

## Chapter IV

### The impact of financial sector consolidation on monetary policy

#### 1. Introduction

This chapter examines whether financial sector consolidation has affected the environment in which monetary policy decisions are made, how they are put into practice or how they are transmitted to the rest of the economy, and whether it may do so in the future. Central banks implement policy by influencing the market for central bank balances in order to maintain a specific short-term interest rate near a target level. The reactions of financial firms and participants in asset markets to changes in current and expected future short-term interest rates then lead to changes in longer-term interest rates and asset prices more generally, which in turn affect spending by firms and households and hence output and prices. The behaviour of financial firms and markets is therefore a key influence on both the implementation and transmission of monetary policy. Consolidation within the financial sector may alter this behaviour, with potentially important implications for how central banks implement their policy decisions and the impact of those decisions. Moreover, if consolidation affects how financial firms and markets react to other shocks, that too may need to be taken into account in monetary policymaking. Any consequences are likely to depend on the form of consolidation – eg within industry, across industries, or across borders – the reasons behind it – eg technological change, economies of scale, or the search for market power – and the initial level of concentration in the financial sector.

The following sections consider the economic arguments for thinking that consolidation may matter, review some of the – admittedly limited – evidence available from relevant empirical studies and report the assessments by central banks surveyed. Section 2 focuses on the implementation of monetary policy and how consolidation might affect the market for central bank balances and the markets in which monetary policy operations are conducted. Section 3 turns to the possible impact of consolidation on the transmission of monetary policy to the rest of the economy through various channels. Is it likely that consolidation amplifies or damps the impact of a given change in the proximate instrument of monetary policy? Might it speed up the transmission of a policy change or slow it down? Might it change the relative importance of different channels? Section 4 considers briefly some further possible consequences of consolidation for monetary policy, such as changes in the way financial shocks are transmitted across markets and borders, changes in the liquidity and volatility of financial markets, and changes in the information content of variables monitored by central banks. Section 5 draws attention to some important caveats that need to be remembered, pointing out the need for further research. Section 6 offers some tentative conclusions.

#### 2. The impact of consolidation on the implementation of monetary policy

Whether consolidation within the financial sector affects the implementation of monetary policy depends on whether it affects the market for central bank balances, or the market or markets used by the central bank to adjust the supply of such balances. Hence any impact on the volatility and price elasticity of financial firms' demands for central bank balances, or on the degree of competition in the relevant markets, could be relevant to monetary policymakers.

All the central banks of the G10 economies currently implement monetary policy by manipulating conditions in the market for central bank balances in order to bring a particular short-term interest rate in line with their target.<sup>151</sup> Central bank regulations with regard to clearing, overdrafts, payment of interest on balances and required minimum levels of balances all influence deposit-taking institutions' demand for central bank balances. At the same time, central banks are monopoly suppliers of such balances and adjust that supply through transactions with financial firms to set the policy interest rate at the desired level. These monetary policy operations include outright purchases of government securities, term and overnight repurchase agreements, and currency swaps.

In addition to their market operations, many central banks use other mechanisms to limit volatility in the market for central bank balances. These include standing facilities that help to keep the overnight interest rate in a desired range. The top of the range is set by the rate on a lending facility to which institutions may turn to obtain central bank balances, and the bottom by the rate on a deposit facility that provides an outlet for excess balances. Minimum reserve requirements can also serve to damp volatility in the market for central bank balances by increasing the willingness of some institutions to adjust their demands within a maintenance period in response to movements in the overnight interest rate. Also, the move towards clear announcements by central banks of a target value for their policy interest rate has probably helped to focus market expectations on the target rate, and thereby increased the influence of intertemporal arbitrage by financial firms in keeping the actual rate near the target.<sup>152</sup>

### **Potential effects of consolidation**

Consolidation could affect the key financial markets for the implementation of monetary policy – the market for central bank balances and those in which policy operations are conducted – through two possible routes. First, consolidation could affect the degree of competition. For example, a reduction in the number of active participants in the interbank market for central bank balances could reduce competition if there are barriers to entry. Barriers to entry could arise due to features of the regulatory environment or other institutional arrangements, or because of the search costs or other informational disadvantages facing potential new entrants. In that event, there would be a danger that some market participants might try to exploit their market power or greater knowledge of liquidity conditions, leading to higher costs of liquidity for other market participants. Such an outcome might impede the arbitraging of rates in the market for central bank deposits into other markets. Moreover, if the ability of market participants to act in this way depended in part on market conditions, the result could be unexpected volatility in very short-term market rates and a more variable cost of liquidity for other market participants. Similarly, a reduction in the number of counterparties for central bank monetary policy operations, if it were sufficient to generate some market power for the remaining firms, might allow some counterparties to obtain funds at rates below those that would prevail if they were all price-takers. The implementation of monetary policy would be made more difficult if the cost of liquidity to non-counterparty participants in the interbank market became higher or more variable as a result. The importance of these effects would depend on the regulatory environment and operating procedures for monetary policy operations and, over a longer horizon, on whether changes in those regulations and operating procedures could be implemented to ensure the efficient operation of the markets following consolidation.

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<sup>151</sup> Borio (1997) presents a very useful summary of the implementation of policy in a variety of industrial nations as of September 1996. Updated descriptions of procedures for the Bank of England, the Swiss National Bank, the Bank of Canada and the European Central Bank can be found in Bank of England (1999), Swiss National Bank (1999), Howard (1998) and European Central Bank (1998) respectively.

<sup>152</sup> See Borio (1997), p 89.

Consolidation could affect the markets involved in the implementation of policy through a second route if the larger firms created by the consolidation were to behave differently from their smaller predecessors, even aside from any changes in the degree of market competition. For example, a change in the size and number of deposit-taking institutions may affect the ability of central banks to estimate the demand for central bank balances and so to supply the funds necessary to achieve the desired target for the policy rate. Also, by internalising what had earlier been interbank transactions, consolidation could reduce the liquidity of the market, making it less efficient at reallocating balances across deposit-taking institutions, increasing market volatility, and perhaps affecting the extent to which changes in conditions in the market for central bank deposits are arbitrated into other short-term markets. If these effects were sufficiently large, consolidation could conceivably cause such arbitrage to break down, thereby cutting the link between monetary policy actions and the real economy.<sup>153</sup> Even if the market were not impaired to that extreme degree, the implementation of monetary policy could become more complicated. Central banks are likely to be able to adjust over time to relatively gradual changes in the level of demand for central bank balances caused by consolidation. But changes in the volatility of demand or the liquidity of the market might lead to increased volatility in the policy rate or other short-term market rates. Of course, central banks might be able to combat such an increase in volatility by, for example, increasing the frequency of fine-tuning operations.

### **Evidence on the effects of consolidation**

While studies have compared the implementation of monetary policy across countries with different degrees of financial sector consolidation, the effects of consolidation on policy implementation have not been explicitly studied.<sup>154</sup> The task force, therefore, circulated a questionnaire to the central banks of the G10, Australia and Spain, asking for information both on the effects of consolidation on the implementation of policy over the past decade and the expected effects in the future. The responses from the central banks indicate that the effects of consolidation both on competitive conditions in key financial markets and on the behaviour of larger market participants have generally been minimal. Consolidation is not expected to pose a significant problem for the implementation of policy going forward.

