Innovation and Regulation in Financial Markets*

A Summary of the 2007 Philadelphia Fed Policy Forum

BY LORETTA J. MESTER

"Innovation and Regulation in Financial Markets" was the topic of our seventh annual Philadelphia Fed Policy Forum, held on November 30, 2007. This event, sponsored by the Bank's Research Department, brought together economic scholars, policymakers, and market economists to discuss and debate the consequences of financial innovation and the implications for financial market regulation. The recent events in financial markets and their effects on the real sector of the economy underscore the importance of greater understanding and further research on these topics.

The planning for our 2007 Policy Forum began well before the onset of the financial market disruptions in the summer of 2007. By the time of our conference on November 30, 2007, the timeliness of the topic – innovation and regulation in financial markets – could not be denied. The continued problems in the financial markets, which began with subprime mortgages but expanded to other financial instruments, the ensuing spillovers from the financial market disruptions to the real sector of the economy, and the steps taken by the Federal Reserve and the U.S. Treasury to help ensure financial stability have led to various proposals for new regulatory structures to help limit systemic risk in our evolving financial markets. Given the importance of the financial markets to our economy, it is vital that we get the reforms right. Better understanding of the pros and cons of financial innovation and financial market regulation – the topic of our 2007 Policy Forum – is an important step in doing so.

Charles Plosser, president of the Federal Reserve Bank of Philadelphia, provided opening remarks and outlined the Policy Forum's three sessions. He pointed out that whenever there is innovation, regulation often follows. By its very nature innovation is a messy process with winners and losers. Market discipline is an important part of the process, helping to weed out flawed from beneficial innovations. But the fact that there are winners and losers sets up an environment that is ripe for regulation.

Our first session addressed issues in corporate governance. In financial markets, the innovation of high-yield bonds contributed to a boom in corporate restructuring and buyouts, which in turn led to changes in corporate governance structures. The boom and bust in technology stocks highlighted some of the shortcomings of these new governance structures, leading to the passage of the Sarbanes-Oxley Act in 2002. Some have argued that Congress was too quick to act. Plosser asked whether there were lessons to be learned for our current situation.

Our second session examined several innovations in financial markets and the role regulation may play in helping innovations yield more efficient economic outcomes. Regulation and innovation are interrelated – regulation, or the desire to evade regulation, can help spur innovation. Some of these innovations may be inefficient and some may fail, causing painful corrections. The current situation is a case in point. Better understanding of the interplay between innovation and regulation may help us avoid these types of situations in the future.

Our third session covered the role of regulation in financial markets. Technology can spur innovation, but regulation also affects the way markets function. For example, different regulatory structures can affect the competitiveness of financial markets.

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*The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

As Plosser pointed out, there are subtle trade-offs in the benefits and costs of particular types of regulation, and these have implications for the health of financial markets. Thus, assessing the costs and benefits will be an important part of redesigning our financial market regulatory structure.

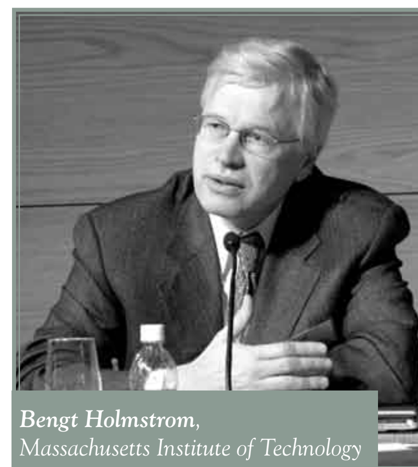
CORPORATE GOVERNANCE[1]

Roberta Romano, of the Yale University Law School, began the first session with a discussion of the Sarbanes-Oxley Act and its effect on corporate governance. Romano pointed out that the act was passed swiftly with little opposition, but since then, some flaws in the act have become apparent and four major commission reports on the act have been published. (One of these, by the Committee on Capital Market Regulation, was discussed by committee co-chair R. Glenn Hubbard in the final session of our Policy Forum.) Two criticisms are that the costs of compliance are disproportionately high for smaller public firms and that there has been an adverse impact on U.S. capital markets' competitiveness. Some have recommended that small firms and foreign firms be exempted. The Securities and Exchange Commission (SEC) has rejected those recommendations, but it has tried to lower the compliance burden on small firms and has made it easier for foreign firms to de-register and leave U.S. markets. The rationale for the latter is that foreign firms may be less reluctant to enter U.S. markets if they feel the costs of leaving are not too high.

