INTERNET INVESTMENT BANKING: THE IMPACT OF INFORMATION TECHNOLOGY ON RELATIONSHIP BANKING

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The banker's network of personal relationships is perhaps the central element of the production technology of the 20th-century investment bank. In his classic history of Investment Banking in America (1970), Vincent Carosso argued that investor networks began to take shape in the 1870s as the evolution of the corporation increasingly required banks to distribute large blocks of securities.1 More recently, in an article published in this journal, Charles Calomiris and Carlos Ramirez traced bank relationships with client firms to the rise of "financial capitalism" in the late 19th century. A distinguishing feature of this form of capitalism was the presence of powerful financiers on corporate boards, which provided companies with the "certification" necessary to raise capital from outside investors.2 And, in their 1988 book on investment banking, Harvard professors Robert Eccles and Dwight Crane added to this general argument by showing how the banks' relationships with corporate clients have provided them with a constant flow of information that has shaped the design of products and services.3

Given the relatively primitive state of information technology for much of this century, this relationship-based production technology appears to have been a remarkably effective institutional adaptation to the information-intensive nature of the investment banking industry. When these financial networks were suppressed in the wake of New Deal financial reforms, the activity and amount of capital raised in public securities markets fell dramatically—and, perhaps more surprisingly, took decades to rebound. Indeed, it was not until the 1960s, when investment bank relationships were able to restore their ties to institutional investors, that U.S. public debt and equity markets returned to their former prominence.4 And yet, in spite of the historical success of this relationship-based production technology, evidence is mounting that it could be displaced—at least in part.

In this article, I provide an economic perspective on how recent advances in information technology have begun to lay siege to the relationship-based technology. Most of the discussion takes place in the context of recent applications of Internet technology to the pricing and distribution of securities. In particular, I focus on strategies pioneered by Wit Capital and, more recently, W.R. Hambrecht + Co. in the market for initial public offerings (IPOs) of equity. Then, near the close of the article, I broaden the focus by sketching some implications of my analysis for other aspects of the investment banking business.

SECURITIES PRICING AND DISTRIBUTION

Securities offerings feature a complex series of events that are orchestrated by the issuing company's investment bank. In part, these events reflect regulatory demands for full and complete disclosure of information that might be relevant to prospective investors. The bulk of these activities consist of the due diligence effort conducted by the issuing firm's bank, auditors, and legal advisors followed by the registration of the offering with the Securities and Exchange Commission and the distribution of a preliminary prospectus account. Although not required, a series of roadshows aimed at the institutional investor community is a common supplementary source of information.5

A subtle intermediation problem arises as investors gain access to information and begin forming opinions about the value of the firm's offering. Historically, investment banks have attempted to assess these
opinions as accurately and efficiently as possible by “building a book” for the offering. The book contains institutional investor responses to the bank’s request for “indications of interest.” These indications typically take the form of offers to purchase a certain number of shares at the market price or, alternatively, the number of shares the investor is willing to purchase at a particular price or range of prices. A though indications of interest are legally non-binding, they are offered in the context of an ongoing relationship between the bank and its institutional investor network. Failure to stand by an implicit commitment can lead to an investor’s exclusion from future deals managed by the bank.

Ideally, the bank would canvass the entire investor population to establish the demand curve for a securities offering. Until very recently, however, it would have been folly to even consider such an undertaking. Faced with relatively primitive information technology, bookbuilding methods economized on search costs by seeking the opinions of a relatively narrow but influential pool of institutional investors. In this capacity, investment bankers have long employed a strategy analogous to that of the modern-day political pollster who seeks the opinions of a representative sample of the population at large.

But there is an important difference between these two polling processes. Participants in an opinion poll are most likely indifferent about the outcome of the polling effort. In contrast, institutional investors have a significant financial stake in the outcome of the poll conducted by the investment bank. The manager of a large mutual fund, for example, knows that providing a strong indication of interest can drive up the offer price both directly and perhaps indirectly by influencing the beliefs of other investors. For this reason, institutional investors have an incentive to understate their interest and thereby compromise the bank’s effort to accurately assess market demand conditions.

In a 1997 article published in this journal, Lawrence Benveniste and I explained how the collection of practices that make up a bookbuilding effort can be understood to diminish this incentive distortion. In short, we interpret the favored treatment enjoyed by institutional investors in IPOs as the “payoff” necessary to obtain accurate indications of interest.

