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Electronic Finance: Reshaping the Financial Landscape Around the World[1]

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Abstract

In recent years, the emergence of electronic finance—especially online banking and brokerage services, and new trading systems—has reshaped the financial landscape around the world. This paper reviews these developments and finds that they are greatly impacting the structure of and competition in financial services industries and will have a large impact on incumbents. Its assessment of how e-finance, and globalization more generally, affects countries highlights the need for changes in four financial sector policy areas—safety and soundness, competition policy, consumer and investor protection, and global public policies—to mitigate risks and reap as much as possible the potential benefits of e-finance.

Key words: E-finance, financial sector development, developing countries, financial sector regulation.

1. Introduction

Economic integration within and across countries, deregulation, advances in telecommunications, and the growth of the Internet and wireless communication technologies are dramatically changing the structure and nature of financial services. Internet and related technologies are more than just new distribution channels—they are a different way of providing financial services. Using credit scoring and other data mining techniques, for example, providers can create and tailor products without much human input and at very low cost. They can also better stratify their customer base and allow consumers to build preference profiles online. This development not only permits the personalization of information and services, it also allows much more personalized pricing of financial services and much more effective identification of credit risks. At the same time, the Internet allows new financial service providers to compete more effectively for customers.

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1 The opinions expressed do not necessarily reflect those of the World Bank.

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All these forces are delivering large benefits to consumers of financial services at the retail and commercial levels.

These technological advances are changing the face of the financial services industry. New providers are emerging within and across countries, including online banks and brokerages, and companies that allow consumers to compare financial services such as mortgage loans and insurance policies. Non-financial entities are also entering the market, including telecommunication and utility companies that offer payment and other services. Vertically integrated financial service companies are growing rapidly and creating synergies by combining brand names, distribution networks, and financial service production. In addition, trading systems—for equities, fixed income, and foreign exchange—are consolidating and going global. Trading is moving toward electronic platforms not tied to any location. Electronic trading and communication networks have lowered the costs of trading and allow for better price determination.

This paper reviews the developments in e-finance and analyzes its public policy implications. It shows that technology, particularly the growth of the internet, is changing financial sector industries around the world, in the process challenging current public policy paradigms. While developments will be more evolutionary than revolutionary, our analysis shows that in some areas public policy actions are becoming urgent in developed countries and advanced emerging markets. At the same time, changes also offer opportunities for countries to leapfrog. E-finance can accelerate financial sector development by lowering the costs, increasing the breadth and quality, and widening access to financial services. But achieving this result requires a reassessment of the approach to financial sector development, particularly in developing countries.

The outline of the paper is as follows. The first section starts with a review of the general trend towards increased globalization and cross-border delivery of financial services. The section then analyzes the specific changes brought on by technological advances in developed countries and major emerging markets. It highlights the impact of recent developments on the structure of and competition in countries' financial services industries. It also discusses the impact of developments on incumbent financial institutions and the benefits to consumers of financial services. The next section analyzes the effect of the changes, particularly the emergence of e-finance, on public policies aimed at mitigating risks and reaping all the potential benefits of e-finance. The section distinguishes four public policy areas of increased interest: safety and soundness, competition policy, consumer and investor protection, and global public policy. The next section discusses the impact of the changes on financial sector development in emerging markets. The last section concludes.

2. Recent trends in financial services

Many of the recent trends in financial services have been driven by the globalization of financial markets. Financial services have also been reshaped by technological and structural changes, including the lowering of regulatory barriers.

2.1. Globalization

The globalization of financial services has increased financial integration, increased mergers and acquisitions within and across borders, and lowered barriers between markets.

2.1.1. Increased financial integration. Reductions in trade barriers and transportation costs and advances in communications technology have accelerated international economic integration. Between 1987 and 1997 world trade in goods increased from 21–30% of global GDP (World Bank, 1999). The complementarity of trade in financial services with trade in goods and a greater ability to trade services across borders have increased the demand for financial services.

Cross-border capital flows have been the most important financial service delivery mechanism. Commercial bank claims on foreigners, the largest conduit of international capital flows, increased from $7.7 trillion in 1980 to $11.0 trillion in 1999. Private capital flows to emerging markets rose from $50 billion in 1980 to more than $200 billion in 1999 (World Bank, 2000a).

But capital flows are just one way that financial institutions in one country can provide a loan or facilitate a security issue to an entity in another country. A financial institution can also obtain a physical presence in another country by acquiring a financial institution or by opening a branch or subsidiary. The costs of establishing a physical presence have declined, and cross-border entry has increased.

2.1.2. Increased mergers and acquisitions within and across borders. Governments have removed entry barriers through legal and regulatory measures such as the Riegle-Neal Act in the United States and the Single Market Program in the European Union. Aided by technological developments, these changes have lowered barriers to entry and increased bank consolidation and mergers and acquisitions among financial institutions, both within and across borders.

Globally, mergers and acquisitions in financial services jumped from $85 billion in 1991 to $534 billion in 1998 (BIS, 1999). In the United States mergers and acquisitions rose from $25 billion (1998 dollars) in the mid-1980s to $250 billion in 1998. Since 1980 the number of U.S. banks has dropped 40%. In the European Union the number of banks has fallen by 25% since 1985. Similarly, Argentina, Brazil, Chile, the Republic of Korea, and Mexico have seen a significant decline in the number of domestic banks in recent years.

2.1.3. Lower barriers between markets. The dismantling of regulatory barriers separating banking, insurance, and securities activities is also driving consolidation.[2]

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2 Of 54 developed and emerging markets surveyed by the Institute of International Bankers in 1998, only China had a ''pure'' separate banking system—in the sense that banks were not allowed to engage in any securities activities. The majority (38) of countries, including all EU countries, allowed integrated banking—that is, banks were allowed to conduct both banking and securities business, including underwriting, dealing, and brokering all kinds of securities within the same banking organization (Source: Institute of Institutional Bankers, 1999).

Boundaries between different financial intermediaries are being blurred, and universal (or integrated) banking is becoming the norm. The merger of Citigroup (banking) and the Travelers Group (insurance) is the most dramatic example of this trend.

An important market incentive for this reduction in barriers has been the disintermediation of bank assets and liabilities by capital market transactions. Commercial paper and corporate bonds have substituted for bank loans, and mutual funds and securities for bank deposits. These forces pressure banks to expand their financial services to cater to all customer needs and preferences. Advances in information and communication technology further facilitate the delivery of a broad array of financial services through one provider.

2.2. The new world of financial services

Technology is revamping the ways in which financial services are produced and delivered. In addition, technology is fundamentally changing the industrial structure of the financial services industry worldwide.

2.2.1. Technological advances. Internet and wireless communication technologies are having a profound effect on financial services. These technologies are more than just new distribution channels—they are a completely different way of providing financial services. Using credit scoring and other data mining techniques, for example, providers can create and tailor products over the Internet without much human input and at very low cost. They can better stratify their customer base through analysis of Internet-collected data and allow consumers to build preference profiles online. This technique not only permits personalization of information and services; it also allows much more personalized pricing of financial services and much more effective identification of credit risks. At the same time, the Internet allows new financial service providers to compete more effectively for customers because it does not distinguish between traditional ''bricks and mortar'' providers of financial services and those without physical presence. All these forces are delivering large benefits to consumers at the retail and commercial levels.

2.2.2. Changes in industry structure. These technological advances are changing the face of the financial services industry. New types of service providers are entering the market within and across countries, including online banks and brokerages, and so-called aggregators (which allow consumers to compare financial services such as mortgage loans and insurance policies (table 1). Nonfinancial entities are also entering the market, including telecommunication and utility companies that offer payment and other services through their distribution networks and customer relationships. To reap the benefits of the new technology, and in response to this new entry, banks, insurance companies, and the like are joining in the electronic delivery of financial services—setting up in-house online activities or completely new ventures such as virtual banks.

Thus the delivery of financial services is moving away from a bricks-and-mortar delivery channel to a multitude of electronic and other channels, with portals and

Table 1. **Providers of electronic finance**

The table provides for various types of financial services (by row, online banks, financial portals, etc.) a number of specific e-finance entrants and e-finance innovators in four regional markets (by column, the United States, Europe, Asia and Latin America. The table is not an exhaustive or necessarily comprehensive listing, but is meant to provide an overview of the nature and degree of e-finance entry and innovation. The information is as of mid-2000 and its source is Hussey et al. (2000), complemented with various individual country sources.

