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*The Internet and the Future of
Financial Services: Transparency,
Differential Pricing and
Disintermediation*

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*The Working Paper Series is made possible by a generous
grant from the Alfred P. Sloan Foundation*

*The Internet and the Future of Financial Services: Transparency, Differential
Pricing and Disintermediation*

Discussion Draft – Comments Welcome

September, 2000

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I. Introduction

The Internet has had a profound effect on the financial service sector, dramatically changing the cost and capabilities for marketing, distributing and servicing financial products and enabling new types of products and services to be developed. This is especially true for retail financial services where widespread adoption of the Internet, the standardization provided by the world-wide web, and the low cost of Internet communications and transactions have made it possible to reach customers electronically in ways that were prohibitively costly even 5 years ago; indeed, pre-Internet attempts at the online distribution of retail financial services were outright failures in the mid-1980s.¹ The concurrent growth and de-facto standardization of Internet-enabled personal financial management software (e.g., Quicken and Microsoft Money) have also contributed to an increasing array of low cost and potentially richer ways to provide information and transaction services to customers.

The growth in Internet-enabled products and service has been rapid in some sectors and slower in others. Retail brokerage has seen a dramatic change with more than 15% (Salomon Smith Barney, 2000) of brokerage assets now managed in on-line trading counts, and substantially more if “traditional” brokerage accounts and mutual funds with on-line access are included. Similarly, approximately 10 million US customers currently use on-line banking (O’Brien, 2000) and 39 of the top 100 banks offer fully functional internet banking (ePayNews, 2000). Many banks and brokerages are on their second or third release of their on-line delivery platform. Credit cards, while not radically transformed in operational aspects of the business, have begun to have some volume of new origination on-line.² In addition, leading credit card companies such as Capital One Financial have been some of the largest “traditional” companies in the use of Internet advertising (see www.adrelevance.com, 1999).

¹ In the 1986, the Chemical Bank Proto System failed due to high operational cost and slow consumer adoption (Clemons, 1992). A similar fate befell early attempts to provide banking services through Prodigy and Comuserve.

² Nextcard, the first purely on-line credit card has accumulated 400,000 customer accounts in the two years following their launch in February, 1998. They claim to capture approximately 25% of all on-line credit card applications (source: www.nextcard.com - “About Us”).

More regulated and complex financial products such as mortgages and insurance have had some origination volume on the Internet (an estimated \$17Bn of mortgages will be originated and ~\$400mm in insurance premiums will be sold online in 2000).³ For these sectors, the adoption of on-line origination has been much slower and concentrated in entrants, rather than incumbent firms. However, despite the small level of originations, the Internet has become a significant and growing source of product information – it is estimated that about 10% of insurance customers and 15% of mortgage customers have used the internet to shop for these products (Forrester, 1998; McVey, 2000). This may ultimately affect product purchase and pricing structure, irrespective of the delivery channel. Internet companies have also played a role in many other segments of the industry such as financial information and news, rating and comparison services, and even some areas where one might think the Internet would have a less significant role, such as financial planning and investment banking. While the continued growth rates are uncertain and the penetration for the more complex products has not yet been shown to be widespread, it is safe to conclude that the Internet will play a significant role in consumer financial services for a large subset of customers, and that this role will be significantly different across different sub-sectors of the financial industry.

In discussions of the Internet impact on the financial services sector, the emphasis has often been placed on the direct cost-saving effects of using the Internet to provide transaction services. These potential cost savings are indeed significant and in the long term may lead to significant creation of value. However, there also substantial barriers to realizing much of this value. In some industries, such as the credit card industry, many of the potential gains from automation have already been realized, and in others, the gains may be concentrated in only a few areas of the value chain. For products which are sold through branches or agents (banking, mortgage and insurance), realization of cost savings will require a difficult and time consuming redesign of the retail delivery system. Finally, many of these efficiencies are accompanied by improved customer convenience. To the extent that consumers respond by consuming more services, particularly

³ The Tower Group estimates that by the end of 2000 about 1% of mortgages will be originated over the Internet, representing about \$17Bn in loan production (Beidl, 2000). Forrester Research projects that in 2000, the Internet will account for about \$440mm in new insurance premiums, the vast majority (70%) of which will be auto insurance.

those that generate costs but not revenue, overall costs may not be substantially reduced. This has been the experience of previous innovations in retail financial service delivery such as automated teller machines (ATMs).

Computers, and more recently the Internet, are best described as “general purpose technologies” (Brynjolfsson and Hitt, 2000), like the electric motor or the telegraph (Bresnahan and Trajtenberg, 1995). For general purpose technologies, most of the economic value they create is associated with their ability to enable complementary innovations in organization, market structure, and products and services. However, at the same time, these complementary changes are often disruptive to the existing structure of an industry (Tushman and Anderson, 1986; Bower and Christensen, 1995), leading to significant redistribution of value among industry participants and between producers and consumers.

To understand the true impact of the Internet on the financial service industry, it is therefore necessary to identify how the Internet affects the critical drivers of industry structure, and how it enables or necessitates changes in products and services. This will necessarily be difficult, as it is hard to isolate the contribution of the Internet separately from the effects of other complementary innovations, and to distinguish Internet effects from other of long-term industry trends and exogenous factors. While obtaining precise numerical estimates of the productivity effects will be hard, in many cases the direction and general magnitude of the impact on productivity, profitability and consumer surplus (consumer value) will be clear.

We see three principal issues that will determine the transformation of retail financial services:

- **Transparency**, or the ability of all market participants to determine the available range of prices for financial instruments and financial services;
- **Diifferential pricing**, in which finer and finer distinctions must be made among groups of customers, setting their prices based upon the revenue streams they generate, the costs to serve them, and their resulting profitability;

- **Disintermediation** or bypass, in which net-based direct interaction eliminates the role previously enjoyed by financial advisors, retail stock brokers, and insurance agents.

Each of these will affect the roles to be played by financial service providers, the sources of profits available to them, and the strategies they may choose to pursue in order to earn those profits. However, different financial products will be affected differently by each of these issues in both the nature and the magnitude of the effect. In addition, these factors are often interdependent – for example, differential pricing is often a necessary response to increasing price transparency to prevent erosion of margins, and the ability to deliver sophisticated (although typically not complex) pricing strategies to customers may be affected by the incentives and structure of the distribution system. For these reasons, we will organize the remainder of the paper around the discussion of these effects as they apply within different sectors in financial services.

The emphasis of our analysis will be on the primary sectors in retail financial services: credit cards, deposit banking, mortgages, brokerage, and insurance. Our focus is the retail segment because it has been the most radically transformed by the Internet to date, primarily because the retail business has the most to benefit from the reduction in customer interaction costs, the ability to reach mass markets, and the reduction in the role of geography in determining the strategies of financial services providers. Much of the computing- and communications-enabled transformation in the relationships among financial institutions or between financial institutions and consumers of wholesale financial services (for example, brokerage houses and exchanges, or large firms and their commercial lenders) have already occurred or were well underway before the Internet was commercialized. For these markets, the economics of computing and networking were still favorable under previous generations of technology. Many of the commercial financial services that are likely to be transformed by the Internet, at least in the medium term (3-5 years), are those that closely resemble retail services (such as commercial mortgage, short term lending, leasing, cash management, and the like). That is not to say that business to business (B2B) e-commerce opportunities do not exist in the financial sector – only that many of the medium term opportunities that are directly a result of the Internet are closely analogous to changes in the retail

sector, and the others are probably more closely related to organizational and market innovation rather than a result of ubiquitous and low-cost communications technology.

II. Credit Cards

We begin our discussion with credit cards, an industry which had been radically transformed by the increasing availability of information for both credit card companies and consumers before the Internet was a relevant factor. However, the Internet has accelerated general trends that were already present in the industry. Because the distribution structure, principally direct marketing and centralized operations, is much simpler than the delivery system of other financial services products, producers have had much more flexibility to respond to technology trends with changes in product design. While there have been significant secondary effects on this sector due to the Internet – on demand, marketing strategy, and on the emergence of alternative payment systems, they primarily reflect drivers of demand and cost on the margin. The increase in transparency and the increased utilization of differential pricing strategies represent potentially large effects on profitability (on the order of several hundred basis points⁴) as well as the availability and pricing of credit card services to a substantial segment of the population.

