



# Studies

**How Might Financial Institutions React  
to Glass–Steagall Repeal?  
Evidence from the Stock Market**

David P. Ely and Kenneth J. Robinson

**Managing Cross-Border Settlement Risk:  
The Case of Mexican ADRs**

Sujit “Bob” Chakravorti

# Financial Industry Studies

Federal Reserve Bank of Dallas

## **Robert D. McTeer, Jr.**

President and Chief Executive Officer

## **Helen E. Holcomb**

First Vice President and Chief Operating Officer

## **Robert D. Hankins**

Senior Vice President

## **W. Arthur Tribble**

Vice President

## **Economists**

Jeffery W. Gunther

Robert R. Moore

Kenneth J. Robinson

Thomas F. Siems

Sujit "Bob" Chakravorti

## **Financial Analysts**

Robert V. Babel

Robert F. Mahalik

Karen M. Couch

Kelly Klemme

Edward C. Skelton

Kory A. Killgo

## **Graphic Designer**

Candi Aulbaugh

## **Editors**

Jeffery W. Gunther

Robert R. Moore

Kenneth J. Robinson

## **Publications Director**

Kay Champagne

## **Copy Editor**

Monica Reeves

## **Design & Production**

Laura J. Bell

*Financial Industry Studies* is published by the Federal Reserve Bank of Dallas. The views expressed are those of the authors and should not be attributed to the Federal Reserve Bank of Dallas or the Federal Reserve System.

Articles may be reprinted on the condition that the source is credited and a copy of the publication containing the reprinted article is provided to the Financial Industry Studies Department of the Federal Reserve Bank of Dallas.

*Financial Industry Studies* is available free of charge by writing the Public Affairs Department, Federal Reserve Bank of Dallas, P.O. Box 655906, Dallas, Texas 75265-5906, or by telephoning (214) 922-5254 or (800) 333-4460, ext. 5254.

## **How Might Financial Institutions React to Glass–Steagall Repeal? Evidence from the Stock Market**

David P. Ely and Kenneth J. Robinson

*Page 1*

Passage of the Glass–Steagall Act in 1933 separated commercial and investment banking activities in U.S. financial markets. After several unsuccessful attempts in Congress to repeal Glass–Steagall, the Federal Reserve Board more than doubled the revenue commercial banking organizations may earn from certain securities activities. David Ely and Kenneth Robinson use this increase as a proxy for how repeal of Glass–Steagall might affect financial institutions. The authors' results show that the stock market reacted favorably to the revenue-limit increase for banking organizations already active in securities activities. The stock price of investment banks, as a group, did not seem to be significantly affected. However, the authors find some evidence that smaller, more profitable investment banks' stock prices reacted positively to commercial banks' greater securities powers. This result is consistent with these investment banks' greater attractiveness as takeover targets.

## **Managing Cross-Border Settlement Risk: The Case of Mexican ADRs**

Sujit "Bob" Chakravorti

*Page 12*

The Mexican securities clearance and settlement system is ahead of many markets in terms of having one of the shortest settlement periods. However, cross-border transactions—such as those involving American Depositary Receipts—have tended to be associated with a greater number of settlement fails than purely domestic transactions because U.S. and other foreign markets have longer settlement periods. This article investigates reforms to the Mexican securities clearance and settlement system that are aimed at improving liquidity and efficiency while maintaining safety and reducing both general and cross-border settlement fails. These reforms include penalties for late settlement and the establishment of an electronic lending facility. In addition, a proposed clearing-house would bilaterally net securities transactions that involve the same type of security.

# How Might Financial Institutions React to Glass–Steagall Repeal? Evidence from the Stock Market

David P. Ely and Kenneth J. Robinson

**T***his article examines several hypotheses about how banking organizations and investment banks' stock prices reacted to the recent expansion in banks' securities activities.*

*David P. Ely is a professor at San Diego State University. Kenneth J. Robinson is a senior economist and policy advisor at the Federal Reserve Bank of Dallas.*

Since the passage of the Glass–Steagall Act in 1933, commercial banks have generally been prohibited from engaging in investment banking activities. These activities include underwriting and dealing in corporate debt and equity securities, as well as acting as brokers and dealers in securities markets. Over time, however, these restrictions have been relaxed somewhat. Currently, the Federal Reserve authorizes individual bank holding companies, on a case-by-case basis, to establish securities subsidiaries. These subsidiaries, though, are limited in the amount of revenue they may derive from investment banking.

After unsuccessful attempts to repeal Glass–Steagall restrictions, in June 1996 Rep. James Leach, chairman of the House Banking Committee, urged the Federal Reserve to increase the amount of revenue commercial banking organizations could earn from certain securities activities. After seeking comments on this proposal, in December 1996 the Federal Reserve Board raised the limit on subsidiary revenue from “ineligible” securities activities from 10 percent to 25 percent of total subsidiary revenue, effective March 1997.

How this expansion of banks' securities activities affected shareholders of financial institutions is the focus of this article. Repeal of Glass–Steagall would eliminate restrictions banking organizations face in their securities activities. The more than doubling in 1997 of the allowable revenue for banking companies from certain securities activities, then, can serve as a useful proxy for investigating the possible effects of repealing the act.

Of particular interest is how share prices of investment banks, commercial banks' main competitor in securities markets, reacted to this change. Did investment bank shareholders view this expansion negatively, perhaps reflecting concerns about increased competition from commercial banks? Or did these shareholders react favorably, perhaps because their firms would be viewed as attractive merger partners for commercial banks eager to expand their presence in securities markets? If so, this expansion in commercial banking powers might have been welcomed by the shareholders of these competitors.

This article also investigates the stock market response of two other categories of firms affected by the Federal Reserve's actions: (1) banking organizations engaged in securities activities and (2) banking organizations that could be expected to petition for a securities subsidiary. For banking organizations a positive

response would indicate that the stock market viewed the expansion in allowable revenue from securities activities as favorable to their earnings potential. Furthermore, the size of any market reaction represents an estimate of the change in the economic value of the various firms affected.

To investigate these issues, we use an event-study methodology to examine the stock market reaction of these different financial institutions to the various events leading up to the revenue limit increase. Because stock prices incorporate future-profit expectations, they signal how financial market participants view the effects of the revenue limit increase. Our results indicate a positive stock price response by banking organizations already engaged in securities activities and a neutral effect for the other category of banking organizations. While a large number of investment banks exhibit a positive stock price reaction, the response of a portfolio of investment banks is not statistically significant.

The favorable stock price reaction for banking companies probably reflects the increased earnings potential associated with expanded securities activities. The failure to find a statistically significant negative stock price reaction for investment banks may reflect the counterbalancing effects of an increase in the competitive environment for investment banks versus their greater attractiveness as takeover targets.<sup>1</sup> That is, any negative response from potential competitive effects may have been offset by the positive response due to potential mergers.

We explore in more detail what factors may lie behind the stock price reaction of individual investment banks. Our evidence indicates that smaller, more profitable investment banks were more likely to exhibit a positive stock market response to the easing of the revenue cap, possibly reflecting concerns about regulatory approval involving mergers of larger firms.

## CONGRESSIONAL ATTEMPTS AT FINANCIAL MODERNIZATION

Banking organizations argue that restrictions on their financial activities limit their ability to diversify their balance sheets and compete in an increasingly integrated marketplace. Recognizing these concerns, financial modernization legislation was introduced in Congress in January 1995. Both Rep. Leach and Sen. Alfonse D'Amato put forth bills that would have ex-

panded the permissible activities of U.S. banks. The Leach bill was more narrow, focusing mostly on repealing Glass-Steagall restrictions on banks' securities activities. D'Amato's bill proposed a more comprehensive overhaul of the U.S. banking system by advocating an end to the long-standing separation of banking and commerce. The Clinton administration also introduced a package that permitted expanded activities similar to the Leach proposal but did not require that those activities be carried out in separate subsidiaries within a holding company structure.

Initially, given the widespread agreement on the antiquated nature of the restrictions, prospects for financial reform legislation seemed favorable. Hearings were held on the Leach proposal, and several variations were introduced in Congress. In June 1995 the House Banking Committee recommended a bill that would substantially reduce regulatory burdens on banks. This bill would have made it easier for banks to comply with rules in such areas as lender liability, deposit and loan rate advertising, and application procedures to open branches or make acquisitions. It would also have reduced the examination requirements of the Community Reinvestment Act (CRA) and blocked regulators from allowing national banks into the insurance business (Wilke 1995, Domis 1995).

In October 1995 the Banking Committee's proposals were merged into Chairman Leach's bill in an effort to move reform efforts forward. This compromise pleased almost no one. Both the American Bankers Association and the Securities Industry Association opposed the insurance restrictions, while the Treasury Department opposed loosening the CRA requirements (McConnell 1995, Wells 1995).

Continued disputes over the extent of insurance activities by commercial banks and the proper organizational framework for banks to conduct any expanded activities ultimately scuttled reform legislation. Consequently, on June 11, 1996, Leach publicly urged the Federal Reserve to increase the revenue limit applicable to section 20 subsidiaries (described in the box entitled "Banks' Securities Activities: A Brief Overview"), citing the Fed's "clear and unquestionable" authority to do so.<sup>2</sup>

## FEDERAL RESERVE ACTION ON FINANCIAL MODERNIZATION

In a press release dated July 31, 1996, the Federal Reserve Board formally requested com-

<sup>1</sup> Indeed, a number of securities companies merged with commercial banks in 1997. These include Bankers Trust New York Corp.'s merger with Alex. Brown Inc., NationsBank Corp.'s acquisition of Montgomery Securities, Fleet Financial Group's acquisition of Quick & Reilly Group Inc., and U.S. Bankcorp's acquisition of Piper Jaffray Co.

<sup>2</sup> See McConnell (1996, 2). Leach introduced financial modernization legislation again in 1997; see the Financial Services Competition Act of 1997, H.R. 10, introduced January 7, 1997. Other financial modernization bills were introduced by Rep. Marge Roukema on January 7, 1997, H.R. 268, and by Rep. Richard Baker on February 22, 1997, H.R. 669. In May 1998 the House passed by a single vote a financial reform bill based largely on H.R. 10.

## Banks' Securities Activities: A Brief Overview

Even before the passage of the Glass-Steagall Act in 1933, securities activities were restricted for national banks. Several court cases in the late 1800s held that the National Bank Act of 1864 prohibited national banks from underwriting, trading, and holding equities for either their own accounts or those of their customers. The Federal Reserve Act also restricted member banks from these activities (Benston 1990, 31-69). State-chartered banks, however, did not operate under these restrictions. As a result, national banks began to create state-chartered affiliates that could underwrite and deal in corporate securities.

Securities activities of national banks increased greatly during World War I as banks played an important role in the marketing of government bonds. This enabled banks to develop an effective distribution system for securities and accustomed individuals to the idea of buying open market securities. The McFadden Act of 1927 reaffirmed national banks' authority to underwrite certain investment securities. Initially, the comptroller of the currency allowed only bond underwriting but later approved underwriting of certain equity securities as well (Kelly 1985, 42-43; Flannery 1985, 67-68).

The stock market crash of 1929 and the subsequent bank failures led Congress to begin a series of investigations into alleged securities market abuses by banks. Of concern were the following possibilities: (1) that banks' securities affiliates were involved in speculative and fraudulent activities at the expense of depositors or shareholders; (2) that large banks' investment activities may have endangered smaller banks with correspondent relationships; and (3) that banks' securities activities may have threatened financial safety and soundness. While isolated instances of fraud and abuse were uncovered, recent evidence generally does not support this view of commercial banks' involvement in securities.<sup>1</sup> Nevertheless, on June 16, 1933, the Glass-Steagall Act was signed into law.

Glass-Steagall was enacted within the Banking Act of 1933.<sup>2</sup> In addition to restricting banks' securities activities, the Banking Act also introduced federal deposit insurance, prohibited the payment of interest on demand deposits, placed ceilings on rates banks could pay on time deposits, and imposed margin requirements on stock purchases. Section 20 of Glass-Steagall prohibits Federal Reserve member banks from being affiliated with any entity "engaged principally in the issue, flotation, underwriting, public sale, or distribution at wholesale or retail or through syndicate participation of stocks, bonds, debentures, notes, or other securities...."<sup>3</sup>

By the 1980s, mainly in response to competitive pressures, banks had begun to pursue more active involvement in securities activities. While they were able to underwrite and deal in U.S. government securities and municipal general obligation bonds, as well as engage in private placements, banks increasingly sought the ability to extend these operations to other types of securities. Beginning in 1987, the Federal Reserve Board issued a series of orders authorizing individual bank holding companies, on a case-by-case basis, to establish section 20 subsidiaries. These subsidiaries would be allowed to engage in underwriting and dealing in securities within the limits of Glass-Steagall.

The Board established a revenue test under section 20 to determine whether a company is "engaged principally" in underwriting and dealing in bank-ineligible securities. Initially, this revenue limit was set at 5 percent of the gross revenue of the subsidiary. In 1989 the Federal Reserve Board raised this limit to 10 percent.<sup>4</sup> For more than ten years now, commercial banking organizations have been allowed to pursue limited securities activities. At the end of 1997, a total of forty-five banking organizations were authorized to establish section 20 subsidiaries.<sup>5</sup> These are mostly large institutions, accounting for almost 48 percent of all U.S. banking assets at the end of 1997.

