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HOW INDIVIDUAL CAPITAL REQUIREMENTS AFFECT CAPITAL RATIOS IN UK BANKS AND BUILDING SOCIETIES(*)

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Abstract

The UK's Financial Services Authority sets individual capital requirements that reflect its assessment of risks and that are greater than the 8% minimum required by Basel. This approach is similar to the supervisory review in Pillar II proposed in the new Basel Accord. Using regulatory returns for UK banks and building societies, we empirically assess how changing a firm's individual capital requirement affects its capital ratio. We find that banks faced with an increase in capital requirements transfer nearly 50% of the increase into changes in their capital holdings, but only 20% if they face a reduction. The results are different for building societies, where about 20% of either an increase or a decrease in capital requirements is transferred into capital ratios.

Words: 5294.
Key words: Banks, building societies, capital requirements.

1 Introduction

The UK's Financial Services Authority (FSA) sets individual capital requirements for UK banks[1] and building societies[2] in excess of the current Basel minimum of 8%. Most banks and building societies hold considerably more capital than required by the FSA. This might lead one to assume that changes in capital requirements do not affect the amount of capital held, as the changes will be fully absorbed by this excess or buffer.

There is a growing empirical literature on the determinants of banks' capital buffers. It includes Furfine (2000) for US banks, Rime (2000) for Swiss banks, Kleff and Weber (2003) for German banks, Ayuso et al. (2004) for Spanish banks, and Lindquist (2004) for Norwegian banks. These papers focus on the capital buffers over the Basel minimum because the regulators do not set individual capital requirements like in the UK. However, the buffer over individual capital requirements in the UK might not be a decision variable and be just residual.

We analyse the determinants of UK firms' capital ratios. Following Alfon et al. (2004) we assume that firms' capital ratios could be influenced by firms' internal factors (e.g. the risk preferences of managers), by market discipline exerted by shareholders and bondholders and by the regulatory framework.[3]

Our research gathers evidence on the role of the FSA's individual capital requirements in determining the capital ratios of UK banks and building societies. In particular we analyse empirically whether and how capital ratios are affected by individual capital requirements.[4] Ediz et al. (1998), exploring UK banks' reactions to regulatory pressure, found evidence that banks boost their capital ratios as soon as they fall to a certain level above the regulatory minimum. Here, we quantify the impact of having individual capital requirements, an arrangement that will be extended to most banks operating in countries that adopt the new Basel Accord.

The paper is structured as follows. Section 2 sets out aspects of the UK framework for individual capital requirements. Section 3 describes the data used. Section 4 presents our empirical model. Section 5 summarises the estimation approach and discusses the results. Section 6 concludes.

1. The term *UK bank* is used here as a bank that both operates in the UK and is incorporated in the UK. We therefore exclude UK branches of foreign banks.
2. A building society is a mutual organisation whose main activity is mortgage lending for house purchase, financed mainly but not exclusively by taking deposits from retail customers.
3. See Alfon et al. (2004a) for a review of these factors and Alfon et al. (2004b) for a summarised qualitative analysis of the factors' relevance for UK banks and building societies, based on interviews.
4. Banks and building societies also accumulate provisions against loan default. These provisions protect against expected losses and are likely to vary over time, Pain (2003). Provisions are therefore different from capital, which should provide a buffer against unexpected losses. Decisions about provisions and capital are unlikely to be independent. For example, Laeven and Majnoni (2002) explore the relationship between capital and provisions and find that banks tend to delay provisioning for bad loans, thereby possibly magnifying the economic cycle's impact on capital. Further research may be needed to explore the relationship between capital and provisions in the UK.

2 Framework for capital requirements in the UK

A regulator may set a capital requirement with the explicit intention that banks always operate with a higher capital ratio. In fact, this is the intention behind the 8% ratio of the current Basel Accord, BCBS (1999). In the UK, the regulator sets individual capital requirements in excess of the 8% as minima with the expectation that firms will always exceed even them.

The FSA inherited from the Bank of England the practice of setting two separate capital requirements for each bank: a ‘trigger ratio’ and a higher ‘target ratio’. The trigger ratio was a minimum capital ratio for the bank that would trigger regulatory intervention if breached. The target ratio was to act as a warning light and as a cushion of capital to help prevent an accidental breach of the trigger ratio. For building societies, the Building Societies Commission set ‘threshold ratios’ that corresponded to banks’ trigger ratios.