Type of Financial Service	United States	Europe	Asia	Latin America
Online banks	Telebanc Net.B@nk X Bank Wingspanbank	Egg Bank, Smile Advance Bank, Bank Girotel, Comdirect, Diba, Entrium, First E, Santander Augsburger Aktien-bank	OUB (Singapore, to be established) Dah Sing (Hong Kong, to established)	Bancol
Online lenders	E-LOAN Mortgage.com NextCard Finet Intuit/Quicken	European Loan (Belgium)	—	—
Aggregators	InsWeb AnswerFinancial Lending Tree Quotesmith.com Intuit/Quicken	InsuranceCity (Germany) Interhyp (Germany)	DollarDEX (Singapore, HK, soon in Malaysia and Taiwan) Eisland.com (Sing.) Admortgage.com (HK) e-finance.com (HK)	Dineronet (Argentinia) Zonafinanciera
Online brokers	Schwab.com E*Trade TD Waterhouse DU Directs Fidelity.com Ameritrade	Consors (Germany) Direct Anlage (Germany) Avanza (Sweden)	Boom Securities (HK) Taiwan: Polaris, Kong Chen, Masterlink Korea: Daishin, LG Sec., Samsung Sec.	Patagon (Arg., Brazil, Chile, Mexico) Socopa Brazil: Souza Barros, Novacao, Hedging Griffo, Coin Valores CB Capitales (Chile)
Financial portals	Yahoo!Finance Microsoft Network Intuit/Quicken America Online Motley Fool TheStreet.com	eXchange Holdings (UK) bfinance (France) FTYour Money (UK)	Hong Kong: Quamnet, Baby Boom, asiabondportal Sing.: Quicken/SPH Korea: PaxNet, Thinkpool, Net Invest China: 99stock.com, stockstar.com, homeway	Investshop (Brazil) Patagon Dineronet (Argentina) Zonafinanciera LatinStocks LatinInvestor Consejero
Enablers	Security First (S1) Sanchez, Corrllian Digital Insight iXL Enterprises Online Resources Alltell, Bisys, Fiserv EDS, M&I, 724 Solutions	—	eBiz Solutions Finese Alliance I-ayala System Access The Edge Consult S1 Singapore Ebx.com	—
E-payments	Check Free, Spectrum, CyberCash, Mondex, CyberSource, Entrust, Verisign, Intelidata, Sterling Commerce, DotsConnect, First Ecom	—	QSI (Australia) First Ecom (Hong Kong) V-check (Singapore)	—

aggregators offering new distribution and advertisement channels for financial services. Vertically integrated financial service companies are growing rapidly and creating synergies by combining brand names, distribution networks, and financial service production. For example, companies associated with portals (America Online, Yahoo, Microsoft) and major telecommunication companies (Deutsche Telecom, Telefonica) are developing strategic relationships or ownership links with major financial service companies, banks (such as the Bank of East Asia with Yahoo), or each other (Telefonica and Lycos). At the same time, many major financial institutions (Morgan Lab, Goldman Sachs, Chase, Merrill Lynch, Morgan Stanley) are part owners of promising Internet start-ups. And goods-producing companies are taking advantage of bank distribution networks (Citibank with a variety of consumer-related companies). These developments are changing the competitive landscape for financial services and will continue to erode the franchise value of existing financial service providers that are inefficient or do not adopt competitive business models.

2.2.3. The new model for financial services provision. Financial services are now offered through a multitude of delivery channels, from traditional brick-and-mortar branches to wireless devices. Six steps can be distinguished in the production and distribution of financial services, though in practice these steps often overlap or are vertically integrated (figure 1).

Access devices (rather than a teller or branch) are becoming many customers' first point of contact with financial services. These devices include personal computers, personal digital assistants (such as Palm Pilots), televisions equipped with Internet access, cellular phones, and other wireless communication devices. These channels will be complemented by low-cost ''branches,'' kiosks (standalone computers connected to bank systems), and other public access devices in supermarkets, convenience stores, and common areas (airports, train stations).

Portals are becoming the critical link between access devices and financial service companies. Portals offer access to a range of financial service providers, often for free or a fixed price, but generate revenue from fees paid by providers referred through the portal. These include specialized portals developed by financial service companies as well as general portals such as the United States-based America Online, Lycos, Yahoo, and Microsoft along with others in emerging markets (Paxnet and Thinkpool in Korea, Terra in Latin America). Portal companies attempt to process and personalize information to capture consumers. Portals are proliferating rapidly, even in emerging markets. Korea, for example, is home to 300 portals, many of which function as a gateway for financial service providers. In addition, customers can access financial service providers through many private networks, and some financial service providers have established their own specialized portals.

Aggregators complement portals, allowing consumers to compare mortgage, insurance, or lending products offered by suppliers of financial services. In addition, quasi-aggregators are emerging those aggregate or display prices of financial products offered by different suppliers or even conduct single or block reverses auctions of mortgage loans or insurance products (as with DollarDEX in Singapore). Finally, other specialized companies are undertaking functions on behalf of larger banks or insurance companies

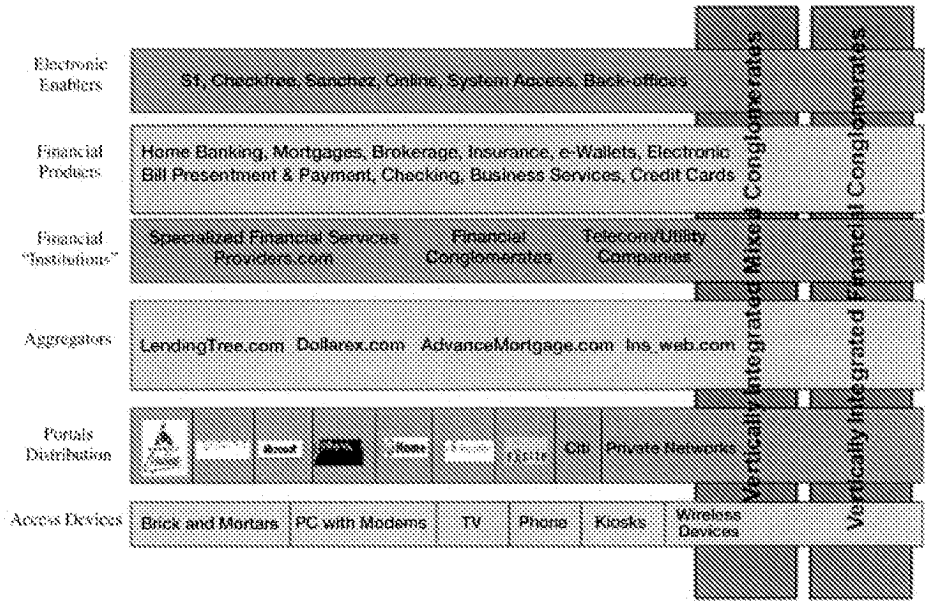

Figure 1. **The new world of financial services.** The figure depicts the new way in which financial services are being delivered. The various rows refer to the stages of distribution and production of a financial service. The *Access Devices* row refers to the means by which consumes can get access to institutions and markets for financial services. The *Portals Distribution* row refers to the electronic networks through which consumers can access financial services provided by a specific institution or by multiple institutions. The *Aggregators* row shows the intermediaries that allow consumers to compare financial services provided by different institutions, facilitate applications for financial services, or collect information on individual's accounts from multiple financial services providers. The *Financial Institutions* row represents the traditional financial entities, such as banks, insurance companies and financial conglomerates, as well as new online-only financial services providers and mixed conglomerates. The *Financial Products* row represents the services themselves, including both traditional services, such as payment and lending services, and new financial services, such as bill presentment and e-wallets. The *Electronic Enablers* represent the companies that support existing financial service providers as well as specialized financial service providers and virtual banks with software and technology. The two vertical columns are integrated financial services providers and mixed bank/non-bank entities which both produce and distribute a wide range of financial services.

and developing online techniques to mine data and offer personalized financial products to consumers.

Financial institutions serve as conglomerate providers of financial services that are global brands (Citigroup, Deutsche Bank, Warburg) and as specialized financial services companies. Partly in response to the entry of new competitors and to reap the benefits of new technology, incumbents (banks, large insurance companies) are consolidating around recognized brand names to position themselves in an environment of increased commoditization and electronic delivery. Merrill Lynch and HSBC, for example, have a joint venture in private banking that combines HSBC's network with Merrill Lynch's product range. Large telecommunication companies that already have access to a large distribution network of customers are starting to provide payment and other services. In addition, telecom companies are forming alliances to extend their global network to

financial services delivered online. Examples include Deutsche Telecom, Telefonica, AT&T, and Telemex. And increasingly specialized financial service providers—so-called mono-liners in all mainline financial services areas, from mortgage lending or personal loans to insurance to brokerage to payment services—are establishing online operations.

Financial products are being commoditized or tailored to the needs of customers. Such products are distributed through specialized financial service providers or financial conglomerates.

Enabling companies support existing financial service providers as well as specialized financial service providers and virtual banks. Specialized software engineering companies such as S1, Checkfree, Sanchez, and System Access provide e-finance system solutions that are completely integrated and permit the rapid adaptation needed in today's world.

2.2.4. Changes in trading systems. Driven by advances in communications technology, trading systems are consolidating and going global. Trading is moving toward electronic platforms not tied to any location. (Nasdaq's computers are based in Trumbull, Connecticut, for example, but traders are located around the globe.) New electronic systems have lowered the transaction costs of trading and allow for better price determination because electronic execution and matching techniques imply less chance of market manipulation. These advantages are more important in markets that had not yet converted to electronic trading (such as the United States) than in those where electronic trading is the norm (such as Europe). The new technology also allows for much easier cross-border trading, and over time for development of inter-market trading systems (ITS).

These changes have involved traditional exchanges as well as business-to-business (B2B) transactions. A number of electronic order routing and trading networks have emerged in recent years. These networks have evolved into order-driven matching systems that are electronically provided to participants seeking anonymity. Electronic communication networks started out as pools of liquidity feeding into existing markets but now serve as alternative trading outlets in several developed and some emerging capital markets. In some markets these networks account for a large share of total trading (one-quarter of the dollar volume of Nasdaq in the United States).

Other alternative trading systems are being set up around the world, often with links to existing trading systems. For example, Instinet began as a local interdealer broker and dealer but now has automatic routings to a number of stock exchanges. There is speculation that a few trading systems will soon allow investors to trade 24 hours a day. Exchanges are recognizing that their services—trading systems—are increasingly becoming a commoditized product offered through other means. Eventually, traditional stock markets such as the New York Stock Exchange will cease to exist in their current form.

