the difference between costs and benefits. The question then is whether Stanford University in our example, as well as other magnet firms that "established" the Silicon Valley network, received enough of the network's surplus.

Answering the particular case requires more facts, but consider how the restitution regime would work in similar cases whenever a research institute (RI) considers bringing a claim against other network members, say a startup firm that allegedly captured uncompensated benefits from the RI. At the outset, the RI must show that both firms belong to the same network, namely, that there were repeated interactions between the parties, that they engaged in interrelated business activities and that the RI conferred benefits on the startup firm (or that the startup "took" benefits from the RI). It is likely that the RI participates in more than one network: it might produce information regarding the biological foundation of various drug therapies to which particular startup enterprises benefitted and also produce information relating to the development of new computing

private benefits for most alliance members could still be reasonably stable. For example, Wal-Mart's alliances with many retailers permits it to exercise its control and central position in the network to extract a larger share of the network value as private benefits. Nevertheless, its partners may be content to accept the high private benefits generated by the alliance even if their network benefits are low. Dyer et al., *supra* note 39, at 146.

¹⁵⁷ *Supra* text accompanying notes 141-144.

¹⁵⁸ *Supra* Section II.C.2.

technologies with benefits accruing to other startup firms.

Thereafter, the RI must introduce evidence sufficient for a court to verify the three variables described above in Section III.A.2. What kind of evidence would be probative? The RI could show that it generated information—say, information about a disease or drug therapy—that was “used” by the defendant startup, perhaps with the participation of other network firms, in developing a new drug. The RI would then be entitled to show how much it invested in research on the relevant therapy—in terms of the costs of manpower, materials and laboratory facilities—as against any corresponding benefits (say, from grants, tuition revenues, patents, and enhanced charitable contributions). Unless rebutted by the defendant, the court would be entitled to find that benefits are lower than costs, and establish restitution damages at some approximate percentage of (gross) costs.

All beneficiary firms in the network are liable for a portion of the restitution damages according to their share in the network's surplus. Thus, the court would need to estimate that share with respect to the defendant firm. For example, the court could estimate that the defendant startup received (or took) 80% of the total benefits, or only 50% of them, and award damages accordingly. The restitution regime outlined above contemplates such rough approximations. These estimates are easier to verify *ex post* rather than *ex ante*: realization of benefits is verifiable, and it also provides better incentives to the RI to share private information with the startups, who can use the information during the critical innovation period prior to realization of benefits.¹⁵⁹

Finally, if the RI can prove it is a magnet firm, the restitution regime contemplates a more generous recovery above net costs (and even if the magnet's benefits clearly exceed its costs). Under these conditions, the court might grant the maximum possible recovery, say 30% of the firm's costs, and again, apportion liability among beneficiaries according to their relative share in the network's surplus.

The Silicon Valley case raises the additional problem of late arrivals: firms that are willing to join the network at a later stage may face higher costs relative to earlier arriving firms. How are late arrivals encouraged to join the cluster rather than move to another location? First, a startup that arrives later and subsequently realizes benefits from the network is entitled (with an *ex post* remedy) to offset higher costs attributable to late entry against any future liability in restitution brought by other cluster members to recover uncompensated benefits. Furthermore, if its participation costs exceed its benefits, the late-arriving firm is entitled to recoup the difference

¹⁵⁹ To be sure, *ex post* damages requires the court to determine when “realization” occurs. The court also needs to determine how frequently the RI can file a restitution claim following any given realization of benefits.

from firms that realized net benefits from the network.

This solution is inadequate, however, in a case where every firm incurs a net benefit. Here, it is tempting to consider awarding ex ante damages equal to the difference between early and late arrival costs. This option, however, begs the question how those incremental costs are to be allocated among other network members, especially when it is unclear who (if anyone) is an (ex post) beneficiary. Given this problem, ex post compensation is the preferable solution, permitting firms that create ex post benefits for network members to recoup the incremental cost of late arrival, even if their benefits exceed their costs. Damages for the incremental cost of late arrival are then allocated among network members in the same way as a losing member's net costs are allocated.¹⁶⁰