Following the Financial Services and Markets Act, which came into force in 2001, the FSA stopped setting target ratios for banks and said that it would “consider it to be good management practice in the financial services industry for a UK bank to hold an appropriate capital buffer above the individual capital ratio advised by the FSA”, FSA (2001). At the same time, the FSA published details about the factors that it would take into account when setting banks’ individual capital requirements, risk being the main factor, FSA (2001). The FSA also announced that it was reviewing banks’ individual capital requirements to make them consistent with the new framework. A similar review took place for building societies.

Three broad characteristics underlie the UK regulatory system for banks and building societies throughout the period analysed: individual capital requirements are set at firm-specific level; the FSA may at any time vary a firm’s requirement; and individual capital requirements exceed the Basel minimum of 8% for all banks and building societies. The “FSA considers that the basic 8% regulatory minimum capital requirement is only appropriate for a well-diversified firm whose business, management, systems and controls are strong and where the risks that it is exposed to are captured adequately by the existing capital model”, FSA (2001). In fact, the Basel Committee of Banking Supervision, BCBS (1999), recognised as weaknesses of the current system its poor risk sensitivity, its difficulty in covering all risks and its inability to provide the right incentives for good risk management practices.[5] These views are shared by many analysts, for example, Milne (2001) and Oliver, Wyman & Company (2001).

5. BCBS (1999) also acknowledged that the requirements mostly deal with credit and market risks: “While the original Accord focused mainly on credit risk, it has since been amended to address market risk. Interest rate risk in the banking book and other risks, such as operational, liquidity, legal and reputational risks, are not explicitly addressed. Implicitly, however, the present Accord takes account of such risks by setting a minimum ratio that has an acknowledged buffer to cover unquantified risks.”

3 Data used

We use data from the prudential returns submitted to the FSA by building societies and UK banks. For building societies we use quarterly data from the second quarter of 1997 to the second quarter of 2002, constituting a balanced panel dataset.[6] For banks we use quarterly data from the third quarter of 1998 to the third quarter of 2002. Banks report at different months. In some cases their reporting pattern is not regular and some have changed it during the period analysed. It is therefore an unbalanced panel dataset that in most cases does not contain information about income and expenditure (profit and loss account data).[7]

Tables 1 and 2 summarise the main statistics of the variables used in analysing building societies and banks respectively. A comparison of the tables shows much higher unweighted average capital ratios and regulatory capital requirements for banks than for building societies.

The tables also show that, with the exception of the building society proxy for the return on equity, all variables show more dispersion across firms than within a given firm over time.[8] In many instances, the differences among firms are four times larger than the differences over time for a given firm. The dispersion is greater for actual capital ratios than for required regulatory ratios, suggesting that the market discipline and management preferences differentiate more between firms than the regulator. Dispersion in capital ratios is much lower for building societies than for banks, which could indicate that the former are more homogeneous.

Table 3 summarises some statistics where the data are weighted by size. We use two measures of size: 1) total assets and 2) risk-weighted assets, with the weights used in the current Accord. The table shows that, weighted by total assets, the average capital ratio for banks is nearly 50% above the average individual capital requirements set by the FSA (35% if weighted by risk-weighted assets). This rises to over 85% for banks without trading book activity (40% if weighted by risk-weighted assets).[9] It must be taken into account that banks that have a trading book are larger than the average bank and most of them have a non-UK parent. On the other hand, building societies hold a weighted average about 31% more than individually required. Building societies' weighted average buffer (i.e. capital minus individual capital required, as a percentage of individual capital required) is below that for banks. The weighted averages of actual capital ratios and buffers are much lower than the unweighted averages, indicating that larger firms tend to have lower capital ratios and smaller buffers.

As Figure 1 shows, over the period banks increased their buffer. Building societies maintained theirs at a steady level. The differences in capital ratios amongst banks have reduced in the same period. The pattern for building societies seems to be the contrary, as the dispersion has increased, especially since 2000.[10]

6. These returns include both capital statements and the income and expenditure account.
7. We have excluded observations of banks where the capital ratio or the capital requirement is missing, where the capital ratio is shown as exceeding 500% of risk-weighted assets, or where more than 100% is obtained for the proportion of total assets that attract a 100% risk-weight or the proportion of commercial and retail deposits to total deposits. We have also excluded two observations with capital ratios at or below the required minimum level, as these banks would have been subject to intervention by the supervisory authorities.
8. The mean of the ROE for the minority of banks for which data are available is 6.88%.
9. The trading book consists of securities, foreign exchange, commodities positions, and derivatives that are held for a short term trading purpose.
10. The coefficient of variation (CV) of banks' individual capital requirements in 1998 was 0.59. It dropped to 0.42 at the end of 2000 and 0.27 in 2002. For building societies, the CV shows the reverse pattern: from 0.04 in 1997 to 0.08 in 2002.