### **Evidence on the market for central bank balances**

The structure of the markets for central bank balances differs widely across countries judging by the evidence from central bank respondents, with the number of active participants ranging from just four or five in a few countries to about 200 (see Table IV.1). Nonetheless, consolidation has reduced the number of participants in this market in many countries, and it was commonly expected to continue to do so. Nearly two thirds of the respondents indicated that consolidation over the past 10 years had caused the number of market participants to decline either somewhat or considerably. Over the coming 10 years, a similar fraction expected this pattern to continue. However, several respondents noted that other factors – including financial difficulties at some deposit-taking institutions, increased concerns about risk and changes in operating procedures – have also contributed to the decline in market participation.

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<sup>153</sup> See Friedman (1999).

<sup>154</sup> See eg Borio (1997).

Table IV.1  
**Number of firms active in markets relevant for monetary policy implementation**  
 (April 2000)

Country	Interbank market for central bank deposits		Open market operations	
	Number of active firms	Central bank estimate of effective minimum <sup>a</sup>	Number of counterparties	Central bank estimate of effective minimum
Australia	52 <sup>b</sup>	n/a <sup>c</sup>	27	5
Belgium	5 <sup>d</sup>	30 <sup>e</sup>	15	10-25
Canada	15	3 <sup>f</sup>	13	5-10
France	200 <sup>g</sup>	n/a <sup>h</sup>	65-71	n/a
Germany	150	20-30	545	10-25
Italy	59 <sup>k</sup>	30-40	40	>25
Japan	40-50	n/a <sup>p</sup>	50	n/a <sup>q</sup>
Netherlands	85 <sup>i</sup>	55-110 <sup>j</sup>	14	>25
Spain	90	n/a	45	n/a
Sweden	4	3-4	8	<5
Switzerland	20 <sup>l</sup>	10	15 <sup>m</sup>	10-25
UK	15 <sup>n</sup>	5	20	5-10
US	200 <sup>o</sup>	20-30	29	10-25

n/a = not available

<sup>a</sup> Responses from euro area central banks generally refer to the minimum number of participants for the euro area as a whole. However, in the case of Germany, the number shown is the estimated number needed in Germany alone.

<sup>b</sup> There are 52 institutions with exchange settlement accounts at the Reserve Bank of Australia. <sup>c</sup> The minimum number of participants is likely to be significantly less than the current number. <sup>d</sup> Number of firms actively participating in the euro overnight market. <sup>e</sup> This is an estimate of the number that market participants would prefer to have. <sup>f</sup> The Bank of Canada estimates that at least three participants would be needed and that a somewhat higher number would be preferable. <sup>g</sup> Precise figures are not available. Twelve institutions are selected in calculating the EONIA rate; 52 are participants in the TELMA system, which allows them to participate in refinancing operations of the Eurosystem, and more than 200 institutions participate in the RTGS TBF. <sup>h</sup> The important point is that no institution can be in a position to become a price-maker. <sup>i</sup> The number of active participants is not known. Currently, 85 institutions have reserve requirements and it is likely that all of them participate in the market at least to a certain extent. <sup>j</sup> The minimum required is 5-10 per euro area country. <sup>k</sup> There are 24 institutions with a market share of 1% or more. There are 59 with market shares of ½% or more. <sup>l</sup> Of the 20 participants, two account for the bulk of the activity. <sup>m</sup> Fifteen institutions participate on a regular basis, while about 30 more participate on an irregular basis. <sup>n</sup> It is difficult to define active participation. About 15 banks made 75% of the total outstanding advances, but only five settlement banks offer a meaningful customer settlement service. <sup>o</sup> About 200 institutions participate in the brokered federal funds market. <sup>p</sup> The number of participants is not the only factor affecting the efficiency with which the market operates. Others include the institutional framework and the degree of competitiveness among the market participants. <sup>q</sup> As in note p, factors other than the number of participants also affect the efficient conduct of operations.

Despite the declining number of participants in this market in the majority of countries, the central banks did not appear to be concerned about its efficient operation. Generally, the number of participants substantially exceeds the central banks' estimates of the number needed to ensure the efficient operation of the market, and, even taking into account the expected reductions over the next decade, the number of participants was expected to remain above that level. Moreover, as some respondents pointed out, the number of participants in a particular country within the euro area is no longer very important, since there is now a single monetary policy and an integrated money market, and the total number of participants in the euro area as a whole is very large.

The central banks' estimates of the minimum number of market participants necessary for the efficient functioning of the market also varied widely, ranging from a low of just three to a high of 30. Those countries with relatively few market participants generally also thought that the minimum necessary number was lower. This pattern suggests either that the market can remain competitive with relatively few participants, or that those countries with relatively concentrated financial sectors have found ways to adjust the markets' operations in order to ensure that they remain efficient. An important consideration in this regard is whether the market is contestable – in other words, whether the existing market participants are constrained from setting prices above the levels that would prevail in perfectly competitive markets by the knowledge that, if they did so, other firms could enter the market quickly and with no sunk costs and would find it profitable to do so. The Bank of Canada, for example, indicated that the market for central bank balances would operate properly even with very few participants so long as it remained contestable.

### **Evidence on central bank monetary policy operations**

The responses to questions on the effects of consolidation on the efficiency of monetary policy operations were broadly similar to those about the market for central bank balances. The number of counterparties for such operations differed substantially across central banks. In several countries there were 15 or fewer counterparties last year, and most others had less than 100. By contrast, Germany had more than 500 counterparties. Not surprisingly, the share of the top five counterparties also varied widely, ranging from less than 20 to 90%. For the European System of Central Banks as a whole, there were more than 800 counterparties, and the share of the top five was just 12%.<sup>155</sup> Nearly half of the respondents reported that consolidation had reduced the number of counterparties for their monetary policy operations and increased the share of the top five counterparties either somewhat or considerably over the past 10 years. However, several of the respondents noted that other factors, including changes in operating methods, probably contributed to these changes. About half of the respondents thought that consolidation would continue to trim their roster of counterparties and boost the share of the largest counterparties in monetary policy operations over the coming 10 years.

The respondents were not generally worried that there would be too few counterparties to ensure the efficient conduct of tenders and open market operations. The largest fraction of respondents reported that a moderate number of counterparties (10-25) would be sufficient, but a couple thought that more were needed and three thought that fewer than 10 would be satisfactory. Again, the minimum number judged necessary fell with the actual number of counterparties, suggesting that fewer counterparties may be necessary than some central banks believe, at least given accommodating adjustments in operating procedures.

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<sup>155</sup> The number of counterparties reported by the ECB is the sum of the numbers of counterparties reported by the national central banks, but the same financial firm may be a counterparty of more than one national central bank, so the number is likely to be an overstatement.

## **Effects of consolidation on the behaviour of financial firms**

Central banks were also asked about the effects of consolidation on the behaviour of firms in the market for central bank deposits and in monetary policy operations. The responses suggested that consolidation had generally had little effect, and was not expected to do so in future. There appears to be little concern about the possibility of firms wielding market power, one of the hypotheses suggested above. Many of the respondents noted that the demand for central bank balances is essentially zero in their economy (eg Canada) or is virtually entirely determined by reserve requirements (eg the European Central Bank). In such cases, consolidation cannot have a significant effect on the level of demand. A couple of respondents noted that larger banks might be more efficient at managing reserves, and so consolidation could reduce holdings of free reserves, but they thought this effect was likely to be small.

Respondents reported that consolidation had not influenced borrowing at their lending facility appreciably in the past and that it was not expected to do so in the future, although a few of them indicated that changes in operating procedures in recent years made it difficult to be sure. Some respondents pointed out that, given their operating methods, borrowing is primarily determined by the quantity of liquidity provided by the central bank relative to the needs of the banking system as a whole, and so consolidation cannot have a substantial effect. It was noted that, in the United States, larger institutions tend to be less willing to borrow. And it was pointed out that, in Australia, larger institutions, while subject to more late-day volatility in payments flows (which might be expected to boost borrowing needs), also have better credit ratings and so are less likely to have to borrow from the central bank.