Roberta Romano,
Yale University Law School

Romano's research has attempted to assess the probability that the act will be revised.[2] This involves assessing the political climate for such a revision, which is usually difficult even when a piece of legislation's flaws are apparent. As part of her assessment, she has examined how Sarbanes-Oxley has been covered by the business press. Coverage of Sarbanes-Oxley has increased over time, with the national press focusing more on the issue of competitiveness and the regional press covering both issues of competitiveness and small-firm impact. As coverage has increased, so have congressional hearings into Sarbanes-Oxley and the introduction of bills that call for some revisions to the act, most of these focused on exemptions for small firms and/or community banks. However, Romano pointed out that it took over 60 years to repeal the Glass-Steagall Act, which separated commercial banking from investment banking, and she thinks it would take a major shift in the political environment before revision of Sarbanes-Oxley would move quickly. She said that despite increasing dissatisfaction with the Sarbanes-Oxley Act, it could take some time before its flaws are addressed, given the difficulty in altering the status quo within our political system.

Bengt Holmstrom, of the Massachusetts Institute of Technology, continued the discussion on corporate governance. He took two perspectives: the first as a member of a board of directors and the second as an academic who has studied the issue. Holmstrom has been on the boards of several companies, including a family firm for 20 years and Nokia, the global mobile telecommunications company, for the past nine years. In his view, the academic literature on the corporate governance scandals hasn't understood the reason the scandals occurred because it hasn't understood the role of the board. The corporate governance discussion has focused too much on executive compensation. In Holmstrom's view, everyone agrees that we got executive compensation wrong, but the literature attributes this to weak boards and their failure to intervene. It concludes that the corporate governance system is fundamentally flawed and therefore in need of wholesale reform, with shareholders gaining significantly more power. Holmstrom disagrees. He pointed out that if you look at the longer record of the U.S. corporate governance system, it has performed extraordinarily well and there is nothing better elsewhere in the world. He cautioned that a wholesale change would be difficult to unwind, as Romano pointed out earlier. Thus, it is important to understand the source of the corporate governance


Bengt Holmstrom,
Massachusetts Institute of Technology

[1] Some of the presentations reviewed here and background papers are available on our website at www.philadelphiafed.org/research-and-data/events/.

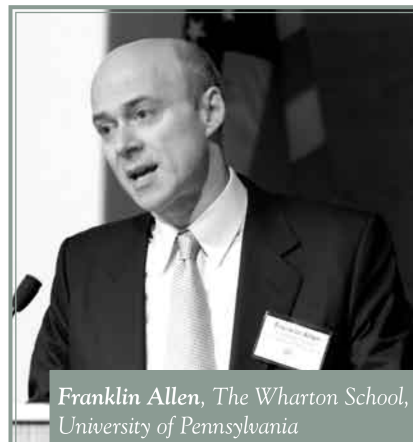
[2] See for example, Roberta Romano, "The Sarbanes-Oxley Act and the Making of Quack Corporate Governance," *Yale Law Journal*, 114 (2005), pp. 1521-1611.

scandals in 2000 before advocating a completely different system.[3]

In Holmstrom's view, flaws in the design of executive compensation schemes, which gave executives powerful incentives to act on their own behalf rather than on the behalf of stockholders, did contribute to the accounting scandals. But weak auditing systems, which allowed the executives to act in this way, were also part of the problem. Some argue that the scandals occurred because the board members weren't strong enough against the executives, and therefore, stockholders need to be given more rights in intervening in the running of the firm. Holmstrom says that there will be costs associated with such a system. His experience suggests that boards should not be watchdogs over CEOs. Instead, the board's role is to evaluate whether the CEO and management know what they are doing and have the ability to get the firm out of a crisis should one arise – to evaluate the management team's capabilities for running the firm, not to determine whether the team is pilfering the firm. The board needs a trusting relationship with the CEO; it needs open communication to know how the CEO approaches problems in order to assess whether this is the right person to be running the company. It would be difficult to have such a relationship if the board were always investigating the CEO. Holmstrom believes one needs to consider how proposed reforms would affect the communication relationship between the board and CEO. If shareholders can intervene significantly into how the firm is run this could adversely affect this communication relationship. While Holmstrom believes that shareholders should have the right to fire the board, he doesn't believe they should be able to fire one member selectively, since that might prevent board members from effectively doing their job.

