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This Quarterly Review *is published by the Research and Statistics Group of the Federal Reserve Bank of New York. Remarks of* E. GERALD CORRIGAN, *President of the Bank, on future priorities in banking and finance and on recent financial disruptions begin on pages 1 and 8, respectively. Among the staff members who contributed to articles in this issue are* GIKAS HARDOUVELIS *and* STEVE PERISTIANI *(on margin requirements: evidence from U.S. and Japanese stock markets, page 16);* SUSAN HICKOK *and* JAMES ORR *(on shifting patterns of U.S. trade with selected developing Asian economies, page 36); and* VIVEK MOORTHY *(on unemployment in Canada and the United States: the role of unemployment insurance benefits, page 48).*

BRUCE KASMAN *contributed to In Brief—Economic Capsules (on monetary policy and U.S. external balances, page 62).*

A quarterly report on Treasury and Federal Reserve foreign exchange operations for the period November 1989 through January 1990 starts on page 69.

Future Priorities in Banking and Finance

Good afternoon, ladies and gentlemen. It is always a pleasure to have this opportunity to address the Mid-Winter Meeting of the New York State Bankers' Association. Allow me to say at the outset that I find it hard to believe that this will represent the sixth year in which I will have addressed this group in my capacity as president of the Federal Reserve Bank of New York.

In that setting, I am reminded of the well-known Chinese curse, "May you live in interesting times." However, I am inclined to the view "interesting," yes, but not *too* interesting! I say that because in reflecting on developments in banking and finance during the 1980s, I am truly struck with all that we have been through in ten short years.

In the early weeks of 1980 we saw the House and Senate reach essential agreement on the Monetary Control Act of 1980, which among other things was to usher in a whole new era of banking by virtue of its deposit interest rate deregulation provisions. But in precisely that same time frame we were also confronted with the first of the major financial disruptions of the decade: the silver market episode. Little did we know at the time that the decade as a whole would see a recurring pattern of serious financial disruptions that would crisscross financial markets and institutions of all types and sizes. LDCs, LBOs, big banks, small banks, thrifts, government securities dealers, stock markets, junk bond markets — to mention some — have all, at one time or another, been sources of concern.

Perhaps because of good fortune, perhaps because of good policies, perhaps because of the ability of individuals and institutions — public and private — to rise to the occasion, or perhaps for all of these reasons, the economy and the financial system weathered these storms in remarkably good order. That is reassuring, but it should not delude us into the belief that our problems are in any way behind us. Let me cite a few examples of what I mean:

- Looking at money center banks, one cannot help but be impressed by the fact that over the last decade, the primary capital of these institutions has almost quadrupled in absolute terms and has more than doubled in relation to assets. That's the good news; the bad news is that for these same banks, net charge-offs over the decade have exceeded net income, and at year-end 1989 — after the longest peacetime expansion in history — nonperforming loans were more than double their level at the end of 1982 when the economy was coming out of the deepest recession since the 1930s.

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Remarks by E. Gerald Corrigan, President of the Federal Reserve Bank of New York, before the 62nd Annual Mid-Winter Meeting of the New York State Bankers' Association, January 25, 1990.

- The LDC debt situation — while not nearly the threat to the international banking system that it was in 1982 — still constitutes a major overhang on bank balance sheets and on the global trading and economic system. Indeed, for both the banks and the individual LDCs the problem today may in some ways be almost as difficult as it was in the early 1980s. The major banks, for example, have strengthened reserve positions to the point that makes it very inviting simply to walk away from the problem and the process, even though in the aggregate that very act could only mean that reserves would become charge-offs and then some. By the same token, the current environment for the LDCs is one in which the temptation to try to finance a country by accumulating interest arrearages or by otherwise ignoring or downplaying the need for ongoing relationships with private sources of credit flows might be very inviting but not in the best long-run interests of the countries themselves. Indeed, either could drive a still larger wedge between the country and the ability to meet ongoing needs for external financing from private markets and institutions in a setting in which public institutions surely will not be able to do the job alone.
- Despite all of the earlier experience with concentrations of bank credit in real estate investment trusts, in LDCs, in the oil patch, and in agriculture, we still see large concentrations of lending in such areas as real estate and highly leveraged financings, either of which can be especially vulnerable to changing economic or financial conditions.

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- In securities and wholesale banking markets we see enormous pressures on spreads and margins amid recurring bursts of volatility, in a setting that seems to suggest an even greater preoccupation not just with the short run but with the very short run. Indeed, I sometimes get the feeling that some market participants seem to view a long-term investment as one they hold overnight! Unfortunately, I also have an uneasy feeling that the lessons that should have been learned from earlier bouts with adversity may not have been fully retained. For example, market participants still seem to me to suffer from the so-called illusion of liquidity, whereby positions are taken and strategies devised in the belief that markets will always be sufficiently liquid to permit such positions to be unwound or hedged with relative ease and at little risk of loss.

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In this environment the need for very strong internal controls, risk management systems, and tight managerial oversight becomes all the more compelling, even though such efforts are very expensive.

- To cite just one more example, despite the passage of several important banking laws over the decade, the basic structure of our banking and financial system remains outdated and in disarray. In certain respects — especially in an international setting — I would go so far as to say that the structural flaws in the U.S. banking and financial system have actually gotten more serious, if only because we tinker while others progress.

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I could go on to cite other examples but I think the message is clear and that, of course, is that while the economy and the financial system of the 1980s showed great progress and adaptability, we start the new decade with a major agenda of unfinished business. The most important part of that agenda has to do with macroeconomic, structural, and trade policies. Having

spoken on those issues in another address only two weeks ago, I would like to concentrate the balance of my remarks today on some of the key priorities for the period ahead in the areas of banking and finance, with emphasis on a number of issues that strike me as having particular importance over the near to intermediate term.

A very high priority, at least as I see it, remains the need to reform and modernize the basic structure of our financial system. While it may sound presumptuous, I still regard the framework suggested in my 1987 essay, *Financial Market Structure—A Longer View*, which was first introduced before this audience, as a very useful starting point in that effort. Having said that, I do not want to leave the impression that there may not be some specific areas in which events of the past three years may have shaded my thinking in one direction or another. However, on the most basic concepts—including the case for a strong and *independent* banking system—the depth of my convictions has, if anything, increased. I also recognize that reform

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and modernization of the structure of the federal regulatory and supervisory system are long overdue, but I continue to believe that effort must follow, not precede, reform of the financial system itself. Finally, I continue to believe that whatever form regulatory restructuring might take, it is vitally important that the Federal Reserve, as the nation's central bank, retain a central role in the banking and financial market oversight and supervisory process.

A second area of importance relates more specifically to securities institutions and markets. Here I want to indicate my support for the broad thrust of S-648. The major provisions of that bill would (1) provide for authority for the Securities and Exchange Commission (SEC) to close markets in emergencies, (2) authorize the SEC to collect information on large securities trades, (3) authorize the SEC to collect information on the risk exposure of affiliates of securities firms, and (4) provide greater impetus for coordination of clearing and settlement activities within and across markets.

In many respects, the provisions of this bill are an outgrowth of the October 1987, and to a lesser extent the October 1989, breaks in stock market prices. Whether in the context of this bill, the ongoing work of the interagency group formed after the 1987 stock market fall, the initiatives of the various stock and futures exchanges, the recommendations of the Group of Thirty regarding improvements in delivery and settlement systems for equities, or the efforts of individual firms to strengthen controls and procedures, much has been done to protect the system against the systemic disruptions that seemed so close at hand in 1987. But I have to wonder aloud whether we will have gone far enough, even if something along the lines of S-648 were promptly enacted.

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For example, there are several areas in which I believe further steps should at least be considered. None of these is going to be very popular, but let me spell them out, if nothing else, as grist for the mill.

First, while it is true that the bill is designed to authorize the SEC to gather certain data on the overall financial condition of securities companies—including information at the level of the holding company—I am not persuaded that we should necessarily stop with information gathering. For example, as a longtime advocate of some limited degree of consolidated supervision in banking, it seems to me that careful thought should be given to the suggestion that minimal capital standards

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and a limited degree of consolidated supervision should apply not only to registered broker dealers but also to the securities firm as a whole, including its parent holding company. This may be par-

ticularly appropriate in view of the fact that many of the more risky activities of such firms take place either at the level of the holding company or in an unregulated subsidiary of the holding company. Similarly, the opportunities for, and the possible risks of, excessive double leveraging are no less in the case of securities holding companies than they are for bank holding companies. Finally, it is also true that a system that relies on at least a degree of consolidated supervision for securities firms would be much more in keeping with arrangements in other industrial countries. Of course, what underlies my view in this regard is that I remain strongly of the opinion that serious problems in any one part of a financial firm will inevitably impact the firm as a whole despite legal separations and regulatory firewalls.

Second, I am still not at all sure that margins for financial futures are as high as they should be, at least from the vantage point of their role as a financial shock absorber helping to ensure the safety and integrity of the clearing and settlement mechanisms for such markets. My concern in that regard was heightened by events after the market sell-off on Friday, October 13, 1989. The Chicago Mercantile Exchange increased margins on the S&P 500 contract by $1000 per contract for the opening of business on Monday, October 16, and again on Tuesday, October 17.

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While such actions can be highly appropriate in particular circumstances — especially when motivated by the desire to protect the financial integrity of the clearing apparatus — it is also true that increasing margins in circumstances such as those prevailing at that time can create the very problem that such actions are seeking to avoid. In fact, a good case can be made that margins should be high enough in the first instance that they do not need to be raised in emergency situations. Indeed, to take it one step further, the mere fact that margins must be raised in an emergency suggests that they may have failed to perform their functions.

Partly for this reason, and this is very much a personal view, I believe that margins in many financial-type futures instruments are typically — if not systematically — too low. In the case of the S&P 500 contract, for example, it seems to me that a significantly higher margin — perhaps as high as 15 percent or so — is always called for. I also have serious doubts as to the wisdom of leaving the day-to-day establishment and administration of minimum margins to the exchanges. In saying this, I know there are many who would take serious objection to this suggestion, primarily on the grounds that such higher margins would increase transactions costs and reduce liquidity in these markets. There may or may not be something to that argument, but even if it were valid, it seems to me that achieving a somewhat deeper financial cushion in the clearing and settlement mechanisms associated with these markets may be worth these costs, especially to the extent that there is a tendency for such liquidity to be illusory in times of stress.

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The ability of all markets to function well under adverse circumstances is crucial to their long-run health and competitiveness *and* their ability to fulfill their fundamental role of helping to achieve the best possible allocation of savings and investment in the economy as a whole. It is in that spirit that I firmly believe that further debate and dialogue on this very controversial subject are urgently needed. The goal must be to find the proper balance between transactions costs and liquidity, on the one hand, and prudential standards, on the other. This, of course, is a matter of judgment, but in my judgment the tilt should be in the direction of greater weight on the prudential considerations.

The *third* area I want to cite in this regard relates to clearance and settlement procedures and systems more generally. Here, great strides have been and are being made, as reflected in the effort to accelerate significantly final delivery and settlement of stock trades in the cash market. Under the best of conditions, however, that

effort will take several years to complete. And as revolutionary as these changes may seem to be, even so they do not come to grips with all the issues, especially the delicate relationship between clearance and settlement systems in the cash markets, on the one hand, and the derivative markets, on the other. A goal worth striving for would be one in which the timing of final settlement in cash and derivative markets would be the same, since in these circumstances a strong case could be made that both the level and structure of margins in both markets could converge to a very significant extent. That may be a long way

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off since it presupposes, among other things, a comprehensive book entry system for equities. It also implies that we make further progress in satisfying market participants that overall market infrastructure — including the all important credit decision-making apparatus — is fully geared to shortened time frames for final payments and settlement. Finally, it implies that much of the burden for adjustment falls in the cash market, but I believe it is a goal worth striving for over time.

This also is an area in which the need to keep in mind the international attractiveness of U.S. markets and market-related institutions is very important. That is, as technology changes and as other countries and other financial centers improve the workings of their financial markets,

As technology changes and as other countries and other financial centers improve the workings of their financial markets, the relative position of U.S. markets can deteriorate unless we are making comparable or greater strides in improving the efficiency, effectiveness, and stability of markets here in New York and in the United States generally.

the relative position of U.S. markets can deteriorate unless we are making comparable or greater strides in improving the efficiency, effectiveness, and stability of markets here in New York and in the United States generally. The United States has an important comparative advantage over most other countries in this regard, and that is something worth preserving — consistent, of course, with the prior dictates of safety and stability.

The *last* subject I want to touch on in this regard is circuit breakers, which I regard as something of a necessary evil. They are necessary because patterns of extreme market volatility seem to provide little alternative but to allow intervals of time during which market participants can better absorb information and react in an appropriate fashion. However, across-the-board halts in trading, and especially the closing of markets, can entail the risk of making things worse rather than better. At the very least, we must keep in mind that once a market is closed, it must be reopened — a task that may not be easy.

Having said that, I must reluctantly confess that I believe we probably do need a system of circuit breakers. However, I also believe it very important that such circuit breakers be closely and carefully coordinated between cash and derivative markets. For example, generalized trading

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halts and/or market closures should always be triggered in a context in which it is recognized that cash and derivative markets are in fact one. At the end of the day, however, our goal should be to encourage patterns of behavior in markets in which circuit breakers, even though they exist, never have to be used.

In a very real way, I find it regrettable that my sense of uneasiness about patterns of behavior in financial markets brings me to the point where I feel the need to put these ideas on the table for consideration. I say that for two reasons: First, whatever else may be said about these suggestions, it must be admitted that they deal with symptoms, not causes. The causes lie with the fundamentals: economic policies and performance, financial market structure, and the perverse incentives — for business corporations and institutional and individual investors — that produce such enormous pre-

occupations with the very short run. Second, and not unrelated, all of us would be much more comfortable with an approach in which the marketplace itself was free to both reward and punish without reliance on regulatory or legislative safeguards. That, of course, raises the profoundly important question as to why such safeguards exist in the first instance.

The historic rationale for these safeguards has a number of foundations, many of which are, one way or another, tied up in the understandable desire to protect small and unsophisticated investors and depositors. Even more essential, however, is the age-old concern about systemic risk, or the danger that a disruption in one part of the banking and financial system will spread to other parts of the system, thereby undermining confidence generally and inflicting damage on the real economy. As I have mentioned on a number of occasions, concerns about systemic risk are neither new nor unique to the United States. For example, in *The Wealth of Nations*, Adam Smith presents the classic case for the regulation of banking on precisely the grounds of systemic risk. Similarly, in every nation, regardless of size, state of development, or political persuasion, governments and monetary authorities are universally reluctant to tolerate the sudden and disorderly failures of banking and financial firms because of concerns about systemic risk and public confidence.

In every nation, regardless of size, state of development, or political persuasion, governments and monetary authorities are universally reluctant to tolerate the sudden and disorderly failures of banking and financial firms because of concerns about systemic risk and public confidence.

Looked at in that light, it is not surprising that governments of all types have chosen to have so-called safety net features associated with the workings of the banking and financial system. While the particulars of such arrangements differ from country to country, they are all deeply rooted in concerns about systemic risks, and they all give rise, to some degree, to the so-called moral hazard problem.

In its most straightforward form, the moral hazard problem has as many as three dimensions. The first is that the mere presence of the safety net (regardless of its specific form) will encourage banking and financial firms to take on more risk than they otherwise would or could. The second is that depositors and/or other creditors will not subject such firms to the same tests of creditworthiness as they would firms that are outside the safety net. The third is that the mere presence of concerns about systemic risk will force the central bank or other authorities to intercede in some fashion on behalf of troubled institutions by providing some form of financial or other support in the face of adversity, thereby validating the behavior implicit in the first two factors cited above.

As we have seen in the thrift industry situation, the moral hazard problem can be quite real and can give rise to sizable claims on the public pocketbook. However, as reprehensible as the thrift industry situation may be, I believe it important that it not cloud our vision as to what makes for good public policy. In this regard, I believe that the basic approach to the safety net in this country is workable and sound, and while the point can be debated, I also believe that arrangements in the United States provide at least as much—if not a greater—role for market discipline than is the case in many other countries.

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Having said that, allow me to quickly add that there are constructive changes in emphasis that could tilt things in the direction of greater market discipline and less implicit reliance on the safety net. I have in mind such possibilities as finding ways to deal with the abuses of brokered deposits, the swifter and earlier resolution of capital-deficient—though still technically solvent—institutions, and achieving still higher levels of capital, especially equity-type capital and/or wholly unencumbered subordinated debt capital in financial institutions.

On the other hand, I find very troubling certain proposals that on the surface seem to have great intuitive appeal. For example, I am unconvinced of the merits of extending deposit insurance premiums to offshore deposits in branches of U.S. banks, not simply on competitive grounds but far more importantly on the grounds that this would extend the appearance of full insurance to the one class of depositor that has unambiguously exerted a clear pattern of market discipline on large banks that get into trouble. While on the subject of large banks, let me say that I am mindful of the widespread view that some banks are too big to fail. That view has very troubling implications and does not jibe with reality. After all, a number of large banks have failed, and in the process managers and shareholders

have been wiped out. In other cases, market and regulatory pressures have forced troubled large institutions into major restructurings, shrinkages, and the need to raise large amounts of new equity-type capital despite the sizable dilution of existing shareholders. Having said that, care and discretion will always be needed in handling serious problems in major institutions in order to guard against the systemic dangers I spoke of earlier.

With any troubled financial institution, but especially in the case of large institutions, I believe the workings both of the safety net and of market discipline will be better served in a context in which the authorities maintain a policy of what I like to call "constructive ambiguity" as to what they will do, how they will do it, and when they will do it. In saying this, I recognize that

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financial market participants do not like uncertainty, but that is just the point! Moreover, while I fully understand the yearning in some quarters for something of a cookbook approach to problems in financial markets or institutions — large institutions especially — I regret to say that in my judgment such a cookbook does not, and never will, exist. The circumstances associated with a particular case, the setting in which it occurs, and the assessment of the relative costs and benefits of alternative courses of action will always have to be looked at case by case. But in no case should it be prudent for market participants to take for granted what actions the authorities might take, and certainly in no case should owners and managers of troubled institutions — large or small — conclude that they will be protected from loss or failure.

I began these remarks with a series of references to all of the difficulties and disruptions our financial system and economy surmounted during the 1980s. We can and should take a measure of satisfaction from that experience, but we must attend to the potential sources of problems down the road. While many of the solutions to those problems lie with the economic policy fundamentals, steps that would improve the structure and workings of our financial system are an important part of that agenda for the future. The case for such improvements seems to me clear on its own merits, but we should also keep in mind that the international competitiveness of our financial markets and institutions is very much at stake.

Looked at in that light, there are many factors that will, over time, be important in maintaining a competitive edge in banking and financial services. However, one overriding consideration will surely be public confidence — both here and abroad — in such markets and institutions. In turn, that confidence will flourish only in

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a setting in which our major institutions are not just strong and sound, but the strongest and soundest, and in a setting in which the safety and absolute integrity of such markets and institutions are beyond question. You can judge for yourselves where we stand on that spectrum, but I, for one, think we have some work to do.

A Perspective on Recent Financial Disruptions

I am delighted to contribute to this important volume sponsored by the National Bureau of Economic Research on *Reducing the Risk of Economic Crisis* if for no other reason than to find that I am not alone in my worries about the vulnerabilities of the economic and financial system. I should also say at the outset that the three background papers prepared by Ben Friedman, Larry Summers, and Paul Krugman have bolstered my confidence in work being done by academic economists. All three papers are first rate; they are readable, coherent, and institutionally sensitive, but most of all, they offer pragmatic guidance to someone like myself who must bridge the gap between theory and practice. What is also striking about the three papers is that none dismisses the possibility that a serious financial disruption could occur, although each comes to that view from a somewhat different vantage point.

Overview

My task, as I understand it, is to add something of my own personal perspective to the discussion as a whole. With that in mind, let me start with several general comments:

First, all three of the background papers grapple with the definition of "crisis," and to varying degrees they attempt to distinguish between types of crises. While I have great difficulty coming up with neat definitions in this area, some useful distinctions can be made. For example, "financial disruptions" can be distinguished from "financial crises" by means of the extent of the damage they inflict on the real economy. That is, the term "crises" should be reserved for those episodes that cause clear and significant damage to the real economy. However, even that distinction may be misleading in that it may ignore or unduly downplay the extent to which a financial disruption has the potential to inflict serious damage on the real economy if left unattended or if handled irresponsibly.

Second, with the above distinction in mind, my personal perspective is one that is tempered by direct experience in dealing with quite a few financial disruptions, but no financial crises, since even the 1987 stock market disruption seems to have had little or no effect on the real economy.

The line between "disruption" and "crisis" can be fine indeed, since it is not at all difficult to imagine circumstances in which specific "disruptions" of the past ten or fifteen years could have tripped into the category of "crises."

However, as suggested above, the line between "disruption" and "crisis" can be fine indeed, since it is not at all difficult to imagine circumstances in which specific "disruptions" of the past ten or

Paper prepared by E. Gerald Corrigan, President of the Federal Reserve Bank of New York, for the National Bureau of Economic Research (NBER) Conference on Reducing the Risk of Economic Crisis. The conference was held in October 1989. In January 1990, the paper was submitted to the NBER for publication.

fifteen years could have tripped into the category of "crises." Indeed, I can readily think of a number of examples of "financial disruptions" that clearly had at least the potential for causing serious if not systemic damage.

Some might feel that this is an exaggeration. Perhaps so, but the hard fact is that when the phone rings, informed judgments have to be made and often they have to be made very quickly in the face of limited and conflicting information. Those initial judgments almost always center on an assessment of whether a given situation has systemic implications and, if so, the nature and extent of such implications. Those initial assessments are also always made in a context in which you know that losses and even failures provide a necessary element of discipline to the system. Thus, efforts to protect the system should not protect those whose miscalculations or misdeeds caused the problem in the first instance.

Third, as I see it, the past fifteen years have witnessed a greater number of financial disruptions with potential systemic implications than was the case over the postwar period prior to 1974. And if we divide the 1974-89 period roughly in half, the latter half of that interval has seen more disruptions than the former, especially in a context in which the last seven years have been characterized by uninterrupted economic expansion—a point Ben Friedman stresses in his paper. At the risk of oversimplification, I believe there are three reasons that the past fifteen years have seen such a high incidence of financial disruptions. First, macroeconomic policies and performance—perhaps especially the tacit acceptance of deficits, debt, and inflation—have contributed both directly and indirectly to elements of volatility and risk taking in financial markets and in other elements of economic activity. Second, financial innovation and technological advances in the financial markets are two-edged swords. These developments clearly provide important new choices and benefits to savers and investors alike, but they are also the source of new elements of risk and volatility. Finally, there is far, far too much emphasis on short-term returns and rewards, surely here in the United States but elsewhere as well.

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If a crisis were to develop, I believe its capacity to generate major damage to the real economy may be greater today than it was in the past. The fundamental reason for this is the nature, speed, and complexity of the operational, liquidity, and credit interdependencies that bind together all major financial institutions and markets in the world.

The *last* general point I would make is that I believe that, looking forward, the risks of financial crises—as distinct from financial disruptions, which are sure to occur—are something more than zero. Since that may be interpreted as a provocative statement, allow me to elaborate. It is probably fair to say that automatic stabilizers and other institutional changes have—as suggested in all three background papers—reduced the statistical probabilities of a financial disruption turning into a crisis. But, and this is a very big but, if a crisis were to develop, I believe its capacity to generate major damage to the real economy may be greater today than it was in the past. The fundamental reason for this is the nature, speed, and complexity of the operational, liquidity, and credit interdependencies that bind together all major financial institutions and markets in the world. In Bagehot's day, and long before, the first precept in banking and finance was "know your counterparty." Today, that's not nearly good enough.

The seeds of many of the financial disruptions we have seen in recent years were sown in the decade between 1969 and 1979, when attitudes about inflation were all too sanguine. More recently, we have made the implicit decision that we can live with huge internal and external deficits and correspondingly high levels of public and private debt.

Indeed, in Bagehot's day, the managers of financial institutions understood very well the nature of the transactions that were generating income and profits; today, that is often not the case. That, of

course, raises the question whether financial management has fully caught up with today's incredibly complex financial marketplace.

Some diagnostics of recent financial disruptions

Against that general background, let me now turn to some diagnostics of the financial disruptions I have had some direct exposure to over the past fifteen years to see what common denominators—if any—may be present. Such an exercise may be helpful in identifying approaches and policies that, at the least, can help check problems when they arise but maybe—just maybe—can also help in the formulation of approaches that reduce the incidence of such disruptions.

The *first* factor I want to cite in this regard I have already touched on, and that, of course, is macroeconomic policy and performance. There is no question in my mind that the seeds of many of the financial disruptions we have seen in recent years were sown in the decade between 1969 and 1979, when attitudes about inflation were all too sanguine. More recently, we have made the implicit decision that we can live with huge internal and external deficits and correspondingly high levels of public and private debt. Directly and indirectly, the resulting economic and financial environment produces patterns of behavior and expectations that surely work to increase risk and fragility in the financial system.

There is another phenomenon, which I call the "illusion of liquidity." That is the belief—obviously unfounded—by many market participants that they are that much smarter or that much quicker, or that their stop-loss strategy is that much better, so as to permit them to take profits and get out when markets turn while others take the losses.

The *second* factor I would cite is concentrations of activities or exposures by financial institutions. Concentrations take many forms: exposures to a single borrower, exposures to a single industry, exposures to a single instrument, exposures to a single class of borrower, or exposures to a single commodity. However concentration is defined, I am hard pressed to think of a single episode of financial disruption in recent years that did not entail some element of concentration on the part of the institution or institutions that got into trouble.

The *third* factor I would cite is what Paul Krugman calls the "bandwagon" effect. Beyond its obvious forms, there is a curious twist on this phenomenon. Namely, financial innovations (new instruments, trading strategies, etc.) that initially produce high rates of return for the innovator tend to be very short-lived in the financial sector because they are so easy to duplicate. However, the "bandwagon" effect, reinforced by the illusion of permanent high rates of returns, tends to draw relatively unsophisticated players into such activities at just the wrong time. As a further extension of the "bandwagon" effect, there is another phenomenon, which I call the "illusion of liquidity." That is the belief—obviously unfounded—by many market participants that they are that much smarter or that much quicker, or that their stop-loss strategy is that much better, so as to permit them to take profits and get out when markets turn while others take the losses.

Payment and settlement systems are of special importance because such systems can be the vehicle through which a localized problem can very quickly be transmitted to others, thereby taking on systemic implications.

A *fourth* factor that has been present in most financial disruptions of the past fifteen years is the threat of dislocation in payment, settlement, or clearing systems. This has been reasonably well documented in the case of the stock market crash, but very difficult and potentially very serious problems with payment and settlement systems have also been encountered in other episodes over the past fifteen years. For example, both the Herstatt situation in 1974 and the silver market disruption in 1980 presented major problems of this nature. Needless to say, payment and settlement systems are of special importance because such systems can be the vehicle through which a localized problem can very quickly be transmitted to others, thereby taking on systemic

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implications.

A *fifth* factor I would cite, but with some trepidation, is the possibility that financial markets — or at least some segments of financial markets — may be characterized by a condition of overcrowding such that spreads and returns do not fully compensate for risks. In saying this, I know full well that the textbooks would say this condition cannot exist for long. The textbooks would also say that the solution to overcrowding is exit — graceful or otherwise. That is, of course, one of the things I worry about. Namely, if the overcrowding hypothesis is correct, can the implied shrinkage and consolidation occur in an orderly way, recognizing that financial institutions are not gas stations?

A *sixth* factor that must be cited is plain old-fashioned greed, which in all too many cases has given rise to fraud and other elements of criminal activity. Indeed, we have seen cases in which widespread violations of criminal statutes have occurred and numerous other examples of reckless and irresponsible behavior that I find utterly shocking. Needless to say, the problem of blatantly excessive risk taking is more likely to be a problem in the case of thinly capitalized institutions since the owners have so little to lose if things go sour.

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A *seventh* and final factor that must be cited relates to supervisory gaps or, even worse, breakdowns in the supervisory process. The worst example of this, by far, is to be found in the thrift industry situation, which saw not only a breakdown in the supervisory process but a public sector "bailout" of incredible proportions. However, the silver market disruption, the Ohio thrift problem, and the stock market crash all revealed at least some troubling elements of supervisory gaps or shortcomings in the supervisory process itself. Even today, I regard the absence of any form of consolidated oversight of major securities companies as a defect in the supervisory framework in the United States.

In this context, I am mindful that questions have also been raised about the effectiveness of the bank supervisory process in cases such as the Continental Illinois failure and the major Texas bank failures. More specifically, the question is often asked as to why the bank supervisors were not able to identify and stop the patterns of behavior that gave rise to these problems before they reached the proportions that ultimately caused failures and the large costs to the deposit insurance fund.

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While each of the financial disruptions of the past fifteen years was very distinct, every episode I can think of had elements of most of the seven factors cited above associated with it. Having said that, allow me to stress that the diagnostics of financial disruption is useful only up to a point. What may be even more important is the traits of firms or markets that have generally avoided problems or the patterns of behavior that have permitted firms to overcome problems without reliance on public funds or other forms of public support. Here it is clear that comfortable margins of capital and liquidity, combined with diversification of activities and exposures and strong management and control systems, are the keys to success in avoiding problems and overcoming them when they arise.

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Some myths about financial disruptions

Having shed some light on common denominators that have been present in most if not all of the financial disruptions of the past fifteen years, I would now like to turn my attention to several of what I regard as popular myths that tend to be associated with the folklore of financial disruptions. I will cite seven such myths:

First, there is the view that systemic concerns are uniquely associated with large financial institutions or, more particularly, with large banks. That is simply not true on two counts: first, large securities houses present many of the same systemic issues that arise with large banks; and sec-

ond, troubled institutions need not be large *or* be banks to raise systemic concerns. The best illustration of this is to be found in the chain of events triggered in 1985 by the failure of E.S.M., a small government securities firm in Florida. That seemingly inconsequential failure triggered the Ohio and Maryland thrift problems and the failure of Bevill, Bressler, and Schulman, a small government securities dealer in New Jersey; placed in jeopardy several insurance companies; and came very close to producing full-scale gridlock in the entire mortgage-backed securities market. This sequence of events produced headlines in newspapers throughout the world, uncovered hundreds of millions of dollars in losses for the affected institutions, and resulted in a number of individuals being convicted of criminal violations. However, none of the institutions involved was "large," none was a bank, and none had federal deposit insurance. Yet by any definition, the sequence of events had the clear potential to produce systemic damage.

There is the view that systemic concerns are uniquely associated with large financial institutions or, more particularly, with large banks. That is simply not true on two counts....

The *second* myth I want to touch on is the bank "bailout" myth in general and, more specifically, the "too big to fail" myth. For these purposes I want to draw a sharp distinction between banks and thrifts because I believe it important that the banking sector not be penalized unjustly by virtue of the problems in the thrift industry and the extraordinary blend of circumstances that gave rise to those problems.

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In banking, as historically defined, the term "bailout" is a misnomer, and I believe there is more to the distinction than semantics. In point of fact, banks—including large banks—have failed, and in the process the shareholders and management have not been bailed out. To be sure, the process of closing, merging, and/or recapitalizing problem or failed banks has cost money, but the funds used for these purposes have, virtually without exception, been provided out of the deposit insurance fund that is funded by the banking industry itself.

Having said that, there is no question that large financially troubled institutions present special difficulties simply because they, by definition, carry with them greater systemic risk and greater threats to public confidence. For these reasons, governments at all times and in all places have been reluctant to run the risk of the sudden and uncontrolled failure of large depository institutions—a pattern we see even in countries that have no formal deposit insurance system. The problem, however, is not so much that large institutions are too large to fail, for large institutions have failed. Rather, the problem is that authorities are reluctant to tolerate the sudden and uncontrolled failure of large institutions and therefore generally opt for managed shrinkage, merger, or recapitalization in a context in which shareholders and management are generally wiped out.

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Looked at in that light, neither equity holders nor senior managers of failed institutions—including large institutions—have any reason to believe they will be bailed out. Yet, we are all acutely sensitive to the so-called moral hazard problem, which in effect postulates that banking and financial market participants take on undue elements of risk in the belief that public authorities will somehow protect them from the risks of loss and/or failure.

There can be no doubt that the moral hazard problem is quite real, just as there can be no doubt that the failure of large institutions presents special problems for the authorities. However, neither of these considerations need imply that any institution is too large to fail or that owners and managers—at the least—of such institutions

will not be severely penalized by virtue of such failures. Perhaps the balance of risks and rewards is somewhat out of kilter — at least at the margin — but even if this were true, it does not justify the all too widely held view that the authorities in this country — to say nothing about other countries — systematically and irresponsibly bail out financial institutions, small or large. That is not to say, however, that there is not greater room in the process for market discipline, for surely there is.

The *third* myth I want to comment on is the one that says disclosure — or more disclosure — is something of a panacea that can solve the market discipline problem. While I am obviously all in favor of disclosure, I think it is sheer fantasy to assume that individual investors and depositors — and perhaps even large and relatively sophisticated investors and depositors — can make truly informed credit judgments about highly complex financial instruments and institutions. Even now

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we may have a condition of information overload in a setting in which even the professional rating agencies have their problems. Continental Illinois and the major Texas banks were investment grade rated during the time interval in which they were acquiring the assets and the concentrations that led to their demise. Once again, this is not to say that disclosure and/or better forms of disclosure cannot play a useful and constructive role in helping the market discipline process along, but only to suggest that the benefits of even the most optimal forms of disclosure are not as great as is assumed by many commentators.

Fourth, there is the view that firewalls are failsafe and can fully insulate the insured depository or the registered broker-dealer from the misfortunes of its parent or affiliated companies. Not only is that view highly questionable in practice but, in the extreme, firewalls can increase risk rather than contain it. That is, to the extent we depend excessively on legislative or regulatory firewalls, we may encourage riskier types of behavior or construct barriers that stand in the way of prudent intracompany flows of liquidity or of capital that can, in particular circumstances, help to minimize problems. Because of this, I believe strongly in the principle of consolidated supervision and resist the combinations of banking and commercial firms. Finally, while firewalls may work the wrong way on safety and soundness grounds, I do believe they play a very necessary and useful role in limiting conflicts of interest and unfair competition.

While firewalls may work the wrong way on safety and soundness grounds, I do believe they play a very necessary and useful role in limiting conflicts of interest and unfair competition.