II.1. General Trends and Productivity Effects on the Margin

Fundamental demand for credit card services is closely linked to final consumer demand, the structure of interest rates, and overall economic conditions, especially personal income and consumer debt levels. In the long term, these demand drivers are likely to be affected by the Internet due to increased productivity and economic growth, and even more directly through the increase in incremental retail sales generated by the Internet where credit cards are the dominant transaction medium.⁵ However, in aggregate these effects are not likely to have wide ranging impact on the structure of the sector. There are a multitude of macroeconomic drivers of interest

⁴ A basis point is the common measurement of margins for financial products. A basis point represents 1/100 of a percent, typically of the face value of a transaction. Therefore, 100 basis points equals 1% of a loan or deposit balance.

rates, and it is reasonable to expect that the Internet itself is only a small fraction.⁶ Retail consumer spending on the Internet still accounts for less than 1% of credit card transaction volume and will not be substantial until well beyond 2004. In addition, on-line transactions are associated with significant levels of fraud and “chargebacks” (where a consumer successfully disputes a charge), which may offset any efficiencies gained from increased volume from on-line purchases. The emergence of consumer-to-consumer payment systems (e.g. Paypal) will shift some transactions to credit cards that would otherwise be made by check, but again the volume is small and these services have ambiguous effects on overall productivity.⁷

Marketing costs play a significant role in the economics of credit cards, and the Internet may have a favorable effect on these costs in two ways.⁸ First, Internet advertising may become an efficient way of targeted marketing of credit card offers to individual consumers, although there is limited use of this technology to date. Internet companies also provide marketing partnership opportunities to credit card firms, further enabling customer acquisition. By themselves, these marketing advantages will create incremental rather than radical gains in performance, but may be enablers of differential pricing strategies, which we discuss in the next section.

II. 2 Industry Transformation in Credit Cards

As most of the operations of credit card issuers are centralized, including marketing and distribution, disintermediation is unlikely to play a role now or in the future. However, the two

⁵ At present, it is estimated that 97% of consumer purchases on the Internet are performed by credit card (Beyer, 1999).

⁶ Estimates of the contribution of all information technology to productivity growth has been on the order of 1% per year, of which the Internet is likely to be only a small fraction. Economic and productivity growth are a significant contributor to interest rates and inflation. See Brynjolfsson and Hitt, 2000 or Gordon, 2000 for a discussion of the role of computers in productivity growth at the firm and macroeconomic levels. In addition, existing consumer debt levels play a substantial role as well, and these were rapidly rising long before the internet became a significant presence.

⁷ Payments by check are typically less costly to process than credit card payments, so simple metrics of productivity may decrease as these systems grow. If we factor in the value of consumer convenience, it is possible that productivity is actually increasing. It is difficult to assess this question as consumer convenience benefits are highly subjective and “revealed preference” arguments (people use it because it is productive) cannot be applied because the service is currently subsidized.

other critical factors, differential pricing and price transparency, have had major effects on the industry both before and after the Internet became commercialized.

Research on the credit card industry has documented the wide dispersion of profitability across different credit card customers even within the same issuer and demographic segment (Clemons and Thatcher, 1997). “Love’ems” – the best two deciles – account for roughly 125% of profits earned by credit card issuers while “Kill ‘yous” – the worst two deciles, are loss making. The remaining population, representing the vast majority of accounts, are generally break-even. Unlike other industries where profitability dynamics are extremely complex, it is well understood what affects customer profitability in credit cards: Love’ems pay finance charges, other customers do not. Kill ‘yous further distinguish themselves from break-even accounts by not paying back principal either, creating expensive charge-offs and significant operational costs in collections.

Up until the mid- to late-1980s, these fundamental differences in profitability were exacerbated by the marketing and operational practices that were common in the industry. Typically, borrowers were offered a single price point (~19.8% annual percentage rate [APR]), and growth primarily came through mass marketing, where any customer who could pass the credit screen was considered attractive. Success in this era meant efficient direct marketing operations and transaction processing systems, typically achieved through economies of scale.⁹ Uniform pricing and mass marketing in the face of enormous intrinsic differences in customer profitability created massive cross-subsidies – the best accounts were being overcharged to subsidize losses incurred by servicing the worst accounts.

⁸ However, marketing costs for “pureplay” Internet credit card companies, like many B2C companies, can be extremely large. For example, according to their 10-Q reports, NextCard’s marketing expenses alone were approximately equal to their revenue (net of interest charges) for the first half of 2000.

⁹ Credit assessment is also an important driver of overall profitability, but rapidly became similar across issuers as credit analysts used similar evaluation techniques, and later, nearly identical computer-based credit scoring models. Technological innovation has created periods of differentiation (for example, the early adoption of fraud prevention systems by American Express provided some advantages in chargeoff rates), but these innovations are typically copied within a few years.

This difference in customer profitability, however, created an opportunity for a company that could devise strategies for only attracting the profitable customers. Capital One Financial (at the time, the credit card division of Signet Bank) pioneered a strategy to exploit these differences, which ultimately proved to be enormously profitable:

- Identify and acquire only profitable customers through a combination of data mining and product design (a mixture of target marketing and price discrimination)¹⁰
- Offer them incentives to switch providers
- Endure slightly higher than average processing costs (primarily to ensure flexibility in account management, data analysis and customer retention)

One interesting observation is that the productivity and consumer surplus effects of this innovation are atypical for a “technology” investment. All three activities, especially product R&D and flexible but inefficient data processing operations, would lead to an apparent decrease in measured productivity. In terms of consumer surplus, there is a substantial reduction in interest costs to those customers who pay finance charges and potentially an increase in charges (explicit or implicit) to customers who do not. Some customers may find their access to credit has been curtailed, especially those most likely to default. In the short term, the change in consumer surplus will be positive, some customers will receive lower rates, others will continue to be subsidized by firms that are unable to distinguish profitable and unprofitable accounts. A by-product of this strategy is that all issuers will ultimately be forced to offer differential pricing or exit the business – persisting with uniform pricing, especially as consumers become better informed about prevailing prices and offers, will ensure that their credit portfolio is comprised solely of unprofitable accounts (Clemons, Croson and Weber, 1996). As all surviving firms will become increasingly adept at differential pricing, these losses will be reduced, cross-subsidies will shrink and some consumers may opt out of the market. However, the market has shown an

¹⁰ Examples included identifying correlations between the use of certain products (e.g. specific magazine subscriptions) and borrowing habits through experimentation and data mining (essentially third degree price discrimination). Capital One’s first major innovation was the balance transfer product where a lower interest rate was offered to customers who transferred outstanding balances from other credit cards. Because this offer is only attractive to customers who both have credit balances and intend to pay them back slowly, this utilizes customer self-selection to attract only profitable accounts (second degree price discrimination).

unusual ability to create profitable products for even the highest risk segments (including those with bankruptcies or convictions for credit card fraud), limited primarily by regulatory restrictions. Thus, over the long term, this transformation will typically not lead to a denial of credit (outside of that caused by regulation), but some consumers will find that credit may be available on much less favorable terms than they enjoyed in the past.

Although the major strategic innovation, differential pricing and elimination of cross subsidies, occurred before the Internet was a significant factor in credit cards, there are direct implications on how these strategies will look in the years to come as a result of the Internet, which, in turn, will affect productivity and profitability of the sector. A primary source of advantage for firms like Capital One (and their subsequent followers) was that competitors' responses were slower than the customers' speed of adoption. Given the Internet's ability to reach customers rapidly, agile competitors can electronically target consumers with new offers and observe responses in almost real time, further increasing the gap between the fast and slow competitors. In addition, Capital One alone has more than 10,000 price points for credit cards (combining fees, APR, other ancillary benefits and services)—a degree of price complexity that could only be implemented through direct contact with consumers.

