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# FINANCIAL CONSOLIDATION AND MONETARY POLICY

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## I. INTRODUCTION

The 1990s were characterized by substantial financial sector consolidation across a large number of industrialized countries. This consolidation included within-industry and within-country consolidation as well as cross-industry (for example, banking and insurance) and cross-border consolidation. In addition to mergers and acquisitions, there was a substantial increase in joint ventures and strategic partnerships between financial sector firms. The number of these looser affiliations increased especially rapidly in recent years.

In response to this ongoing transformation of the financial landscape, the Group of Ten (G-10) undertook a study of financial sector consolidation.<sup>1</sup> The resulting report, produced by the G-10's Task Force on the Impact of Financial Consolidation on Monetary Policy (Group of Ten 2001) includes an analysis of the patterns and causes of consolidation in different sectors and countries. The report also evaluates the possible effects of consolidation, both in the past and going forward, in a number of important policy areas, including supervision, efficiency and competition, payments systems, and monetary policy.

At the outset, those organizing the study thought that consolidation could have significant implications for the conduct and effectiveness of monetary policy (Ferguson 2001, p. 6). Consolidation could affect monetary policy by

influencing the implementation of policy, the monetary transmission mechanism, or the environment for policy (including, for example, the liquidity and volatility of financial markets or the effects of difficulties at large institutions). However, the report concludes that the effects of consolidation on monetary policymaking have generally been very modest thus far, and that consolidation is unlikely to pose significant problems going forward (Group of Ten 2001, Chapter 4).

The next section provides some background on financial sector—and especially banking industry—consolidation in recent years. Section III summarizes the G-10 report on consolidation and monetary policy, laying out the reasons why one might expect consolidation to have effects on monetary policymaking, the evidence gathered by the task force, and the conclusions reached. Section IV offers some possible implications of the report for U.S. policymakers; Section V concludes.

## II. CONSOLIDATION AND BANKING INDUSTRY CONCENTRATION

The financial sector consolidation of recent years has been driven by a number of factors, including technological advances, deregulation, globalization of financial markets, and increased pressure from shareholders.<sup>2</sup> This consolidation has

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been accomplished through mergers and acquisitions as well as by joint ventures and strategic alliances. Such ventures and alliances are arrangements between firms allowing each to remain autonomous while also engaging in a “new business arrangement to achieve predetermined objectives” (Group of Ten 2001, p. 41). These looser links may be particularly useful when differences in language, regulation, corporate culture, or expectations make a formal merger either too expensive or prohibitively risky. They may also allow firms to move more gradually toward a merger (Group of Ten 2001, p. 32).

As shown in Table 1, the pace of financial sector consolidation picked up considerably over the past decade. The number and dollar volume of financial sector mergers and acquisitions increased rapidly over the 1990s. The bulk of these transactions—84 percent by dollar volume—reflected mergers within a single industry, and an even larger percentage reflected mergers of firms in the same country. The number of joint ventures and strategic alliances, while considerably smaller than the number of mergers and acquisitions, also expanded greatly over the course of the decade, with particularly fast

growth recently. As one might expect, the fraction of joint ventures and strategic alliances accounted for by cross-border deals has been considerably higher than the comparable share of mergers and acquisitions. Such arrangements have been particularly common in Europe and the Pacific Rim (Group of Ten 2001, p. 41).

Mergers and acquisitions among securities and banking firms are likely to have the largest impact on the conduct of monetary policy because the resulting reduction in the number and increase in the size of such firms could have important effects in financial and banking markets. Within the financial sector, the banking industry has accounted for the substantial majority—more than 60 percent by dollar volume—of the merger and acquisition activity, and these transactions have had a notable effect on industry concentration in many countries (Group of Ten 2001, p. 338). Table 2 shows the share of the domestic deposit market accounted for by the top five banks in each of the listed countries in 1990 and in 1998.<sup>3</sup> Most countries saw a considerable rise in industry concentration, as measured by the change in the share of the top five banks, over

TABLE 1  
Financial Sector Consolidation in the 1990s

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Mergers and Acquisitions by Number of Transactions											
Total	324	549	616	682	773	856	842	901	874	887	7,304
Within-border	266	481	556	622	695	740	742	782	741	766	6,391
Cross-border	58	68	60	60	78	116	100	119	133	121	913
Within-industry	252	448	517	578	642	692	677	722	716	684	5,928
Cross-industry	72	101	99	104	131	164	165	179	158	203	1,376
Mergers and Acquisitions by Dollar Volume (Billions of Dollars)											
Total	38.0	38.2	38.4	65.3	53.4	151.6	97.0	293.0	495.1	353.2	1,623.1
Within-border	30.1	37.0	34.9	59.7	47.3	136.6	80.2	260.1	462.1	293.2	1,441.3
Cross-border	7.9	1.2	3.4	5.6	6.1	15.0	16.8	32.9	33.0	59.9	181.8
Within-industry	24.2	33.4	32.6	58.6	48.7	139.4	86.4	247.6	379.2	319.9	1,370.1
Cross-industry	13.8	4.8	5.7	6.7	4.7	12.2	10.6	45.4	115.9	33.2	253.0
Joint Ventures and Strategic Alliances by Number of Transactions											
Total	119	149	123	129	211	326	165	344	718	721	3,005
Within-border	46	59	73	82	133	220	92	223	434	435	1,797
Cross-border	73	90	50	47	78	106	73	121	284	286	1,208

Source: Group of Ten (2001, pp. 335, 403).