While on the subject of firewalls, I should also acknowledge that in the eyes of many practitioners, the presence of complex regulatory firewalls in the context of the bank holding company structure places U.S. firms at a significant disadvantage in relation to their international competitors. While there is something to this view, it is very difficult to judge how important this factor may be in competitive terms. What is clear, however, is that the differences in structure do introduce political tensions in the application of national treatment principles to banking and securities firms operating in foreign markets.

The next myth, the *fifth,* is that market participants, or even the central bank, can readily distinguish liquidity problems from terminal financial problems in the very short run. This is simply not always the case. This reality has enormous impli-

The next myth, the *fifth,* is that market participants, or even the central bank, can readily distinguish liquidity problems from terminal financial problems in the very short run. This is simply not always the case.

cations for the way market participants will behave in the face of uncertainty. For example, had it been clear from the outset that the stock market crash of 1987 would not result in any solvency problems of consequence, the near gridlock conditions that prevailed in financial markets at times in the days after October 19 would not have occurred. However, in the face of uncer-

tainty, market participants tend to hold back on credit extensions, delay payments, or hold back on the delivery of securities or collateral, as is suggested in Larry Summers' October 1991 scenario. Unfortunately, in these circumstances, what may start out as a liquidity problem can all too easily become a far more serious problem, ultimately giving rise to the risk of failures or insolvencies.

The inability to distinguish liquidity from solvency problems in the very short run can also have implications for the supervisor and the lender of last resort. For the supervisor, the problem can be the legal and policy ramifications of closing or taking over a troubled institution in a context in which it may be clearly capital deficient but not so clearly insolvent. For the lender of last resort, there is the danger of violating Bagehot's first principle of "never lending to unsound people." I might add in this context that the problem of distinguishing between liquidity and solvency becomes all the more difficult in a globally integrated financial system in which large institutions may have dozens, if not hundreds, of branches, subsidiaries, and affiliates scattered throughout the world.

The problem of distinguishing between liquidity and solvency becomes all the more difficult in a globally integrated financial system in which large institutions may have dozens, if not hundreds, of branches, subsidiaries, and affiliates scattered throughout the world.

The *sixth* myth I want to discuss is the view that there is something fatally and irreversibly flawed with the U.S. system of deposit insurance that in turn seriously complicates the moral hazard problem. Here again, I want to focus particularly on commercial and bank deposit insurance. The argument is rather straightforward: namely, the mere presence of a system of officially supported deposit insurance — but especially one that has gravitated towards full insurance of all deposits — largely eliminates market discipline and promotes excessive risk taking.

It seems to me that at least in its extreme form, this argument can be challenged on several grounds. First, in a number of other countries, even where there is no system of deposit insurance, the authorities are generally no more willing to allow depositors to incur losses than they are in this country, and if anything, in many cases they may tend to be more cautious with respect to their willingness to permit banks or other financial firms to fail in a disorderly manner. Second, in every case of a severely troubled bank — including those that have overcome problems — we have seen significant deposit outflows. This of course suggests that at least some depositors — typically large and/or overseas depositors — do not fully accept the notion of full insurance. Finally, as noted earlier, shareholders and managers of failed banks have in fact been systematically and seriously penalized for their mistakes.

In a number of other countries, even where there is no system of deposit insurance, the authorities are generally no more willing to allow depositors to incur losses than they are in this country, and if anything, in many cases they may tend to be more cautious with respect to their willingness to permit banks or other financial firms to fail in a disorderly manner.

These remarks should not be construed to imply that I believe that there are no constructive opportunities to strengthen the workings of the deposit insurance system. Rather, the point is that we should be careful in approaching the task of reform. For example, the suggestion of subjecting offshore deposits in branches of U.S. banks to insurance premiums — whatever its merits on other grounds — runs the clear risk of further broadening the appearance of de facto full insurance and thereby changing the behavior of the one class of depositor that clearly exerts a powerful element of market discipline on major banks. I have similar reservations about risk-based deposit insurance premiums on the grounds that they may simply be viewed by some as a license to be even more risk-prone in their activities.

These remarks should not be construed to imply that I believe that there are no constructive opportunities to strengthen the workings of the deposit insurance system.

On the other hand, proposals to deal with the obvious abuses of the brokered deposit market, to find faster and surer ways to merge, close, or take over seriously troubled institutions, and to

strengthen both the amount and structure of capital all warrant careful study in a context in which the 1989 Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) has already put in place a number of constructive reforms. At the end of the day, however, the keys are the factors I cited earlier: abundant amounts of capital — especially equity-like and unencumbered debt capital — and a strong yet flexible supervisory apparatus.

The *final* myth I want to mention is the idea that central banks can "solve" financial disruptions simply by providing individual institutions or the market at large with ample liquidity. Before going into this subject further, it is important to recognize that the contemporary central bank can provide liquidity in *at least* two ways: one is the traditional lender of last resort function via the discount window, and the second is open market operations. Depending on the nature and source of the disruption, either or both may be appropriate and either or both can provide important elements of flexibility. However, in the face of major uncertainties — especially relating to the creditworthiness of major institutions — there is no guarantee that even the provision of generous amounts of central bank liquidity can necessarily prevent a "disruption" from becoming a "crisis." Larry Summers' paper makes it plain that others recognize this possibility when he raises questions about the extent of moral suasion (arm twisting) on major banks in the wake of the October 1987 market break. You will understand why I object to phrases like "arm twisting," but hopefully you will also understand my conviction that in times of stress the central bank must be prepared to provide not just liquidity but also leadership — consistent, of course, with the exercise of individual credit and business judgments by particular institutions in the marketplace. But for observers and practitioners to assume that central banks have a magic wand of liquidity and moral suasion that can overcome each and every problem is simply wrong and, even worse, dangerous.

For observers and practitioners to assume that central banks have a magic wand of liquidity and moral suasion that can overcome each and every problem is simply wrong and, even worse, dangerous.

Having said all of that, there is another side to the lender of last resort issue that is raised in Ben Friedman's and Paul Krugman's papers. Specifically, Ben raises the specter that the central bank will have to "cave in" on inflation in order to avoid financial disorder while Paul suggests the possibility that the process of providing liquidity to contain a financial disruption could trigger an international run on the dollar. These dangers are very real, but I believe it is possible to provide needed amounts of liquidity in the short run without necessarily having to compomise the basic thrust of monetary policy, and I believe that the events of October 1987 can be looked at in precisely that light.

Needless to say, however, if a "disruption" tilts into a crisis, the balancing act becomes all the more difficult, although in those circumstances, immediate concerns about current and prospective inflation would be significantly dampened, if not eliminated.

Conclusion

The focus of this article is diagnostic rather than remedial. Therefore I will not at this time attempt to outline a long or a short list of public or private initiatives that could reduce elements of fragility and volatility in financial markets. Nevertheless, throughout the text are numerous comments that point in the directions in which I believe public policy should be moving. More generally, I would offer two closing comments. The first would be the importance of sound overall macroeconomic and structural policies, keeping in mind that the roots of many of the financial problems we have seen can be traced to the policy fundamentals — fundamentals that include the need to reform and modernize the structure of the financial system. The second would be that we not lose sight of the fact that the primary burden of securing the safety and integrity of financial institutions and markets lies not with the authorities but with financial market practitioners and most especially the directors and senior management of individual firms.

The primary burden of securing the safety and integrity of financial institutions and markets lies not with the authorities but with financial market practitioners and most especially the directors and senior management of individual firms.

Do Margin Requirements Matter? Evidence from U.S. and Japanese Stock Markets

The October 1987 stock market crash has prompted regulators to seek out policy tools that can control abrupt stock price changes and market volatility. The sudden 23 percent drop in stock prices in a single day was a reminder that the market is often dominated by investors whose actions may violate economists' rules of rational behavior. One possible curb on volatility and "irrational" speculation that has recently generated some interest is the use of margin requirements. This article considers whether margin requirements are in fact an effective policy tool. It reviews the evidence on the relationship between margin rules and volatility in the United States and offers new evidence drawn from the Japanese experience with margin requirements.

The function of margin requirements in the stock market is to restrict the amount of credit that brokers and dealers can extend to their customers for the purpose of buying stocks.[1] The U.S. Congress first imposed official margin requirements on stock transactions in 1934, after a period of great turbulence in the stock market. Congress believed that the margin restrictions would rid the market of highly leveraged speculators and hence lead to greater stability. The Federal Reserve, given jurisdiction over the appropriate level of margin requirements, changed the official margin requirement twenty-two times between 1935 and 1974 in response to what it perceived as excessive speculation (or the lack of sufficient speculation) in the market. In the last fifteen years, however, the Federal Reserve has effectively suspended the use of margin requirements as a policy tool.

The effect of margin requirements on the U.S. stock market has been the focus of many empirical studies. Most earlier studies concentrated on the effect of margin requirements on the level of the market: they found that increases in margin requirements decreased stock prices while decreases in margin requirements boosted stock prices, although both effects were weak.[2] Only two of the earlier studies, one by Douglas (1969) and another by Officer (1973), concentrated on stock market volatility.[3] Both authors found a negative association between the level of official margin requirements and stock market volatility. Recently, one of the authors of this *Quarterly Review* article corroborated the findings of Douglas and Officer and extended the analysis by examining excess volatility — volatility that cannot be explained by the variability of the economic environment — and long-run deviations of stock prices from their fundamental values. He concluded that in periods

[1]For example, an official margin requirement of 60 percent implies that an investor can only borrow up to $40 in order to buy a stock worth $100.

[2]See Jacob Cohen, "Federal Reserve Margin Requirements and the Stock Market," *Journal of Financial and Quantitative Analysis,* September 1966, pp. 30-54; James Largay, "100% Margins: Combating Speculation in Individual Security Issues," *Journal of Finance,* September 1973, pp. 973-86; and Dudley Luckett, "On the Effectiveness of the Federal Reserve's Margin Requirement," *Journal of Finance,* June 1982, pp. 783-95. Luckett finds that investors' equity in their margin accounts with brokers is affected negatively by a change in margin requirements. For further references, see Gikas Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices," Federal Reserve Bank of New York, Research Paper no. 8818, to be published in the September 1990 *American Economic Review.*

[3]George Douglas, "Risk in the Equity Markets: An Appraisal of Market Efficiency," *Yale Economic Essays,* Spring 1969, pp. 3-45; and R. Officer, "The Variability of the Market Factor of the New York Stock Exchange," *Journal of Business,* vol. 46 (July 1973), pp. 434-53.

of high margin requirements and in periods when margin requirements increase, excess volatility is low and deviations from fundamentals tend to subside.[4]

These empirical findings have sparked a number of new studies disputing the effectiveness of margin rules. These studies question the extent of the negative effect of margin requirements on actual volatility but do not address the findings about the reduction of excess volatility and long-run stock price deviations from fundamentals.[5]

The existence of such distinctly different points of view on the effectiveness of margin rules is partly attributable to the small sample that is available for empirical analysis—a total of twenty-two changes in margin requirements. Because of the small sample size, the negative association between margin requirements and stock market volatility cannot be estimated very precisely. Hence, the evidence is not sufficiently strong to alter some economists' belief that regulatory restrictions on the stock market are ineffective.

This article seeks to remedy the small sample problem and expand the available evidence by examining the Japanese experience with margin requirements. While margin requirements in the U.S. market changed twenty-two times over the last fifty-five years, margin requirements in the Japanese market changed over one-hundred times in the last thirty-five years. The more frequent margin changes in Japan provide considerable statistical power that should shed light on the contested effectiveness of margin regulation. Furthermore, Japanese authorities, unlike their U.S. counterparts, administer margin requirements very actively even today. Hence the recent Japanese experience with margin requirements may provide significant additional information about the contemporary impact of margin policy.

The article is organized as follows: We begin by presenting the theoretical link between margin requirements and volatility and then review the recent evidence on the effects of margin requirements on the volatility of U.S. stock prices. The next three sections shift the focus to Japan. First, we review some institutional characteristics of the Japanese stock market and describe the regulation of margin trading. Next we estimate the average relationship between changes in margin requirements and changes in the momentum of stock prices over the sample period from 1951 through 1988. Finally, we extend the analysis to daily stock price volatility. The article concludes with a summary of our principal findings.

Margin requirements and volatility: is there a precise theoretical link?

Economic theory does not posit an exact and unambiguous link between margin requirements and volatility but does suggest that an increase in margin requirements is likely to lower excess volatility. In order for margin requirements to reduce excess volatility, they must impose a binding constraint on the market activities of investors, and they must primarily restrict the behavior of destabilizing speculators.

The first of these requirements would be met if the alternative sources of credit available to investors for the purpose of investing in stocks were more costly. In this case, margin requirements—official quantity ceilings on the cheaper broker-dealer funds—would constrain the amount of total borrowing for the purpose of investing in stocks. This constraint would affect the equilibrium price in the market. In particular, one expects to observe that margin requirements bind during periods when financial markets are not fully developed and alternative sources of credit are scarce or when the overall supply of credit in the economy is tight.

Many economists would argue, however, that even if margin requirements have a binding effect on investors, such an effect is short-lived. Smart investors who like to obtain financial leverage in order to invest in stocks can find alternative sources of credit at no extra cost in the long run and hence undo the constraining effect of the increase in margin requirements.[6] This argument is only partly persuasive, however. In a dynamic market with new entrants and exitors every period, even a con-

[4]Gikas Hardouvelis, "Margin Requirements and Stock Market Volatility," this *Quarterly Review*, Summer 1988, pp. 80-89; and "Margin Requirements, Volatility, and the Transitory Component of Stock Prices."

[5]See G. William Schwert, "Business Cycles, Financial Crises and Stock Volatility," University of Rochester, William Simon Graduate School of Business, Working Paper no. 88-06, October 1988; David Hsieh and Merton Miller, "Margin Regulation and Stock Market Volatility," *Journal of Finance*, vol. 45 (March 1990), pp. 3-30; Paul Kupiec, "Initial Margin Requirements and Stock Returns Volatility: Another Look," *Journal of Financial Services Research*, vol. 3 (November 1989), pp. 287-301; Richard Roll, "Price Volatility, International Market Links, and Their Implications for Regulatory Policies," *Journal of Financial Services Research*, vol. 3 (November 1989), pp. 211-46; Michael Salinger, "Stock Market Margin Requirements and Volatility: Implications for Regulation of Stock Index Futures," *Journal of Financial Services Research*, vol. 3 (November 1989), pp. 121-38; Raman Kumar, Stephen Harris, and Don Chance, "The Differential Impact of Federal Reserve Margin Requirements," Virginia Polytechnic Institute, November 1988, mimeo. For a response to these arguments, see Gikas Hardouvelis, "Commentary: Stock Market Margin Requirements and Volatility," *Journal of Financial Services Research*, vol. 3 (November 1989), pp. 139-51.

[6]For a related argument, see Michael Goldberg, "The Relevance of Margin Regulations," *Journal of Money, Credit and Banking*, vol. 11 (1985), pp. 521-27. Hardouvelis ("Margin Requirements, Volatility, and the Transitory Component of Stock Returns," Tables 5b, 6c) does present evidence consistent with the view that in the period immediately following a margin increase, the effects of margin requirements are stronger.

stant level of margin requirements can reduce the amount of leverage of the new entrants and consequently affect the price fluctuations in the stock market.

The second requirement if margin requirements are to reduce excess volatility is that their force be felt primarily by destabilizing speculators. Finance theory suggests that the less risk-averse investors hold more stocks and less cash in their portfolios and are likely to lever themselves through the use of broker-dealer margin credit. Hence it is the aggressive, risk-prone investors that will be affected by the imposition of margin requirements. If the same aggressive investors are influenced by waves of optimism and pessimism and do not pay proper attention to economic fundamentals, they will create unnecessary market volatility. This volatility can be reduced by the imposition of margin requirements.

Economists who reject the view that an increase in margin requirements decreases destabilizing speculation and market volatility argue that the market is dominated by rational investors and that speculation by rational investors is a stabilizing force overall. In their opinion, increasing margin requirements is harmful to the market. An increase in the cost of investing in stocks will lead to reduced participation in the market by rational investors, less liquidity, and ultimately, higher volatility.

The question whether speculation — even by rational investors — is stabilizing or destabilizing cannot be resolved theoretically. Economists have constructed models in which speculation can either stabilize or destabilize prices.[7] It follows that the effect of margin requirements on excess market volatility also cannot be determined theoretically and will require some form of empirical test.

Margin requirements in the U.S. stock market: a review

The evidence from the cash market

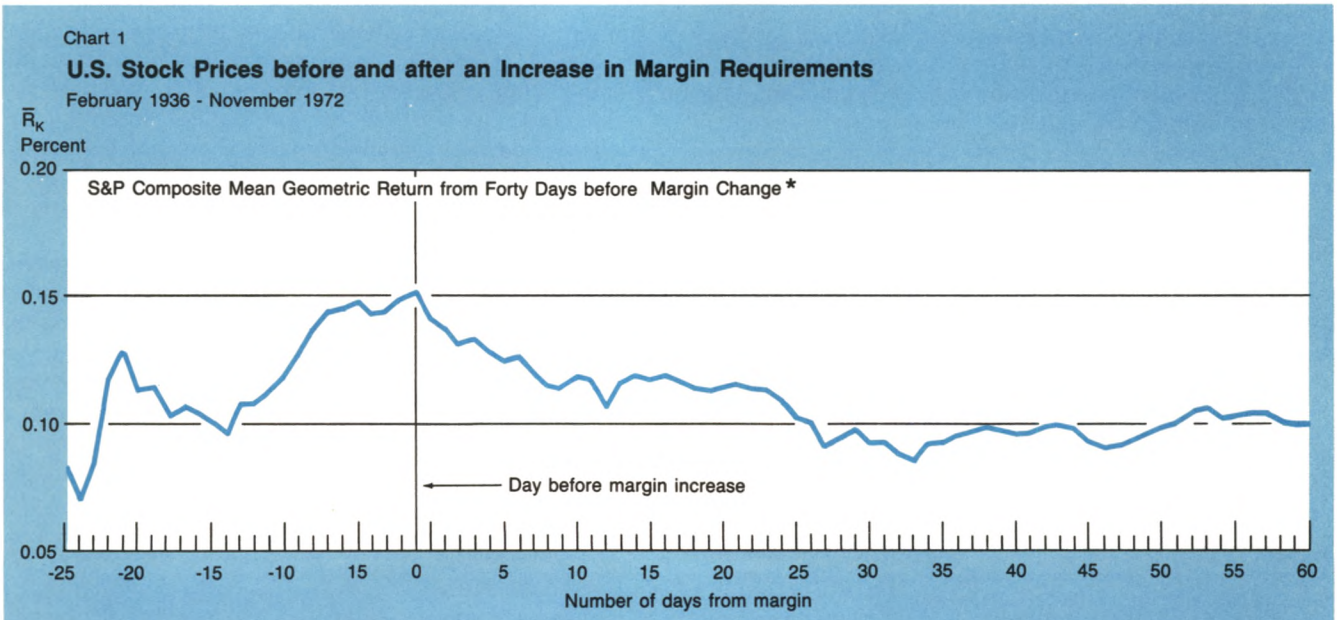
We now turn to a brief summary of the U.S. stock market experience with margin requirements. Chart 1 illustrates the momentum of stock prices before and after an increase in margin requirements. Chart 2 repeats the same analysis for a margin decrease. For each business day, the charts show the total return excluding dividends — average geometric daily capital gain or loss — obtained by investors who buy the portfolio of stocks in the Standard and Poor's 500 index on the fortieth business day before the margin change and subsequently sell the same portfolio of stocks k busi-

[7] See, for example, Oliver Hart and David Kreps, "Price Destabilizing Speculation," *Journal of Political Economy,* vol. 94 (October 1986), pp. 927-52. Hart and Kreps show that rational investors can destabilize prices.

Chart 1

U.S. Stock Prices before and after an Increase in Margin Requirements

February 1936 - November 1972



* First fifteen observations were erratic and frequently fell off the scale; they are not shown in this chart.

ness days later (k = 15, ..., 100), that is, $R_k = (SP_{k-40}/SP_{-40})^{1/k}-1$, where SP denotes the Standard and Poor's index. The return of a business day k is estimated as the arithmetic average of individual returns across the eleven historical margin increases (Chart 1) or the eleven historical margin decreases (Chart 2). Chart 1 shows that margin requirements increase following a period of rising stock prices and that after the increase in margin requirements, stock prices decline slowly. Chart 2 shows that margin requirements decline long after the market falls and rebounds and that after the decrease in margin requirements, stock prices continue to increase. Overall, the evidence is consistent with an interpretation that margin requirements affect the movement of the market in the desired direction.

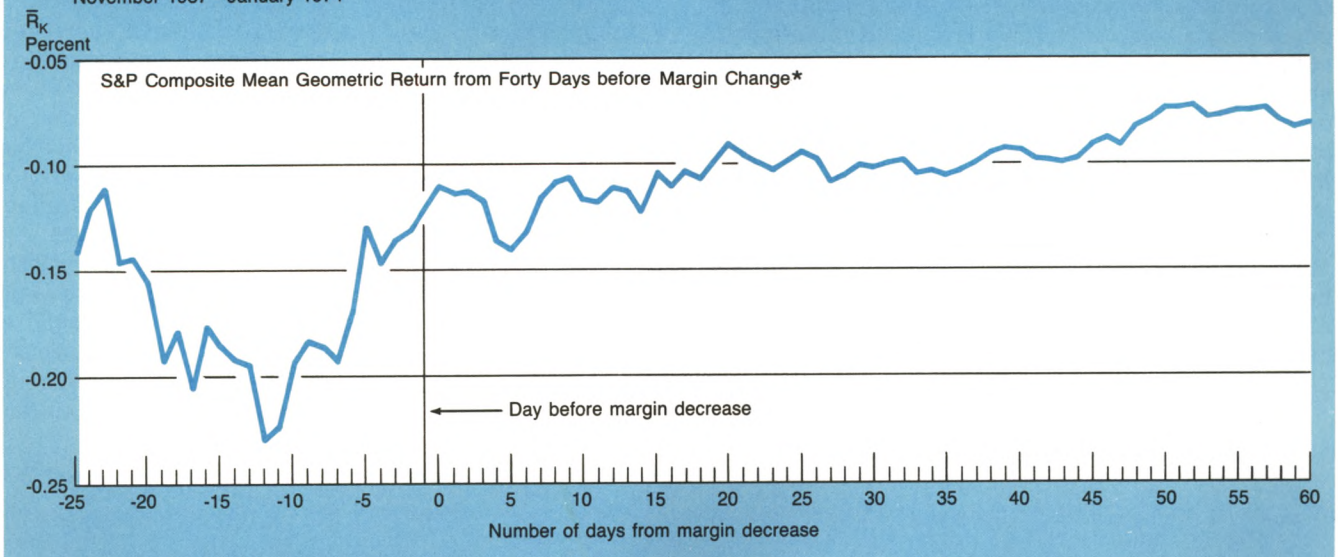
Most earlier studies of margin requirements concentrated on the market responses shown in Charts 1 and 2 and argued that these responses were economically and statistically insignificant. Observe that the evidence is particularly weak in Chart 2: the margin decrease does not occur until after the market rebounds, so it is unclear whether the margin decrease pushes prices up or the market simply follows its own upward momentum. Recent research, however, has shifted attention to the volatility of the market as opposed to the level of the market. The question asked is: Have margin requirements prevented the occurrence of unusual swings in stock prices? After all, one of the basic aims of margin regulation in the 1930s was to prevent the so-called pyramiding-depyramiding process in stock prices that was thought to result from the high degrees of leverage available to investors through broker-dealer loans. Congress believed that official margin requirements would restrain excessive speculation and reduce large unjustified stock price fluctuations.

One way to capture long swings in stock prices is to calculate the standard deviation of stock returns over a horizon long enough to allow the pyramiding-depyramiding process to run its course—a horizon, for example, of one year. The summer 1988 issue of this *Quarterly Review* presented evidence of statistically and economically significant negative association between the level of margin requirements and this measure of volatility. Of course, volatility per se is not a measure of speculative excess; part of the observed

Chart 2

U.S. Stock Prices before and after a Decrease in Margin Requirements

November 1937 - January 1974



*First fifteen observations were erratic and frequently fell off the scale; they are not shown in this chart.

stock market volatility is due to the variability of the fundamental determinants of stock prices.

The *Quarterly Review* article did not present evidence of the association between margin requirements and excess volatility, that is, volatility that cannot be explained by the variability of the economic environment. The study on which this article was based, however, showed that periods of high or increasing margin requirements are associated with lower excess volatility and smaller deviations of stock prices from their fundamental values.[8] Here we present an example that gives a flavor of these findings.

The example draws on the empirical observation that an increase in current price-dividend ratios is followed by a decrease in stock returns over a period of three months to five years.[9] Two alternative hypotheses are proposed to explain this negative correlation. The first hypothesis assumes that the market is often subject to destabilizing speculation. It runs as follows: A high price-dividend ratio reflects an overvalued market. Later, stock prices fall, lining up closer to fundamentals, and this movement generates a negative return. The second hypothesis assumes a rationally priced market and asserts that a high price-dividend ratio is due to a low risk premium. The low subsequent stock returns simply reflect a low reward for the small amount of risk that market participants rationally expected to assume. It turns out that the size of the negative correlation between price-dividend ratios and subsequent stock returns varies with the level of margin requirements. The negative correlation is weaker in periods of high margin requirements and in periods when margin requirements increase. This evidence suggests two possibilities: high or increasing margin requirements reduce the degree of mispricing in the market and hence the long-term excess volatility that is generated by the presence of irrational price swings; or, high or increasing margin requirements reduce the perceived risk in the market. Under either interpretation, higher margin requirements are effective.

Recent studies responding to these volatility results have concentrated on the negative association between margin requirements and actual volatility rather than on the evidence of a relationship between margin requirements and excess volatility.[10] In general, the commentators do not disagree with the presence of an overall negative association between margin requirements and volatility, but they believe that such an association is not robust enough to justify the use of margin requirements as a tool for controlling market volatility. Unfortunately, the few historical episodes of a change in margin requirements provide very little statistical power for even the most carefully designed test of the effectiveness of margin requirements. The only way to obtain a decisive test is to examine other economies or other markets where margin requirements are administered on a more frequent basis.

Can futures data be used to examine the effects of margin requirements on volatility?

Margin requirements have been imposed on the Standard and Poor's 500 futures contract since its inception in 1982. The initial margin, a fixed dollar amount per contract, is designed to minimize the probability of default by any single investor and thus to ensure the smooth functioning of the market. In setting the appropriate amount of margin, the exchange's margin committee takes into account the expected future volatility of futures prices so that the margin money will be sufficient to cover losses arising from a single day's unusual price fluctuation.[11]

Futures margin requirements are substantially lower than the cash market margin requirements, and for this reason, the current policy debate on the appropriate level of margin requirements has focused on futures margins. The question of immediate regulatory concern is whether an increase in futures margins would decrease stock market volatility. This question is hard to answer with direct empirical evidence, however, because futures margin requirements have changed only eight times since 1982 and three of these changes occurred in October 1987 following the stock market crash. In fact, the few changes in futures margin requirements provide even less statistical power for testing the hypothesis that margin requirements affect volatility than do the cash market margin changes.

Another problem in correlating stock market volatility with futures margins could not be solved even if a large number of futures margin changes had taken place. The margin committee increases futures margins in anticipation of an increase in volatility and revises its expectations of future volatility based on what happens to current

[8]See Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices."

[9]Eugene Fama and Kenneth French, "Dividend Yields and Expected Stock Returns," *Journal of Financial Economics*, vol. 22 (October 1988), pp. 3-25.

[10]See the Appendix for a brief summary of these studies and a discussion of their relevance. A detailed response to the studies is

Footnote 10 continued
contained in Hardouvelis, "Commentary: Stock Market Margin Requirements and Volatility."

[11]See the summer 1988 *Quarterly Review* articles by George Sofianos, "Margin Requirements on Equity Instruments," pp. 47-60; and Arturo Estrella, "Consistent Margin Requirements: Are They Feasible?" pp. 61-79.

volatility relative to the past. Consequently, there is a built-in positive correlation between margin changes and volatility changes that reflects a causal link from volatility to margin changes. For example, four of the eight futures margin changes occurred over a two-month period following the stock market crash of October 1987. Volatility increased after the crash, and subsequently the exchanges increased margin requirements three times in October 1987. Then, when volatility began to decline in late November, the exchanges apparently revised their volatility estimates downward and decreased margin requirements in mid-December. Thus, any study that attempts to correlate futures margins with volatility would be biased in favor of a positive association.[12] Such a bias does not exist in cash market margin requirement studies. In the cash markets, the authorities have traditionally responded to run-ups and rundowns of prices but not to daily volatility.

Since futures markets cannot provide reliable evidence to test the effects of margin requirements on destabilizing speculation, we look next to foreign cash markets in which authorities follow an active margin policy. Of the markets in this group, the Japanese market is the logical choice for analysis because it is the largest foreign stock market in terms of both capitalized value and trading volume.

Margin requirements in Japan: the regulatory structure

Institutional structure of the Tokyo Stock Exchange

Japan currently has eight stock exchanges and a small over-the-counter market. The Tokyo Stock Exchange (TSE) is the largest of the exchanges and has gained significance over time. The TSE's share in stock trading increased from 56 percent in 1950 to 86 percent in 1988.[13] The average daily volume in 1988 was 1,035 million shares, worth 1,045.9 billion yen (about $7.7 billion).[14] By comparison, the New York Stock Exchange (NYSE) has a volume of 161 million shares with an approximate value of $5.4 billion. Financial institutions own 44.6 percent of the shares at the TSE, business corporations 24.9 percent, securities companies 2.5 percent, the government 0.8 percent, individuals 23.9 percent, and foreigners 3.6 percent. Individual stock ownership has declined relative to the ownership of financial institutions and business corporations over time.

The TSE divides listings into two categories. The first category, termed the "First Section," encompasses listings of the largest companies. New companies are usually classified in the "Second Section." At the end of each business year, the exchange reviews all stock listings. Qualified Second Section companies are moved up to the First Section, and First Section companies that fail to meet the appropriate criteria may be relegated to the Second Section. Foreign stocks are treated according to different criteria and are classified in the "Foreign Section." At the end of October 1989, 1,705 stocks were listed on the TSE. Of these, 1,156 were listed on the First Section, 433 on the Second Section, and 116 on the Foreign Section.[15]

The TSE and the other Japanese stock exchanges are best described as auction markets. Their microstructure is quite different from American and British exchanges, in which specialists act as market makers. There are market makers in Japan, called *saitori,* but they are not allowed to trade on their own account. Currently, there are 4 *saitori* members and 114 regular members at the TSE. Regular members are brokers and dealers who can trade on behalf of their own accounts or their customers' accounts. All orders are placed by regular members and are handled by the *saitori* members, who execute orders according to well-specified auction rules. Stock trading takes place between 9:00 a.m. and 11:00 a.m. and between 1:00 p.m. and 3:00 p.m.

Although the most commonly cited index for the TSE is the Nikkei-Dow, the Japanese counterpart of the Dow-Jones index, a more comprehensive index is the Tokyo Stock Price Index (TOPIX). The TOPIX reflects all stocks traded in the TSE. It was introduced on July 1, 1969, and has been computed retroactively to May 1949, when trading began at the TSE. In our data analysis we use the TOPIX of the First Section stocks.

Until very recently, the TSE had no futures trading in stocks. On September 3, 1988, the TSE introduced trading in futures contracts based on TOPIX. As in the United States, these contracts carry very low margin requirements relative to the margin requirements in the cash markets and hence represent a cheaper method of leveraging. The introduction of futures contracts does not affect our empirical analysis, which focuses on cash market margin requirements. The last margin

[12] See, for example, Paul Kupiec, "Futures Margins and Stock Price Volatility: Is There a Link?" Board of Governors of the Federal Reserve System, December 1989, mimeo. Kupiec's analysis suffers from an additional problem because he correlates volatility with the margin requirement expressed as a percent of the value of the futures contract. This correlation is dominated by the positive association between the inverse of the stock price level and volatility, an association which is observed in the data even before the establishment of futures markets.

[13] See Shinji Takagi, "The Japanese Equity Market: Past and Present," *Journal of Banking and Finance*, vol. 13 (1989), pp. 537-70.

[14] See the 1989 *Tokyo Stock Exchange Fact Book*.

[15] The source is private correspondence with officials of the TSE.

change in the cash market that we examine occurred in June 1988, three months before trading began in the futures market.

Margin finance[16]

Finance companies play a major role in margin transactions. These companies were created by the Bank of Japan and the Ministry of Finance in 1950 to provide badly needed liquidity. The largest finance company is Japan Securities Finance Company (JSF), which is privately owned and handles margin transactions settled on the TSE. JSF borrows funds in the call market and from member firms and banks, and provides funds to securities houses; the securities houses then filter the funds to individual investors who purchase stocks on margin. JSF also lends stock certificates to securities houses, which subsequently make the certificates available to customers who wish to short sell on margin.

In the 1950s and 1960s, JSF dominated the market for margin finance. However, by the early 1970s Japan's four largest security houses — Nomura, Nikko, Daiwa, and Yamaichi — had improved their financial positions and obtained direct bank loans at interest rates lower than those offered by JSF. Their new ability to borrow from direct sources and their improved profitability enabled the big security houses to finance a growing portion of their margin clients internally. Since then, JSF's share in margin financing has dropped, although it continues to be the main source of funds for medium and small security houses.

At the end of October 1989, margin transactions represented 16.5 percent of all the "regular way" volume transactions.[17] In 1987 and 1988 the corresponding percentages were 16.7 and 19.6, respectively. These percentages are slightly below those of the early 1980s. The recent relative decline in margin trading may be partly attributed to the declining share of individual investors and to the greater activity of foreign investors, who are only allowed to deal on a limited margin basis.

Margin regulation

Margin regulation in Japan is broadly similar to margin regulation in the United States but has some special features of its own. Margin transactions were introduced in 1951, two years after trading began at the TSE. Originally, the margin loan had a maximum term of thirty days, but later the maximum term was extended to three months and then to six months.[18] The total interest on margin loans has an unusual feature: Customers who purchase securities on margin pay the quoted interest rate on the *full* amount of the stock transaction, not on the amount of the actual loan.[19] If customers continue to hold the stock after the expiration of the margin loan, the terms of the margin loan are recontracted. Customers who sell short borrow the securities from the brokers. Brokers keep the cash they receive from selling the securities on behalf of their customers and pay the customers interest. The interest rate received by margin short sellers is typically 4.5 percentage points below the interest rate paid by margin borrowers.