Holmstrom is also skeptical of some of the reforms being proposed for executive compensation schemes. For example, the use of options in executive compensation schemes arose because of problems with the performance plans used in the 1960s and 1970s. Now the pendulum has swung back to such plans in which accounting numbers are used as triggers for how much to pay people. Holmstrom prefers payment schemes that are simpler but more transparent, since he believes such plans would yield better incentives. A compensation scheme that aims to give the executive a sufficiently high stake in the firm over time should yield better incentives.

Franklin Allen, of the Wharton School, University of Pennsylvania, expanded the discussion to corporate governance outside the U.S. Allen noted that the notion of a corporation's purpose differs across countries. When you ask executives (or his MBA students) from countries where the spoken language is English and those from non-English speaking countries whom a company is there for, you get radically different answers. Those from English-speaking countries say the company is there for the shareholders. Those from non-English speaking countries say it is there for all stakeholders–shareholders, employees, bondholders, and customers. If you ask whom the company should look after if things go bad, you again get different answers. In Japan, 97 percent say job security is most important. In Germany and France, a strong majority also favors maintaining employment. But in the U.S. and the U.K., maintaining dividends is significantly more important.


Franklin Allen, The Wharton School, University of Pennsylvania

These differences also mean there will be differences in corporate governance structures across countries. The U.S. and the U.K. have specific laws stating that the managers' duty is to the shareholders' interests. In Germany, employees have a 50 percent representation on the firm's supervisory board, which oversees the management board. Thus, workers' interests are taken into account in the firm's strategic decisions. China has recently introduced mandatory representation of workers on boards. In France, while it is not mandatory to have workers on boards, workers do have the right to attend board meetings. In Finland, companies can choose whether to have workers on their boards, and many companies have chosen to have worker representation. Allen points out that despite the existence of different systems, the corporate governance literature has focused only on shareholder value, at least until recently.

One question of interest is which system is better in terms of allocating society's resources most efficiently. We know from economics that if markets are complete, there is no asymmetric information, and there is perfect competition, then maximizing shareholder

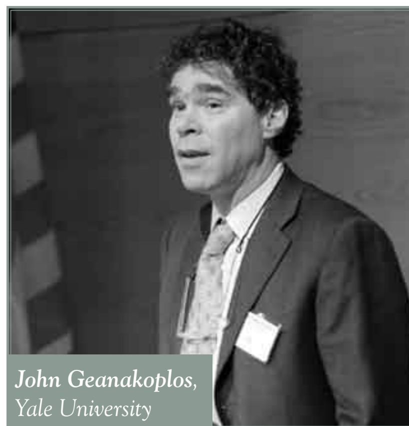
[3] For further discussion, see Bengt Holmstrom and Steven N. Kaplan, "Corporate Governance and Merger Activity in the United States: Making Sense of the 1980s and 1990s," *Journal of Economic Perspectives*, 15 (Spring 2001), pp. 121-144 and Bengt Holmstrom and Steven N. Kaplan, "The State of U.S. Corporate Governance: What's Right and What's Wrong," *Journal of Applied Corporate Finance*, 15 (Winter 2003), pp. 8-20.

value is efficient. However, if there are market imperfections, it isn't clear this yields the best outcome. Some of Allen's ongoing theoretical research with Elena Carletti and Robert Marquez indicates that when there are imperfect markets, shareholders as well as workers may be better off when workers are represented on a firm's board.[4] Worker representation changes the firm's incentives toward taking actions that reduce the chance of bankruptcy. This leads to less competition, which takes the form of higher prices (which hurt consumers), but this in turn leads to higher expected profits and in some cases higher overall market value than when the firm acts only in shareholders' interests. Thus, it is not always the case that workers gain at the expense of shareholders. Allen and his co-authors are also investigating when firms will choose to be stakeholder-oriented versus shareholder-oriented, and what happens in product markets when firms of each type compete. The auto industry provides such an example, with firms from the U.S., a shareholder-oriented system, and Germany, a stakeholder-oriented system, competing. Questions such as these become even more important as countries such as China, with different corporate governance structures, gain global economic importance.

INNOVATIONS IN FINANCIAL MARKETS

Our second session delved into financial market innovations with speakers who have academic, policymaking, and market practitioner experience. **John Geanakoplos**, of Yale University, discussed his research on the foundations of market liquidity and financial crises. This research yields several policy implications for the current period of financial market distress. Geanakoplos noted that the interest rate has played a central role in economics for more than a century, but during crises, collateral levels and margins, which he sees as synonymous with leverage, become paramount. In these situations, the interest rate may not move at all, but the economy is transformed by radical shifts in margins and collateral levels. Thus, in his view policymakers may want to pay more attention to collateral levels and less attention to interest rates.