2. *Freeriding on Indirect Ties*

In the Apple-Sony case, the information Sony acquired indirectly from IBM was used by Sony to develop, together with Apple, the laptop computer and also used to advance Sony's business interests in consumer electronics. Thus, in the network composed in part of Apple, Sony and IBM, IBM conferred benefits on both Apple and Sony but only had an alliance contract with Apple: the question arises whether IBM is entitled to restitution damages given the uncompensated network benefits it conferred on Sony. We assume that neither Sony nor Apple committed a justiciable wrong since the information derived from IBM that Sony used was not protected by IP law,¹⁶¹ and we further assume that Apple was not in breach of its contract with IBM. Indeed, it is common in strategic alliance networks for one party to acquire information from a contract partner that has been acquired by the contract partner in collaboration with third parties.

One way to approach the problem is through the traditional tools of contract law: the contract between IBM and Apple arguably accounted for the possibility of information being made available to Sony (or other third parties) and the alliance contract priced it accordingly. Relying on the alliance contract to internalize the subsequent benefits to third parties is sub-optimal, however: not only do the contracting parties face substantial uncertainty at time of contract, which makes pricing a formidable task, but ex ante pricing also provides the party possessing the information inadequate incentives to share it with the counterparty, knowing the information might later be used in alliances between the counterparty and third parties. Thus, if IBM has been paid ex ante for the subsequent use of the information by Apple and Sony, IBM, in deciding what information to share in its alliance contract with Apple and what information to withhold, would ignore any future benefits that Sony – or Sony's counterparts –

¹⁶⁰ *Supra* text accompanying note 104.

¹⁶¹ We assume the information is “know-how” that is not subject to property right protection.

would derive from that information.

An alternative solution is to realize that IBM, Apple and Sony are part of a strategic alliance network, where IBM conferred substantial network benefits on Apple and Sony but (potentially) received fewer benefits in return. Thus, the Apple-Sony case is a variation of our Case 2 (unilateral creation of benefits: active beneficiaries).¹⁶² An award of restitution damages to IBM gives parties in IBM's position an incentive to share information with alliance partners, such as Apple even if they appreciate the risk that the information will ultimately be used by third party competitors (like Sony).

But how should the restitution regime be implemented in a case like this? We assume that all three parties' efforts and expertise combined and resulted in the development and manufacturing of the new laptops and more innovative consumer electronics and that IBM did not receive any compensating benefits. Hence, IBM should recover restitution damages from Sony and Apple: the court would estimate IBM's contribution to the new laptops and consumer electronics produced by Sony and Apple respectively and determine that 10%, 20% or 30% of the profits made by Sony and/or Apple should be attributed to information generated by IBM. As we have explained, such estimates are not much different in nature from the estimates courts make when they apportion damages in tort cases either among joint tortfeasors or between injurers and victims based on comparative fault or causal contribution.¹⁶³ From that percentage, the court decides the quantum of damages to award to IBM. Consistent with the imposition of low-powered restitution remedies, a court should be very cautious to avoid awarding damages that are higher than IBM's true contribution to the realized profits. Any uncertainty is resolved in Sony's (and Apple's) favor in order to reduce chilling effects on entrepreneurs who might fear that some of the profit they realize from innovation might subsequently be attributed to information derived indirectly from other network participants.¹⁶⁴

3. Exploiting "Structural Holes"

In the Tata Group case, one large Indian firm—Tata Group—uses valuable information it received from smaller Indian firms for its own benefit. The difficult question is whether the smaller firms should be entitled to some of the network's surplus that currently is captured mostly by Tata. If Tata is a magnet enterprise, as in Case 2 in the model,¹⁶⁵ allowing it to retain a large portion of the network surplus is the right

¹⁶² *Supra* Section II.C.2.

¹⁶³ *Supra* notes 124-125 and accompanying text.

¹⁶⁴ Here too, ex post awards would probably be preferred to ex ante awards. *Supra* text accompanying notes 159-160.

¹⁶⁵ *Supra* Section II.C.2.

solution. In this way, Tata would secure an appropriate return from sharing its reputational benefits with other network members. When Tata is allowed to capture the greater part of network benefits, it is motivated to make more efficient decisions regarding the network's operation and composition than if it had to disgorge a substantial portion of its profits.