In addition to the establishment of limited securities activities, calls for further financial modernization increased in light of the banking problems of the late 1980s. A 1991 Treasury proposal recommended the following:

The current bank holding company structure would be replaced with the new financial services holding company [FSHCs]. Well-capitalized banks that form FSHCs would be rewarded with the ability to engage in a broad new range of financial activities through separate holding company affiliates.

These new financial affiliates could engage in any financial activity, including full-service securities, insurance, and mutual fund activities (U.S. Treasury 1991, 56).

These recommendations, however, were not included in the FDIC Improvement Act, which Congress passed in late 1991. Continued recognition of the harmful effects of Glass-Steagall restrictions led in early 1995 to the introduction of legislation in both the House and Senate to expand the permissible activities of banking organizations.

<sup>1</sup> See Kelly (1985) for individual bank abuses before 1933. For evidence that banks' securities activities were not excessively risky, see Ang and Richardson (1994), Kroszner and Rajan (1994), White (1986), Benston (1990, 1996), and Puri (1994, 1996).

<sup>2</sup> Only four sections (16, 20, 21, and 32) of the Banking Act of 1933 are technically designated as the Glass-Steagall Act.

<sup>3</sup> See Kelly (1985, 41). Other sections of Glass-Steagall also deal with banks' securities activities. Section 16 prohibits national banks from underwriting corporate securities. Section 21 makes it unlawful for any person or organization engaged in the activities defined in section 20 to engage in the business of deposit banking. Section 32 prohibits officer, director, or employee interlocks between member banks and entities "primarily engaged" in activities described in Section 20.

<sup>4</sup> In its initial 1987 order, the Federal Reserve Board authorized bank holding companies to underwrite and deal in commercial paper, municipal revenue bonds, mortgage-backed securities, and securities related to consumer receivables. In 1989 the Board authorized underwriting and dealing in all types of corporate debt and equity securities. The Board also included several firewalls to prevent the transfer of risk from section 20 activities to the insured commercial bank. See Mester (1996, 17-18).

<sup>5</sup> All of these section 20 subsidiaries are authorized to underwrite and deal in certain municipal revenue bonds, mortgage-related securities, commercial paper, and asset-backed securities. In addition, twenty-eight of these subsidiaries are authorized to underwrite and deal in corporate debt and equity.

Table 1  
**Hypotheses on the Effect of Revenue Limit  
 Increase on Stock Prices**

Firm	Earnings/competitive hypotheses	Takeover hypothesis
Banking organizations with securities subsidiaries	+	+/-
Banking organizations without securities subsidiaries	+	+/-
Investment banks	-	+

+ indicates a positive effect on stock prices is hypothesized.  
 - indicates a negative effect on stock prices is hypothesized.  
 +/- indicates either a positive or negative stock price reaction could occur.

ment on a proposal to raise the limit on section 20 subsidiary revenue from underwriting and dealing in bank-ineligible securities from 10 percent of total subsidiary revenue to 25 percent. Bank-ineligible securities are those that member banks may not underwrite or deal in and include municipal revenue bonds, one- to four-family mortgage-related securities, securities related to consumer receivables, certain types of commercial paper, and debt securities. The same press release also requested comment on proposals to amend or eliminate three of the prudential limitations, or firewalls, imposed on the operations of section 20 subsidiaries.

The comment period ended on September 30, and on December 20 the Board announced an increase in the revenue limit, effective March 6, 1997. A press release stated that "based on its experience supervising these subsidiaries and developments in the securities markets since the revenue limitation was adopted in 1987, the Federal Reserve Board concluded that a company earning 25 percent or less of its revenue from underwriting and dealing would not be engaged principally in that activity for purposes of section 20" (Federal Reserve Board 1996).

The Board reported that it received forty-two public comments on the proposed revenue increase—thirty-four favorable (mostly from banks) and eight opposed (mostly from the securities industry) (*Federal Register* 1996). Several banking industry comments asked for a revenue limit as high as 49 percent. Some comments predicted the higher, 25 percent revenue limit would facilitate the creation of new section 20 subsidiaries, thereby increasing competition in financial markets. The Securities Industry Association opposed raising the limit because it would undermine comprehensive financial reform, achievable only through legislation. The association also argued that the Federal Reserve

Board lacked the authority to increase the revenue limit. Industry commenters also argued securities firms would be at a competitive disadvantage with banks (Lackritz 1996). The Board, however, concluded that increasing the revenue limit would extend the benefits of "increased competition, greater convenience to customers, increased efficiency and maintenance of domestic and international competitiveness" (*Federal Register* 1996, 68, 755).

Of interest for this article is how this expansion in the revenue limit was greeted by financial market participants. We investigate several hypotheses about what may lie behind the stock market's reaction to the expansion in the securities activities of commercial banks.

### EFFECTS OF FINANCIAL MODERNIZATION: ALTERNATIVE HYPOTHESES

This article examines several hypotheses about how banking organizations and investment banks' stock prices would react to the revenue-limit increase. We would expect the stock prices of bank holding companies with section 20 subsidiaries to react favorably to an increase in the revenue limit because of the expanded profit opportunities this represents. We refer to this as the "earnings hypothesis." In a similar vein, we would expect the stock prices for banking companies without section 20 subsidiaries to react favorably, consistent with the earnings hypothesis. This would accord with the comments the Federal Reserve Board received about the expanded opportunity for creation of new section 20 subsidiaries. In addition, *American Banker* cited a prediction by the chairman of the American Bar Association's subcommittee on bank securities activities that the revenue increase could result in 25 percent more banks developing section 20 subsidiaries (Dunaief 1996a).

The competitors of bank holding companies in the securities business, however, can be expected to exhibit a different response. A negative stock price reaction for investment banks could be expected if the increased revenue limit results in more competition for investment banks, with a concomitant decline in expected profits. We label this the "competitive hypothesis." Under this hypothesis, banking organizations would be expected to exhibit a positive stock price reaction.

Finally, in what we label the "takeover hypothesis," if investment banks are seen as attractive takeover targets in light of commercial banks' greater securities powers, then a

positive stock price reaction would be expected, to the extent that investment banks are expected to share in benefits arising from synergies or receive generous premiums from the acquiring commercial bank. As an article in *Business Week* pointed out, "Except for a handful of the largest, strongest brokerages, which could stay independent or even buy banks, the brokerage industry with all of its regional diversity could dwindle sharply. Commercial banks, on the other hand, could use broker acquisitions to regain lost market share and bolster their range of services" (Rea, Spiro, and Galuszka 1996). A *Wall Street Journal* article also described how the securities industry viewed the proposed revenue increase. "The securities industry, which stands to see its market share trimmed by the proposal, was understandably less enthusiastic." Regarding the prospects for commercial banks' purchase of investment banks in light of the revenue increase, a financial analyst was quoted in the same article saying, "It should make it more economic for acquisitions across a whole spectrum of size ranges" (Taylor and Frank 1996). Banking organizations' stock prices can react either positively or negatively under the takeover hypothesis. (Table 1 summarizes the expected effect on the stock prices of each group of firms under each of these hypotheses.)

To test these hypotheses, and to estimate the economic impact of the revenue limit increase, an event-study methodology is used to determine how the stock market viewed the events leading up to the revenue increase. A variation on the market model is estimated. Expected stock returns are assumed to be linearly related to overall market conditions, but the level of stock returns may deviate from the norm on individual event dates. (The box entitled "Event-Study Methodology" summarizes the procedure used.)

Three events corresponding to different periods leading up to the revenue increase are examined for any abnormal stock price reaction by banking companies with and without securities subsidiaries and for a sample of investment banks. Table 2 identifies these events. To estimate the economic impact of the increase in the revenue limit, the events identified must have been unanticipated by financial markets. A search of articles in *American Banker* and the *Wall Street Journal* indicates that around the days preceding each of these events, there was little, if any, reporting that indicated financial markets anticipated the congressional or regulatory actions identified in Table 2.

Table 2

**Events Associated with Federal Reserve Approval for Increasing the Revenue Limit for Section 20 Subsidiaries**

Event	Date	Description
D <sub>1</sub>	June 11, 1996	Rep. James Leach abandons attempts to pass financial modernization legislation and urges the Federal Reserve Board to increase the revenue limit on banking organizations' securities subsidiaries.
D <sub>2</sub>	July 31, 1996	Federal Reserve Board formally requests comment on raising the section 20 revenue limit and on amending or eliminating three prudential limitations, or firewalls, on the operations of section 20 subsidiaries.
D <sub>3</sub>	December 20, 1996	Federal Reserve Board press release announces an increase in the revenue limit from 10 percent to 25 percent, effective March 6, 1997.

**CHRONOLOGY**

Leach's action, the first event in Table 2, seems to have been unexpected. On June 12, 1996, *American Banker* characterized Leach's abandonment of his efforts to pass financial modernization as a "dramatic move." The article describes how Leach canceled a planned committee vote on his bill (McConnell 1996, 1). Regarding the second event, we found no news stories that anticipated the Federal Reserve's July 31 press release requesting comment on the proposal. However, there is evidence that financial markets anticipated the Fed's approval of the revenue increase in December. Articles in both the *Wall Street Journal* and *American Banker* on December 16 stated that the Federal Reserve was expected to announce approval of the revenue increase on December 20. The *Wall Street Journal* reaffirmed this in a December 19 article, noting that the Federal Reserve Board was scheduled to discuss section 20 subsidiaries at an open meeting the following day. It is not surprising that this Board action was anticipated, especially since the Federal Reserve supported expanded powers for banks (Greenspan 1997).

However, articles in the financial press leading up to the December approval did not express certainty over the final outcome. On June 12, the day after Leach proposed raising the revenue limit, the *Wall Street Journal* reported that "some analysts think the Fed won't go all the way to 25 percent, or might even keep the 10 percent limit but adjust the way it is calculated to give banks more breathing room" (Wilke and Frank 1996). Two weeks later *American Banker* reported that "legal observers

## Event-Study Methodology

The event-study methodology this article uses is similar to that employed by Schipper and Thompson (1983); Binder (1985); Smith, Bradley, and Jarrell (1986); and Millon-Cornett and Tehranian (1989, 1990). These studies estimate the economic impact of regulatory changes in several industries. Specifically, the economic impact of regulatory changes, or events, can be measured using the market-model regression, whereby the stock return of an individual firm, or of a portfolio of firms, is assumed to be a function of the returns generated on a marketwide index of stocks. A system of seemingly unrelated regression equations using Zellner's technique is estimated, where the return-generating process is also conditioned on the occurrence or nonoccurrence of an event or, in our case, an announcement of a change in the regulatory environment.<sup>1</sup> This estimation is accomplished by augmenting the market model with dummy variables to capture the different events of interest. We estimate the following model:

$$(B.1) \quad R_{sec20,t} = \alpha_{sec20} + \beta_{sec20} * R_{mt} + \sum_{k=1}^3 \gamma_{sec20,k} * D_{k,t} + \varepsilon_{sec20,t}$$

$$(B.2) \quad R_{non20,t} = \alpha_{non20} + \beta_{non20} * R_{mt} + \sum_{k=1}^3 \gamma_{non20,k} * D_{k,t} + \varepsilon_{non20,t}$$

$$(B.3) \quad R_{invest,t} = \alpha_{invest} + \beta_{invest} * R_{mt} + \sum_{k=1}^3 \gamma_{invest,k} * D_{k,t} + \varepsilon_{invest,t}$$

In this model,  $R_{sec20,t}$  is the return on an equally weighted portfolio of banking companies with section 20 subsidiaries on day  $t$ ,  $R_{non20,t}$  is the return on an equally weighted portfolio of a sample of banking companies without section 20 subsidiaries on day  $t$ ,  $R_{invest,t}$  is the return on an equally weighted portfolio of a sample of investment banks on day  $t$ , and  $R_{mt}$  is the equally weighted return on a marketwide index of stocks. The  $D_k$  variables represent dummy variables that equal one during the period of the  $k^{\text{th}}$  event and zero otherwise. Our event window, or the period covered by the event date, is two days—the day before the announcement (to allow for market anticipations cited in this article) and the day of the announcement itself. The  $\alpha$ 's represent the intercept terms in each regression, the  $\beta$ 's are the coefficients on the market return, and the  $\gamma$ 's are the effects of the  $k$  different events on each respective portfolio, or the abnormal returns generated by the event. This approach allows us to test several hypotheses, including whether the abnormal returns for each portfolio equal zero for each event and whether the economic impact of an event differs significantly across the portfolios of the different firms.

In estimating Equations B.1 through B.3, we use daily return data from the Center for Research in Security Prices (CRSP) on firms that trade on the New York Stock Exchange or the American Stock Exchange. Our period runs from January through December 1996. We have stock price data for twenty-four banking companies with a section 20 subsidiary, forty-one banking organizations with no section 20 subsidiary, and twenty investment banks.<sup>2</sup>

<sup>1</sup> The use of Zellner's seemingly unrelated regression technique does not affect the coefficient estimates. Statistical inferences, however, are affected by improving the efficiency of the parameter estimates by modifying the variance-covariance matrix.