However, the profitability of these strategies will be eroded over time as consumers are increasingly priced at their risk-adjusted cost to serve. As customers become more informed about prices, competition will eventually squeeze out the margins in each segment, making future profitability more difficult to attain. Increasing consumer informedness also has a strong negative consequence. Poorly designed products which offer a disproportionate share of the surplus to consumers will be rapidly identified and adopted, making pricing mistakes much more costly. While the current generation of “shopbots” in financial services are relatively rudimentary, some of the price search agents in retail have already begun to target firms that offer “loss leader” products.¹¹

¹¹ See, for example, www.pricegrabber.com

The tradeoff between pricing complexity, competition and price transparency will ultimately determine the ability to earn supra-normal profits within the sector. However, as differential pricing increasingly provides customized prices to individual customers, and competition drives down margins within each customer segment, one would generally expect significant gains (albeit declining on the margin) in consumer surplus over time and long term reductions in profitability of the sector, possibly offset somewhat by increased utilization resulting from more efficient pricing. Those firms that are more successful at this game will probably delay the profit impact while still providing the market the benefits of allocative efficiency (consumers making correct decisions resulting from correct pricing), but the general long run trend is toward compressed margins. Exact estimates of this change are difficult, but current evidence suggests that these numbers are indeed large.¹² Measured productivity of the sector, if calculated using traditional measures such as cost per customer, may indeed decline as the support infrastructure for differential pricing and customer retention continue to add incremental costs that did not previously exist, although general progress in software and computing may help offset these costs.

III. Retail Banking (Deposit Products)

Like credit cards, the Internet has enabled a cost reduction in many of the service aspects of retail banking which is likely to create both productivity and service improvements. However, the fundamental transformational effects of the Internet in this industry are driven by two critical factors, neither of which are present in the credit card industry. First, a significant component of the cost structure is embedded in the retail delivery system (principally branches and to a lesser extent automated teller machines (ATMs)). Second, unlike credit cards and most other financial services products, there is a much more limited customer profitability gradient. While there are customers who are enormously profitable (e.g., those that leave large balances in non-interest bearing accounts) these are much less common and it is difficult to become a “Kill ‘you”, especially if modest steps are taken in product design to charge for transaction services. As a result, much of the innovation in the use of the Internet in retail banking has been in increasing

¹² In the first half of 2000, Capital One financial earned about 850 basis points (after credit loss provision) of interest margin on their loans. In contrast, the comparable number for Internet startup NextCard, which competes almost entirely on the Internet and is probably less experienced at differential pricing, is 200 basis points.

convenience and availability of banking services and attempts to reduce costs by offloading transactional activity from high-cost bank branches to other channels.¹³

III.1. Alternative Service Delivery in Retail Banking

Innovation in service delivery has a long history in banks, beginning with ATMs (1970s), touch-tone telephone banking, voice response units, centralized telephone call centers, co-located (e.g., supermarket) branches, and now, on-line banking. All of these investments resulted in lower per-transaction costs in these channels and substantial increases in customer convenience, although this was typically tempered by increases in customer transaction volume and a limited ability to reduce costs in other channels as a result of these efficiencies. For example, in the early 1990s, 20 years after ATMs were introduced, the number of bank branches was still increasing (Osterberg and Sterk, 1997) and ATMs were largely viewed as a competitive necessity rather than a source of incremental profit or competitive advantage (Clemons, 1990). Steiner and Teixeira (1992) suggest that this is a general trend for many for many types of technology innovations in banking which are “creating value, destroying profits”.

These observations are largely consistent with the experience of home banking. The first large-scale attempt at home banking was the Chemical Bank Pronto system (1986), which failed because of high infrastructure costs and low consumer adoption due to the need to impose fees (Clemons, 1990). The next significant innovation was the introduction of “PC banking” in the mid-1990s. This service offered customers the ability to perform simple transactions, make inquiries and in some cases, pay bills and generate checks using a software application on their personal computer and a dial-up connection to a proprietary network (Frei and Kalakota, 1997). Over time these systems increasingly utilized off-the-shelf personal financial management software (PFM) that was customized slightly for the bank,¹⁴ and the proprietary dial-up networks transitioned to the Internet. The economics of these products were mixed – on the one hand PC

¹³ For example, Booz-Allen reports that the marginal cost of an on-line banking transaction is \$0.04, a call center transaction is \$.70, while a traditional teller based transaction costs \$1.44 (McQuivey et al, 1998).

banking operations appeared to be highly profitable. However, this was primarily due to already profitable customers adopting the product with minimal change in their overall profitability (Hitt and Frei, 1999). In addition, these products had significant operational costs for software licensing, network operations and customer support totaling \$5 to \$15 per month, only partially offset by fees (see Figure 1). Outsourcing fees played a substantial role in these costs, especially for electronic payments, which were typically provided by an outside service such as CheckFree.¹⁵

By 1998, most banks were transitioning these proprietary systems toward Internet banking which had substantially different economics on the cost side. The use of a web browser (or internet enabled PFM) eliminated most of the network and software costs, although the costs of centralized servers, electronic payment fulfillment and customer service remain. Nonetheless, this cost reduction enabled banks to provide basic inquiry-only service for free, while charging nominal fees for on-line bill payment (\$5-\$10). This rapidly increased adoption of online banking from around 3% for PC Banking, to more than 10% for Internet banking (ePayNews, 2000). For example, Wells Fargo bank now has more than 1.4 million customers utilizing on-line access with 1.3 million of these customers accessing the bank through the web (>20% of all customers). There are also several on-line only banks, but by 2000 they had been adopted by only 7% of on-line banking users (<1% of banking households) and even less in terms of assets since few customers exclusively use on-line banks (Online Banking Report, 2000).

In the near term, the overall impact of cost efficiencies from on-line banking is probably neutral to slightly cost saving, although it clearly has increased consumer convenience. Evidence in the banking trade press is mixed, with a few notable success stories (e.g., Wells Fargo discussed in Mayo, Marks and Boenes, 2000) while others suggest that Internet-banking disproportionately attracts unprofitable customers (Toonkel, 2000). These equivocal effects are probably due to the relatively small penetration of on-line banking thus far, the difficulty of measuring the impact of a single channel in the presence of multiple alternatives, and the concentration in inquiry-only

¹⁴ The three most common products were Quicken, Microsoft Money and MECA, a package created by a consortium of banks expressly for on-line banking applications. In some cases, the only customization of the product is providing a bank logo on the “splash screen” when the product loads.

services that are likely to be incremental rather than substitutes for other channel usage.¹⁶ While growth in the use of on-line will increase the likely impact to magnitude of the effects, significant gains in productivity from direct cost savings will require greater adoption of higher-value transactions services (bill payment and presentment) which have not yet seen widespread acceptance, and a restructuring of other delivery channels to capture the savings created by on-line efficiencies.¹⁷

III.2. Industry Transformation in Banking: Disintermediation and Commoditization

The combination of a limited customer profitability gradient and relatively simple and standardized product design has made banks tremendously susceptible to problems of price transparency. This was historically offset by geographic differentiation (most customers bank within 2 miles of where they live or work), service quality differences,¹⁸ and modest levels of switching costs, although this created a proliferation of bank branches and other investments in improving service and convenience. Banks also responded also by the creation of “relationship banking” where they tried to maximize the number of products used by a customer through promotional efforts and cross-subsidies among products.

The emergence of on-line banking has eroded many of the underpinnings of this strategy. On-line banking has reduced the role of physical geography in consumers’ choice of banking services. On-line availability of rates and large advertising expenditures by banks with direct distribution like Telebank which emphasize pricing, have informed consumers of the best prices for these products and created downward pressure on margins. The advantages of bundling products has also been reduced – ease of on-line money management and the interoperability across institutions of many personal financial management software packages (e.g., Quicken) make it possible to

¹⁵ ePayNews (2000) reports that only 10-15% of electronic bill payment and presentment transactions are processed by banks. The bulk (~55-70%) are fulfilled by third-party service providers and the remainder by billers.