Reflecting these competitive pressures, and the more general desire for increased liquidity through larger markets, many stock exchanges in developed countries have established links, merged, or even de-mutualized (that is, become for-profit organizations rather than cooperative, not-for-profit organizations). Recent examples include the merger between the Amsterdam, Brussels, and Paris exchanges, joint ventures and alliances between Nasdaq and stock exchanges in Australia, Canada, Hong Kong (China), and Japan, and a joint venture between Nasdaq and Deutsche Boerse focused on growth stocks.

Table 2. **Features of international stock markets and exchanges**
The table provides some key characteristics of major stock markets and exchanges around the world. The first column provides the average daily trading volume in billion of U.S. dollars, and the second column the market capitalization, also in billion of U.S. dollars. The last column indicates the links, already established or under discussion, for each market or exchange with other exchanges or electronic communication networks. The table refers to the situation as of mid-2000, and the source is the Federation Internationale de Bourses de Valeures.

Market or Exchange	Average Daily Trading Volume (Billion U.S. Dollars)	Market Capitalization (Billion U.S. Dollars)	Links with other Exchanges or electronic Communication Networks
New York Stock Exchange	35.0	12,000	Preliminary talks with Toronto Stock Exchange, Euronext, and Mexico's Bolsa; cooperative links with Tokyo Stock Exchange
Nasdaq Stock Market	41.5	5020	All electronic communication networks trade Nasdaq stocks; deals with Osaka Stock Exchange, Deutsche Boerse, London Stock Exchange, Quebec government, Hong Kong Stock Exchange, and Australian Stock Exchange
Tokyo Stock Exchange	6.8	4100	Cooperative links with exchanges in the Republic of Korea, the Philippines, Singapore, and Thailand, as well as with the New York Stock Exchange
London Stock Exchange	13.5	2800	Nasdaq joint venture
Tokyo Stock Exchange	2.85	1700	New York Stock Exchange, Euronext, Hong Kong Stock Exchange, Mexican Bolsa, São Paulo Bovespa
Deutsche Boerse	4.53	1500	Nasdaq joint venture, MarketXT joint venture
Paris Bourse	4.18	1500	Euronext alliance
Hong Kong Stock Exchange	1.5	568	Co-listing agreement with Nasdaq, New York Stock Exchange
Australian Stock Exchange	0.8	370	Nasdaq, Singapore Stock Exchange
São Paulo Bovespa	0.4	208	London Stock Exchange, Lisboa Stock Exchange, Argentina's Caja de Valores
Globally	148.8	35,005	

The Singapore and Australian stock exchanges recently agreed to cross-list all traded shares. The New York Stock Exchange has formed alliances with the Tokyo Stock Exchange, Hong Kong Stock Exchange, Australian Stock Exchange, Toronto Stock Exchange, Mexican Bolsa, São Paulo Bovespa, and Euronext to trade through linked exchanges 24 hours a day. The consolidation of these markets—accounting for more than 60% of global market turnover—is leading to a smaller number of very large markets.

Combined with globalization, these forces are putting pressure on incumbent stock exchanges. They have responded with mergers and alliances (table 2). Because many exchanges are self-regulating organizations, the pressures for change usually do not come from within the industry. Rather, they come from users or investors who want to pay smaller commissions, effect trades more quickly, and maintain anonymity on placed orders.

2.3. What effect have the changes had?

Figure 2 summarizes the recent developments in financial products and services along two dimensions: ease of commoditization and existence of entry barriers. Entry has been particularly strong in financial services that could be easily unbundled and commoditized and that offered attractive initial margins. These include many nonbanking financial services, including brokerage, trading systems, some retail banking services, and new services such as bill presentment or even payment gateways for business-to-business (B2B) commerce. Because these services are subject to less regulation, new entrants could easily innovate with new technology and could show limited or no earnings without raising supervisory concern. As these new entrants gained market share and consolidated their position, some started to diversify into more highly regulated banking services. An example is e-trade's recent acquisition of a bank to provide the full range of financial services to its retail clients.

Services involving sunk costs and low commoditization, such as corporate advisory services or mergers and acquisitions within investment banking, have seen much less new entry. Instead the trend has been toward global consolidation to reap the advantages of reputation, brand name, and economies of scale. Although deposit-taking and many

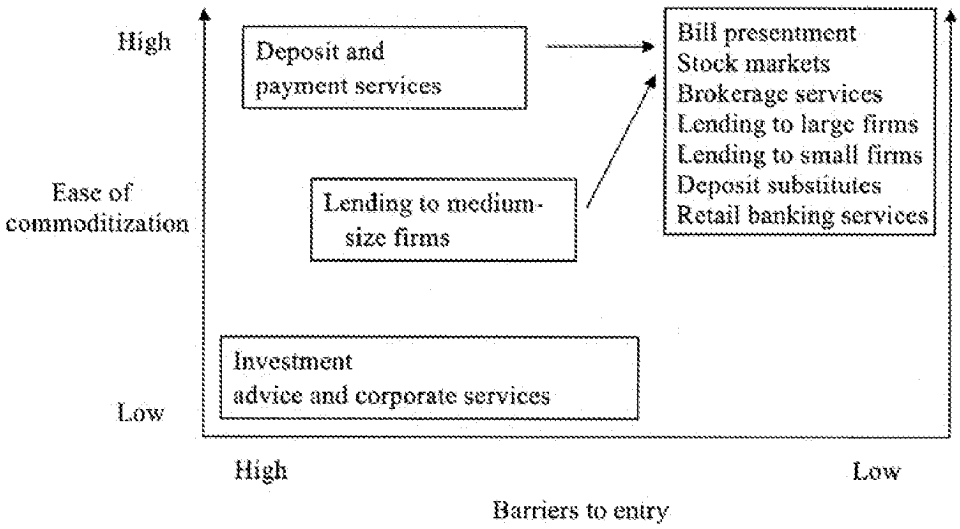

Figure 2. **Potential competition and commoditization in financial services.** The figure summarizes characteristics of financial services along two dimensions: ease of commoditization (vertical) and existence of entry barriers (horizontal). The figure indicates that markets for many financial services have low entry barriers and that these services are easy to commoditize. These services include many nonbanking financial services, such as brokerage, trading systems, some retail banking services, and new services, such as bill presentment. Other services often involving sunk costs, such as corporate advisory services, mergers and acquisitions and other investment banking services, are more difficult to commoditize, have much higher entry barriers and have seen less new entry. Although deposit-taking and many traditional payment services exhibit large potential for commoditization, entry has been limited, in part because of regulatory barriers. From a production point of view, however, these services display high potential for commoditization.

traditional payment services exhibit large potential for commoditization—through online banks, payment services using ''smart'' cards, and other technologies—entry has been limited, in part because of regulatory barriers. From a production point of view, however, these services could easily migrate to the high commoditization, low entry barrier sector.

Widely available real-time market information lowers the cost of financial services by easing uncertainty, mitigating asymmetric information, and reducing transaction costs associated with paper processing or human error. In addition, new distribution channels have opened up, search costs have fallen for consumers, and new entities (including telecom and utility companies) are providing financial services.

2.3.1. Lower costs for providing financial services. The technology on which the financial service industry depends has become much cheaper, and in the past 20 years computer power has risen by a factor of 10,000 (World Bank, 1999). Similar changes are occurring in telecommunications—in the past 20 years the cost of voice transmission circuits have fallen by a factor of more than 10,000. Communication costs have fallen sharply in most countries, and the rapidly growing importance of broadband and wireless Internet-based communication systems—such as Bluetooth or wireless application protocol (WAP)—indicate that costs will continue to fall and Internet access will continue to widen. The Internet eliminates many processing steps and labor costs, while avoiding or reducing the fixed costs of branches and related maintenance. A typical customer transaction through a branch or phone call costs about $1, but that transaction costs just $0.02 online (figure 3). Overhead expenses for Internet banks are 1% of assets or less, compared with 2–3% for brick-and-mortar banks.

The Internet and other technological advances have shrunk economies of scale in the production of financial services (table 3). The main financial service still exhibiting

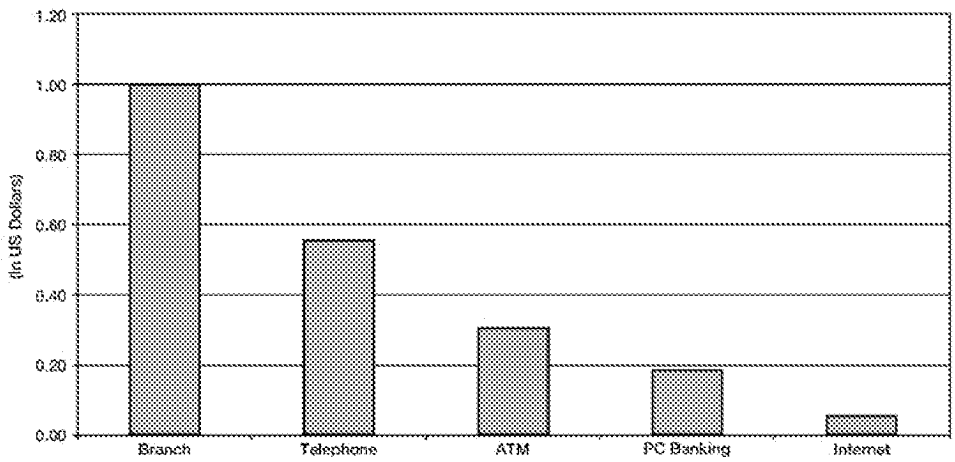

Figure 3. **The Internet and the cost of transactions.** The figure depicts the marginal cost, in U.S. dollars, for a financial institution of providing a standard financial transaction through different delivery channels. The data are obtained from Hodes et al. (1999).