In recent years, the steadily increasing share of assets controlled by institutional investors has probably strengthened their bargaining power relative to banks and, in so doing, increased the cost of doing business with the relationship-based technology. For this reason alone, investment banks have recently sought to deepen their retail investor channels. A deep retail network provides a credible fallback during (implicit) bargaining with institutional investors over the “price” at which they will provide accurate indications of interest. Recent consolidations and strategic alliances between wholesale and retail organizations represent a traditional response to the shifting balance of power. But even such alliances cannot alter the reality that, as the cost of direct communication with individual investors has plummeted, the relative cost of the relationship-based production technology has increased.

OFFERING SECURITIES VIA THE INTERNET

Andrew Klein was the first to exploit this shift in relative costs with the 1996 founding of Wit Capital, now widely known as “the Internet investment bank.” Wit coordinates an “e-syndicate” of retail investors who are offered first-come first-served access to IPOs. The price of admission to the esyndicate is a willingness to refrain from “flipping” allocations in the immediate secondary market for the offering; investors who sell their allocations within 60 days are excluded from future offerings. The firm seeks to develop this reliable network of retail investors both directly and through relationships with online brokerage firms.

Although Wit was founded to serve firms too small to bear the fixed costs of the traditional underwritten securities offering, it has increasingly sought to provide esyndicate members with access to larger offerings underwritten by the bulge-bracket banks. To date, Wit has participated in about 30 offerings in this capacity— and it soon expects to achieve co-manager status.

It is noteworthy that Wit’s strategy of providing retail investors with access to IPOs in exchange for a commitment to refrain from flipping is very much consistent with the perspective developed in the preceding section. In this respect, Wit’s pioneering efforts in Internet investment banking thus far have mainly
complemented rather than substituted for the existing production technology. The question remains whether this is the logical endpoint of innovation or simply a means of establishing the presence necessary to supplant the existing technology.

In contrast to Wit’s complementary strategy, the success of the OpenIPO auction mechanism recently introduced by W.R. Hambrecht + Co. will be measured by its capacity for displacing the networks of investor relationships that have been central to the pricing and distribution of securities. Through OpenIPO, Hambrecht accepts bids from the public at large for 100% of the shares in IPOs that it manages. Any investor can place a bid through the Internet for up to 10% of the shares being offered. Based on these bids, the offer price will be set at the highest price at which all shares can be sold. Finally, there are no restrictions or penalties related to the sale of initial allocations. In short, the only price of admission is a brokerage account.

Although narrow in its current focus, William Hambrecht’s status as founder and former CEO of Hambrecht and Quist has led to characterizations of OpenIPO as a harbinger of the future of investment banking. Hambrecht’s fundamental insight has been to recognize that the technology that enables Wit Capital to coordinate retail investors also enables individual retail investors to speak for themselves. By offering individual investors an alternative to voicing their preferences through an institutional representative, Hambrecht’s technology attempts to “divide and conquer” the institutional investor network at the core of the relationship-based technology. The success of this strategy will depend in part on continued efficiency gains in online discount brokerage and the willingness of individual investors to take back the responsibility for investment decisions that so many have delegated to institutional representatives. But the recent interest in online-brokerage technology shown by Merrill Lynch and Goldman Sachs, among others, suggests that bulge-bracket banks take this prospect seriously.

THE CHALLENGE TO THE RELATIONSHIP-BASED TECHNOLOGY

Thus far, I have suggested that the traditional relationship-based technology for pricing and distributing securities offerings evolved in response to the high cost of communicating with the investor community at large. Relationships with institutional investors provided banks with summary statistics for market demand conditions and efficient means of distributing large blocks of securities. Strategic pricing and allocation features of the bookbuilding process responded to the bargaining power these investors enjoyed as a consequence of their central role in the marketplace. In this setting, the seemingly large 7% fee commonly paid to investment banks might simply reflect the cost of doing business with relatively primitive information technology.

But more fee-based competition seems likely to reduce those spreads in the very near future. Hambrecht predicts that OpenIPO will place IPOs for 3-5% of gross proceeds. More extreme predictions have suggested that existing technology could reduce an implicit underwriting fee of 150 basis points for a $100 million corporate bond issuance to about 30 basis points. Although cost savings projections of this size suggest that we take seriously the prospect that new technologies for securities pricing and distribution are simply more efficient, it remains to be seen whether the benefits of the relationship-based technology can be matched. To gain further insight into this question, it is useful to probe more deeply into the differences between historical practices and those built on recent advances in information technology.