Margin regulation in Japan, as in the United States, specifies both initial and maintenance margin requirements. Initial margin requirements can be fulfilled by depositing either cash or securities. The securities can be either bonds or stocks. If the margin requirement is 60 percent and the investor chooses to deposit cash as collateral, the required amount of cash is 60 yen per 100 yen transaction. However, if the investor chooses to deposit securities in lieu of cash as collateral for the 100 yen loan, the market value of the required securities will be larger than 60 yen. Japanese authorities discount the market value of securities by a certain percentage, which is called the "loan value." For instance, if the loan value on collateral stocks is 70 percent, the investor is required to deposit stocks with a minimum market value of 60/.7 = 85.71 yen. The loan value varies with the type of security: 95 percent for government bonds, 90 percent for government-guaranteed bonds, 85 percent for other bonds, and 80 percent for convertible bonds. Stocks have a lower loan value than bonds. The loan value of stocks has varied over time but the loan value of bonds has remained constant.

Initial margin requirements are imposed only at the time of the transaction. After the transaction, the margin requirements become less strict and are called maintenance margins. In Japan, maintenance margins specify that the customer's capital with the broker must

[16]The information in this subsection and the following subsection comes from a variety of sources, the most important of which is private correspondence with TSE officials. See also Stephen Bronte, *Japanese Finance: Markets and Institutions*, Euromoney Publications Limited, London, 1982; *Securities Markets in Japan*, Japan Securities Research Institute, Tokyo, 1986; and *Tokyo Stock Exchange Fact Book*, 1989.

[17]All market orders are considered "regular way" unless otherwise specified. A regular way transaction is settled through the clearing department of the exchange on the third business day following the day of contract.

[18]See Shinji Takagi, "The Japanese Equity Market: Past and Present." Note that the U.S. authorities, unlike their Japanese counterparts, do not regulate the maturity on the margin plan.

[19]This requirement implies that the lower the amount of the loan, the higher the interest rate. Hence, if investors decide to use margin borrowing, they have an incentive to maximize the amount of borrowing.

always be larger than 20 percent of the price of the stock at the time it was originally bought or sold on margin. If the customer's capital drops below the designated minimum of 20 percent, margin calls will occur. For example, if a customer bought a stock worth 100 yen and deposited 60 yen as collateral, the price of the stock could fall to 60 yen without triggering a margin call, but a further price drop below 60 yen would cause an immediate margin call. The 60 yen new market price implies an unrealized loss of 40 yen; hence the customer's capital with the broker becomes 20 yen, or exactly 20 percent of the original price of 100 yen.[20]

Although the official initial margin requirement has changed many times since 1951, the official maintenance margin requirement has remained at 20 percent. Of course, brokers and dealers can always impose more stringent initial or maintenance margin requirements on their customers. But data on individual dealers' margin requirements, although desirable, are not available. Our empirical analysis, therefore, will be based on the historical changes of the official initial margin requirements.

Chart 3 presents a summary of all margin require-

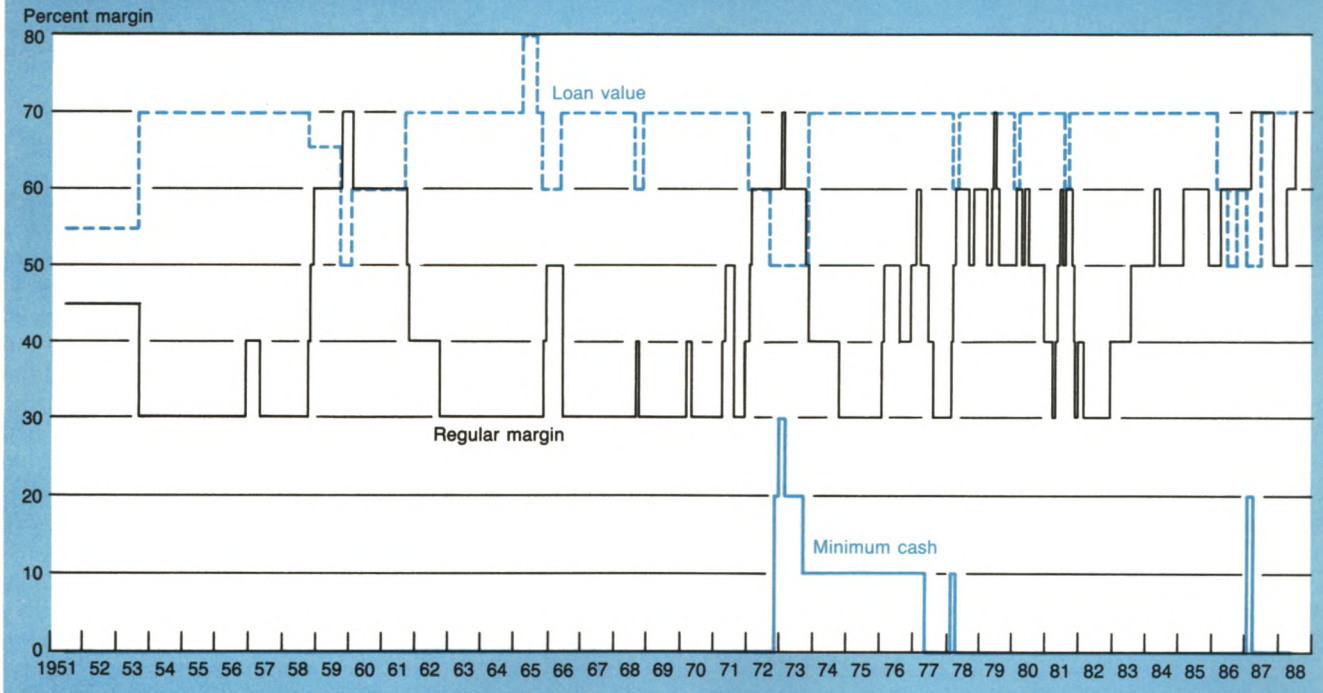
[20]When investors deposit securities in lieu of cash, margin calls can also occur if the collateral security declines in value. Suppose the loan value is 70 percent for stocks and the customer deposits a stock worth 60/.7 = 85.71 yen. Assume for simplicity that the price of the stock bought on margin remains at 100 yen. Then a margin call will occur if the market price of the collateral stock falls from 85.71 yen to slightly below 28.57 yen, a level that is equivalent to (28.57)×(.7) = 20 yen of cash.

The calculation of the official maintenance margin is more complicated when, in addition to the change in the price of the collateral stock, a change occurs in the price of the stock that was

Footnote 20 continued
originally bought on margin. An increase in the price of the stock bought on margin does not count as a capital gain in the calculation of maintenance margins, but a decrease in its price does count as a capital loss. For example, let us assume that the price of the collateral stock falls from 85.71 yen to 28.57 yen *and* that the price of the stock bought on margin increases from 100 yen to 110 yen. Despite the unrealized capital gain of 10 yen, margin calls will occur the moment the collateral stock drops below 28.57 yen, as in the earlier example. Next, suppose that the price of the stock bought on margin dips from 100 yen to 90 yen, causing an unrealized capital loss of 10 yen. In this case, margin calls will occur well before the collateral stock drops to 28.57 yen. Margin calls will occur when the price of the collateral stock falls below 42.86 yen, which is equivalent to (42.86)×(.7) = 30 yen of cash.

Chart 3

Tokyo Stock Exchange Margin Requirements



Source: Tokyo Stock Exchange.

ment changes since the imposition of official margin requirements in 1951. Initial margin requirements have varied between 30 and 70 percent; the loan value of stocks has varied from a discount of 70 percent to a heavier discount of 50 percent. Only once did the discount value rise to 80 percent. Observe that in the early to late 1970s, the TSE employed an additional regulatory restriction on margin loans, a minimum cash requirement. On two occasions the minimum cash requirement reached a maximum of 30 percent, but the more typical requirement was 10 percent. In the framework of our previous example of a margin requirement of 60 percent and a loan value of 70 percent, a 10 percent minimum cash requirement implies that customers have to deposit 10 yen in cash and then choose between an additional 50 yen of cash or an additional minimum of 50/.7 = 71.43 yen worth of securities. Given a positive premium on cash, a positive minimum cash requirement has the same effect on the market as raising the margin requirement.[21]

In addition to imposing all these straightforward margin controls, the TSE can affect trading on individual stocks by a number of direct methods. For instance, if the daily stock price variation or margin activity of an issue is large, then margin trading can be temporarily stopped. Clearly, control of individual stocks affects the volatility estimates of these stocks. If the affected stocks carry a large weight in the construction of the TOPIX, the TOPIX volatility will also be affected. However, if individual stock restrictions are imposed randomly across time and are consequently uncorrelated with the decision to change margin requirements uniformly for all stocks, the resulting measurement error in the TOPIX volatility does not create systematic bias in the estimated effect of margin requirements. It follows that our subsequent empirical analysis would not be affected by individual stock manipulations.

The effective margin requirement

The TSE has traditionally used two different methods to affect investor behavior in the stock market: changing the initial margin requirement, M_t^c, and changing the loan value of stocks, L_t, where the subscript t denotes the business day. To incorporate both tools in one variable, we define the effective margin requirement as the required market value of stocks per unit of margin loan.[22] The effective requirement, M_t, is then the ratio of the official margin requirement, M_t^c, and the loan value of stocks, L_t:

$$(1a) \qquad M_t = 100\ (M_t^c / L_t).$$

The above ratio does not take into account the additional cash-only requirements, C_t, which are sometimes imposed. To incorporate these requirements, we adjust the definition of the effective margin requirement as follows:

$$(1b) \qquad M_t = 100\ [\delta\ C_t/L_t + (M_t^c - C_t)/L_t],$$

where δ is a parameter that reflects the extra opportunity cost associated with cash deposits. In the empirical analysis of the following sections, we arbitrarily assume that δ equals 1.5, but we have checked the sensitivity of the results to different values of δ ranging from 1 to 2. The results are not very sensitive to the particular choice of δ. To verify this last point, we also present the results by excluding all cases when C_t is changed. For this purpose we use equation 1a to describe our effective margin requirement.

Over the thirty-seven-year period from 1951 to June 1988, M_t has changed ninety-six times. Of the ninety-six changes, sixty are changes in initial margin requirements alone, seventeen are changes in the loan value alone, five are minimum cash changes alone, ten represent simultaneous changes in initial margin and loan value, and four reflect concurrent changes in the minimum cash requirement and loan value.

The effect of a change in margin requirements on Japanese stock prices

We begin by examining the behavior of Japanese stock prices around the days of a margin change. We ask the questions: Do margin changes affect the momentum of the stock market? If they do, does the effect persist in the 1980s? Charts 4, 5, 6, and 7 provide a first view of the effects of margin changes. We have partitioned the sample in the middle of 1978 so that forty-eight margin changes — changes in M_t of equation 1b — occur in the first part and forty-eight occur in the second part; and for each subperiod, we present the results for margin increases and margin decreases separately.

Like Charts 1 and 2 for the U.S. stock market, the charts for the Japanese stock market plot the total return excluding dividends — geometric average daily capital gain or loss — obtained by investors who buy the portfolio of stocks in the TOPIX on the fortieth business day before the margin change and subse-

[21] We have confirmed this statement with the TSE.

[22] The opportunity cost of depositing cash as collateral is larger than the opportunity cost of depositing stocks. Cash pays no interest while stocks carry dividends and the potential for appreciation during the time of the margin loan. Similarly, given the very low interest rate of bonds, stocks have a greater potential for high returns. Investors would prefer depositing stocks to depositing cash or bonds as collateral. Hence, a change in the loan value of stocks is an effective restriction for most investors and should be taken into account.

Chart 4

Japanese Stock Prices before and after an Increase in Margin Requirements

December 1956 - April 1978

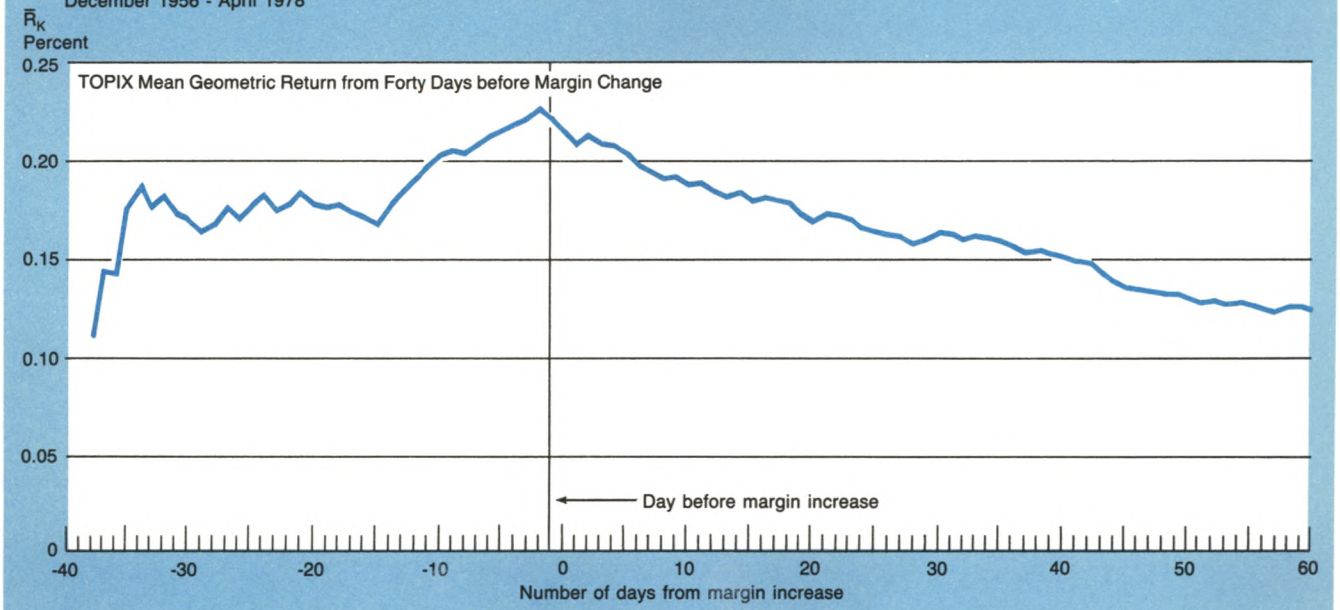


Chart 5

Japanese Stock Prices before and after an Increase in Margin Requirements

October 1978 - June 1988

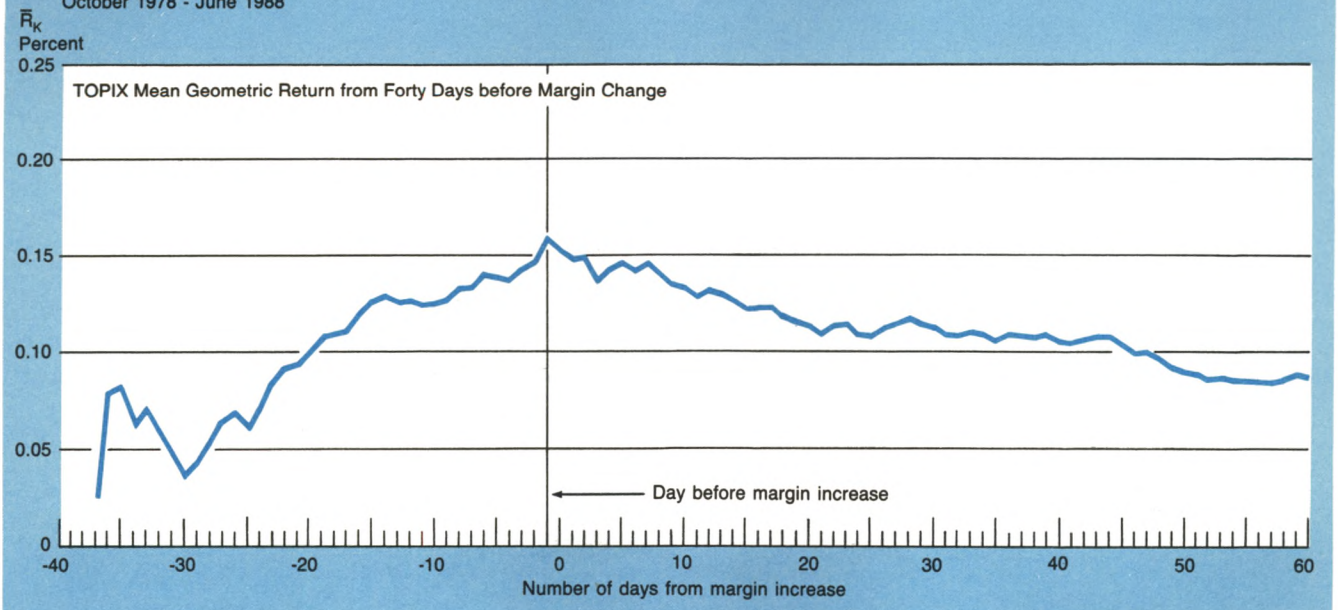


Chart 6

Japanese Stock Prices before and after a Decrease in Margin Requirements

September 1953 - May 1978

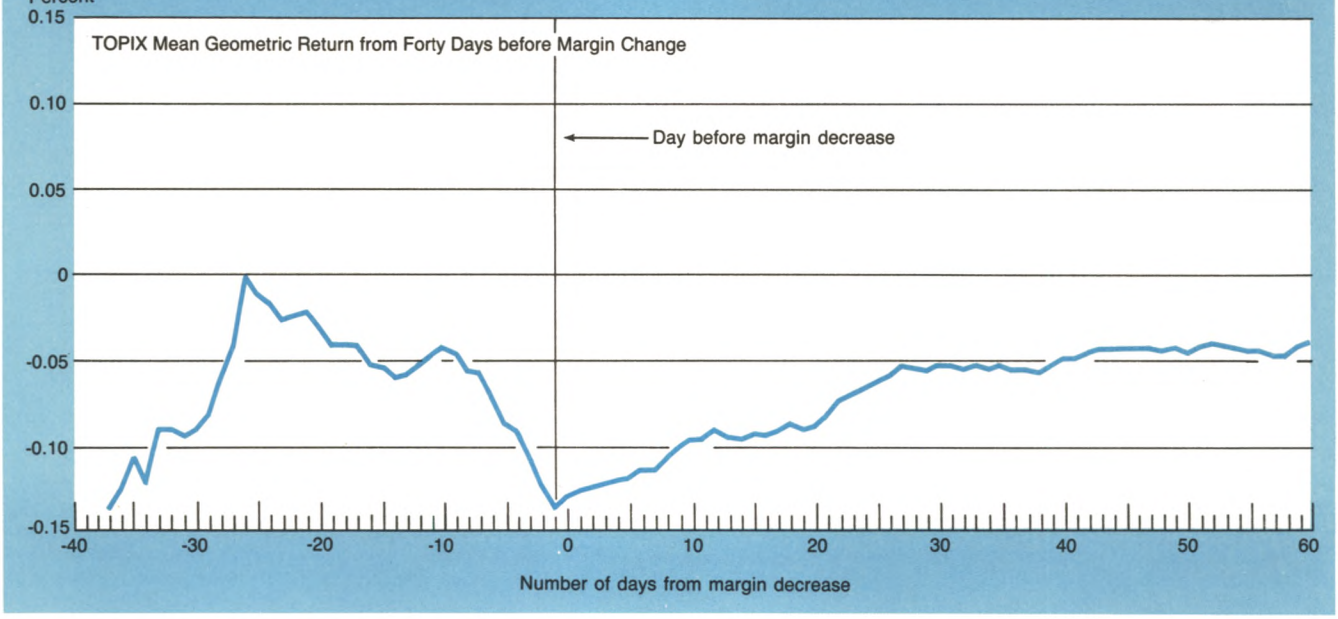
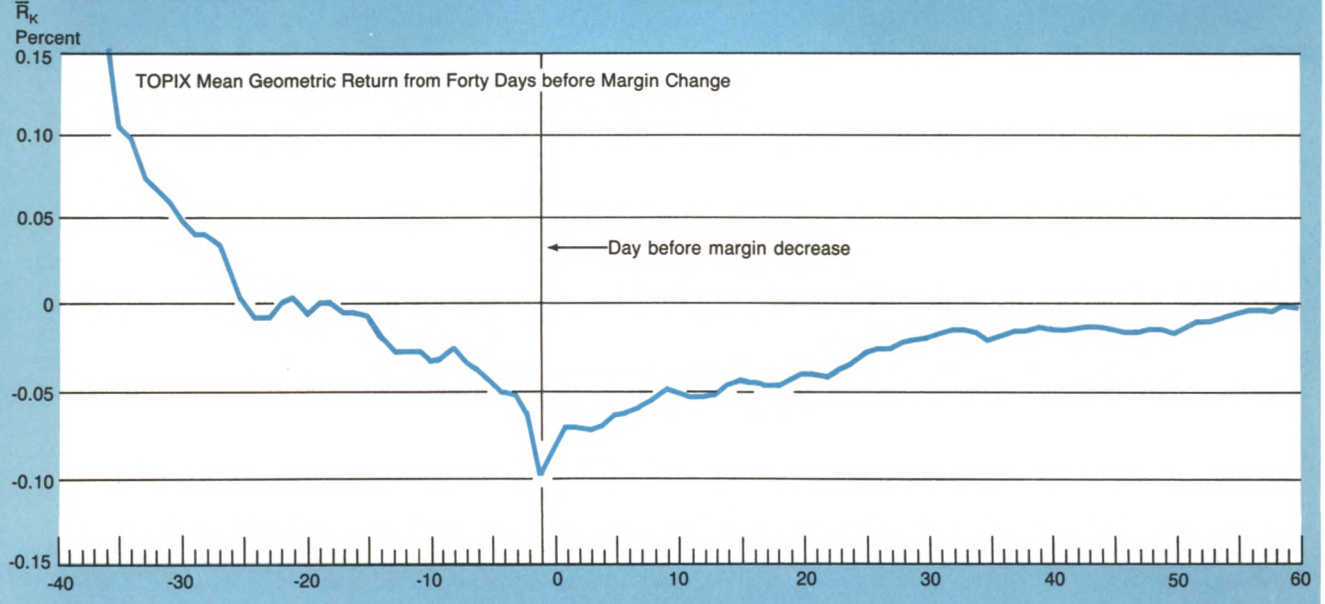


Chart 7

Japanese Stock Prices before and after a Decrease in Margin Requirements

June 1978 - October 1987



quently sell the same portfolio of stocks k business days later (k = 1, ..., 100).[23] The return of a business day k is the arithmetic average of individual returns across the historical margin changes (approximately twenty-four cases per chart).[24]

The charts show that margin increases occur after a run-up in stock prices and that, on average, the moment the increase in margin requirements becomes effective, the market begins a downward trend. Similarly, margin decreases take place following a rundown in stock prices; on average, the moment the decrease in margin requirements takes place, the market begins an upward trend. In each chart we plot a vertical line on business day -1. Margin requirement changes are announced after the market closes on business day -1 and become effective for all transactions on business day 0. Hence, if changes in margin requirements affect the market, we ought to see a price reversal on business day 0. Indeed, the peaks in stock prices in Charts 4 and 5 coincide exactly with the market close of business day -1, before a margin increase is announced and implemented; and the troughs in stock prices in Charts 6 and 7 coincide with the market close of business day -1, before a margin decrease is announced and implemented. This is strong evidence that the margin changes have a *causal* role in the observed reversal of price trends. Recall that such an immediate reversal is not always observed in the U.S. data presented in Charts 1 and 2.

Comparisons of Chart 4 with Chart 5 and of Chart 6 with Chart 7 show that the quantitative effect of margin requirements is similar across the two subsamples. This similarity suggests that margin requirements continue to be important in today's financial environment. Another item of interest is the relatively slow reversal in stock price trends following a margin change. In an efficient market, one expects full and immediate adjustment towards equilibrium. In the absence of a precise benchmark for a normal return or normal price level, however, it is hard to make judgments about market efficiency.

While the charts show that the effects of margin requirements are quantitatively very important, they do not provide evidence on the statistical significance of the plotted price reversals. The statistical significance of the observed price reversals can be inferred from the regression results of Tables 1 and 2. In Table 1, we examine the TOPIX return over an interval of twenty-four days preceding the margin change and a like interval following the margin change. A horizon of twenty-four business days corresponds approximately to a cal-

Table 1

The Effect of Margin Requirements on Stock Returns—Interval of Twenty-Four Business Days

Dependent Variable: $\Delta R = R_A - R_B$ = Change in Return

Independent Variables	Effective Margin Change	Cash Margin/ Loan Value Change
Sample Period: June 1951 to June 1988		
Constant	0.0290	0.0337
	(1.121)	(1.265)
ΔM	−0.0078**	−0.0075**
	(−7.434)	(−6.650)
R^2	0.3303	0.3319
Sample size	96	91
RMSE	0.2536	0.2542
Sample Period: June 1951 to April 1978		
Constant	0.0480	0.0508
	(1.416)	(1.646)
ΔM	−0.0077**	−0.0084**
	(−5.941)	(−5.723)
R^2	0.4342	0.4324
Sample size	48	45
RMSE	0.2334	0.2401
Sample Period: May 1978 to June 1988		
Constant	0.0093	0.0184
	(0.233)	(0.462)
ΔM	−0.0081**	−0.0066**
	(−4.684)	(−3.741)
R^2	0.3229	0.2413
Sample size	48	46
RMSE	0.2759	0.2701
F-Test for Structural Stability across Subperiods		
All parameters	0.294	0.455
p-value	0.755	0.636
ΔM-parameter	0.032	0.602
p-value	0.857	0.440

Notes: t-statistics are in parentheses.

R_A = geometric daily return from the business day before margin change to twenty-four business days after margin change (in percent).
R_B = geometric daily return from twenty-four business days before margin change to the business before margin change (in percent).
ΔM = M_A-M_B = change in average margin.
M_A = average margin level in the twenty-four business day period before margin change (in percent).
M_B = average margin level in the twenty-four business day period after margin change (in percent).
RMSE = root mean squared error.
R^2 = coefficient of determination.

**Significant at the 5 percent level.

[23] In Japan, dividends are very small relative to the size of the capital gain. Their inclusion in the definition of stock return would not alter our results.

[24] Similar figures were included in Hardouvelis, "Commentary: Stock Market Margin Requirements and Volatility," but there the returns were arithmetic instead of geometric daily averages.

endar month. We regress the change in the average geometric daily return on the change in the average level of M_t over each interval, as follows:[25]

$$(2) \qquad \Delta R_i = \alpha_0 + \alpha_1 \Delta M_i + u_i,$$

where ΔR_i denotes the change in the average geometric daily return from before and after the margin change i, ΔM_i is the change in average level of the effective margin, and u_i is white noise. The regression coefficients are negative and, indeed, statistically significant. The estimated regression coefficient of −.0078 for the full sample implies that after the initial margin requirement increases from 50 to 60 percent (assuming a typical level of 70 percent for the loan value and no minimum cash requirements), there will be a full price reversal in the market equal to $[(.0078) \times (10/.7)]/2$, or 0.06 percent, each day over a period of a month. This reversal is equivalent to a cumulative drop of about 1.44 percent over the month.

The regression coefficient of ΔM_i remains very similar across the two subperiods, as we expected from the subperiod responses shown in the charts. Table 1 also shows that a formal F-test of structural change cannot reject the null hypotheses of parameter stability.

The second column in Table 1 presents the results of regressions that exclude the five cash-only margin changes; the effective margin requirement is defined by equation 1a. The results do not change.

Table 2 repeats the exercise of Table 1 but considers a longer horizon of seventy-five business days, or approximately three calendar months. The purpose of this exercise is to examine the effects of stock price swings that may last longer than one month. The results in Table 2 confirm the price reversals of Table 1: there is a statistically significant reversal in prices following a change in margin requirements. However, the size of the reversal — measured in daily returns — is smaller, approximately one-third the size of the reversal in Table 1. This finding suggests that the effects in the three-month intervals before and after the margin change of Table 2 are primarily due to the effects of the one-month horizon of Table 1. Apparently, the TSE responds to a run-up or rundown in prices after approximately one month and then it requires approximately one month for an almost complete reversal. The extra two months in Table 2 primarily add noise to the parameter estimates, reducing the size of the t-statistics.[26]

One might argue that the negative correlation between changes in margin requirements and changes in stock returns does not reflect a causal relation but simply the simultaneous response of the TSE and private investors to macroeconomic developments or other third factors. For example, suppose news hits the market that the Bank of Japan and the Ministry of Finance have adopted a restrictive policy to counter an overheated economy that is driving stock prices up. A fall in the market that coincides with an increase in margin requirements might stem from the anticipated negative effect of the future restrictive monetary policy on the economy and on the profitability of publicly

[25] We average the individual business day M_t's over each interval of twenty-four business days because in some cases another margin change occurs within these intervals.

Table 2

The Effect of Margin Requirements on Stock Returns — Interval of Seventy-Five Business Days

Dependent Variable: $\Delta R = R_A - R_B$ = Change in Return		
Independent Variables	Effective Margin Change	Cash Margin/ Loan Value Change
Sample Period: June 1951 to June 1988		
Constant	−0.0094	−0.0029
	(−0.619)	(−0.188)
ΔM	−0.0024**	−0.0022**
	(−4.641)	(−3.786)
R^2	0.1864	0.1387
Sample size	96	91
RMSE	0.1498	0.1490
Sample Period: June 1951 to April 1978		
Constant	0.0009	0.0133
	(0.376)	(0.510)
ΔM	−0.0027**	−0.0026**
	(−3.856)	(−3.123)
R^2	0.2443	0.1849
Sample size	48	45
RMSE	0.1652	0.1736
Sample Period: May 1978 to June 1988		
Constant	0.0255	0.0168
	(−1.325)	(−0.942)
ΔM	−0.0019*	−0.0015*
	(−2.484)	(−1.919)
R^2	0.1183	0.0773
Sample size	48	46
RMSE	0.1331	0.1209
F-Test for Structural Stability across Subperiods		
All parameters	0.845	0.811
p-value	0.433	0.448
ΔM-parameter	0.493	0.826
p-value	0.484	0.366

*Significant at 10 percent level.
**Significant at 5 percent level.

[26] In the horizon of seventy-five business days there is considerable overlapping between the $96 \times 2 = 192$ intervals; this overlap diminishes the precision of the estimates.

traded companies, and not from the increase in margin requirements. If this interpretation were correct, the sequence of events would create a spurious negative association between margin requirements and stock returns. However, such interpretations cannot withstand rigorous scrutiny. First, margin requirement changes are administered by the TSE and are not necessarily coordinated with other fiscal or monetary measures. Second, if one estimates a hypothetical TSE margin response function to information variables, it becomes clear that macroeconomic variables do not play a vital role. The only variables that appear to affect the TSE's decision to change margin requirements are related to the stock market directly: unusual stock price trends, unusual trading volume, the percentage of trading volume due to margin trading, and so forth.[27] Controlling for such variables in the regressions of Tables 1 and 2 has no effect on the results.

Margin requirements and the volatility of daily returns in the Japanese stock market

We have seen that margin requirements in Japan can significantly affect the stock market by reversing a previous upward or downward trend in prices and that this impact did not diminish in the 1980s. We now turn to the issue of volatility. In this article we consider only actual volatility, leaving for future research the questions of excess volatility and long waves of stock prices away from fundamental values. Measuring excess volatility in the Japanese financial and economic environment can be quite involved and is beyond the scope of the present article.

The relation between volatility and returns

Recall that in the United States, volatility and the level of the market are negatively correlated. One explanation of this phenomenon is that high stock prices imply low debt-to-equity ratios and hence lower risk and volatility. The importance of controlling for the effects of market level on volatility is discussed in the Appendix. Thus, before we examine the effects of margin requirements on the volatility of Japanese stock returns, we will want to know if a similar relationship between stock returns and volatility is present in the Japanese data.

We study the relation between stock returns and volatility using monthly observations on volatility and returns from 1949 to June 1988. Our monthly measure of returns, R_m, is an average of daily returns within the month. Our monthly measure of volatility, σ_m, is the standard deviation of the residuals of a second-order autoregressive model of returns. The second-order autoregression eliminates the serial correlation in Japanese daily stock returns. The model is estimated separately for each month using the daily returns of that month alone. In addition, to ensure the independence of the volatility estimates across consecutive months, we have eliminated the first two daily returns from the sample size of each individual month.[28] The results of regressing contemporaneous volatility on contemporaneous return are as follows:

$$(3)\quad \underset{(15.389)}{\sigma_m = 0.6417} \underset{(-6.178)}{- 0.3875\, R_m}, \quad R^2 = 0.0762,\ \text{RMSE} = 0.0030,\ \text{DW} = 1.154,\ m = 1, \ldots, 469$$

where R^2 denotes the coefficient of determination, RMSE the root mean squared error of the regression, and DW the Durbin-Watson statistic for serial correlation. The t-statistics are given inside the parentheses below the estimated coefficients.[29] The regression equation shows that an increase in stock returns of 1 percent is associated with a decline in volatility of 0.39 percent. This negative association is similar to the relation between volatility and returns in the United States.

Examining the theoretical underpinnings of the negative relation between returns and volatility is beyond the scope of this paper. However, the presence of such a relationship implies that in our regressions of volatility on margin requirements we ought to control for the size of stock returns. This is especially important because stock returns are affected by the change in margin requirements. An increase in margin require-

[27]For a detailed description of a TSE response function, see Gikas Hardouvelis and Steve Peristiani, "Do Margin Requirements Stabilize the Market? The Case of Japan," Federal Reserve Bank of New York, Research Paper, April 1990. The only macroeconomic variable that has a statistically significant effect on the probability of a change in margin requirements is the Bank of Japan discount rate of the previous month. The relation between the two variables is negative, implying that the TSE is less likely to increase margin requirements if the Bank of Japan's discount rate is high. Hence, restrictive monetary policy cannot explain the negative association between an increase in margin requirements and a fall in stock prices.