Table 3. **Characteristics of financial service provision in an Internet world**

The table summarizes characteristics of a number of financial services, grouped by type, from a competitive point of view along four dimensions: economies of scale, ease of commoditization, up-front costs and network externalities. Each entry depicts, through the number of circles, the strength or severity of the particular dimension for a specific financial service, that is, • means none, •• means low, ••• means medium, and •••• means high. In case of the payments services row, for example, the two circles in the economies of scale column means payment services are subject to some, but not much economies of scale. The three and two circles in the commoditization and up-front costs columns respectively indicate that payments services are relatively easy to commoditize and have no major up-front costs. The four circles in the network externalities column indicate that payments services are subject to large network externalities. Underwriting, mergers, acquisition advice, and risk management. The table is based on the authors' own assessments.

	Economies of Scale	Commoditization	Up-front Costs; Branding, Advertising	Network Externalities
Retail services				
Payment	••	••••	••	••••
Lending/mortgage	••	••••	••	•
Discount brokerage services	••	••••	•••	••
Investment advice	••	•••	••••	••
Mutual funds	••	•••	•••	••
Insurance	••	•••	•••	••
Wholesale services				
Commercial lending				
Large	••	•••	••	•
Medium-size	•••	•••	••	•
Corporate services	••	••	••••	•
Large-value payments systems	•••	•••	••••	••••
Markets				
Trading systems/exchanges	••	••••	•••	••••
B2B exchanges	••	••••	••	••••
New services				
E-payment providers	••	•••	••	••••
Enablers	••	••	••	•••
Financial portals	•	•	•••	••••
Aggregators	••	•••	••	••

increasing returns to scale is the medium-size loan market, because large databases of credit history are required to build a credit-scoring model for medium-size clients. This necessity gives larger lenders a potential competitive advantage. For most credit, however, economies of scale have become small, because the fixed costs associated with screening small borrowers (less than $100,000) have dropped significantly.

Financial service providers using the Web can avoid many technology conflicts, such as separate interface-to-core systems for automated teller machine (ATM), branch, call center, or kiosk transactions. Web-based financial services unify the Internet as a communication standard by combining a Web browser, a display standard, and a Web server as the access point into back-end operational systems. As a result, cross-selling of products becomes easier and economies of scope increase.

The lowering of scale economies has increased competition, particularly among financial services that can easily be unbundled and commoditized through automation (see figure 2). These include payment and brokerage services, mortgage loans, insurance, and even trade finance. Most of these services require limited initial capital outlays and no unique technology. Lower transaction costs can substantially increase competition for providers and cost savings for consumers. To retain market share, online brokerage firms have been forced to radically restructure the way they deliver brokerage services. Brokerage commissions and fees fell from an average of $52.89 a trade in early 1996 to $15.67 in mid-1998—and by mid-2000 some online brokerage services had reduced their commissions to zero. Electronic communication network commissions, now at $0.05 a share, are continuing to fall. Barriers to entry based on ownership of physical facilities are disappearing, and incumbent institutions are being forced to merge or in some cases to demutualize to even have a chance of remaining viable.

In the past, sunk costs were important entry barriers in the financial services industry. Examples of sunk costs include branch networks, knowledge about local borrowers, access to payments systems, branding advantages involving large up-front advertising expenses, perceptions of size and safety, long-lasting customer relationships, and substantial up-front investments in technology. But sunk costs are becoming less important in financial services, partly because electronic delivery modes do not rely on a branch network (see table 3).

At the same time, new entry barriers are being created through first-mover advantages. Once a new entrant is established as a service provider, other new entrants will have to spend a lot on advertising to attract new customers (as E*trade and Ameritrade have done in the United States). In product areas such as underwriting and mergers and acquisitions advice, financial services exhibit low levels of commoditization and still require relationship capital, a certain size, and a brand name to compete effectively. But these services enjoy few or no network externalities and are increasingly subject to global competition. The scope for a contestable market will then depend on the size of the market. A limited number of financial institutions involved in underwriting, but operating on a global basis, present a very different competitive environment than would a few players in a small market (say, less than $1 billion).

Although declining economies of scale, increasing standardization and commoditization, and declining up-front costs foster competition, this development need not be the case for services that exhibit network externalities. A financial service exhibits network externalities if the value of the service rises with the number of market participants using it. Payment services, for example, have decreasing economies of scale, low up-front costs, and ease of commoditization. But payment services are subject to large network externalities, because the value of electronic payment services largely depends on the degree to which users adopt a common standard. The financial service provider that manages to create this common standard will end up with a large share of the market, decreasing competition. Similar characteristics apply to trading systems and exchanges (traditional or B2B), to financial portals, and to a lesser extent to e-enablers (see table 3).

2.3.2. Benefits for consumers and corporations. Providers and consumers will share the benefits of cheaper financial services. With the advent of new types of intermedi-

aries, such as aggregators, consumers can increasingly compare prices for financial services. Aggregators can bring together many suppliers of financial services and coordinate information flows in a rational way. Lending Tree, for example, allows customers to compare a wider base of potential lenders than is possible or cost-effective using traditional loan agents or direct communication channels. Since Lending Tree prequalifies loan applicants, lenders can find creditworthy customers inexpensively. The Internet also allows consumers to more easily combine financial services from different providers. This comparison is done through comparison shopping companies and through portals.

Commercial borrowers that undertake B2B transactions and treasury operations will also benefit from lower transaction and search costs and from increasing access to financial services. In the case of small and medium-size enterprises, new online companies such as garage.com and techpacific.com provide a full array of services to start-up companies, including legal services, Web design, accounting services to assist in preparing accounts and meeting disclosure standards, branding and advertisement, investor relations, and so on. Investors (venture capital arms of nonfinancial and financial companies) use these companies to screen potential start-up ideas. In addition, the use of the Internet for data mining in lending holds promise for improving the outreach of financial services to very small companies.

3. Implications for public policy

All governments, even the most market-oriented, regulate and supervise the financial sector for reasons of safety and soundness, competitiveness and antitrust concerns, and consumer protection. The recent changes in financial services raise questions about whether the current approach to financial sector regulation is adequate, whether traditional reasons for regulation and supervision remain valid, and what areas (competition policy and consumer protection) deserve increased emphasis. The key public policy findings are summarized in table 4.

3.1. Safety and soundness

The need for a financial sector safety net—and associated prudential regulation and supervision—arises from the need to treat deposit-taking institutions differently from other economic agents. Banks have not always been treated differently. Except for the lender of last resort facility, most aspects of the safety net—which also includes deposit insurance and central bank operations in respect to the payments system—were adopted by today's developed countries only after 1930. Prudential regulation and safety nets are a more recent phenomenon in most emerging markets, but were introduced at relatively low levels of development.

3.1.1. Is there a need for a safety net in the long run? To answer this question, one must first ask if current developments in technology and deregulation are eroding the

Table 4. **Public policy issues for the financial sector**

The table describes the current, future and transition public policy issues related to the emergence of e-finance. The issues are divided into three public policy issues: safety net, competition policy, and consumer protection.

Current Issues	Future Issues	Transition Issues
Safety net		
Banks are considered special because they extend essential credit to firms, provide payment services, and are inherently fragile and susceptible to runs. Thus governments have provided safety nets—regulation and supervision, deposit insurance, lender of last resort facilities—to minimize the adverse effects of bank failures. But safety and soundness regulation and deposit insurance pose barriers to the entry of new firms and favor incumbent firms. The safety net also raises moral hazard issues.	Banks are no longer special because many substitutes have emerged for deposit and lending products. Thus there may be less of a need for a public safety net, and correspondingly less need for prudential regulation and supervision. Government should increasingly allow the private sector to find mechanisms to curb excessive risk taking. More efficient interbank markets reduce the need for lender of last resort facilities. Moreover, banks' special role in the payments system is declining as technology allows for the unbundling of payment and credit services. Thus authorities may want to separate payment from other credit services and allow freer entry to the payments system.	Authorities should be wary of extending the safety net to non-deposit-taking activities and deposit substitutes. They should require financial service providers with non-deposit-taking activities to adopt a bank holding company structure or a narrow banking structure. With increased competition and the decline in franchise value, decapitalized institutions will have incentives to gamble for resurrection. Thus governments need to strengthen failure resolution mechanisms and reduce extensive guarantees that often apply to all financial system liabilities.
Competition policy Because banks are considered special, competition policy is subsumed under prudential policy. Competition policy aims to ensure an adequate franchise value for banks to enhance their soundness and incentives for prudent behavior.	As the safety net is eliminated, markets for financial services can be treated like any other product from a competition policy point of view. This finding means that: Freer trade in financial services will become even more important. Scale and scope economies are unlikely to be effective barriers to entry.	
Competition policy Tools of competition policy include minimum capital requirements, capital adequacy, and fit and proper test.	Sunk costs, externalities, and vertical integration may be barriers to entry and could hamper competition. Market and product definitions, which are critical for competition tests, will be difficult to define. With globalization, competition policy will have to be coordinated worldwide.	
Consumer protection		
	Consumer protection issues relate to security risk, privacy, transparency of information, and investor protection. Key public policy areas include defining consumer protection standards, defining minimum standards for self-regulating organizations, and ensuring incentives for enforcement of such standards.	How to modify legislation and regulations credibly to permit proper enforcement including the area of minimum disclosure.

nature of what has made banks special. Banks are no longer the only institutions providing deposit-type services. Many substitutes for banks' deposit products have emerged, and alternative payment mechanisms have developed.