<sup>2</sup> The names of the bank holding companies with section 20 subsidiaries were obtained from the Board of Governors of the Federal Reserve System. The sample of bank holding companies without section 20 subsidiaries was obtained from the CRSP tapes by retrieving data on all publicly traded firms with Standard Industrial Classifications (SIC) of 6021 (national commercial bank) and 6022 (state commercial bank). The sample of investment banks used is based on data from the CRSP tapes using SIC classification 6211 (security brokers, dealers, and flotation companies). This last group of firms consists of "establishments primarily engaged in the purchase, sale, and brokerage of securities; and those, generally known as investment banks, primarily engaged in originating, underwriting, and distributing issues of securities" (*Standard Industrial Classification Manual* 1987, 341).

expect the Fed to raise the cap" (Seiberg 1996a). However, in that same issue, an op-ed piece reflected some uncertainty about the final outcome when it stated that "hopefully, the board will be equally deferential in complying with this latest congressional mandate to remove the artificial regulatory burden on bank holding company securities activities" (Fein 1996). Finally, in late September (at the end of the comment period for raising the revenue limit) *American Banker*

reported that "some analysts guessed that the board may act on the proposal in November, depending on the comments that will be received" (*American Banker* 1996). At the end of October, *American Banker* reported that "the Fed is expected to act on that proposal [raising the revenue limit] within a few months" (Seiberg 1996b). From these comments, it appears that the extent to which the Federal Reserve Board would raise the revenue limit was unclear before its December 20 press release. Our empirical results attempt to account for any market expectations or anticipations associated with the different events.

## EMPIRICAL RESULTS

### Portfolio Approach

Table 3 shows the results of estimating Equations B.1 through B.3 from the box entitled "Event-Study Methodology." For all three portfolios, the coefficients on the overall market return,  $R_{mt}$ , are highly significant, indicating that movements in the stock market affect our individual portfolios. Regarding the stock market's response to the events leading up to the increase in the revenue limit, we find significant positive abnormal returns only for the third event,  $D_3$ —when the Federal Reserve announced an increase in the limit. In particular, consistent with the earnings hypothesis, banking organizations with a section 20 subsidiary show a fairly high (1.25 percent) daily excess, or abnormal, return over the two-day window when approval was announced. However, holding companies without a section 20 subsidiary and our sample of investment banks show positive but no statistically significant abnormal returns for any of the events listed in Table 2. These results for the latter two groups do not support the earnings hypothesis or the competitive hypothesis.

We also estimate a model using December 16, 1996, as an event date in place of December 20 and a model that includes dummy variables for both the December 16 and December 20 event dates, given the reports in the financial press anticipating the Federal Reserve's approval. We then include a five-day window to encompass the December 16–20 period. The December 16 date alone produces no significant abnormal return, while significant abnormal returns are indicated for these other models for the section 20 portfolio. We also estimate the model including October 31, 1996, as an event date (along with those events listed in Table 2) to estimate the impact of the *American Banker*

article stating that the Fed was expected to act on the revenue limit in a few months. This October event date produces no significant abnormal returns. Next, we reestimate the model using separate dummy variables for each day in the event window, rather than assuming the same response across the two-day window. This specification does not affect our conclusions.

To judge the robustness of our results we also estimate several variations of the model used in Table 3. In place of the CRSP market return, we use Standard & Poor's 500-stock index. This model gives a slightly smaller abnormal return of 0.74 percent for banking organizations with a section 20 subsidiary. We try estimating the model excluding foreign-owned banking organizations with a section 20 subsidiary and using only U.S.-based banking organizations with a section 20 subsidiary. Our conclusions remain unchanged, with these domestic organizations also showing a fairly high (1.4 percent) abnormal return associated with  $D_3$ . We also augment the model in Equations B.1 through B.3 by adding the change in the daily three-month Treasury bill rate. This does not affect our conclusions. Finally, we begin our estimation period in March, rather than January, because of a change in the discount rate on January 31 and a change in the prime rate on February 1. Our results are qualitatively the same using this period.

Generally, our results are not sensitive to the length of the event window. The qualitative results do not change when the event window is expanded to cover three days—the day before the event, the day of the event, and the day following the event. But we find no statistically significant abnormal returns when the event window is narrowed to only the event date itself.<sup>3</sup>

Table 4 provides statistical evidence about whether the economic impact of the December 20 event differs across the three portfolios. These are Wald test statistics. The Wald test is asymptotically equivalent to both the Lagrange multiplier test and the likelihood ratio test (Greene 1993, Chapters 4 and 13). The hypothesis that the abnormal returns associated with the December 20 event for our section 20 portfolio of banking organizations are the same as the abnormal returns for our non-section-20 banking companies produces a test statistic of 2.71 that is rejected at the 10 percent level of significance. Similarly, a test statistic of 4.91 indicates that the hypothesis that there is no difference between the abnormal returns for section 20 banking companies and our sample

Table 3

### Estimates of Abnormal Portfolio Returns

Portfolio	Coefficient estimates				
	Intercept	$R_{mt}$	$D_{1t}$	$D_{2t}$	$D_{3t}$
Sec20	.0003 (.0004)	1.2729*** (.0999)	-.0000 (.0050)	.0001 (.0050)	.0125** (.0052)
Non20	.0003 (.0002)	.8323*** (.0453)	.0009 (.0024)	.0025 (.0024)	.0037 (.0023)
Invest	.0000 (.0004)	1.5981*** (.0867)	.0005 (.0044)	.0025 (.0044)	.0035 (.0043)

NOTES: The models are estimated using daily data over the period January–December 1996. Numbers in parentheses are standard errors. Sec20 represents an equally weighted portfolio of banking organizations with a securities subsidiary; Non20 represents an equally weighted portfolio of a sample of banking organizations with no securities subsidiary; and Invest represents an equally weighted portfolio of a sample of investment banks.  $R_{mt}$  is the return on the CRSP equally weighted market index.  $D_{1t}$ ,  $D_{2t}$ , and  $D_{3t}$  are two-day dummy variables for the three events listed in Table 2.

\*\*\* = significant at the 1 percent level.

\*\* = significant at the 5 percent level.

of investment banks is rejected at the 5 percent level. These test results imply that section 20 bank holding companies experience significantly different excess returns around the December 20 event than do banking organizations without section 20 subsidiaries and investment banks. Finally, there appears to be no statistical difference between the abnormal returns associated with non-section-20 firms and those for investment banks.

#### Firm-Level Estimates

To determine if our results are sensitive to the averaging across individual firms undertak-

Table 4

### Tests of Coefficient Restrictions on Abnormal Returns for December 20, 1996, Event

Hypothesis	Wald test statistics
$\gamma_{sec20,D_3} = \gamma_{non20,D_3}$	2.71*
$\gamma_{sec20,D_3} = \gamma_{invest,D_3}$	4.91**
$\gamma_{non20,D_3} = \gamma_{invest,D_3}$	.001

NOTES:  $\gamma_{sec20,D_3}$  is the abnormal return for the portfolio of section 20 firms for event  $D_3$ .

$\gamma_{non20,D_3}$  is the abnormal return for the portfolio of non-section-20 firms for event  $D_3$ .

$\gamma_{invest,D_3}$  is the abnormal return for the portfolio of investment banks for event  $D_3$ .

\*\* = significant at the 5 percent level.

\* = significant at the 10 percent level.

<sup>3</sup> Bhargava and Fraser (1998) also fail to find significant wealth effects associated with the Federal Reserve's request for comment on its proposal to raise the revenue limit (which we identify as  $D_2$ ). These authors find no significant wealth effects for banking organizations with section 20 subsidiaries, other banking organizations, or investment banks. Bhargava and Fraser do find a significant positive stock market response for banking organizations granted section 20 subsidiaries around the time the Federal Reserve initially approved the creation of these subsidiaries. However, when the Fed doubled the revenue limit in September 1989, negative wealth effects were found for banking organizations with section 20 subsidiaries and for a sample of investment banks.

Table 5  
Hypotheses Tests Based on Individual Firm Estimates

Individual firm type	Test statistics for:			
	Event dates			Positive and negative returns
	$D_1$	$D_2$	$D_3$	
	$\gamma_1 = 0$ for all firms	$\gamma_2 = 0$ for all firms	$\gamma_3 = 0$ for all firms	(No. +/No. -)
Sec20	11.04	23.25	46.51***	(22/2)***
Non20	18.33	43.35	47.33	(27/14)**
Invest	7.79	9.81	36.96**	(15/5)**

NOTES: Sec20 represents individual banking organizations with a securities subsidiary. Non20 represents a sample of those individual banking organizations with no securities subsidiary. Invest represents a sample of individual investment banks. The Wald test statistics under each event date test the hypothesis that the individual firm-level abnormal returns are jointly equal to zero in each portfolio.  $\gamma_1$  is the excess return associated with event  $D_1$ ,  $\gamma_2$  is the excess return associated with event  $D_2$ , and  $\gamma_3$  is the excess return associated with event  $D_3$ . The last column gives the number of positive abnormal returns relative to the number of negative abnormal returns for event  $D_3$ . The significance level in the last column is based on a binomial test that positive and negative abnormal returns associated with  $D_3$  have equal probability of occurring.

\*\*\* = significant at the 1 percent level.

\*\* = significant at the 5 percent level.

en to construct the portfolio returns, hypotheses tests are also conducted based on a system of individual firm-level equations. Table 5 reports various test statistics derived from individual firm estimates of the augmented market models given in Equations B.1 through B.3 in the box entitled "Event-Study Methodology." The numbers under each event provide test statistics for the hypothesis that the individual estimates of the  $\gamma_i$  (the excess returns associated with each event for each firm in the portfolio) are jointly equal to zero.

Similar to the portfolio results, the hypothesis that the excess returns for each firm are jointly equal to zero is rejected for event number three,  $D_3$ , for banking organizations with section 20 subsidiaries. Interestingly, as shown in the third column of numbers in Table 5, the hypothesis that the excess returns are jointly equal to zero is also rejected for our sample of investment banks when considering  $D_3$ .

The last column of Table 5 shows the number of positive coefficient estimates (positive abnormal returns) associated with  $D_3$  relative to the number of negative coefficient estimates. For example, out of our sample of twenty-four section 20 banking organizations, twenty-two firms have positive excess returns associated with  $D_3$ . Using a binomial test statistic, we can reject the null hypothesis that positive and negative returns have an equal probability of occurrence when considering  $D_3$  for all three groups of firms.<sup>4</sup> From these bino-

mial tests, we have indications that the portfolio approach may obscure some important firm-level results. For banking organizations with no section 20 subsidiary, we now have evidence of a statistically significant abnormal return associated with  $D_3$ .<sup>5</sup>

Moreover, for investment banks, evidence from both the binomial test and tests of the joint significance of individual firm abnormal returns suggests a closer examination of firm-level results. While most investment banks experience positive excess returns for  $D_3$ , two individual investment banks exhibit very large, statistically significant negative daily abnormal returns of -2.1 percent and -2.7 percent over the two-day window. As shown in Table 3, our results indicate that the impact averaged across all firms is close to zero for investment banks when considering  $D_3$ . A closer look at the individual results for the sample of investment banks might shed more light on the various hypotheses being tested.

### Individual Investment Banks' Abnormal Returns

Based on the results in Table 5, three-fourths of the investment banks in our sample exhibit positive excess returns. This would be consistent with the takeover hypothesis in that investment banks that would be attractive merger candidates might be expected to exhibit positive excess returns. In fact, three investment banks in our sample were acquired by commercial banking organizations in 1997. Bankers Trust acquired Alex. Brown, Fleet Financial Group acquired Quick & Reilly, and U.S. Bankcorp merged with Piper Jaffray. Two of these investment banks exhibit fairly high daily excess returns over the two-day window for the December 20 date of 1.58 percent (Alex. Brown) and 1.1 percent (Piper Jaffray), although only the former's return is statistically significant.

To explain the pattern of excess returns our sample of investment banks exhibits for the December 20 event date, we regress those excess or abnormal returns on a number of individual firm-level characteristics that attempt to capture size and profitability. These include each investment bank's log of total assets (*LTA*), profit margin (*PM*), return on equity (*ROE*), market capitalization (*MC*), and market-to-book-value ratio (*MKBK*).<sup>6</sup> Table 6 shows the results of these estimations. In considering each firm characteristic individually, only the profit margin is statistically significant, indicating that greater individual excess returns are associated with investment banks that are more profitable. When a regression is estimated using all of

<sup>4</sup> Assuming a 95 percent significance level, sixteen section 20 firms, twenty-six non-section-20 firms, and fourteen investment banks with positive (negative) abnormal returns are required to reject the null hypothesis.

<sup>5</sup> Of the twenty-seven banking organizations without a section 20 subsidiary that record positive excess returns, three have statistically significant abnormal returns of more than 2 percent, which would be consistent with the earnings hypothesis, while the average abnormal return across these firms is 0.36 percent. One possible explanation for this result is that some, but not all, banking organizations in this group are likely to create section 20 subsidiaries.

<sup>6</sup> The profit margin is defined as income before extraordinary items divided by net sales; return on equity is defined as income before extraordinary items divided by common equity; and the market-to-book-value ratio is defined as the share price divided by the book value of common equity on a per-share basis. Common equity, share price, and total assets are as of the company's fiscal year end closest to January 1, 1997. Income and sales are for the four quarters ending closest to January 1, 1997. These data are from Compustat.

these characteristics, both firm size and profitability—as measured by the profit margin—are statistically significant.