[28]This measure of volatility is similar in spirit to the measure used by Kenneth French, G. William Schwert, and Robert Stambaugh in "Expected Returns and Volatility," *Journal of Financial Economics*, vol. 19 (1987), pp. 3-29. Their measure takes into account first-order serial correlations in daily stock returns, while ours takes into account second-order serial correlation as well. Estimating a single regression over the entire sample of daily stock returns R_t on R_{t-1} and R_{t-2} yields the following results:

$$R_t = \underset{(5.013)}{0.000361} + \underset{(21.4)}{0.199\, R_{t-1}} \underset{(-3.536)}{- 0.032\, R_{t-2}}, \quad R^2 = 0.038,\ \text{RMSE} = 0.0077,\ T = 11{,}482$$

where R^2 is the coefficient of determination, RMSE is the regression root mean squared error, T is the sample size of more than 11,000 observations, and t-statistics are in parentheses.

[29]Coefficient estimates were obtained by a maximum likelihood method that corrected for the presence of a fourth-order autoregressive model of the errors. Note that the reverse regression of returns on volatility produces a statistically significant negative relation as well.

ments causes a decrease in stock returns, and the decline in stock returns may cause an increase in volatility. A failure to account for this relationship would generate a spurious positive correlation between changes in margin requirements and changes in volatility.

Margin requirements and volatility

We now turn to the main theme of this section: the relation between the change in volatility and the effective margin change itself in the period surrounding the margin change. Tables 3 and 4 present the results. Table 3 employs a volatility measure derived from horizons of twenty-four business days, while Table 4 uses a horizon of seventy-five days. As in the earlier section, we use both definitions of the effective margin requirement and estimate the various relations over the whole sample and over two subperiods. We also estimate the

Table 3

The Effect of Margin Requirements on Stock Volatility—Interval of Twenty-Four Business Days

Dependent Variable: $\Delta\sigma = \sigma_A - \sigma_B$ = Change in Volatility

Independent Variables	Effective Margin Change		Cash Margin/Loan Value Change	
		Sample Period: June 1951 to June 1988		
Constant	0.1063**	0.1359**	0.1111**	0.1485**
	(2.367)	(3.514)	(2.251)	(3.765)
ΔM	−0.0011	−0.0090**	−0.0012	−0.0096**
	(−0.587)	(−4.844)	(−0.628)	(−5.005)
ΔR		−1.0218**		−1.1096**
		(−7.019)		(−7.549)
R^2	0.0036	0.3487	0.0044	0.3958
Sample size	96	96	91	91
RMSE	0.4399	0.3576	0.4499	0.3525
		Sample Period: June 1951 to April 1978		
Constant	0.0681	0.0967**	0.0702	0.1001**
	(1.577)	(2.408)	(1.530)	(2.370)
ΔM	0.0013	−0.0031	0.0013	−0.0035
	(0.791)	(−1.582)	(0.721)	(−1.598)
ΔR		−0.5752**		−0.5864**
		(−3.696)		(−3.350)
R^2	0.0134	0.2153	0.0120	0.2203
Sample size	48	48	45	45
RMSE	0.2968	0.2676	0.3066	0.2756
		Sample Period: May 1978 to June 1988		
Constant	0.1333*	0.1458**	0.1469*	0.1742**
	(1.692)	(2.224)	(1.799)	(3.046)
ΔM	−0.0038	−0.0147**	−0.0041	−0.0140**
	(−1.119)	(−4.770)	(−1.145)	(−4.799)
ΔR		−1.3426**		−1.4818**
		(−6.210)		(−6.864)
R^2	0.0265	0.4758	0.0289	0.5367
Sample size	48	48	46	46
RMSE	0.5453	0.4045	0.5537	0.3869
		F-Test for Structural Stability across Subperiods		
All parameters	1.207	3.701**	1.198	3.847**
p-value	0.303	0.015	0.302	0.012
ΔM-parameter	1.946	10.095**	1.872	7.787**
p-value	0.166	0.002	0.175	0.007
ΔR-parameter		7.312**		9.905**
p-value		0.008		0.002

σ_A = volatility measure for the period of twenty-four business days before margin change (in percent).
σ_B = volatility measure for the period of twenty-four business days after margin change (in percent).

*Significant at 10 percent level.
**Significant at 5 percent level.

relation between the change in volatility and the change in the effective margin without controlling for the effect of stock returns on stock volatility. The regression equation has the following form:

$$(4) \quad \Delta\sigma_i = \alpha_0 + \alpha_1 \Delta M_i + \alpha_2 \Delta R_i + u_i,$$

where $\Delta\sigma_i$ represents the change in volatility from the twenty-four-day interval before margin change i to the twenty-four-day interval after margin change i. As in the monthly case, the level of volatility was measured by the standard deviation of residuals obtained from a second-order autoregression for each interval.

Before we discuss the effects of margin requirements on volatility, note that the α_2 parameter in the above regression measures the effects of returns on volatility in the instances when margin requirements change. Since Table 3 uses a horizon of twenty-four business days, or approximately one month, estimates of α_2 in Table 3 can be compared to the regression coefficient

Table 4

The Effect of Margin Requirements on Stock Volatility—Interval of Seventy-Five Business Days

Dependent Variable: $\Delta\sigma = \sigma_A - \sigma_B$ = Change in Volatility

Independent Variables	Effective Margin Change		Cash Margin/Loan Value Change	
		Sample Period: June 1951 to June 1988		
Constant	0.0850**	0.0770**	0.0887**	0.0862**
	(2.714)	(2.679)	(2.771)	(2.938)
ΔM	−0.0005	−0.0025**	−0.0011	−0.0029**
	(−0.466)	(−2.344)	(−0.920)	(−2.506)
ΔR		−0.8429**		−0.8389**
		(−4.367)		(−4.230)
R^2	0.0023	0.1721	0.0094	0.1768
Sample size	96	96	91	91
RMSE	0.3061	0.2803	0.3041	0.2788
		Sample Period: June 1951 to April 1978		
Constant	0.0423	0.0475	0.0346	0.0412
	(1.282)	(1.579)	(1.070)	(1.371)
ΔM	0.0003	−0.0013	−0.00003	−0.0012
	(0.313)	(−1.283)	(0.033)	(−1.189)
ΔR		−0.5870**		−0.4950**
		(−3.199)		(−2.838)
R^2	0.0021	0.1870	0.0000	0.1609
Sample size	48	48	45	45
RMSE	0.2253	0.2056	0.2143	0.1986
		Sample Period: May 1978 to June 1988		
Constant	0.1216**	0.0918*	0.1362**	0.1124**
	(2.279)	(1.842)	(2.515)	(2.296)
ΔM	−0.0015	−0.0038*	−0.0026	−0.0048**
	(−0.706)	(−1.795)	(−1.105)	(−2.145)
ΔR		−1.1679**		−1.4145**
		(−3.117)		(−3.450)
R^2	0.0107	0.1864	0.0270	0.2379
Sample size	48	48	46	46
RMSE	0.3691	0.3384	0.3673	0.3288
		F-Test for Structural Stability across Subperiods		
All parameters	1.095	1.069	1.752	2.394*
p-value	0.338	0.367	0.180	0.073
ΔM-parameter	1.681	1.274	1.202	2.2486
p-value	0.411	0.262	0.127	0.137
ΔR-parameter		2.127		4.898**
p-value		0.148		0.002

*Significant at 10 percent level.
**Significant at 5 percent level.

of R_m in equation 3 above. In fact, we observe that the α_2 estimate for the full sample is −1.0218, while the estimate given by equation 3 is considerably lower at −.3875. This disparity is expected because the regressions in Table 3 are centered on the ninety-six margin changes, while the regression of equation 3 uses all 469 uncentered monthly observations. The discrepancy in the estimated coefficients arises because periods with margin changes are marked by higher price volatility. For instance, the average monthly volatility for the seventy-eight months that have at least one margin change is 0.702; the corresponding figure for the remaining months is 0.576. In fact, if we estimate the model given by equation 3 for only those seventy-eight months with margin changes, the coefficient estimate becomes −.998, which is more comparable to the estimates of Table 3.

Table 3 shows that both the partial effect—as in equation 4—and the total effect of margin requirements on volatility are negative. When the change in margin requirements is the only explanatory variable, the volatility response is not statistically significant, but such a relation suffers from omitted variables bias. When the change in stock returns is included in the regression in order to obtain a correct specification, the size of the volatility response to a change in margin requirements increases substantially and becomes statistically significant. A regression coefficient estimate of −.0096 implies that if stock returns are held constant, an increase in the margin requirements from 50 to 60 percent will cause a decline in the daily volatility of (.0096 × 14.3/2), or 0.07 percent.

A striking aspect of Table 3 is the increased impact of margin requirement changes on volatility during the second half of the sample. The negative regression coefficients (both total and partial) increase in size after 1978, and formal tests of structural change reject the hypothesis of parameter stability. This result is surprising for two reasons. First, Tables 1 and 2 showed that the effect of margin requirements on the market momentum did not change in the latter part of the sample. Second, one would expect to see that margin requirements had a smaller overall impact on the market in the 1980s, a period of increasing deregulation in the financial markets of Japan.[30]

Table 4 replicates the results of Table 3 using a horizon of seventy-five days. The impact of margin changes on volatility is still negative, but the magnitude is smaller. There are two explanations for the smaller magnitude. First, margin requirements may have only a temporary effect on volatility. After a month or so, investors who create volatility may find ways to avoid changes in regulatory restrictions. Second, this finding may be only an artifact of the estimation procedure. Results obtained using an interval of seventy-five days are contaminated by severe data overlapping. When the interval of twenty-four business days is employed, about fifty of ninety-six episodes have some overlap, but the overlapping margin changes are primarily in the same direction and thus logically consistent. When the horizon of seventy-five business days is used, about eighty of the ninety-six episodes have some overlap and many of the overlapping margin changes are in opposite directions. This blending of margin increases with margin decreases reduces the power to detect an association between margin requirements and volatility.

[30]Table 3 also shows that the impact of stock returns on volatility is higher in the latter subsample. It may be that in the late 1970s and the 1980s, volatility became more sensitive to many kinds of exogenous factors, including margin requirements, than it had been in earlier years. But whatever the explanation for this finding, the increased sensitivity of volatility to margin requirements in the 1980s shows that margins rules have gained more importance in recent years.

Conclusion

The strength of the negative association between cash market initial margin requirements and stock volatility in the U.S. data has recently generated considerable controversy among academic economists. The evidence is not strong enough to convince those economists who believe that regulatory restrictions on the stock market are ineffective. Margin requirements in the United States have changed only twenty-two times, a sample too limited to provide a decisive test of the effectiveness of margin regulation in calming the market.

This article shifted the focus to the effects of margin regulation in the Japanese stock market. In Japan, margin requirements have changed approximately 100 times during the last thirty-five years, and half of those changes occurred over the last ten years. Thus the margin experience in the Japanese market provides an unusually rich data set in a contemporary financial environment. Using this data, we found that changes in margin requirements are quite effective in curbing gyrations in stock prices. Margin requirements affect both the momentum of stock prices and the daily volatility of the market. An increase in margin requirements causes a complete reversal in the previous month's upward trend in stock prices and reduces daily volatility. Conversely, a decrease in margin requirements causes a rebound in a previously sluggish market and increases daily volatility. Furthermore, we found that margin policy in Japan has been at least as effective during the last ten years as it had been in the previous twenty-six years. The impact on daily volatility is stronger over the last ten years, a result which is quite surprising.

Recent episodes of unusual stock price fluctuations

have heightened the need for regulatory methods of containing volatility. Margin requirements represent one possible tool for influencing volatility, and the Japanese experience indicates that they may very well be an effective tool. Our evidence suggests that researchers can learn more about the importance of margin requirements in curbing market volatility by exploring other important foreign stock markets.

Gikas Hardouvelis
Steve Peristiani

Appendix: Some Technical Issues Raised by the U.S. Volatility Results

"Margin Requirements and Stock Market Volatility," published in the summer 1988 issue of the *Quarterly Review,* argued that higher initial margin requirements were statistically associated with a decrease in both actual stock market volatility and excess stock market volatility. The article elicited a number of responses that concentrated on the negative association between margin requirements and actual volatility rather than the more interesting relationship between margin requirements and excess volatility. Some questioned the robustness of the negative correlation across different subsamples; others took issue with the interpretation of the negative correlation, the estimation procedure, or the specification of the estimated equations. This appendix provides a brief evaluation of the issues raised by these responses.

We look first at the interpretation of the negative correlation. Some commentators posed the question: Does a negative correlation between margin requirements and volatility imply causation from margin requirements to volatility or the reverse? Intuition suggests that the Federal Reserve would not respond to an increase in volatility by decreasing margin requirements; hence it is difficult to accept the causation from volatility to margin requirements. In addition, statements by the Federal Reserve on its reasons for changing margin requirements never mention volatility as a causal variable. Further evidence is provided by a multivariate vector autoregressive system of equations for margin requirements, stock returns, stock volatility, and so forth: the results indicate that margin requirements are temporally prior to volatility and that volatility is not temporally prior to margin requirements.†

The second issue concerns the robustness of the negative correlation across the different subsamples.‡ The *Quarterly Review* article showed results for a sample period that began in 1931, before the establishment of official margin requirements, and for a sample period that began in 1935, after the establishment of official margin requirements. Since the latter sample period excluded the early 1930s, a period of very high volatility in the stock market and zero-level official margin requirements, it naturally showed a weaker negative correlation. The early 1930s were excluded because of a concern that the broker-dealer margin requirements of that time diverged from the official margin of zero much more than they diverged later on in the sample period — a possibility that would bias the results. Some commentators argued that even the results for the post-1934 period may be misleading and hence irrelevant for contemporary margin policy. They claimed that the negative correlation was primarily attributable to the depression years and that the correlation in the postdepression period, although negative, was statistically insignificant. It is unclear why the depression years' experience with margin policy should be discounted. If anything, the recent stock market crashes are reminiscent of similar abrupt stock price changes in the 1930s. Furthermore, the negative association between excess volatility and margin requirements was stronger in the postdepression sample.§

A third concern, raised primarily by Hsieh and Miller, focused on some technical aspects of estimation.‖ To

†See G. William Schwert, "Business Cycles, Financial Crises and Stock Volatility," and the response in Gikas Hardouvelis, "Commentary: Stock Market Margin Requirements and Volatility."

‡Perhaps it should not come as a surprise that at different sample periods the correlation has a slightly different size. Theoretically, there are two opposing effects from margin requirements to volatility — the effect on stabilizing investors and the effect on destabilizing investors — and at different

Footnote ‡ continued
points in time the relative importance of the two effects may well vary. In addition, estimation error induces differences in subsample coefficient estimates even when the true coefficient remains the same. The estimation problem is aggravated by the very few changes in margin requirements over the whole sample. In subsamples the margin changes are even less.

§In Tables 4a and 4b of Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices," the sample is partitioned in the middle and at other break points. Despite the arguments that the negative correlation is due to the depression years, the correlation in the second half of the sample is statistically significant.

‖See David Hsieh and Merton Miller, "Margin Regulation and Stock Market Volatility."

Appendix: Some Technical Issues Raised by the U.S. Volatility Results *(continued)*

estimate the effect of the level of margin requirements on the level of volatility, the *Quarterly Review* article made use of overlapping monthly observations and applied the Newey-West correction of the standard errors. Hsieh and Miller objected to the use of overlapping data but did not attempt to reestimate the relation between volatility and margin requirements using nonoverlapping observations. The results do not change when nonoverlapping annual observations are used instead of overlapping monthly observations.# Hsieh and Miller also claimed that the estimated correlation between the level of volatility and the level of margin requirements may be spurious and recommended as a better measure the correlation between the change in volatility and the change in margin requirements.* They found that the negative correlation was present in the first difference specification only when additional control variables were included in the estimated equation.†† This finding brings us to the interesting question: Which control variables should appear in the estimated regression equation?

The *Quarterly Review* article examined the statements made by the Federal Reserve about its motives for changing margin requirements. Two variables that the Fed itself consistently cites in explaining changes in margin requirements are the recent trend in stock prices and the recent trend in margin credit.‡‡ To avoid spurious effects on volatility from the variables that prompt the Fed to respond, we must control for their variation by including them in the regression. For example, it is an established empirical fact that volatility is low during a bullish stock market and high during a bear market.§§ Since stock prices are high before a margin increase and low thereafter, it is possible to observe a spurious positive association between volatility and margin requirements.

Hsieh and Miller questioned the inclusion of lagged growth of margin credit in the regression equation, despite the fact that lagged margin credit growth was a main indicator for changing margin requirements.‖‖ Their analysis makes it clear that from their perspective the proper specification is a general simultaneous equations system. Such a system would allow for margin requirements to have an effect on both margin credit and volatility and for margin credit to have an effect on volatility and margin requirements. The authors did not attempt to estimate such a system, however, and thus the original single equation specification employed by Hardouvelis remains the most complete specification in the literature so far.

Others also raised the issue of margin debt, though in a different context. Salinger claimed that in the matter of volatility, it is margin debt that matters and not margin requirements. In support of his position, he noted that when the contemporaneous values of both variables are included in the regression, the coefficient of margin debt is significant but the coefficient of margin requirements is insignificant. A similar argument was advanced by Jones, Mulherin, and Titman.## All these authors also contended that since margin debt is presently only about 1.5 percent of the capitalized value of the New York Stock Exchange, it is not a factor that in the present financial environment can seriously contribute to volatility. The response to such a line of reason-

#See Table 4a in Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices."

*They justify their use of first differences by pointing to the high serial correlation in volatility when overlapping data are used. However, given the data overlap, such a correlation is very typical and does not justify using first differences. To see whether volatility has a unit root, one has to examine nonoverlapping data.

††In Table 4c of Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices," the twenty-two instances when the margin requirement changed are isolated and then the change in volatility is regressed on the change in margin requirements. The correlation of margin requirements is statistically significant only when additional control variables appear in the regression.

‡‡See Board of Governors of the Federal Reserve System, *Annual Report*, various issues.

§§In a bullish stock market, corporate debt-to-equity ratios are by definition lower, implying lower volatility in stockholder returns. See Andrew Christie, "The Stochastic Behavior of Common Stock Variances: Value, Leverage and Interest Rate Effects," *Journal of Financial Economics*, vol. 10 (December 1982), pp. 407-32.

‖‖In the *Quarterly Review* article, Hardouvelis presents a Federal Reserve response function based on a simple regression of the change in margin requirements on past information variables. In the *American Economic Review* article, he sharpens the modeling of the Fed response by estimating an ordered response logit equation. The latter shows that recent changes in margin credit have a significant effect on the probability that the Fed will change margin requirements.

##See Jonathan Jones, J. Harold Mulherin, and Sheridan Titman, "Speculative Trading and Stock Market Volatility," Securities and Exchange Commission, January 1990, mimeo.

Appendix: Some Technical Issues Raised by the U.S. Volatility Results *(continued)*

ing is straightforward. First, margin debt is not an exogenous variable; it is affected by margin requirements. Hence evidence that margin debt matters is indirect evidence that margin requirements matter. Second, even though the size of margin debt represents a very small fraction of the value of the New York Stock Exchange stocks, trading based on margin accounts may represent a much larger fraction of total trading — perhaps as high as 20 percent — and thus volatility can be very sensitive to the presence of margin accounts.** In Japan, where data on margin trading are collected regularly, margin trading represents approximately 20 percent of trading volume despite the fact that margin accounts are, as in the United States, less than 2 percent of the capitalized value of the country's stock market. Overall, the role of margin debt is far from settled and more research is required in this direction.†††

The commentators raise one further point of interest: If margin requirements restrict the behavior of investors, one should observe an adverse effect on their trading activity and on the amount they borrow from brokers and dealers. The evidence on these variables is unambiguous: Luckett finds that investors' equity accounts with brokers and dealers in fact decline after an increase in margin requirements; Hardouvelis, using a vector autoregressive model, shows that both margin credit and trading volume decline following an increase in margin requirements.‡‡‡ Kupiec, however, argues otherwise. He shows that the amount of short sales increases slightly following an increase in margin requirements, and he interprets this relation as evidence contradicting the hypothesis that high margins reduce speculative trading activity.§§§ Yet Kupiec's interpretation seems arbitrary. The activity of short sellers, unlike that of long buyers, is ambiguously affected by an increase in margin requirements. Such an increase will raise the cost of leverage, resulting in less borrowing and less short selling. But if the increase in margin requirements causes investors to revise their expectations of the future movement in stock prices downward — that is, if margin requirements are effective — investors have an incentive to short sell before stock prices decline. A priori, it is unclear which of the two effects dominates the behavior of short sellers, while Kupiec's evidence simply suggests that the latter speculative effect is the dominant one.‖‖‖

In summary, although the economists who responded to the *Quarterly Review* article did not disagree with the presence of an overall negative association between margin requirements and volatility, they argued that such an association was not robust enough to support the idea of using margin requirements as a tool for controlling market volatility. Certainly, the few historical episodes of a change in margin requirements provide very little evidence with which to resolve the question of margin requirement effectiveness. For this reason, we direct our attention in this article to other economies and other markets where margin requirements are administered on a more frequent basis.

**Unfortunately, no contemporaneous data exist on the activity of margin accounts. A study by the Board of Governors of the Federal Reserve System, "A Review and Evaluation of Margin Requirements," 1974, presents some results from surveys performed in the 1960s and 1970s that show margin trading to be a relatively large fraction of total trading. Also note that margin requirements can have an effect on volatility without necessarily affecting margin debt. The reason is that a change in margin requirements affects the cost of leveraging even if investors can find alternative sources of credit.

†††Salinger and Hardouvelis (the latter responding to Salinger) find that the contemporaneous level of margin debt is positively related to volatility, as expected. However, the lagged growth rate in margin debt is negatively related to volatility, a result which is puzzling. Jones, Mulherin, and Titman add a new twist to the puzzle by showing that although the lagged growth rate of margin debt is negatively related to a volatility measure based on monthly observations, it is positively related to a volatility measure based on daily observations.

‡‡‡Luckett, "On the Effectiveness of the Federal Reserve's Margin Requirement"; Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices."

§§§Kupiec, "Initial Margin Requirements and Stock Returns Volatility."

‖‖‖In Japan, the behavior of short sellers has changed over time. In the first subsample (1951-78), short sellers borrowed less funds after an increase in margin requirements, but in the second subsample (1979-88), short sellers became more sophisticated and borrowed more in order to short sell following an increase in margin requirements. The behavior of long buyers in Japan is the same in both subsamples: they borrow less after an increase in margin requirements. See Hardouvelis and Peristiani, "Do Margin Requirements Stablilize the Market?"

Shifting Patterns of U.S. Trade with Selected Developing Asian Economies

The United States is running substantial trade deficits with the four Asian economies of Taiwan, South Korea, Malaysia, and Thailand. The U.S. imbalances with Taiwan and South Korea are quite large, although they have narrowed over the past two years. This narrowing in part reflects significant currency appreciation against the U.S. dollar. The U.S. trade deficits with Malaysia and Thailand, while much smaller, have grown rapidly since 1987. The increasing U.S. deficits with these two countries stem from the rapid development of the Malaysian and Thai manufacturing sectors as well as gains in their price competitiveness relative to Taiwan and South Korea in the late 1980s.

This article examines the evolution of the U.S. trade balance with these four Asian economies. The first part of the article describes export and import trends, highlighting shifts in U.S. trade flows with the four individual economies. Particular attention is given to the changing composition of U.S. trade with the economies as a group and with each economy individually over the decade of the 1980s. Changes in market shares of U.S. exports and imports are used to determine how the competitiveness of different U.S. and Asian manufacturing sectors has evolved over time. The market share analysis also shows how U.S.-Asian bilateral trade developments both affected and were affected by the trade of other countries. The second part of the article considers price movements and other factors underlying the 1980s trade balance changes. Developments in Asian cost and supply capacity are examined. The article concludes with some remarks on the implications of the U.S.-Asian trade developments for U.S. global trade balance adjustment.

Overall, the analysis suggests that changes in Asian competitiveness led to a mounting U.S. trade deficit with these four economies during the 1980s. Although this deficit has recently declined, it remains much larger than it was at the beginning of the decade. Favorable price developments and high investment rates, among other factors, explain the strong Asian trade performance. Along with these competitiveness factors, developments in both capital goods and consumer goods trade have helped keep the U.S. trade deficit high. Taiwan and South Korea rapidly developed their capital goods industries during the 1980s, boosting their overall export sales and offsetting some of the weakness in their consumer goods sales since 1987. Malaysia and Thailand, on the other hand, rapidly developed their consumer goods industries in the 1980s. Consequently, they were in a good position to benefit from the recent slowdown in Taiwan's and South Korea's consumer goods sales. Two other factors contributed to the Asian trade surplus with the United States during the 1980s: U.S. capital goods exports to the Asian economies faced stiff competition from Japanese exports, while the operations of Asian subsidiaries of U.S. multinational corporations supported Asian sales to the United States.

U.S. trade flows with the Asian economies

Overview of trade balance developments

Much discussion has focused on the large trade balance deficits that the United States has been running with the four Asian NICs (newly industrialized countries) of Taiwan, South Korea, Hong Kong, and Singapore during the 1980s. U.S. trade deficits with

Malaysia and Thailand have received considerably less attention. Although Malaysian and Thai trade flows with the United States are still significantly smaller than U.S. trade flows with each of the four NICs (Table 1), these two economies have been rapidly expanding their trade with the United States in recent years. U.S. imports from Malaysia and Thailand have grown much faster than U.S. imports from any of the other four Asian economies since 1987, and the U.S. trade deficits with Malaysia and Thailand are now larger than the U.S. trade deficit with Singapore.

This study analyzes U.S. trade with Malaysia, Thailand, and two of the NICs — Taiwan and South Korea. U.S. trade with Hong Kong and Singapore is not discussed. Despite the substantial U.S. trade flows with these latter two economies, Hong Kong and Singapore are much more limited in terms of resources — population, land area, and in Singapore's case, GNP — and consequently less important in terms of potential trade growth than Taiwan, South Korea, Malaysia, and Thailand. Moreover, a large share of U.S. trade with Hong Kong and Singapore is based on the entrepôt roles of the two island economies and thus depends on conditions in economies other than those of Hong Kong and Singapore themselves. Most notably, Singapore is an entrepôt for Malaysian trade with other countries.

The U.S. trade deficit with Taiwan and South Korea grew sharply from 1982 until 1987 (Chart 1). By 1987 the combined U.S. trade deficit with these two economies reached $27 billion. It has since fallen back to $20 billion, a level still almost four times that of the U.S. deficit in 1982.[1] The U.S. trade deficit with Malaysia and Thailand grew sharply in 1988 and 1989, the two years when the Taiwanese and South Korean trade surplus declined. In 1989 the combined U.S. trade deficit with Malaysia and Thailand reached $4 billion. In consequence, the overall U.S. trade deficit with the four Asian economies equaled $24 billion last year, accounting for almost one-quarter of the total U.S.

[1]The U.S. deficit with Taiwan fell sharply in 1988, in part because of inordinately large Taiwanese gold purchases from the United States. Given the unusual nature of these gold purchases, analyzing the 1987-89 change in Taiwan's trade balance with the United States rather than the 1987-88 change gives a more accurate picture of underlying trade flow developments.

Chart 1

U.S. Trade Balance with Four Asian Economies

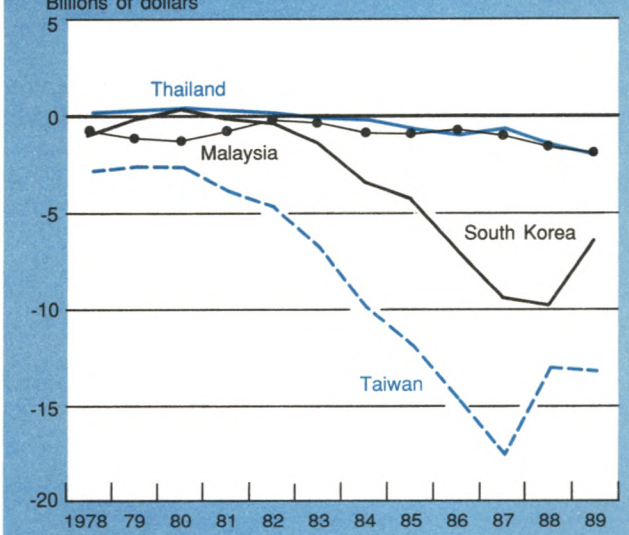


Table 1

Characteristics of Selected Asian Economies

	1988 Population (Millions)	Land Area (Thousands of Square Kilometers)	1988 GNP (Billions of Dollars)	1989 Exports to the United States (Billions of Dollars)	1989 Imports from the United States (Billions of Dollars)	1989 Trade Balance with the United States (Billions of Dollars)
Taiwan	20	35.9	120	24.2	11.0	13.2
South Korea	42	99.1	169	19.6	13.2	6.4
Malaysia	17	329.7	33	4.7	2.7	2.0
Thailand	55	542.4	57	4.4	2.2	2.1
Hong Kong	6	1.1	54†	9.7	5.9	3.8
Singapore	3	0.6	25†	8.9	7.0	1.9

†Figures for Hong Kong and Singapore refer to GDP.

trade deficit with the world.[2] The next two sections will examine the Asian export and import developments that lay behind this Asian trade balance performance.

Asian export developments

Asian exports to the United States tripled between 1982 and 1989 (Chart 2). Spurred by soaring Taiwanese and South Korean export sales, export growth was strongest during the 1982-87 period. In 1988 and 1989, growth slowed markedly as Taiwanese and South Korean sales weakened. Nevertheless, two factors tempered this late 1980s slowdown in growth: Malaysian and Thai exports to the United States actually surged during the last two years, and the development of very strong Taiwanese and South Korean capital goods export industries during the 1980s helped keep the exports of these two economies relatively high in 1988 and 1989. Because of these developments, all four Asian economies showed a very impressive market share performance in the U.S. economy. In the sectors in which the Asian performance did falter somewhat in the late 1980s, exporters from other countries stepped in to replace all the forgone Asian sales. Consequently, the slowdown in the exports of the Asian economies since 1987 had relatively little overall impact on the U.S. global trade balance. These developments are described in greater detail in the rest of this section.

Over the course of the 1980s, the combined sales composition of the four Asian economies to the United States showed relatively little change (Chart 3). In 1982 consumer goods accounted for almost 60 percent of the Asian economies' combined exports to the United States. Despite the tripling of Asian export sales over the 1980s, in 1989 these goods accounted for only a modestly lower percentage. Capital goods accounted for just over 20 percent of the combined Asian exports to the United States in 1982 and only a slightly higher

[2]The global trade surpluses of Taiwan, South Korea, and Malaysia in 1989 were $14 billion, $4 billion, and $3 billion (Malaysian estimate based on data through 1989-III), respectively. Thailand had a global trade deficit of $5 billion in 1989.

Chart 2

Asian Exports to the United States

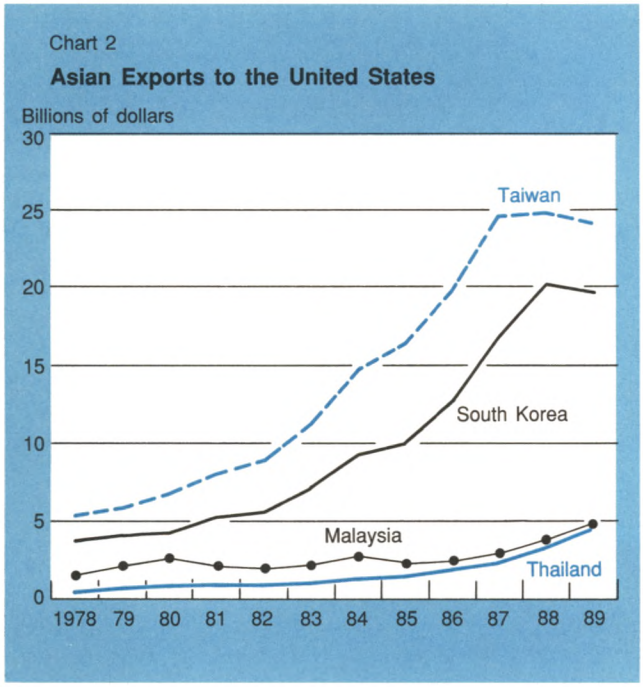
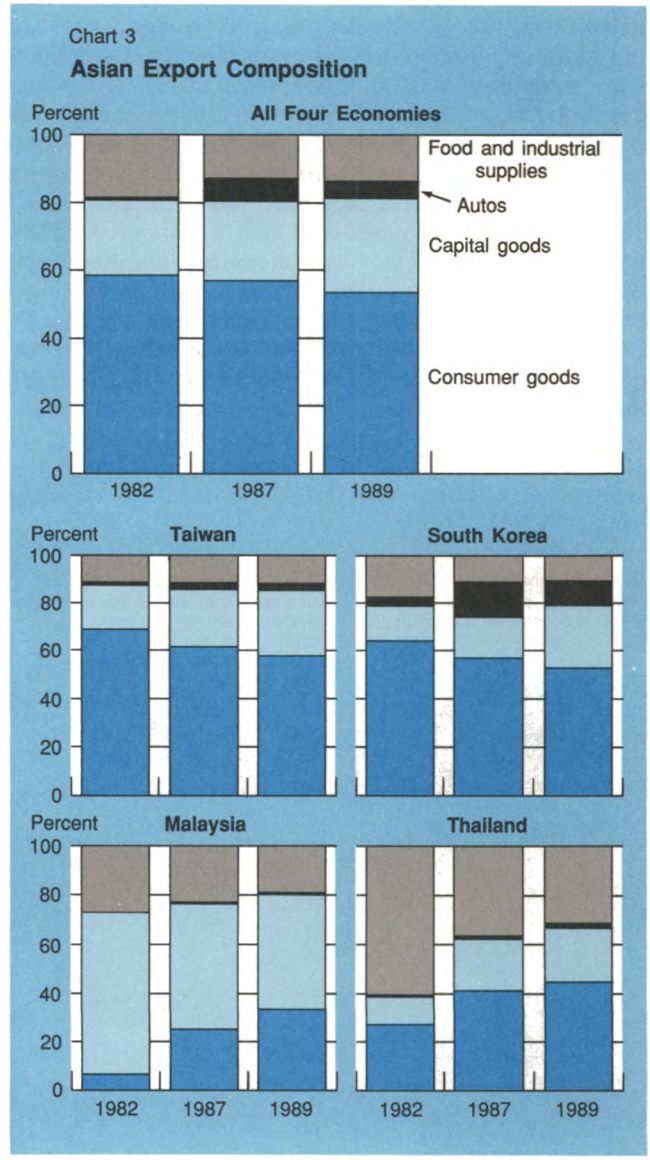


Chart 3

Asian Export Composition



percentage in 1989.