The importance of banks as lending institutions is also waning, and capital markets have become increasingly important sources of corporate financing in developed countries. The increased reliance on securities markets for funding is especially pronounced among large businesses, which use the commercial paper market to fill short-term financing needs and the bond market for long-term needs. Capital markets also affect many other segments of borrowers through asset- and mortgage-backed securities. Nonbank sources of financing are also becoming more important in many countries. The decline in the special character of banks, at least in developed countries, is further demonstrated by the fact that—with a few notable exceptions—the cost of bank failures (in terms of real output losses) has declined because corporations have had access to alternative forms of financing.

E-finance allows non-deposit-taking financial institutions and capital markets to reach far more borrowers, because transaction costs are lower and information is more widely available. Advances in information technology are reducing asymmetric information and, accordingly, banks' proprietary information about borrowers. Small and medium-size firms have greater access to financing because of better credit scoring and securitization techniques. As a result, and especially in developed countries, banks are providing fewer balance-sheet-based services and are becoming less special in lending.

In this context, private parties' incentives to reduce the special nature of banks will depend on the degree to which governments provide banks with preferential treatment. If the safety net is not shrunk, banks could continue to remain special—though not necessarily for the right reasons. A smaller safety net also diminishes the need for prudential regulation and supervision.

3.1.2. Revisiting banks' role in the payments system over the short term. In most countries banks make up the core of the payments system. This dominant role developed because payment services were often linked with credit extension and the exchange of bank claims. But this dominant role is no longer the case. Many mutual funds and most brokerage houses permit individuals to automatically deposit their paychecks in cash management accounts, from which routine payments can be made automatically and irregular payments can be made by check or phone 24 hours a day. Money market accounts can be linked to a credit card that also functions as a debit card at ATMs (Allen and Santomero, 2000). While payments through the account are still cleared through a bank, this clearing is not the essential part of the transaction. Rather, it is a regulatory artifact.

Technological progress allows for the further unbundling of credit and payments services, reducing banks' importance in the provision of payment services. New nonbank providers of payment services use new technologies (e-mail transfers, stored value cards, smart cards) to provide payment functions. Balances on stored value cards can typically be transferred without involving a depository institution directly (Osterberg and Thomson, 1998). Thus payment services now offer a continuum of options ranging from new types of services—including barter forms (frequent flier miles, bonus points), Internet-enabled

payment gateways, e-money (i.e., electronic forms of payments, such as PayPal), and stored value cards—to traditional transfers of transaction accounts held at banks.

From a regulatory point of view, these developments raise the question of which payment services should fall under regulatory oversight and what institutions should have access to the payments system. Regulatory authorities can define payment services rather broadly and extend existing regulation to all types of payment providers and their activities. Or they can define payment services narrowly as transaction and checking accounts at banks (deposit-taking institutions chartered by the regulator).

As an example, in many countries a range of providers, including transport companies offers stored value or even multipurpose cards. But do stored value cards issued by nonfinancial entities constitute deposits—since the cards carry a balance—and should they be regulated and covered by deposit insurance schemes? The decision of which alternative services to regulate will matter greatly, particularly if the form of regulation is prudential as opposed to consumer-protection-related, because prudential regulation implies that the services are covered by the safety net. Since the new types of payment services cover a continuum of modalities, authorities need to evaluate carefully where to draw the line and be cognizant up front of a possible shifting of the line over time due to political and other pressures. Authorities should be especially wary of extending deposit guarantees to new deposit substitutes because the moral hazard implications can be substantial.

Similarly, authorities have to decide whether to open access to the payments system to nonbanks and, if so, in what form. In most countries only banks have access to the payments system, and alternative providers of payment services have to clear through banks. Restricting access to the payments system to banks allows incumbent banks to preserve a core part of their franchise value. Allowing direct entry by nonbanks and nonfinancial companies (telecom and utility companies, brokers) will reduce the franchise value of banks and risk increasing overlap and blurring lines between financial and nonfinancial companies. This development could result in an enlargement of the safety net, even if by default.

Over the short term, to limit the blurring of lines, regulatory authorities could require nonfinancial corporations to provide payment services through bank subsidiaries. More generally, authorities may want to signal clearly what type of services or institutions they will continue to regulate and supervise and require that providers offering deposit substitutes indicate to their customers that these are uninsured products and that the credit risk is not assumed by a public deposit insurance scheme. Over the long run, authorities may want to separate payment from other credit services and may want to allow freer entry in payment services. These developments suggest that the traditional reasons why banks were considered special are no longer valid. Furthermore, these developments necessitate a review of the central bank's role in the payments system and the way it provides comfort to payments system participants.

3.1.3. Preventing the extension of the safety net over the short run. Redesigning the safety net is all the more urgent because of the risks that it will otherwise be extended in the short run rather than being reduced. Financial services have become more complex, with increasingly blurred distinctions between products and institutions and between the financial and nonfinancial companies providing these services. As financial

service providers extend their activities, an extension of the safety net to nonbanking activities of financial service providers could occur without policy change. Governments may end up taking on a much larger range of risks, most of them unrelated to any economic reasons for a public safety net in the first place.

As one way of limiting the risks of extending the safety net, regulatory authorities could require financial institutions with nondeposit banking activities to adopt a bank holding company structure under which deposit-taking activities are performed through a separately capitalized subsidiary. Or authorities could require financial service providers that offer insured deposit products to offer these in separately capitalized subsidiaries that are only allowed to hold ''safe assets'' such as government bonds (that is, narrow banking).

Similarly, central banks should reexamine their lender of last resort function. In particular, to prevent liquidity support from becoming solvency support, as during the East Asian crisis, central banks need to carefully define this function and clearly lay out conditions that ensure that support is provided as a last resort to solvent institutions. Yet given technological and market changes, central banks may find it increasingly difficult to limit their lender of last resort support unless they reduce the overall scope of the safety net.

3.1.4. Supervisory issues. Many of the changes under way will render less effective the current approach to supervision. In addition, many new regulatory issues will arise. With financial services increasingly being provided by financial institutions offering a wide range of services and having extensive links to nonfinancial companies, supervision will become more difficult. Traditional supervisory processes—such as those used to assess a bank's risk controls and the definition of fit and proper tests for mergers and acquisitions or entry—will need to be reviewed.

Portals will present new supervisory issues, such as whether they are deemed appropriate to provide investment advice. Should aggregator companies be licensed, regulated, or supervised? What if underneath they are a holding company where a bank is also present? How can the holding company be ''ring fenced'' so that a bank will not come to the rescue of its holding company? More generally, how should consolidated supervision be defined in the new world of financial services? And how can prudential regulation and supervision be better coordinated with competition policy?

Governments will need to evaluate the public policy objectives—systemic risks, competition policy, consumer protection—they aim to achieve and adapt regulation and supervision accordingly. In this context of shifting overall objectives, there will also be a need to revisit the structure of supervision. Traditionally, many countries have aligned their supervisory system by type of financial institution. If financial institutions increasingly operate as integrated entities and new entities emerge that offer the same or similar financial services, then the type of institution becomes hard to define. For example, banks now sell securities, and securities firms offer cash-account products that compete with bank deposits. This breakdown of product and service barriers results in jurisdictional overlap among supervisors.

The functional approach to supervision tries to deal with some of the drawbacks of the institutional approach by organizing supervision by economic function (deposit taking,

underwriting, and so on). But since product definitions continue to evolve and often defy categorization, as with certain derivatives, the functional approach has drawbacks. And neither the institutional nor the functional approach explicitly considers the public policy objectives for supervision because they tend to focus on institutional or industry-specific issues. Regulators are thus not necessarily focused on why to regulate in the first place.

By contrast, the objective approach has the benefit that policy objectives are not mixed with product and entity concepts. Regulation and supervision apply to activities that affect specific public policy goals, irrespective of product definition on sector and intermediary boundaries. Thus the objective approach can ensure a more consistent regulatory environment and a level playing field among different financial service providers and be more flexible.

3.1.5. Impacts on financial stability. Financial service providers will see their franchise values decline as financial products are commoditized and new entrants emerge. Franchise values will fall more for institutions that derive much of their earnings from services that are being commoditized. The easier that cross-border financial service provision and establishment become, the higher will be the loss of franchise value of financial institutions.

At the same time, deregulation and new technology can allow entities to use their brand names to cross-sell a wide range of products, and the Internet permits new markets to be tapped at low marginal costs. Thus well-established institutions with good technology might be able to exploit first-mover advantages and gain significant shares of new markets or retain franchise value. Reduced profitability might also be offset as deregulation allows institutions to diversify their risks across geographic and product barriers.[3] In addition, information technology has allowed the creation, valuation, and exchange of financial instruments that unbundled and redistribute risks among market participants, widening the scope for risk management. Thus incumbent financial institutions might lose profitability but gain lower risk. And existing players may have incentives to consolidate, because under current regulations, size provides more assured access to the public safety net, and counterparties and customers may perceive such financial institutions as being too big too fail. Stability issues are thus not just supervisory issues, but require a dynamic analysis of the means and degree to which profits will shift between financial products and among institutions.