Greater profitability would likely invite increased investor interest by potential merger partners, thereby increasing excess returns. Larger firms, though, may not tend to be as attractive as takeover targets, given the existence of the revenue limit and possible concerns about regulatory approval of large mergers. If so, the excess return for investment banks will tend to diminish as firm size increases, which would be consistent with the negative coefficient for *LTA*.

## REVIEW OF RESULTS

The stock market response to recent regulatory actions can be taken as a proxy for the possible effects on publicly traded financial institutions that may occur if Glass-Steagall is repealed. Overall, the empirical evidence indicates that the stock market viewed the approval of the increase in the revenue limit for securities operations as favorable for banking organizations, especially those already possessing a securities subsidiary. The positive response for these banking organizations' stock prices probably reflects the increased earnings potential associated with expanded securities activities. The evidence is weaker that shareholders of banking organizations without a security subsidiary, as a group, viewed the revenue increase positively.

Our conclusions about raising the revenue limit to 25 percent differ from Bhargava and Fraser's (1998) findings that commercial banks and investment banks experienced negative wealth effects around the Federal Reserve's decision to raise the revenue limit from 5 percent to 10 percent in September 1989. Further, Bhargava and Fraser find no wealth effects in their investigations of the increase in the revenue limit from 10 percent to 25 percent. However, these authors only use the date of the Fed's request for comments as an event date. Our analysis indicates that accounting for stock price movements at the time the Federal Reserve approved the 25 percent revenue limit produces a very different conclusion from that found by Bhargava and Fraser.

Finally, an explanation for the positive response exhibited by most of the stocks of individual investment banks may lie in their potential as takeover targets. An *American Banker* article noted that "experts said that raising the revenue limit makes all investment

Table 6  
Determinants of Investment Banks' Excess Returns

Dependent variable: Individual excess return						R <sup>2</sup>
Independent variables:						
Constant	<i>LTA</i>	<i>PM</i>	<i>ROE</i>	<i>MC</i>	<i>MKBK</i>	
.9620** (.3766)	-.0740 (.0483)					.02
.1657 (.1650)		.0441** (.0184)				.16
.4413*** (.1295)			.0010 (.0008)		.13	
.3701** (.1481)				-.0001 (.0001)		.00
.6860*** (.1839)					-.1826 (.1107)	.06
2.2451*** (.4561)	-.2842*** (.0568)	.0523** (.0241)	.0002 (.0010)	.0000 (.0012)	-.0259 (.1284)	.35

NOTES: *LTA* is the log of each investment bank's total assets; *PM* is each firm's profit margin; *ROE* represents the return on equity; *MC* is each firm's market capitalization; and *MKBK* is the market-to-book-value ratio. All data are for year-end 1996 and are from Compustat. Numbers in parentheses are standard errors. The estimation procedure uses a heteroscedasticity correction described in Karafiath, Mynatt, and Smith (1991, Appendix A).

\*\*\* = significant at the 1 percent level.

\*\* = significant at the 5 percent level.

banks potential targets." The same article quoted a financial market analyst predicting that commercial banks would begin buying brokerage firms six to twenty-four months after the approval of the revenue limit increase (Dunaief 1996b). Foreign banking organizations, which currently make up two-fifths of those with a section 20 subsidiary, were said to have been particularly interested in expanding their securities operations in the United States (Frank, Raghavan, and Deogun 1996). If so, the attractiveness of investment banks as takeover targets may have offset any negative effect from the greater competition brought about by increasing the revenue limit.

The Federal Reserve has supported financial modernization of the type Leach proposed in his original, 1995 legislation. Steps need to be taken, though, to limit any transfers to these new activities of the subsidy created by deposit insurance and other features of the federal safety net. This is best accomplished by utilizing the holding company framework. Permitting the affiliation of banks and securities firms would then improve the earnings potential of financial services firms and result in greater choice for consumers.

## REFERENCES

*American Banker* (1996), "Amendment Falls Short of Needed Overhaul," September 30, 1.

- Ang, James S., and Terry Richardson (1994), "The Underwriting Experience of Commercial Bank Affiliates Prior to the Glass–Steagall Act: A Re-examination of Evidence for Passage of the Act," *Journal of Banking and Finance* 18 (March): 351–95.
- Benston, George J. (1990), *The Separation of Commercial and Investment Banking: The Glass–Steagall Act Revisited and Reconsidered* (New York: Oxford University Press).
- (1996), "The Origins of and Justification for the Glass–Steagall Act," in *Universal Banking: Financial System Design Reconsidered*, ed. Anthony Saunders and Ingo Walter (Chicago: Irwin Professional Publishing), 31–69.
- Bhargava, Rahul, and Donald R. Fraser (1998), "On the Wealth and Risk Effects of Commercial Bank Expansion into Securities Underwriting: An Analysis of Section 20 Subsidiaries," *Journal of Banking and Finance* 22 (May): 447–65.
- Binder, John J. (1985), "Measuring the Effects of Regulation with Stock Price Data," *Rand Journal of Economics* 16 (Summer): 167–83.
- Domis, Olaf de Senerpont (1995), "House Panel OKs Relief Bill but Insurance Fight Looms," *American Banker*, June 30, 1.
- Dunaief, Daniel (1996a), "Fed Plan Could Expand Investment Banking Ranks," *American Banker*, August 8, 1.
- (1996b), "Banks Seen as Acquirers of Investment Banks Soon," *American Banker*, August 13, 1.
- Federal Register* (1996), "Revenue Limit on Bank-Ineligible Activities of Subsidiaries of Bank Holding Companies Engaged in Underwriting and Dealing in Securities" (December 30), 68, 750–56.
- Federal Reserve Board (1996), press release, December 20.
- Fein, Melanie (1996), "Time for Fed to Unshackle Banks in Underwriting," *American Banker*, June 25, 14.
- Flannery, Mark J. (1985), "An Economic Evaluation of Bank Securities Activities Before 1933," in *Deregulating Wall Street: Commercial Bank Penetration of the Corporate Securities Market*, ed. Ingo Walter (New York: John Wiley & Sons), 67–87.
- Frank, Stephen E., Anita Raghavan, and Nikhil Deogun (1996), "Banks' Expansion in Securities Business Is Unlikely to Spark Wave of Big Mergers," *Wall Street Journal*, August 2, A4.
- Greene, William H. (1993), *Econometric Analysis*, 2nd ed. (New York: Macmillan Publishing).
- Greenspan, Alan (1997), "Testimony of Chairman Alan Greenspan Before the Committee on Banking and Financial Services, U.S. House of Representatives," Federal Reserve Board, May 22.
- Karafiath, Imre, Ross Mynatt, and Kenneth L. Smith (1991), "The Brazilian Default Announcement and the Contagion Effect Hypothesis," *Journal of Banking and Finance* 15 (June): 699–716.
- Kelly, Edward J. III (1985), "Legislative History of the Glass–Steagall Act," in *Deregulating Wall Street: Commercial Bank Penetration of the Corporate Securities Market*, ed. Ingo Walter (New York: John Wiley & Sons), 41–43, 67–87.
- Kroszner, Randall S., and Raghuram G. Rajan (1994), "Is the Glass–Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933," *American Economic Review* 84 (September): 810–32.
- Lackritz, Marc E. (1996), letter from the president of the Securities Industry Association to William W. Wiles, secretary, Board of Governors of the Federal Reserve System, September 30, <<http://www.sia.com.sia08y.htm>>.
- McConnell, Bill (1995), "Outlook Uncertain on Glass–Steagall as Bankers Balk," *American Banker*, October 26, 2.
- (1996), "Leach Bags Reg Relief for Modest Reform Bill," *American Banker*, June 12, 1–2.
- Mester, Loretta J. (1996), "Repealing Glass–Steagall: The Past Points the Way to the Future," Federal Reserve Bank of Philadelphia *Business Review*, July/August, 3–18.
- Millon-Cornett, Marcia H., and Hassan Tehranian (1989), "Stock Market Reactions to the Depository Institutions Deregulation and Monetary Control Act of 1980," *Journal of Banking and Finance* 13 (March): 81–100.
- (1990), "An Examination of the Impact of the Garn–St. Germain Depository Institutions Act of 1982 on Commercial Banks and Savings and Loans," *Journal of Finance* 45 (March): 95–111.
- Puri, Manju (1994), "The Long-Term Default Performance of Bank Underwritten Security Issues," *Journal of Banking and Finance* 18 (March): 397–418.
- (1996), "Commercial Banks in Investment Banking: Conflict of Interest or Certification Role?" *Journal of Financial Economics* 40 (March): 373–402.

Rea, Alison, Leah Nathans Spiro, and Peter Galuszka, (1996), "Bankers Get Set to Go for Brokers," *Business Week*, December 2, 92.

Schipper, Katherine, and Rex Thompson (1983), "The Impact of Merger-Related Regulations on the Shareholders of Acquiring Firms," *Journal of Accounting Research* 21 (Spring): 184–221.

Seiberg, Jaret (1996a), "ABA Asks Fed to Double Allowable Amount of Securities Underwriting," *American Banker*, June 25, 2.

——— (1996b), "Fed Flattens Three Major Barriers to One-Stop Corporate Banking," *American Banker*, October 31, 1.

Smith, Rodney T., Michael Bradley, and Greg Jarrell (1986), "Studying Firm-Specific Effects of Regulation with Stock Market Data: An Application to Oil Price Regulation," *Rand Journal of Economics* 17 (Winter): 467–89.

*Standard Industrial Classification Manual* (1987), Executive Office of the President, Office of Management and Budget.

Taylor, Jeffrey, and Stephen E. Frank (1996), "Fed Set to Ease Bank Underwriting Curbs," *Wall Street Journal*, August 1, A2.

U.S. Treasury (1991), *Modernizing the Financial System: Recommendations for Safer, More Competitive Banks* (February).

Wells, Rob (1995), "Leach Introduces New Bank Reform Bill," Associated Press, October 24, Dow Jones Interactive Publications Library, <<http://nrstg2s.djnr.com/cgi-bin/DJ>>.

White, Eugene N. (1986), "Before the Glass–Steagall Act: An Analysis of the Investment Banking Activities of National Banks," *Explorations in Economic History* 23 (January): 33–55.

Wilke, John R. (1995), "Panel Clears Bill to Deregulate Banking Sector," *Wall Street Journal*, June 30, A4.

Wilke, John R., and Stephen E. Frank (1996), "House Banking Chief Bars Overhauling of Industry, but Asks Limited Change," *Wall Street Journal*, June 12, B8.

# Managing Cross-Border Settlement Risk: The Case of Mexican ADRs

Sujit "Bob" Chakravorti

**R**ecent and proposed changes to the clearance and settlement process for Mexican securities should ease considerably the difficulties associated with cross-border transactions, including those involving American Depositary Receipts.

This article is based on interviews and correspondence with market participants, financial market regulators, and clearinghouse operators. I would like to thank Jorge Familiar, Alfonso de Lara, Hector Perez Galindo, Rhys Jones, Gerardo Orendáin, José Quijano, Alicia Rodríguez, Ruben Shiffman, Francisco Solís, Lilia Sumiko, and the staffs of various banks and brokerage houses for providing details on the workings of the Mexican securities market.

<sup>1</sup> For a discussion of foreign exchange settlement risk, see Chakravorti (1995) and Bank for International Settlements (1996b).

<sup>2</sup> In this article, I focus on the clearance and settlement of equity transactions.

*Sujit "Bob" Chakravorti is a senior economist at the Federal Reserve Bank of Dallas.*

Technological advances and a global securities market enable individuals to buy shares of foreign companies with a click of the computer mouse. Such investors rarely ponder the underlying intricacies involved because these cross-border transactions usually occur without problems. This article analyzes the international transfer of funds and securities and one financial market's commitment to improving the process.

Deregulation of financial markets around the world, together with new technology, has led to rapid increases in the value and volume of cross-border transactions and capital flows, especially to emerging markets. Daily foreign exchange turnover rose from \$717 billion in 1989 to \$1,572 billion in 1995 (Bank for International Settlements 1996a). From 1990 to 1996, annual private capital flows to emerging markets increased dramatically, rising from \$45.7 billion to \$235.2 billion (Folkerts-Landau, Mathieson, and Schinasi 1997).

With the increase in cross-border transactions, risks in financial markets have also increased (Federal Reserve Bank of Kansas City 1997; Group of Thirty 1997). In the global marketplace, the failure of a participant in one part of the world may have dire consequences for participants elsewhere. Such a crisis occurred in the foreign exchange market when the authorities closed Bankhaus Herstatt in 1974. At the time it was closed, the German bank was involved in foreign exchange transactions that had not been completely settled. The bank had received Deutsche mark payments from foreign exchange transactions but was closed before it could deliver U.S. dollars to its counterparties. The Herstatt case highlighted the potential for problems caused by different parts of foreign exchange transactions settling at different times in different countries. This type of risk has become known as Herstatt risk, or foreign exchange settlement risk.<sup>1</sup>

Differences in settlement times are also common in the settlement of cross-border securities transactions. Various components of a transaction may settle in different countries on different days. This article focuses on the difference in the Mexican and U.S. settlement periods. In Mexico, securities transactions are settled two business days after a trade, whereas in the United States these transactions are settled three business days after a trade.<sup>2</sup> This difference in settlement periods can increase the risk of settlement fails in Mexico.