¹⁶ Bill payment is estimated to have been adopted by less than 2% of households (Campbell, 1999).

¹⁷ In addition, for on-line only players, customer acquisition costs are also an issue. For now, acquisition costs outweigh any possible cost savings in the short term. A key issue is whether customer retention is such that these investments are ultimately productivity and profit increasing.

¹⁸ Switching costs represent the explicit or implicit costs of changing providers (see Chen and Hitt, 2000) for a discussion in a financial services context.

replicate many of the advantages of consolidating accounts in one institution. Consumers can now find the best price products and services from a variety of providers (including brokerage houses and mutual funds) and coordinate these activities on-line. The sustainability of cross-subsidies in this type of environment is highly suspect – customers will increasingly identify and disproportionately adopt the “loss leaders” while customers in products that are overpriced will be targeted by specialist firms offering better pricing or service. Unlike the credit card industry and to a less extent commercial banking, which has embraced differential pricing, retail banks are typically reluctant to offer customized pricing which may make these difficulties even more acute. Part of this is due to inflexibility of banking software platforms, some of which cannot effectively handle customized pricing; the remainder is probably due to the service costs and price erosion that would occur if customers discovered that their bank account rates and fees were negotiable.

It is unlikely that all customers will ultimately choose to bank exclusively on-line, and many customers may never use on-line channels. As a result, physical banks will still play a significant role in the delivery of banking services. This will have a mixed impact on profitability. On the one hand, geography will still have a role in service differentiation. On the other hand, as customers move on-line and banks will be continually adjusting and reconfiguring their branch network, which has often proven managerially and socially difficult. One counter-strategy has been to increase the sale alternative financial services products through bank branches (such as brokerage accounts, mutual funds and annuities), although these products are often deficient compared to the best available offerings in the market, and may face even more severe pressures from the Internet as we shall discuss later in the paper.

In summary, it is likely that in terms of operational efficiencies, there will be opportunities for cost savings, but that much of this gain will be passed to consumers in the form of margin declines and increased convenience. Due to the complexity of altering the branch system and slow consumer adoption of online variants of high-cost and high-value transactions, these effects will play out more slowly over time than in some other industries such as brokerage and credit card. However, like in the credit card industry, the impact of price transparency is likely to be more rapid and

begin to put pressure on banks to eliminate cross-subsidizes and reduce costs to cope with declines in overall margins.

IV. Mortgage Lending

IV. 1. On-Line Mortgage Origination

While the overall level of Internet originated mortgages is still small (<1% of the market), the mortgage sector has seen a substantial amount of Internet activity. Here the attraction has been the cost structure and perceived lack of entry barriers in mortgage origination. The mortgage origination process is a collection of activities that involve consumer counseling and sales at one end, and application acceptance, credit evaluation and document processing at the other. This part of the overall mortgage value chain consumes about 100-200 basis points of the value of a typical mortgage. Most of the other areas of mortgage operations involve the inter-firm transactions among mortgage banks, mortgage servicers, securitization agencies, investment banks, and institutional investors. Automation and communications have played a large role in realizing efficiencies in operations and have had a significant impact in facilitating a general shift toward optimization of activity in the value chain, although this is principally due to transaction standardization and private networks rather than the Internet (Jacobides, 2000).

Both the informational/sales aspects and the operational aspects of mortgage origination have moved on-line. Many sites provide information services, especially services that allow customers to calculate payments, evaluate their purchasing power, and search for lenders and rates. These sites typically earn income from advertising and referral fees. A few firms also have the ability to take on-line mortgage applications, typically for a single on-line or traditional mortgage broker or lender. Finally, multi-lender sites aggregate information from multiple lenders and enable consumers to submit a single application to multiple lenders, promoting competition among mortgage lenders for customer business (the most notable example is LendingTree.com).

The structure of the mortgage product is such that there are not significant advantages to automating service operations – typically the only post-origination service is payment processing and refinancing. The demand for mortgages overall is determined by housing sales, interest rates and changes in interest rates, and is not largely affected by the efficiency of the origination process, at least not relative to what has already happened in the industry. This suggests that most of the demand for “on-line mortgages” is a replacement for mortgages that would have been originated in traditional channels. Therefore, we expect that most of the economic impact of the Internet on the mortgage sector will be determined by how the internet affects two long-running trends in the industry: the continued disintermediation of the mortgage origination function, and the impact of price transparency on pricing, margins and allocative efficiency.

IV. 2. Transparency in Mortgages

The presence of informational sites and competition among on-line mortgage originators, which often bundle information services as part of their offering, has created an ease of price search that will ultimately lead to greater price transparency. Given that the number of mortgage shoppers outweighs the number of customers that have actually purchased mortgages on-line by an order of magnitude, it will be price transparency that puts pressure on margins long before on-line origination is prevalent. The limited number of product dimensions (interest rate, fixed versus variable, term, down payment requirements, documentation requirements) make this product ideal for Internet search as the search process is easily standardized, but multidimensional, leading to a potentially large number of combinations that can be handled efficiently by on-line search technology. Moreover, mortgages are a product bought only periodically, making it less likely that customers favor a particular mortgage provider with which they have a “relationship”. Multi-lender sites, which enable consumers to receive the benefits of price search without actually searching, will further expand the population of consumers that can benefit from transparency and competition.

Normally, one would expect the lenders to respond with differential pricing strategies, particularly when the profitability of individual loans (like other credit products) can vary substantially across

consumers. However, the characteristics of the product and to a lesser extent prices are constrained by both government regulation as well as constraints imposed by the agencies/enterprises that securitize loans (e.g., Fannie Mae). Since about 75% of mortgages originated in the US are securitized and sold in secondary markets, lenders have less incentive to create unique products which cannot be securitized. Similarly, their concern is more with the average profitability over all their loans rather than the profitability of their individual loans, since these differences will be eliminated when the loans are pooled – this further decreases incentives to attempt differential pricing or product innovation. This situation could change if some firms begin to aggressively identify and target low risk loan opportunities, potentially enabled by the Internet. This may be particularly attractive to other financial services providers such as stock brokers and insurance companies that may have substantial information about the risk of a potential borrower from their use of other products. In this scenario, the ultimate effects would be similar to credit cards with an increasing profit disparity between firms that do and do not engage in differential pricing. However, the current structure of the industry does not suggest that this is not yet prevalent, at least for the majority of loans.

IV.3. Disintermediation of the Mortgage Origination

As mentioned earlier, in the longer term the attractiveness of high potential margins in the origination that will create a significant interest in disintermediation. Unlike almost all other banking services where most activity occurs in a “captive” branch system or is centralized, the mortgage origination process has a mixed distribution channel. Currently, about half of all mortgage loans in the U.S. are originated through mortgage brokers (independent representatives of the mortgage companies) with the others being originated directly by the captive distribution arm of mortgage banks or branches of traditional banks (which typically operate through mortgage banking subsidiaries). Fees for sales and origination (or the operational costs of the captives) consume between 100 and 200 basis points of the typical mortgage loan making this an attractive area for disintermediation.

Most of the internet-based businesses focus on the “sales” process – identifying customers, counseling them about loan options and encouraging the submission of a loan application – operations activities are often offloaded to traditional mortgage lenders (although some internet lenders also provide software designed to streamline the origination process). However, to the extent that this sales component of the origination processes justifies relatively high fees for the other origination activities which are complex but standardized, it represents a real threat, particularly to independent brokers who rely on these fees for their profitability and where the Internet may offer significant economies in reaching at least some customers more efficiently.¹⁹ This is even more significant when combined with price transparency because mortgage lenders will increasingly look for cost savings in distribution efficiency to offset declining margins and customers may ultimately be able to perform many of the pre-application processes themselves, cutting out the role of agents and brokers entirely.