Note: Totals may not sum due to rounding.

TABLE 2  
**Banking Sector Concentration**  
 Share of the Top Five Banks in Domestic Deposits

Country	Percent		Change
	1990	1998	
Australia	72.1	73.9	1.8
Belgium	48.0	66.7	18.7
Canada	60.2	77.7	17.5
France	51.9	70.2	18.3
Germany	17.1	18.8	1.7
Italy	25.9 <sup>a</sup>	39.3	13.4 <sup>a</sup>
Japan	31.8	30.9	-0.9
Netherlands	73.7	81.7	8.0
Spain	38.3	47.2 <sup>b</sup>	8.9 <sup>b</sup>
Sweden	62.0	84.0	22.1
Switzerland	53.2	57.8 <sup>b</sup>	4.6 <sup>b</sup>
United Kingdom	43.7	35.2	-8.3
United States	11.3	26.2	14.9

Source: Group of Ten (2001, p. 447).

<sup>a</sup>Share is for 1992, change is for 1992-98.

<sup>b</sup>Share is for 1997, change is for 1990-97.

the decade. Consolidation appears to have been most rapid in Belgium, Canada, France, and Sweden, where the domestic deposit market share rose about 20 percentage points. The United States and Italy also posted substantial gains. By contrast, consolidation in Australia and Germany was very modest, and in Japan and the United Kingdom, concentration actually declined.<sup>4</sup>

### III. SUMMARY OF THE G-10 FINDINGS ON CONSOLIDATION AND MONETARY POLICY<sup>5</sup>

The G-10 task force considered the possible effects consolidation could have for monetary policymakers in three areas: policy implementation, the monetary transmission mechanism, and the policy environment. In evaluating these possible effects, the task force examined the existing literature; conducted a survey of staff at the central banks of the G-10 countries, Australia, and Spain; and interviewed staff at those central banks.

## Possible Effects of Consolidation

In general, the implications of consolidation for monetary policymaking are ambiguous. The effects of consolidation depend on the initial situation in the financial markets, the reasons for the consolidation, the form that the consolidation takes, the speed at which the consolidation occurs, and the institutional and regulatory arrangements in the country where the consolidation happens. Thus, of the issues discussed below, the one that is most pertinent in a particular case will depend on a variety of factors.

### *Possible Effects on the Implementation of Policy*

Consolidation could affect the implementation of policy either by influencing the operation of the market for central bank balances directly or by changing the behavior of the counterparties for central bank monetary policy operations. The market for central bank balances could become less efficient if consolidation reduces the number of firms participating in the market and the level of competition falls as a result (perhaps owing to regulatory or technological barriers to entry). Even if consolidation does not affect the level of competition in the market, it could have an effect on the operation of the market if large firms' behavior—for example, the aggressiveness with which they manage their central bank balances—differs from that of smaller firms. The effects of such differences on the operation of the market are not necessarily clear cut, however. For example, smaller buffers of excess balances might boost volatility, but improved management of reserves positions and better access to credit could reduce volatility. By reducing the value of interbank payments, consolidation might also reduce the liquidity of the market for central bank balances, which could increase market volatility and impair the reallocation of central bank balances across depository institutions. Such effects might make it more difficult for a central bank to achieve its targeted level of the policy rate.

Consolidation could also affect the implementation of monetary policy by reducing the number of counterparties for monetary policy operations. Such a reduction could make these operations less competitive, thereby allowing some counterparties to make profits at the expense of the central bank, other counterparties, and firms not participating in the operations. It could also lead to greater uncertainty about the likely effects of operations on the policy interest rate. The size of these effects in a particular case would presumably depend

on the regulatory environment, the structure of the central bank's monetary policy operations, and other features of the market for central bank deposits.

### *Possible Effects on the Transmission Mechanism*

In addition to its possible effects on the implementation of policy, consolidation could affect the monetary transmission mechanism linking movements in the central bank's policy rate to the real economy. The nature of these effects would depend on the characteristics of the transmission mechanism.

In the simplest case, the transmission mechanism might be well represented by the conventional interest rate or "money" channel of monetary policy transmission. In that case, financial sector consolidation could affect the impact of changes in monetary policy by influencing the pass-through of changes in the central bank's policy rate to other market rates. For example, the arbitrage that transmits changes in the central bank's policy rate to other market rates and to asset prices more broadly could be weakened if consolidation reduced the liquidity or increased the volatility of the market for central bank deposits. The resulting changes in the pass-through of the policy rate to asset prices could involve either the speed or degree of pass-through. Alternatively, the speed of pass-through might be increased by consolidation, because larger institutions operating in many asset markets could make arbitrage between markets more efficient than it would be with smaller and more fragmented firms.