4 Empirical model

The framework used to explore the effect of individual capital requirements on actual capital is based on Ayuso et al. (2004) and Lindquist (2004), which analyse the buffer capital of Spanish and Norwegian banks respectively.

We specify the model in terms of actual capital ratios.[11] The most general specification of our model can be represented as:

$$K_{it} = A_i\ KREQ_{it}^{\alpha}\ RISK_{it}^{\beta}\ SIZE_{it}^{\delta}\ GGDP_{it}^{\gamma}\ DEP_{it}^{\tau}\ PEER_{it}^{\lambda}\ Z_{it}^{\xi}\ K_{it-1}^{\mu}\ \eta_i\ \varepsilon_{it} \quad (1)$$

where K_{it} is the total capital held by firm *i* at time *t* as a ratio of risk-weighted assets, and *A* is a constant.

KREQ is the individual capital requirement set by the FSA (a ratio of capital to risk-weighted assets).[12] If banks and building societies react to the individual capital requirements α should be positive and statistically significant.[13] A theoretical approach that links the probability of regulatory intervention and a bank's level of capital, can be found in Milne (2000).

The variable *RISK* is an ex-post measure of risk, calculated as the proportion of a firm's total assets that are assigned the highest risk (i.e. those with a 100% risk-weight).[14] A statistically significant β coefficient could be interpreted as evidence that firms assess risk differently from regulators. A positive coefficient would suggest that increases in the risk of the portfolio are associated with capital increases beyond those required by the heavier regulatory weight given to those assets. This would suggest that firms assign an even larger risk to these assets than the regulator; a negative coefficient would be compatible with either the presence of moral hazard behaviour in firms or the possibility that firms with riskier assets also have better quality risk management mechanisms, so that they can hold less capital than less sophisticated firms with the same risk.

SIZE is measured by total assets. Most hypotheses suggest a negative relationship between size and capital ratio. It could be argued that screening and monitoring to reduce the asymmetric information between lender and borrower generate costs some of which can present economies of scale. We also expect a negative relationship between capital ratio and size, because of diversification benefits that can arise with a large portfolio. Moreover, according to the "too-big-to-fail" hypothesis, the largest institutions could be holding less capital since they expect that in the event of a problem they will receive support from the

11. As explained earlier, Ayuso et al. (2004) and Lindquist (2004) used the buffer over the Basel minimum as the explanatory variable because regulators in Spain and Norway do not set individual capital requirements. We have also estimated our model with the buffer over individual capital requirement as the dependent variable. The results are similar to those presented here: there is inertia or adjustment costs; risk, size, quality of capital and growth have a negative impact on the buffer; non-wholesale deposits and peer pressure have a positive effect (although the latter is not statistically significant).

12. We use the trigger ratio and the individual capital requirements for banks and the threshold ratio for building societies as the measure of regulatory requirements.

13. We carry out a Granger causality test to assess the hypothesis that changes in individual capital requirements precede changes in actual capital and not the other way round. We carry out the test, using a random-effects (within) estimator. When we regress banks' individual capital requirements on the lagged variables, the p-value of the lagged actual capital ratio is 0.33 (0.64 in the within estimation). When we regress banks' actual capital on the lagged variables, the p-value for the lagged individual capital ratio is 0.03 (0.43 in the within estimation). Therefore there is some evidence that the changes in individual capital requirements precede changes in levels of actual capital.

14. The data suggests that the largest firms seem to be holding the lowest proportion of risky assets. For example, on average, 25.6% of the assets of the largest banks are 100% risk-weighted whereas the smallest banks have, on average, 38.5%.

regulator. A negative relationship would also result if small firms had more difficulties accessing capital markets when faced with stressful situations and preferred to hold a higher level of capital overall than large firms did. Small firms could have proportionally larger adjustment costs. A negative relationship between size and capital ratio could also support the hypothesis of market signalling, whereby small firms might use their capital as a mechanism to show the market their soundness or their prudence. It could also support the hypothesis that small firms need slack to finance their long-term strategies.