Overall, the long-term trends on productivity and profitability in this sector are moderately clear. With industry-imposed constraints on pricing structure, increased price transparency and the entry of on-line competitors with a potentially lower cost structure for distribution, margins will be squeezed, at least on mortgage origination. Measured productivity will increase in the sector, partially because consumers will increasingly take responsibility for front end parts of the process in return for cost savings (co-production), and also because price pressures will force firms to reduce costs or exit this segment of the business. The net effect is that productivity will increase in this segment of the value chain. It is not obvious that there are real cost savings to be achieved through Internet origination by itself in the current industry structure, making these pressures even more acute.

V. Brokerage

¹⁹ The experience of internet-based lenders to date provides little information about the ultimate efficiency of this sector. Their economics are currently dominated by advertising and customer acquisition costs which have created substantial losses for all of the publicly traded companies (such as E-loan, LendingTree, Mortgage.com). Unlike other businesses where losses in customer acquisition are incurred to ultimately support a more efficient operational cost structure, acquisition costs are a critical cost driver of mortgage origination efficiency suggesting that they have not created any gains in aggregate productivity thus far.

V.1. Falling Prices and Growth in On-Line Brokerage

The retail brokerage sector has been the most radically transformed of the retail financial services industries, principally by the emergence of low price on-line securities trading and free financial information services.²⁰ Over 140 retail brokers now operate on-line, typically providing a limited array of standardized information services along with low cost trading.²¹ Prices for a “market order” (an order to buy or sell a security at the prevailing price) range from \$5 to around \$30 for on-line brokers compared to prices on the order of \$100-300 for a typical retail-size order at a full service broker. In aggregate, analysts at Morgan Stanley Dean Witter have calculated that the price of an average retail stock trade (overall, including all channels) has dropped from an average of \$80 in 1998 to an average of \$50 in 2000 with continued drops predicted for at least the next five years (McVey, 2000).

Despite the large number of on-line brokers, the market share of this industry is heavily concentrated with the top 9 firms accounting for approximately 95% of on-line brokerage assets. Two of the three largest, Fidelity and Schwab were leading firms in the mutual fund and discount brokerage industry respectively; E*trade, the remaining broker of the top three, is the largest of the new on-line entrants. While they do not have significant on-line market share, two of the most prominent full service brokers, Morgan Stanley Dean Witter and Merrill Lynch have begun to provide (in 1999) on-line access and trading services at discounted commissions (comparable to the high end of pricing at the online firms), to their full service clients. Overall, the industry has experienced dramatic growth. From essentially a base of zero in 1995, on-line brokers manage more than 15% of retail brokerage assets, account for more than 30% of retail stock trades, and have in excess of 10 million accounts in the year 2000 (Morgan Stanley, 2000; Gomez Advisors, 2000).

²⁰ Many of these services were not originally free but aggressive competition among content providers of all types of information, especially financial information, has forced many sites to abandon a fee-based model in favor of advertising and partnerships to facilitate customer acquisition.

²¹ See www.gomez.com for the Gomez Advisors report on on-line discount brokers.

In many respects the Internet has a natural fit with the retail brokerage industry. Customers require a great deal of timely, text-based and numeric information that can be easily delivered over a web site. The trading process from a retail investor's perspective is relatively standardized, with the actual transaction typically requiring no intervention by a market professional. The previous generation "technology", direct phone calls to order taking brokers, was fraught with inefficiencies such as errors in communications of orders, limited ability to authenticate the customer, access problems (especially at times of peak trading), and overall high costs, both to the customer and to the firm. Particularly for active traders who did not want or need advising from a market professional, internet-based trading offers significant advantages. The ability to unbundle high-cost advising and service aspects from trading services also lead to the ability to profitably charge significantly lower prices, and the volume this created by this price reduction enabled firms to offset the relatively high fixed costs of the technology infrastructure.

These changes have created substantial productivity improvements in "front office" operations of firms that are primarily devoted to on-line trading, while increasing the volume to scale-intensive back office operations, which have remained largely unchanged (possibly providing a small productivity boost). Full service brokers have also realized some of these efficiencies through improved communications with customers over the Internet, although the magnitude of these savings is less significant.

Offsetting the operational cost savings are extreme investments in customer acquisition. The average 50%+ annual growth in the number of on-line brokerage accounts has been fueled by an advertising blitz that consumes more than 100% of the revenue of most startup on-line brokers. Bill Burnham, the online brokerage analyst for Credit Suisse First Boston, noted that while the startup technology and administrative costs for an online broker are probably around \$10 million, the costs of advertising necessary to have a viable customer base was closer to \$70 million. The most aggressive advertising of the on-line only firms, E*trade, spent more than \$120 million in 1999 alone promoting their on-line brokerage site and this number continues to rise. For now, while productivity has increased in aggregate, much of this value is being transferred to

consumers in the form of adoption subsidies, some of which were quite large,²² and to advertisers in promoting these sites. The fundamental economics of these investments can be favorable if customers can be retained (with a 1-2 year payback for an active customer), and the market capitalization of a typical on-line broker is on the order of \$1000 to \$3000 per customer, suggesting that external investors, for now, are willing to finance customer acquisition.

V. 2. Different Intermediation, Transparency and Alternative Revenue Sources

Price transparency, disintermediation and differential pricing all play a significant role in the implications of the Internet for the long term structure of the brokerage sector.

In this industry, pure disintermediation of the entire value chain is not a relevant threat – customers for the most part have no ability to access the financial markets directly. However, there is a significant threat of “different intermediation” as on-line brokers have the potential to capture significant market share due to cost efficiencies that result from unbundling trading and advising and, to a lesser extent, operational costs which enable lower prices. Perhaps the most serious threat to current industry structure is that more full service customers will choose the combination of low-cost on-line brokers and free or low cost on-line information services instead of the traditional bundle of trading and information services. However, this ultimately is affected by the pricing differentials between the on-line and other brokers and the ability of these brokers to respond with differential pricing and service offerings. Second, the business practices of on-line brokers have further enhanced the position of firms that operate off-exchange trading systems and electronic crossing networks (ECNs) further leading to further disintermediation of the primary stock exchanges. As we will discuss later, many on-line brokers utilize alternative trading systems in an attempt to earn incremental profits on retail trades through “payments for order flow” from the operators of these systems.

²² E*trade was offering \$400 in free computer equipment purchased at a computer retailer to sign up for an account. Various other brokers have offered free personal digital assistants (retail value ~\$200) for new accounts, in many cases with minimal initial investment requirements.

The emergence of on-line brokers (and their advertising expenditures) has educated customers on the prices that they need to pay for transaction services. This has created substantial downward pressure on prices, particularly for full service brokers. However, in some respects this price transparency is illusory. Customers pay significant costs for using retail brokerage services, many of which are difficult to understand or are hidden and almost impossible to identify. Given that explicit transaction fees have been driven to close to marginal cost (informal estimates place the marginal cost of processing a stock trade at about \$3-\$5 – see Thompson and Gamble, 1999), brokers have sought other ways to improve profitability. There are at least three significant sources of additional revenue that are received directly from the customer in ways that are moderately or completely opaque. First, uninvested balances at most brokerages are invested in a house “money fund”, which typically pays interest – this interest rate is typically well below prevailing short term interest rates by as much as 200 basis points and some e-brokers pay no interest on uninvested balances. Second, when customers borrow money on “margin” to make investments, they pay finance charges to the broker. The size of these finance charges varies substantially across brokers – for example a casual scan of several brokers revealed differences of 200+ basis points across brokers, and even larger differences within brokers. Customers with small balances are charged extremely aggressive interest rates, which is consistent with a form of price discrimination if smaller investors are less informed about the appropriate price for margin lending. Given that these loans are essentially zero risk due to the security requirements, these can represent a significant source of income. Moreover, they are not subject to disintermediation – the margin lending function is only zero risk if it is tied to the brokerage account that holds the assets purchased on margin. This prevents preventing third-parties from disintermediating the broker to capture the rents that exist in margin lending.