Other effects are possible if the transmission mechanism includes an active "credit channel" owing to capital market imperfections. There are at least two types of models with such credit channels: those focusing on the informational role that banks may play in financial markets and those focusing on the role that collateral can play in reducing information problems. Models with a "bank-lending" channel assume that some borrowers require specialized lending services, such as screening or monitoring, that only banks are able to provide, and so bonds are not a perfect substitute for bank loans. Moreover, banks are assumed to find it difficult—perhaps because of regulations, capital market imperfections, or investor concerns about the banks' financial health—to offset declines in transaction deposits with increases in other liabilities without paying a substantially higher price. Under these assumptions, the interest rate on bank loans would generally not be equal to the rate on bonds, and monetary policy could have effects on spending through its effects on the rate charged on bank loans as well as through market rates.<sup>6</sup>

Large banks likely have better access to markets for managed liabilities than do smaller banks because of reduced information costs and the smaller relative importance of fixed costs. As a result, an increase in the share of the banking industry accounted for by large banks owing to consolidation could dampen the impact of tighter monetary policy on the supply of bank loans, thereby reducing the size of its effect on the real economy. Similarly, if consolidation leads to stronger banks taking over weaker ones, then a larger share of the industry could be accounted for by banks with access to markets for managed liabilities, again dampening the effects of tighter policy on output through this channel.

A second strain of the credit channel literature has focused on the possible effects of changes in monetary policy on a borrower's financial condition and creditworthiness. In this "balance-sheet channel" of monetary policy, collateral plays a crucial role in the lending process.<sup>7</sup> In the conventional interest rate view of the transmission mechanism, collateral is not an issue because debt contracts are implicitly assumed to be costlessly enforceable. However, if enforcement is costly, then lenders may demand collateral for some loans, and, as a result, some borrowers may be constrained by the value of the collateral that they can provide. In this case, if tighter policy reduces the value of collateral, then borrowers that have to provide collateral will not be able to borrow as much and are likely to cut back on spending.

The effect of consolidation on the balance-sheet channel is not clear. On the one hand, consolidation could result in financial institutions that are better able to afford increased investment in technologies used to assess borrower risk. In that case, fewer borrowers might be required to provide collateral, thereby weakening the balance-sheet channel. On the other hand, the purchase of a small, local institution by a larger, nonlocal one could lead to the loss of some institutional knowledge about the creditworthiness of local borrowers. In that case, consolidation might imply an increase in the use of collateral, thereby strengthening the balance-sheet channel.

### *Possible Effects on the Policy Environment*

In addition to its effects on policy implementation and transmission, consolidation might change the economic and financial environment in which monetary policy decisions are made. Consolidation could enhance the financial linkages across both markets and countries, thereby increasing the size and speed by which shocks are transmitted. For example, if consolidation yields larger financial firms with operations in a wider variety of financial markets, then a decline in asset prices

in one market might, by reducing the capital of such firms, cause them to reduce their activity in other markets. The resulting decline in liquidity could cause prices to decline in those markets, whereas they would not have been much affected before consolidation took place. Similarly, cross-border mergers may allow shocks to foreign economies to have larger effects on domestic financial markets than would have been the case before such mergers occurred. However, because the larger firms would presumably be better diversified, they might also be better able to absorb shocks. In that case, the effects in the market where the shock originated might be reduced, and the effects in other markets could be fairly small except in the event of a very large shock.

Consolidation could also affect the liquidity and volatility of financial markets. Some theoretical models suggest that a decrease in the number of market makers could trim bid-ask spreads, for example, by reducing the impact of informed traders on the profits of market makers (see Dennert [1993]). However, empirical work indicates that a reduction in the number of market makers appears to lead to a widening of spreads, likely reflecting changes in the degree of competition (see, for example, Wahal [1997]).<sup>8</sup> Such effects would be compounded if differences in the outlook among the remaining firms decline at times because their models and trading strategies converge.<sup>9</sup> However, consolidation could increase market depth because the resulting larger firms might be more willing and able to take larger positions when market making. Moreover, if consolidation led to a more rapid adjustment of asset prices to changes in fundamentals—perhaps because larger firms were better able to afford the analysis of asset values—its effects could be beneficial even if it resulted in increased volatility.

Consolidation could cause problems for monetary policymakers by altering the behavior of indicator variables, such as interest rate spreads and monetary and credit aggregates, making it more difficult for central bankers to evaluate the appropriate stance of monetary policy at least for a time. Clearly, if consolidation has a significant effect on the transmission of shocks to financial markets, then it could affect the size or timing of moves in interest rate spreads or other market-based indicators. Similarly, if consolidation affects financial market volatility or liquidity, such measures could also become more volatile or less accurate. Alternatively, to the extent that the large banks resulting from consolidation have different funding or investment patterns than their smaller predecessors, consolidation could affect the behavior of monetary or credit aggregates. For example, because larger banks have better access to markets for managed liabilities, consolidation might cause a reduction in narrow monetary aggregates that do not include such liabilities.

Finally, the G-10 report notes that consolidation could foster the development of larger and more complex financial firms. The failure of such firms could be more difficult for the authorities to manage in an orderly fashion.<sup>10</sup> Difficulties at such firms could also present central banks with challenges in terms of both liquidity provision and the possible need to ease the stance of monetary policy in response to their potential effects on the real economy.

## Evidence from the G-10 Study

To evaluate these possible effects of financial sector consolidation on monetary policymaking, the G-10 task force examined the pertinent existing literature, and gathered data from the central banks in the study nations through a survey and interviews.

### *Evidence on Policy Implementation*

To learn about the effects of consolidation on the implementation of monetary policy, the task force conducted a survey of central bankers involved in these operations. The survey asked about the actual and expected future effects of consolidation on the market for central bank balances, on the markets in which the central banks conduct monetary policy operations, and on other monetary policy issues. A majority of the central banks indicated that the number of firms participating actively in the market for central bank balances had declined over the past ten years as a result of financial sector consolidation, with some reporting a substantial decline. A similar share of the central banks expected consolidation to reduce the number of active participants further over the next ten years. Nonetheless, the number of active participants was generally thought to be well above the level deemed necessary for the market to operate efficiently. Even allowing for the expected decline in market participation over the next decade, the number of participants was still expected to be sufficient. In addition, the central bankers generally indicated that the behavior of firms in the market for central bank balances had not changed significantly as a result of consolidation.