The central banks also reported that consolidation had not affected the behaviour of counterparties for monetary policy operations – including their willingness to participate in operations and the size of the positions they are willing to take. Only the Swiss National Bank reported an increased willingness to participate in operations over the past 10 years. Similarly, only two of the central banks thought that consolidation would make counterparties more willing to participate in operations over the coming 10 years. Two respondents argued that the behaviour of counterparties was determined by the central bank, and that central banks could encourage participation in central bank operations by making them more attractive sources of liquidity.

## **Adjustments made by central banks in response to consolidation**

Since most of the central banks thought that consolidation had not had very large effects, few had made changes in operating or other procedures as a result, and few expected to do so. While many of the central banks reported having changed monetary policy operating procedures, particularly in the run-up to Stage III of Economic and Monetary Union (EMU) in the euro area, these changes had not usually been made in response to consolidation. The only exception was Switzerland, where consolidation had led to substantial changes in operating procedures in recent years. The Swiss National Bank increased the frequency of tender operations, introduced repo operations – thereby making it easier for smaller institutions to participate – and changed its rules for counterparties to encourage participation in operations by foreign-related institutions.<sup>156</sup> Looking forward, only one central bank (The Reserve Bank of Australia) thought that, if there were significant further consolidation in the financial services sector, changes might become necessary, including an increase in the number of fine-tuning operations, changes in the types of operations employed, or changes in the rules for their borrowing facility.

Some of the central banks thought that changes in procedures might be introduced in the event that further consolidation reduced the number of counterparties available for monetary policy

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<sup>156</sup> The Swiss National Bank also shifted from a reserves target to an interest rate target, but the decision to do so was not the result of consolidation.

operations to an unacceptable degree. About half thought that more careful monitoring of operations would be either possible or likely – presumably to reduce the possibility of non-competitive behaviour by counterparties. A smaller number thought it likely that their central bank would increase the openness of the conduct of operations (some of the respondents noted that their operations were already open) or monitor the activities and financial condition of counterparties more carefully. Only two pointed to possible stricter management of credit risk, such as tighter limits on exposures to counterparties. Nearly half of the respondents thought that none of these possible responses was likely to be adopted. A few of them commented that a problem was unlikely to arise in their jurisdiction. In the case of the euro area, in particular, it was noted that the introduction of the single monetary policy had greatly increased the number of possible counterparties for operations. One respondent indicated that actions would be taken to ensure that operations remained competitive, but did not elaborate.

Another possible response to a substantial reduction in the number of counterparties would be to change the eligibility criteria for counterparties in order to include a broader range of financial firms. Doing so might be useful for two reasons. First, it would directly increase the number of firms that could choose to be counterparties, which might be expected to increase the number doing so. Second, it might make the pool of counterparties less homogeneous. A broader range of counterparties could be helpful in times of stress, since shocks having relatively large adverse effects on some classes of financial firms – potentially making them less willing to participate in operations – might leave other types of firms relatively unaffected.

Despite these possible benefits, the central banks surveyed were generally not inclined to change their eligibility criteria. Only the Swiss National Bank reported having done so, implementing changes allowing participation in operations by foreign institutions. Similarly, only two of the respondents (Spain and Switzerland) thought that it might become important to encourage participation in monetary policy operations by smaller firms in order to offset the effects of consolidation.<sup>157</sup> Indeed, the introduction of repo operations by the Swiss National Bank had reduced the cost of participation for smaller firms. However, opinion was generally mixed on the desirability of participation by such firms. Three of the central banks thought that there should be no preference shown to larger firms in monetary policy operations. Four of them noted that the efficiency gains from operations with larger counterparties made it necessary to focus operations on a relatively small number of larger firms, especially in the case of fine-tuning operations. In particular, the ECB noted that its procedures are designed to ensure the participation of a broad range of counterparties, but that for technical reasons the European System of Central Banks (ESCB) can select a limited number of counterparties for fine-tuning operations. (The ECB also noted that fine-tuning operations have played only a very minor role thus far.) A couple of the respondents pointed to factors other than size that influence their selection of counterparties, including a firm's activity in interbank markets. Some also noted that while operations with very small counterparties were inefficient, medium-sized firms did not pose a problem.

While many of the respondents reported that their central banks had implemented organisational changes over the past 10 years, only two reported that such changes had been undertaken in response to consolidation. In France, the relationship between the central bank's money desk and payment system division was strengthened. In Switzerland, the central bank has organised teams to monitor monetary policy operations with the largest institutions. The other respondents reported that no changes in central bank organisation were even being contemplated as a result of consolidation.

A couple of respondents reported that consolidation had led to changes in risk management practices with regard to monetary policy operations. Going forward, five respondents thought

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<sup>157</sup> However, central banks of several of the smaller countries in the euro area (responses for which were reported by the ECB) thought that doing so might be desirable.

that their central bank might face heightened operational risks. The most common risk noted was increased moral hazard on the part of borrowers. This moral hazard could take two forms. Most directly, consolidation could allow some financial firms to manipulate monetary policy operations in order to obtain lower cost funding from the central bank than would otherwise have been the case. A second possibility is that the larger firms resulting from consolidation could be seen by investors as very likely to obtain substantial central bank credit in the event of financial difficulty. As a result, the risk premium on such firms' obligations would be lower than otherwise, encouraging them to take on increased risk. Of course, even in this case, investors would need to be mindful that central banks, particularly the national central banks in the euro area, cannot be expected to provide emergency liquidity to institutions in all circumstances regardless of the institutions' size. In addition to these concerns about moral hazard, two of the central banks thought that consolidation could, by increasing the size of transactions with the largest firms, increase the credit risks they face, and one of the respondents was concerned that consolidation could lead to less efficient management of systemic risks.

### **3. The impact of financial sector consolidation on the transmission of monetary policy**

Financial sector consolidation may affect the impact of monetary policy by altering the monetary transmission mechanism that links central bank operations in the market for central bank deposits to output and inflation. Consolidation may therefore be relevant to policymakers' choice of the appropriate setting of monetary policy instruments.

Changes in monetary policy instruments are transmitted to the rest of the economy through various channels. This section considers three of these channels – the “monetary” channel, the “bank lending” channel and the “balance sheet” channel (the latter two being variants of what is often termed the “credit” channel). It outlines briefly the key characteristics of each channel in order to identify how consolidation might affect them, and it considers what empirical studies reveal about whether in fact any effects can be identified. The section also draws on the results of a second questionnaire and a series of interviews with central bank staff, which sought to find out to what extent policymakers themselves think that consolidation alters the monetary transmission mechanism.

#### **The monetary channel**

In simple models of the monetary (or interest rate) channel, central bank policy determines the short-term interest rate. Arbitrage across markets ensures that yields on longer-term financial assets are an appropriately weighted average of current and expected future short-term interest rates, after allowing for the assets' perceived riskiness. Competition amongst lenders to firms and households and deposit-takers ensures that interest rates set by banks are determined by the term structure of market interest rates. In practice, arbitrage is imperfect and depends on, amongst other factors, market liquidity, risk aversion, and the degree of monopoly power. In this model, changes in monetary policy affect spending by changing household wealth and the opportunity cost of funds facing firms and households.