This article analyzes steps taken by Bolsa Mexicana de Valores (BMV)—the Mexican stock

exchange—and S.D. Indeval to reduce settlement fails resulting from cross-border securities transactions. Indeval is responsible for clearing and settling securities transactions. It does so by operating Sistema Interactivo para el Depósito de Valores (SIDV), the Mexican securities transfer system, and is the central securities depository. The BMV and Indeval impose penalties on participants that do not settle on time, and they have created an electronic securities lending facility. To further improve the efficiency and liquidity of the settlement process, Indeval has proposed that a clearinghouse be established. These initiatives help ensure the timely settlement of securities in Mexico and reduce both general and cross-border settlement risk. (See the glossary on page 22 for a definition of this and other terms in this article.)

## SECURITIES CLEARANCE AND SETTLEMENT

The severe downturn in global stock markets in 1987 led to the recognition that securities clearance and settlement systems worldwide needed strengthening. In October 1987, substantially increased volume and price volatility increased the financial risks to clearinghouses and their members (U.S. Securities and Exchange Commission 1988). The Brady Report, the product of a presidential task force created to study the October 1987 stock market downturn, suggested that problems with securities clearance and settlement systems resulted in less liquid markets, leading to increased investor uncertainty (Presidential Task Force on Market Mechanisms 1988).<sup>3</sup> Gerald Corrigan, then president of the Federal Reserve Bank of New York, later said that “the greatest threat to the stability of the financial system as a whole in that period [October 19–26, 1987] was the danger of a major default in one of these clearing and settlement systems” (Corrigan 1990, 129).<sup>4</sup>

The 1987 incident also highlighted the strong international linkages of national securities markets. As a result, central banks and other financial regulators started coordinating their efforts to strengthen domestic clearing and settlement systems (Bank for International Settlements 1992, Group of Thirty 1989, Organization for Economic Cooperation and Development 1991, U.S. Securities and Exchange Commission 1988, Stehm 1996). The need for coordination continues to be a major issue in the international financial community.

In 1989 the Group of Thirty, a private-sector nonprofit organization concerned with the workings of international financial markets,

recommended improvements that have since become standards for securities clearance and settlement systems. (See the box entitled “Group of Thirty Recommendations for Securities Clearing and Settlement” for a complete list.) One of the nine recommendations was that securities markets reduce their settlement period to  $T + 3$ , where settlement occurs three business days after the trade date,  $T$ .

In June 1995 the U.S. securities market moved to  $T + 3$  settlement from  $T + 5$ , the trade date plus five business days. When the move to  $T + 3$  was proposed, individual investors were concerned that because of the time required to send checks and securities by mail, the shorter period would limit their participation in the securities market. Another obstacle to moving to  $T + 3$  settlement was the flow of information between the various participants in a transaction during the clearing process. Greater coordination between investment managers (firms that order a trade), broker-dealers (firms that execute a trade), and securities custodians (firms responsible for the safekeeping of securities) would be necessary to settle at  $T + 3$  than at  $T + 5$ . (For a description of these interactions, see Weiss 1993, chapter 12.)

These obstacles were overcome, and the subsequent move to  $T + 3$  resulted in safer clearance and settlement systems. The report issued by the Bachmann Task Force (1992) calculated that the move could reduce by up to 58 percent the risk faced by National Securities Clearing Corporation (NSCC), the primary provider of centralized clearance, settlement, and information services to the U.S. securities market. The implementation of  $T + 3$  settlement resulted in a decrease in settlement fails, and today financial analysts agree that the move benefited all participants by reducing settlement and systemic risk (Levitt 1996, Grasso 1996, Lindsey and Pecora 1997).

Although the Group of Thirty recommended  $T + 3$  settlement, an even shorter period may be preferable. Grasso (1996), Levitt (1996), and Litan (1997) argue that a shorter period could further reduce risk because it would reduce participants’ credit exposure to their counterparties. However, Levitt identifies potential impediments to adopting same-day settlement. First, individual investors who choose to hold the physical securities or who are registered shareholders instead of holding stocks in “street name” might be unable to participate fully because sufficient time might not be available to deliver the securities.<sup>5</sup> The Bachmann Task Force (1992) suggested that

<sup>3</sup> Improvements to the clearance and settlement of securities in the United States were implemented as a result of the 1987 stock market downturn. For details, see Lindsey and Pecora (1997).

<sup>4</sup> Although clearance and settlement problems did not cause extended stoppages to U.S. securities markets, the Hong Kong Futures Exchange experienced problems that led to its closure for four days in October 1987. See Folkerts-Landau et al. (1995).

<sup>5</sup> When securities are registered in street name, they are registered in the name of a brokerage house, bank, or depository. Such securities are easier to process since they are ready for delivery.

## Group of Thirty Recommendations for Securities Clearing and Settlement

### 1. Trade Comparison

By 1990, all comparisons of trades between direct market participants (that is, brokers, broker/dealers, and other exchange members) should be accomplished by T + 1.

### 2. Trade Affirmation

Indirect market participants (such as institutional investors, or any trading counterparties which are not broker/dealers) should, by 1992, be members of a trade comparison system which achieves positive affirmation of trade details.

### 3. Central Securities Depository

Each country should have an effective and fully developed central securities depository, organized and managed to encourage the broadest possible industry participation (directly and indirectly), in place by 1992.

### 4. Trade Netting System

Each country should study its market volumes and participation to determine whether a trade netting system would be beneficial in terms of reducing risk and promoting efficiency. If a netting system would be appropriate, it should be implemented by 1992.

### 5. Delivery Versus Payment

Delivery versus payment (DVP) should be employed as the method for settling all securities transactions. A DVP system should be in place by 1992.

### 6. Same Day Funds

Payments associated with the settlement of securities transactions and the servicing of securities portfolios should be made consistent across all instruments and markets by adopting the "same day" funds convention.

### 7. T + 3 Settlement

A "Rolling Settlement" system should be adopted by all markets. Final settlement should occur on T + 3 by 1992. As an interim target, final settlement should occur on T + 5 by 1990 at the latest, except where it hinders the achievement of T + 3 by 1992.

### 8. Securities Lending

Securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions. Existing regulatory and taxation barriers that inhibit the practice of lending securities should be removed by 1990.

### 9. Common Message Standard

Each country should adopt the standard for securities messages developed by the International Organisation for Standardisation [ISO Standard 7775]. In particular, countries should adopt the ISIN [International Securities Identification Number] numbering system for securities issues as defined in the ISO Standard 6166, at least for cross-border transactions. These standards should be universally applied by 1992.

SOURCE: Group of Thirty (1989).

individual investors be charged a fee for the issuance of securities in paper form and be required to deliver the securities to their brokers before selling them. Second, as described above, various parties may be involved in a securities transaction. Changes in current business practices, such as when trades between the different parties involved are confirmed, would be necessary before the settlement period could be reduced further.<sup>6</sup>

Securities in Mexico are settled two business days after the trade date.<sup>7</sup> The short settlement period is possible because all exchange-traded securities must be deposited with Indeval, the only central securities depository in

<sup>6</sup> According to Levitt (1996), in November 1995 less than 10 percent of the institutional trades submitted to Depository Trust Company, the main securities depository in the United States, had settlement instructions at T.

<sup>7</sup> In Mexico government and bank securities settle at T.

Mexico. Furthermore, tax incentives ensure that almost all equity trades are made via the exchanges. Because, for the most part, the physical securities are stored with Indeval, book-entry transfers are possible for almost all transactions, allowing shorter settlement periods.

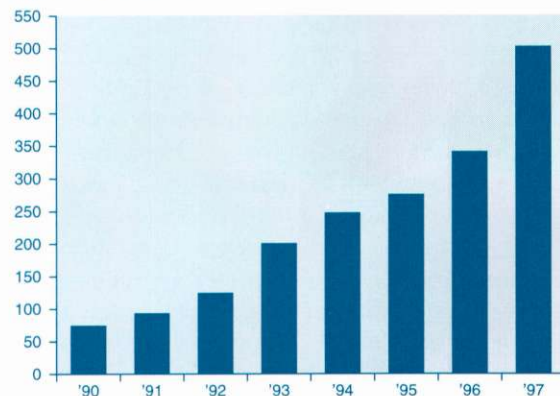
Mexican participants are concerned about settlement delays in their market resulting from cross-border transactions involving foreign markets where the settlement period is longer. The longer U.S. settlement period, for example, complicates timely settlement of cross-border transactions because one part of the transaction is settled at T + 2 in Mexico while the other part is settled at T + 3 in the United States. However, financial market participants, exchanges, and clearinghouses have increased the likelihood of timely settlement in Mexico by imposing penalties for late settlement, increasing the efficiency of the settlement process, and improving the liquidity of the underlying securities.

### American Depository Receipts

A description of the trading, clearing, and settling of an American Depository Receipt (ADR), a popular instrument U.S. investors use to participate in foreign markets, provides a framework for discussing cross-border settlement risk in the Mexican context. (For a discussion of the benefits and types of ADRs, see the box entitled "American Depository Receipts" on page 17.) What have become known as depository banks began issuing ADRs in 1927. After receiving the underlying shares in the home country of the firm that issued them, the depository

Chart 1  
Trading in Listed Depository Receipts

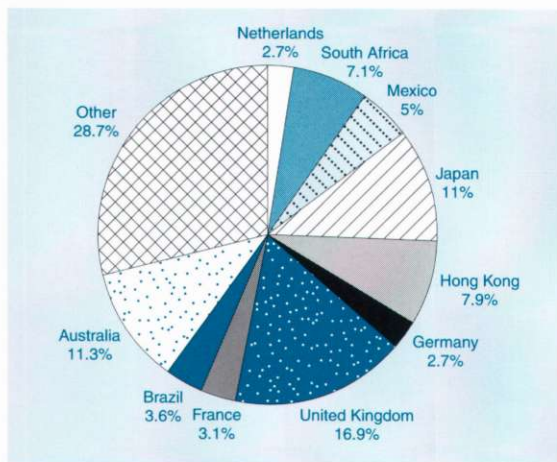
Billions of U.S. dollars



NOTES: Trading volume data is for Depository Receipts (ADRs and GDRs) listed on U.S. exchanges only. In 1997, listed programs accounted for 457 of the 1,358 programs.

SOURCE: Bank of New York (1998).

**Chart 2**  
**Distribution of Depositary Receipt Programs, 1997**



NOTE: In 1997 there were 1,358 Depositary Receipt programs, 292 of them unsponsored.

SOURCE: Bank of New York (1998).

tary bank in the United States issues ADRs that are dollar-denominated negotiable instruments. (For details on ADRs, see Coyle 1995, Deutsche Morgan Grenfell 1996, Riley 1998.) ADRs can be traded over the counter or on exchanges.

ADR programs can be either sponsored and unsponsored. To start a sponsored program, foreign firms can approach depository banks directly or use broker-dealers to set up depository contracts. All exchange-traded ADRs must belong to a sponsored program, in which a depository contract exists between the depository bank and the foreign firm issuing the shares.<sup>8</sup> To start an unsponsored program, broker-dealers set up programs with depository banks without informing the foreign firm that issued the underlying shares. Regardless of the type of program chosen, the U.S. Securities and Exchange Commission (SEC) must be notified.

According to a study commissioned by Citibank, 51 percent of U.S. portfolio managers prefer making foreign investments through ADRs to directly purchasing shares in the local market (Citibank 1996). Some U.S. market participants that otherwise restrict themselves to investments in domestic securities participate in ADRs because they are treated as U.S. securities, even though they are fully backed by foreign shares. During the 1990s, the trading volume in these instruments has increased dramatically. Dollar volume for exchange-listed ADRs and Global Depositary Receipts (GDRs) rose from \$75 billion in 1990 to \$503 billion in 1997 (Chart 1).<sup>9</sup>

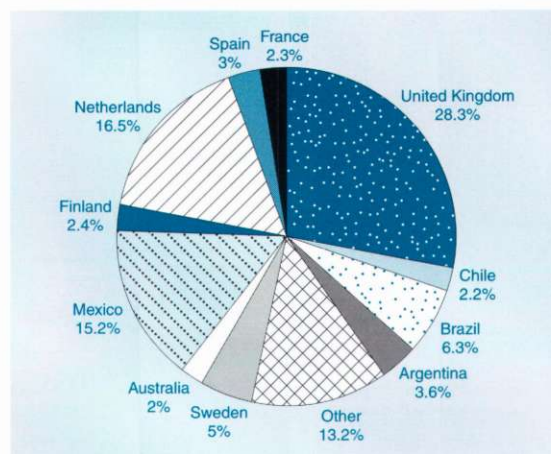
In 1997 Mexico did not rank among the world leaders in the number of ADR and GDR programs. But in terms of ADR and GDR share volume on U.S. exchanges, Mexico trailed only the United Kingdom and the Netherlands with 15.2 percent (Charts 2 and 3). Nearly 100 Mexican companies have ADR programs. However, the majority of the trading occurs in thirty companies (Riley 1998).

### ADR Purchase

When U.S. investors place a buy order for Mexican ADRs with U.S. brokers, the brokers have two means of purchasing the ADRs: (1) the brokers can purchase existing ADRs in the U.S. market, making what is known as an intramarket trade, or (2) they can purchase the underlying shares in Mexico and have a depository bank issue ADRs.<sup>10</sup> Most ADR transactions are intramarket trades. However, if the U.S. market lacks sufficient liquidity, brokers access the Mexican market. The creation of each ADR usually starts with the purchase of the underlying shares in Mexico.