The survey produced similar results regarding the effects of consolidation on the conduct of monetary policy operations. Nearly half of the central banks noted that consolidation had reduced the number of firms serving as counterparties for such operations over the past ten years. However, a number of the respondents suggested that other factors might have contributed to the declines. A majority indicated that they

expected a further decline in the number of counterparties over the next ten years. However, as in the case of the market for central bank reserves, the number of counterparties was generally viewed as sufficient to ensure the efficient conduct of operations.

Not surprisingly, given their view that consolidation had not significantly affected the implementation of policy, few of the central banks had taken any actions or made any changes in operating procedures in response. Although a number of them reported changes in operating procedures in advance of Stage III of Economic and Monetary Union, these changes were not made in response to consolidation. Some suggested that, if the number of participants in monetary policy operations fell to an unacceptable level, the central banks would take action to ensure that operations remained efficient. Indeed, the Swiss National Bank noted that changes had been made to operating procedures, partly in response to consolidation. The changes included the introduction of repo operations, which make it easier for smaller institutions to participate. It also noted changes in eligibility criteria, which allow foreign institutions to participate in operations.

The continued contestability of key markets and the introduction of the euro are two common reasons given to explain why consolidation had not been an important factor in the implementation of monetary policy in many of these countries. Some of the central banks emphasized that it was not just the number of participants in key markets that mattered, but also their behavior in those markets. Although this behavior could presumably depend on a variety of factors, it was pointed out that low barriers to entry could, by ensuring that markets were contestable, constrain the ability of large firms to exploit market power. Moreover, in the euro area, several central banks noted that the advent of the new currency had more than offset the effects of consolidation. They argued that money markets in the euro-area countries had become integrated, so the number of participants in the market for central bank deposits should now be seen as the euro-area total, rather than the number domiciled in individual countries. Similarly, the appropriate number of counterparties to consider was the number for all of the euro-area central banks.

### *Evidence on the Monetary Transmission Mechanism*

The G-10 report finds little evidence that consolidation affects the money channel of monetary policy transmission. Empirical studies of the effects of concentration on the pass-through of

changes in policy rates to other interest rates are inconclusive. A few central banks indicated that consolidation could increase the size and speed of pass-through, but such effects were generally thought to be small.

Although the academic literature on the importance of the credit channels of monetary policy is fairly ambiguous, there is some work suggesting that differences in financial structure across countries can affect the impact of changes in monetary policy on the real economy. For example, Cecchetti (2001) considers the relationship between the sizes of countries' monetary policy multipliers and an index of indicators of financial structure that one would expect to be related to the strength of the bank-lending channel. The variables he includes in his index are measures of the importance of bank financing for firms, banking industry health, and banking sector concentration. These last two categories could be affected by consolidation. As one might expect if variation in the bank-lending channel were important, his results suggest that the effects of monetary policy on output are larger in countries with less healthy and more fragmented banking systems and in which firms are relatively dependent on banks for financing. Taking another approach, de Bondt (2000) estimates models of bank lending in several European countries, finding evidence of a bank-lending channel in some of them. He then tries to capture possible macroeconomic effects of the bank-lending and credit channels of policy by adding variables related to such channels to vector error-correction models of the European economies. His results suggest that the bank-lending and balance-sheet channels are operative in some cases, providing the possible scope for consolidation to influence the transmission mechanism in those countries.

The G-10 task force conducted interviews with central bank staff involved in the monetary policy process to find out if consolidation had affected the monetary transmission mechanism. These interviews also focused on the effects of consolidation on the operation of financial markets and on the interpretation of information variables. Some of the central banks indicated that consolidation was too recent a phenomenon for its effects to be clearly evident. Nonetheless, those interviewed generally reported that consolidation had little effect on the monetary transmission mechanism. Where changes in the transmission mechanism had occurred, they were thought to be fairly minor, and the role that consolidation had played was difficult to assess because it had been accompanied by changes in regulations and technologies, increased competition, and globalization.

When asked about the different channels of transmission, most central bankers were unsure of the importance of the credit channels of policy in their economies. However, even

assuming that they were active, there was little evidence that these channels had been affected by consolidation. For example, most central banks had not seen a change in the distributional impact of monetary policy changes, which one might expect if consolidation were influencing the credit channels of monetary policy.

Although most central banks said that consolidation had not significantly affected the monetary transmission mechanism in the past, they were less sure of its effect going forward, especially if the pace of consolidation accelerated for a time. However, there was considerable uncertainty about what that effect likely would be.

### *Evidence on the Policy Environment*

The central bank staff members interviewed generally did not consider the effects of consolidation on the operation of financial markets to be significant. As in the case of the implementation of policy, the effects of consolidation in the euro area had likely been offset by the introduction of the euro and the subsequent integration of financial markets. Moreover, the central banks pointed out that if consolidation did lead to higher volatility and lower liquidity than is compatible with competitive markets, then, so long as barriers to entry remained low, one would expect new entrants to offset the effects of consolidation over time. Nonetheless, staff at the Bank of Japan did express some concern that the substantial consolidation among large firms that is expected in that country might have an effect on market operations there.