#### **The effects of consolidation on the monetary channel: empirical evidence**

This view of the traditional monetary channel suggests that one should consider whether financial sector consolidation has affected the pass-through of changes in policy-determined interest rates to other interest rates at longer maturities, and asset prices generally. It was argued above that in some circumstances consolidation might reduce the level and increase the volatility of interbank liquidity, impeding arbitrage across financial markets and thus slowing pass-through and reducing its extent. On the other hand, to the extent that large firms are able to process information more effectively than small firms, because of the set-up costs and

economies of scale in information processing, consolidation may promote more rapid arbitrage of interest rate changes across markets and assets. In addition, consolidation amongst those lending to firms and households, if it reduced competition, could bring about higher margins between wholesale interest rates and those charged to borrowers. That would cause difficulties for monetary policymakers if it was not expected, particularly if the change was observed imperfectly or with a significant lag. Margins could also become more erratic if the number of lenders (and potential lenders) was sufficiently small that they could alter their pricing in response to perceived changes in the elasticity of demand for loans, the supply of credit by their competitors, and expected changes in monetary policy.

In practice, it is difficult to assess the independent effect of consolidation on pass-through. In many countries, consolidation has been accompanied – and, in some cases, encouraged – by the introduction of new technology, the removal of some barriers to entry (including regulatory ones) and improved access to alternative sources of finance. Hence it has not always led to reductions in liquidity or competition.

Amongst studies of the pass-through of money market rates into retail rates, one considers the possible role of differences in financial structure across countries.<sup>158</sup> It shows that, while in the long run bank lending rates respond virtually one-for-one to changes in money market rates, the pass-through during the following month is generally much less. Moreover, there is considerable cross-country variation, particularly in the short-term responses. But is that variation related to differences in the degree of financial sector consolidation? Neither GDP per capita, as a proxy for the overall degree of development of the financial system, nor the market share of the largest five banks, as a proxy for the degree of competition within the banking system, were found to be significant. But results with a qualitative index of the existence of barriers to entry suggested that lack of contestability of markets, rather than concentration or consolidation in markets per se, is the critical factor in slowing down pass-through.

Research at the Bank of Canada suggests that consolidation has been accompanied by an increased responsiveness of mortgage rates to official interest rate changes, although it is difficult to establish causation (see Box IV.1). In contrast, work on the transmission of official rates into retail mortgage and saving rates in the United Kingdom suggests that there has been no significant change in the speed of pass-through over the past 15 years, a period during which some consolidation has taken place.<sup>159</sup> But other developments may have acted to offset any impact on competitive conditions in retail banking markets. In the United Kingdom, for example, the demutualisation of former building societies, together with the arrival of new entrants, seems to have encouraged greater competition in lending to households. (Also, the Canadian study uses weekly data, so it may have been able to pick up changes that were unobservable in the monthly data available in the United Kingdom.)

Evidence of an impact of consolidation on bank margins is not strong. Studies have found no effect of increasing concentration amongst Swiss or Spanish banks on interest rates.<sup>160</sup> Instead, increased competition has made the banking system more responsive to monetary policy impulses over the past decade, and consolidation has not prevented that development. To the extent that increased scale has enabled banks to diversify income streams and squeeze out costs, consolidation amongst institutions has allowed profit margins to be sustained despite this increased competition. According to one paper, consolidation in the United States increased margins on personal loans, but had no effect on automobile loan margins.<sup>161</sup>

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<sup>158</sup> See Cottarelli and Kourelis (1994).

<sup>159</sup> See Hoffman and Mizen (2000).

<sup>160</sup> See Braun et al (1999) and Fuentes and Sastre (1999).

<sup>161</sup> See Kahn et al (2000).

Even if other things being equal, consolidation does tend to increase margins, a central bank should be able to alter its own target interest rate to offset any impact on aggregate demand and asset prices, once it has observed the change in the relationship between its target rate and rates charged in the market. Thus, although the wider margins would be undesirable because of their effects on the efficiency of intermediation, they might not have an important effect on monetary policy making. However, there might be greater difficulty in setting the appropriate official rate in the transition period during which margins adjusted, depending on how quickly policymakers identified the phenomenon.

#### **The effects of consolidation on the monetary channel: assessment by central banks**

Central banks generally suggested that consolidation alone had not had an important influence on the pass-through of official interest rate changes to administered rates, such as bank loan and deposit rates, over the past 10 years. Only the Swedish and Swiss respondents thought that pass-through had become more rapid as a result of consolidation (Table IV.2). A couple of respondents indicated that the speed of transmission had increased, but suggested that factors other than consolidation were likely to have been responsible.

Box IV.1

**The pass-through of interest rate changes in Canada**

In recent years, the Canadian financial system has been characterised by five or six large banks, one large trust company (which has very recently been taken over by one of the large banks) and a number of smaller players. Mergers in the 1990s increased the market share of the group of large institutions in certain markets. As Table A shows, the market shares of the “Big Six” Canadian banks in the deposit and residential mortgage markets increased by around 10-15 percentage points between 1990 and 1999.

Table A  
Market shares (per cent)

	1990 (Dec)		1999 (Dec)	
	“Big 6”	“Big 6” + CT <sup>1</sup>	“Big 6”	“Big 6” + CT <sup>1</sup>
Total CAD Deposits <sup>2</sup>	56 (52)	62 (58)	70 (66)	75 (71)
Residential mortgage loans	39	46	55	58

<sup>1</sup> CT= Canada Trust. <sup>2</sup> Figures in brackets exclude money market mutual funds, but include life insurance annuities.

The pass-through from market rates to administered rates has typically been rapid and complete in Canada. Econometric investigation of the speed of adjustment of mortgage rates suggests that it may have increased in the second half of the 1990s compared to the first half. For example, since 1995, the pass-through of market rate changes to five-year mortgage rates has been about 60% complete after one week has elapsed, compared with a 45% pass-through for the period 1990-95.

Table B  
Effect on the mortgage rate of changes in government bond yields

Short-run effect <sup>1</sup>	Impact		One week		Three weeks	
	1990-95	1996-2000	1990-95	1996-2000	1990-95	1996-2000
One-year mortgage rates	0.10	0.32	0.46	0.60	0.82	0.86
Five-year mortgage rates	0.16	0.26	0.45	0.59	0.79	0.97

<sup>1</sup> Effect on mortgage rate of a sustained one-percentage-point rise in government yield for the same maturity.

Overall, the evidence is not consistent with the hypotheses that (i) financial sector consolidation will decrease the speed or size of the response of administered rates to market rates, or (ii) a financial system that is dominated by six or seven big institutions will display a slow, partial or unpredictable response of administered rates to market rates. However, one cannot conclude that consolidation in Canada has resulted in the opposite effects. Other factors are also likely to have been at work. In particular, more sophisticated information technology systems may be allowing more rapid and more frequent changes in administered rates. And the arrival of actual and potential entrants (whether domestic or foreign) with highly sophisticated systems (and unconstrained by a need for an expensive branch network) may have encouraged large institutions to move administered rates more rapidly than in the past.

Table IV.2

Q: Over the past 10 years, how has consolidation in the financial services industry affected the SIZE and SPEED of the effect of changes in your central bank's policy interest rate on administered rates, such as rates on bank deposits and bank loans?

Effect	Left it about unchanged	Increased it somewhat	Increased it substantially
SIZE	Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, UK, US.	Sweden, Switzerland	
SPEED	Belgium, Canada, Germany, Italy, Japan, Netherlands, Spain, UK, US.	Sweden, Switzerland	

Similarly, most of the central banks did not expect consolidation to have important effects on pass-through in the future, although they were somewhat less certain. Most of the respondents thought that consolidation would not affect either the speed or the size of the effects of changes in the policy rate on market rates over the coming 10 years. However, as shown in Table IV.3, a few of the European central banks thought that consolidation would affect the pass-through to administered rates, with most of them expecting pass-through to be somewhat faster and larger.