First, we should note that, at an abstract level, the auction mechanism proposed by Hambrecht is simply a set of rules by which the market’s valuation of an asset is determined; the price-revealing bidding behavior depends upon the specific pricing and allocation rules that define the auction. Similarly, bookbuilding practices can be characterized as a set of well-understood, albeit informal, rules for achieving the same goal.

Auctions for items with a “true” but unknown value (such as the present value of a firm’s future cash flows) commonly suffer from a winner’s curse. That is, if nothing else, at the end of the auction, the winning bidder knows that his or her estimate of the item’s value was greater than that of any other bidder. Kevin Rock has argued that this problem arises in IPOs because some investors (presumably institutional investors) are invariably better informed about the issuing firm than others. Those who are relatively well-informed
avoid offerings they perceive as being overpriced while demanding large allocations of those selling at an apparent discount. This behavior will tend to crowd relatively poorly informed investors out of discounted offerings and leave them holding the bag for overpriced offerings. Faced with this threat, poorly informed (perhaps retail) investors will bid cautiously or not at all. The net result is that the expected proceeds from an issuing firm’s IPO are diminished.

Lawrence Benveniste and I have shown that bookbuilding practices respond to this problem by encouraging the release of private information that well-informed investors would otherwise prefer to keep to themselves.\textsuperscript{15} Two practices deserve special attention in this regard because they are less commonly featured in proposals to replace the bookbuilding technology. First, we showed in a 1996 paper (with Walid Busaba) that a strategic commitment to secondary market price stabilization can promote efficiency in the bookbuilding process.\textsuperscript{16} Wit Capital’s requirement that its investors hold initial allocations for at least 60 days is consistent with the strategy that we propose (although I would also point out that OpenIPO explicitly disavows penalties and constraints on secondary market activity).

Moreover, Benveniste and Paul Spindt suggest in their 1989 paper that a bank’s longstanding relationships with a stable pool of investors can provide a more subtle source of efficiency.\textsuperscript{17} Specifically, they suggest that, in the context of a longstanding relationship, a bank and its investors can implicitly agree to bundle IPOs rather than treating each as an independent transaction. Doing so provides greater pricing flexibility because investor concerns about any single deal being overpriced are reduced. As a consequence, issuing firms on average can expect to achieve greater proceeds from their offerings. I am not aware of any proposal to date that attempts to replace this element of linkage among deals that the relationship-based technology makes possible.

Of course, the fact that such practices have not yet been observed in online banking efforts does not mean they are impossible. Indeed, both require little more than some form of memory. Clearly, Wit Capital has demonstrated the capacity for conditioning investors’ IPO allocations on their past behavior in the secondary market. The bundling of transactions envisioned by Benveniste and Spindt traditionally would have relied on “institutional memory.” But, with recent advances in digital storage and access, the benefits of institutional memory should be easily replicable if they indeed promote efficiency.

Finally, it is worth considering the possibility that the information problem bookbuilding practices address may arise in part because of the special status accorded institutional investors. As individual investors have placed their assets under the control of institutional investors, incentives for information production related to firms going public have improved. Delegating this responsibility to institutional investors reduces duplication of effort and the incentive of individuals to “free ride” on the information production effort of others. Thus, the relationship-based technology that evolved in response to a primitive information technology may have widened the gulf between relatively informed and uninformed investors. Although bookbuilding practices can help to place investors on more nearly equal footing, a simple mechanism like OpenIPO coupled with advanced information technology might prove superior.

Of course, that depends on how one defines a “superior” outcome. If online investment opportunities diminish the relative private benefits of delegating asset management to institutional investors, they may also reduce the public benefits associated with the production of information by institutional investors. If so, primary equity market prices could become less useful guides for capital allocation decisions in the economy at large. Unfortunately, it will be difficult to predict how technological innovation will influence the delicate balance between public and private interests that presumably contributes to the vibrancy of U.S. primary equity markets.

In sum, the present state of information technology is such that the relative private benefits of the traditional relationship-based technology for pricing and distributing securities are about to be substantially reduced. The technical hurdles to investors speaking as individuals rather than through the common voice of an institutional representative are few and rapidly shrinking. Auction theory is sufficiently well-developed that codifying best practices for assessing market demand conditions is straightforward. Finally, even subtle benefits of the relationship-based technology such as institutional memory are now amenable to approximation if not replication. Add to these developments the widespread concerns about discrimination
TRADING, PRODUCT INNOVATION, AND M&A ADVISORY SERVICES

Is this an isolated threat or will technological advances have similar consequences throughout investment banks? To gain insight into this question, note first that the preceding argument was based only in part on the reduced importance of maintaining a network of relationships as a means of economizing on the costs of communicating with investors at large. Of perhaps greater importance than technological change, as I have suggested, are the advances in economic theory cited above that have essentially codified the critical collateral function of correcting incentive distortions that would otherwise prevent investors from accurately conveying their demands. In my view, it is these continuing advances in economic theory—aided, to be sure, by better information technology—that represent the most serious threat to the demand for the continuous human judgment embodied in banking relationships.