Consolidation also does not appear to have had an important effect on the information content of indicator variables. Because the impact of consolidation on the operation of financial markets was generally viewed as minimal, the effects of consolidation on indicator variables based on asset prices or market interest rates have presumably been unimportant. Although some of the central banks indicated that developments in the financial sector had reduced the predictability of the monetary aggregates, they generally did not attribute the difficulties to consolidation. The central banks that did report an effect of consolidation did not view it as having been very significant. Nonetheless, a few of the central banks thought that consolidation could have more substantial effects on monetary aggregates in the future, especially if the pace of consolidation picked up.

Finally, it was noted that financial difficulties at one of the larger and more complicated financial institutions resulting from consolidation could pose challenges to central banks in

terms of both their lender-of-last-resort and monetary policy roles. On the lender-of-last-resort side, the central bank would have to decide upon the appropriate magnitude and duration of lending to the institution while taking into account the possible moral-hazard effects of such lending. Indeed, some of those interviewed emphasized that investors should bear in mind that even very large institutions would not necessarily receive emergency liquidity assistance in all cases. On the monetary policy side, the respondents noted that policy would remain focused on the central bank's goals for output and inflation and not be unduly influenced by the possible effects of policy on the financial position of the troubled firm. It was also pointed out that if policy were eased in such a situation to address the effects of financial market stresses on the real economy, policymakers would need to be ready to tighten policy again as conditions in financial markets improved.

### Conclusions of the Task Force

The G-10 report concludes that consolidation has generally not had important effects on monetary policymaking and that its effects going forward are likely to remain modest. Nonetheless, three possible lessons for policymakers are noted. First, sufficient consolidation could limit competition in key financial markets and might hamper central banks' implementation of policy. Thus, central bankers should be ready to make necessary changes in regulations and procedures to address the effects of consolidation.

Second, although central bankers generally did not think that consolidation had affected the monetary transmission mechanism, it should be noted that the difficulties associated with making such an assessment make it hard to rule out such an effect. Although regular assessments of the data may allow central banks to take any changes that do occur into account when setting policy, they should be ready to respond if evidence emerges of a change in the monetary transmission mechanism owing to consolidation.

Third, although consolidation is not likely to greatly affect the operation of financial markets or the interpretation of information variables, it has fostered the creation of very large and complex financial firms, the failure of which could be difficult to manage. Financial difficulties at such a firm would require careful decisions by central banks on the appropriate level of lending and the possible need to ease monetary policy to cushion the macroeconomy from the financial market strains caused by the firm's problems.

## IV. IMPLICATIONS FOR U.S. POLICYMAKERS

Given the large number of financial firms in the United States relative to many of the other countries studied, consolidation here seems less likely to have substantial effects on either the implementation or the transmission of monetary policy. However, consolidation could still influence the economic and financial environment in ways that policymakers would need to take into account.

### Effects on the Implementation of Policy and the Transmission Mechanism

Despite the cautions offered by the G-10 report, U.S. officials are unlikely to have difficulties implementing policy because of consolidation any time soon. The United States still has a huge number of banks and a relatively low level of industry concentration (Table 2). Moreover, participation in the market for central bank balances and monetary policy operations appears to be ample to support their efficient operation. Indeed, the evidence compiled by the G-10 task force suggests that central banks can successfully implement policy even with a very concentrated financial sector (Group of Ten 2001, p. 226).

It also seems unlikely that consolidation will have a significant effect on the monetary transmission mechanism in the United States. U.S. financial markets are already very sophisticated, and it does not seem likely that consolidation will have a significant impact on the speed at which changes in monetary policy are transmitted to asset prices. Evidence regarding the importance of the bank-lending channel in the United States is inconclusive.<sup>11</sup> In any case, the channel is likely to be relatively less important in the United States than in most other industrial countries: although the United States continues to have a very large number of small banks, U.S. banks are very healthy and U.S. financial markets are well developed (Cecchetti 2001). Moreover, the government-sponsored mortgage agencies—Fannie Mae and Freddie Mac—give even smaller banks the ability to securitize mortgages, and the Federal Home Loan Bank System provides such banks with access to funds outside their deposit bases.<sup>12</sup> Thus, the effects of consolidation—if any—on that channel should be fairly small. Similarly, the effects on the balance-sheet channel are likely to be modest. As noted earlier, the effect of consolidation on the importance of collateral for lending is not clear a priori. In addition, banks do not have to be

particularly large to take advantage of advances in the evaluation of borrower risk because credit scores are available from private vendors.

### Effects on the Policy Environment

Two features of financial sector consolidation in the United States may have important implications for the policy environment. First, spurred by regulatory changes, including the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, consolidation has resulted in greater geographical diversification of banking institutions. Second, mergers among the largest banking firms have resulted in the development of very large and complex institutions. Difficulties at such firms may have large effects in financial markets and on the real economy.

Increased geographical diversification of banking firms should help to limit the effects of regional economic shocks. In Texas in the mid-1980s and in New England in the early 1990s, substantial shocks to the local economy had adverse effects on many banks in the affected regions. The deterioration in the banks' balance sheets may have compounded the effects of the shocks, as banks reduced their lending activities in response to capital pressures.<sup>13</sup> However, interstate consolidation should reduce this sort of "financial accelerator" because banks operating in a region hit by an adverse shock will be better diversified, owing to their operations in other regions.