Finally, a common practice in the industry is “payment for order flow” in which retail brokers receive fees from market making firms in return for the right to handle their orders. These market makers are often able to internally match orders or trade on off-exchange electronic crossing networks (ECNs), enabling them to capture a significant portion of the bid-ask spread (the difference in the market between the highest price offered to buy a security and the lowest offer to sell). These payments for order flow can represent a significant component of revenue for many

brokers. Because customers receive prices no worse than the prevailing price on the exchange, this is a legitimate business practice, although as a result they may lose any ability to obtain better prices than the prevailing quote, which is often the case for actively traded stocks on major exchanges.²³ Thus, while price transparency appears to be a critical issue and has put substantial pressure on margins, at least in the short term, brokers have responded by identifying other revenue opportunities that are more opaque to the customer.

Brokerage customers significantly differ in their profitability. Customers who actively trade, that do not create operationally costly activities (e.g., forced liquidations of margin positions), and that consume relatively little broker time can be extremely profitable, particularly at full service brokerage rates. Customers who consume all the service options of full service brokers, but generate few trades, or worse, consume services from full service brokers and then trade elsewhere at discount rates, can be extraordinarily unprofitable. In particular, full service brokers are particularly vulnerable to opportunistic “pick-off” of their high profitability accounts. This has already placed pressure on margins, partly to close this gap, and it also has forced the full service firms to offer Internet trading, which will further decrease profitability and total revenue to the industry.²⁴

However, full service brokers have two advantages that may enable them to sustain their market share in the face of competition from on-line brokers. First, they offer a vertically differentiated service – a higher quality product at a higher price – which has withstood 20 years of onslaught by discount brokers, although at a somewhat lower price gap and facing less aggressive marketing tactics. Many customers truly value the service they receive from full-service brokers, particularly high net worth individuals with complex financial planning needs. In addition, these brokers can often offer access to IPOs and other coveted investment opportunities that may not be made

²³ On the New York Stock Exchange, only 11% of customer orders are intermediated by a specialist who captures the bid-ask spread. On the Nasdaq, an interdealer market, market makers would expect to be on the “correct” side of the trade half the time and capture 50% of the spread on average (the remainder going to the customer). On some of these off-exchange trading systems the customer loses the spread almost 100% of the time.

²⁴ A “back of the envelope” calculation suggests that indeed total revenue in the industry for trading fees is shrinking. Prices have dropped by a factor of roughly 10 from full service rates. Trading in on-line accounts is typically 4x as much as trading in regular accounts. This suggests a net revenue reduction to the industry of ~60% per customer defection to on-line brokers or about 6% overall, primarily borne by the fully service firms.

available to the broader retail market. Second, full service brokers are already well informed about who is and is not a profitable account and have more pricing flexibility to respond to loss of a potential customer. This makes it significantly more difficult for entrant on-line firms to target the most attractive full service customers. In fact, over the long term some of these effects may reverse as full service firms create internet-based offerings that can be profitably sold to moderate wealth investors who couldn't have been economically serviced in the traditional full-service model.

Overall, the Internet has already created significant productivity gains and expanded the consumption of trading services by customers who would have traditionally utilized discount brokers. This has created a substantial expansion of consumer surplus due to reduced cost and increased consumption of trading services (although some would argue that this is not true economic output as trading itself is, to a first approximation, a zero sum game).²⁵ However, much of the gain to date has been dissipated by increases in advertising and promotional expenditures. The ultimate productivity effects are dependent on the extent to which customer retention strategies can be implemented at low cost. Preliminary research (Chen and Hitt, 2000) suggests that the customer attrition and switching rates among on-line brokers is significant (10-25%), especially for those that have the highest advertising expenditures. It has also placed margin pressure on full service brokers without dramatic changes in the cost structure, and led to a loss of some customer accounts. As full service brokers introduce on-line trading options, the rate of loss has apparently been slowing. However, the key question for the long-term productivity and viability of the full service sector is the extent to which they will continue to attract new high-wealth clients in the future, especially those that may have had their initial exposure to the financial markets through on-line brokerage firms.

VI. Insurance

²⁵ See Bresnahan, Milgrom and Paul (1992) for an analysis the sources of consumer and producer surplus that arise from financial trading activity.

While insurance shares many of the structural characteristics of other sectors in financial services, particularly the large customer profitability gradient and a complex and high-cost distribution system, it to date has probably been least affected by the Internet of all the retail finance sectors. Penetration of even simple commodity products such as term life has seen rapid growth but remains insignificant in terms of overall volume in the industry – for example, premiums for term life issued on the Internet are projected to double from \$38mm in 1998 to over \$74mm in 2000, but still only represent <1% of term life premiums (Forrester, 1998). Similar trends are observed for the simplest property and casualty insurance products, auto and homeowners, while the traditional whole life, annuities and variable life products have had no significant adoption by consumers through on-line channels.

The Internet transaction activity in insurance is dominated by price comparison services. Insuremarket and Quotesmith in non-health products, and eHealthInsurance.com are examples of firms that offer “instant quotes” from a wide variety of providers. However, these firms are not insurance agents – they primarily provide leads to insurance company representatives or a local general agent who will process the actual application and facilitate issuance of the policy. Several of these companies went public in the last year, presumably to support their extensive marketing budgets, but thus far their revenue and stock performance has been dismal. The emergence of these services probably account for the small but significant number of customers (~15%) who report using the Internet to search for insurance information, although this is relatively small compared to many other consumer search categories.

Like mortgages, the agency system consumes a significant portion of overall value in the industry – commissions are on the order of the entire first year premium for most renewable contracts, with renewal premiums on the order of 5-10% of all future payments, which makes agencies a potentially attractive target for disintermediation.

There have been some dramatic moves by incumbent firms, in particular, the decision by Allstate in early 2000 to bring all their agents in-house to provide more flexibility offering alternative internet-based products, which may be resisted by independent agents. Some of the direct writers

(such as Geico), unencumbered by issues of channel conflict, have placed applications for auto insurance on-line, although fulfillment still goes through their normal process and is primarily off-line. Many firms have taken smaller steps, creating internet-only products for delivery through the existing insurance marketplaces, advertising on the internet, or beefing-up informational sites to provide agent locators, product information, and account self-service options.

The reason for the relatively slow penetration is a combination of factors that are unique to the insurance industry. First, the nature of the product itself does not lead to rapid consumer adoption of alternatives. Insurance is an event driven product (buy a car or house, change jobs, get married, and so forth) and the vast majority of customers renew their policies without a reconsideration of the product, company or agency. Even for short-term products such as term life, at most 1/12 of the policies are up for renewal in any given year, and only a small fraction of these are actually “in play”. While the application process and provision of an initial quote can be partially automated by the Internet, there is still a substantial off-line underwriting process, preventing “instant quote” from converting into “instant issue”. Finally, making insurance readily available to the mass market may encourage the acquisition of unprofitable customers – this “adverse selection” problem is probably more acute in insurance than any other industry due to the large number of unobservable factors that drive profitability and strong regulatory restrictions on the use of some types of information by underwriters, carriers and agents.

The central role that agents play in the distribution of insurance also may be a significant factor in limiting the potential for disintermediation of agents. The industry adage, “Insurance is a product that is sold, not bought”, suggests that the agent may have a significant role in generating demand for insurance products. In addition, most insurance customers identify their agent rather than the company as the provider of insurance. Any significant attempt to use the Internet for direct distribution or to otherwise alter the agents’ interaction with their customers (for example, many agents have resisted earlier attempts to improve customer service through call centers) is likely to meet with substantial resistance. Agents recognize that their commissions represent a significant component of any cost savings from Internet distribution; the firms’ savings will largely be funded by them! Thus, agents resistance to online distribution will be strong; it will be particularly strong

from general agents (independent commissioned sales representatives), who are in a position to move significant share away from any company that attempts to reduce commissions through a direct distribution strategy. Slow consumer adoption (due to the factors described above) and the relative invisibility of the carrier will increase the threat of this shift. Even in firms with captive agency systems (where the agents are employees of the company), commissions can constitute a significant portion of their income and they agency force typically wields substantial political clout. That is, there are significantly more agents that vote than CEOs and agents have a significant voice in decisions at most insurance companies.