Individually, however, Taiwan and South Korea experienced a substantial movement away from consumer goods exports during the 1980s. In 1982, labor-intensive consumer goods dominated Taiwanese and South Korean sales to the United States. As Taiwan and South Korea developed, capital goods, especially computer equipment and other high-tech goods, increased significantly as a share of each economy's exports, while consumer goods declined.[3] This shift was most pronounced in 1988 and 1989, the two years when overall Taiwanese and South Korean export growth slowed. Taiwanese consumer goods sales actually fell over these two years, after growing at double digit rates earlier in the decade, while growth in South Korean consumer goods sales was extremely weak.

Shifts in the composition of Malaysian and Thai exports during the 1980s were even sharper than those in the composition of Taiwanese and South Korean exports. Although Malaysia's domestic economy was still based on natural resources in 1982, capital goods surprisingly accounted for about two-thirds of Malaysian exports to the United States that year.[4] These capital goods exports consisted almost entirely of electronic components made by the subsidiaries of U.S. multinational corporations (Table 2). Thailand's export composition in 1982 was more typical of that of a developing country: commodities based on natural resources accounted for about two-thirds of Thai exports. As the 1980s progressed, however, both Malaysia and Thailand moved increasingly into consumer goods exports.[5] A substantial Malaysian and Thai presence in the international textile and apparel industry developed during this period. Malaysia's and Thailand's shift toward consumer goods allowed both economies to benefit from the weakening Taiwanese and South Korean consumer goods export performance in 1988 and 1989. In fact, Malaysian and Thai consumer goods exports doubled over these two years. Although Malaysian and Thai capital goods exports also grew rapidly, burgeoning consumer goods sales were the largest contributor to overall Malaysian and Thai export growth in the late 1980s.

Reflecting export developments in all four Asian economies, total exports of capital goods to the United States have grown briskly over the entire 1980s period. Total exports of consumer goods grew rapidly until 1987 but slowed in 1988 and 1989 as soaring growth rates for Malaysian and Thai consumer goods exports only partially made up for the slowdown in growth of Taiwanese and South Korean sales (Table 3).

A review of market share changes in the U.S. economy will place these export developments in a broader perspective. Market share performance is a good measure of the competitiveness of different market participants because it abstracts from the increase in sales of all market participants arising from U.S. demand growth. Market share analysis also has implications for U.S. trade balance adjustment with the world since it shows whether changes in the exports of the four Asian economies have been offset by changes in the sales of other exporters to the United States or by changes in the sales of U.S. domestic producers.

The four Asian economies as a group actually doubled their market share for both capital goods and consumer goods in the U.S. economy between 1982 and 1987 (Table 4). Their market share for capital goods grew further in 1988 and 1989 despite some slowdown in labor-intensive capital goods exports (such as fans and pumps) sold by Taiwan.[6] The market share held by the Asian economies for consumer goods, however, fell in 1988 and 1989. Still, it only dropped back to about where it was in 1986 and remained far ahead of its 1982 position.

[3]Automobiles also increased sharply as a share of South Korean exports in the 1980s. Strike activity in the South Korean automobile industry in the late 1980s contributed significantly to the slowdown in South Korean exports during the past two years.

[4]The high share of capital goods in part reflects a sharp fall in the price of Malaysian commodity exports in 1982. Commodities were a much higher share of Malaysia's exports in 1981 than in 1982.

[5]Some of the recorded growth in consumer goods exports reflected a reclassification of certain electronic goods from the capital goods to the consumer goods category in the U.S. trade data rather than an actual change in export composition. Most of the growth, however, reflected the development of Malaysia's and Thailand's consumer goods industries.

[6]Malaysia's relatively weak market share gain for capital goods during the 1980s reflects the already well established presence of U.S. multinational corporations in Malaysia in 1982. A reclassification of certain electronics products from capital goods to consumer goods in U.S. trade data from 1983 on also tended to overstate Malaysia's market share for capital goods in 1982 relative to its share in later years.

Table 2

Share of U.S.-Asian Trade Flows Accounted for by Subsidiaries of U.S.-Owned Multinational Corporations in the Four Asian Economies, 1987

(Percent)

	Taiwan	South Korea	Malaysia	Thailand
Asian exports	5.4	4.8	59.2	15.1
Asian imports	6.9	9.0	61.7	21.4

Source: U.S. Department of Commerce, *U.S. Direct Investment Abroad: Operations of U.S. Parents and Their Foreign Affiliates.*

These Asian market share developments, in conjunction with developments in the market share of all exporters to the United States, do not offer an encouraging outlook for the global adjustment of the U.S. trade balance. The continued growth in the Asian economies' market share for capital goods in 1988-89, in part stemming from the operations of U.S. multinational corporations, indicates that U.S. demand for these Asian products has not weakened. Moreover, since the Asian economies accounted for a steady proportion of total U.S. capital goods imports during the last two years, their recent market share gain appears to have come at the expense of U.S. producers rather than that of other exporters selling to the United States. In addition, although the Asian economies' market share for consumer goods has recently declined, U.S. consumer goods imports from all countries appear to have lost no significant market share since 1987. Consequently, the market share loss of the Asian economies has apparently benefited other consumer goods exporters to the United States rather than U.S. consumer goods producers.

Asian import developments

On the import side, Asian purchases from the United States more than doubled from 1982 until 1989. In contrast to the late 1980s slowdown in exports, Asian import growth was much faster in 1988 and 1989 than it had been in the preceding five years (Chart 4). Also in contrast to Asian exports, Asian imports have shown only slight differences in composition, both across economies and across time. Capital goods and food and industrial supplies accounted for most of the Asian purchases from the United States throughout the 1980s. A major similarity between Asian export developments and Asian import developments has been that U.S. capital goods producers have faced significantly stiffer competition than U.S. consumer goods producers in both the U.S. and Asian markets.

Table 4

Market Share in the United States

(Percent, Not Seasonally Adjusted)

	Capital Equipment		
	1982†	1987	1989-I to 1989-III
Market share belonging to:			
Taiwan	0.80	2.06	1.89
South Korea	0.39	1.03	1.45
Malaysia	0.57	0.50	0.61
Thailand	0.05	0.16	0.26
Above four economies	1.81	3.76	4.22
All U.S. imports	17.77	29.17	32.38
	Consumer Goods		
	1982†	1987	1989-I to 1989-III
Market share belonging to:			
Taiwan	1.13	2.18	1.78
South Korea	0.67	1.38	1.32
Malaysia	0.02	0.11	0.18
Thailand	0.04	0.13	0.23
Above four economies	1.87	3.79	3.51
All U.S. imports	7.35	12.67	12.63

Note: Capital equipment does not include transportation equipment.

†A change in the trade classification of certain electronic products makes 1982 data not entirely compatible with later data. This reclassification mainly affects Malaysian exports and explains the apparent loss of Malaysian market share in capital goods between 1982 and 1987.

Table 3

Change in U.S. Trade Flows with Four Asian Economies from 1987 to 1989

(Billions of Dollars)

	Taiwan	South Korea	Malaysia	Thailand	Total	Annualized Percent Change
Asian exports						
Total	−0.4	2.7	1.8	2.1	6.2	6
Food and industrial supplies	0.0	0.2	0.2	0.5	1.0	8
Capital goods	0.7	2.0	0.7	0.5	3.9	17
Autos	0.1	−0.4	0.0	0.1	−0.2	−4
Consumer goods	−1.2	0.8	0.8	1.1	1.5	3
Asian imports						
Total	4.0	5.7	0.8	0.8	11.3	28
Food and industrial supplies	1.3	2.6	0.1	0.3	4.4	21
Capital goods	1.4	2.4	0.7	0.1	4.6	28
Autos	0.6	0.0	0.0	0.0	0.7	176
Consumer goods	0.3	0.3	0.0	0.1	0.7	37

Note: Components may not add to totals because of rounding and exclusion of "other" subcategory.

U.S. food, industrial supplies, and capital goods exports accounted for about 90 percent or more of total U.S. exports to each of the four Asian economies in both 1982 and 1987 (Chart 5). Capital goods were about 35 percent of U.S. sales to Taiwan and South Korea, 50 percent of U.S. sales to Thailand, and over 75 percent of U.S. sales to Malaysia throughout the period. Commodities accounted for most of the remaining U.S. sales. The high share of exports of U.S. capital goods to Malaysia primarily represented shipments by U.S. multinational firms of electronic components for processing in their Malaysian subsidiaries (Table 2).

The composition of U.S. exports continued to show relatively little change in 1988 and 1989, despite the substantial pickup in U.S. export sales. U.S. exports of consumer goods and especially automotive products grew extremely rapidly (Table 3), but growth was from a very small base. Capital goods and commodities, consequently, continued to account for over 85 percent of U.S. export sales to each of the Asian economies.[7]

In terms of market share developments in the Asian

[7]This calculation excludes a relatively large group of 1989 U.S. exports that have not been classified.

Chart 4

Asian Imports from the United States

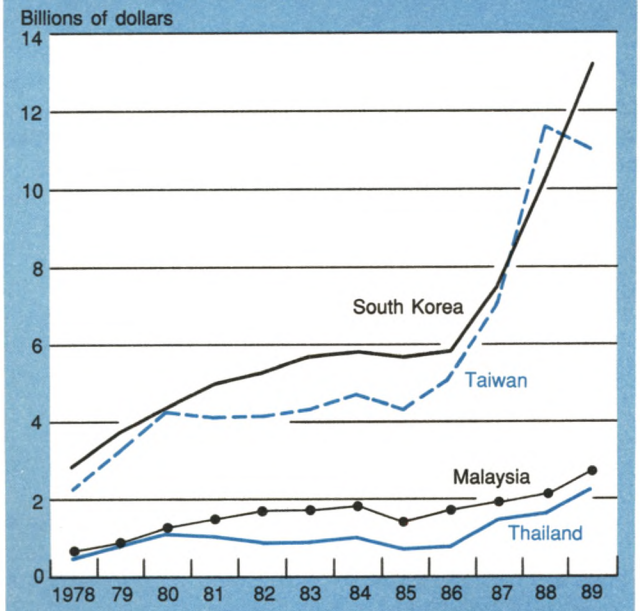


Chart 5

Asian Import Composition

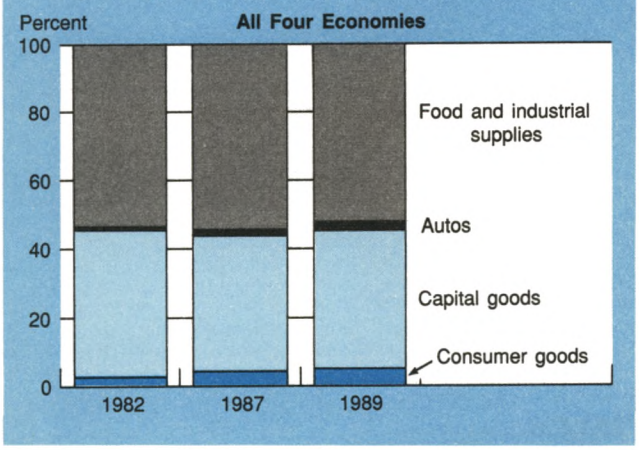


Table 5

Market Share in the Asian Economies

Four Asian economies combined	1982	1987	1988
Private consumption expenditures			
U.S. market share	0.3	0.5	0.6
Market share for imports from all sources	5.9	4.7	5.1
U.S. share of consumer goods imports	5.3	10.2	12.2
Capital equipment expenditures			
U.S. market share†	27.4	17.3	17.9
Market share for imports from all sources†	60.1	68.7	67.9
U.S. share of capital equipment imports	40.0	26.9	25.0
Taiwan	**1982**	**1987**	**1988**
Private consumption expenditures			
U.S. market share	0.5	0.9	1.2
Market share for imports from all sources	5.1	5.2	6.4
U.S. share of consumer goods imports	10.4	17.5	18.3
Capital equipment expenditures			
U.S. market share	23.6	23.7	24.6
Market share for imports from all sources	38.0	59.1	60.6
U.S. share of capital equipment imports	62.1	40.1	40.6
Automotive products			
U.S. market share	3.0	10.8	25.3
Market share for imports from all sources	48.2	44.2	66.1
U.S. share of automotive imports	20.8	24.4	38.7

Note: Capital equipment does not include transportation equipment.

†The market share data are for Taiwanese and South Korean markets only.

economies, U.S. consumer goods and automotive producers performed substantially better than U.S. capital goods producers (Table 5), a result analogous to the findings on market share developments in the U.S. economy.[8] The market share held by the United States for consumer goods in the Asian economies doubled between 1982 and 1988. Most of the U.S. gain occurred in 1987 and 1988, with relatively little change in the U.S. share between 1982 and 1986. The United States also sharply gained market share for automotive products in Taiwan after 1982.[9] (Of the four economies, only Taiwan has an automotive market in which the United States has significant sales.) The increase in automotive market share was particularly dramatic in 1988.

U.S. capital goods exports performed much less successfully, losing 35 percent of their market share for total Asian capital equipment expenditures between 1982 and 1988.[10] This loss basically reflects the sharp drop in U.S. market share in South Korea, the Asian economy which has most rapidly built up its own domestic capital goods sector. Although the United States achieved a slight increase in market share in Taiwan, the gain was much smaller than the U.S. market share gains for consumer goods or automotive products in Taiwan. Data are not available to compute changes in the market share held by U.S. capital goods producers in Malaysia or Thailand. Trade statistics show, however, that the U.S. share of total Malaysian capital goods imports has been quite volatile and that the U.S. share of total Thai capital goods imports has fallen steadily since 1982. In fact, the U.S. share of total capital goods imports in all four Asian economies combined fell 38 percent between 1982 and 1988. This loss in import share implies that other exporters (notably Japan, the other chief supplier of capital goods to these economies) were prime beneficiaries of the weak U.S. capital goods performance.[11]

Overall, market share developments in the Asian economies, like market share developments in the U.S. economy, do not suggest a favorable outlook for U.S. global trade balance adjustment. U.S. consumer goods producers have done fairly well in the Asian economies in recent years, but U.S. consumer goods exports remain relatively small in dollar terms. In contrast, U.S. capital goods producers face stiff competition in the

[8]Some U.S. exports to Malaysia may enter through Singapore and thus may not be included in the U.S. market share figure for Malaysia.

[9]This market share analysis is based on purchases of transportation equipment by Taiwanese industry. Data on Taiwanese private consumer purchases of automobiles are not available.

Table 5

Market Share in the Asian Economies (continued)

South Korea	1982	1987	1988
Private consumption expenditures			
U.S. market share	0.2	0.3	0.4
Market share for imports from all sources	1.6	2.9	2.6
U.S. share of consumer goods imports	13.7	11.7	17.1
Capital equipment expenditures			
U.S. market share	31.5	13.9	14.4
Market share for imports from all sources	83.8	73.8	71.6
U.S. share of capital equipment imports	37.6	18.9	20.1
Malaysia	**1982**	**1987**	**1988**
Private consumption expenditures			
U.S. market share	0.4	0.3	0.3
Market share for imports from all sources	27.0	14.0	17.5
U.S. share of consumer goods imports	1.6	2.0	1.8
Capital equipment			
U.S. share of capital equipment imports	35.8	45.7	35.4
Thailand	**1982**	**1987**	**1988**
Private consumption expenditures			
U.S. market share	0.2	0.2	0.3
Market share for imports from all sources	2.4	3.4	3.1
U.S. share of consumer goods imports	7.5	7.3	9.8
Capital equipment			
U.S. share of capital equipment imports	24.6	18.0	13.0

Note: Capital equipment does not include transportation equipment.

[10]Part of the poor U.S. capital goods performance may be due to price rather than volume factors. As the U.S. dollar depreciated over the 1985-88 period, the price of products from Taiwan, South Korea, and other exporting countries rose in dollar terms. Although it is important from an output perspective to separate price from volume changes, the above analysis concentrates on overall nominal market share since it is nominal trade balances that must be financed or adjusted. Moreover, dollar translation effects would have had an impact on consumer goods and automotive market share developments as well. Yet in these two areas U.S. producers did very well.

[11]Foreign direct investment often leads to capital goods exports from the country of the investor. But the decreasing share of U.S. products in the total capital goods imports of the Asian economies does not appear to result from changes in the relative magnitude of U.S. direct investment flows to these economies. The ratio of U.S. direct investment flows during 1981-82 to the Asian economies' total 1982 capital goods imports was roughly the same as the ratio of U.S. direct investment flows in 1987-88 to the Asian economies' capital goods imports in 1988 (under 10 percent in both cases). Consequently, U.S. direct investment appears to have played a minor role in U.S. capital goods exports to these economies, both in 1982 when the United States accounted for 40 percent of total capital goods imports and in 1988 when the United States accounted for only 25 percent of total capital goods imports.

Asian economies, owing in significant part to the success of other exporters to these economies.

Factors behind the changing U.S. trade balance with the four Asian economies

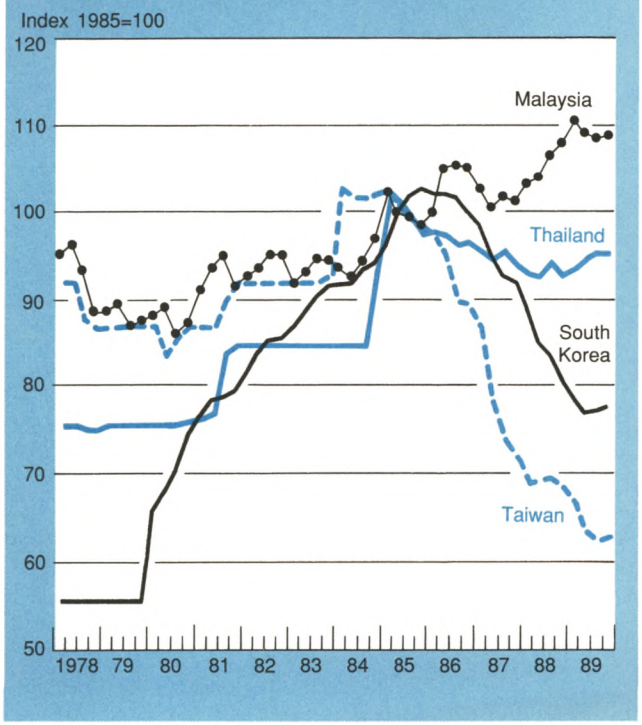
The following sections examine the factors underlying U.S. trade developments with the four Asian economies over the 1980s. The analysis uses exchange rate movements, labor productivity and labor cost developments, supply capacity growth, and trade policy changes to explain the sharp rise and recent modest reduction in the U.S. trade deficit with these economies.[12] The findings suggest that in the early 1980s all four Asian economies became significantly more competitive. In the late 1980s Malaysia and Thailand continued to gain price competitiveness and were in a strong supply position to take advantage of their gains. At the same time, Taiwan and South Korea lost substantial price competitiveness, in large part because of currency changes, rising labor costs, and trade policy developments both at home and in the United States. Nevertheless, Taiwan and South Korea remain in a strong competitive position relative to the United States.

[12]Differences in GDP growth rates between the United States and the Asian economies give rise to differences in import demand and thus may account for part of the observed trade balance trends. Throughout the 1980s, however, average annual GDP growth rates in the Asian economies remained roughly two to two and one-half times the GDP growth rate in the United States. These higher Asian growth rates alone would have been a source of U.S. trade balance improvement during the 1980s. This section, therefore, focuses on the exchange rate and other factors more closely linked to the U.S.-Asian trade balance deterioration in the 1980s.

Chart 6

Nominal Exchange Rates

Foreign Currency per U.S. Dollar



Exchange rates

Exchange rate movements have helped determine the pattern of price competitiveness shown by the Asian economies. The currencies of all four economies depreciated substantially against the U.S. dollar from 1980 through 1985 (Chart 6).[13] The New Taiwan dollar depreciated 16 percent, the South Korean won 43 percent, the Malaysian ringgit 14 percent, and the Thai baht 33 percent during this period.[14] Because changes in exchange rates affect trade balances over a period of time, these depreciations contributed significantly to the $23 billion deterioration in the U.S. trade balance with the Asian economies between 1982 and 1987. In particular, the very large South Korean depreciation was an important factor behind the emergence of that economy's $9 billion surplus with the United States during the mid 1980s. The Thai depreciation was also large, but the Thai trade surplus increased by only about $1 billion during this period because the depreciation was partially offset by the falling price of Thailand's raw commodity exports.

During the post-1985 period the performances of the Asian currencies against the U.S. dollar were much more varied. The New Taiwan dollar and South Korean won sharply appreciated against the U.S. dollar over the last four years. This appreciation was a prime factor behind the decline in the U.S. trade deficit with these two economies in the late 1980s. The New Taiwan dollar appreciated 36 percent against the U.S. dollar between 1986 and 1989, rising above its 1980 level. The South Korean won, however, appreciated only 23 percent against the U.S. dollar over the same period, remaining below its 1980 level. The differences in currency appreciation in part explain why the recent U.S.

[13]Real exchange rates adjust the nominal exchange rate for differences in rates of inflation. Explicit real exchange rate comparisons are not presented here because of significant differences between the United States, Taiwan, South Korea, and Thailand in the composition of the price indexes used to measure inflation in traded goods and because of the lack of any comparable index for Malaysia. Thus, the discussion focuses on the movements in nominal exchange rates only. The next section focuses on movements in manufacturing production costs.

[14]These calculations are based on year-average exchange rate levels. The exchange rate movements are measured as changes in the values of the Asian currencies per U.S. dollar.

trade balance improvement was smaller with South Korea than with Taiwan.

As for Malaysia and Thailand, the Malaysian ringgit continued to depreciate against the U.S. dollar from 1985 through 1989 while the Thai baht showed only a modest appreciation. These changes kept Malaysia and Thailand competitive with U.S. producers and, more important, made these two economies much more competitive relative to Taiwan and South Korea than they had been earlier in the decade. Malaysia and Thailand were therefore able to capture sales in the United States at the expense of the other two Asian economies.

Labor productivity and labor costs

The relatively low wages in the manufacturing sectors of the Asian economies have been another important source of their price competitiveness. Data on labor compensation throughout the 1980s for all four of the economies are not available. Data for 1988, however, show that each of the economies continued to have a wage rate only between 6 and 19 percent of the U.S. level (Table 6).[15] Moreover, labor productivity growth (measured by value added per employee) in the Asian economies averaged about 5 percent during the 1980s and, with the exception of Thailand, matched or exceeded that of the U.S. manufacturing sector.[16] Consequently, labor productivity and cost developments were an important determinant of the rise in the Asian economies' trade surpluses with the United States in the 1980s.

A comparison of developments across the four Asian economies reveals, however, that substantial labor cost divergences have begun to appear in recent years. Like exchange rate movements, these late 1980s labor cost developments have played a significant role in the increase in the U.S. deficit with Malaysia and Thailand and in the decline in the U.S. trade deficit with Taiwan and South Korea, notably in the labor-intensive consumer goods area. Since 1985, labor productivity growth in Malaysia and Thailand has continued to match the productivity growth rates of Taiwan and

[15]The hourly compensation figures listed in Table 6 include nonsalary compensation for the United States, Taiwan, and South Korea, but not for Malaysia or Thailand. This difference in coverage gives a modest downward bias to Malaysian and Thai labor costs measured relative to those of the other economies.

[16]Labor productivity growth is measured as growth in value added per employee. This measure is available for each of the four Asian economies. An alternative measure that is commonly used is total outpur per hour, but this measure is not available for Thailand and Malaysia. In South Korea, the two measures yield significantly different results: the annual growth of total output per hour is 15 percent while the annual growth in value added per employee is 5.1 percent. This discrepancy appears to stem from the difference in the measurement of labor input.

Table 6

Indicators of Asian Manufacturing Competitiveness

	Hourly Compensation			Output Per Employee		
	1988 Level (U.S. Dollars)	1988 Hourly Compensation Relative to U.S. Level	1986-88 Average Annual Growth (In Local Currency Terms, Percent)	1988 Level (Measured in 1980 U.S. Dollars)	1988 Level Relative to U.S. Level	1986-88 Average Annual Growth (Percent)
Taiwan	2.71	.19	10.2	10539	.26	6.9
South Korea	2.52	.18	14.9	9162	.23	5.1
Malaysia	.81	.06	2.5	8561	.21	6.4
Thailand	.86	.06	5.9	4844	.12	4.7
United States	13.90	1.00	3.1	40307	1.00	3.9

Sources: The hourly compensation data for Taiwan and South Korea are taken from the Bureau of Labor Statistics. For Thailand, the hourly compensation data are from the Bank of Thailand, *Annual Report,* and for Malaysia, from the Malaysian Industrial Development Authority and Bank Negara Malaysia, *Annual Report*. Data on output per employee are taken from Asian Development Bank, *Key Indicators*.

Notes: Data for Taiwan and South Korea include nonwage compensation. The compensation figure for Malaysia is the average wage of selected semiskilled operatives in the electronics and textile industries and does not include nonwage compensation. The average annual growth in Malaysian wages is based on negotiated wage settlements in the manufacturing sector. Data on wage levels of manufacturing workers in Thailand do not include nonwage compensation. Because data on manufacturing wage growth in Thailand are not available, the growth rate of wages of government workers is shown in the table. For the 1986-88 period it is roughly the average of the 1.5 percent growth in the minimum wage rate and the larger growth in wages of all nonagricultural workers. Anecdotal evidence suggests that this average is fairly representative of the Thai manufacturing sector.

Output per employee was computed by converting value added per employee into U.S. dollars at 1980 exchange rates and multiplying by the rate of productivity growth between 1980 and 1988.

South Korea.[17] But recent labor cost trends (measured in local currency terms) have substantially improved the price competitiveness of both the Malaysian and the Thai manufacturing sectors relative to that of the manufacturing sectors in the other two Asian economies.

Although Taiwan and South Korea still maintain a cost advantage, they have recently lost price competitiveness against the United States as well as against Malaysia and Thailand. This loss was largely due to rapid wage growth (again, measured in local currency terms), which significantly outpaced increases in labor productivity. Nevertheless, in 1988 Taiwanese and South Korean wage rates were still only about one-fifth those of manufacturing production workers in the United States while productivity levels were about one-quarter those in the United States. As a result, Taiwanese and South Korean unit labor costs remained very competitive relative to those in the United States.

Manufacturing production capacity

Labor and capacity supply constraints are important economic concerns for rapidly growing economies. Although the four Asian economies have differed in labor market conditions, they all appear to have substantially increased their manufacturing supply capacities during the 1980s, making a rapid expansion of their exports to the United States possible. Investment and savings rates have been very high in the four economies, particularly compared with the United States (Table 7). The high Asian investment rates have been an important factor supporting both the rapid output growth rates and the strong labor productivity performances of these economies during this period.

[17]Malaysia's labor productivity was almost equal to Taiwan's and South Korea's in the 1980s, in large part because of the high value added per employee in Malaysia's semiconductor and refined petroleum industries.

One significant aspect of the 1980s increase in supply capacity in the Asian economies has been the role played by multinational corporations, which supply direct access to foreign markets. Foreign direct investment in the four Asian economies, already substantial between 1982 and 1986, picked up sharply in 1987 and 1988. The United States and Japan accounted for most of the foreign direct investment in these two years (Table 8), although Taiwan and South Korea have recently become sources of sizable foreign direct investment in the manufacturing sectors of Malaysia and Thailand.[18] Investors from Taiwan and South Korea have been attracted to Malaysia and Thailand as production locations by their relatively low labor costs and lack of significant currency appreciation and by the incentives offered foreign investors, particularly in

[18]A significant decline in the U.S. investment position in the Thai petroleum industry offset increased U.S. investment inflows in other industries, resulting in no net inflows from the United States to Thailand for this period.

Table 8

Foreign Direct Investment Inflows in 1987 and 1988 Combined

(Billions of Dollars)

	Total	From the United States	From Japan
Taiwan	1.7	0.7	0.7
South Korea	1.5	0.5	1.1
Malaysia	1.1	0.3	0.6
Thailand	1.5	0.0	0.6
Above four economies	5.8	1.5	3.0

Source: Japanese data are drawn from survey results reported by the Ministry of Finance.

Note: Data for Japan are based on fiscal rather than calendar year.

Table 7

Measures of Capacity in the Four Asian Economies

	Unemployment Rate in 1988	Employment in Manufacturing in 1988 (Thousands)	Annual Average Ratio of Gross Fixed Capital Formation to GDP, 1982-88	Average Annual Ratio of Gross National Savings to GDP, 1982-88	Average Annual Growth in Manufacturing Output, 1986-88
Taiwan	1.7	2798	21.0	34.5	10.0
South Korea	2.5	4667	30.2	28.9	11.9
Malaysia	8.1	1013	29.8	27.5	8.9
Thailand	5.8	2760	23.8	21.5	8.3
United States	5.5	19366	17.4	13.4	5.7

Sources: Asian Development Bank, *Key Indicators,* and Bank of Thailand, *Annual Economic Report.*

Malaysia.[19]

Of the four economies, Taiwan currently appears to face the tightest supply constraints, notably on the labor side, while Malaysia and Thailand appear to be least constrained. The low unemployment rate in Taiwan suggests that virtually no additional Taiwanese labor is now available. On the capital side, Taiwan has the lowest domestic investment rate of the four economies because much of its relatively large savings is being invested abroad. South Korea continues to maintain impressive levels of savings and investment. Although its unemployment is relatively low, South Korea also does not appear to have as serious a labor constraint as Taiwan. Savings and investment rates are high in both Malaysia and Thailand. These economies, moreover, appear to have relatively ample labor supplies. Industrial development in Thailand has been hindered to some extent by the strains on infrastructure caused by the tight concentration of manufacturing plants in the Bangkok area. However, Thailand's strong investment performance and efforts to spread manufacturing production to other regions should help ease these bottlenecks.

Trade policy

Trade policy developments represent the final set of factors contributing to changes in the competitiveness of the four Asian economies. A substantial number of trade restraints affected U.S.-Asian trade during the 1980s. On the Asian side, all four economies had significant tariff and licensing restrictions, which limited U.S. exports in the early to mid-1980s. On the U.S. side, the major restraint on imports from the Asian economies during this period was imposed by the Multi-Fiber Arrangement.[20] Nevertheless, because the Asian and the U.S. restrictions had been in place for many years, they were not a major determinant of the U.S.-Asian trade balance evolution from 1982 to 1987.[21]

More recently, substantial changes in some trade policies have had a significant impact on trade developments. Changes undertaken by Taiwan, South Korea, and the United States contributed to the recent decline in the U.S. trade deficit with Taiwan and South Korea and the growth in the U.S. trade deficit with Malaysia and Thailand.

Taiwan reduced its average nominal tariff level by 8 percentage points over the last three years, lowering it from 20 percent in 1987 to 12 percent in 1989.[22] There was a particularly sharp reduction in the tariff schedule for automobiles. The average weighted effective Taiwanese tariff level for all products is now about equal to the industrial country average, although the range of Taiwanese tariffs across commodity categories still remains relatively large. Over the past few years Taiwan also extended preferences for the importation of U.S. capital goods, including restricted bidding on government projects and subsidized loans.

South Korea recently reduced its nominal average tariff rate from 20 percent to 12 percent and cut substantially the number of products requiring import licenses.[23] (The licenses were equivalent in their effects to a quota system.) In addition, South Korea began providing subsidized loans for capital goods imported from the United States.

The major U.S. trade policy change was the removal of Generalized System of Preferences (GSP) benefits from Taiwan and South Korea in the beginning of 1989. GSP benefits allow certain products to enter the United States duty-free. Malaysia and Thailand continue to receive GSP benefits, which effectively reduce the price of their GSP-eligible products about 5 percent relative to that of other exporters' products in the U.S. market. Consequently, for GSP products (about a third of Malaysian and Thai sales to the United States), Malaysia and Thailand have gained price competitiveness relative to the other Asian economies.

Conclusion

The United States continues to experience large trade deficits with Taiwan, South Korea, Malaysia, and Thailand. The deficits with Taiwan and South Korea have fallen recently, primarily in response to substantial import liberalization and the appreciation of the currencies of these two economies. Nevertheless, all four Asian economies remain very competitive because of their strong productivity growth rates, moderate unit labor costs, and high domestic investment levels. Malaysia and Thailand, moreover, have gained a significant

[19] In 1988, Taiwan received approval from Malaysia for investment projects valued at over $780 million (*Asian Wall Street Journal Weekly*, January 22, 1990). Taiwan's manufacturing investments are largely geared toward production for export, with sizable investments in the electrical and electronic equipment, chemicals, and textiles industries. South Korean investors have concentrated on Thailand, where in 1988 they received approval for investments of over $100 million (*Far Eastern Economic Review*, November 16, 1989).

[20] The Multi-Fiber Arrangement limits the growth rate of clothing imports from various countries to the United States.

[21] A U.S. policy placing restrictions on steel imports, adopted in 1984, did limit U.S. steel purchases from South Korea starting in 1985. By 1987, however, South Korea was selling less than its restricted steel level to the United States, in part because of strong demand elsewhere. Since it is not known how South Korean steel capacity might have grown in the absence of U.S. trade restrictions, the impact of these trade restrictions on South Korea's trade balance is unclear.

[22] *National Trade Estimate Report on Foreign Trade Barriers*, Office of the U.S. Trade Representative, 1987 and 1989 issues.

[23] *National Trade Estimate Report*, 1987 and 1989 issues.

amount of the sales that Taiwan and South Korea have lost. Malaysia and Thailand have in fact done so well that if they maintain their momentum of the last few years, they are likely to reach the current level of Taiwanese and South Korean manufacturing export sales by the mid-1990s.

This picture of strongly competitive and rapidly growing Asian economies makes it important to assess how the U.S. competitiveness position is apt to change over time. Market share analysis suggests that the recent improvement in the U.S. competitiveness position with the Asian economies came almost entirely in the consumer goods and automotive products sectors. This improvement may not be sustainable. Although U.S. exports of consumer goods have grown rapidly, they remain quite small. Furthermore, the modest decline in Asian exports of consumer goods to the United States has been accompanied by an increase in U.S. consumer goods imports from other countries. In consequence, imports from all sources have maintained their market share, and U.S. manufacturers have received relatively small benefit from the recent bilateral change in U.S.-Asian consumer goods trade.