3.2. Competition policy

Competition policy aims at ensuring general access, efficient production, and fair pricing. Competition policy has traditionally been associated with public utilities, railways, power and natural gas, roads, and more recently software (Microsoft). But until recently

3 Barth, Caprio, and Levine (1999) show that countries with fewer restrictions on bank operations are less likely to face a banking crisis. But closer links between financial and nonfinancial companies spurred by technological developments do not necessarily result in less risky banking systems (Isimbabi, 1994).

competition policy was not viewed as critical for financial services or more broadly in the formulation of policy relating to industries involved in information production (Kahn, 1998; Dewatripont and Tirole, 1994; Baumol et al., 1982; Shapiro and Varian, 1999).

In the financial sector, regulations have generally tried to maintain the franchise value of incumbent institutions while fostering competition, which might reduce this value. The main tools of financial sector ''competition'' policy have been initial capital requirements, fit and proper tests in allowing entry, capital adequacy requirements, restrictions on the structure of ownership or activities, and extrajudicial exit procedures. Only in some areas, such as self-regulating organizations (SROs; SROs are legally defined in some countries and their processes and standards are subject to oversight) or pension services, has competition policy been applied to financial services (Glaessner, 1993; Bossone and Promisel, 1999). As noted, recent changes are making financial services more like other goods and services and financial product markets more akin to nonfinancial markets. Technologies are leading to specialization in the production of financial services and to the development of separate markets, particularly wholesale markets, insulated from other financial markets. For example, these markets deal with risk through continuous mark-to-market and collateral arrangements, reducing the chance of systemic risk. The recent advent of straight-through processing of transactions will further reduce operational risks and risks relating to human error.

These developments make competition policy for financial services more feasible. At the same time, the speed of technological innovation in financial service provision—and its associated benefits—are increasingly becoming a function of the degree to which entry by nonfinancial and financial entities is allowed. This circumstance is making competition policy more important but, as noted, also raises issues with respect to extension of the safety net.

The need for competition policy traditionally arises from increasing economies of scale and scope, nonexcludability in consumption of a good, sunk costs in the production or distribution of a good, links between production and distribution networks, and existence of network externalities. Any competition policy requires definition and analysis. For financial services, several issues need to be clarified: what market definition to use, what constitutes market power, what are the barriers to entry, and what are allowable ownership structures—vertical and horizontal—within an industry. A specific issue to analyze is what are permissible links between financial and nonfinancial institutions. And given the increased importance of new (quasi-) financial service providers, the question arises of whether such providers need to be subject to competition policy as well.

3.2.1. Definition of products, markets, and barriers to competition. All competition tests require a definition of the product and market. But it is getting harder to precisely define a financial product and its market. Many traditional nonfinancial services are taking on characteristics of financial contracts. The creation of cash equivalents, derivative markets in weather and power (such as enermetrix.com), and other derivative contracts settled in cash defy classification into distinct categories of financial or nonfinancial services. The continuum from cash (notes) to stored value cards to barter-type arrangements competing not just as cash substitutes, but also on many other dimen-

sions, makes it hard to define the concept of payment services or even a deposit precisely.

It is obviously awkward to define barriers to entry in the provision of a service that cannot be well defined. Moreover, market sizes are changing. Changes in delivery modes for retail financial services are reducing barriers to entry in many financial service areas that were once local, making traditional market concentration measures meaningless. Many markets have become global, rendering a geographic definition of markets more difficult. In countries such as New Zealand and in some Latin American and Eastern European countries, foreign banks account for more than two-thirds of the local market.

With markets going global, nontariff and nonquantity barriers have become more important for financial services. The ability of foreign financial institutions to provide financial services on a global basis can be hampered by differences in laws (such as differences in laws relating to bank secrecy and ''knowing the customer'' provisions relating to money laundering and fraud), regulations, and conventions. Globalization raises the importance of such nondiscriminatory structural barriers because they can be anticompetitive actions. But they are not easily measurable or likely to be harmonized in the short run. Empirical techniques may be the only way to test the contestability of a market, but it will be difficult to find robust models for this. Global markets nonetheless call for a global competition policy framework, or at least for increased coordination among countries' competition policies. Furthermore, because different industries will be involved in the production and delivery of financial services, regulators within and across countries will have to coordinate how they define and assess violations of competition policy.

3.2.2. Scale and scope economies' barriers to entry. If a good or service is subject to scale or scope economies, the resulting imperfect competition may create entry barriers unless markets are contestable. Competition policy concerns about economies of scale become less important as globalization expands market size. Similarly, economies of scope may become less important as market size increases. Sunk costs are changing rapidly through electronic delivery modes that do not rely on a branch network and are becoming less important for a number of financial services (see table 3). As such, sunk costs are unlikely barriers to entry for most financial services. Sunk costs might still be important for investment advice and corporate services, but these services are increasingly subject to global competition.

In some product markets, network externalities may become important for competition policy because they can create entry barriers once critical mass is reached, and market participants will have strong incentives to internalize these externalities and the associated rents. Markets involving network externalities warrant regulation to assure access and efficient outcomes (Weinberg, 1997; Shapiro and Varian, 1999; Simons and Stavins, 1998). Network externalities arise especially in areas like payment services and trading systems.

For example, ATM systems in the United States started as small, private proprietary systems, then standardized and, over time linked up nationally without creating serious competitive concerns. In many continental European countries with concentrated banking systems, single nationwide networks with adequate access developed. But in some

countries regulators had to force more open access on these networks, regulate pricing policies, limit exclusivity agreements, and overcome incumbent (first-mover) advantage. Similarly, governments may need to force public access on other network services, trading systems, or electronic communication networks. Finally, in some cases governments may have a role precisely when network externalities are difficult to internalize, as when a basic technology must be shown to be technologically feasible. For example, the Internet may not have reached critical mass as quickly as it did without the early subsidies provided by government.

3.2.3. Organizational structures and competition. Partly because of the many network features of financial services, much of the infrastructure of a financial system—clearing houses, stock exchanges, credit bureaus, rating agencies—is owned by market participants. Competition within the industry depends on the ownership and governance structures of these entities, often called SROs or self-regulating associations (SRAs; SRAs are associations that set standards for members that are not subject to external regulatory or supervisory oversight). There can, for example, be advantages and disadvantages in terms of access between ''mutual'' and ''commercial'' ownership of trading systems.

The recent intention of exchanges in Australia, Hong Kong (China), the United States, and elsewhere to de-mutualize reflects competition from new electronic exchanges as well as competition across existing exchanges and suggests disadvantages to the mutual model.[4] In Europe many stock exchanges have long been for-profit organizations. At the same time, trading systems owned by a few large players may be uncompetitive because there will be a natural incentive to limit access.

Many of these organizations are already subject to oversight by their SROs and have their own ownership and corporate governance framework, which should help limit conflicts of interest, depreciation of listing standards, and desires to limit competition. The knowledge that network externalities can be realized only if exchange practices are deemed fair will discipline any anticompetitive practices of a corporatized exchange. Still, in some markets de-mutualization, coupled with global competition for order flow, has led to a weakening of listing standards and to more lax surveillance than might be appropriate. Hence in Australia and Hong Kong (China) regulators have reassumed some self-regulating functions. Competition and securities regulators will continue to examine SROs and review corporate governance and ownership in terms of access and competition. Providing incentives for private parties to avoid such difficulties will be challenging.

3.2.4. Entry by nonbanks, links with banks, vertical integration, and competition. Authorities have generally allowed markets and actors to proceed with little restriction, with entry in financial services by nonfinancial entities and strategic alliances between financial and nonfinancial entities. Entry by nonfinancial entities has increased competition, particularly in services traditionally provided by banks. Aggregators such as

4 It should be noted that the de-mutualization of stock exchanges has not necessarily led to changes in control structures as the shares are usually still owned by many of the members before de-mutualization.

Lending Tree in the United States, Advantage Mortgage in Hong Kong (China), and DollarDEX in Singapore have increased competition and widened access in mortgage markets. New payment services, such as the Octopus card in Hong Kong (China), bypass banks and lower the costs and increase the quality of services. New entities in the brokerage business have sharply lowered commissions in many countries.

But the mixing of brand names, distribution networks, and financial services is leading to complex ownership and alliance structures, and extensive vertical integration could undermine competition. Links can lead to fewer benefits for consumers when they exploit reputation or involve sunk-cost investment to reduce competition on price.[5] Mixed conglomerate structures can also challenge a basic principle of competition policy, the separation of content and carriage. Some mixed conglomerates—such as a telecom company merged with a financial service provider—will be able to control content and carriage and can limit access to networks by buyers of services, or to suppliers that wish to access potential customers.

As long as new entry is possible in important parts of the chain or the complete chain, these vertical links may not inhibit competition. Lack of competition may not result in higher prices for financial services, but it could reduce product and process innovation. To ensure competition and innovation, restrictions may be called for on such vertical or horizontal links. In considering such restrictions, authorities will have to balance many issues, including the potential risk diversification benefits of mixed conglomerates and the benefits for competition of entry by nonfinancial entities in the financial service sector.

3.3. Consumer protection

The advent of e-finance is making consumer protection a more important function of public policy on financial services. Consumer protection issues include security, privacy, transparency, and investor protection. Consumer protection raises the role of standards for consumer protection and market development reasons, as well as who can best develop and enforce such standards.

