
INFORMATION MARKETS

*What Businesses
Can Learn from
Financial Innovation*

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I

INFORMATION MARKETS

When it was evening, the disciples came to him and said, “This is a lonely place, and the day is now over; send the crowds away to go into the villages and buy food for themselves.” Jesus said, “They need not go away: you give them something to eat.” They said to him, “We have only five loaves here and two fish.” And he said, “Bring them here to me.”

Matthew 14:15–18

JUST AS the simple act of sharing fed the multitude, so sharing amplifies the value of information. Information’s capacity for simultaneous use means “that we can take all of the poor people in the world right now, let them use all of the knowledge, all of the discoveries that we already take advantage of—and we can raise their standard of living without reducing our own.”¹ In the jargon of the economist, this means that information, like little else in this world, is *non-rival*. Little wonder that Stewart Brand, founder of The WELL, concluded that information wants to be free.

Feeding the multitude took a leap of faith, and so too does sharing information. In spite of information’s non-rival nature, the rewards from its strategic use are a powerful temptation. For this reason, nations, business organizations, and individuals spend enormously on intelligence and security to ensure that they are among the well informed. Even when someone willingly shares information, as a reader might share her preferences with Amazon.com, it’s difficult to prevent further dissemination. And yet an inability to control personal information might prove costly or embarrassing. Who among us would want her life to be an open book? The problem is that once free, or disembodied from its originator, information is virtually impossible to recapture. In short, although sharing information is the path to collective benefit, sharing information also makes one vulnerable.

This book is about the intermediaries who promote trade in financial markets by balancing the tension between self-interest and collective interests in information. Financial markets always have been dominated by information. For those who envision the world in the midst of transition to a “new economy,” a world in which economic welfare depends heavily on trade in information, we believe there is much to be learned from the experience of bankers, traders, and other practitioners of high finance. Financial markets have witnessed a slow, steady shift in the balance of power between Wall Street and Main Street over the course of the twentieth century. The Internet has punctuated this shift, but its effect is different in degree, not in kind, from previous advances in information technology. Careful attention to the slower-paced democratization of financial markets offers perspective that few managers and entrepreneurs operating in Internet time have the luxury of gaining first-hand.

Financial intermediaries manage the tension created by self-interest in information among their clients, but they endure a similar tension in their dealings with one another. Competition among intermediaries, traditionally fueled by the human capital of key individuals, is now technology driven. Primitive information technology enabled early financial intermediaries to form information networks by scattering human repositories for information as widely as possible.² Fair dealing over time within the network led to strong relationships bound by trust through which information moved more freely than it would have otherwise. Reputations and relationships, the foundations for trust, are simply composites of information regarding a series of human interactions that are not easily disembodied from the originator—you can’t buy a reputation.

Among information assets, those that remain embodied in their originators are the most easily protected because the originator simply can choose not to share. But the embodiment of information within key individuals, whether by design or the nature of the information, limits the scope of its application. J.P. Morgan and Michael Milken, perhaps Morgan’s only near equal among modern bankers, were known for their direct involvement in virtually every deal that passed their way. This concentration of power diminished the threat of competition from underlings who might break off on their own with knowledge and reputation formed under Morgan or Milken. But concentration of these powerful intellectual assets in the hands of their originators limited their

scope of application. Morgan, for example, was prone to long absences from 23 Wall Street, and Milken found it necessary to sleep for at least a few hours daily.

Sometimes the lure of exploitative use of information is too great for trust alone to support cooperation. An intermediary can still add value, but it must either acquire or be granted the power to act as a benevolent dictator. When all else failed, Morgan forced cooperation among railroad concerns at the turn of the twentieth century by (credibly) threatening to shut the pipeline for European capital. Modern society is rich with instances in which individuals voluntarily submit to coercive intermediation. We'd all like to drive at higher speed, but we also recognize the collective danger and voluntarily submit to speed restrictions enforced by traffic patrols or speed cameras.

Setting aside the threat that benevolence diminishes with power, this heavy-handed approach to intermediation is more vulnerable to competition than intermediation built on trust. When the rules defining the intermediary's value-added responsibilities are easily codified, there is little to distinguish one person's capacity for carrying them out from another's. The originator of codifiable human capital suffers diminished control, which undermines the incentive to invest in human capital in the first place. In the extreme, machines execute instructions previously carried out by people—with the advent of speed cameras, it's fortunate for traffic cops that their function extends beyond simply monitoring adherence to traffic regulations. But codification of human capital serves the public interest by expanding its scope of application.