At the same time, however, not allowing the smaller Indian firms any share in the network surplus above what they receive from their mere participation in alliances with foreign entities is likely to deter some of those firms from participating in the network. That destabilizing result would occur when those firms determined that the expected costs of participation—in particular the costs of disclosing valuable private information to Tata that could adversely affect their business opportunities—would be prohibitive.

The fact that Tata is a central firm, together with the need to attract the small Indian firms to participate in the network, argues for allowing the smaller firms to collect restitution damages from Tata but only in the amount of their net costs ($C_r - B_{in}$), plus a modest premium: most of the network surplus would remain with Tata, but the smaller firms' incentives to join the network would increase. Indeed, in theory, it might be appropriate to allow Tata to collect damages from the subset of smaller firms who benefitted significantly through the network. Assuming, however, that Tata's positional monopoly has permitted it to capture rents, it is doubtful whether this solution is justified given the difficulties of proof (although it might well be justified in cases where the central firm suffers only modest network gains (or even net losses), while the smaller firms are able to capture substantial network benefits.).

How might a claim by a given sub-set of smaller Indian firms be advanced successfully under the restitution regime? As we have suggested above, the court must first conclude that the evidence is sufficient to sustain a finding that the firm has suffered a net loss, and thereafter award as reimbursement damages a designated percentage of verifiable costs. Proxies for costs incurred would include, for example, the loss of business opportunities or potential customers owing to the ability of a competitor to exploit information obtained through Tata. As always, recovery is denied in the absence of evidence sufficient to sustain the plaintiff's burden of production. The Tata case is a difficult one to resolve under the restitution regime, however, and implementation might be implausible absent soft intervention by the state. An expert tribunal can more readily sort the complex interaction between the benefits properly attributable to Tata's position in the network as the reputational intermediary from the rents that are attributable to its positional monopoly. Moreover, this case is an appropriate one for an information revelation mechanism: the state could support a rule that any firm that joined the network after a fee request from a central firm such as Tata is deemed to have accepted a legally binding offer thus making any subsequent restitution claims redundant.

4. *Exploiting Informational Synergies*

In the Microsoft case, one large firm has many strategic alliances and, as a consequence of its central position in the network, it can exploit informational synergies to capture a larger share of the future projects available to network members. The knowledge and expertise in pursuing future business opportunities resulting from this synergy of information is not traceable to any other network member or alliance partner. Should Microsoft's alliances share in the gains obtained by Microsoft?

The problem this case poses for a restitution regime is that it is especially difficult to measure the contribution of any given network member or alliance partner to the gains made by Microsoft at a later stage. At the same time, however, there is the reluctance of some firms to do business with Microsoft exactly for the reason that they fear being "exploited."¹⁶⁶ Thus, the Microsoft case is similar to Case 3.2 in the restitution model (multilateral creation of benefits when contributions are complements),¹⁶⁷ but with the complication that one firm (Microsoft) is also a central member of the network (similar to Case 2¹⁶⁸). In such cases, leaving some of the network surplus to the peripheral firms (in addition to what they would receive by their participation in the network) is a plausible solution that would motivate more firms to participate fully in sharing private information with others and, in particular, with the centrally embedded firm.

The question remains, however: can the measurement problems this case poses be overcome? As long as the legal objective is modest, a limited restitution remedy would improve internalization of network benefits. This argues for reimbursing the verifiable net costs ($C_r - B_{in}$)¹⁶⁹ of Microsoft's alliance partners, plus a fixed premium. Moreover, if $C_r - B_{in}$ is not verifiable, a court motivated to support spiderless networks has available the alternative suggested above for the Sony-Apple exemplar: once Microsoft realizes substantive benefits from a new product and the plaintiff can show that its extra-contractual private information was used by Microsoft in developing the new product, the plaintiff is eligible to recover damages measured by the relative contribution of the plaintiff's information to the development of the new product.

¹⁶⁶ *Supra* text accompanying note 155.

¹⁶⁷ *Supra* text following note 93.

¹⁶⁸ *Supra* Section II.C.2.

¹⁶⁹ *See supra* Section III.A.2.