Obvious parallels exist in other areas of investment banking. As the science of portfolio theory and contingent claims analysis becomes standard fare in the training of every MBA, activities such as trading, market making, and money management continue to become more systematic. Derivatives trading desks, for example, have long relied on option pricing theory codified in computer software to monitor and coordinate trading in real time across many different marketplaces. Similarly, passive and quantitative money management techniques increasingly substitute for human judgment, particularly in the management of fixed income portfolios.

Perhaps less obvious are the implications for product innovation. Historically, the design of new securities products has been more an art than a science—an undertaking that, as Eccles and Crane suggest, benefited from day-to-day client interaction and experimentation. This in turn led to longstanding client-bank relationships based on an informal understanding that a banker’s time spent understanding and responding to a client’s needs would eventually be rewarded by compensation received from that client from a transaction of some kind. One rationale for this business model is that financial products are relatively easy to reverse engineer, represent intellectual property that is difficult to prevent others from using, and yet, as Peter Tufano has documented, have relatively high development costs. In the absence of strong relationships, client firms might share an innovative bank’s ideas with a competing bank that has not borne development costs with the expectation that the latter will provide the product or service at a lower price. By preventing such behavior, client-bank relationships provided a mechanism for efficient sharing of R&D costs. This interpretation is supported by Tufano’s finding that innovative banks, although able to underwrite a median of only one deal before a competitor develops a comparable product, are able to capture larger market share in the new products.

Obviously, many recent product innovations were made possible by low-cost, high-speed computers. Perhaps more important to the future shape of the industry, however, are technological advances related to the continued codification of advances in the practice of “financial engineering” and the increasingly wide array of publicly traded “building blocks” for risk management and security design. Both should reduce production costs—the former by reducing the need for learning by trial and error and the latter by commoditizing basic inputs to production. Moreover, the codification of product design implies that the production technology itself is more nearly a public good, which in turn opens the door to greater competition among banks and client firms developing their own solutions. Consistent with this interpretation is the pronounced shift toward a more transactional orientation between banks and client firms documented by Eccles and Crane—a shift that suggests the industry is far along in replacing a traditional relationship-based production technology that supported sharing of R&D costs.

But does all this mean we will soon see an end to relationship banking? Not likely. For one thing, the mergers and acquisition side of the business will remain dependent on a relationship-based technology for the foreseeable future. So, too, will the financing of small and middle-market companies, and corporate finance advisory work, including risk management, for large corporations. The banker’s network in this capacity provides for continuous measurement of the “pulse” of the marketplace. It is unlikely that information
technology will soon substitute for considerations of trust and confidentiality central to the free flow of information. Moreover, because the science of corporate (financial) structure remains relatively immature, the typical corporate restructuring is a “poorly defined problem” with no clear solution or solution strategy. Even if corporate restructuring becomes highly systematized, the division of any value created by a restructuring will be determined by bargaining among the various interested parties. Thus we should expect the central role of the banker in this part of corporate finance to persist.

CONCLUSION

Historically, the production technology of investment banking has depended heavily on the capacity of investment bankers to maintain networks of relationships with institutional investors and client firms. In this article, I have suggested that advances in information technology, together with increased understanding and codification of investment banking practices, have and will continue to diminish the importance of these relationships. Relationships with institutional investors that have long formed the foundation for the pricing and distribution of securities offerings appear particularly vulnerable to recent efforts to conduct securities offerings via the Internet.

In the past, the scale of a bank’s network of relationships has been limited by the processing capacity of individual bankers and their ability to coordinate with one another. The existence of the underwriting syndicate, which temporarily brings together the networks of many banks for a single firm’s offering, suggests that the network of any single bank has not been broad enough to support efficient pricing and distribution of the typical IPO. If the use of information technology to communicate more directly with individual investors takes hold, we might expect to observe both a (continued) decline in the role of the syndicate and fewer, more dominant intermediaries in the securities underwriting business.