In the first case—intramarket trades—existing ADRs trade, clear, and settle like any U.S. security. These securities usually clear and settle through the Depository Trust Company (DTC) and settle at  $T + 3$  (see Chart 4a).<sup>11</sup> ADRs can be held in physical form, but most are held in book-entry form. In the second case, U.S. brokers purchase the underlying shares, either through their Mexican offices or a Mexican

**Chart 3**  
**Depositary Receipt Dollar Trading Volume, 1997**



NOTE: Trading volume data is only for Depositary Receipts (ADRs and GDRs) listed on U.S. exchanges, accounting for 457 of the 1,358 Depositary Receipt programs in 1997.

SOURCE: Bank of New York (1998).

<sup>8</sup> Some unsponsored ADR programs that existed before the Securities Exchange Acts of 1933 and 1934 are exempt from this rule.

<sup>9</sup> Global Depositary Receipts are depository receipts that trade in more than one country. The GDRs included in these figures trade in the United States and at least one other country. However, GDRs need not trade in the United States, although most do.

<sup>10</sup> This article uses the terms *brokers* and *broker-dealers* interchangeably.

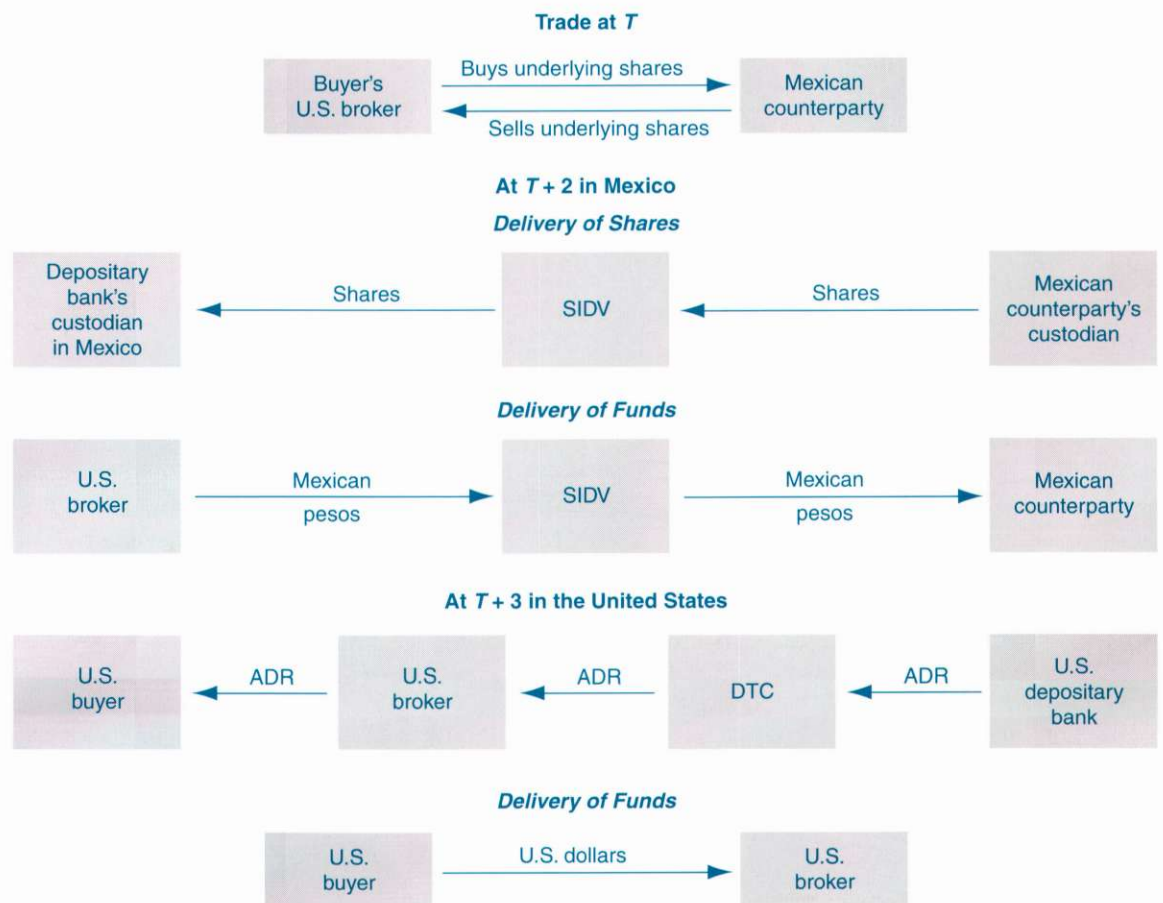
<sup>11</sup> In addition to being a central securities depository, the DTC is a clearinghouse for securities transactions for member banks and broker-dealers. Both the DTC and the NSCC are involved in the clearance and settlement of securities in the United States. After netting securities transactions among its members, the NSCC settles the net securities positions on the books of the DTC. For more on the DTC's role, see Depository Trust Company (1996) and Citibank (1998).

For simplicity, I have not included the NSCC's possible role in netting these transactions. By using the NSCC, participants reduce their cost of transacting due to the multilateral netting of a given type of security and the netting of funds.

Chart 4a  
**U.S. Broker Buys ADR in U.S. Market**



Chart 4b  
**U.S. Broker Buys Underlying Shares in Mexican Market**



<sup>12</sup> The risk faced by the broker is the potential price decrease between when the security was purchased and the price at T + 3 if the U.S. investor does not deliver funds. Furthermore, the broker faces the risk that the peso will depreciate vis-à-vis the dollar if the broker has to liquidate its position because the U.S. investor fails to deliver dollars at T + 3.

<sup>13</sup> For SIDV transactions, participants settle the net funds position at the end of the day. Netting the funds side for all transactions in a given day generally reduces a participant's liquidity needs. See Chakravorti (1997a).

agent. Such transactions are cleared and settled via the SIDV. (For a diagram of these transactions, see Chart 4b.) At T + 2, settlement day in Mexico, the U.S. broker delivers Mexican pesos to a Mexican agent that in turn delivers these funds to the SIDV. However, in most cases the U.S. buyer only delivers U.S. dollars to a broker at T + 3 in the United States. This asymmetry in timing exposes the U.S. broker to credit risk because the broker could deliver funds in

Mexico before receiving funds in the United States.<sup>12</sup> To reduce or eliminate this exposure, the broker could extend a line of credit—which may be collateralized—to the customer or could collect funds from the customer at T + 2, the settlement date in Mexico. In any case, acquiring funds is easier than acquiring the underlying securities since Mexican money markets are very liquid, whereas a given security may be considerably less liquid.<sup>13</sup> Although the

U.S. broker may be exposed to credit risk, the risk of settlement fail caused by the inability to deliver funds is minimal.

On the securities side of the transaction, the Mexican counterparty instructs its custodian to deliver the underlying shares to the depositary bank's custodian in Mexico at  $T + 2$ . These transactions are settled using delivery versus payment, whereby the funds are only delivered to the seller if the securities are delivered to the buyer. After receipt of the underlying shares in Mexico, the depositary bank issues the ADR and delivers it to the broker via the DTC in the United States at  $T + 3$ .<sup>14</sup> Also at  $T + 3$ , the U.S. buyer delivers dollars to the U.S. broker in exchange for the ADR.

### ADR Sale

When an investor wants to sell an ADR through a U.S. broker, the broker can either make an intramarket trade or sell the underlying shares in Mexico.<sup>15</sup> If the trade is an intramarket one, the transaction usually settles via the DTC at  $T + 3$  (see Chart 5a).

A U.S. broker that decides to access the Mexican market searches for a buyer for the underlying shares (see Chart 5b). The U.S. broker may use a Mexican agent to sell the underlying shares. At  $T + 2$ , in most cases, the depositary bank does not instruct its custodian to release the underlying Mexican shares.<sup>16</sup> Thus, for settlement to occur the U.S. broker must obtain the shares elsewhere. If the U.S. broker has the needed shares in its own portfolio, the broker could use those shares. If the U.S. broker does not own the shares needed for settlement, the broker or its agent would borrow the shares from the securities lending market. If this market lacks sufficient liquidity, a settlement fail would occur.

On the funds side, the Mexican counterparty delivers funds via the SIDV to the U.S. broker at  $T + 2$ . After receiving the funds in pesos, the seller's broker converts it into dollars and credits the seller's account at  $T + 3$ . However, as mentioned above, all SIDV transactions are settled using delivery versus payment. Thus, if the underlying securities are not delivered, the seller does not receive the corresponding amount of funds. If the transaction fails at  $T + 2$ , it will most likely be settled at  $T + 3$  when the depositary bank releases the underlying shares.

In the next section, I discuss recently established penalties for late settlement and a new securities lending facility that allows brokers to borrow securities to make settlement. I also discuss a proposed clearinghouse that

By using American Depositary Receipts, foreign companies are able to increase their investor base and visibility and, with certain types of ADR programs, raise capital. For U.S. investors that are not active traders in the home country of the ADR, the cost of investing in these instruments is considerably less than the cost of directly accessing the home country's securities market.

ADRs are issued by depositary banks, whose functions for their clients include disseminating financial and shareholder meeting information about the foreign companies and making dividend payments in U.S. dollars. The price of the ADR should be close to the price of the underlying shares because if arbitrage opportunities existed investors would buy from the market offering the lower price and sell in the one with a higher price until the profit opportunity disappeared. In globally linked financial markets these opportunities should not last long, if they do exist. However, investors do face foreign exchange rate risk because the dollar price may change due to exchange rate fluctuations. The number of ADR programs has grown from fewer than 800 in 1991 to about 1,800 today (Riley 1998).

There are five main types of ADR programs—unsponsored, sponsored—level 1, sponsored—level 2, sponsored—level 3, and restricted. An unsponsored program is initiated by a U.S. bank or broker and may not involve the foreign corporation that issued the shares. Unsponsored programs face less stringent requirements than sponsored programs. With sponsored programs, formal agreements—called deposit agreements—exist between the foreign issuer and the depositary bank. Sponsored—level 1 programs trade over the counter and are not subject to as rigorous regulation by the SEC as the two other sponsored programs. Sponsored—level 2 programs allow shares to be listed on a U.S. exchange if exchange rules and more stringent SEC requirements are met. However, these ADR programs cannot be used for public offerings. In other words, firms may not use this type of program to raise capital. Sponsored—level 3 ADR programs allow public offerings, and most meet full SEC disclosure in addition to the requirements for sponsored—level 2 ADR programs. Restricted ADRs, or Rule 144A ADR programs, are private placements with qualified institutional buyers as defined by SEC Rule 144A, introduced in April 1990 to stimulate capital raising by foreign corporations.

would net securities transactions involving the same type of security, resulting in the need for fewer securities to settle a day's transactions. All these reforms should help foreign participants meet their settlement obligations when a depositary bank does not release the underlying shares at  $T + 2$ .

### MEXICAN REFORMS

In the Mexican securities market, a significant portion of settlement fails results from cross-border transactions. To reduce these fails, the BMV, Indeval, and financial authorities have embarked on a series of reforms. Not only do these improvements reduce cross-border settlement risk, but they also improve efficiency and reduce settlement risk in all transactions. The greater liquidity and safer clearance and settlement process resulting from the reforms should make the Mexican securities market more attractive to foreign investors.

### Timely Settlement

To promote timely settlement, institutions responsible for clearance and settlement must establish clear rules and impose penalties on participants when needed. Otherwise, market

<sup>14</sup> In foreign markets where the settlement period is longer than  $T + 3$ , the depositary bank usually waits to issue the ADR until it has received the foreign shares. The depositary bank may release the ADR before having custody of the shares, but cash collateral and proof of ownership are usually required for the issuance of the ADR.