As noted in the G-10 report, financial difficulties at a large and complex financial firm could pose challenges for central banks in both their monetary policy and lender-of-last-resort roles (Group of Ten 2001, pp. 241-2). It is not clear whether consolidation has increased the riskiness of individual financial firms. However, consolidation may have increased the risks that a large and complex banking organization's failure in the United States would be more difficult to resolve in an orderly manner than was the case in the past (Group of Ten 2001, p. 133). As a result, the stresses in financial markets caused by difficulties at such an organization—and their possible macroeconomic effects—may be more likely to require a monetary policy response. However, it is likely to be very difficult to judge the effects of such difficulties in advance because they would presumably depend in large part on the source of the firm's problems, details of its positions, and investors' assessments of the possible effects on other large financial firms. In practice, monetary policymakers will likely have to judge the appropriate stance of monetary policy by monitoring the stresses in financial markets and then

evaluating the likely effects of changes in policy on the markets and on the real economy.

The increased difficulty in achieving an orderly wind-down of the largest firms reflects a number of factors. The first factor is simply a lack of experience with the failure of very large firms. The largest bank ever resolved by the Federal Deposit Insurance Corporation (FDIC) was First Republic Bank Corp. in 1988, which had assets of \$33 billion (or \$49 billion in 2000 dollars).<sup>14</sup> By comparison, at the end of last year, there were ten U.S. bank holding companies with more than \$100 billion in assets, and twenty-one with assets of more than \$50 billion.<sup>15</sup> Moreover, the largest U.S. bank holding companies also have very large off-balance-sheet derivatives positions, and these positions have expanded very rapidly over the past decade (Office of the Comptroller of the Currency 2001, Table 4).

A second factor that may contribute to the increased difficulty of achieving an orderly resolution of the largest banking firms is the increased complexity of such institutions. These firms commonly have various lines of business conducted in a number of different legal entities, and their data systems are primarily for the management of business lines rather than legal entities (Group of Ten 2001, pp. 133-4).<sup>16</sup> As a result, there may be complex intergroup transactions that would be difficult to unwind in the event of troubles at one of the legal entities. Moreover, different legal entities within the bank holding company can have different supervisors (including state insurance departments, the Securities and Exchange Commission, and one or more of the federal banking agencies), which would have to be coordinated in the event of difficulties at the firm. Indeed, the different supervisors might have different priorities in some cases (Group of Ten 2001, p. 135).

Cross-border consolidation could compound the problems caused by difficulties at a major banking firm (Group of Ten 2001, p. 242). For example, in the event the firm was operating internationally, it might not be clear which central bank should provide emergency liquidity assistance. Other complications may arise with regard to the closure of such an internationally active, large, and complex financial institution, owing to different approaches to bankruptcy across countries and possible efforts by some national authorities to liquidate as separate entities those portions of the institution within their jurisdiction. These issues are especially pointed because several of the largest U.S. banks have substantial activities abroad, and a number of large foreign banking firms have substantial operations in the United States.<sup>17</sup> For example, about a third of the banking organizations in the Federal Reserve System's supervisory program for large, complex banking organizations are foreign-based (DeFerrari and Palmer 2001, p. 55).

Finally, legal changes following the thrift and banking troubles of the late 1980s and the early 1990s may also increase the complexity of some large bank resolutions. The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) established guidelines for Federal Reserve discount-window lending to troubled institutions (12 U.S.C. §347b(b)). Lending in excess of the guidelines can make the Federal Reserve liable for a portion of any resulting increase in FDIC resolution costs. Although the financial penalties are not likely to be large, the guidelines would presumably subject such lending to additional scrutiny.<sup>18</sup> FDICIA also generally requires the FDIC to resolve failing institutions at "least cost" to the deposit insurance funds (12 U.S.C. § 1823(c)(4)). Since some large and complex banks have relatively low volumes of domestic deposits, liquidation might be accomplished at no cost to the insurance funds. Although that does not mean that liquidation would be required in such cases, it could make the choice of resolution method more complicated (Group of Ten 2001, p. 134). The act provides for a "systemic risk exception" to least-cost resolution, but the process is fairly elaborate.<sup>19</sup> This exception has never been invoked, and so it is difficult to know under what circumstances it might be applied, and what alternative resolution method would be employed as a result. Even if the systemic risk exception were invoked, all creditors of the failing institution need not be repaid in full: the FDIC presumably would use the increased flexibility to address the systemic risks while undermining market discipline as little as possible (Federal Deposit Insurance Corporation 2000, p. 36).

## V. CONCLUDING REMARKS

A final issue raised by the report—and not just for U.S. policymakers—is the apparent disagreement between the results of the G-10 task force interviews and the Committee on the Global Financial System (CGFS) report on the operation of financial markets in the fall of 1998 regarding the effects of consolidation on the operation of financial markets. The central bankers interviewed were virtually unanimous in reporting that consolidation had not influenced the volatility and liquidity of financial markets. By contrast, the CGFS report suggested that consolidation had affected the operation of financial markets, concluding that it was one of the "market mechanisms" that had contributed to the difficulties in financial markets at that time. The CGFS report states that "increasing concentration of activity among a few large global institutions that were active in many markets made the propagation of shocks across markets more immediate and

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dramatic. Because of the broad scope of their business dealings, decisions by some of these firms to reduce their exposure to risk . . . influenced the prices of many financial instruments” (1999, p. 14).