In the extreme, low-cost direct communication, memory, and data-processing capacity might lead to something more like a “direct marketing” business model. Already, Wit Capital seeks to identify “affinity groups” for a firm’s offering and electronically alerts potential investors to impending offerings. This business model derives scale economies not only from its dependence on information technology but also because the benefits from “data mining” for client tendencies increase with scale.

Perhaps a more likely path of development, particularly in the short run, is one in which a technology like Wit Capital’s continues to complement the traditional technology for “firm-commitment” (underwritten) offerings and a Hambrecht-like technology displaces “best efforts” offerings of smaller IPOs by less prestigious, regional banks. This more conservative prediction rests on the idea that there will never be a sufficiently large fraction of the individual investor population that chooses to take responsibility for asset management decisions. Clearly, declines in transactions costs and timely, low-cost dissemination of information are quickly taking us to a point where the individual can compete on more equal footing with institutional investors. However, as Herbert Simon observed, “a wealth of information creates a poverty of attention.” We must ask how many individual investors will sift through the mass of information being placed at their fingertips. So long as there remains a strong incentive for delegating asset management decisions to institutional representatives, we might expect these representatives to be treated “more equally” than other individual investors.

In any event, investment banks will continue in the information brokerage role I have described in this article. However, we should expect information technology to reduce the degree to which banker networks are embodied in individual investment bankers. Although space constraints do not permit me to go into detail here, further codification of the knowledge base (or “human capital”) at the core of production will alter industry structure and the organization of banking firms and will probably lower the relative wage in certain areas of investment banking. The relative cost to individual investors of not delegating responsibility for asset management will continue to fall—a development that most will welcome. But, as I argued earlier, information production in the overall economy, and therefore the informational efficiency of the marketplace, could suffer as a consequence. Obviously, not every investor will choose to participate in this
brave new world — and constraints like those imposed by Wit Capital on the secondary market sale of share allocations can force those who do to make some investment in firm-specific research. But we might hope that the future of securities offerings is not foreshadowed by the recent Internet-related IPOs, with their unprecedented price runups and volatility.

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9 I am grateful to Thomas Chemmanur and Alec Petro for discussions that have helped to clarify my thoughts on several of the issues at hand. Bruno Biais, Wald Busaba, Alexander Ljungqvist, Alan Marcus, Pégaret Fichler, and Patrick Schumacher also provided helpful comments. My e-mail address is william.wilhelm@bc.edu.
12 For documentation of the near universality of the 7% underwriting spread, see Hsuan-Chi Chen and Jay R. Ritter, “The Seven Percent Solution,” University of Florida working paper (http://bear.cba.ufl.edu/~ritter/index.html), February 1999. In a recent Oxford University working paper, Michel Habib and Alexander Ljungqvist emphasize that fees are just one dimension of issuance costs that the issuing firm optimally weights along with expected underpricing against firm-specific and bank-specific characteristics.
13 Lawrence Benveniste and Paul Spindt (in “How Investment Banks Determine the Offer Price and Allocation of Initial Public Offerings,” Journal of Financial Economics, Vol. 24 (1989) provide the first such characterization of bookbuilding practices. In a 1998 Université de Toulouse working paper entitled “IPO Aucions” Bruno Biais and Anne Marie Fauconer-Crouzet demonstrate that the optimal mechanism identified by Benveniste and Spindt can be implemented in the auction-like “mise en vente” used for many French IPOs.
20 Recent years have witnessed a decline in syndicate size. This is likely a consequence of the sharply diminished risk-sharing role the syndicate played when firms were private partnerships and opportunities for laying off risk in the marketplace were limited. For a more detailed discussion of the syndicate and the coordination problems it may help to resolve, see Pégaret J. S. Fichler and William J. Wilhelm, Jr., “A Theory of the Syndicate: Form Follows Function,” Boston College working paper, 1999.
21 This model also gives rise to a variety of privacy and property rights concerns that remain largely unresolved. For a discussion of these issues, see Anne Wells Bruscomb, Who Owns Information?, Basic Books, 1994.
22 Goldman Sachs recently agreed to purchase a 22% stake in Wit Capital for an estimated $25 million. Public statements reported in The Wall Street Journal (March 30, 1999) identify the complementary nature of the firms’ networks as the motivating force behind the agreement.
25 An example of the latter is the steady demise of the partnership, which can be interpreted as an organizational form that served the development and retention of human capital, in favor of the corporate form of organization to better meet the growing demands for large-scale risk capital investments.