Economic conditions may also affect the overall level of capital, see Borio et al. (2001). *GGDP* tries to capture the role of the cycle and is measured as the real annual GDP growth rate by quarter. We expect that in a downturn, when risks are more likely to materialise, actual capital ratios may decrease as a result of write-offs and because of increases in specific provisions. Moreover, the default probabilities of loans and the value of collateral could be highly correlated, since when the market turns down many participants might want to sell assets at the same time. A macroeconomic downturn will lead to a deterioration in ratings and hence to additional demands on capital for those firms using ratings to assess their loans' risks and to decide on capital. In an upturn, risk reduces and firms can safely hold less capital than in a downturn. If actual capital is pro-cyclical, we expect the coefficient of *GGDP* to have a negative sign.

For each period *t* and firm *i*, the variable *PEER* is the average capital ratio of all firms, except firm *i*, that report at time *t* and that are of similar size to firm *i.*[15] It tries to capture peer pressure as its existence could imply that there is a kind of herd effect.[16] If this effect exists, we would expect the coefficient of *PEER* to be positive.

DEP is the proportion of commercial and retail deposits (i.e. non-interbank deposits) over total deposits. Only retail deposits up to certain limits fall within the scope of deposit compensation scheme so this variable is included to capture the relevance of deposit insurance. For example, Nier and Bauman (2003) find that a higher share of uninsured funding leads banks to choose a larger capital buffer for a given risk, so the larger the amount of insured funding, the weaker the market discipline could be. A negative coefficient of *DEP* could be regarded as evidence of moral hazard behaviour by firms.

Other variables, denoted generically as Z, have also been included in the estimation depending on their availability and relevance. For building societies, return on equity, *ROE*, is included as a proxy for the cost of capital. It is measured as the proportion of profits over capital. We expect the sign of the coefficient to be negative. As already mentioned, this variable could not be constructed for most banks as their returns do not include the relevant data.

For banks, we include as part of Z the variable *TRADE* as a proxy for the amount of trading book activity. It is measured as the proportion of the trading book's notional risk-weighted assets over total risk-weighted assets. It is included as it could be argued that the risk associated with these activities could have different implications for capital than does credit risk. The variable could capture business differences associated with trading activities in the firms' overall portfolio.[17] We also include *FOREIGN*. This is a trend dummy variable that takes the value of 1 if the country of origin of the bank's parent is the UK and 0 otherwise.

15. Firms are grouped by quartile.
16. Lindquist (2004) proposes a similar measure, although not grouping firms by size.
17. The average proportion of assets in the trading book was 2.3% for UK-owned banks, 13.3% for other EU-owned banks, 17.1% for US-owned banks and 12.2% for other foreign banks.

The hypothesis that there are adjustment costs in attaining the desired level of capital is captured by the inclusion of the dependent variable lagged one period.

Finally, η_i is an unobservable variable that captures the idiosyncratic features of each firm that are constant over time but vary from firm to firm. These could cover management's aversion to regulatory risk, management's strategy for new business opportunities and management's freedom from shareholders. ε_{it} is a random shock.

5 Estimation and empirical results

In order to carry out the estimation, we re-specify equation 1 in logs, so that it becomes:

$$k_{it} = a_{it} + \alpha\, kreq_{it} + \beta\, risk_{it} + \delta\, size_{it} + \gamma\, ggdp_t + \tau\, dep_{it} + \lambda\, peer_{it} + \xi\, z_{it} + \mu\, k_{it-1} + \eta_i + \varepsilon_{it} \qquad (2)$$

where the lower case names indicate all variables are in logs.

We treat *risk, dep, trade* and *roe* as endogenous. As the lagged endogenous variable is included among the regressors, we transform the equation into first differences and estimate it with a GMM estimator. We use as instruments the lagged levels of the dependent variable and of the endogenous variables (second, third and fourth lags), and the lagged differences of the exogenous variables. We report the estimated coefficients and robust standard errors from the robust first-step estimators. We also report the Sargan test of over-identifying restrictions and autocorrelation tests of first and second order.[18]

Table 4 presents the results from the dataset for building societies. Column 1 reports the results for the whole sample. Columns 2 and 3 report the results for building societies that have experienced an increase or decrease respectively in their individual capital requirements. The last column shows the results for building societies with buffers in the lowest quartile.