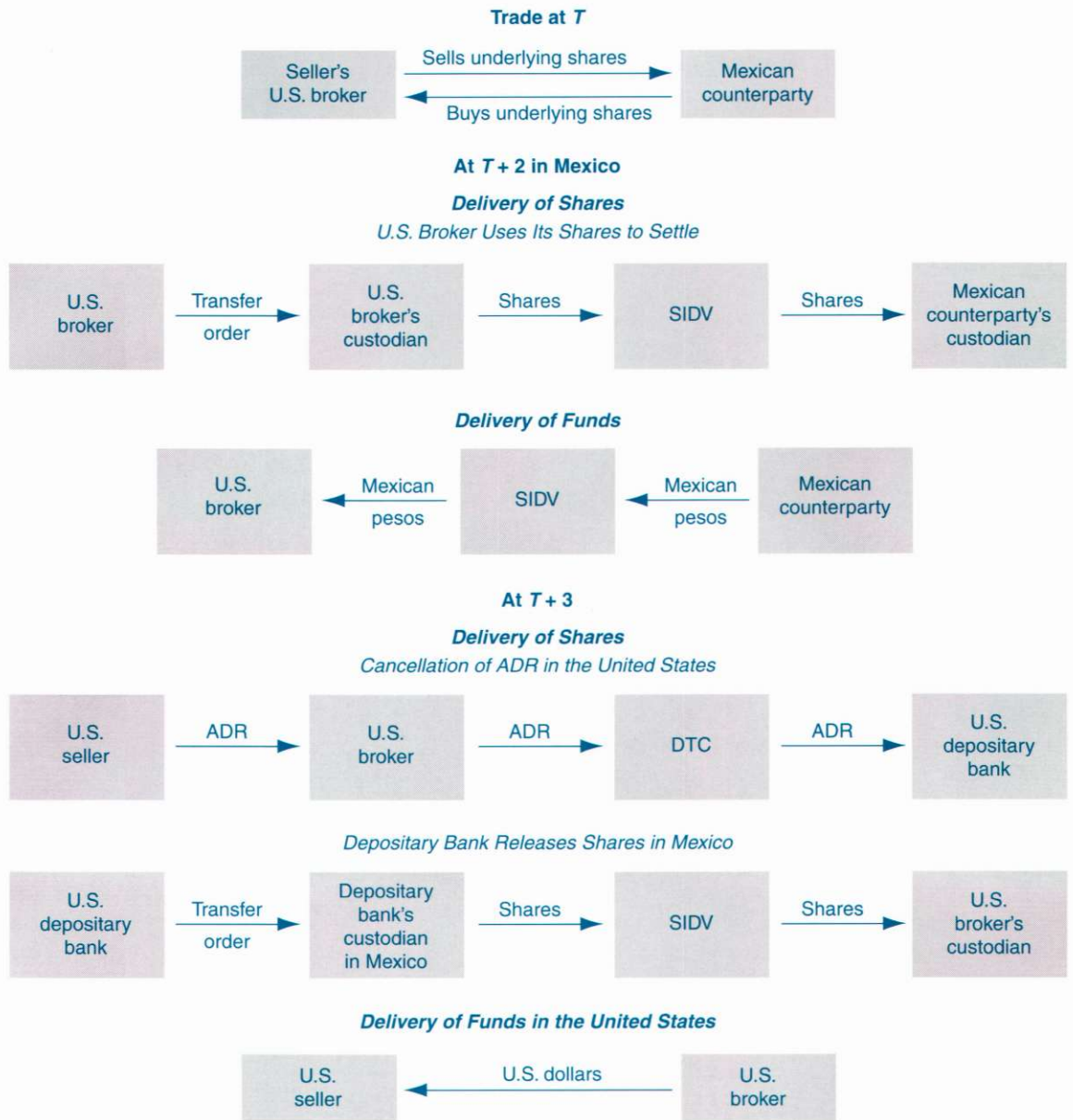
<sup>15</sup> Usually, the U.S. broker accesses the Mexican market if unable to sell the ADR in the U.S. market or to offset a transaction that it was part of in Mexico.

<sup>16</sup> If the depositary bank releases the underlying shares without possession of the corresponding ADRs, it assumes the default risk up to the full value of the underlying shares. In other words, if the ADRs are not delivered to the depositary bank, it would still have outstanding ADRs that would need to be backed by shares of the foreign firm.

Chart 5a  
**U.S. Broker Sells ADR in U.S. Market**



Chart 5b  
**U.S. Broker Sells Underlying Shares in Mexican Market**



participants may lack the incentive to settle on time. Market participants in Mexico point to the difference in U.S. and Mexican settlement periods as the cause of the majority of settlement fails. As shown in Chart 5b, the delivery of an ADR to a depository bank occurs at  $T+3$ , but the settlement of underlying shares occurs at  $T+2$ . If the depository bank is unwilling to release the shares before receiving the ADR in the United States, and if the U.S. broker or its Mexican agent is unable to acquire shares from another source to make settlement, the cross-border transaction results in a settlement fail.

To provide an incentive to settle on time, in April 1997 the BMV established penalties for late settlement, along with buy-in and sellout procedures for transactions not settled by  $T+5$ . Currently, the BMV calculates price differentials and imposes the appropriate penalties on participants unable to make timely settlement. If settlement does not occur at  $T+2$ , the penalty is based on when settlement does occur. If settlement occurs at  $T+3$ , the penalty is the amount of the position of the party unable to settle multiplied by TIIE (Tasa de Interés Interbancario de Equilibrio), the domestic interbank rate. Whether or not settlement is achieved at  $T+3$ , the party unable to settle must deliver the penalty amount to the counterparty at  $T+3$ . If settlement occurs at  $T+4$ , the penalty is twice the TIIE multiplied by the value of the transaction and must be delivered by the party unable to make settlement to the counterparty. If settlement has not occurred by  $T+5$ , the party unable to settle must pay three times the TIIE multiplied by the value of the transaction at  $T+5$ .

In addition, if the trade remains unsettled at  $T+5$ , the party able to make settlement invokes a buy-in or sellout.<sup>17</sup> If the party unable to settle is the seller, then a buy-in procedure is conducted. In a buy-in, the security is bought on the market by the buyer, and the seller must pay the difference between the market price and the agreed selling price, plus the penalty. If the agreed selling price is above the market price at  $T+5$ , no price differential is collected from the seller and the buyer acquires the securities at the lower price. If the party unable to settle is the buyer, a sellout procedure is used. In a sellout, the security is sold and the buyer must pay the difference between the agreed trade price and the market price, plus the penalty. If the market price is higher than the agreed trade price, the buyer does not pay the price difference and the seller receives the higher market price from the sale at  $T+5$ .

Between April 1997 and February 1998, the average monthly percentage of trades that failed—that is, trades in which one party could not make settlement—was 0.16 percent. Of these fails, almost 77 percent were settled at  $T+3$ , 22 percent were settled at  $T+4$ , and less than 1 percent went into a buy-in procedure. The sellout procedure was never initiated. In other words, in none of the settlement fails was the buyer unable to deliver funds eventually.<sup>18</sup>

### Increasing Liquidity at Settlement

The imposition of penalties for settlement fails may raise the cost of transacting in the Mexican market for brokers that sell shares underlying ADR sales in the United States. This is because the delivery of the underlying shares usually occurs at  $T+3$ . These brokers have two options for avoiding the penalty. First, they can carry reserves of the underlying securities and use them for settlement; however, the cost of holding these securities for the purposes of making settlement may outweigh the benefits of holding the reserves. Second, the brokers can borrow the securities until the depository bank releases the underlying shares.

The Group of Thirty (1989, 16) recommended that “securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions. Existing regulatory and taxation barriers that inhibit the practice of lending securities should be removed by 1990.” The group stressed that securities lending should be fully collateralized and the lender should be compensated for temporary use of its securities. The group also cautioned financial markets not to interpret this recommendation as promoting the sale of securities without owning them and that explicit safeguards are needed to ensure operations are conducted smoothly and at minimal risk. The International Organization of Securities Commissions (1992) echoed the need for securities lending to promote the timely settlement of transactions but cautioned against its use for speculative purposes.

In 1992 the Mexican National Securities Commission began allowing brokerage firms to lend securities to clients unable to deliver securities because of differences in settlement periods, time zones, and business days among different markets (Group of Thirty 1992). At that time, Indeval did not participate in securities lending.

To promote market liquidity and help participants meet their settlement obligations, in

<sup>17</sup> However, if a participant fails before  $T+5$ , a buy-in or sellout procedure occurs before  $T+5$ .

<sup>18</sup> The fact that the buy-in procedure was sometimes necessary while the sellout procedure was never used is consistent with the argument that settlement fails more often reflect the difficulty obtaining securities than the difficulty obtaining funds.

January 1997 Indeval started operating an electronic securities lending facility, called Valores en Préstamo (VALPRE). For a fee, participants owning securities lend them to participants lacking those securities.<sup>19</sup> In addition, if a participant is unable to acquire the underlying security to make settlement, the BMV can access VALPRE to complete settlement if the underlying security is available. So far, only one loan transaction has been conducted in such a manner. In most cases, participants without the securities access VALPRE directly. Consistent with the Group of Thirty's recommendations, all securities transactions are collateralized. All securities pledged for collateral are discounted from their market value, based on the type of security used.

Although quantifying VALPRE's effect on the frequency of cross-border settlement fails is difficult, the ability to borrow securities does help participants involved in both cross-border and domestic transactions make timely settlement. In February 1998 VALPRE handled 622 transactions, valued at 633.63 million pesos.<sup>20</sup> VALPRE transactions accounted for 0.64 percent of all equity transactions. The average time securities were borrowed was 1.6 days.

### Benefits of Netting and the Role of a Securities Clearinghouse

Another way brokers in ADR transactions can avoid late-settlement penalties is to net securities of the same type. By doing so, on average a broker has to deliver fewer securities. For example, suppose a broker engaged in ten transactions, each involving ten shares of the same security with the same counterparty.<sup>21</sup> In five of these transactions the broker sold the shares, and in the other five it bought the shares.

Without netting, the broker might not be able to offset securities to be delivered against securities to be received. The broker would then have three options: maintain a reserve of at least fifty shares in its portfolio and send them to the counterparty on settlement day; borrow the underlying securities and make delivery; or wait for the counterparty to send shares and then send them back to make settlement. In the first two options, the broker would incur additional costs. In the third option, if both participants wait for the other to deliver, the result could be that no settlement occurs.

With netting there would be no transfer of securities because the net position for each of the two participants is zero. If fewer securities are required to settle, fewer securities need to be borrowed, and in some cases the number of shares required for settlement of ADR transac-

tions may be offset by other transactions in the Mexican market.

An important feature of clearinghouses is their ability to net transactions and allow their participants to settle the net amounts.<sup>22</sup> The netting could occur bilaterally, as described above, or multilaterally, whereby netting occurs with more than two participants.<sup>23</sup>

### Mexico's Proposed Clearinghouse

To increase liquidity and efficiency in the clearance and settlement of securities, Indeval has proposed the formation of a clearinghouse—Cámara de Compensación y Liquidación (CCV)—that would begin operating in February 1999.<sup>24</sup> The primary benefit of this clearinghouse would be to reduce the cost of delivering securities for each transaction by allowing the participants to bilaterally net securities of the same type. Both foreign and domestic participants would benefit from its establishment. The clearinghouse would be the counterparty in every transaction and guarantee settlement of all transactions. In the first phase the CCV would only clear and settle BMV transactions; in the second phase the CCV would add OTC transactions. (As before, here I focus only on the clearing and settling of equities.)<sup>25</sup>

With the establishment of the CCV, Indeval's role in securities clearing and settlement would change. Upon full implementation of the CCV's proposed functions, Indeval would be responsible for securities safekeeping, cash and securities transfers, management of securities, issuer services, and collateral management. The CCV would be responsible for clearing, cash and securities settlement, and collateral management.

The CCV would have two types of members: indirect and direct. Indirect participants would include mutual fund firms, insurance and pension fund firms, other domestic investors, and foreign financial institutions and investors. Direct participants would be institutions that currently settle transactions through the SIDV—brokerage houses, commercial and development banks, and the Bank of Mexico. A subset of direct participants would be settling members, which would settle trades for themselves and all other members. CCV organizers hope custodial banks will participate as settling members to help in the timely settlement of cross-border transactions. Clearance and settlement would be a three-day process, or  $T + 2$  settlement. Each settling member would have two clearing accounts at Indeval, one for funds and the other for securities. In addition, the CCV would have

<sup>19</sup> In the case of funds, the central bank has various options to increase the supply of funds in the financial market. For a description of some of these options, see Chakravorti (1997b).

<sup>20</sup> All these transactions involved equities.

<sup>21</sup> One firm may issue more than one type of share. For netting to occur, the type of share must be the same.

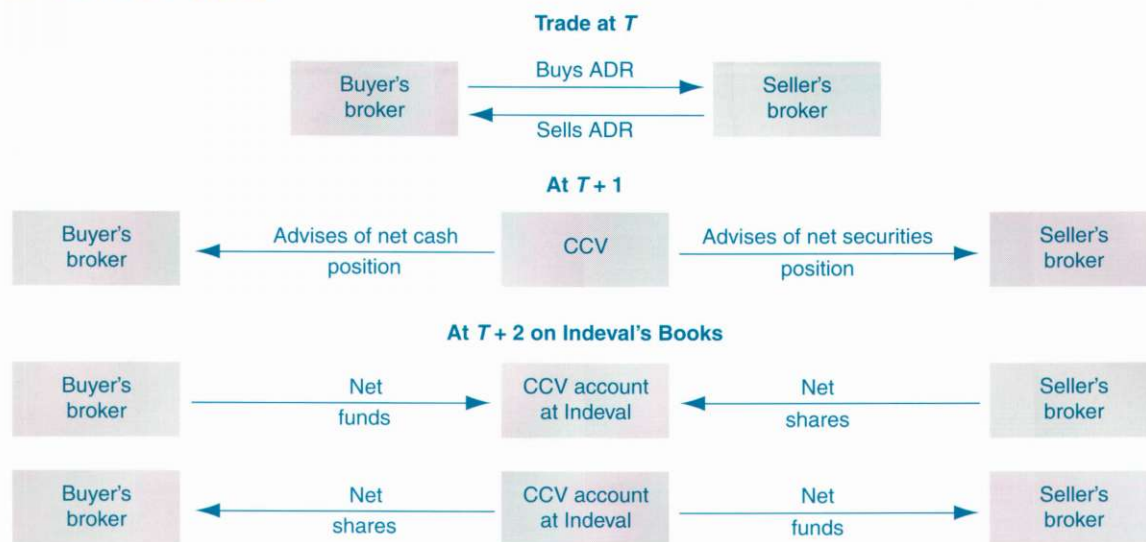
<sup>22</sup> By centralizing the clearance and settlement of trades and risk management services for their members and associated exchanges, clearinghouses can take advantage of economies of scale, thereby improving the efficiency of the financial market as a whole.