One way to square these results is if the adverse effects of consolidation on the functioning of markets are only observable during periods of market turbulence, and the central bankers’ responses referred to more ordinary situations. It seems plausible that if, as a result of consolidation, there were only a few large firms trading actively in a particular market, the market might continue to operate well in normal times. However, the effects of a substantial shock in a particular financial market could be larger and more widespread as a result of consolidation because most large financial firms would be active in that market and they would be adversely

affected by the shock and also because competitive pressures to act as a shock absorber for borrowers and traders during turbulent periods might be reduced (Group of Ten 2001, pp. 240-1). Another possibility is that in a more concentrated market, if a shock forced one firm to pull back sharply on its activities, then the resulting decline in market liquidity for the other firms would be relatively large. Therefore, the other firms might reduce their activities considerably, potentially leading to a substantial self-reinforcing decline in market liquidity, at least for a time.<sup>20</sup> Thus, when considering the possible effects of difficulties at a large, complex financial firm, central banks might be well advised to take into account the possibility of a larger-than-expected deterioration in financial market performance.

## ENDNOTES

1. The study's working party was chaired by Roger W. Ferguson, Jr., Vice Chairman of the Board of Governors of the Federal Reserve System. The working party included finance and central bank staff from the G-10 countries, Australia, and Spain, as well as representatives from the Bank for International Settlements, the European Central Bank, the European Commission, the International Monetary Fund, and the Organisation for Economic Co-operation and Development (OECD).
2. Further discussion of the causes of consolidation can be found in Group of Ten (2001, pp. 65-124).
3. The G-10 report also provides concentration data for insurance firms. Increased concentration in the insurance industry, while significant in a few cases, does not appear to have been as widespread as in the banking industry (pp. 449-50). National concentration data for securities firms over the 1990s are not available, but concentration in worldwide debt and equity underwriting does not appear to have increased over the decade (p. 56). Nonetheless, some securities activities were quite concentrated at the end of the decade (p. 57).
4. However, concentration in Japan has increased considerably since, owing to mergers among large institutions (Group of Ten 2001, p. 58).
5. The material in this section is summarized from Group of Ten (2001, pp. 223-46). The chair of the Task Force on the Impact of Financial Consolidation on Monetary Policy was Alex Bowen of the Bank of England. The task force included staff members from the Bank of Canada, the Board of Governors of the Federal Reserve System, the Bank of Japan, the National Bank of Belgium, and the Bank of France, plus representatives from the OECD. Since the report includes a substantial amount of information, this summary necessarily reflects my views on which parts to emphasize. The interested reader should consult the report for additional information and a more nuanced view of some of the topics summarized.
6. A useful presentation is in Bernanke and Blinder (1988).
7. For example, see Bernanke and Gertler (1998).
8. Of course, even with a large number of market makers, collusion on bid-ask spreads may be possible. See Christie and Schultz (1994) and Christie et al. (1994) for analyses of Nasdaq spreads.
9. This possibility is discussed in Committee on the Global Financial System (1999, p. 15).
10. The supervisory issues raised by such firms are discussed in Group of Ten (2001, pp. 125-222).
11. See, for example, Kashyap et al. (1993), Kashyap and Stein (2000), and Miron et al. (1994).
12. Indeed, the increased securitization of mortgages may have reduced the bank-lending channel of monetary policy considerably. Estrella (forthcoming) suggests that increases in securitization have been associated with a substantial decline in the sensitivity of U.S. output to changes in monetary policy.
13. For a summary of the evidence on the link between bank capital and lending, see Sharpe (1995).
14. Between April 1988 and July 1989, the FDIC resolved four large Texas banking organizations with combined assets of more than \$65 billion, or about \$100 billion in today's dollars (Federal Deposit Insurance Corporation 1998, p. 33). Even taken together, however, these failures do not compare with the largest U.S. banking organizations today. At the time of its failure, the Bank of New England Corp. was somewhat smaller than First Republic Bank Corp. was at the time of its failure. However, the operations of the Bank of New England Corp. may have been more complex (Group of Ten 2001, p. 133).
15. Of course, the assets of the largest bank holding companies exceed those of the largest banks. Nonetheless, at the end of 2000, there were eight banks with assets of more than \$100 billion and eighteen with assets of more than \$50 billion.
16. The development of very large and complicated banking organizations in the United States has led the Federal Reserve to develop and implement a program for the supervision of "large, complex banking organizations," or LCBOs. In recent years, there have been twenty-five to thirty such organizations. For a description of these efforts, see DeFerrari and Palmer (2001).
17. See Houpt (1999) for a discussion of the foreign operations of U.S. banking firms as well as the U.S. operations of foreign banking firms.

## ENDNOTES (CONTINUED)

18. Under the guidelines, the Federal Reserve can be liable for a portion of any resulting increase in FDIC resolution costs if the Federal Reserve lends for more than 60 days in any 120-day period to a depository institution that is undercapitalized (as defined in FDICIA) or has a “CAMELS” rating of 5. The same potential liability applies if the Federal Reserve lends to a critically undercapitalized institution for more than five days after it becomes critically undercapitalized. The sixty-day limit can be waived for sixty days if the appropriate regulator or the chairman of the Federal Reserve Board provides written certification that the borrower is viable, as defined in FDICIA, or if the Board chooses to treat the institution as critically undercapitalized. The liability of the Federal Reserve Board is limited to the lesser of: the increase in FDIC resolution costs, the loss that the Federal Reserve would have sustained on increases in lending after the periods noted in FDICIA had such lending been unsecured, or the interest on the increased lending.