When human capitalists dominated financial intermediation, innovation often flourished in the context of close relationships and powerful intermediaries that tempered competition but protected easily copied ideas and products. This protection encouraged financial innovation by more nearly ensuring a fair return on investment in intellectual property. Today, human networks are giving way to technology that vastly expands the speed and scope of information dissemination and storage media that provide rapid access to information and indefinitely preserve its integrity. Technological advances expand the possibilities for codifying human capital and thus weaken the grip of the human capitalists. Seen in this light, it is natural that financial intermediaries only recently have aggressively sought patents and other protections for intellectual property. But even with the large-scale substitution of information technology for human intermediaries, the subtle

maneuvering of financial dealmakers that frees information to flow through the vastly expanded pipeline remains largely a black art. Can further advances in information technology provide for codification of even this element of human capital?

This tension between human capital and information technology has profound consequences for the organization and management of intermediary firms. The small family partnerships that dominated early financial markets provided an environment in which human capital was nurtured and passed from one generation to the next. By contrast, the modern financial firm depends far more on financial capital to support the large-scale but low-margin operations that remain when intermediary functions are codified. But, contrary to predictions of the demise of intermediaries by many early proponents of the Internet, subtleties in the institutional fabric suggest that intermediary functions, although being reshaped by information technology, will not soon be displaced. The two brief vignettes in Boxes 1-1 and 1-2 will help to fix these ideas as we pose several questions about the interplay between human capital and information technology in financial markets and its potential implications for the modern economy.

The diminished power of financial intermediaries in the aftermath of the 1933 Banking Act did not signal the demise of the functions they carried out. In fact, many economists argue that diminishing their power held back the economy for decades until institutional investor networks began to reform in the 1960s. But there is a fine line between intermediaries having sufficient market power to warrant investment in the intellectual property at their foundation and having so much power that they stifle innovation or extract undeserved profits from consumers.

If you've followed the U.S. Justice Department's prosecution of Microsoft for alleged anti-competitive behavior, this argument should sound familiar; it likely will reappear ever more frequently. Intellectual property is more difficult to protect than physical property, and so firms pursue market power to complement or substitute for institutionalized protections for intellectual property. At what point and how aggressively should we limit the market power of firms dealing in intellectual property? Where network effects arise, can policymakers do better than simply dismantling the network?

The lawsuit brought by the recording industry against Napster reflects the opposite side of the coin—the rising difficulty in controlling

Box 1-1 Turn-of-the-Century Investment Banking, Circa 1900

At the turn of the twentieth century, J.P. Morgan dominated U.S. and world capital markets. Although his organization comprised about ten partners, fewer than 150 other employees, and about \$147 million in capital (in current dollars), Morgan and his men oversaw an immense web of relationships—the “money trusts” that controlled the bulk of the day’s industrial activity. Morgan’s visibility equaled that of heads of state and he simultaneously was feared and revered. For all of his well-known assertions of the centrality of character in financial dealings, Morgan wielded a heavy club when necessary to achieve his goals.

As Morgan’s power grew to the point of influencing national and worldwide economic events, the public balked; ultimately, the House of Morgan was divided by the 1933 (Glass-Steagall) Banking Act. The resulting investment bank, Morgan Stanley, specialized in advising large corporations and assisting them in raising debt and equity financing. The commercial bank, J.P. Morgan & Co., served wealthy individuals and made loans to large corporations. The webs of influence that enabled Morgan and other prominent bankers to match and marry capital with investment opportunities were essentially destroyed.

software or codified intellectual property as the costs of storage and dissemination plummet. However, this struggle has also been experienced by financial intermediaries. As both information technology and economic theory advanced over the course of the twentieth century, intermediary functions carried out by people were codified and mechanized. Program trading, involving the coding of investment strategy for computer execution, is perhaps the extreme example.

Given the relative ease of reverse engineering financial products and strategies, the financial analogue to digital recording of copyrighted material, one might be concerned for investment bankers’ incentives to develop clever new strategies. Investment bankers aren’t starving artists, but the starving artists might learn something from how investment bankers protect intellectual property that rarely has been served by patent, copyright, and trademark law. In some instances, we’ll see that sharing intellectual property in a controlled setting,

exemplified by the partnership culture of The Goldman Sachs Group (see Box 1-2), sets off a virtuous cycle for its further development and preservation.