Just as supply and demand determine the interest rate in equilibrium, in Geanakoplos's theory they also determine the equilibrium margin. There is a leverage cycle in which the economy can go from having too much leverage to too little. Consider an economy that has too much leverage, that is, where margins are very low. If there is a spate of bad news that lowers expected values but increases expected volatility, individuals may demand more margin to cover their higher risk, and the situation becomes one in which there is too little leverage in the market. Geanakoplos pointed to several historical episodes in which there were extreme changes in margins: the 1994 derivatives crisis, 1998 emerging markets debt crisis, and the 2007 subprime crisis (and a possible housing market crash, which he speculated might follow).



John Geanakoplos, Yale University

Geanakoplos is a partner of Ellington Capital Management, a mortgage hedge fund, so he spoke as both an academic and a practitioner as he elaborated on the subprime crisis. In his view, the problems in the subprime market derive from the margin requirement, that is, the down payment, which prevents subprime borrowers from refinancing. Prior to the current crisis, when a subprime borrower's mortgage rate reset at a higher level, a borrower that was in good standing was able to refinance at a lower rate. Now, both the decline in housing prices and the rise in down payment requirements have prevented such refinancings. In Geanakoplos's view, the interest rate has not played the main role.

In Geanakoplos's theory, a liquidity crisis begins when bad news about an asset lowers its price. The owners of this asset had been the most optimistic buyers and they were leveraged because they wanted to invest more in the asset than their own resources permitted. The drop in the asset price hurts them more than others in the economy. Thus, wealth is redistributed away from the asset's natural buyers, and this causes the asset price to fall more, which then causes a further drop in wealth, and so on. The crisis reaches its climax only when lenders then tighten the margin requirements, that is, the amount of collateral they require to back a loan. This tightening of margins may force investors to sell the asset, which leads to even greater declines in the asset's value, and there may be spillovers to other asset prices if they also need to be sold. Of course, those who manage to survive the crisis can benefit from the buying opportunity provided by the low prices of the assets.[5] In Geanakoplos's

[4] See Franklin Allen, Elena Carletti, and Robert Marquez, "Stakeholder Capitalism, Corporate Governance, and Firm Value," Wharton Financial Institutions Center Working Paper 07-39, August 4, 2007.

economic model, even a small piece of bad news, that is, one that results in just a small increase in the chance of a bad outcome, can have a large effect on the price if it results in driving the most optimistic buyers (who were the most leveraged) out of the market and increasing borrowing margins. The leverage cycle, then, has broad implications for the economy.

While crises are, thankfully, rare events, changes in margins and the resulting problems happen more frequently. In some cases, bad news isn't large enough to drive the optimistic buyers from the market and create a financial crisis. Instead, it raises uncertainty and disagreement about the future among people so that the less optimistic want to sell their assets, and the optimists want to buy up the assets being sold. Because margins have risen, in order to do that, the optimists need to sell some of their other assets, an action that causes their prices to fall. Thus, there is some contagion. The optimists also want to hold assets they can borrow money against, so they reallocate their portfolio. There is a flight to quality, a flight away from illiquidity.

Geanakoplos pointed out that an important implication of the theory is that policymakers might want to focus more attention on regulating margins. Forcing people to have tighter margins in normal times and looser margins during crises can make society better off.

Randall Kroszner, member of the Board of Governors of the Federal Reserve System, discussed the role of information in the development of new financial products and lessons to be learned about risk management and regulation to help foster productive financial market innovations. The economy has benefited from innovations that have allowed capital to be allocated to its most productive uses and risks to be dispersed to a wide range of market participants. But innovations also create challenges when participants don't have the necessary information to value new instruments. Kroszner described the typical life-cycle of a new instrument. When a new product is developed, there is usually an experimentation phase when market participants try to learn about the product's performance and risk characteristics. The product's characteristics are adjusted in response to market demand. Information is gathered to facilitate price discovery, the process that reveals the market-clearing price of the asset. Kroszner discussed how the lack of information, inadequate due-diligence to verify information, and lax risk management have created problems in the market for some structured finance products like SIVS, structured investment vehicles. Their complexity and the lack of information about where the underlying credit, legal, and operational risks reside have made these instruments hard to value. According to Kroszner, when market participants realize they lack the necessary information for price discovery, the price discovery process becomes disrupted, market liquidity can become impaired, and it may take a significant amount of investment in information gathering and time before the price discovery process can be revived.