Table IV.3

Q: Over the coming 10 years, how do you anticipate that consolidation in the financial services industry will affect the SIZE and SPEED of the effect of changes in your central bank's policy interest rate on administered rates, such as rates on bank deposits and bank loans?

Effect	Decrease it somewhat	Leave it about unchanged	Increase it somewhat
SIZE	Sweden	Australia, Canada, Germany, Netherlands, Spain, UK, US	France, Italy, Switzerland
SPEED		Australia, Canada, Germany, Netherlands, Spain, Sweden, UK, US	France, Italy, Switzerland

While a number of central banks noted that the transmission mechanism had changed in recent years, such changes were generally viewed as fairly minor and likely to be due to changes in financial markets and institutions that were essentially unrelated to consolidation. Table IV.4 summarises the responses to the task force's questionnaire as a whole. It seems likely that other factors have offset any effects of consolidation alone and, indeed, that consolidation may have occurred, at least in part, in response to these factors. For example, competition has reportedly increased in retail domestic credit and deposit markets in a number of countries, but the further globalisation and integration of wholesale markets, exemplified by EMU, have acted to offset any increases in market power that large institutions might otherwise have enjoyed.

Table IV.4

**Impact of financial sector consolidation on the monetary transmission mechanism (MTM)**

(summary of questionnaire responses)

Q	Effect of consolidation	Australia	Belgium	Canada	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	Switzerland	UK	US
1	Overall impact on policy	N	N	N	N	N	Y?	N	N	N	N	N	N	N
2	Impact on one or more specific channel of policy	N	N	N	N?	?	Y	?	N	N	?	?	N	N
3	Distributional effects	N	N	N	N	N	Y	N	N	?	N	Y	N	N
4	Impact on financial markets	N	N	N	N	N	N	?	N	N	N	N	N	N
5	Impact on information indicators	Y	N	N	N	N	N	N	?	N	N	Y	?	N
6	Changes in monetary policy strategies	N	N	N	N	N	N	N	N	N	N	?	N	N
7 & 8	Future MTM and policy	N	?	N	?	Y	?	?	?	?	N	Y	?	

Y = explicit effect observed/or expected; N = no evidence of impact; ? = uncertain. The ECB was only asked about the prospective effects of consolidation on the MTM (questions 7 & 8). According to the ECB, these effects are uncertain.

### The bank lending channel

Monetary policy may affect the economy via its impact on the scale of bank lending, in addition to its influence over interest rates generally. This channel depends on bonds, bank loans and bank deposits being imperfect substitutes. When interest rates rise, transactions and savings deposits at banks are likely to contract, requiring banks to reduce the size of their balance sheets and hence the stock of lending. This reduction may be larger – particularly in the short run – than the reduction in the demand for loanable funds that would be brought about anyway by the increase in the central bank’s target interest rate. In that event, a gap would arise between the supply of and demand for funds, which banks would be able to fill if they could replace the deposits they had lost with new wholesale funding. Because of information asymmetries, however, banks may be unable to raise wholesale funds at the same rates as they pay on deposits. As a result, banks may have to increase the wedge between capital market interest rates and the rates they charge their borrowers. The thicker wedge implies that a tightening of monetary policy will have a bigger impact on bank-dependent borrowers – including households and smaller businesses – than on those borrowers who are able to tap financial markets directly.

### The effects of consolidation on the bank lending channel: empirical evidence

Consolidation could affect the size of the bank lending channel in two ways. First, larger banks may have better access to sources of funds other than transactions and savings deposits because of improved name recognition, fixed costs, or lower information costs. If so, then the effect of

tighter monetary policy on the supply of bank loans is likely to be reduced by consolidation if consolidation reduces small banks' share of the industry.<sup>162</sup> Unfortunately, the height of the threshold that banks need to cross in order to gain improved access to wholesale markets is not clear. Consolidation amongst banks already able to borrow at good rates in wholesale markets is unlikely to have a significant effect; nor is consolidation amongst small banks if it does not carry the consolidated banks over the relevant threshold. Whatever its current height, the threshold is likely to fall as a result of the increasing size, depth and integration of capital markets. The second possibility is that consolidation, by allowing stronger banks to take over weaker ones, could strengthen the financial condition of the banking sector. In that case, banks would also have improved access to alternative sources of funds, the bank lending channel thereby attenuating and reducing the impact of a given change in the proximate instrument of monetary policy.

While there is no direct evidence regarding the effect of consolidation on access to markets for managed liabilities, there is strong circumstantial evidence that larger banks find it easier than smaller banks to fund loans in periods of tight monetary policy.<sup>163</sup> The impact of a policy tightening on bank lending is smaller for banks with more liquid balance sheets, where liquidity is measured by the fraction of assets accounted for by securities which can be sold to fund loans. This effect of liquidity is important primarily for smaller banks (those in the bottom 95% of the size distribution), suggesting that these institutions are less able than larger banks to find alternative sources of funds.

However, there is considerable controversy about whether the bank lending channel is empirically important at all. A number of studies report results suggesting an important role for the bank lending channel in the United States.<sup>164</sup> However, drawing on evidence from a variety of countries, others cast doubt on the existence of this channel.<sup>165</sup>

In addition, it is difficult to assess the effects of consolidation on the bank lending channel in an individual country because of the relatively modest amount of consolidation experienced in many of them. However, there are substantial differences in financial sector concentration across countries, and some recent cross-country studies may shed light on the effects of consolidation on the bank lending channel. For example, one study tests the hypothesis that the effects of changes in monetary policy should be larger in countries that have smaller and less robust banks, greater dependence on bank finance and smaller firms, because theory suggests that the bank lending channel should be stronger in such economies.<sup>166</sup> It considers data from EMU countries on the size and concentration of the banking system, the health of the banking system, the importance of bank finance and the size of firms. Smaller firms were regarded as more likely to be bank dependent. Using a vector autoregression approach to measure the size of the effects of monetary policy, it finds some evidence in support of this hypothesis. This result suggests that consolidation in a given country could, by increasing the size of banks and perhaps also by improving the health of the banking system, reduce the importance of the bank lending channel.

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<sup>162</sup> Note that the effect of consolidation on the bank lending channel depends on how it influences the responsiveness of bank loan supply to changes in policy. The static effect of consolidation on the availability of bank loans to bank-dependent borrowers is discussed in Chapter V.

<sup>163</sup> See Kashyap and Stein (2000).

<sup>164</sup> See Kashyap et al (1986) and Kashyap and Stein (2000).

<sup>165</sup> See Dale and Haldane (1995), Favero et al (2000), Miron et al (1993) and De Bondt (1998).

<sup>166</sup> See Cecchetti (1999).

By contrast, a second study tests to see if the timing and size of the effects of policy are influenced by variables that would be involved in the credit channel of policy transmission.<sup>167</sup> In particular, it considers banking sector holdings of securities as a measure of banks' ability to continue lending following a policy-induced reduction in deposits. This study, which focuses on large European countries, indicates that the bank lending channel is probably not important in Belgium, the Netherlands and the United Kingdom, but may be important in France, Germany and Italy. The different results across countries could be due to one of four reasons. First, the financial sectors of the United Kingdom and the Netherlands may be "healthier" than those in the other countries.<sup>168</sup> Second, Belgium, the Netherlands and the United Kingdom have a greater portion of foreign-owned banks, which may be better able to find alternative sources of funding to mitigate any potential bank lending channel.<sup>169</sup> Figures show that 30-40% of the banking system is foreign-owned in Belgium, the Netherlands and the United Kingdom, while the comparable figure in the other countries in this sample is less than 10%.<sup>170</sup> Third, a low level of concentration in the banking industry, as in Germany for example, could cause the bank lending channel to be amplified, since smaller banks may be less able to find alternative sources of funds. Finally, a better developed market for managed liabilities in the United Kingdom could account for the lack of evidence of a bank lending channel there. If any of these conjectures are valid, then consolidation could well have the effect of weakening the bank lending channel, thereby reducing the effect of monetary policy on the economy.