Table 5 shows the results for banks. Column 1 shows the results for the whole sample. Column 2 shows the results for banks with a trading book. Columns 3 and 4 show the results for banks that have experienced an increase and a decrease respectively in their individual capital requirements. 33 banks have experienced both increases and decreases in their requirements during the period considered and are therefore included in both columns. Column 5 shows the results for banks with the lowest buffers (those in the lowest quartile).

None of the estimated equations in Tables 4 and 5 can reject the Sargan test of over-identifying restrictions. They all show the adequate properties in the face of autocorrelation: they show first order autocorrelation but the hypothesis of no second order autocorrelation can not be rejected in all cases.

We find that size has a negative effect on capital, so the larger the firm the lower its capital ratio. This negative relationship could be consistent with any of the hypotheses discussed above under "size". The current specification does not allow for a unique interpretation.

The relationship between capital ratios and the proposed measure of ex-post risk is estimated to be negative, so the higher the risk appetite of a firm, the less capital it holds. Evidence of a negative risk effect is also obtained in Ayuso et al. (2004) and Lindquist (2004). This result could support the hypothesis that there is moral hazard in firms' behaviour. However, this interpretation is not consistent with the positive relationship estimated between capital and the ratio of partially insured deposits over total deposits plus capital holdings.

18. Using data on first differences, we should observe first order autocorrelation and no second order autocorrelation.

It could be argued that firms with riskier assets also have better quality systems and controls allowing them to be comfortable with less capital for a given risk.[19]

We find a negative and significant relationship between the economic cycle and the capital ratio for banks. The results are consistent with those reported in Ayuso et al. (2004) for buffers of Spanish banks. Not surprisingly, for building societies the results are less clear: the estimated coefficient is negative but not significant. We also find evidence that peer pressure affects the capital ratio of all types of firm considered, although the coefficient is not very high. This is broadly consistent with Lindquist (2004). This suggests that firms may be using the capital ratio as a signalling device.

For banks with a trading book, we estimate a negative relationship between the value of assets in the trading book and the capital ratio. Again it could suggest that firms with a trading book value risks differently from firms without, perhaps because assets in the trading book are more liquid than in the banking book.

The coefficient of the cost of capital for building societies is estimated to be positive and statistically significant –a result which is difficult to interpret–. However, when we exclude the lagged capital ratio (a proxy for adjustment costs), we find a weak and negative relationship between *roe* and capital ratio.[20] A possible explanation is that profits are the main source of capital for building societies, so that the proxy used in the estimation for the cost of capital is not appropriate. For the banks that include profit and loss data in their returns, the estimated coefficient of the return on equity is positive and not statistically significant. The role of the cost of capital and the need to find a meaningful proxy for it need to be explored further.

We might also expect that firms whose actual capital ratio is closer to their individual capital requirement would react more strongly to changes in capital requirements, because of the greater risk of breaching the requirement, Ediz et al. (1998). To test this hypothesis, we estimate the equation for groups of firms defined according to their buffer. For the lowest quartile, we find that the estimated coefficient is higher for banks and building societies with low buffers than for the average bank. In other words, firms with small buffers react more to a given change in individual capital requirements.[21] The estimated coefficient for banks with low buffers is higher than the coefficient for building societies with low buffers. This suggests that the banks with the lowest buffers react more than building societies with the lowest buffers to changes to individual capital requirements.

For both building societies and banks we obtain a significant and positive relationship between individual capital requirements and actual capital ratios, indicating that the higher the required individual capital ratio the higher the actual capital ratio. The short term coefficients range from 0.28 for all banks to 0.43 for banks engaged in trading activities. The long term coefficients are 0.41 and 0.61 respectively. For building societies the short term coefficient is 0.18 and the long term one is 0.29. So there is never a one-to-one response. These figures suggest that, in general, much less than 50% of changes in individual capital requirements are translated into changes in the capital ratio. In other words, the buffer tends to absorb most of any change in the requirements.

19. Rather similar results were obtained when we proxied risk by the ratio of Tier one capital over total eligible capital and when we used other definitions of risks such as the ratio of highest risk assets over risk-weighted assets, the proportion of assets weighted at 50% or proportion of risk-weighted assets to total assets.