Randall Kroszner, Board of Governors, Federal Reserve System

Investment in information gathering may also result in more standardization of the instrument. Kroszner pointed out several benefits of standardization. It can decrease complexity and increase transparency of the instruments. More standardization lowers the information-gathering costs, and also the transactions costs for the instrument, which in turn increases market liquidity. Kroszner suggested that improvements in standardization could help address some of the current challenges in the subprime market, perhaps facilitating the workout and loan-modification processes. He said that the Federal Reserve and other regulators have been actively encouraging mortgage lenders and servicers to work with borrowers at risk of losing their homes. Kroszner noted that the supervisory agencies and the industry are addressing the need for improved risk management, including more comprehensive due-diligence for new financial products, and better stress-testing to cover contingent exposures, market-wide disruptions, and potential contagion.

John Bogle, founder and former CEO of The Vanguard Group, Inc., and president of Bogle Financial Markets Research Center – himself a financial markets innovator – provided his views on when innovation goes too far. In his view, innovation and entrepreneurship are major drivers of global economic growth, but financial innovation is unique because of the sharp dichotomy between the value of innovation to the financial institution and the value of innovation to the institution's customers. Bogle believes

[5] For further discussion, see John Geanakoplos, "Liquidity, Default, and Crashes: Endogenous Contracts in General Equilibrium," *Advances in Economics and Econometrics: Theory and Applications, Eighth World Conference, Volume II*, Econometric Society Monographs (2003), pp. 170-205.

John Bogle, The Vanguard Group

that institutions have a large incentive to favor complex and costly over simple and cheap. He estimates that the costs of the financial sector have risen from about $100 billion in 1990 to about $530 billion in 2006. These costs include annual expenses borne by mutual fund investors, brokerage commissions, investment banking fees, fess paid to hedge fund managers, and legal, accounting, marketing, and advertising costs. Bogle asks whether the costs of the financial sector have reached a level that exceeds the value of the sector's many benefits.

In Bogle's view, two recent innovations in the banking industry – CDOs (collateralized debt obligations backed by pools of mortgages) and SIVs (structured investment vehicles) – are complex and costly vehicles of questionable benefit. He discussed a number of innovations in the mutual fund industry over the years that brought mutual fund managers high fees but ultimately losses to investors, including aggressive growth funds in the latter half of the 1960s, government-plus funds in the 1970s, adjustable-rate mortgage funds in the 1980s, and technology funds in the 1990s.

Bogle explained that some mutual fund innovations have benefited fund investors. One of these is the money market fund, which he sees as one of the greatest innovations in the industry's history. He also outlined several of the innovations of his own firm, Vanguard, which he established in 1974. These include a fund organizational structure that keeps investment costs down; the first market-index mutual fund, created in May 1975, that tracks the returns of the S&P 500 stock index; and tax-managed funds, introduced in 1993.

Bogle concluded by suggesting that financial innovations nearly always create value for their creators, but that too often, in his view, these innovations have subtracted value from investors.

REGULATION AND COMPETITIVENESS

Bogle's discussion provided an excellent segue into the final session, which addressed the proper role of regulation in capital markets. Given financial market disruptions that have taken place since the Policy Forum, this session provides particularly useful insights into thinking about the regulatory structure that is to come.

R. Glenn Hubbard, dean of the Columbia University Business School and chairman of the Council of Economic Advisers from 2001 to 2003, focused his discussion on the regulation of equity markets, drawing on the work of the Committee on Capital Markets Regulation, a nonpartisan group co-chaired by Hubbard and John Thornton, former president of Goldman Sachs. Hubbard sees our financial markets as one of the important sources of the productivity boom in the U.S. over the past decade, and thus, it is important to preserve and enhance the global competitive position of U.S. capital markets. The U.S. share of equity raised in global public markets dropped from about 30 percent in 2002 to about 19 percent in 2007 (through November). There has been an increase in U.S. companies doing initial public offerings abroad and a decrease in the number of firms that are listing on U.S. equity exchanges. Economic research indicates that, on average, foreign firms still receive a benefit from listing in the U.S., but that listing premium has declined in recent years. Hubbard argued that one of the reasons for these trends is that the U.S. securities regulatory system does not do an adequate assessment of the costs and benefits of proposed and enacted regulations. The implementation of Sarbanes-Oxley could be improved to lower its costs. Another cost facing firms doing business in the U.S. is potential litigation. He cited issues surrounding auditor and director liability and securities class-action lawsuits, which have larger and more frequent settlements in the U.S. than in other financial centers.