19. Under the statute, the FDIC can employ a non-least-cost resolution method only if the U.S. Secretary of the Treasury (in consultation with the President) makes an explicit determination to that effect. To do so, the secretary must find that least-cost resolution would have “serious adverse effects on economic conditions or financial stability,” and that a more costly resolution method “would avoid or mitigate such adverse effects.” In addition, both the Federal Reserve Board and the FDIC Board must recommend, by two-thirds votes, that the systemic risk exception be invoked.

20. This sort of feedback of one firm’s activity on the desired level of activity of another firm is explored in Reinhart and Sack (2000, pp. 201-3).

## REFERENCES

- Bernanke, Ben, and Alan Blinder.* 1988. "Credit, Money, and Aggregate Demand." *AMERICAN ECONOMIC REVIEW*, May. Papers and Proceedings of the 100th Annual Meeting of the American Economic Association.
- Bernanke, Ben, and Mark Gertler.* 1998. "The Financial Accelerator in a Quantitative Business Cycle Framework." NBER Working Paper no. 6455, March.
- Cecchetti, Stephen G.* 2001. "Legal Structure, Financial Structure, and the Monetary Transmission Mechanism." In *Deutsche Bundesbank, ed., THE MONETARY TRANSMISSION PROCESS: RECENT DEVELOPMENTS AND LESSONS FOR EUROPE*. New York: Palgrave.
- Christie, William G., Jeffrey H. Harris, and Paul H. Schultz.* 1994. "Why Did Nasdaq Market Makers Avoid Odd-Eighth Quotes?" *JOURNAL OF FINANCE* 49 (December): 1841-60.
- Christie, William G., and Paul H. Schultz.* 1994. "Why Do Nasdaq Market Makers Avoid Odd-Eighth Quotes?" *JOURNAL OF FINANCE* 49 (December): 1813-40.
- Committee on the Global Financial System.* 1999. *A REVIEW OF FINANCIAL MARKET EVENTS IN AUTUMN 1998*. Basle: Bank for International Settlements.
- de Bondt, Gabe J.* 2000. *FINANCIAL STRUCTURE AND MONETARY TRANSMISSION IN EUROPE: A CROSS-COUNTRY STUDY*. Northampton, Mass.: Elgar.
- DeFerrari, Lisa M., and David E. Palmer.* 2001. "Supervision of Large Complex Banking Organizations." *FEDERAL RESERVE BULLETIN* 87 (February): 47-57.
- Dennert, Jurgen.* 1993. "Price Competition between Market Makers." *REVIEW OF ECONOMIC STUDIES* 60 (July): 735-51.
- Estrella, Arturo.* Forthcoming. "Securitization and the Efficacy of Monetary Policy." Federal Reserve Bank of New York *ECONOMIC POLICY REVIEW*.
- Federal Deposit Insurance Corporation.* 1998. "Failed Bank Cost Analysis." December.
- . 2000. "Deposit Insurance Options Paper." August.
- Ferguson, Roger W., Jr.* 2001. "Remarks." Delivered at the International Banking and Financial Systems Conference, Bank of Italy, Rome, Italy, March 9.
- Greenspan, Alan.* 2001. "Testimony before the Committee on Banking, Housing, and Urban Affairs, United States Senate." February 13.
- Group of Ten. Task Force on the Impact of Financial Consolidation on Monetary Policy.* 2001. "Report on Consolidation in the Financial Sector." Basle: Bank for International Settlements.
- Haupt, James V.* 1999. "International Activities of U.S. Banks and in U.S. Banking Markets." *FEDERAL RESERVE BULLETIN*, September.
- Kashyap, Anil K., and Jeremy C. Stein.* 2000. "What Do a Million Observations on Banks Have to Say about the Transmission of Monetary Policy?" *AMERICAN ECONOMIC REVIEW* 90, no. 3: 407-28.
- Kashyap, Anil K., Jeremy C. Stein, and David W. Wilcox.* 1993. "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance." *AMERICAN ECONOMIC REVIEW* 83, no. 1: 78-98.
- Miron, Jeffrey, Christina Romer, and David Weil.* 1994. "Historical Perspectives on the Monetary Transmission Mechanism." In N. Gregory Mankiw, ed., *MONETARY POLICY*. Chicago: University of Chicago Press.
- Office of the Comptroller of the Currency.* 2001. "OCC Bank Derivatives Report, Fourth Quarter 2000."
- Reinhart, Vincent, and Brian Sack.* 2000. "The Economic Consequences of Disappearing Government Debt." *BROOKINGS PAPERS ON ECONOMIC ACTIVITY*, no. 2.

## REFERENCES (CONTINUED)

*Sharpe, Steven A.* 1995. "Bank Capital Regulation, and the Credit Crunch: A Critical Review of the Research Findings." Board of Governors of the Federal Reserve System Finance and Economics Discussion Series, no. 95-20, May.

*Wahal, Sunil.* 1997. "Entry, Exit, Market Makers, and the Bid-Ask Spread." *REVIEW OF FINANCIAL STUDIES* 10 (fall): 871-901.

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