Price transparency has played a more limited role. Even the simplest insurance product, term life, requires the specification of age, smoking habits, duration, and coverage amount before an “instant quote” can be generated. Unlike bank deposits, which have government guarantees and can be easily moved, insurance purchases are long term and the stability of the provider can be a significant issue. In addition, the rates shown on insurance comparison sites are conditional on a number of individual factors – a significant number of the “super preferred” rates that are offered on insurance quote sites may not be valid for a large fraction of consumers. While, like mortgages, comparison engines can provide a greater degree of price transparency, there is a greater degree of complexity to insurance products, which may make it difficult to compare products directly.

Differential pricing plays a major role in insurance due to the “rating” process, where prices are determined based on actuarial risk. However, additional use of differential pricing, particularly pricing based on characteristics of individuals that could be facilitated by the Internet, is strongly limited by regulation. Insurance represents one of the few industries with explicit prohibitions for many types of differential pricing as a social policy. Practices that are generally permitted elsewhere, including ones that can improve market efficiency or are commonplace in other financial industries, are frequently banned in insurance. This limits the ability to offer tailored pricing which could lead to significant transformation of the industry.

Overall, the insurance sector has been only mildly affected by the Internet, due to many structural factors of the industry and the nature of the products. There are certainly opportunities for promotion as well as some small incremental cost savings possible through the simple automation of some types of service tasks. However, the bottom line is that until there is a substantial change in regulatory practices or a significant change in the role of agents in the product delivery and service process, it is hard to envision significant effects on industry productivity or profitability. This will happen, but it will happen slowly. For example, the erosion of the role of the travel agent for the distribution of air travel and the subsequent reductions in commission took more than 20 years to occur, and travel agents still wield considerable power, particularly those that have moved to a non-commissioned, fee-for-service model in the business travel segment of the market (Clemons and Hann, 1999).

VII. Summary

Our analysis of the various retail financial services industries suggests that three factors — price transparency, differential pricing and disintermediation — will play a significant role in determining how the Internet affects the structure of these industries. These three factors will have different effects in the various segments of financial services; in particular, they will have different implications for productivity, profitability, and consumer surplus. Our principal findings are summarized in Table 1.

For all industries, the increased price transparency enabled by the Internet will be a significant factor. It will be especially important for industries with relatively simple products, which can be easily compared by consumers, such as credit cards and deposit products in banking. Direct comparisons of simple products will increase simple price-based competition and will ultimately drive each market segment towards Bertrand competition. Transparency will also be important where the market structure allows differential pricing, as it is one of the primary ways in which firms can respond to increased transparency. That is, when consumers can all find their best deals there is very limited margin for error when companies price their offerings to them. Targeting strategies, such as those pioneered by Capital One, will become the norm, based upon the

increased transparency available to companies concerning consumer attributes, which will also be enabled by the 'net. No consumer can reliably be expected to cross-subsidize others in a transparent and efficient market, and consequently each customer will need to be priced closer to his risk-adjusted rate of profitability (credit card), his cost to serve (insurance and brokerage), or other related factors.

Improved price transparency will typically favor consumers, leading to increased consumer surplus, at the expense of producers, who will have to make additional investments in service, differentiation or retention, or redesign products on a more frequent basis to offset increased consumer informedness. This will be a cost of doing business, a requirement for dealing with better informed customers who shop for their best price and better informed competitors who accurately set their own prices. These forces will tend to increase costs in these industries, leading to the possibility that measured productivity actually decreases, although it will be partially offset by cost savings opportunities that the Internet may provide. In other industries where these counter strategies are not possible, firms must bundle other high margin products (in ways that cannot lead to opportunistic pickoff or unbundling), which have less transparency or endure a sustained period of lower profits.

Differential pricing will be a factor whenever it is consistent with regulatory constraints or industry practices. Differential pricing strategies will tend to eliminate cross-subsidies among consumers, which should generally lead to increased surplus in the long run as the prices customers receive may better represent their actual cost to serve, creating allocative efficiency. This also favors favor agile and informed competitors at the expense of unformed and inflexible firms. Opportunistic pickoff by the informed firms will leave uninformed firms with a portfolio increasing composed of Kill yous. Attempts to recapture profitability by raising average prices to all consumers will create even more customers vulnerable to opportunistic repricing in a self-defeating "death spiral" (Clemons, Croson and Weber, 1996; Clemons, 1997). Thus, these industries will also be characterized by substantial shifts in profitability across firms, although the general trend will be toward decreased margins and profitability as competition eventually enters each finer and finer segment of customers.

Bypass or disintermediation, or at least the threat of bypass, will be significant in any industry that relies on a high cost, agency-based distribution channel, whether the agents are employees or independent contractors. Typically, much of the benefits of Internet distribution in these industries, if they exist, will be shouldered by these agents and other participants in the distribution system. Where customer adoption of on-line alternatives is rapid, where the agents lack any special information advantages over firms that would like to engage in direct distribution, when agents have limited influence over the purchasing behavior of their clients, or the threat of new entrants to the overall viability of a firm is high, disintermediation will be a significant factor (Clemons and Row, 1998). When agents wield substantial power and adoption is slow relative to the ability of agents to punish firms engaged in disintermediation, disintermediation will be present but very slow. It may also be concentrated in entrants rather than incumbent firms. Of the three products that have a significant agent-based distribution system, brokerage is the most likely to be disintermediated. That was always a potential problem, and computer-enabled discount brokerage has existed since before the Internet. While full service brokerage firms have not wanted to move towards alternative strategies too quickly, to avoid cannibalizing profitable business and to avoid offending their powerful brokers, they have indeed have been able to adapt. Mortgage brokers may indeed encounter some disintermediation, but the current industry structure, the complexity of application and consumers' desire for assistance, and the resulting low customer adoption all imply that any significant change will be slow. In Insurance, it is hardest to envision a significant transformation over the medium term, except in the simplest products. The power of the broker, enabled in large measure by the complexity of high-end products and the resulting slow rate of consumer adoption will deter aggressive efforts in disintermediation. The consumers' desire for assistance, and need for a trusted intermediary, likewise have slowed adoption and enhanced agents' power. This could change dramatically if new on-line entrants demonstrated true efficiencies in customer acquisition, enabling pricing and product distribution that were truly attractive to consumers. To date this has not been the case.

The stronger the threat of disintermediation, the more likely the industry will realize cost savings in origination and sales activities. Consumer surplus will typically increase, as competition will

allocate these gains to the consumers, in the short term through subsidies for adoption, and in the long term through production efficiencies. Profits for the sector will depend on the effectiveness of firms versus their agents of capturing the value not allocated to consumers. Productivity should be strictly improved by successful disintermediation.

The three trends — transparency, differential pricing, and disintermediation — are transforming all service sectors. They interact in complex ways: as we have seen, the possibility of differential pricing has made disintermediation much more rapid in brokerage than in mortgage. They will change market structures over time — the absence of differential pricing in mortgage or insurance will not be stable, and pricing of mortgages and rating of insurance will need to become much more information-intensive. Over time, consumers who are lowest risk or easiest and most profitable to serve for other reasons will enjoy better pricing, and as we know from both theoretical concerns and experience with industries such as telecommunications, the allocative efficiency that results will be good for consumers and will increase demand. Productivity of service providers, as measured in terms of income per employee or revenue per employee or even product produced per employee may appear to decline, and producer surplus may decline as well. Some consumers will be relatively disadvantaged; this will be experienced by those consumers whose interest rates, premiums or financial advisory fees will be increased. But, in general, consumer welfare will increase when measured in aggregate.