#### **The effects of consolidation on the bank lending channel: assessments by central bankers**

Perhaps not surprisingly, given the lack of academic consensus on the issue, the central bankers interviewed generally thought that either the bank lending channel was not important in their country or that its importance was difficult to assess. It was noted that the impact of policy transmitted through the bank lending channel was likely to be highly correlated with the impact via the traditional monetary channel. In the United States, there was evidence in the early 1990s that shocks to bank capital had an effect on bank lending, and that difficulties obtaining bank loans may have reduced activity in some regions and industries. While this experience was consistent with an important bank lending channel for monetary policy, it was still not clear to policymakers whether bank lending had an important independent role in the transmission of policy changes.

The central bankers also generally reported that, assuming a distinct bank lending channel did exist, consolidation had not had a noticeable effect on the size or speed of the transmission of monetary policy via that route. Nor did they view such an effect as likely to be important in the future.

Central bank officials in Germany pointed to the possible importance of another aspect of bank lending to small and medium-sized firms. In Germany, such firms often have a special relationship with their "house bank", which in effect helps to insure them against cash flow problems in the event of a downturn or a tightening of monetary policy. The house bank, far from magnifying the impacts of changes in monetary policy on its borrowers, tends to cushion them. This conclusion implicitly assumes that the house bank has the ability to fund loans in such situations and can afford to do so. In practice universal banks may find that easier than banks with generally less diversified balance sheets (such as commercial banks in the United States). Consolidation could lead to a reduction in house bank relationships, by making the

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<sup>167</sup> See De Bondt (1998).

<sup>168</sup> This was pointed out by Kashyap and Stein (1997).

<sup>169</sup> See Jayaratne and Morgan (1997).

<sup>170</sup> See De Bondt (1998).

close monitoring on which such relationships depend more difficult to carry out, and by reducing the trust of the borrowers that the implicit contract underlying such relationships would be honoured. In that case, banks might allow loan rates to respond more to changes in official interest rates, rather than buffering such changes. If that were to happen, those firms that rely on a continuing relationship with their bank (most typically small and medium-sized firms), and so are limited in the choice of alternative finance sources, would face higher borrowing costs following a tightening of policy than they do under current arrangements. Such changes could imply an increase in the importance of the bank lending channel. However, as the Bundesbank also noted, consolidation has been accompanied and perhaps partly caused by globalisation, securitisation and disintermediation, all of which facilitate smaller firms' access to market-based finance and thereby reduce the strength of the bank lending channel.

### **The balance sheet or “financial accelerator” channel**

A second variant of the credit channel of monetary policy is the balance sheet or financial accelerator channel, which derives from the role of collateral in lending. Lenders may require borrowers to post collateral if they are uncertain that borrowers would otherwise be able or willing to repay loans. A tightening of monetary policy is likely to reduce the value of that collateral, by reducing demand for the borrower's products (in the case of a firm) and increasing the rate at which future service flows generated by the collateral asset are discounted. A reduction in the value of collateral could, in turn, lead to cutbacks in spending, defaults when existing loans come up for renewal, and fire sales of collateral assets.

### **The effect of consolidation on the balance sheet channel: empirical evidence**

The key question in this case is whether consolidation eases or aggravates the information problems between lenders and borrowers that lead lenders to demand collateral as security for loans. If consolidation makes newly merged lending institutions more efficient assessors of credit risk, for example because larger institutions can afford increased investment in information technology, then fewer borrowers might be required to provide collateral, and the balance sheet channel might weaken. If, on the other hand, the larger consolidated institutions are more remote from borrowers (are less like small “relationship banks”) and rely more on statistical rules and uniform lending policies, then it is possible that the balance sheet channel might strengthen. Thus, the effect of consolidation on the balance sheet channel could be either positive or negative. Moreover, either result could be consistent with consolidation having been driven by competitive pressures.

As with the bank lending variant of the credit channel, there is controversy in the academic literature about whether this channel is empirically significant at all. A number of studies cast doubt on the existence of a (household) balance sheet channel, at least in some countries.<sup>171</sup>

But some cross-country studies hint at an important effect in some cases. One finds that differences in the effects of monetary policy on the real economy in a number of European countries may reflect differences in variables intended to proxy for both bank credit and balance sheet channels, in particular, financial structure, levels of household debt and the prevalence of collateralised loans.<sup>172</sup> Another tests whether the net worth of households and businesses appears to influence the transmission of monetary policy, as one might expect if the balance sheet channel were operating.<sup>173</sup> It finds evidence of a household balance sheet channel in Germany, Italy and the Netherlands, but not in Belgium, France or the United Kingdom. It also

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<sup>171</sup> See eg Jappelli and Pagano (1989), Bachetta and Gerlach (1997) and De Bondt (1998).

<sup>172</sup> See Dornbusch et al (1998).

<sup>173</sup> See De Bondt (1998).

reports some, but by no means a perfect, correlation of the strength of the balance sheet channel (by this measure) with financial sector concentration. The strength of the balance sheet channel varies across European countries in a way that is consistent with differences in the efficiency of the market for secured lending to households.<sup>174</sup> To the extent that consolidation promotes access to credit (eg by facilitating mortgage equity withdrawal), it is likely to erode the importance of balance sheet effects. These cross-country studies suggest, then, that consolidation might weaken the strength of the balance sheet channel.

#### **The effects of consolidation on the balance sheet channel: assessment by central bankers**

The central bankers interviewed by the task force were unsure of the importance of the balance sheet channel and, assuming that such a channel was operative, they generally did not appear to believe that consolidation had had a noticeable effect on its magnitude. However, some conceded that such an effect could manifest itself in future.

#### **Implications of any reduced importance of the credit channels**

Since the credit channels are the result of credit market imperfections, if consolidation reduces their importance, welfare should be improved. However, monetary policymakers may face difficulties in adjusting to some of the changes. First, easing credit market imperfections may lead to a temporary increase in borrowing and spending, as some who had previously been constrained by higher borrowing costs or lack of collateral find themselves able to borrow. Second, any reductions in borrowing constraints may boost equilibrium real interest rates, and policymakers will need to take the higher equilibrium rates into account when setting policy. These two effects would probably be similar to those experienced in some countries as a result of financial liberalisation.<sup>175</sup> Finally, the reduction in the size of the credit channel implies that, to attain a particular effect on the real economy, policy instruments will have to be adjusted more than had previously been the case. Of course, in practice, the effects of consolidation on the credit channel are likely to emerge only slowly, allowing the central bank to observe these effects and allow for them in an orderly way. Indeed, none of the central banks interviewed had noticed an effect of consolidation on the monetary transmission mechanism or on the distribution of the effects of monetary policy across classes of borrowers (eg households versus firms, small firms versus larger ones, or producers of tradable goods and services versus producers of non-tradables).

## **4. Some further possible consequences of consolidation for monetary policy**

While there is little evidence that consolidation has generally affected either the implementation of policy or the monetary transmission mechanism, it is nonetheless possible that it could influence the setting in which policy is determined. For example, consolidation may affect the impact of financial shocks and the way that they are transmitted across markets and borders. To the extent that consolidation leads to larger firms that have major positions in many markets and countries, shocks that once might have been isolated in a single market, region or country may have broader effects. For example, an economic downturn in one country could, through its effects on the balance sheets of banks with cross-border operations, cause a tightening of lending standards or terms in other countries. As a result, the appropriate stance of policy in

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<sup>174</sup> See Iacoviello and Minetti (2000).