<sup>23</sup> The Bank for International Settlements (1990) recommended minimum international standards, known as the Lamfalussy standards, for netting schemes. Hanley, McCann, and Moser (1995) provide possible extensions to these standards that may be more appropriate for securities markets.

<sup>24</sup> The regulatory authorities have not given final approval to the establishment of this clearinghouse. The description of CCV is based on communication with Indeval.

<sup>25</sup> The CCV will eventually clear the following securities traded on the BMV: equities and Certificados de Participación Ordinaria (CPO) (ordinary certificates), fixed income securities, bonds, promissory notes, Certificados de Participación Inmobiliario (construction certificates), and commercial paper. In addition, the CCV will clear the following OTC securities: bank notes and bonds, Pagaré con Rendimiento Liquidable al Vencimiento (promissory notes with yields payable at maturity date), CPO guaranteed by NAFIN, certificados de las tesorerías de la federación, bonos, ajustabonos, Udibonos, United Mexican States (sovereign securities issued by the Mexican government in foreign markets), and Bradys.

Chart 6  
Proposed CCV System



similar accounts at Indeval. Transactions would be cleared on a bilateral net basis, security by security for each settling member. In other words, transactions involving the same security between two participants would be netted.

Chart 6 shows an example of a transaction that would be cleared and settled via the CCV. On the trade date, the CCV would receive confirmation of the trade from the BMV, an electronic trading system, or Indeval. The CCV would separate trades by settling members and non-settling members. At  $T + 1$ , the CCV would inform settling members of their net cash positions and their net positions in each security with every other participant.<sup>26</sup> For transactions involving a foreign participant that would deliver securities at  $T + 2$ , confirmation from the custodian of the foreign participant would be required.

At  $T + 2$ , settlement day, there would be three settlement cycles—night (around 2 a.m.), midday (around noon), and afternoon (around 3 p.m.). For the night settlement cycle, Indeval would debit the accounts of participants and credit the CCV's account. Later that morning (around 10 a.m.), the CCV would collect funds from the participant that would be receiving the securities. Participants would be required to deliver funds to one of three places—the CCV's cash account at Indeval; the CCV's account at Sistema de Atención a Cuentahabientes de Banco de México—the large-value gross settlement system that transfers funds between reserve accounts at the Bank of Mexico; or CCV's account at a commercial bank. Upon

receiving funds from the buyer, the CCV would release the corresponding securities to the participant that delivered funds and the funds to the participant that delivered securities. If the participant delivering securities chooses another settlement cycle, the corresponding participant delivering funds would have to deliver funds during that cycle.

If unsettled transactions remain at the end of  $T + 2$ , the CCV would take the following actions. If cash were not delivered at the specified time, the participant's margin would be used. There would be no grace period. If the margin were insufficient to cover the position, the settling member's previous contribution to a clearing fund would be accessed. If a shortfall still existed, explicitly stated loss-sharing procedures would be imposed on the remaining members. Additional safeguards are still under consideration, such as a reserve account that would be funded by Indeval.

For nondelivery of securities, the CCV would attempt to fill the position by borrowing the underlying securities via VALPRE on behalf of the participant unable to deliver them. The CCV would administer the collection of price differentials, penalties, and additional margin requirements. If the participant were unable to deliver the securities, a buy-in procedure similar to the one described above would be used. If a buy-in procedure were not feasible, the position would be settled with cash, and if the participant were unable to meet this cash obligation, the safeguards described above would be used.

<sup>26</sup> The role of the CCV would be similar to that of the NSCC in the United States, except securities are multilaterally netted per security in the NSCC and would be only bilaterally netted in the CCV.

## Glossary of Terms

**American Depositary Receipt** An ADR is a U.S.-dollar-denominated negotiable instrument, issued by U.S. depository banks and fully backed by foreign shares.

**Bolsa Mexicana de Valores** The BMV is the Mexican stock exchange.

**Cámara Mexicana de Compensación y Liquidación** The CCV is the proposed clearinghouse that would clear and settle securities transactions in Mexico.

**Comision Nacional Bancaria y de Valores** The CNBV is an autonomous agency of the Mexican Ministry of Finance and Public Credit, with executive powers established by the National Banking and Securities Commission Act.

**Clearing** Clearing is the processing of payment or security transfer instructions, including the netting of obligations to pay or deliver securities for establishing final settlement positions.

**Cross-border settlement risk** This is the risk that cross-border transactions associated with different settlement periods will lead to settlement fails.

**Depository Trust Company** The DTC is a U.S. clearinghouse involved in the clearance and settlement of securities transactions for member banks and broker-dealers.

**Global Depositary Receipt** A GDR is similar to an ADR. GDRs are depository receipts that can trade in two or more countries outside of the underlying firm's home country.

**National Securities Clearing Corporation** The NSCC is the primary provider of centralized clearance, settlement, and information services to the U.S. securities market.

**S.D. Indeval** Indeval is the private institution responsible for the custody, administration, clearing, settlement, and transfer of securities in Mexico. It is also the only institution in Mexico authorized to operate as a central securities depository.

**Settlement** This is "an act that discharges obligations in respect of funds or securities transfers between two or more parties" (Bank for International Settlements 1993).

**Settlement risk** This is the risk that one party to a transaction is unable to make settlement.

**Sistema Interactivo para el Depósito de Valores** The SIDV is the Mexican large-value securities transfer system.

**Systemic risk** In the payments system context, this is the risk that a participant's inability to settle will result in the inability of one or more other participants to settle.

The Bank of Mexico and the CNBV would be responsible for regulatory oversight of the CCV. The CCV would also be governed by the Securities Market Act and its supplementary laws. The risk and audit committees of the CCV would issue policies concerning its operation and safety.

Market participants and financial regulators view the proposed clearinghouse as an improvement to the clearance and settlement of securities. The liquidity and efficiency of the financial markets should improve with the CCV. The use of bilateral netting should help reduce settlement fails involving ADR transactions because fewer securities should be required for settlement. In addition, many risk-reducing measures would be implemented to contain most financial disturbances, including those resulting from cross-border transactions. Furthermore, by explicitly stating loss-sharing procedures, the perception of implicit government guarantees may be reduced significantly.

## CONCLUSION

Although a country's financial market benefits greatly from linkages to global securities markets, such linkages may carry cross-border settlement risk resulting from differences in settlement periods. In the case of Mexico, securities transactions settle two days after a trade, a shorter period than in most other countries. Although shorter settlement periods are preferred, unilaterally implementing such periods may pose settlement problems for cross-border transactions. As a result, the BMV, Indeval, and Mexican financial authorities have implemented policies that could ease the burden associated with the clearance and settlement of international transactions.

These policies have resulted in penalties for late settlement and an electronic lending facility that improves the liquidity of securities. A proposed clearinghouse could potentially reduce the quantity of securities required to settle transactions. With netting systems, the inability of a participant to settle may affect the settlement of other participants. To reduce such risk, Mexico's proposed clearinghouse would establish safety measures that include margin requirements, a clearing fund, and other, related provisions. Taken together, these recent and proposed reforms could go a long way toward alleviating the complications for cross-border transactions resulting from the longer settlement periods that exist in most other countries.

## REFERENCES

- Bachmann Task Force (1992), *Report of the Bachmann Task Force on Clearance and Settlement Reform in U.S. Securities Markets*, submitted to the chairman of the U.S. Securities and Exchange Commission.
- Bank for International Settlements (1990), *Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries* (Basle, Switzerland: Bank for International Settlements, November).
- (1992), *Delivery Versus Payment in Securities Settlement Systems* (Basle, Switzerland: Bank for International Settlements, September).
- (1993), *Payment Systems in the Group of Ten Countries* (Basle, Switzerland: Bank for International Settlements, December).
- (1996a), *Central Bank Survey of Foreign Exchange and Derivatives Market Activity 1995* (Basle, Switzerland: Bank for International Settlements, May).

——— (1996b), *Settlement Risk in Foreign Exchange Transactions* (Basle, Switzerland: Bank for International Settlements, March).

Bank of New York (1998), *Depository Receipts (ADRs and GDRs): 1997 Year-End Market Summary*, <<http://www.bankofny.com/adr/mktstat.htm>>.

Chakravorti, Sujit (1995), "The Tradeoff Between Risk and Efficiency in Foreign Exchange Settlement Systems" (Ph.D. dissertation, Brown University).

——— (1997a), "Mexican Payments System Reforms," Federal Reserve Bank of Dallas *Financial Industry Studies*, August, 12–22.

——— (1997b), "Payments-Related Intraday Credit Differentials and the Emergence of a Vehicle Currency," Federal Reserve Bank of Dallas Financial Industry Studies Working Paper no. 3–97 (Dallas, August).

Citibank (1996), "Analysis of U.S. Investment Manager Interest in Depository Receipts," <[http://www.citibank.com/corpbank/adr/fact\\_fil/inv\\_srvy.htm](http://www.citibank.com/corpbank/adr/fact_fil/inv_srvy.htm)>.

——— (1998), "The Depository Trust Company," in *Depository Receipts: Fact File*, <[http://www.citibank.com/corpbank/adr/fact\\_fil/dtc.htm](http://www.citibank.com/corpbank/adr/fact_fil/dtc.htm)>.

Corrigan, E. Gerald (1990), "Luncheon Address: Perspectives on Payment System Risk Reduction," in *The U.S. Payment System: Efficiency, Risk and the Role of the Federal Reserve*, ed. David Humphrey (Norwell, Mass.: Kluwer Academic Publishers), 129–39.

Coyle, Richard (1995), *The McGraw-Hill Handbook of American Depository Receipts* (New York: McGraw-Hill).

Depository Trust Company (1996), *Annual Report* (New York: Depository Trust Company).

Deutsche Morgan Grenfell (1996), *The Focus on the ADR Product*, <<http://www.adr-dmg.com/welcome.html>>.

Federal Reserve Bank of Kansas City (1997), *Maintaining Financial Stability in a Global Economy* (Kansas City, Mo.: Federal Reserve Bank of Kansas City).

Folkerts-Landau, David, Garry Schinasi, Marcel Cassard, Victor Ng, Carmen Reinhart, and Michael Spencer (1995), "Effect of Capital Flows on the Domestic Financial Sectors in APEC Developing Countries," in *Capital Flows in the APEC Region*, ed. Mohsin Kahn and Carmen Reinhart (Washington, D.C.: International Monetary Fund, March), 31–74.

Folkerts-Landau, David, Donald Mathieson, and Garry Schinasi (1997), *International Capital Markets: Developments, Prospects, and Key Policy Issues* (Washington, D.C.: International Monetary Fund, November).

Grasso, Richard (1996), "Same Day Settlement for Securities Transactions" (Presentation at "Risk Reduction in Payments, Clearance and Settlement Systems Symposium," sponsored by Goldman, Sachs & Company, January).

Group of Thirty (1989), *Clearance and Settlement Systems in the World's Securities Markets* (New York: Group of Thirty).

——— (1992), *Clearance and Settlement Systems Status Reports: Autumn 1992* (New York: Group of Thirty).

——— (1997), *Global Institutions, National Supervision and Systemic Risk* (Washington, D.C.: Group of Thirty).

Hanley, William, Karen McCann, and James Moser (1995), "Public Benefits and Public Concerns: An Economic Analysis of Regulatory Standards for Clearing Facilities," Federal Reserve Bank of Chicago Working Paper no. 95–12 (Chicago, September).

International Organization of Securities Commissions (1992), *Clearing and Settlement in Emerging Markets—A Blueprint* (October).

Levitt, Arthur (1996), "Speeding Up Settlement: The Next Frontier" (Presentation at "Risk Reduction in Payments, Clearance and Settlement Systems Symposium," sponsored by Goldman, Sachs & Company, January).

Lindsey, Richard, and Anthony Pecora (1997), "10 years After: Regulatory Developments in the Securities Markets Since the 1987 Market Break" (unpublished manuscript).

Litan, Robert (1997), "Institutions and Policies for Maintaining Financial Stability," in *Maintaining Financial Stability in a Global Economy* (Kansas City, Mo.: Federal Reserve Bank of Kansas City), 257–97.

Organization for Economic Cooperation and Development (1991), *Systemic Risks in Securities Markets* (Paris: Organization for Economic Cooperation and Development).

Presidential Task Force on Market Mechanisms (1988), *Report of the Presidential Task Force on Market Mechanisms*, submitted to the president of the United States, the secretary of the Treasury, and the chairman of the Federal Reserve Board.

Riley, Jennifer (1998), "ADRs: One Way to Invest in Mexico," *El Financiero International* 7 (January 12-18): 13.

Stehm, Jeff (1996), "Clearance and Settlement Systems for Securities: Critical Design Choices in Emerging Market Economies," World Bank Discussion Paper no. 321 (Washington, D.C., April).

U.S. Securities and Exchange Commission (1988), *The October 1987 Market Break* (Washington, D.C.: U.S. Securities and Exchange Commission).

Weiss, David (1993), *After the Trade Is Made: Processing Securities Transactions* (New York: New York Institute of Finance).