20. The estimated coefficient is negative and statistically significant at the 20% level of confidence.

21. In general terms, firms with a large buffer do not seem to react to changes in the required capital: the coefficient of individual capital requirement is either not statistically significant or much lower than for firms whose capital is closer to the regulator's requirement.

In order to assess the robustness of these results we test for asymmetric responses to changes in capital requirements. When the sample is split between firms that have experienced an increase in their required capital ratio during the period analysed and firms that have experienced a decrease, the results show different responses to changes. In particular, banks that have experienced an increase in their requirements raise their actual capital ratio by 50% of the increase in the requirement in the short term and by nearly 71% in the long term. For banks that have experienced a decrease, the adjustment is around 20%. This result seems to suggest that banks are more concerned with the possibility of regulatory breach than with the additional costs associated with holding excess capital.[22] Building societies react similarly to increases and reductions in regulatory capital requirements. Under both circumstances the buffer absorbs 80% of the change and the building society changes its capital holdings by 20%.

22. The lack of statistical significance of *roe* mentioned earlier could support such an interpretation. However, as already pointed out, the results obtained for *roe* must be treated with caution.

6 Conclusions

Our main finding is that, although firms have a buffer over individual capital requirements, changes in the individual capital requirements are very likely to be accompanied by some response in the capital ratio. For example, if a bank (building society) which is holding capital at 15% of risk-weighted assets has its individual required capital ratio increased from 10% to 11%, it would on average increase its actual capital ratio at least to 15.4%.

The evidence shows that firms operating close to their individual capital requirement are more sensitive to changes in regulatory capital than firms with a large buffer. As the firms with smaller buffers are generally large banks, it could be argued that changes in individual capital requirements will affect them more than they will affect smaller banks. The firm's degree of risk aversion will influence the final impact as firms with riskier assets seem to hold less capital.

The implementation of the new Basel Accord will change the relationship between regulatory capital requirements and the capital held by firms. Since regulatory capital will rely more heavily on internal models devised by firms to set their desired capital, the link between capital requirements and actual capital may be reinforced. This requires further research.

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Figure 1. Unweighted average buffer over required capital (%)

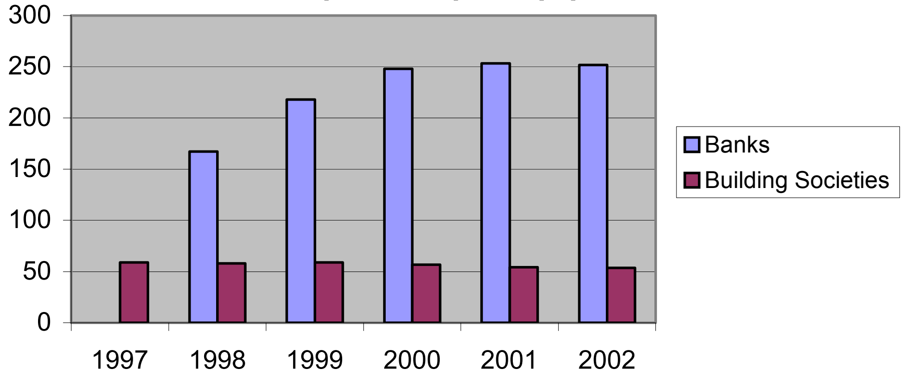

TABLE 1. Summary statistics about building societies[1]

	Mean	Overall standard deviation	Standard deviation over time	Standard deviation within firms
Actual capital (% of risk-weighted assets; *K*)	15.16	4.11	4.05	0.88
Capital requirements (% of risk-weighted assets; *KREQ*)	9.65	0.50	0.40	0.30
Tier 1 capital (% of total capital)	95.45	6.89	6.52	2.37
Buffer (% in excess of capital requirement)	56.92	40.51	39.70	9.39
Buffer (difference between actual capital and capital requirement in percentage points)	5.50	4.02	3.96	0.87
Size (£m of assets; *SIZE*)	2229	7947.4	7859.9	1513.1
Riskiness (% of total assets attracting a 100% risk-weight; *RISK*)	6.88	4.18	3.75	1.89
Return on equity (%; *ROE*)	6.83	4.52	2.55	3.75
Observations: 1365 Firms: 65				

[1] Quarterly data; unweighted; second quarter 1997 to second quarter 2002.