*D. Crowding Out and Chilling Effects**1. Crowding Out*

As we explained in Part I, legal sanctions have the potential of crowding out informal norms, since the threat of legal sanctions can make the parties' actions and motivations less observable. This is so because legal sanctions a) change the way a party *perceives* the behavior of the other party, and b) also reduce the *frequency* of the behavior that signals an intention to cooperate.¹⁷⁰ When actions and motivations are less observable the parties may rely less on norms of trust and reciprocity and that might discourage cooperation between them. The question, then, is whether liability under a low-powered restitution regime crowd out norms of trust and reciprocity that currently form the foundation of spiderless networks? To be sure, this concern is less relevant with respect to networks that have yet to form: assuming that norms of trust and reciprocity do not preexist the network, liability under restitution law would encourage more parties to form new networks and crowding out would not be a concern. Also, with respect to firms that have elected not to participate in a network, liability under restitution law could only improve their incentives, without any risk of crowding out. The principal question then is whether firms in networks that have already (or are in the process of being) formed would be subject to crowding out effects.

We argue that crowding out in this context is unlikely because the normative structure of business networks is parsimonious. There is no norm of *altruism* among business firms. No firm is implicitly obligated to cooperate with other network members and produce value for them, *even if the cooperating member loses value*. There is also no norm of *risk sharing* among network members who are not in a direct contractual relationship. A firm that gains benefits from the network has no implicit obligation to compensate a firm that cooperated with others in the network but incurred net losses. In sum, the low-powered legal remedy contemplated by a restitution regime cannot crowd out altruism and risk-sharing norms for the simple reason that those norms do not exist in a spiderless business network. To be sure, there are network norms of reciprocity and cooperation but, as we have argued and as the experimental data support, a low-powered restitution regime is most likely to complement rather than to substitute for those existing norms.¹⁷¹

¹⁷⁰ *Supra* text accompanying notes 58-60.

¹⁷¹ The experimental data suggests that informal norms and legal remedies are complements when each strategy reinforces the effectiveness of the other. Thus, a legal sanction that covers some but not all of the parties' obligations complements existing norms if the remaining obligations can be enforced informally. Sergio Lazzarini, Gary J. Miller & Todd R. Zenger, *Order with Some Law: Complementarity versus Substitution of Formal and Informal Arrangements*, 20 J. L. ECON. & ORG. 261 (2004); Mary Rigdon, *Trust and*

2. *Chilling Effects*

Liability sometimes chills desirable activities. In tort law, judicial errors cause chilling effects when injurers expect liability even for benign behaviors.¹⁷² The risk of liability might encourage them inefficiently to reduce their activity level. Would the restitution regime outlined above chill desirable activities?

Consider Case 2 in the restitution model (unilateral creation of benefits with active beneficiaries).¹⁷³ Here, a magnet firm relocates and small firms consider moving to its vicinity in order to capture positive externalities produced by the magnet firm. Assume that those firms are exposed to liability risks under a restitution regime. They might anticipate that error costs will lead to liability in restitution that exceed the benefits they expect to capture from the magnet firm. As a consequence, the small firms may elect not to relocate even when relocation is efficient. In contrast, in the absence of expected liability the firms would relocate in order to capture positive network benefits from the magnet firm.

There are several reasons why this risk of chilling effects would not lead an efficiency minded court to reject a restitution regime. *First*, in a world without legal remedies there are offsetting efficiency losses caused by large-scale externalities that threaten the viability of a spiderless network: without a mechanism to internalize the externalities, the magnet firm may not relocate and no network will be formed, and in any event the network would not function to maximize the entire network surplus. *Second*, chilling effects are reduced when sanctions are low-powered: in the magnet firm cases (Cases 1 and 2 in the model), the magnet firm recovers less than the entire benefits it created for the others. Any chilling effect is reduced as smaller firms anticipate retaining measurable benefits. *Third*, chilling effects might be reduced with an ex ante remedy; with such a remedy each firm would be able to know at an early stage, even before joining the network, the approximate liability (or entitlement) it might bear and decide accordingly whether or not to join. And finally, firms can engage in standard risk management techniques until insurance markets evolve to reduce the variance in liability caused by high rates of error.