Market share developments in the United States and Asia also indicate that U.S. capital goods, which have traditionally been very competitive, have fared significantly worse than U.S. consumer goods in recent years. The U.S. capital goods performance is complicated by two factors. First, the loss of U.S. market share for capital goods in the Asian economies reflects the strong performance not only of the Asian economies themselves but of other capital goods exporters as well. Second, the gain of Asian market share for capital goods in the U.S. economy is partly attributable to shipments from the foreign subsidiaries of U.S. multinational corporations. Overall, developments in both the consumer goods and capital goods sectors highlight the broad context in which the bilateral U.S.-Asian trade balance evolution must be viewed. An analysis of this evolution must consider the role of multilateral trade flows and multinational corporations, as well as traditional bilateral trade determinants, if it is to provide a complete understanding of U.S. and Asian trade developments.

Susan Hickok
James Orr

Unemployment in Canada and the United States: The Role of Unemployment Insurance Benefits

Over the last two decades, a large gap between the unemployment rates of Canada and the United States has emerged. These rates were very close throughout the 1950s and 1960s, then diverged in the 1970s when Canada's rate surpassed the U.S. rate by half a percentage point. In the 1980s, this gap widened further, averaging an enormous two and a half percentage points (Chart 1, Table 1).[1]

This divergence is puzzling because in many respects the economies of the two countries are very much alike. Demographic trends in Canada parallel those in the United States. The structure of labor markets is similar, as is the sectoral composition of employment.[2] Moreover, the business cycles of the two countries are closely correlated, and their inflation rates, though slightly different, have moved in tandem. Another notable similarity concerns the method of measuring unemployment: both Canada and the United States use household surveys to determine the number of unemployed persons.

Although many articles have analyzed the reasons for the U.S-Canadian unemployment gap, no consensus has been reached on its causes. Some authors have pointed to demand deficiency in Canada, while others have argued that Canada's higher unionization rate and more generous unemployment insurance (UI) system have given rise to greater "labor market rigidities" than exist in the United States. Other studies find that conventional explanations based on supply or demand are unsatisfactory.[3]

This article argues that the unemployment gap can be primarily attributed to more liberal UI benefits in Canada. An important distinction between this analysis and other studies emphasizing the role of UI is the contention that a critical feature of the Canadian UI system—the provision of benefits not only to those unemployed persons who have lost their jobs, but also to some who have reentered the labor force or left their jobs—has been largely responsible for Canada's higher unemployment.

The article demonstrates that Canada's more inclusive beneficiary pool is a key to understanding certain unemployment trends that other studies have failed to analyze or satisfactorily explain. First, benefits were more generous in Canada even in the 1950s and 1960s, yet Canada's unemployment rate was not appreciably higher than the the U.S. rate until the 1970s.

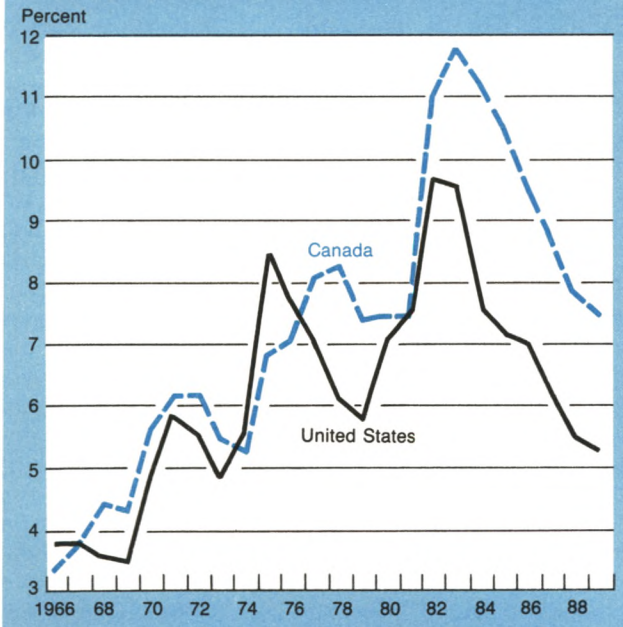
[1]Before 1966, a consistent unemployment rate series is not available for Canada. However, available data indicate that the unemployment rates were quite similar prior to 1966. The implications of the pre-1966 data are discussed later in this article.

[2]Canadian and U.S. collective bargaining agreements are fashioned along comparable lines, and in both countries employers respond to short-run declines in demand by laying off workers temporarily—a practice that is far less prevalent in continental Europe. The sectoral composition of employment in the two countries is also remarkably similar, with about three-fourths of total employment in the service sector.

[3]Some recent articles illustrate the range of arguments advanced. Pierre Fortin ("How Natural is Canada's High Unemployment Rate?" *European Economic Review*, 1989) stresses the role of demand deficiency. Herbert Grubel ("Drifting Apart: Canadian and U.S. Labor Markets," *Contemporary Policy Issues*, vol. 6 [January 1988], pp. 39-54) emphasizes real wage rigidity in Canada, which he attributes to more generous UI and a higher unionization rate. Orley Ashenfelter and David Card ("Why Have Unemployment Rates in Canada and the United States Diverged?" *Economica*, vol. 53 [1986], Special Supplement, S 171-95) find no explanation for what they characterize as a post-1981 unemployment gap.

Chart 1

Unemployment Rates



Second, despite measures to tighten some provisions of the UI system in the late 1970s, Canada's unemployment rate in the 1980s was higher than in the 1970s.

The first trend is explained by the interaction of two developments in the 1970s: benefits to unemployed persons other than job losers were significantly liberalized under Canada's Unemployment Insurance Act of 1971, and the labor force participation of women accelerated. In preceding decades, Canada's unemployment rate was not appreciably higher than the U.S. rate because the labor force was dominated by adult men, whose labor force participation is less responsive to the availability of UI than that of women. In the 1970s, however, with the adult male portion of the labor force declining, workers with a lower employment commitment gained substantially greater access to UI, and their unemployment rate surged. A related explanation is offered for the second trend, the sharp increase in the unemployment rate in the 1980s. Despite the increased stringency of the Canadian UI system since the late 1970s, a substantial component of the unemployed other than job losers continue to receive benefits.

Comparative economic performance

Macroeconomic analysis suggests that the emerging unemployment gap in the 1970s was masked by

Table 1

Unemployment Rates by Demographic Groups

	Canada				United States			
	Total	Men	Women	Youth	Total	Men	Women	Youth
1966	3.4	2.6	2.7	5.6	3.8	2.2	3.3	8.5
1967	3.8	3.0	2.8	6.5	3.8	2.0	3.7	8.7
1968	4.5	3.5	3.3	7.7	3.6	1.8	3.2	8.6
1969	4.4	3.2	3.7	7.5	3.5	1.7	3.2	8.4
1970	5.7	4.1	4.4	10.0	4.9	2.8	4.1	11.1
1971	6.2	4.3	5.0	11.1	5.9	3.5	5.0	12.7
1972	6.2	4.1	5.7	10.9	5.6	3.1	4.6	12.1
1973	5.5	3.4	5.4	9.6	4.9	2.6	4.1	10.5
1974	5.3	3.3	5.1	9.3	5.6	3.0	4.6	11.9
1975	6.9	4.3	6.5	12.0	8.5	5.5	7.0	16.1
1976	7.1	4.2	6.6	12.7	7.7	4.8	6.4	14.7
1977	8.1	4.9	7.4	14.4	7.1	4.2	6.0	13.6
1978	8.3	5.2	7.7	14.5	6.1	3.4	5.1	12.2
1979	7.4	4.5	7.0	12.9	5.8	3.3	4.9	11.8
1980	7.5	4.8	6.5	13.2	7.1	4.8	5.5	13.9
1981	7.5	4.8	6.7	13.2	7.6	5.1	5.9	14.9
1982	11.0	8.2	8.8	18.7	9.7	7.5	7.3	17.8
1983	11.8	9.2	9.6	19.8	9.6	7.7	7.2	17.1
1984	11.2	9.0	9.7	17.8	7.5	5.7	6.0	13.9
1985	10.5	8.3	9.4	16.4	7.2	5.3	5.9	13.6
1986	9.5	7.6	8.6	15.1	7.0	5.4	5.5	13.3
1987	8.8	7.0	8.3	13.7	6.2	4.8	4.8	12.2
1988	7.8	6.0	7.5	12.0	5.5	4.2	4.3	11.0
1989	7.5	6.1	7.3	11.3	5.3	3.9	4.2	10.9

demand conditions favorable to Canada over that decade. Chart 2 plots the annual growth rates of gross domestic product (GDP) for both countries from 1966 onwards. Growth in the two countries is highly correlated, and Canada's GDP growth generally exceeds that of the United States, that is, its potential growth rate is higher.[4] The straight lines in Chart 2 correspond to the difference in the average actual growth rates (the Canadian rate minus the U.S. rate) over different periods. Although both countries underwent a productivity slowdown starting in the early 1970s, the difference in their average growth rates over the last two decades was 1.1 percentage points, identical to the difference in the 1950s and 1960s. Between 1966 and 1989 — the period analyzed in detail in this article — the average growth rate difference was also 1.1 percentage points.

However, a comparison of the rates for the 1970s and 1980s in Chart 2 reveals substantial differences in average growth. In the 1970s, in part because of the stimulus provided by high real commodity prices, Canada's growth rate exceeded that of the United States by 1.9 percentage points. In the 1980s, when real commodity prices slumped, the difference in GDP growth — the Canadian value minus the U.S. value — was a minuscule 0.3 percentage points.

The relationship between each country's potential and actual growth reveals a similar pattern. An econometric estimate puts Canada's average potential growth rate between 1970 and 1979 at 4.1 percent, while its actual growth rate averaged 4.6 percent. Over the 1980s its estimated potential growth rate was 3.4 percent, while its actual growth rate averaged 3.1 percent.[5] Thus, in the 1970s, Canada's unemployment rate was unusually low since its GDP growth was about half a percentage point above its potential, but in the 1980s, its actual growth was below potential. In contrast, in the United States, output growth was below potential in the 1970s but roughly at potential in the 1980s. In the 1970s, actual GDP growth and potential GNP growth averaged 2.6 and 3.1 percent, respectively; during the 1980s, actual GDP growth and potential GNP growth averaged 2.4 and 2.5 percent, respectively.[6]

In brief, if Canada and the United States had grown at roughly their potential during both the 1970s and the 1980s, the large unemployment gap would have emerged in the 1970s, rather than in the 1980s. Thus, what needs to be explained is not only the enormous actual gap of the 1980s, but also the large latent gap of the 1970s.

[4]The correlation coefficient between annual GDP growth rates over this period is 0.76. Canada's higher growth rate is largely due to higher productivity growth.

Chart 2

Growth Rates of Gross Domestic Product

Note: Straight lines represent average differences in Canadian and U.S. GDP growth rates over specified time periods (Canadian minus U.S. values).

Assessing differences in UI generosity

A feature of the two labor markets that may influence their unemployment rates is the extent of UI benefits. To assess the generosity of a country's UI program, one must look at a wide range of benefit characteristics. Some programs might pay benefits that replace a substantial portion of a worker's wages, while others might offer benefits over a longer period of time. One must also keep in mind that since UI systems are essentially set up to assist laid-off workers, the actual benefits received by the unemployed depend on demand conditions and increase in a recession. Moreover, even the maximum benefits allowed in a UI program also depend on demand, because the upper limit is usually raised — by legislation or automatic rules — during recessions.

[5]The estimates for Canada are from the International Monetary Fund, *World Economic Outlook*, October 1988. The estimates presented here are weighted averages of the IMF estimates for subperiods.

[6]The difference between GDP and GNP growth for the United States is negligible. The estimates of potential GNP growth for the United States are from Jeffrey D. Hallman, Richard D. Porter, and David H. Small, *M2 per Unit of Potential GNP as an Anchor for the Price Level*, Board of Governors of the Federal Reserve System, Staff Study no. 157, 1989.

Five criteria provide a reasonably comprehensive basis for evaluating the generosity of UI:

(1) the replacement rate, or the ratio of UI benefits to wages
(2) the maximum duration of benefits
(3) the fraction of the work force covered by the UI system
(4) the weeks of work necessary to qualify for benefits
(5) the categories of unemployed persons who qualify for UI. Some UI programs extend benefits only to those who have lost their jobs; under other programs, those who reenter the labor market, enter it for the first time, or leave their jobs may also qualify for UI.[7]

These five criteria usually vary across individuals by industry, region, seniority, and so forth. They can be aggregated, however, to get economy-wide measures, which are strongly cyclical. Judged by most of the above criteria, the Canadian system has always been more generous than the U.S. system, and in the 1980s the generosity gap was larger than in the 1970s, in part because of declining U.S. benefits. The following section provides a description of the salient features of the UI systems in the two countries and an account of the changes each has undergone in the 1970s and 1980s. This information is also summarized in Table 2.

United States

In the United States, benefits are granted primarily to *job losers* — workers on temporary and permanent layoff — whose jobs are covered by the UI system. Under some limited circumstances, workers who quit for "just cause" can qualify, but in general, job leavers, new entrants, and reentrants to the labor force cannot qualify for benefits. Persons discharged for misconduct ("fires") also do not normally qualify for benefits. The percentage of the civilian labor force covered by UI schemes grew to roughly 90 percent by 1978, with very little change since then.[8] This expansion came about primarily through large discrete increases in coverage in 1956, 1972, and 1978, when entire categories of

[7] A system that appears generous when judged by criteria 1 to 4 may turn out to be less liberal when judged by criterion 5. Sweden, for instance, is often cited as a country that combines generous UI and low unemployment. Judged by criterion 5, it may not be so generous: only job losers qualify, and even they can be denied benefits if they turn down training or a job offered by the local labor market board (Anders Bjorklund and Bertil Holmlund, *The Structure and Dynamics of Labor Market Behavior: Sweden and the United States* [Amquist & Wiksell International, 1981]). Sweden's example suggests that another aspect of UI, the disqualification rate for those who apply for benefits, is also an important criterion.

[8] Jobs, not workers per se, are covered under the UI system in the United States. As of 1978, roughly all employees on nonagricultural payrolls were covered; there has been a slight decline in coverage since then because some small miscellaneous programs were phased out. (Payroll employment is roughly 90 percent of the civilian labor force.)

Table 2

How Canada and the United States Differ in the Provision of Unemployment Insurance Benefits

	United States	Canada
1. Average rate of wage replacement	About 50 percent after taxes during the 1970s. It fell in the 1980s because of the taxation of benefits.	About 50 percent after taxes during the early 1970s; lower since the late 1970s. The effective replacement rate is likely to be higher because the unemployed have greater access to medical care than do their U.S. counterparts.
2. Maximum duration of benefits	Twenty-six weeks during normal circumstances; possibly up to sixty-five weeks during the 1975 recession. During the 1982 recession, benefits beyond twenty-six weeks were often not available.	Available in phases of varying lengths depending on the unemployment situation. Maximum duration was fifty weeks in both the 1970s and the 1980s.
3. Coverage	By 1978, almost all wage and salary workers, or about 90 percent of the labor force, were covered.	Near universal coverage of labor force was provided in 1972, up from 80 percent earlier.
4. Qualifying period	About nine weeks for a full-time worker at the minimum wage; twenty weeks or more in some states. It rose slightly in the 1980s.	In 1972, lowered from thirty weeks to eight weeks for most claimants; raised to a range of ten to fourteen weeks in the late 1970s.
5. Persons qualifying	Essentially job losers. Requirements were more stringent in the 1980s.	Job losers, reentrants to the labor force, and some job leavers. Requirements have been more stringent for the latter two categories since the late 1970s.

workers were brought under the aegis of the UI system.[9]

Regular benefits in the United States are provided through state programs for about twenty-six weeks. When they are exhausted, additional (*extended*) benefits of varying duration are provided if economic hardship warrants. Before 1970, such additional benefits were only granted under special programs enacted in recessionary times. In 1958 and 1961, Congress enacted laws establishing the temporary Unemployment Compensation Program for those who had exhausted regular benefits.

In 1970, partly in response to rising unemployment, the Federal State Extended Unemployment Compensation Act was passed. The law provided extended benefits for an additional thirteen weeks if warranted by the insured unemployment rate.[10] More specifically, the law allowed extended benefits if the insured unemployment rate in a state reached 4.5 percent or if the nationwide insured unemployed rate reached 4 percent. In addition, federal programs were enacted to provide *supplemental* benefits when extended benefits ran out during the 1975 and 1982 recessions. These benefits varied in duration up to twenty-six weeks. Thus in the 1975 recession, a worker in the United States qualifying for regular, extended, and supplemental benefits could obtain up to sixty-five weeks of benefits.

The economy-wide *average* pretax replacement rate — the ratio of average weekly benefits to average weekly earnings — is around 40 percent in the United States and has not varied much throughout the postwar period.[11] Assuming a 20 percent tax rate on wage or salary income, the 40 percent pretax replacement rate amounts to a 50 percent after-tax rate when UI is not taxed. Before 1979, benefits were not taxed; by 1987, they were fully taxed. Although replacement rates have been the focus of numerous empirical studies analyzing the effects of UI, replacement rate data may not be very useful: the growing divergence between wages and compensation (the latter includes medical and related benefits that are generally terminated when an employee ceases to work) makes it difficult to calculate the effective replacement rate, tax considerations aside.

The minimum number of weeks that a person must have worked to qualify for UI has also not varied much in the postwar period. In the United States, a worker has to accumulate a minimum amount of "wages" in order to qualify for UI. Dividing qualifying wages (a standard which varies by state) by actual weekly wages yields the (implicit) number of qualifying weeks. Between 1971 and 1979, the ratio of minimum qualifying wages to average weekly wages, averaged across states, was about three.[12] This implies a qualifying period of about nine weeks for a full-time worker at the minimum wage (about one-third of average hourly earnings). This statistic may, however, understate the minimum qualifying period for the whole United States because some states impose an explicit number-of-weeks requirement (usually twenty) and also because the maximum duration of benefits in some states depends on the length of previous employment.

In the 1980s, benefits in the United States declined sharply following the 1979 revision of the UI law and other changes. The major changes were: partial federal taxation of benefits and full taxation by 1987; a small increase in the qualifying work period; the reduction of extended benefits through a 1981 increase in the state "trigger" insured unemployment rate from 4.5 percent to 6 percent and the abolition of the national insured unemployment rate trigger; the tightening of qualifying conditions; and much greater stringency in enacting supplemental benefits during the 1982 recession relative to the 1975 recession.

Canada

Canada's UI system shares many of the administrative features of the U.S. system. The forty-eight regions through which UI is administered differ in specific qualification requirements and provisions, just as the state programs in the United States differ in their rules. Extended benefits are granted in phases of varying length, up to a cumulative maximum of fifty weeks, and are triggered by high regional and/or national unemployment, as they are in the United States. These administrative similarities notwithstanding, the Canadian UI system is far more liberal by most criteria and particularly by criterion 5: workers others than job

[9] If only job losers qualify for UI, an increase in coverage to relatively noncyclical sectors with low rates of job loss, such as government employees, does not per se constitute a significant increase in UI generosity.

[10] The insured unemployment rate is the ratio of the number of continuing claims filed by those receiving regular benefits to a twelve-month lagged average of covered employment.

[11] The actual replacement rate received by individuals varies by state, industry, and other factors. Even if these rates were equal for all individuals, the average rate, as defined above, would be less than the actual rates for individual workers since UI replaces wages only up to a certain level of earnings. The average replacement rate goes up in a recession: average weekly earnings fall, and cyclical shifts in the composition of unemployment tend to raise the average weekly benefit. Hence, empirical studies of the effect of replacement rates on unemployment are subject to "simultaneity bias" if they do not use panel data or actual replacement rates.

[12] This statistic and other important data pertaining to the UI system are summarized in Walter Corson and Walter Nicholson, *An Examination of Declining UI Claims During the 1980's: Draft Final Report*, U.S. Department of Labor, Employment and Training Administration, May 1988, Table III.2, p. 57.

losers can obtain benefits. Benefits were greatly liberalized after the passage of the June 1971 Unemployment Insurance Act. Official sources explained the goals of the legislation thus:

> In essence, the document [that is, the June 1970 white paper that led to the passage of the act] proposed to make UI compatible with other Social Security programs,...to enable Canadians to cope with interruptions in their labour earnings, [and] to assist individuals to enter and reenter the labour market....One major objective of the Law was to provide "adequate" income support for *all individuals experiencing temporary earnings interruption.* The Act provided universal coverage, eased eligibility and added new benefits in case of sickness, maternity and retirement.[13]

The act distinguished between claimants with a minor attachment to the labor force and those with a major attachment. The former were eligible only for *regular* benefits, while the latter were eligible for *special* or *miscellaneous* benefits (sickness, maternity, retirement, job training, and so on) as well. The minimum number of qualifying weeks of work for minor attachment claimants was reduced from thirty to eight weeks, while major attachment claimants had to have twenty or more weeks. Although claimants for UI had to prove that they were unemployed, capable of and available for work, and unable to find suitable employment, these last two requirements were waived for those receiving miscellaneous benefits.[14]

Thus the mandate of the act to assist "all individuals experiencing temporary earnings interruptions" greatly enhanced the availability of UI to unemployed persons other than job losers. Further, coverage of the labor force was expanded to 96 percent in February 1972 from 80 percent previously, and the pretax replacement rate was raised substantially from 28 percent in 1971 to 41 percent in 1972.[15]

Benefits were then tightened in 1975, 1977, and 1979. These changes consisted of lowering, in phases, the *maximum* replacement rate (that is, the benefit amount as a proportion of maximum insurable earnings) for all workers from 75 percent in 1972 to 60 percent by 1979 and raising the minimum qualifying work period from eight weeks (mandated in 1972) to a variable between ten and fourteen weeks, depending on the regional unemployment rate. The 1979 reform also raised the qualifying work period to twenty weeks for long-term reentrants, that is, those out of the labor force for most of the preceding year. However, unlike the United States, Canada continued to make benefits beyond twenty-six weeks easily available in the 1980s.

To compare the UI systems, it is necessary to weight the five criteria identified earlier and summarized in Table 2. As an alternative to obtaining or constructing measures of criteria 1 to 5 and then weighting them, it is more informative to look at comprehensive "reduced-form" measures of *actual* UI that reflect the interaction of these various factors. Two such measures are (1) the ratio of beneficiaries to all unemployed, and (2) the (after-tax) ratio of UI income to wage and salary income.

These measures, both strongly cyclical, are plotted in Chart 3 and Chart 4, respectively. Annual data, going back to 1966 for the first measure and back to 1950 for the second measure, are used.[16] The ratio of beneficiaries to unemployed in Chart 3 does indicate, for Canada, the increase in generosity in 1972 and the slight subsequent tightening in the late 1970s. For the United States, Chart 3 indicates the stark difference in UI availability in the 1975 and 1982 recessions.

However, Chart 4 is more comprehensive than Chart 3 because it fully reflects the effect of criterion 5, that is, the effect of granting benefits to unemployed persons other than job losers. For Canada, the ratio of beneficiaries to unemployed rose from about 0.80 in 1971 to about 0.95 in 1972, an increase which does not seem inordinately large. However, UI income as a percentage of wage and salary income increased enormously, from 2.3 percent in 1971 to 3.9 percent in 1972. Chart 4 reveals that, while UI was always more gen-

[13] *Unemployment Insurance Statistics,* Annual Supplement, Statistics Canada, 1986, p. 9; emphasis added.

[14] See *A Chronology of Response: The Evolution of Unemployment Insurance from 1940 to 1980,* Employment and Immigration Canada, p. 62, for a description of qualifying requirements. Most of the miscellaneous beneficiaries — about 10 percent of total beneficiaries on average — would have been identified as "employed" or "not in the labor force" rather than "unemployed" in the Labour Force Survey because the survey definition of the "unemployed" required that they be looking for and available for work. However, it is possible that a few of the miscellaneous beneficiaries might have been classified as unemployed. (Also see the definition of "unemployed" in *The Labour Force,* Statistics Canada, for other minor exceptions to the available-for-work condition.) Although Canadian job leavers and persons discharged for misconduct "without just cause," like their U.S. counterparts, did not generally qualify for UI benefits, these stipulations were made less stringent as a result of the 1971 Act.

[15] Although benefits have been taxed in Canada since 1972, the reported benefits are adjusted for taxes *(Unemployment Insurance Statistics,* Annual Supplement, Statistics Canada, 1986, p. 16).

[16] For the 1979-86 period, when benefits were partially taxed in the United States, marginal tax rates on U.S. benefits were assumed to lie between 0 and 20 percent. Full details on the tax adjustments as well as annual data for various UI measures and labor force statistics are provided in a more detailed version of this article, "Unemployment in Canada and the United States," Federal Reserve Bank of New York Research Paper, forthcoming.

erous in Canada, the gap between Canadian and U.S. UI payments increased through the 1970s and became much larger in the 1980s.[17]

Evidence for the effect of UI on unemployment rates

If the Canadian system encourages unemployment more than the U.S. system does, the outcome should be apparent in higher unemployment in those categories of workers who can obtain benefits in Canada but not in the United States. This section provides evidence that unemployment in two such categories accounts for a substantial portion of the overall unemployment differential between Canada and the United States:

(1) *job leavers* (those who have left their jobs and moved into unemployment);[18] and

(2) *secondary workers* (those with weak labor force attachment; some women and teenagers would come under this category).

Unemployment by reason and the job leaver rate

Since the Canadian UI system provides benefits more easily to unemployed persons other than job losers, a breakdown of total unemployment by "reason for unemployment" can clarify how the incentives created by Canada's more generous UI system affect total unemployment. Table 3 provides such a breakdown from 1975 — the year in which these data are first available for Canada — to 1988. The unemployed are divided into job losers, job leavers, new entrants and reentrants to the labor force.[19] As a first approximation, job loss can be considered involuntary, that is, the unemployed are willing, or *more* than willing, to trade places with identical employed workers. Other reasons for unemployment — most obviously, job leaving — involve a greater degree of volition.

Between 1975 and 1988, Canadian unemployment averaged 1.5 percentage points more than U.S. unemployment; however, its job loser rate averaged only 1 percentage point more than the U.S. job loser rate. What is much more striking is that over this period, the

[17]The available labor force data indicate that between 1954 and 1965 the ratio of beneficiaries to unemployed was close to unity in Canada, while in the United States it varied in the 50 percent range. Thus the data corroborate the evidence from Chart 4 that UI was more generous in Canada even prior to 1966.

[18]Job leavers are defined in this article as those who leave their jobs and move into unemployment; in practice, most job leavers or "quits" move on to another job directly.

[19]For the United States, job losers are further broken down into those "on layoff" and "other job losers"; the former expect to be recalled to their job and the latter are considered to be on indefinite or permanent layoff.

Chart 3

Ratio of Unemployment Insurance Beneficiaries to Total Unemployment

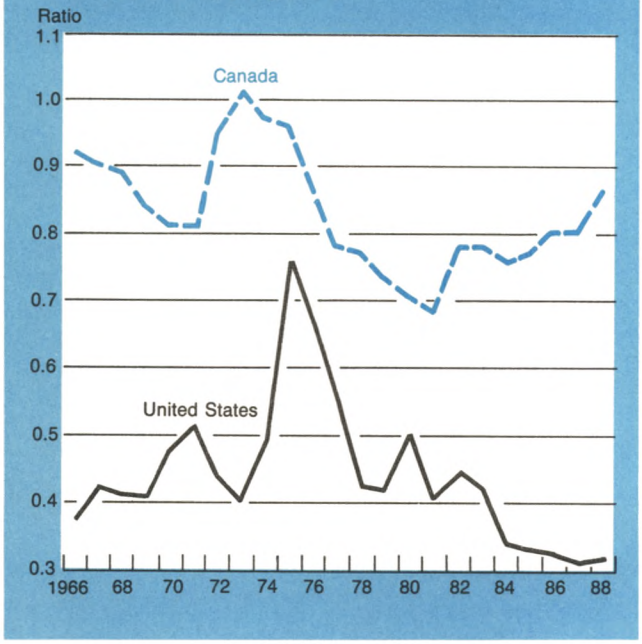
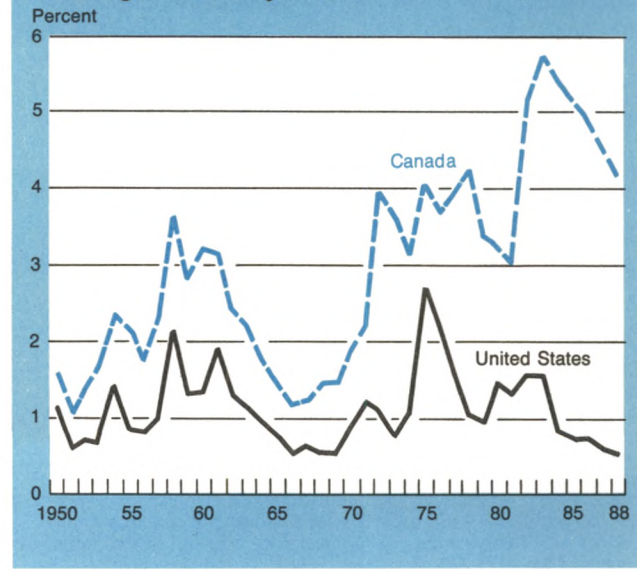


Chart 4

Unemployment Insurance Income as a Percentage of Wage and Salary Income



job leaver rate in Canada averaged 1.7 percent, roughly *twice* the job leaver rate in the United States, 0.8 percent. In Canada, job losers averaged a little over 50 percent of total unemployment and job leavers averaged a little under 20 percent, while UI beneficiaries averaged about 80 percent of unemployment between 1975 and 1988. By contrast, in the United States, job losers also constituted about 50 percent of unemployment while job leavers constituted a little over 10 percent of unemployment; UI beneficiaries constituted about 45 percent of unemployment between 1975 and 1988. The much higher job leaver rate in Canada, despite higher overall unemployment, suggests that Canadian workers are more willing to tolerate being unemployed than their U.S. counterparts. Thus it appears that providing benefits to some job leavers in Canada induces such behavior.

The classification by reason for unemployment is also useful in examining the influence of unions on unemployment. Unionized workers are often seen as "insiders" and nonunionized workers as "outsiders." It has been argued that when the employed union insiders are insulated from the unemployed nonunion outsiders, wages do not decelerate in the face of high unemployment, which therefore tends to persist.[20]

[20]Assar Lindbeck and Dennis Snower ("Cooperation, Harrassment, and Involuntary Unemployment: An Insider-Outsider Approach," *American Economic Review*, vol. 78 [1988], pp. 167-88) stress the insider-

Table 3

Unemployment Classified by Reason

(Percent of Labor Force)

United States

	Total†	Loser	Leaver	New Entrant	Reentrant	Ratio of UI Beneficiaries to Job Losers
1975	8.5	4.7	0.9	0.9	2.0	1.4
1976	7.7	3.8	0.9	0.9	2.0	1.4
1977	7.1	3.2	0.9	1.0	2.0	1.3
1978	6.1	2.5	0.9	0.9	1.8	1.1
1979	5.8	2.5	0.8	0.8	1.7	1.0
1980	7.1	3.7	0.8	0.8	1.8	1.0
1981	7.6	3.9	0.8	0.9	1.9	0.8
1982	9.7	5.7	0.8	1.1	2.2	0.8
1983	9.6	5.6	0.8	1.1	2.2	0.7
1984	7.5	3.9	0.7	1.0	1.9	0.7
1985	7.2	3.6	0.8	0.9	2.0	0.7
1986	7.0	3.4	0.9	0.9	1.8	0.7
1987	6.2	3.0	0.8	0.8	1.7	0.7
1988	5.5	2.5	0.8	0.7	1.5	0.7
1967-74 average	4.7	2.0	0.7	0.6	1.5	1.1
1975-88 average	7.3	3.7	0.8	0.9	1.9	0.9

Canada

	Total	Loser	Leaver	New Entrant	Reentrant	Ratio of UI Beneficiaries to Job Losers
1975	6.9	2.7	1.9	0.4	1.8	2.4
1976	7.1	3.3	1.7	0.4	1.8	1.9
1977	8.1	4.1	1.7	0.5	1.8	1.5
1978	8.3	4.2	1.8	0.5	1.9	1.5
1979	7.4	3.6	1.5	0.5	1.9	1.5
1980	7.5	3.7	1.5	0.4	1.9	1.4
1981	7.5	3.8	1.4	0.4	1.9	1.4
1982	11.0	6.5	1.6	0.5	2.3	1.3
1983	11.8	7.0	1.6	0.6	2.6	1.3
1984	11.2	6.4	1.7	0.5	2.5	1.3
1985	10.5	5.8	1.8	0.5	2.4	1.4
1986	9.5	5.3	1.7	0.4	2.1	1.4
1987	8.8	4.7	1.7	0.4	2.1	1.5
1988	7.8	4.0	1.6	0.3	1.9	1.7
1975-88 average	8.8	4.7	1.7	0.5	2.1	1.5

†Totals may not sum because of rounding.

For many years, unionization rates in both countries were fairly similar, hovering in the range of 30 percent to 35 percent, but then began to diverge in the early 1960s (Chart 5). In Canada, this rate increased to about 40 percent by the early 1980s and thereafter declined slightly. In the United States, the unionization rate has been declining steadily since the early 1960s, dropping steeply in the 1980s to about 17 percent by 1988.

Viewed in isolation, stronger union power in Canada might seem to explain much of Canada's higher unemployment. However, Canada's higher job leaver rate suggests that union effects on total unemployment are not of primary importance: an employed worker in Canada is roughly twice as willing to trade places with the unemployed as in the United States. If insider/outsider effects were important, Canada would have a lower job leaver rate because insiders would be more reluctant to become outsiders.[21]

Footnote 20 continued
outsider distinction and the role of unions in causing unemployment. Olivier Blanchard and Lawrence Summers ("Hysteresis and the European Unemployment Problem," *National Bureau of Economic Research Macroeconomics Annual*, vol. 1 [1986], pp. 15-78) argue that recessionary shocks have caused unemployment to persist in many European countries owing in part to their strong unions. Hysteresis can also occur if the unemployed lose their job skills and become unemployable.

Interaction between demographic changes and UI

A classification of unemployment by demographic groups also reveals the role of UI in inducing higher unemployment in Canada. To begin with, although Canada has had slightly higher population growth than the United States, the overall trend in the growth of the working-age population has been remarkably similar in both countries. Nevertheless, markedly different trends in unemployment across demographic groups have emerged in the two countries. Although the relationship between Canadian and U.S. male unemployment has shown little change, Canadian and U.S. female unemployment has diverged considerably. This divergence can be traced to the more generous Canadian UI system and is documented here with respect to unemployment rates, the composition of total unemployment, labor force growth, and labor force participation rates.