The mobility of key individuals like Geoff Boisi and the resulting pressure on firms to control investments in human capital seem the order of the day among law firms, accounting and management consulting organizations, and other professional service organizations. Simultaneously, professional firms are reexamining the partnership organization that made owners of key human capitalists, often turning to public incorporation and so placing human capitalists in control of outsiders' financial capital. With the exception of Goldman Sachs, this shift was complete among bulge-bracket investment banks by the mid-1980s. Might something be learned from the experience of these banks as well as the ones that chose to continue as relatively small partnerships?

Finally, the large-scale consolidation sweeping financial markets has strong parallels with reorganization movements in the media and other information-intensive markets in which advances in information technology are forcing a reexamination of the balance of power between content and distribution. We'll suggest again that while the shift in the balance between content and distribution—human capital and information technology if you will—has been abrupt, leading to the likes of the AOL/Time Warner merger, it has been more nearly a continuous process in financial markets. If so, might we learn something from the experience that will shed light on what appears to be a regime shift in some non-financial markets?

Financial Intermediaries

We're not claiming to have answers to all of these questions. If we did, it would take more than a book contract to persuade us to share them! But we do believe these questions lend themselves to analysis of the kind economists have long applied to financial intermediaries. Development of such an analytical framework is the focus of chapters 2, 3, and 4. Chapter 2 examines the functions carried out by financial intermediaries. Technology and regulation influence how these functions are carried out and bundled with one another, but the basic functions are quite stable.

If we see intermediaries as institutional responses to impediments to trade in the markets they serve, the relative stability in their functions is not surprising. The ideal market that brings all relevant

Box 1-2 Turn-of-the Century Investment Banking, Circa 2000

In November 1991, Geoffrey Boisi announced his retirement from partnership at Goldman Sachs. During twenty-two years with Goldman Sachs, Boisi had been the youngest-ever partner, had led the firm's investment banking operations, had founded the global finance department, and was widely regarded as a key "culture carrier" because of his mentoring of junior bankers. Boisi was well-known in Wall Street circles, but his commitment to Goldman Sachs's culture of teamwork kept him from the public eye. At his retirement, Boisi was a member of the firm's management committee and headed strategic planning for the firm, including periodic consideration of the costs of maintaining the partnership as profit margins in traditional banking functions narrowed. Upon his departure, Boisi perceived Goldman Sachs, now with 128 partners and about 6,400 other employees, as remaining a partnership in name only. Chief among his concerns was the trend toward non-partner traders, supported by information technology worthy of NASA, putting partners' capital at risk in exchange for huge bonuses and public visibility when they succeeded, but little personal cost when they failed.

Boisi resurfaced in 1993, along with three former Goldman Sachs partners, to form the Beacon Group, a small, private partnership specializing in corporate advisory services and private equity management. By 1999, Boisi concluded that investment banking was becoming a game of scale, and in May 2000 he sold the fourteen-partner firm to Chase Manhattan for an estimated \$500 million and was appointed head of Chase's investment banking business. *The Economist* characterized the outcome for Boisi as perhaps "the largest signing bonus in Wall Street history."³ In short order Chase acquired J.P. Morgan & Co. to complete a series of acquisitions predicated on the recent demise of the Glass-Steagall Act. The acquisition propelled J.P. Morgan Chase & Co., now with a capital base of \$42 billion (equity capital) and almost 100,000 people worldwide, into a select group of full-service global banks.

Meanwhile, Goldman Sachs went public in June 1999, with one stated goal being to position the firm for the acquisitions necessary to compete with the new breed of full-service bank.

parties together at no cost, in one time and place, with equal access to all relevant information does not exist. In fact, if we ignore the institutional fabric that physically defines a market, all but academic economists might find it difficult to imagine the presence of a market. Institutions and people embody the rules and practices carried out by intermediaries.

To make the discussion concrete, throughout the book we use the investment bank, broadly interpreted, as a point of reference. By *investment bank* we mean organizations such as Goldman Sachs and Morgan Stanley that have long conducted the high finance of coordinating large-scale institutional investor networks and providing strategic advice to senior business and government officials. In chapter 3, we take Goldman Sachs as our representative of the traditional investment-banking platform and examine the range of its intermediary functions. We then introduce three pioneering “Internet investment banks,” OffRoad Capital, Wit Capital (now Wit SoundView), and WR Hambrecht + Co., which appear throughout the book as representative challengers to the traditional intermediary platform.