Reciprocity in Incentive Contracting, 70 J. ECON. BEHAV. & ORG. 93 (2009). Furthermore, the reciprocity equilibrium, if achieved, might stabilize existing networks and make their operation more efficient. In this way, restitution might create a new norm of fairer, and more efficient, sharing of networks' surplus, according to each member's contribution. See Daphna Lewinsohn-Zamir, *The Importance of Being Earnest: Two Notions of Internalization* 65 U. TORONTO L.J. 37, 58 (2015) (arguing that mild sanction is likely to reinforce voluntary compliance).

¹⁷² Louis Kaplow, *Information and the Aim of Adjudication: Truth or Consequences?* 67 STAN. L. REV. 1303 (2015) (arguing that chilling effects should be a major concern in setting standards of proof).

¹⁷³ *Supra* Section II.C.2.

E. Restitution as a Bargain-Enabling Default

Given the substantial costs of verifying the benefits and costs individual firms incur in spiderless networks, it is tempting to argue that restitution claims of the sort we have outlined above rarely will succeed and even less frequently will be pursued by firms that have suffered lost value in network activity. Nevertheless, a restitution regime can have a positive effect on improving network efficiency even in a world where successful claims are rare: the acknowledgement by the state that a restitution remedy is an available legal option can motivate firms participating in spiderless networks to search for ex ante contractual solutions that better address the network's goal of achieving a reciprocity equilibrium. In that sense, the restitution regime we have designed can serve as a bargain-enabling default—a virtual spider in the web-- that increases the probabilities that parties will more easily resolve the collective action problems that otherwise plague spiderless networks.

The available evidence suggests that networks with spiders offer a broad menu of contractual solutions that mitigate the positive and negative externalities that characterize informal network cooperation. For example, food cooperatives form organically as spiderless networks, but those that survive typically then organize around a bureaucratic structure that internalizes much of the external effects of informal cooperative behavior.¹⁷⁴ Similarly, franchise networks, construction networks, and modern supply chains are merely a few examples of ways a central party can organize network activity contractually by using master contracts,¹⁷⁵

¹⁷⁴ See e.g., Nigel D. Poole et al., *Formal Contracts in Fresh Produce Markets*, 23 FOOD POL'Y 131 (1998) ("The challenges facing the food industry in tackling uncertainty and thereby reducing transaction costs are being met in part through an array of contractual arrangements, such as partnerships and alliances that aim to achieve greater vertical coordination and efficiency....Closer coordination can also be achieved through the use of written contracts"); Rachel E. Goodhue et al., *Contracts and Quality in the California Winegrape Industry*, 23 REV. INDUS. ORG. 267 (2003) ("Contracts ...have been important in broiler chicken production, and in fruit and vegetable production for many years, and are becoming increasingly important in other commodities...."); H. Christopher Peterson et al., *Strategic Choice along the Vertical Coordination Continuum*, 4 INT'L FOOD AND AGRIBUSINESS MGMT REV. 149, 149-50 (2001) ("Many variations of vertical coordination have evolved...in agri-food markets..including joint ventures, keiretsus, virtual corporations, licensing agreements, production specification contracts, etc.").

¹⁷⁵ See, e.g., Long Term Agreement between John Deere & Company and Stanadyne Corporation (5 year supply contract for the purchase of fuel filtration systems, injection nozzles and related products by Deere from Stanadyne); Agreement between Phoenix Technologies Ltd. and Intel Corporation (December 1995) (supply contract for Phoenix to be a principal supplier of system-level software to Intel); General Terms Agreement between the Boeing Company and Spirit Aerosystems Inc. (June 30, 2006) (general terms agreement covering purchase orders by Boeing for particular product to be supplied by Spirit); Component Supply Agreement between American Axle & Manufacturing, Inc. and General Motors Corporation (June 5, 1998) (requirements contract for motor vehicle components to be supplied by AAM to GMM).

third party beneficiary law¹⁷⁶ and related contractual means of internalization.