The committee recommended that a more risk-based approach be taken toward securities regulation to ensure that regulation enhances shareholder value by improving the incentives of managers, auditors, and directors, and the rights of shareholders with respect to corporate control. This would include the SEC's performing formal cost-benefit analyses of regulations. Regarding litigation reform, the committee recommended allowing alternative dispute resolution for class actions, which might include shareholders waiving their rights to class actions at the time of the initial public offering. Hubbard suggested that the Financial Services Author-

R. Glenn Hubbard, Columbia University Business School

ity in the United Kingdom, which is a consolidated system of financial supervision, might provide a model worth considering in the U.S., and indeed the costs and benefits of such a system are being assessed as part of the work regarding regulatory reforms needed in the aftermath of the current financial market disruptions.

Annette Nazareth, who at the time of the Policy Forum was a commissioner at the SEC, was our final speaker. Nazareth argued that a well-conceived and balanced system of securities regulation gives the U.S. a competitive edge in global financial markets. The SEC's balanced approach to securities regulation is based on the principles of competition, transparency, investor protection, and market integrity. Nazareth believes the approach has worked well and has been instrumental in establishing confidence in the U.S. securities markets, which in turn has increased market liquidity and has attracted business to the U.S. Indeed, rather than conflicting with market forces, high-quality regulation, she feels, is a complement that works with market forces.

***Annette Nazareth**, Former Commissioner, Securities and Exchange Commission*

In Nazareth's view, high-quality regulation is based on clear goals and standards. It should be minimally intrusive in the marketplace, allowing disparate business models to compete vigorously and effectively, which fosters innovation. It should be flexible enough to accommodate different business models. It should promote market efficiency. Nazareth believes securities regulation has been most effective in addressing market externalities, a type of inefficiency. She outlined four types of externalities that regulation has successfully addressed: dominant markets, principal-agent conflicts, collective-action issues, and information asymmetries.

Markets with high market power may use it anti-competitively. The U.S. has multiple competing securities markets, and the SEC has used its authority to enhance the competition in these markets. For example, the SEC mandated fair-access rules that ensured that all market participants would have access to the market. The commission also regulated the sharing of market price data, which is necessary for trading.

As Bogle described in the previous session, financial intermediaries and their customers are in a principal-agent relationship, in which there are sometimes conflicts of interest. Nazareth discussed the SEC's regulation of sales practices, which is intended to alleviate some of these conflicts. She pointed out that the U.S. has the highest level of retail investor participation anywhere in the world and attributes this to the standards set for sales practices, which inspire confidence in our markets.

The SEC has helped solve collective action problems in financial markets. Nazareth discussed an example that arose in the over-the-counter credit derivatives markets. As Nazareth explained, it was discovered that there was a very serious problem of incomplete documentation on high volumes of transactions in this market. Although the securities firms realized there was an issue, none individually had the incentive or the ability to solve the problem on its own. The SEC has worked with the firms toward clearing up this problem.

The SEC has advocated transparency and has mandated standardized disclosure to alleviate asymmetric information problems. Globalization has led to convergence in disclosure as well as accounting standards across countries, and this has raised market efficiency.

In Nazareth's view, these four types of market imperfections point out the need for regulation to ensure that the evolution of the marketplace benefits investors and serves the public interest. If regulation is well-designed, it will enhance competition, not stand it is way.

SUMMARY

The 2007 Policy Forum generated lively discussion among the program speakers and audience on the consequences of innovation in global financial markets and the implications for financial market regulation. The recent financial market disruptions, their effect on the real sector of the economy, and the feedback from the real economy to financial markets underscore the need for better understanding of financial market innovations, performance, liquidity, and regulation. It now appears clear that some reform of the financial supervisory system in the U.S. is needed and will take place. Given the vital importance of financial markets and institutions to our economic well being, it is imperative that rigorous economic modeling and empirical research be used in developing these regulatory reforms to avoid unintended consequences and to help ensure a more efficient and productive financial system that is less susceptible to systemic risk.