<sup>175</sup> The effects of financial liberalisation on aggregate demand and real interest rates are discussed in G10 (1995), pp 49-52.

those other countries might change. Similarly, losses sustained in one financial market could lead to movements in prices or liquidity in other financial markets, as firms active in the troubled market trimmed their positions or cut back on trading and market-making activities as a result of their losses. On the other hand, because such firms are more diversified and might also benefit from a cushion of monopoly rents, they may be in a better position to absorb rather than transmit shocks, particularly if they perceive them to be temporary. In either case, the dynamics of foreign exchange rate determination would be likely to change if a greater proportion of cross-border capital flows were internalised by large, global financial firms. Such an outcome seems unlikely, however, given the declining relative importance of bank lending in international capital flows in recent years.

Another way in which consolidation might affect the environment for policy is by decreasing market liquidity and boosting volatility. Most simply, consolidation could reduce liquidity if it allowed market-makers in a financial instrument to use their market power to boost bid-asked spreads at the expense of other market participants. Alternatively, liquidity could decline if the restructuring that followed consolidation led to a reduction in the total amount of capital allocated to trading in, or making markets in, a particular instrument. A related possibility is that, following consolidation, the total amount of resources dedicated to the analysis and forecasting needed to price an instrument appropriately could decrease. In that case, the market price of the instrument could vary more widely around the value justified by fundamentals, directly boosting volatility and increasing trading risk, and perhaps reducing liquidity. Volatility could also increase if consolidation resulted in a few very large firms dominating financial markets, because in that case a change in the investment strategy of a single firm could have a substantial impact on asset prices. Moreover, consolidation could increase herding behaviour since departures from the consensus view might be more noticeable, in which case deviations of market prices from fundamentals could increase in size, boosting volatility.<sup>176</sup> These factors could also cause financial markets to respond less predictably to changes in the stance of monetary policy, perhaps strengthening the case for gradualism and transparency in policy making.

As noted in the previous chapter on systemic risk, consolidation could not only affect the liquidity of markets, but might also cause a deterioration in market performance during times of stress. Such an effect would likely be a greater concern if consolidation led to a small number of large firms dominating many important financial markets, especially if differences in outlook among those firms were, at times, smaller than in the past because their models and trading strategies had converged. In such situations, a shock in a particular market could be transmitted across firms and markets more rapidly and to a greater degree than had previously been the case. Moreover, subsequent decisions by some firms to reduce their risk exposures – because of reductions in their capital, reductions in their appetite for risk or counterparties' concerns about their financial strength – might trim market liquidity and cause further declines in market prices. Indeed, the report by the Committee on the Global Financial System (CGFS) on the financial events in the autumn of 1998 notes that such factors may have exacerbated the response of markets to shocks at that time.<sup>177</sup>

Consolidation could also cause markets to be less resilient following a shock if it reduced the likelihood that financial firms would act to cushion the impact of the shock on borrowers and markets. For example, consolidation could result in all of the largest and most important financial firms in an economy participating in the same broad set of financial markets. Clearly, consolidation need not have this effect, and the extent to which it does so would depend on the forces driving the consolidation. Nonetheless, to the extent that consolidation had such an effect, a major shock in one market could impose substantial losses on virtually all of the large

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<sup>176</sup> See Scharfstein and Stein (1990) for a model of herding behaviour in financial markets.

<sup>177</sup> See CGFS (1999), p 14.

financial firms. As a result, none of the firms might be willing and able to expand their activities to compensate for reductions by the others, thereby amplifying the effect of the shock on markets and the real economy relative to the outcome with a more fragmented and diverse financial sector. Thus, while consolidation might reduce the impact of smaller shocks – since financial firms would be better diversified – it could increase the effects of large shocks because the financial sector would be less well diversified. Consolidation could affect the resilience of financial markets through other channels as well. On the one hand, it could reduce the competitive pressures on financial firms to provide finance and market-making in periods of market turbulence. These pressures might be important, since each firm would probably want to reduce its activities if it could do so without the risk of losing future business as a result. On the other hand, if all firms cut back on their activities, they might all be made worse off. If so, consolidation could actually reduce firms' incentives to pull back, since larger financial firms might be more likely to take account of the effects that their own activities could have on the macroeconomic outcome and so on the value of their positions.

In any case, the potential effects of consolidation on the operation of financial markets do not yet appear to have become significant practical concerns. The central bankers who were interviewed generally thought that consolidation had not affected the volatility or liquidity of financial markets. Only in Japan, where significant consolidation of domestic institutions is expected to take place within the next couple of years, together with increased involvement of large overseas institutions in key asset markets, did the central bank think that such effects might become an issue in the future. Other central banks were more sanguine. In Europe, it was evident that the largest institutions were the providers of market liquidity in national markets, in adverse conditions or otherwise. But the introduction of the euro had significantly increased the size of the market in which they operate. In the United States, it was pointed out that consolidation did not necessarily imply any change in the aggregate capital allocated to trading and market-making. Indeed it was noted that, so long as barriers to entry are not large, the effects of consolidation on market volatility and liquidity should be small, since increased volatility and reduced liquidity relative to their levels in competitive markets would seem to offer profit opportunities to potential entrants.

Another possible adverse effect of consolidation for monetary policy is that changes in financial structure might make it more difficult to interpret movements in indicator variables such as yield spreads or the monetary aggregates. There have been instances in the past when financial-sector liberalisation has had unexpected consequences for widely monitored variables (eg monetary aggregates in the United Kingdom in the 1980s), with the consequence that the monetary policy stance has been difficult to assess. Could consolidation have a similar impact? At least thus far, it does not seem to have done so. As noted, the central bankers interviewed generally did not believe that consolidation had had noticeable effects on the behaviour of financial markets, suggesting that indicators based on prices or interest rates have been essentially unaffected. Similarly, few of those interviewed thought that consolidation had significantly affected the behaviour of monetary aggregates. While a number of central banks noted that financial market developments more generally had made movements in the aggregates more difficult to predict, only a few of them reported that consolidation had had an influence, and its effects were generally thought to have been fairly minor. However, a few of the central banks thought that the effects of consolidation on the behaviour of the aggregates was not yet clear, or thought that such effects could be more significant in the future. If the pace of consolidation were to increase suddenly, that would be more likely to have an effect similar to that of sudden financial liberalisation.

If consolidation led to the development of very large and complex institutions, the failure of which would be particularly difficult to manage, central banks' lender of last resort and monetary policy responsibilities would be more challenging. If such firms became troubled, the central bank, taking account of the potential moral hazard problems, would have to decide upon the appropriate magnitude and duration of any provision of emergency liquidity to the affected firm or firms. It would also have to carefully consider the possible need to ease the stance of

monetary policy both to cushion the real economy from the effects of the resulting stresses in financial markets – which might include an increased aversion to risk taking and reduced market liquidity – as well as to potentially reduce those stresses. Such consideration would require the central bank to judge the likely duration of the financial market difficulties, their potential impact on the economic outlook and the possible downside risks they pose to that outlook. Moreover, if policymakers decided that easier policy were warranted, they would need to be prepared to reverse course once market conditions began to improve. In practice, central banks have, at times, thought it appropriate to ease monetary policy in response to concerns about the possible macroeconomic effects of difficulties at financial institutions or in financial markets. For example, in the early 1990s monetary policy in the United States was for a time easier than it otherwise would have been owing to concerns about the effects on the economy of efforts by many banks to boost their capital in response to regulatory and market pressures. Moreover, consolidation – by increasing the number of large, complex institutions whose failure might have significant macroeconomic effects – might increase the likelihood that monetary policy would have to respond to financial difficulties at a particular firm or firms. In such situations, monetary policymakers would need to take care that their decisions were not unduly influenced by the possible effects of policy changes on the financial condition of the troubled firm or firms, but rather remained focused on the effects of such changes on the economy. In practice, however, the central bankers interviewed did not believe that consolidation had increased the likelihood that policy would be adversely affected by firm-specific concerns. But some pointed out that this possible distortion made past and present efforts to limit contagion through improvements in clearing, payments and settlement systems and tightened capital standards even more important.