3.3.1. Security risks. Because Internet transactions involve ''open'' systems, they are vulnerable to interception and fraud, including access to information by unauthorized third parties. (At the same time, electronic audit trails permit regulators to trace transactions more easily.) A (perceived) lack of security can, in the short run, limit the use of the Internet and other electronic payments systems to small-denomination transactions, which do not warrant the costs and risks of engaging in fraud.

But cryptographic techniques for ensuring transaction security are rapidly improving, and are almost fully secure for consumer transactions. Further technological

5 Gual (1999) suggests that competition through price and variable costs leads to less concentration and lower entry barriers relative to competition based on taking advantage of brand or reputation through investments involving sunk costs.

developments—better cryptographic techniques, cards with built-in chips, and other verification techniques—are expected to soon provide the security needed for large transactions, leading to complete electronic systems for consumer and B2B transactions. Nevertheless, not all operators will adopt the required technology and may need to be encouraged or required to do so by regulators as part of licensing or certification.

In some countries the laws on payment and credit transactions may not be adequate for Internet-based financial and other transactions. Many countries are, however, considering legislation for the legal treatment of electronic documents, transactions, and means of authentication (BIS, 1999). Some countries are introducing protocols and legal changes, including for digital signatures and certification of authenticity, to assure the authenticity of participants and legal standing (including nonrepudiation) of electronic transactions. Introducing these measures will overcome many security and other risks, stimulating e-commerce and e-finance. Further changes are no doubt necessary, because in many countries—particularly those with civil law traditions—market participants may be unwilling to engage in electronic transactions without third-party certification authority.

3.3.2. Privacy. The Internet raises many privacy issues. It has greatly simplified the collection and sharing of credit and other data on individuals and businesses, and technology has lowered the cost of processing and using such information for financial services. One privacy issue includes the improper sharing of information within a financial institution or conglomerate. The entry of nonfinancial entities that have their own information sources on consumers (utilities, retailers) raises additional information-sharing issues. International variations on information-sharing and privacy and bank secrecy laws further complicate matters. Global standards and protocols that can be credibly enforced will become increasingly necessary, not only to assure the desired privacy, but also to allow efficient cross-border provision of financial services.

3.3.3. Transparency. The rapid proliferation of new products, delivery channels, and institutions has allowed easier comparison of prices and financial products, particularly traded securities. But the emergence of many new products and providers can reduce transparency on the exact service being offered. Given the reluctance of consumers to pay for information on the Internet, for example, information providers typically collect revenues indirectly, including through referred financial transactions. The indirect collection of revenues could result in less transparency and, to the extent that referred entities are related, conflicts of interest.

To the extent that entities like portals have both an online and offline business that are not sufficiently separate, there can be incentives not to disclose material information—or even to provide disinformation—if doing so helps the offline business. Moreover, access to information within financial institutions or across related entities can lead to unfair transactions and unfair advantages because of locks on information and sharing of certain information.

An important transparency issue in capital markets, and more generally, will be promoting the best execution and trading practices and assuring fairness. Alternative trading systems and a greater variety of financial products may challenge the fair and

efficient operation of markets. The multitude of products and the possible fragmentation of trading systems will make price and execution comparisons more difficult, and insiders may be able to get price and information advantages. Solutions will have to balance the objectives of increased competition with access and fairness. Solutions will likely vary by country and market.

In capital markets, requiring and disclosing a global limit order book may sometimes be a solution. In other circumstances a requirement that orders are routed through a stock exchange may be more appropriate. And in many circumstances, no single solution will suffice. For many new infomediaries (indirectly) involved in financial service provision, disclosure requirements and ''buyer beware'' notifications can be mandated. For other entities, certification or licensing may be useful.

3.3.4. Investor protection. Investor protection issues will become more complicated with the increased use of technology and the Internet. With increased cross-border transactions, a key issue will be identifying the authorized legislative or regulatory body. Under what jurisdiction falls a trade by a Thai investor of a London-based stock of a German-incorporated company with its main business in Latin America executed on a trading system incorporated in Luxembourg with computers based in the United States?

Furthermore, the emergence of nontraditional financial service providers complicates the application of investor protection mechanisms. For example, in many countries it is unclear which agency has jurisdiction over electronic communication networks or aggregators indirectly involved in financial services. The Internet can facilitate fraud and other criminal activity and arbitrage of regulatory regimes and coverage. Many fly-by-night firms based in ''cyber nowhere'' may take advantage of uninformed investors.

Government agencies need not directly intervene to combat these problems and should avoid unnecessary mission creep. Regulators will mainly want to educate operators and consumers on the various risks. This educational process is already under way with the U.K. Financial Services Authority warning on the risks of Internet trading and the U.S. Securities and Exchange Commission warning on day trading on the Internet. Regulators will want to actively enforce certain investor protections and pursue cases with high-visibility payoffs. Different approaches will likely be required for small- and large-denomination transactions.

Regulators will also want to ensure that minimum standards for detecting fraud or significant operational risks are in place at self-regulating organizations that administer funds to compensate consumers for fraud, such as the Securities Investor Protection Corporation fund in the United States. In addition, to the extent that market participants offer minimum investor protection through alliances with insurance companies or others, authorities should only be concerned that certain minimum standards are met. The increasingly global nature of trading and financial services will require greater coordination across countries by regulators or their equivalents.

3.3.5. Development and enforcement of standards. Given the evolving nature of new technology, standards for e-commerce and e-finance are lagging market developments. Rapid developments make it hard to assess whether issuing standards now would help

or hinder market development. Public standards could play into the market structure in unpredictable ways.

Still, there may be good reasons to establish standards at this point (aside from the general technology standards needed for e-commerce and the Internet). A need could arise, for example, on standards for pricing structures or limits on pricing practices in (new) payment and other services. In addition, there may be a need to certify new infomediaries (indirectly) involved in financial services.

There could be public goods aspects to establishing standards for Internet and e-finance transactions to remove impediments to their further growth. Private systems or standards for e-commerce and e-finance may not emerge, or there might be too much fragmentation with too many standards or too little competition if proprietary standards dominate. Governments could, after extensive consultations with the private sector, issue policy statements to help develop industry practices, thereby nurturing the market.

Development and enforcement of standards need not be the exclusive province of the government, but could also fall to SROs or SRAs. Given the international dimensions of e-finance, developing and enforcing standards will have to be a global effort, differentiated by the various types of e-finance (private retail payments, B2B transactions, and so on). These efforts will likely be complemented by private commercial agencies—rating agencies, credit bureaus, information production firms, new firms—that rate Internet firms. Still, there may be a role for governments to provide guidance through standards that must be adhered to by any SRA and, in some cases, to fill gaps left by the market. In any case, SROs and SRAs might need formal backing for their disciplinary actions.

3.4. Global public policy

E-finance raises several global public issues, including harmonization of standards and practices and the spread of market disturbances.

3.4.1. Harmonization of standards and practices. The increased ability to deliver services across borders raises a number of issues for the harmonization of standards and practices. First is the degree to which residents will be allowed access to financial services provided by foreign firms. While technology will allow domestic residents more flexible access to services from anywhere—such as an insurance product from a foreign financial institution purchased on the Internet—the ability to do so will be determined by the rules in the country in which the consumer resides.

Many countries limit the cross-border provision of financial services. They require, for example, local establishment for foreign financial institutions to be able to solicit business onshore. They also limit solicitation more implicitly through ''know thy customer'' rules that require physical registration before services can be delivered online. These limits will be harder to impose as the Internet extends its reach and as the location of providers becomes harder to pinpoint, solicitation harder to define, and the definition of a financial service more complex. Such limits can then just become costly, distortive, and uncompetitive.

Regulators will have to decide on the best approach and timing to phase out such

restrictions. A comprehensive approach would be the global equivalent to the EU approach of a single license (passport) allowing cross-border provision with home rule regulation (Key, 1997). This process will take time to develop partly because there will be concern that regulatory and supervisory systems in some countries are not sufficient to support such a system.

Second, when allowed, cross-border provision raises the issue of which country's standards and jurisdiction apply. Because standards differ in many areas—for listing requirements, insolvency arrangements, accounting standards, and the like—inconsistencies can easily arise, raising transaction costs and reducing benefits. Differences can also lead to regulatory arbitrage and raise the possibility of a race to the bottom. While standards are increasingly being harmonized—for example, the International Organization of Securities Commissions has just endorsed international accounting standards proposed by the International Accounting Standard Committee—large differences remain.

Enforcement and legal recourse across borders can also be complicated. To some extent, market forces will deal with the issue of legal jurisdiction because consumers of financial services will prefer to deal in environments that provide them with the greatest certainty—as has been long the case in wholesale markets, where corporations and sovereigns generally choose to issue or cross-list in a few markets. Nevertheless, as the Internet expands the access of less informed consumers—issuers and investors—to cross-border services, investor protection and transparency issues may arise. The ''global passport approach'' would assign the responsibility for supervision to the home authority, but even with more harmonized standards, that may not be sufficient. Short of full harmonization in regulation and supervision, regulators may need to act within their own jurisdictions. Increased globalization through technology requires greater coordination in many areas. The spread of alternative trading networks across borders and the entrance of nontraditional financial service providers, for example, can create new risks. Greater use of technology and networks with important externalities introduces operational risks of computer breakdowns or infiltration by hackers on a global scale. Risk safeguards across trading systems, within and across countries, will need to be developed. Cross-margining or ex post collateral-sharing agreements will become essential as market trading goes global and involves position taking on many electronic exchanges. Even with safeguards in place, many new systems will have untested market stability features, and their operators may lack experience and be subject to spillovers from nonfinancial parts of the group anywhere in the world. Access of new systems to contingent financing mechanisms is unclear, especially on a global basis.