The differing paths of male and female unemployment in Canada vividly illustrate the effects of the

[21] While Canada's higher total job leaver rate may be due to a higher job leaver rate in the nonunionized/low-wage sector, the evidence suggests that union effects on the total job leaver rate and thereby on total unemployment have not been of primary importance.

Chart 5
Union Membership as a Percentage of Nonfarm Work Force

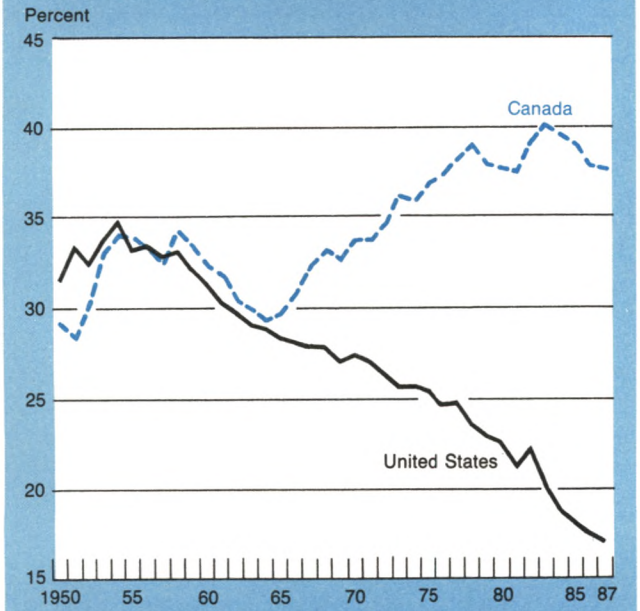
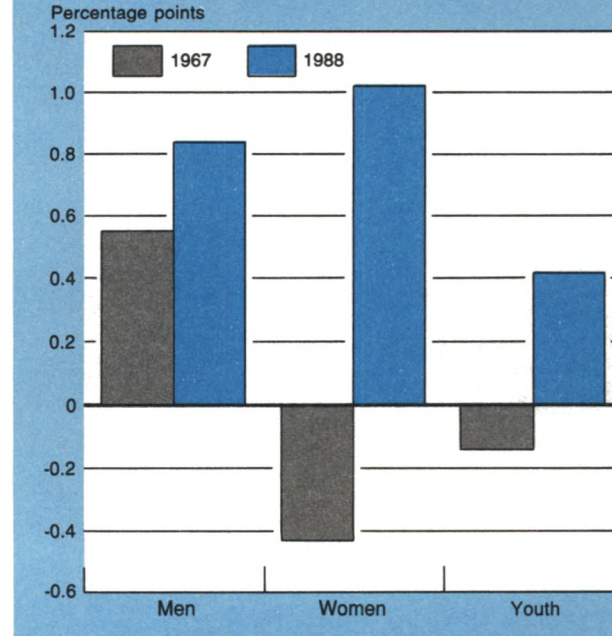


Chart 6
Differences in Contributions to Unemployment
Canadian minus U.S. Values



Unemployment Insurance Act, which went into full effect in 1972. It is noteworthy that the unemployment rate for women rose from 5.0 percent in 1971 to 5.7 percent in 1972, while the unemployment rate for men fell from 4.3 percent in 1971 to 4.1 percent in 1972, as Table 1 indicates.[22] (The total unemployment rate was unchanged at 6.2 percent.) In 1972, GDP growth in Canada was 5.7 percent; estimated potential growth in that year was 4.9 percent. The unusually large increase in female unemployment in 1972, a year when output growth was above potential, suggests that the increase in female unemployment was a response to the act. Opposite movements in Canadian male and female unemployment of this magnitude have not occurred in other years, nor have they occurred in the United States.[23]

To analyze further the evolution of unemployment in both countries, it is useful to compare 1967, when the overall unemployment rate in both countries was 3.8 percent, with 1988, when a 2.3 percentage point gap had emerged between the Canadian rate (7.8 percent) and the U.S. rate (5.5 percent). A decomposition of the

[22]"Youth" in the United States corresponds to those aged sixteen to twenty-four; in Canada, youth corresponds to those aged fifteen to twenty-four. Men aged twenty-five and over and women aged twenty-five and over are simply called "men" and "women," respectively. All the demographic data in this article pertain to the civilian labor force; "total" refers to the aggregate, as distinct from demographic subgroups. The definition of "total" in this article differs from the customary labor force definitions, in which "total" includes the military.

[23]The other noteworthy case of opposite movements in male and female unemployment in Canada occurred following the tightening of benefit qualification in 1979 for reentrants. The male unemployment rate rose from 4.5 percent in 1979 to 4.8 percent in 1980, while the female unemployment rate fell from 7.0 percent in 1979 to 6.5 percent in 1980. In 1980, GDP growth in Canada was 1.5 percent, a rate well below the estimated potential growth of 3.5 percent.

Table 4

Summary of Unemployment and Demographic Data

		Unemployment Contributions†								
		Men			Women			Youth		
		1967	1988		1967	1988		1967	1988	
Canada		1.62	2.73		0.60	2.58		1.60	2.46	
United States		1.07	1.89		1.03	1.56		1.74	2.04	
Difference		0.55	0.84		−0.43	1.02		−0.14	0.42	
		Labor Force Participation Rate‡			Employment-Population Ratio‡			Growth Rates between 1967 and 1988§		
		1967	1988	Change‖	1967	1988	Change‖	Population#	Labor Force	Employment
Men	Canada	84.5	77.7	−6.8	82.0	73.0	−9.0	2.12	1.72	1.56
	United States	83.3	77.0	−6.3	81.6	73.8	−7.8	1.86	1.50	1.39
	Difference			−0.5			−1.2	0.26	0.22	0.17
Women	Canada	32.3	55.2	22.9	31.4	51.1	19.7	2.28	4.83	4.60
	United States	39.4	54.9	15.5	37.8	52.6	14.8	1.81	3.40	3.37
	Difference			7.4			4.9	0.47	1.43	1.23
Youth	Canada	56.6	69.6	13.0	52.9	61.3	8.4	0.69	1.67	1.38
	United States	57.8	68.4	10.6	52.7	60.8	8.1	0.97	1.77	1.65
	Difference			2.4			0.3	−0.28	−0.10	−0.27
Total	Canada	57.6	66.7	9.1	55.4	61.5	6.1	1.87	2.57	2.37
	United States	59.6	65.9	6.3	57.3	62.3	5.0	1.68	2.16	2.07
	Difference			2.8			1.1	0.19	0.41	0.30

†The unemployment contribution of a group is the percentage points of overall unemployment attributable to that group: the unemployment contributions sum to the total unemployment rate. The unemployment contribution of a group can be calculated by dividing the number of unemployed in that group by the total labor force.

‡In percent.

§Growth rates are calculated as the compounded annualized percentage changes between 1967 and 1988.

‖Percentage points.

#Civilian noninstitutional population of working age: sixteen to sixty-five years in the United States, fifteen to sixty-five in Canada.

total unemployment rate into the unemployment *contributions* of the three groups — men, women, and youth — reveals that the greater part of the 2.3 percentage point unemployment gap between 1967 and 1988 can be attributed to women and youth.[24] Of the 2.3 percentage point increase in the unemployment rate gap, only 0.29 percentage point is due to men (0.84 minus 0.55); 1.45 percentage points (1.02 minus negative 0.43), or almost two-thirds of the increase, is due to women; and 0.56 percentage point (0.42 minus negative 0.14), or about a quarter of the increase, is due to youth (Chart 6 and Table 4).

A comparison of the growth rates of the working-age population, the labor force, and employment in the two countries also suggests that Canada's more generous UI offers a greater incentive to be in the labor force. Total population growth is slightly faster in Canada, by 0.19 percentage point; however, total labor force growth is 0.41 percentage point higher. What is particularly noteworthy is the very large difference in female labor force growth rates (1.43 percentage point) in Canada and the United States, despite a much smaller difference in female population growth rates (0.47 percentage point) (Chart 7, Table 4).[25]

A comparison of the differences (Canadian minus U.S. values) in male and female unemployment rates over the period 1967 to 1988 reveals a much sharper upward trend in the unemployment rate difference for women (Chart 8). The regression analysis (see Box) buttresses this conclusion: there is a statistically significant upward trend in the difference in unemployment contributions and rates for women, but not in that for men.

The differential response of male and female unemployment to UI provides a basis for determining the extent to which benefits may have led to persistence, or hysteresis, in Canadian unemployment. It has recently been argued that a change in one element of the Canadian UI system — the abolition, in 1977, of the national unemployment rate trigger for one phase of

[24]The unemployment contribution of a group is merely the number of percentage points of unemployment attributable to that group; the contributions sum to the total unemployment rate.

[25]An extremely similar picture emerges if we compare the changes between 1967 and 1988 in labor force participation rates for Canada and the United States. In both countries, there is an upward trend in labor force participation for women and youth, and a downward trend in labor force participation for men. However, for Canada, the cumulative increase in female labor force participation is 7.4 percentage points higher and in youth participation 2.4 percentage points higher, while the cumulative decrease in male participation is 0.5 percentage point higher (Table 4).

Chart 7

Differences in Annual Growth Rates

Canadian minus U.S. Values, 1967 to 1988

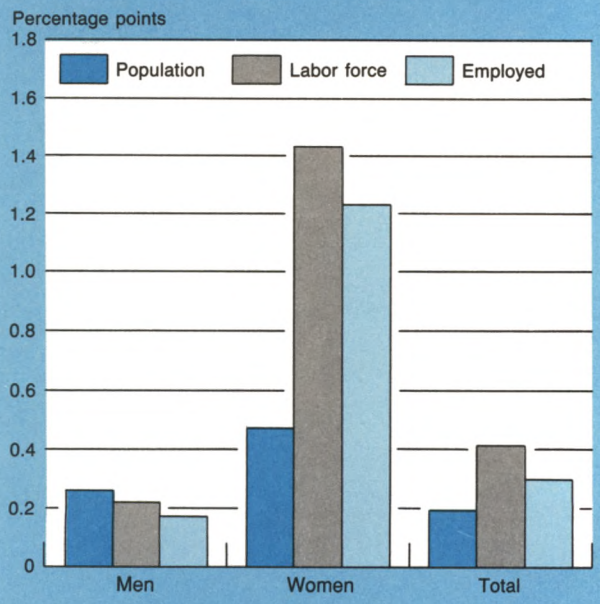
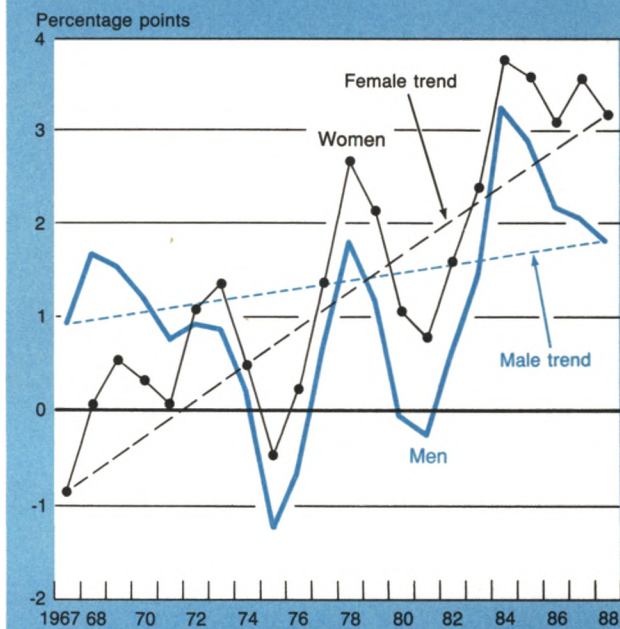


Chart 8

Differences in Unemployment Rates

Canadian minus U.S. Values



Box: Differences in "Okun's Law" Relationships by Demographic Groups

The link between unemployment and demand is usually examined using Okun's law regressions, which link GNP (or GDP) growth and changes in the unemployment rate.† In the context of this article, the relevant question is: To what extent do demand fluctuations explain the difference in the levels of U.S and Canadian unemployment since 1966?

Regressions using the total unemployment rate seem to suggest that Canadian unemployment, looked at in isolation, does not appear to be unusually high in relation to Canadian GDP growth in the 1980s. When the links between Canadian and U.S. unemployment are taken into account, however, there is weak evidence that the difference between Canadian and U.S. unemployment is high in relation to differences in their GDP growth in the 1980s.‡

The regressions presented here examine the effects of differences in GDP growth on the differences (Canadian minus U.S. values) in unemployment by major demographic groups. The groups chosen were men over twenty-five and women over twenty-five. The

†For a detailed discussion and numerous estimates of Okun's law regressions for the United States, see Douglas Woodham, "The Changing Relationship between Unemployment and Real GNP in the United States," Federal Reserve Bank of New York, Research Paper no. 8407. Woodham summarizes his findings in "Potential Output Growth and the Long-Term Inflation Outlook," this *Quarterly Review,* Summer 1984.

‡These regressions are presented in the more detailed version of this article cited earlier. The relation between GDP growth and unemployment can change for any number of reasons: exogenous changes in productivity, the endogenous response of productivity to changes in labor costs, the response of labor force participation to changes in the availability of UI, and so on. Hence, from an Okun's law equation, it is difficult to disentangle the effects of demand and supply on unemployment.

Sample Period 1966-III to 1988-IV

		Explanatory Variables†						
$\bar{R}^2$ (S.E.R.)‡	Dependent Variable	Intercept	UCMLDIF(−1)	UCMLDIF(−2)	GRODIF	GRQDIF(−1)	Trend	Durbin-Watson Statistic
.919	UCMLDIF	.08	1.19	−.26	−4.41	−5.12	−.001	1.98
(.147)		(2.44)**	(12.3)*	(−2.73)*	(−2.91)*	(−3.27)*	(−.29)	
		Intercept	UCFMDIF(−1)	UCFMDIF(−2)	GRODIF	GRODIF(−1)	Trend	
.953	UCFMDIF	−.03	1.07	−.19	−1.56	−2.32	.002	1.97
(.110)		(−.89)	(10.2)*	(−1.75)*	(−1.32)	(−2.06)**	(2.00)**	
		Intercept	URMLDIF(−1)	URMLDIF(−2)	GRODIF	GRODIF(−1)	Trend	
.927	URMLDIF	.16	1.20	−.28	−9.24	−10.5	−.0007	1.96
(.306)		(2.18)**	(12.7)*	(−2.95)*	(−2.93)*	(−3.23)*	(−.05)	
		Intercept	URFMDIF(−1)	URFMDIF(−2)	GRODIF	GRODIF(−1)	Trend	
.934	URFMDIF	.21	.99	−.13	−5.54	−8.52	.006	1.98
(.374)		(.21)	(9.37)*	(−1.25)	(−1.38)	(−2.21)**	(1.89)***	

Notes: All "difference" variables are Canadian minus U.S. values.

GRODIF = difference in GDP growth rates, measured as the difference of the natural logarithms of the levels.
UCMLDIF = difference in male contributions to unemployment.
UCFMDIF = difference in female contributions to unemployment.
URMLDIF = difference in male unemployment rates.
URFMDIF = difference in female unemployment rates.

*Significantly different from zero at the 1 percent level.
**Significantly different from zero at the 5 percent level.
***Significantly different from zero at the 10 percent level.

†The t-statistics are reported in parentheses below the coefficient.

‡The standard error of the regression (S.E.R.) result is reported in parentheses below the (adjusted) $\bar{R}^2$.

Box: Differences in "Okun's Law" Relationships by Demographic Groups *(continued)*

dependent variables are the differences in the unemployment contributions or unemployment rates for men and for women respectively. (The unemployment contribution of a group is the number of percentage points of unemployment attributable to that group.) The explanatory variables are the first and second lag of the dependent variables, current and lagged values of the difference in GDP growth, and a linear time trend. These regressions indicate a statistically significant upward trend in the difference in female unemployment contributions and rates, but not in the difference in male contributions and rates.

extended benefits and its replacement by a regional unemployment rate trigger—has caused regional and thereby total unemployment rate increases in Canada to persist in the 1980s.[26] However, although the number of male beneficiaries increased proportionately much more than the number of female beneficiaries during the 1982 recession, it has also subsequently fallen more; only the increase in female beneficiaries has displayed substantial persistence over 1983-88. (See Chart 9, which plots *all* male and *all* female beneficiaries in Canada.[27]) When demand revived, the number of male beneficiaries dropped sharply, suggesting that the regional trigger mechanism per se was not responsible for the persistence in unemployment.

It is well known from labor market literature that the labor supply of secondary workers (a category including some women and teenagers) is more responsive to wages than that of primary workers.[28] In the same vein, one might expect the labor force participation of these workers to be more responsive to the availability of UI than that of primary workers. This variation in the response to UI would partially explain why male and female unemployment and hence total unemployment followed such diverse trends in Canada and the United States. In the 1950s and 1960s, when the bulk of the labor force consisted of primary workers, Canada's more generous UI system did not have a large impact on unemployment.[29] Only when the generous Canadian UI system interacted with the increase in the labor force participation of women did the unemployment gap increase significantly. This interaction continues to keep Canada's unemployment high, despite a slight tightening of benefits in the late 1970s. Although male unemployment in Canada may also be responding to generous UI availability, the response is likely to be weaker, slower, and harder to detect.

[26] See Ross Milbourne, Douglas Purvis, and David W. Scoones, "Unemployment Insurance and Unemployment Dynamics," Institute for Economic Research, Queen's University, Discussion Paper no. 750, June 1989. Between 1972 and 1977, Canada had a five-phase benefit structure, with both national and regional triggers for extended benefits. In 1977 this was replaced by a three-phase structure, with only a regional trigger.

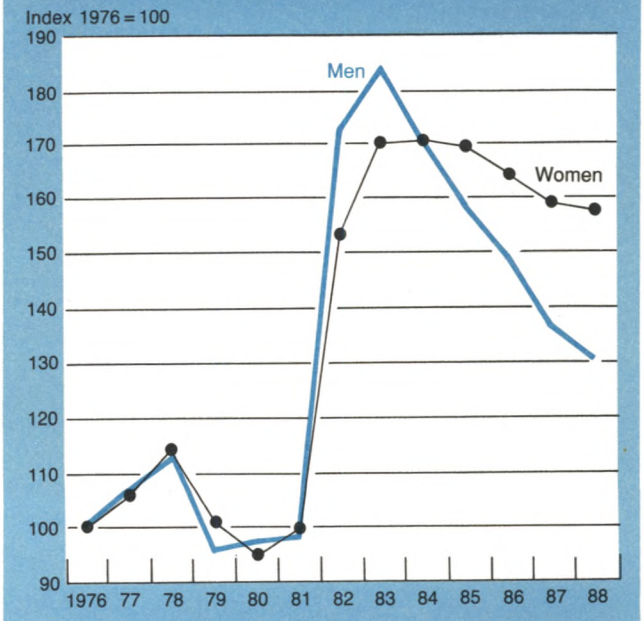
[27] The data on the number of beneficiaries are disaggregated by sex but not by age. Chart 9 pertains to those receiving regular benefits; it excludes miscellaneous beneficiaries.

[28] See, for instance, Glen G. Cain and Harold W. Watts, eds., *Income Maintenance and Labor Supply* (Rand McNally, 1973).

[29] In Ashenfelter and Card's Canadian unemployment rate series that adjusts the pre-1966 data to post-1966 age definitions ("Why Have Unemployment Rates in Canada and the United States Diverged?"), Canada's rate averages half a percentage point lower than the U.S. unemployment rate between 1954 and 1959. However, before 1960, temporary layoffs were excluded from the definition of unemployed in Canada (see Ken Bennett, "40th Anniversary of the Labour Force Survey," *The Labour Force*, November 1985, which presents the unadjusted series). The exclusion of temporary layoffs may explain why unemployment is substantially lower in Canada than in the United States before 1960, even in the age-adjusted Ashenfelter and Card series. In this series, Canada's unemployment increased between 1959 and 1960 by almost a full percentage point from 5.5 percent to 6.4 percent, an increase identical to that in the unadjusted series, although the U.S rate remained constant at 5.5 percent between those years.

Chart 9

Male and Female Unemployment Insurance Beneficiaries in Canada



Conclusion

The difference between the Canadian and the U.S. unemployment rates, negligible until the late 1960s, has been rising since then. In the 1980s, it averaged a substantial two and a half percentage points. To a large extent, this difference can be traced to more generous Canadian UI provisions and, in particular, to the easier availability of benefits to unemployed persons other than job losers that resulted from the Unemployment Insurance Act of 1971. A comparison of unemployment by reason in both countries leads to this conclusion: Canada's job leaver rate over the period 1975-88 averaged 1.7 percent, about twice that of the United States.

The unemployment gap also reflects in part the interaction between the generous UI system in Canada and the secular increase in the labor force participation of women. A classification of unemployment by demographic groups reveals that the unemployment gap between the two countries that emerged since the mid-1960s can be largely attributed to adult women. Recent theories of unemployment posit that shocks to unemployment tend to persist because of union power or other factors. However, the analysis presented in this article supports the simpler hypothesis that labor force participation and unemployment in Canada have evolved in response to the country's generous UI system.

Vivek Moorthy

Appendix: Data Sources

Canada

The Canadian data used here are from Statistics Canada and can be accessed via the CANSIM Main Base or the Data Resources Incorporated Mini Base. A convenient source, published annually, for most national income accounts and labor force statistics is the *Canadian Economic Observer,* Historical Statistical Supplement, Catalogue 11-210.

All the relevant UI data, some of which is not available in the *Economic Observer,* can be found in *Unemployment Insurance Statistics,* Annual Supplement, Catalogue 71-202. The number of beneficiaries was calculated by dividing the total benefit weeks paid by fifty-two times the number of unemployed. From 1972 on, benefit weeks based on regular benefits (not total benefits) were used. An alternative approach is to use the reported statistic "average number of beneficiaries," which is very similar to the computed average, but this series is available only from 1975 onwards. The ratio of UI income to wage and salary income is published in *Unemployment Insurance Statistics,* Annual Supplement, starting from 1972, and was adjusted to reflect only regular benefits. For the period before 1972, UI income can be computed as the average weekly benefit times the number of weeks paid. Wage and salary income data back to 1950 were provided by Statistics Canada.

The data on unemployment by reason for 1975-83, listed as "Flows into Unemployment," are available from the publication *Labour Force: Annual Averages,* Catalogue 71-529, and for succeeding years from the December issue (annual averages) of *Labour Force,* Catalogue 71-001. In 1989, some minor census revisions to the labor force statistics were made; these revisions have been incorporated in some, but not all, the data presented here. The data on unions were provided by Statistics Canada.

United States

For the United States, data from the Commerce Department's National Income and Product Accounts and data from the Bureau of Labor Statistics' Current Population Survey are available on the major data bases, such as Citibase. The *Economic Report of the President,* published annually, is a convenient textual source for the above data, as well as for the UI benefits data. The reported statistic on the number of beneficiaries was taken from this source. The *Economic Report of the President* does not provide data on supplemental benefits; these and other UI data are available in *Economic Indicators,* published by the Joint Economic Committee for Congress. The *Social Security Bulletin* also provides comprehensive UI data. For the period 1954-80, the data on unions were drawn from the *Handbook of Labor Statistics,* Table 42 (1978); for the period 1981-85, from Ashenfelter and Card, "Why Have Unemployment Rates Diverged?" *Economica,* 1986; and for the period 1986-88, from the January issue of *Employment and Earnings.*

In Brief
Economic Capsules

Monetary Policy and U.S. External Balances

The trend toward greater economic interdependence among nations has been accompanied by increased interest in the international repercussions of U.S. macroeconomic policies. Policymakers, economists, and businessmen now regularly assess the effect that U.S. policies are likely to have on exchange rates, foreign activity, and external trade positions; concern for these external variables has at times been an important motivation in the formulation of policy.

This *In Brief* examines the impact of monetary policy actions on the U.S. current account balance. Specifically, it analyzes how a move to tighten money and credit growth in the United States will alter the flow of trade between this country and other nations. Both historical evidence and macroeconomic model simulations are used to explore these relationships and to measure the effect of particular policy initiatives on the U.S. external position.

The findings indicate that a tightening in monetary policy unambiguously leads to a decline in the current account balance. The effects of the contraction are seen principally in the services balance, which falls sharply because of the increased net investment income paid to foreigners as interest rates rise. In contrast, the influence of monetary policy on the U.S. merchandise trade balance appears to be small and of uncertain sign over the medium term.

These results suggest that in recent years a significant change has taken place in the way that monetary policy influences the external balance. With the rapid deterioration in the U.S. net external debt position and the related increase in net foreign holdings of U.S. financial assets, the sensitivity of investment income payments to changes in interest rates has increased. Our estimates indicate that the linkage between monetary policy actions and the investment income balance has strengthened substantially since the early 1980s and is now a powerful channel for monetary influence on the external balance. As a result of this development, monetary policy's effect on the U.S. current account is likely to be stronger and more consistent than it was in the past.

Identifying the main channels of influence

Economists generally agree on the identity of the main channels linking monetary policy to U.S. trade flows. However, these channels have offsetting effects and there is no a priori reason to believe that any particular channel dominates. Consequently, economic theory cannot predict definitively how changes in monetary policy will influence U.S. external balances.

To understand the nature of this ambiguity, consider what is thought to happen to trade flows when monetary policy is tightened. In most conventional models, which posit a well-defined relationship between U.S. interest rates, foreign interest rates, and exchange rates, a monetary contraction raises U.S. interest rates and induces an incipient capital inflow that pushes up the value of the dollar. Rising interest rates slow demand and thereby reduce income growth, causing a fall in import volumes that improves the trade balance. Most analyses suggest that this interest rate effect on income and trade will grow for one to two years and then slowly dissipate.

The appreciation of the dollar will, however, trigger other developments that over the medium term have an

offsetting effect on the trade balance. The dollar's higher value will increase the price of U.S. goods relative to those abroad. Since import and export demands respond slowly to these price movements, trade volume changes are likely to be small at the outset. Over the short run, therefore, the dollar's rise will be felt primarily in nominal trade balance improvement as the value of imports falls along with their price. Nevertheless, over a longer period that may extend well beyond two years, lower import prices will increase demand for import volumes and the higher relative price of our goods abroad will reduce export volumes. The net effect of the higher dollar over this longer horizon will be a worsening in U.S. trade in both real and nominal terms.

While these channels describe policy's impact on trade in most goods and services, monetary policy may also influence trade through the direct effect of interest rate movements on the net investment income component of the services balance.[1] U.S. financial assets and liabilities, consisting of securities holdings and bank claims, are largely denominated in dollars and are responsive to short-term interest rate movements. Consequently, our investment income payments to foreigners as well as receipts on our investments abroad will increase soon after a policy contraction causes interest rates to rise. When the U.S. net financial asset position (representing our net international investment position less direct investments) is close to balance, these changes in investment income flows are likely to lead to small changes in the services and overall trade position. But because our net financial asset position has moved increasingly into deficit since the early 1980s, reaching a level in excess of $500 billion, changes in investment incomes are now likely to have a more substantial effect on the trade balance. As we will see, this channel has acquired new importance in transmitting the influence of policy actions to the current account balance.

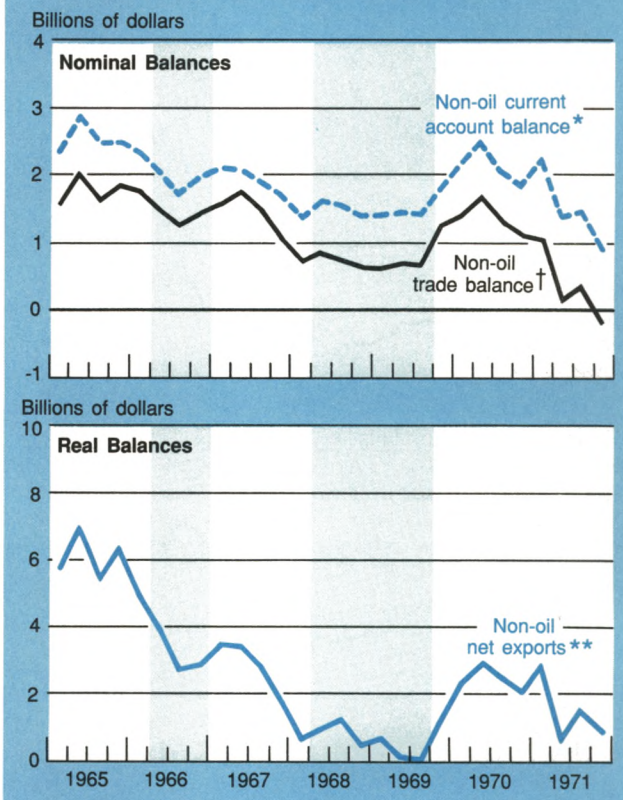
Historical evidence

Because theory cannot offer an unambiguous view of how monetary policy affects the trade balance, we now evaluate the empirical evidence on the issue. A brief review of historical relationships points to the conclusion that monetary policy actions have not in the past had a consistent effect on U.S. external balances over the medium term.

Charts 1A and 1B reveal how different measures of the U.S. trade position responded to monetary contractions during the period 1965-83. The chart plots the U.S. current account balance, the merchandise trade balance, and real net exports — all excluding oil imports — and indicates the major episodes of monetary tighten-

Chart 1A

The Response of U.S. External Balances to Monetary Tightening, 1965 to 1971



Source: Department of Commerce, "Survey of Current Business."

Note: Episodes of monetary tightening are represented by the shaded areas.

* Current account balance excluding oil imports and net transfer payments.

† Merchandise trade balance excluding oil imports.

** Real net exports (constant 1982 dollars) excluding oil imports.

[1]The investment income component of the U.S. current account balance measures payments and receipts derived from international direct investment and portfolio holdings. Although our analysis focuses on the influence of interest rate movements on investment income, other forces can alter investment income when monetary policy changes. For a discussion of the determinants of international investment income, see William Helkie and Lois Stekler, "Modeling Investment Income and Other Services in the U.S. International Transactions Accounts," Board of Governors of the Federal Reserve System, *International Finance Discussion Papers, no. 319, December* 1987.

ing with shading.[2]

Approximately three years after an episode of tightening begins, a point in time when the first-round effects of interest rate and exchange rate changes have been largely realized, no consistent pattern of change in real or nominal trade balances is observed. Some episodes of monetary tightening (1973-74) are followed by improvement in U.S. external positions; others (1966 and 1979-81), by a deterioration in these positions.

Over a shorter horizon, external balances do seem to exhibit a consistent response to tightening. Indeed, in nearly every instance, all three external balances rose in the quarters immediately following a period of contraction. The generally close correlation between movements in merchandise trade and the current account further suggests that this improvement in trade, along with the subsequent tendency of this improvement to dissipate, is attributable to monetary policy's effect on the merchandise trade balance. Policy actions apparently have had only a minor effect on the U.S. services balance during this period.

It is difficult to draw firm conclusions from these historical relationships alone. Numerous factors unrelated to U.S. monetary policy actions undoubtedly have influenced external balances during these periods.[3] Nonetheless, the existing body of empirical evidence corroborates these findings.[4]

Table 1 summarizes results from a study of the policy transmission mechanism in twelve large econometric models. The effects on the current account and real net exports of a simulation exercise in which monetary authorities expand the money supply by 4 percent in

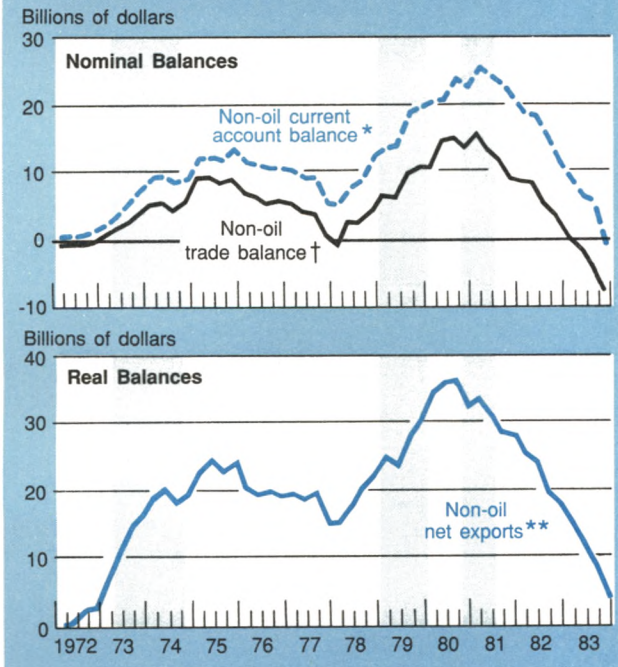
[2]A period of monetary tightening is defined here as one in which there are persistent increases in the federal funds rate both in absolute terms and relative to long-term government bond yields.

[3]For example, the tightening of U.S. monetary policy from 1979 to 1981 was accompanied by major shifts in the stance of macroeconomic policy in a number of large industrial economies. These shifts are often cited as factors explaining the sharp subsequent decline in U.S. external balances.

[4] See, for example, Ralph C. Bryant, Dale W. Henderson, Gerald Holtham, Peter Hooper, and Steven A. Symansky, eds., *Empirical Macroeconomics for Interdependent Economies* (Washington, D.C.: Brookings Institution, 1988); Ralph C. Bryant, John Helliwell, and Peter Hooper, "Domestic and Cross-Border Consequences of U.S. Macroeconomic Policies," Board of Governors of the Federal Reserve System, International Finance Discussion Papers, no. 344, March 1989; and Ralph C. Bryant, Gerald Holtham, and Peter Hooper, *External Deficits and the Dollar: The Pit and the Pendulum* (Washington, D.C.: Brookings Institution, 1988).

Chart 1B

The Response of U.S. External Balances to Monetary Tightening, 1972 to 1983



Source: Department of Commerce, "Survey of Current Business."

Note: Episodes of monetary tightening are represented by the shaded areas.

* Current account balance excluding oil imports and net transfer payments.

† Merchandise trade balance excluding oil imports.