Spiderless networks lack a means of organizing the distribution of network value precisely because high transaction costs preclude the creation of a spider or any other contractual arrangement among members. So how might parties opt out of a restitution default when transaction costs are high? After all, opting out requires a contractual arrangement and if contracts are infeasible opting out is infeasible as well. Here the coordinating function of the restitution regime offers a possible solution. A bargain-enabling default, such as the restitution regime we propose, economizes on transaction costs by providing focal points that align the parties' expectations and thus permit them to solve a coordination problem more efficiently. Parties who participate in networks are involved in a mixed motive game. They coordinate on certain expectations but have conflicting interests on others. One way they align their expectations is through communication. When the parties can communicate, experiments show that their "cheap talk" facilitates coordination.¹⁷⁷ As Thomas Schelling famously noted, when the problem is selecting one means of coordinating among many, focal point solutions stand out and attract the attention of both parties.¹⁷⁸ In short, the state's comparative advantage is its ability to create salience by publicizing the restitution default. Once announced, the focal point default economizes on costly precontractual communications: this function is especially valuable when the parties have different possible ways to coordinate, and there is no consensus as to how to do so.

The current default rule in spiderless networks is zero compensation to network members who have suffered negative externalities from network activity. An appropriately designed restitution regime can create a more attractive focal point and thereby improve network efficiency. All network firms benefit from an agreement that reduces uncertainty and avoids expected litigation costs. Indeed, even short of a fully specified master contract, the parties can always contract over restitution damages in order to make the implementation of any restitution regime less costly.

¹⁷⁶ See generally, Schwartz & Scott, *supra* note 1, (manuscript at 34-35) (arguing that the legal question regarding third party beneficiary law shouldn't be whether the contract parties intended to confer a benefit on the plaintiff. Instead, the correct question is whether it would be ex ante profitable for the network contracting members to serve the potential beneficiary class to which the plaintiff belongs).

¹⁷⁷ See, e.g., Vincent Crawford, *A Survey of Experiments on Communication via Cheap Talk*, 78 J. ECON. THEORY 286, 287 (1998) ("When players' preferences are sufficiently close, communication via cheap talk can be informative").

¹⁷⁸ THOMAS SCHELLING, *THE STRATEGY OF CONFLICT* 54-55 (1963).

IV. CONCLUSION

In this Article we have proposed recruiting restitution law in order to support the formation and operation of spiderless business networks. While some spiderless networks function today without legal intervention, the evidence suggests that many are fragile and fail to form successfully. Our foundational claim is that a well-designed restitution regime will induce more parties to participate cooperatively in forming durable networks, and that those networks—both existing and new—will operate more efficiently. To be sure, the chilling effects endemic in a legal regime where expected verification costs are substantial, as well as the ancillary risk of crowding out, argues for a low-powered restitution regime: in most cases, an efficiency minded court should limit a firm that has suffered lost value in its cooperative network activities to the difference between its costs and benefits unless the firm can establish its central role as a magnet enterprise.

The tremendous growth of spiderless business networks in recent years has attracted little attention from legal scholars. This neglect is no longer justifiable. Nevertheless, for several reasons our normative claims are tentatively held. The salient legal issues concern the externalities that some network dyads confer or impose on other network dyads and the consequent issues of liability and remedy. But since lawyers have largely ignored the subject, what courts are capable of doing in network contexts are largely unexplored issues. There is thus little institutional wisdom to exploit. Moreover, so far economists are not concerned with the issues of liability and strategic defection that occupy lawyers. Hence, the economic literature offers less wisdom here than it does in other contexts. Finally, our normative criterion is partial: legal rules that increase network member welfare will not always increase social welfare. It is an open question just how wide the actual divergence is between local and global efficiency.

Despite these caveats, we conclude with two claims. First, the issues raised by possible restitution claims in connection with business networks deserve a more prominent place in doctrinal and in law and economics scholarship. To be sure, liability for benefits conferred is much less common in the law than liability for harms or for breach of contract, and for good reason.¹⁷⁹ The new Restatement on Restitution and Unjust Enrichment shows, however, that restitution law can usefully improve efficient operation of business activity in areas of commercial life that traditionally have been considered to be out of its sphere. The demand for an increased scholarly focus on the nature and extent of legal liability in network contexts is justified by the subject's practical significance, its normative importance and its intellectual interest. Second, we believe that courts should interpret existing law in terms that promote the formation and

¹⁷⁹ Porat, *supra* note 69, at 198-200 (presenting the law's different approach to benefit and harm cases, and suggesting justifications).

performance of business networks. This normative criterion is more likely to survive a social welfare analysis than is the disinterested posture of current law.