Many of the large and complex financial institutions that might pose challenges to central banks would have cross-border operations. Difficulties at such firms would raise the additional question of which central bank should provide emergency liquidity assistance should it prove necessary. This issue was considered in the preparations for the century date change, and there was broad agreement that foreign banking organisations should have the same access as domestic institutions to normal sources of central bank liquidity, so long as they satisfied the criteria for such lending (eg quality of collateral and standards of home country supervision). However, more difficult situations could arise if an institution's collateral proved insufficient or concerns about its condition meant that the borrowing likely was probably not just to meet a temporary liquidity shortfall, but rather suggested a more substantial problem. In that event, the question might no longer be about the appropriate source of liquidity assistance, but rather how to handle an impaired institution. In such cases, it was thought that home and host country central banks and supervisory authorities would need to consult closely and that home country central banks might well be responsible for providing liquidity from the outset or at least very soon after such support became necessary. It was also noted at that time that the ability to use collateral in another country to back borrowing from a central bank could be useful for some institutions. Of course these issues were discussed in the context of the century date change, and further discussion will be needed for the case of lending to large, complex, internationally active banking institutions.

## **5. Some caveats and research challenges**

While there is no compelling evidence that consolidation has generally had effects on the implementation or transmission of monetary policy, it is worth bearing in mind some of the difficulties in assessing its impact.

First, variation in financial sector concentration over time within most countries has been relatively small compared to the variation across countries. Thus, identifying the effects of consolidation on monetary policy based on information from individual countries alone may be hard. On the other hand, cross-country studies are difficult because of the significant differences in legal and regulatory frameworks, institutional and market structures, and attitudes and

expectations across countries. An additional complication is that central banks may respond to consolidation by adjusting their operating procedures, thereby offsetting the effects that consolidation might otherwise have had.

Second, many of the central banks interviewed noted that consolidation had taken place at the same time as a number of other important changes in financial markets, including globalisation, deregulation, and substantial improvements in information and communications technology. As a result, it is difficult to separate the effects of consolidation alone from the effects of other changes, and to disentangle cause and effect.

Third, empirical estimates of the effects of monetary policy on the real economy are fairly imprecise, making it difficult to tell if consolidation has changed the transmission mechanism. And the hypotheses being tested have sometimes not been formulated clearly.

Finally, since most analyses of the effects of monetary policy are based on models that do not include many potentially important features of banks and financial markets, they have little to say about the influence of changes in the industrial structure of the financial sector on the effects of policy.

This review suggests several avenues of research that might allow a more thorough assessment of the impact of financial sector consolidation on monetary policy. Further development of formal models of the bank lending and balance sheet channels of the monetary transmission mechanism, to incorporate a richer characterisation of the financial sector, would help in formulating testable hypotheses. Work in a number of other areas would also be helpful. Studying the impact of a reduction in the number of participants on competition and efficiency in different market and auction settings would help to clarify both how far consolidation can go before difficulties in implementing policy are likely to emerge, and what changes in operating procedures might help to ameliorate those difficulties. A better understanding of the effects of heightened volatility in the policy rate on other market interest rates would be important if it was found that consolidation did in fact tend to raise the volatility of the policy rate. Across countries, the average volatility of a country's overnight rate is not related to the volatility of other short-term market rates in the country. This suggests that central banks may be able to allow some rise in volatility in the policy rate without great concern. However, periods of increased volatility in a country's policy rate are associated with periods of higher volatility in other short-term market rates, suggesting that some vigilance is appropriate.<sup>178</sup>

## **6. Conclusions**

Thus far, financial sector consolidation does not appear to have impeded the implementation of monetary policy, even though it has affected the markets in which central banks act in order to set policy. While most of the central banks surveyed reported that the number of participants in the market for central bank balances and the number of counterparties for monetary policy operations had declined as a result of consolidation, they generally thought that these numbers remained high enough to ensure that markets were competitive. While many central banks had made changes in monetary policy procedures and some had restructured their operations, these changes had not generally been undertaken in response to consolidation. Many of the central banks were confident that the appropriate regulations and operating procedures could ensure adequate competition going forward. Nonetheless, changes in regulations and procedures may be necessary to offset adverse effects of further consolidation, and central banks need to be alert to this possibility. For example, competition may be enhanced by promoting the participation of a wider range of counterparties. Indeed, the Swiss National Bank reported having made some

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<sup>178</sup> See Borio (1997).

changes that had helped to offset undesirable effects of consolidation on participation in monetary policy operations.

There is little evidence of an effect of consolidation on the monetary transmission mechanism in individual countries. Central banks generally report that the pass-through of changes in policy rates to market rates and rates on bank deposits and loans had not changed appreciably as a result of consolidation, and only a few respondents expected effects in the near term. Central bank staff generally indicated that they had not identified significant changes in the monetary transmission mechanism in recent years. It seems possible that consolidation might reduce the importance of the bank lending and balance sheet channels of policy – if indeed they are operative – because larger banks are likely to find it easier to raise funds in capital markets and to assess credit risk amongst potential borrowers (thus reducing the role of collateral). If so, it would be likely that the impact of a given change in the monetary policy instrument on output would be reduced. A reduction in the importance of these channels would also be expected to affect the distributional impact of monetary policy changes (eg by putting less of the burden of adjustment on agents without direct access to capital markets, such as most smaller businesses and the household sector), yet the central banks reported no evidence that the distributional impact had, in fact, changed.

However, many of the central banks noted that it was difficult to disentangle the effects of globalisation, technical innovation and financial sector consolidation, so that some effect of consolidation could not be ruled out. It is quite possible that consolidation has changed the economic environment in which central banks operate, but that they have been able to adjust policy appropriately without having to identify the reasons for the changes. A few central banks argued that the phenomenon was too recent for them to be able to evaluate its effects with any confidence. Some of them also thought that consolidation might be relevant in the future – particularly if its pace picked up relative to that of globalisation. Moreover, studies of cross-country differences in the strength of the monetary transmission mechanism offer some support for the existence of financial structure effects on the potency of monetary policy. In short, it should not be asserted that there is conclusive evidence that financial sector consolidation has had no effect on monetary policy. Rather the case for such an effect is not proven; it may simply be too early to tell. Central banks need to be flexible about how they set the proximate instruments of monetary policy, so that they can respond to any apparent changes in the monetary transmission mechanism. The optimal response will depend upon the reason for the change. Understanding the potential impact of financial sector consolidation – and indeed of other factors such as globalisation – should enable central banks to do better than with trial and error alone. It would be prudent for forward-looking central banks to bear in mind in particular the possibility that consolidation could, in future, tend to reduce the importance of the so-called credit channels of monetary policy transmission – to the extent they are operative – and thereby reduce the impact of changes in monetary policy instruments on the real economy.

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