In general, the links between operators and systemic risks will become harder to understand. The Russian and Long Term Capital Management crises of 1998 surprised many. The lines between financial and other markets will become even more blurred as trading spreads through power, natural gas, and agricultural commodity contracts, risking greater spillovers from nonfinancial institutions and markets to financial markets. Going forward, firms and regulators will be pressed to respond in a timely manner to any disrupting event arising somewhere in the world, potentially turning once-manageable situations into systemic crises. Risk safeguards will have to be extended within countries and on a global basis, and greater information sharing will be necessary among regulators and SROs.

3.4.2. Market disturbances. E-finance and greater use of the Internet facilitate the spread of information and misinformation, increase the speed with which information will affect asset prices, and could raise volatility. Volatility will be compounded by greater commoditization, which will lead to far more contracts and assets being traded. With more trading and less risk sharing through institutions, turbulence and contagion may spread more easily through markets, and countries may become more vulnerable to attacks on their currency.

The Internet, with commoditized products and increased participation by less sophisticated players, will also make it harder for firms to signal the quality of the financial products they offer. These various factors may result in greater herding and volatility (Calvo and Mendoza, 1999; Agenor et al., 1999). Herding could also increase prospects for contagion.

These risks can be exacerbated by the fact that e-finance will make it harder to use capital account restrictions to limit capital flows. Capital account controls require definitions of financial transactions by nature, country of origin and destination, and underlying parties—definitions that will be difficult to form and implement in e-finance. Capital account transactions will result from the purchase or sale of financial instruments that did not used to be part of capital account movements, which could make capital flows more volatile. An implication for the international financial architecture is a need to strengthen financial systems, regulation, and supervision along with tax collection and enforcement.

In addition, e-finance and the potentially much larger and more fragmented number of creditors can complicate problems of coordinating actions prior to or during a financial crisis—particularly in emerging markets, where coordinating mechanisms are less developed. The increased number of investors will make a ''bailing in'' policy much harder to enforce because of issues related to the calculation of burdens and loss sharing. Ex ante rules of the game and global contingency plans will become more important.

These risks are not new, and some have existed without direct consequences on financial stability and without a direct public policy response. Reasonable policy solutions have been elusive, regulation can stifle innovation and development, and market solutions may emerge. Information asymmetries in reputation and quality might be overcome by links between existing and new players, which could lead to a few firms with established names dominating certain markets. SRAs and SROs may help avoid market disturbances.

Another private solution may be the emergence of private clearing houses for Internet transactions. Because market participants will find it increasingly difficult to assess the credit and operational risks of counterparts, there will be a tendency to channel transactions through fully collateralized intermediaries or special-purpose banks. This tendency could reduce credit risks and coordination problems (Solomon, 1999; McAndrews, 1997).

Short of a global approach to cross-border provision (such as a global passport with home rule regulation and supervision), regulators may, apart from fit and proper and financial tests, require applicants to demonstrate their commitment to the market. This requirement could result in preferred modes of entry, such as subsidiaries over branches. The provision of some financial services may be conditioned on presence or some other pre-commitment mechanism. There may, for example, be a need for bonding mechanisms,

not unlike those used in some insurance markets, where insurers have to contribute to an indemnity fund before being able to offer insurance policies.

4. Impact on developing countries

4.1. Penetration of e-finance in emerging markets

Many advances in payment and financial services are starting to affect developing countries. In these markets the efficiency and quality of financial services lag what the Internet can offer. The low efficiency and quality of financial services favor migration toward e-finance in many emerging markets. Also a skewed profile (income distribution, education, technical skills, demographics) of typical users of financial services in developing countries favor a move to online accounts. E-finance penetration has grown rapidly in many developing countries—especially in Latin America and parts of East Asia (table 5). In some emerging markets, for example, online banking is already on par with that in developed countries.

The degree to which emerging markets will be able to adopt Internet technologies will depend on their telecommunications infrastructure. Access to the Internet is much lower in emerging markets than in developed countries (see table 5). Reforms to make telecommunications more competitive deserve priority.

The most immediate impacts will also differ by market. In some countries, due to limited markets or a lack of regulatory barriers, new entry across a spectrum of financial services has been attractive. In other emerging markets entry has been more specialized. In several markets, such as Korea, Internet trading and brokerage have seen rapid growth while more traditional payment services remain dominated by local banks. In India online banking accounts and financial services are growing rapidly, and even low-income customers are moving online with access provided through cybercafes.

Other markets have seen significant entry in ancillary services. Processar, a Mexican company, has been developing an Internet-based product for certain pension services, such as collection, account balance information, and transfer of accounts between private pension fund administrators. Many ancillary services—credit information, accounting and audits, actuarial data—will be made available over the Internet. The cost of credit information is falling dramatically as information becomes available worldwide, as evidenced by the increasingly global operations of companies like Equifax. This development will reduce information barriers to prospective investors or financial service providers.

Continued economic integration and new delivery channels for financial services, such as wireless protocols, will increase opportunities for foreign banks to deliver financial services to remote areas and countries, potentially even revolutionizing microfinance and agricultural finance. These developments will increase the scope of financial instruments offered in emerging markets and the venues for trading risk at lower transaction costs, as in cases of trade finance or even traditional terms of agricultural storage finance. While a key impediment in many emerging markets is a lack of supporting infrastructure, such as

Table 5. **Internet banking and telecommunications access in various economies**
The table provides for a sample of countries data on internet and e-finance penetration. The first column provides the percentage of banks in the country providing online banking services. The second column lists the percentage of bank customers using online banking. The third column lists the percentage of inhabitants with mobile phones and the fourth column list the computers with IP address connected to the internet, per 10,000 People. Data are for the year 2000 and 1998 as indicated. The sources for the table are Credit Suisse First Boston Global Bank Team 1999 (columns 1 and 2) and the World Bank 2000 (columns 3 and 4).

Region	Percentage of Banks Offering Online Banking, 2000	Percentage of Bank Customers using Online Banking, 2000	Percentage of Inhabitants with Mobile Phones, 1998	Computers with IP Address Connected to the Internet, per 10,000 People, 1998
The Americas				
Argentina	4	3	8	16
Brazil	< 50	5	5	10
Mexico	< 10	< 1	3	9
United States	63	4	26	975
Europe				
Austria	75	4	28	163
Central Europe	35	< 1	8	54
Denmark	60	5–10	36	359
Finland	85	29	57	996
Germany	60	2	17	141
Greece	40	< 1	19	38
Italy	50	1	36	56
Spain	90	< 2	18	62
Sweden	90	11	46	430
Switzerland	75	5	24	289
United Kingdom	50	2	25	202
Asia				
Australia	90	4	29	400
Hong Kong (China)	25	< 2	47	108
India	10	< 1	1	0
Indonesia	0	0	1	0
Korea, Rep. of	90	3	30	38
Malaysia	10	< 1	10	18
Philippines	15	< 1	2	1
Singapore	95	5	35	187
Taiwan	10	0	22	48
Thailand	0	0	3	4

telecommunications, changes now under way offer many countries an opportunity to accelerate financial sector development.

4.2. Implications of e-finance for financial stability

E-finance will offer fewer choices to economies with poorly capitalized banking systems, weak regulatory systems, and extensive guarantees on liabilities. Options for protecting

incumbent institutions will become increasingly obsolete as consumers go offshore. To reduce the risk of financial crises, regulatory approaches should recognize the weak governance and institutional frameworks, scarce human resources, and concentrated ownership structures in developing countries. These shortcomings make textbook solutions difficult and argue for simpler approaches. More entry of foreign financial institutions will often be a more viable way forward.

4.3. New paradigm for financial sector development

E-finance will require a reassessment of the paradigm that has been used for financial sector development. For all countries, financial sector safety nets need to be substantially reduced, with less emphasis on prudential regulation and supervision. For developing countries, e-finance allows much easier access to global capital and financial service providers, which offers many potential gains, including increased financial sector stability. As financial services are imported, the need to strengthen regulation and supervision in developing countries declines. It also raises the issue of whether small, undiversified economies should have domestic equity and debts markets and, in the extreme, banking systems.

Finally, in many countries e-finance presents opportunities to quickly widen access to and improve the quality of financial services, such as for consumer, small and medium-size enterprise lending, and rural finance. Achieving these gains will require a much more intense focus on three basic areas of reform in emerging markets: strengthening the legal framework, improving the framework for financial and other information infrastructure, and improving technology-related infrastructure.

Especially in developing countries where access to and the quality of financial services is limited, electronic finance and globalization offers important opportunities. Electronic finance has the potential to improve the quality and scope of financial services and opportunities for trading risks and can provide widened access to financial services to a much greater set of retail and commercial clients by offering a more cost effective delivery of services. Emerging markets are starting to participate in the e-finance revolution, with a significant impact in some markets.

5. Conclusions

Technology, particularly the growth of the internet, is changing financial sector industries around the world, in the process challenging current public policy paradigms. While developments will be more evolutionary than revolutionary, in some areas public policy actions are becoming urgent in developed countries and advanced emerging markets. At the same time, changes also offer opportunities for countries to leapfrog. E-finance can accelerate financial sector development by lowering the costs, increasing the breadth and quality, and widening access to financial services. But achieving this result requires a reassessment of the approach to financial sector development, particularly in developing countries.

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