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Table 1 (part 1): Summary – Credit Card and Banking

Industry	Transparency	Pricing	Disintermediation	Productivity / Profitability and Consumer Surplus
Credit Card	High, due to product simplicity	-Acute competition, due to product simplicity and transparency -Accurate price discrimination, due to simplicity of ABC and accuracy of information -Winners curse	-Disintermediation of local banks had already occurred, due to simplicity of product and ease of direct mail marketing -Possibility of re-disintermediation, as net enables new players	-As with any industry that eliminates cross subsidies, allocative efficiency is improved. -Big users will use more as their price declines -Labor and other inputs will not increase -Least credit worthy will be denied access as winners curse forces greater care.
Banking	High, due to simplicity of individual products	-Acute competition in some products, due to product simplicity and transparency -Not yet accurate pricing in PC banking -Not yet rational pricing of individual product lines -More extreme winners curse	-Disintermediation is not a threat; with very few exceptions, C2C retail lending, borrowing, payment systems for settlement and clearing is not an option - But re-intermediation / end of local relationships, opportunistic pickoff of best rates available anywhere, will heighten competition	Two competing trends: -End of relationship banking, accurate individual product pricing, will make each product more like credit card. Allocative efficiency, etc. -Relationship pricing will reduce acute competition on pricing of individual products, if sufficient value to consumer can come from bundling and inter-connection of products via PC banking. Consumers will benefit from product design, banks will benefit from increased profitability.

Table 1 (part 2): Summary Mortgage and Brokerage

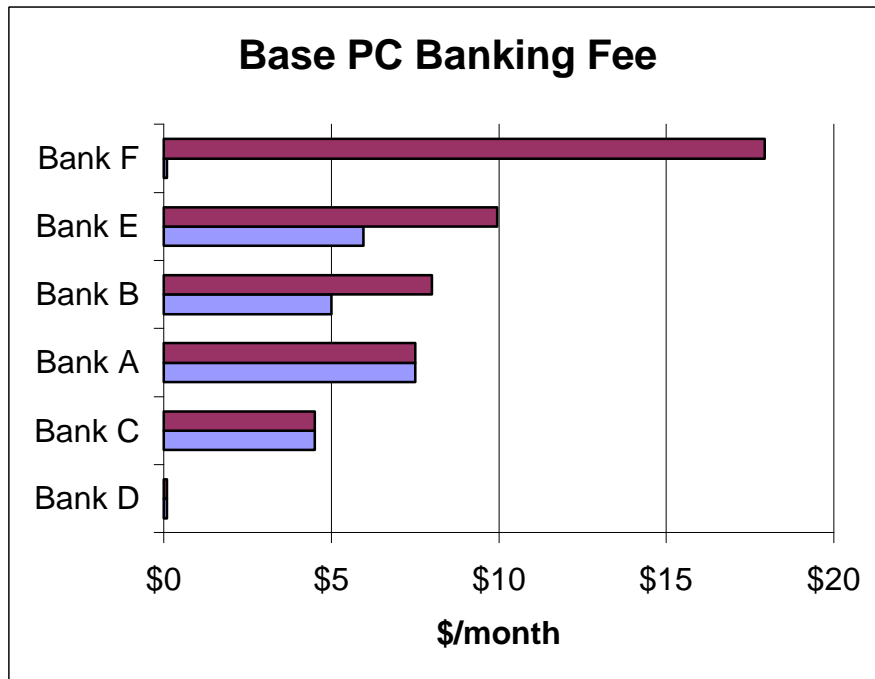
Industry	Transparency	Pricing	Disintermediation	Productivity / Profitability and Consumer Surplus
Mortgage	<p>Already high, due to product transparency</p>	<p>-Currently limited competition, limited price discrimination, due to Fannie Mae and Freddie Mac</p> <p>-Large scale securitization has created moral hazard, reduced or eliminated desire to rate on risk</p>	<p>-Re-intermediation of local banks has largely occurred</p> <p>-Net-based transparency may increase re-intermediation of local banks</p> <p>-Net-based transparency may result in re-re-intermediation, as current players are also replaced</p> <p>-The current system is not stable, and new players will replace current players, as described in next column.</p>	<p>-Current system is not stable. Even with the subsidies that Fannie and Freddie receive (as a result of governmental guarantees, which reduce the incentive to risk rate), cross subsidies of highest risk from lowest risk borrowers charged the same rate creates opportunities for mortgages.</p> <p>-This will increase allocative efficiency. However, consumption of mortgages will be affected only slightly. Some individuals will now be more able to buy a house, or to buy a larger house. Others will be unable to purchase a home and will need to rent, resulting in commercial mortgages replacing some consumer mortgages.</p>
Brokerage	<p>-Transparency of trading service pricing is now high</p> <p>-Transparency of pricing for secondary services (margin loans, etc.) is less, perhaps due to reduced interest and understanding among investors</p>	<p>-Full competition and full efficiency in pricing for discount services, subject to fact that support service pricing is less transparent</p> <p>-Not yet full price discrimination. Two tiered service: full service and discount service brokerage</p>	<p>-Some replacement of full service intermediaries by discount brokers occurred even before net</p> <p>-Process of replacement has been accelerated by the net</p> <p>-One mitigating factor is the need for coaching and explanation, financial planning, and confidence in investment management products among some segments of the market</p> <p>-Unlike insurance (which follows) customer adoption has been rapid, especially so among those investors who are easiest to serve, and quite slow among those who have been more complex to serve. Interesting balancing act, trying to provide online services without alienating brokers and losing remaining customers</p>	<p>-Clear example of allocative efficiency. Day traders as a large population now exist. More trading occurs, with far less labor.</p> <p>-So productivity is improved as well</p> <p>-Although profitability may or may not change</p> <p>-The distress of the industry demonstrates that new pricing strategies and new relationship value propositions will be required</p>

Table 1 (part 3): Summary – Insurance

Industry	Transparenc y	Pricing	Disintermediation	Productivity / Profitability and Consumer Surplus
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<p>Insurance</p>	<p>-Transparency of simplest products becoming quite high</p> <p>-More complex products (universal life, etc.) remain largely unaffected by net</p> <p>-Non-price attributes (company reputation, etc.) limit transparency of products</p>	<p>-Pricing has not achieved the full efficiency of credit card or other financial services products.</p> <p>-Although the reasons are different from mortgage, the underlying cause is governmental interference with market efficiency, in this case by placing severe restrictions on the use of information in pricing</p>	<p>-Disintermediation has occurred to some extent in the simplest products, like term life, which are already often sold through professional associations via direct mail</p> <p>-Disintermediation can occur to a greater extent in the future, due to use of the net</p> <p>-One mitigating factor is the need for coaching and explanation, financial planning, and confidence in risk management products, which have a higher emotional content than pure investments</p> <p>-Another mitigating factor is the imbalance between speed of customer adoption of proposed echannels (low and slightly favorable) and agent response to proposed echannels (high and quite damaging)</p> <p>-Greatest threat comes from net-based off-shore products that have looser regulatory regime; best risks can get best prices, causing extreme winners curse among more tightly regulated on-shore issuers. May result in fundamental instability, as with mortgage industry.</p>	<p>-Disintermediation of distribution of simple products, perhaps more accurately called distribution channel simplification, will reduce labor costs and improve efficiency.</p> <p>-Disintermediation of more complex products may occur only slowly, over time. Just as some products (socks) can readily be purchased online, and others (dress suits, tuxedos) require custom fitting, so too will some insurance products require custom fitting at least in the near term.</p> <p>-Moreover, the very plausible threat of agents to punish firms that introduce agentless channels will delay alternative distribution.</p> <p>-However, as with mortgages, the current pricing system is unstable. In mortgages we have seen the some players may opt out of the current pricing system by giving up the right to resell with Federal guarantees. In insurance, other players may attempt to escape state regulation by moving off-shore.</p> <p>-Allocative efficiency can be greatly increased by allowing more accurate pricing, as Rothschild and Stiglitz, Mayasaki and Spence, and others have shown</p> <p>-Productivity will probably increase as well, due to efficiencies in distribution (where agents are not used) and in service (to keep cost of agent-based distribution manageable).</p>
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Figure 1: Bank Fees for On-line Banking



Reproduced from Hitt and Frei, 1999. Top bar is the price at introduction. Bottom bar us the ultimate price that the bank charged.