** Real net exports (constant 1982 dollars) excluding oil imports.

Table 1

Medium-Term Effects of a Monetary Expansion on U.S. External Balances

(Billion Dollar Deviation from Baseline, Three Years after Initial Shock)

Model	Current Account	Real Net Exports
Median of twelve models	1.8	0.6
DRI	3.2	11.8
EEC	−2.8	−3.3
EPA	2.4	8.2
MCM	−1.9	0.0
OECD	1.8	2.3
LINK	−12.6	−2.4

Source: Data for this table are derived from Richard N. Cooper, "U.S. Macroeconomic Policy, 1986-88: Are the Models Useful?" Tables 12-4 and 12-7, in Ralph C. Bryant and others, eds., *Empirical Macroeconomics for Interdependent Economies* (Washington, D.C.: Brookings Institution, 1988).

1985 are provided for the median of the entire group and for a sampling of individual models.[5] Two points emerge from this analysis. First, there is no consensus among these models regarding the direction in which monetary policy alters trade. Of the six individual models presented in the table, three predict that the current account and real net exports will improve in response to an expansion, while three predict that these balances will fall or remain unchanged.[6]

Second, these models suggest that, on average, monetary policy actions do not have large net effects on U.S. trade. The median estimates predict changes in the current account and real net exports of less than $2 billion over three years, and most of the individual models predict effects of less than $3.5 billion. Considerable diversity is displayed, however, with outcomes for the current account ranging from +$3.2 billion to -$12.6 billion.

Monetary policy's influence on trade and the growing U.S. net debt position

To assess the influence of monetary policy on the current account in more detail, let us now turn to an analysis of simulation exercises from two large macroeconomic models — the Federal Reserve Board's Multicountry Model (MCM) and the Data Resources Incorporated Model (DRI).[7]

These two models are broadly similar in their view of the structure of the U.S. economy and its international linkages.[8] However, they employ different estimates for the key parameters determining the relative sizes of the channels of transmission. As a result, in the past they have implied different patterns of transmission: MCM simulations predicted that a monetary policy contraction would yield current account improvement, while DRI simulations predicted deterioration.

In the simulation exercise considered here, authorities generate a sustained increase of 100 basis points in U.S. short-term interest rates beginning at the end of 1989.[9] In contrast to the somewhat mixed evidence

[5]For further details on this exercise and the properties of the models, see Bryant and others, *Empirical Macroeconomics for Interdependent Economies*.

[6]The disagreement among these six models is also present in the larger sample: seven models predict current account improvement while five predict a deterioration following a monetary expansion.

[7]For a more detailed description of the DRI model, see Roger Brinner, "The 1985 DRI Model: An Overview," in *Data Resources Review of the U.S. Economy* (Lexington, Mass.: Data Resources-McGraw Hill, September 1985). A detailed description of the MCM model is found in Hali Edison, Jaime Marquez, and Ralph Tryon, "The Structure and Properties of the Federal Reserve Board Multicountry Model," *Economic Modelling*, vol. 4 (April 1987). The 1983 MCM simulation results presented in this section were taken from this article. The 1990 MCM simulation results were graciously provided by William Helkie of the Federal Reserve Board.

[8]In particular, both models have basic Keynesian structures, treat expectations adaptively, and closely link exchange rates to U.S.-foreign interest differentials.

[9]More specifically, the experiment in the MCM model involves a sustained increase of 100 basis points in the U.S. three-month Treasury bill rate in the first quarter of 1990. In the DRI model the

Table 2

Transmission of a Monetary Policy Contraction

(Billion Dollar Deviation from Baseline Level Unless Otherwise Indicated)

	DRI Model† Number of Quarters after Shock			MCM Model‡ Number of Quarters after Shock		
	4	8	12	4	8	12
Current account balance	−3.3	−8.7	−15.5	−3.3	−6.1	−8.6
Merchandise trade balance	1.0	−1.5	−4.5	1.0	1.3	1.4
Exports	−2.6	−10.1	−18.8	−3.9	−11.8	−19.3
Export volume	−1.5	−6.5	−11.2	−2.3	−6.6	−9.6
Imports	−3.7	−8.7	−14.3	−4.9	−13.1	−20.7
Import volume	−0.1	−0.4	−1.2	−1.3	−6.0	−9.4
Net services and transfers	−4.3	−7.2	−11.1	−4.3	−7.4	−10.0
Net investment income	−4.5	−6.6	−9.2	−4.7	−8.4	−11.3
GNP (percent deviation from baseline)	−0.3	−0.7	−1.1	−0.4	−1.0	−1.4
Domestic demand (percent deviation from baseline)	−0.2	−0.7	−1.0	−0.3	−0.9	−1.2
U.S. long-term interest rate (percentage point deviation from baseline)	0.5	0.6	0.6	0.4	0.7	0.8
Effective exchange rate (percent deviation from baseline)	1.4	2.1	2.7	1.6	2.5	3.4

†Simulation consists of a sustained increase of 100 basis points in the U.S. federal funds rate from 1989-III onward.

‡Simulation consists of a sustained increase of 100 basis points in the U.S. three-month Treasury bill rate from 1990-I onward.

presented earlier, these simulations predict that a monetary contraction leads to a persistent worsening in the U.S. current account balance (Table 2). One year after the policy shock, the current account has fallen by $3.3 billion in each model, and after three years, the current account balance has fallen by $8.6 billion in the MCM simulation and more than $15 billion in the DRI model.

The discrepancy between model simulations and historical experience is not evident in the transmission of a monetary contraction to merchandise trade. In the DRI and MCM models, the merchandise trade balance shows a modest improvement in the year after policy tightens, a pattern similar to that which actually emerged in the 1965-83 period. Moreover, at a horizon extending beyond two years, these models support the historical evidence indicating no consistent relationship between monetary policy and merchandise trade. Three years after the contraction begins, the merchandise trade balance is $1.4 billion dollars above its baseline level in the MCM simulation; in the DRI model, the initial improvement is reversed and a decline of $4.5 billion is predicted.

This divergence in merchandise trade balance outcomes in the DRI and MCM models is largely explained by their different predictions regarding the response of import demand. Import volumes are largely unchanged following a contraction in the DRI simulation because income and relative price effects are of roughly equal magnitude. In contrast, the response of import volumes to falling income dominates relative price effects in the MCM model, causing a decline in import volumes that amounts to more than $9 billion dollars over three years.[10]

Although monetary policy's effect on merchandise trade differs in the DRI and MCM simulations, the effect of a monetary contraction on the services balance is similar in the two models. A steady decline in services trade, amounting to roughly $10 billion dollars over three years, can be observed in both models. This effect, which was not seen in the evidence presented earlier, is the key factor in the predicted deterioration in the U.S. current account in these simulations.

Underlying this substantial decline in the service balance is our large net financial debt position. As a result of the buildup in U.S. financial debt, which has risen from $26 billion at the end of 1980 to more than $530 billion at the end of 1988, the investment income component of services trade has become much more sensitive to interest rate movements. Higher interest rates are now accompanied by a large increase in net debt interest payments, reflected in the roughly $9 billion and $11 billion declines in net investment income in the DRI and MCM simulations, respectively.

A clear indication of how the transmission of monetary policy to the current account has been changed by the deterioration in our net foreign asset position is provided in Table 3. The table compares our 1990 simulation of monetary tightening with an identical exercise conducted for 1983, a year when the net financial position of the United States was close to balance. The simulation predicts that a monetary contraction in 1983 would reduce net investment incomes by roughly $3 billion over three years.[11] Although the two models predict similar effects of monetary policy on net investment income, they disagree on how a monetary contraction alters the current account balance. This disagreement largely reflects their divergent views on the importance of income and relative price changes for other components of trade.

Since 1983, however, the predicted response of investment income to a monetary tightening has increased significantly in both these models. The effect of monetary policy on debt service payments

Footnote 9 continued
federal funds rate is increased by 100 basis points in the third quarter of 1989. Note that these simulations are not comparable to those presented in Table 1.

Table 3

The Change in Monetary Policy's Effect on Trade

(Billion Dollar Deviation from Baseline, Three Years after a Monetary Contraction)

	Simulation Beginning in 1983†		Simulation Beginning in 1990‡	
	DRI Model	MCM Model§	DRI Model	MCM Model
Current account balance	−4.3	1.0	−15.5	−8.6
Net investment income	−3.5	−2.7	−9.2	−11.3

†The effects of a sustained increase of 100 basis points in federal funds rates (for DRI simulation) or three-month Treasury bill rates (for MCM simulation) beginning in 1983-I.

‡Simulation is identical to that conducted in Table 2.

§Results for net investment income from 1983 MCM model simulation are derived from staff estimates based on the Federal Reserve Bank of New York services trade model.

[10]Estimates made by Bryant and others in *External Deficits and the Dollar* suggest that the income sensitivity of non-oil import demand in the MCM model is nearly twice as great as that in the DRI model.

[11]A breakdown of the components of the current account was not available for the 1983 MCM model simulation. Thus, for this simulation, the movements in investment incomes are derived from staff estimates based on the Federal Reserve Bank of New York services trade model. Our analysis suggests that these estimates provide a good indication of how investment incomes evolve in the MCM model. Nonetheless, it must be emphasized that these results may differ somewhat from the actual simulation.

has consequently become a considerably more important channel of policy transmission, and a contraction in monetary policy now clearly worsens the U.S. current account balance in the DRI and MCM models.

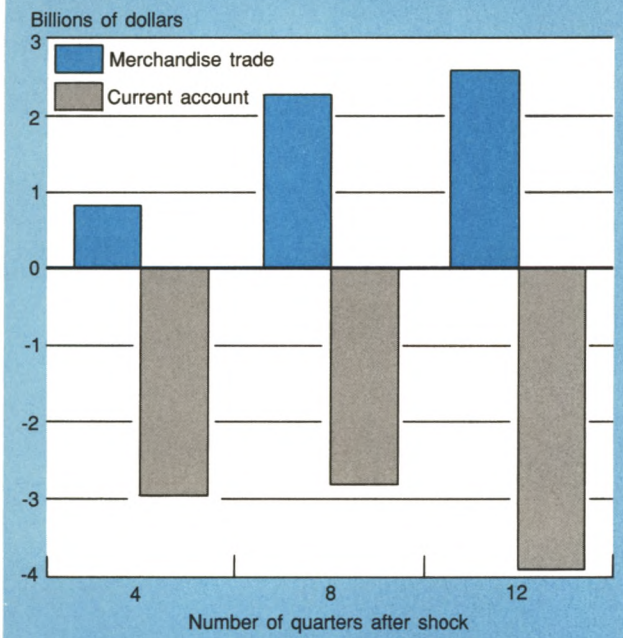
The importance of the linkage between interest rates and investment incomes is further emphasized in Chart 2. The chart evaluates the effects of a monetary policy contraction in the DRI model in an environment in which foreign activity and the dollar's value remain unchanged. As might be expected, a tightening in policy can result in a sustained improvement in the merchandise trade balance when the dollar does not appreciate. Over three years, the merchandise trade balance improves by about $2½ billion dollars. Although the increase is not large in absolute size, it does place the United States in a trade position that is more than $6 billion better than that achieved when a tightening in policy is accompanied by dollar appreciation.

Even when a monetary policy contraction leaves the dollar's value unchanged, we observe a deterioration in the current account amounting to about $4 billion dollars over three years. The worsening of the current account is entirely attributable to the effects of higher interest rates on the services balance. This evidence suggests that as a result of the United States' current position as a large net debtor, the size of the direct effect of interest rates on trade through investment income may exceed the size of the traditional linkage of interest rates to trade flows through income.

Chart 2

Effects of a Monetary Contraction with Unchanged Exchange Rates

Deviation from Baseline, DRI Model Simulation



Note: Chart shows the result of a simulation of a permanent 100 basis point increase in federal funds rates beginning in the third quarter of 1989. Exchange rates and foreign activity are held unchanged from baseline levels.

Although our results indicate that monetary policy actions can now be expected to lead to a significant change in the U.S. current account balance, the model-based estimates presented here may somewhat overstate the actual effects of monetary policy on trade. These model estimates are predicated on the assumption that policymakers can alter the path of interest rates over an extended period. Authorities' control over interest rates in these models is enhanced because market expectations are modeled as adaptive — that is, they respond slowly and with a lag to changes in economic conditions. In practice, market expectations are likely to respond more strongly and immediately to a persistent change in policy, thereby placing greater offsetting pressures on interest rates than these models predict. For example, attempts by authorities to improve the current account by sustaining interest rates at low levels over an extended period will likely encourage expectations of higher inflation and activity growth as market participants become aware of the implications of the policy stance. These expectations will increase upward pressures on both nominal and real interest rates, and consequently limit policymakers' ability to affect the current account balance through monetary policy actions. Further pressures on interest rates may arise if the credibility of monetary authorities' commitment to price stability is eroded by a persistent expansionary policy stance. The perception of the increased risk of inflation and dollar depreciation that will likely accompany such a policy stance will lead market participants to demand higher real rates of return to hold U.S. assets.

Conclusion

This analysis indicates that monetary policy is likely to have a consistent and strong effect on the U.S. current account balance over the medium term. In particular, a monetary contraction can be expected to lead to a deterioration in the current account balance. The deterioration will arise from the higher investment income payments that accompany rising U.S. interest rates. In contrast, there is no clear evidence that monetary policy actions will have a consistent effect on the U.S. merchandise trade balance over the medium term.

The analysis also suggests that the linkage between interest rates and the U.S. current account has strengthened in recent years. The accumulation of U.S. net foreign debt and the greatly increased net foreign holdings of U.S. financial assets have made overall service account flows considerably more sensitive to movements in U.S. interest rates. Although the ability of authorities to pursue specific current account targets independent of other objectives remains limited, monetary policy actions are likely to have a stronger and more consistent effect on the current account than in the past.

Bruce Kasman

Treasury and Federal Reserve Foreign Exchange Operations

November 1989 - January 1990

Movements of the dollar against individual currencies diverged widely between November 1989 and January 1990—a period when the rapid opening up of Eastern Europe benefited the German mark and a number of factors continued to weigh against the Japanese yen. The dollar experienced occasional bouts of upward pressure against the yen, and on several of these occasions the U.S. monetary authorities intervened to resist the dollar's rise against that currency, selling a total of $750 million for yen. On balance, the dollar declined against the mark and other European currencies, moving down 8½ percent, 7¼ percent, and 6 percent, respectively, against the mark, Swiss franc, and British pound. The dollar rose, however, about 1 percent against both the yen and the Canadian dollar. On a trade-weighted basis, as measured by the staff of the Federal Reserve Board of Governors, the dollar declined 5¾ percent.

November through mid-December

The movement in dollar exchange rates against the European currencies was most marked during the first half of the reporting period. Positive sentiment toward the mark built rapidly following the opening on November 9 of the borders between East and West Germany. Market participants anticipated that an influx of East German immigrants would benefit the German economy by providing a new supply of skilled labor. At the same time, the new immigrants were expected to stimulate domestic demand and thereby spur higher mark interest rates as the Bundesbank sought to contain any potential inflationary pressures. More broadly, international investors focused on the prospects for greatly expanded market opportunities for German enterprises, and the German equity market surged in response to actual and anticipated capital inflows.

Against this background, the mark strengthened against all major currencies, and talk began to circulate, especially around the December 8-9 European Community summit, that exchange market pressures would lead to a revaluation of the mark within the European Monetary System (EMS). Germany has had large sustained trade surpluses against most of its European trading partners. Moreover, the German authorities were presumed to welcome any developments that would foster adjustment of the trade surplus or help dampen inflationary impulses to the economy. Market participants believed that a realignment within the EMS would be viewed by Bundesbank officials as consistent with both of these objectives. Accordingly, speculative flows into marks increased, and reports circulated in the market that the Bundesbank's partner central banks were intervening to sell both dollars and marks to support their own currencies.

In the process, the dollar declined steadily against the mark. From DM 1.8415 at the beginning of November, the dollar declined by mid-December to around DM 1.7300, a drop of 6 percent.

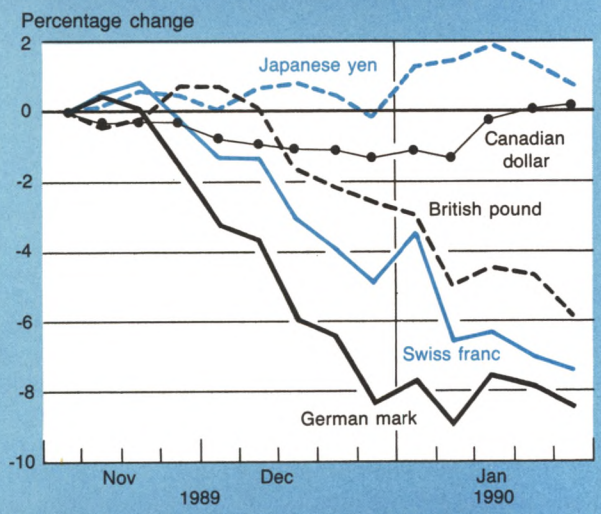
Against the yen, the dollar showed less of a trend, although it experienced upward pressure from time to time when there were reports of strong Japanese

A report presented by Sam Y. Cross, Executive Vice President in charge of the Foreign Group at the Federal Reserve Bank of New York and Manager of Foreign Operations for the System Open Market Account. George G. Bentley was primarily responsible for preparation of the report.

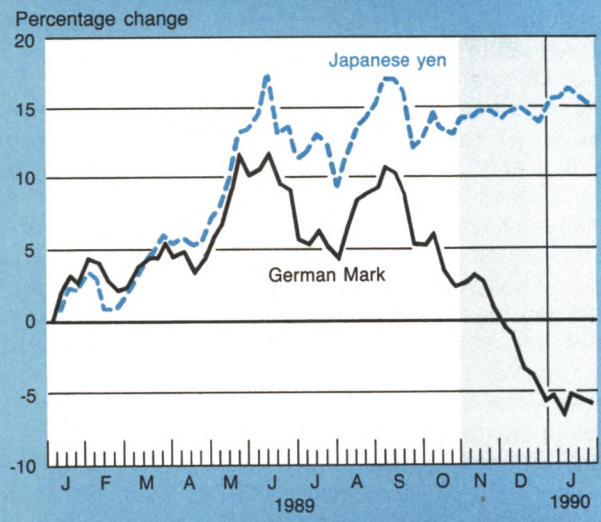
investor demand for portfolio and direct investments in the United States. Market participants were particularly impressed that Japanese interest in investing in dollar-denominated assets appeared to remain strong, even though market commentary about the outlook for U.S. and Japanese monetary policy implied that the interest rate differentials favoring the dollar would continue to narrow. Once in November and again in early December, the U.S. monetary authorities, in keeping with Group of Seven understandings on exchange rate cooperation, intervened to sell a total of $150 million against yen. These operations were coordinated with the Bank of Japan. By mid-December, the dollar was trading around ¥ 144.00, a level ¾ percent higher than at the start of the reporting period.

Chart 1

Movements of the dollar against individual currencies diverged widely during the period, . . .



with the dollar declining against the German mark while experiencing bouts of upward pressure against the Japanese yen.



The top chart shows the percent change of weekly average rates for the dollar from November 1989. The bottom chart shows the percent change of weekly average rates for the dollar from January 1989. All figures are calculated from New York closing quotations.

Mid-December through January

In mid-December, one focus of market attention was the extent to which monetary policies in the United States and Japan might move in opposite directions. Economic statistics released through mid-December suggested that the U.S. economy was still sluggish and price pressures subdued, keeping alive expectations that U.S. interest rates would continue to move lower. The market's hope that the Federal Reserve had intended to signal a new easing of monetary policy in November had proved unfounded. But market participants were still confident that the Federal Reserve would continue to respond, as it had in preceding months, to evidence of a decelerating economy by allowing short-term interest rates to ease a bit further. Indeed, the Federal Reserve moved on December 20 to supply liquidity under circumstances that led market participants to believe that another such move had

Table 1

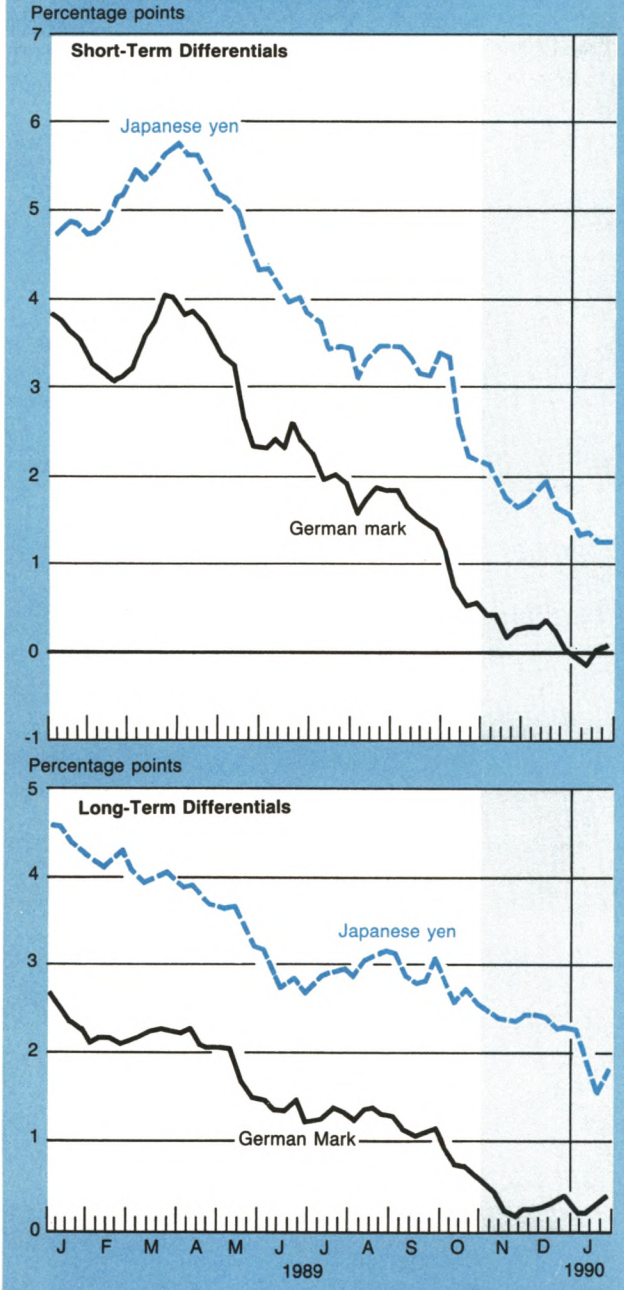
Federal Reserve Reciprocal Currency Arrangements

In Millions of Dollars

Institution	Amount of Facility January 31, 1990
Austrian National Bank	250
National Bank of Belgium	1,000
Bank of Canada	2,000
National Bank of Denmark	250
Bank of England	3,000
Bank of France	2,000
Deutsche Bundesbank	6,000
Bank of Italy	3,000
Bank of Japan	5,000
Bank of Mexico	700
Netherlands Bank	500
Bank of Norway	250
Bank of Sweden	300
Swiss National Bank	4,000
Bank for International Settlements:	
Dollars against Swiss francs	600
Dollars against other authorized European currencies	1,250
Total	30,100

Chart 2

Both short- and long-term interest rate differentials favorable to the dollar generally continued to narrow during the period.



The top chart shows weekly average interest rate differentials between three-month Eurodollar rates and three-month Euromarket deposit rates for marks and yen. The bottom charts shows the weekly average differentials between U.S. government long-bond yields and German and Japanese government long-bond yields.

occurred, and they anticipated that further moves would be forthcoming early in the new year.

In Japan, market participants had noted that short-term market interest rates had drifted progressively higher for several months, and that this trend had continued even after the Bank of Japan raised its discount rate in a surprise move in October. Trying to anticipate the authorities' next action, dealers were sensitive to the possibility that the Bank of Japan might again raise its discount rate to follow up on the move in market rates. When such an action did not occur by mid-December, market participants began to suspect that these expectations might not be fulfilled. They began to doubt that the authorities would move on interest rates at a time of impending changes in Bank of Japan leadership and so soon before parliamentary elections in early 1990. It surprised market participants, therefore, when Japanese newspapers reported on December 18 that the Bank of Japan would soon raise its discount rate, a move which indeed took place on December 25. When worldwide trading resumed following the Christmas holidays, the dollar declined to its period low against the yen at ¥ 141.70 on December 27 and a twenty-month low against the mark at DM 1.6752 on December 28—1 percent and 9 percent lower, respectively, than at the start of November.

In early January, the market's assessment of the outlook for dollar interest rates began to change. Accumulating signs that the U.S. economy had stopped decelerating began to raise doubts about both the timing and the extent of any further easing of U.S. monetary policy. Data released around the turn of the year suggested that growth might not be as fragile as had previously been thought and that the slowdown in some manufacturing sectors in late 1989 had not spilled over into other sectors of the economy. Unseasonably cold weather led to a sharp run-up in oil prices and heightened concerns about renewed price pressures in the food and energy sectors. The January 12 report of an unexpectedly large jump in U.S. producer prices was then interpreted as justifying concerns that little scope remained for further immediate declines in dollar interest rates. Later in January, the dollar received additional support as market participants focused on interpretive press reports indicating the Federal Reserve's continuing concerns with inflation and its more optimistic assessment of economic growth prospects in 1990. When trading resumed after the new year, this reassessment helped to move the dollar up from its lows of late December and provided continuing support to the dollar throughout the rest of January.

Against the yen, the dollar also benefited early in January from the potential uncertainties surrounding the upcoming parliamentary elections in Japan. Around

the start of the new year, rumors of scandals involving members of the ruling Liberal Democratic Party once again unsettled the exchange markets, and the dollar reached its three-month high against the yen at ¥ 146.80 on January 3. With upward pressure on the dollar/yen exchange rate persisting throughout the first half of the month, the U.S. monetary authorities again intervened, on three days, to sell $600 million against yen. These operations, which were coordinated with the Bank of Japan, brought the total of U.S. intervention for the November-January period to $750 million, shared equally by the Federal Reserve and the U.S. Treasury. The dollar closed the period at ¥ 144.45, roughly 1 percent higher than at the start of November.

The dollar recovered little against the mark in early January. At this time, talk revived of a revaluation

Table 2

Drawings and Repayments by Foreign Central Banks under Reciprocal Currency Arrangements with the Federal Reserve System

In Millions of Dollars; Drawings (+) or Repayments (−)

Central Bank Drawing on the Federal Reserve System	Amount of Facility	Outstanding as of October 31, 1989	November	December	January	Outstanding as of January 31, 1990
Bank of Mexico†	700.0	700.0	—	—	—	700.0

Data are on a value-date basis.
†Drawn as a part of the $2,000 million near-term credit facility established on September 21, 1989.

Table 3

Drawings and Repayments by Foreign Central Banks under Special Swap Arrangements with the Federal Reserve System

In Millions of Dollars; Drawings (+) or Repayments (−)

Central Bank Drawing on the Federal Reserve System	Amount of Facility	Outstanding as of October 31, 1989	November	December	January	Outstanding as of January 31, 1990
Bank of Mexico†	125.0	84.1	−6.5	−35.8	−7.7	34.1

Data are on a value-date basis.
†Drawn as a part of the $2,000 million near-term credit facility established on September 21, 1989.

Table 4

Drawings and Repayments by Foreign Central Banks under Special Swap Arrangements with the U.S. Treasury

In Millions of Dollars; Drawings (+) or Repayments (−)

Central Bank Drawing on the U.S.Treasury	Amount of Facility	Outstanding as of October 31, 1989	November	December	January	Outstanding as of January 31, 1990
Bank of Mexico†	425.0	384.1	−6.5	−35.8	− 7.7	334.1
Central Bank of Bolivia‡	100.0	75.0	—	−75.0	—	0
Central Bank of Bolivia§	75.0	—	—	+75.0	−75.0	0
National Bank of Poland‖	200.0	—	—	+86.0	—	86.0

Data are on a value-date basis.
†Represents the ESF portion of $2,000 million near-term credit facility.
‡The facility, which was established for $100 million on July 11, 1989, was renewed on September 15, 1989.
§The latest facility was established on December 29, 1989, and expired upon repayment on January 12, 1990.
‖Represents the ESF portion of a $500 million short-term credit facility established on December 27, 1989.

of the German mark within the EMS. In fact, an adjustment of the EMS was announced on January 5 to accommodate a request from the Italian government to bring the Italian lira within the narrow band of the exchange rate mechanism of the EMS. When this relatively modest adjustment occurred smoothly and without a generalized realignment, expectations of further near-term adjustments of exchange rates diminished. The dollar's low for the period was DM 1.6630 on January 8.

For the remainder of January, movements in the dollar/mark exchange rate were dominated by events in Eastern Europe. Although indications of heavy investor demand for the mark continued to support that currency, reports in mid-January began to reveal the fragility of the government structure in East Germany and elsewhere in Eastern Europe. Doubts also were voiced about political stability in the Soviet Union, especially in light of mounting separatist movements in several Soviet republics. These fears somewhat dampened the near-term enthusiasm for the mark, which traded with little clear direction for the rest of the month. The dollar closed the period against the mark at DM 1.6850.

Uncertainty about the implications of the widespread political and economic changes taking place was reflected in increased volatility in the world equity and

Table 5

Net Profits (+) or Losses (−) on United States Treasury and Federal Reserve Foreign Exchange Operations

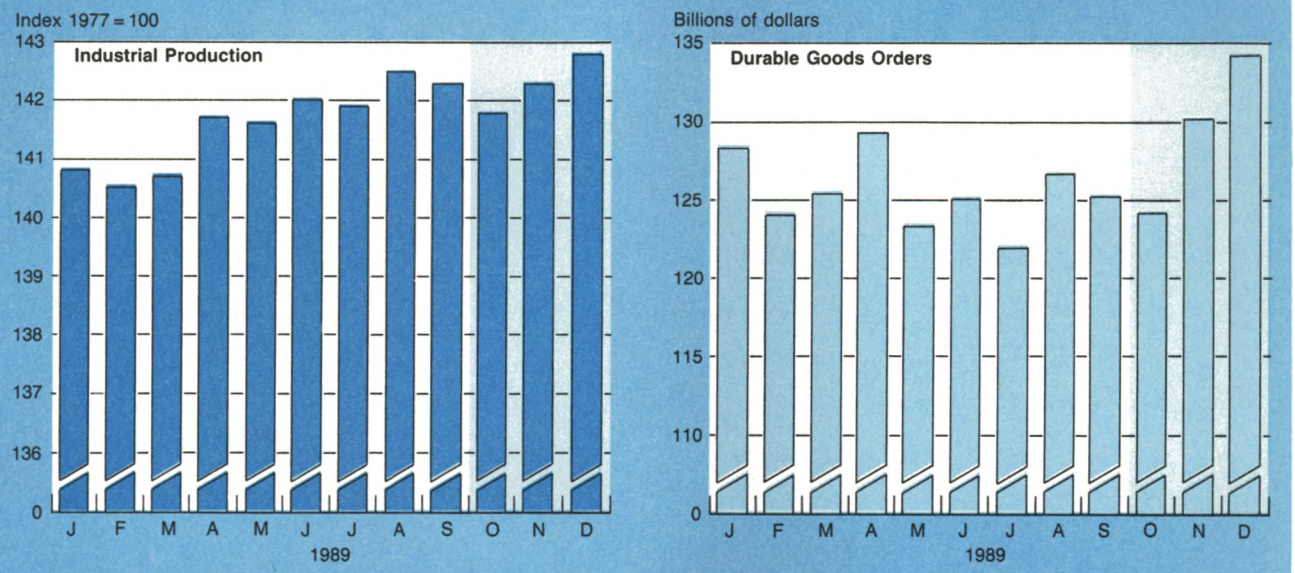
In Millions of Dollars

October 31, 1989 to January 31, 1990	Federal Reserve	U.S. Treasury Exchange Stabilization Fund
Realized	0	0
Valuation profits and losses on outstanding assets and liabilities as of January 31, 1990	+2,709.6	+2,011.0

Data are on a value-date basis.

Chart 3

In the latter half of the period, evidence about the performance of the U.S. economy began to raise doubts about both the timing and the extent of a further easing of U.S. monetary policy.



The left chart shows the monthly index of total U.S. industrial production, seasonally adjusted. The industrial production figures for October, November, and December were released on November 14, December 15, and January 17, respectively. The right chart shows monthly U.S. manufacturers' total new orders for durable goods, seasonally adjusted. The new orders figures for October, November, and December were released on November 22, December 22, and January 26, respectively.

bond markets during January. This volatility, together with convergence of long-term interest rates in the United States, Germany, and Japan and the attraction of new investment opportunities in Europe, revived concerns about the continued smooth financing of the U.S. current account deficit. In this context, dollar rates from day to day were sometimes influenced by sharp movements in other financial markets. But for the month as a whole, these developments appeared to have little lasting effect on dollar exchange rates.

Against the Canadian dollar, the dollar trended lower throughout the three-month period until mid-January. The dollar reversed its course at that time, when a move by the Bank of Canada to ease interest rates precipitated a sell-off of the Canadian currency.

In other operations, the U.S. Treasury through the Exchange Stabilization Fund (ESF), together with the Bank for International Settlements (BIS) (acting for certain participating central banks), agreed to provide short-term support of $500 million to the National Bank of Poland for its economic stabilization and reform efforts, effective December 27. The ESF's share in the facility was $200 million. On December 28, Poland drew $86 million of the ESF's portion.

Also during the period, Bolivia on December 29 repaid in full its $75 million outstanding drawing of a $100 million facility established with the ESF. On the same day, Bolivia drew the full amount of a newly established $75 million facility. The drawing was fully repaid upon maturity on January 12.

On four separate occasions, Mexico repaid portions of its outstanding swap commitments under the $2,000 million facility established with the U.S. monetary authorities, the BIS (acting for certain participating central banks), and the Bank of Spain. The Federal Reserve and ESF each received a total of $50 million.

As of end January, cumulative bookkeeping or valuation gains on outstanding foreign currency balances were $2,709.6 million for the Federal Reserve and $2,011.0 million for the ESF. (Valuation gains on holdings warehoused by the ESF with the Federal Reserve are excluded in the first figure and, correspondingly, included in the second figure.) These valuation gains represent the increase in dollar value of outstanding currency assets valued at end-of-period exchange rates, compared with the rates prevailing at the time the foreign currencies were acquired.

The Federal Reserve and the ESF regularly invest their foreign currency balances in a variety of instruments that yield market-related rates of return and have a high degree of quality and liquidity. A portion of the balances is invested in securities issued by foreign governments. As of end January, holdings of such securities by the Federal Reserve amounted to $7,180.4 million equivalent, and holdings by the ESF amounted to the equivalent of $7,477.6 million.

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