OffRoad Capital uses the Internet to carry out several intermediary functions in the private debt and equity markets that previously were either technically or economically infeasible. In doing so, OffRoad is creating a market where one previously did not exist. In contrast, Wit SoundView and WR Hambrecht are pioneering innovative approaches to well-established and highly successful intermediary functions carried out in the primary equity markets. The vibrancy of the U.S. primary equity market—otherwise known as the initial public offering (IPO) market—is often cited as a key force underlying U.S. industrial innovation generally and the burgeoning information economy specifically. And yet the IPO market and its intermediaries, investment banks, are coming under increasing criticism for practices that are perceived as both inefficient and discriminatory.

Wit SoundView’s efforts to open the IPO market to retail investors provide a case study in the democratizing power of modern information technology and the capacity for forming communities of interest among previously fragmented parties. WR Hambrecht’s online electronic IPO auction mechanism goes a step further, illustrating the potential for realization of ivory tower visions of bringing all interested trading parties together in one (virtual) time and place. This and similar virtual marketplaces provide a laboratory for examining how

advances in information technology in concert with advances in theoretical knowledge of the functions carried out by information intermediaries are driving the codification and mechanization of practices that previously demanded human judgment.

In addition to examining how these entrants are challenging the status quo in the marketplace, we consider why established firms have not been pioneers in this area. Where networks of customer relationships bind processes and products together, interdependence within the network substantially raises the costs of incremental innovation. Financial markets are an extreme case of a networked industry, and intermediaries are the glue that binds the network. Existing intermediaries find it difficult, or at least cannibalistic, to make incremental changes to their network structure. Entrants such as OffRoad, Wit SoundView, and WR Hambrecht essentially begin with a clean slate.

But while existing networks might impede innovation, they also provide the foundation for a powerful competitive response to innovators if they are complementary to the new technology. OffRoad, Wit SoundView, and WR Hambrecht may have ideas whose day has come, but can these ideas be protected from adoption by firms with established reputations and relationships? In fact, this form of expropriation already is occurring wholesale as established investment banks, most prominently Goldman Sachs, scramble to establish a presence on the Internet. By raising this point in chapter 3, we introduce questions related to the nature of competition in information-intensive markets between entrants and established firms that will surface repeatedly throughout the book.

The Economics of Information Intermediation

The second part of the book takes us more deeply into how information intermediaries (or *infomediaries*, to use the word coined by McKinsey & Co. consultant John Hagel) carry out their functions in the marketplace. Chapter 4 examines how intermediaries balance the competing interests of parties to a transaction. For example, a car dealer has an interest in squeezing as much as possible from a potential customer, and vice versa. But if either party or both are too aggressive in their pursuit of private interests, the transaction may fall through, leaving both worse off than had it not. The essence of the intermediary's role here is leading the counterparties away from the purely competitive

strategy of grabbing as much as possible of a fixed economic pie and toward the cooperative strategy of accepting a smaller fraction of a substantially larger pie.

In many instances, the value in a network or community of interest derives from members' willingness to contribute to a common pool of resources. In financial markets, individuals contribute to market liquidity through their willingness to trade, thus setting off a virtuous cycle of increasing returns. In information networks, whether in financial markets at large, in individual firms, such as those being formed within many management consultancies, or in voluntary communities of interest, the pool of information is more valuable than the sum of its parts. Unfortunately, it is often difficult or simply not worth the effort to block those who contribute little from the benefits generated by more prolific or cooperative contributors. But failure to do so undermines incentives to contribute in the first place.

These are a few of the problems that arise in the brokering of strategic information. We've mentioned that one solution involves granting coercive power to a benevolent dictator. But for a variety of reasons it's useful to identify business models that promote voluntary cooperation among members of an information network—what economists refer to as *incentive-compatible* mechanisms. Simply put, incentive compatibility means that network participants find it in their own self-interest to cooperate in a manner stipulated by an intermediary. The intermediary's function is to identify and commit to upholding an incentive-compatible set of rules that best serves the interests of its network membership.

Chapter 4 offers a simple example to illustrate the concept of incentive compatibility and then develops it more fully in the context of the IPO market. Our purpose in this chapter is to convince you that an admittedly abstract concept has considerable power to explain traditional, human-capital-intensive practices in a market where human judgment is still considered by many as central to the market's success. But if we make a convincing case, then we've already gone well down the path toward codifying traditional practice. From there it's a short step to mechanization along the lines proposed by Wit Sound-View and WR Hambrecht. Thus, careful attention to the design principles for incentive-compatible mechanisms provides both the tools for designing new business platforms and a benchmark for judging the competition for new standards.