TABLE 2. Summary statistics about banks[1]

	Mean	Overall standard deviation	Standard deviation over time	Standard deviation within firms
Actual capital (% of risk-weighted assets; *K*)	41.45	61.01	61.44	22.60
Capital requirements (% of risk-weighted assets; *KREQ*)	12.78	5.90	5.21	3.33
Tier 1 capital (% of total capital)	87.28	14.89	13.89	5.87
Buffer (% in excess of capital requirement)	234.52	558.38	546.15	223.14
Buffer (difference between actual capital and capital requirement in percentage points)	28.67	59.67	60.02	22.81
Size (£m of assets; *SIZE*)	14536.5	46452.24	42617.7	11559.41
Riskiness (% of total assets attracting a 100% risk-weight; *RISK*)	30.82	26.22	24.69	9.29
Proportion of commercial and retail deposits (% of all deposits; *DEP*)	63.04	35.00	32.72	13.14
Proportion of assets in the trading book *(%; TRADE)*	7.55	20.08	18.62	6.04
Observations: 2744 Firms (foreign): 187 (92)				

(1) Quarterly data; unweighted; third quarter 1998 to third quarter 2002.

TABLE 3. Additional data for banks (1998-2002) and building societies (1997-2002)

		Average capital requirements % of risk-weighted assets	Average actual capital % of risk-weighted assets	Average buffer % of capital requirement	Proportion of assets in trading book % of risk-weighted assets	Proportion of tier 1 capital % of total capital	Average size £ billion of assets
All banks	Unweighted	12.78	41.45	234.52	7.55	87.28	14.54
	Weighted by total assets	9.42	14.16	48.06	9.83	84.78	
	Weighted by risk-weighted assets	9.42	12.92	35.03	8.61	95.14	
Banks with trading book activity	Unweighted	10.97	30.24	177.67	22.80	83.15	33.74
	Weighted by total assets	9.20	12.71	36.38	12.79	84.21	
	Weighted by risk-weighted assets	9.24	12.49	33.82	11.23	97.04	
Banks without trading book activity	Unweighted	13.68	47.0	262.68	0	89.61	5.02
	Weighted by total assets	10.15	18.99	86.95	0	86.79	
	Weighted by risk-weighted aassets	10.01	14.33	39.03	0	88.88	
Building societies	Unweighted	9.65	15.16	56.92	n/a	95.45	2.23
	Weighted by total assets	9.45	12.40	31.13	n/a	90.32	
	Weighted by risk-weighted assets	9.43	12.33	30.76	n/a	90.56	

TABLE 4. Determinants of building societies' capital ratios[1]

Variable	All sample	Firms that experienced an increase in capital requirements	Firms that experienced a decrease in capital requirements	Firms with a low buffer [2]
kreq	0.18 (0.07)**	0.22 (0.10)**	0.21 (0.10)**	0.29 (0.14)**
size	-0.02 (0.02)	-0.05 (0.03)**	0.01 (0.01)	-0.08 (0.04)**
risk	-0.04 (0.01)**	-0.05 (0.01)**	-0.04 (0.01)**	-0.01 (0.02)
ggdp	-0.002 (0.005)	-0.003 (0.007)	-0.004 (0.006)	-0.01 (0.009)
peer	0.16 (0.06)**	0.17 (0.09)**	0.04 (0.08)	0.17 (0.13)
roe	0.01 (0.004)**	–	–	–
k_{t-1}	0.48 (0.06)**	0.39 (0.06)**	0.63 (0.12)**	0.34 (0.09)**
k_{t-2}	-0.10 (0.04)**	-0.10 (0.04)**		
Sargan test[3]	1.00 (291)	1.00 (239)	1.00 (242)	1.00 (242)
H_0 = No 1st order autocorrelation Prob > z	0.000	0.0004	0.13	0.03
H_0 = No 2nd order autocorrelation Prob > z	0.87	0.93	0.80	0.55
Number of observations	1162	954	304	305
Number of firms	65	53	16	33

(1) Quarterly data from second quarter 1997 to second quarter 2002. First difference regressions. First-step robust standard errors in brackets. All equations include quarterly dummies. *Risk, dep, roe,* k_{t-1} *and* k_{t-2} have been instrumented with their 2nd ,3rd and 4th lags and the lagged differences of the exogenous variables.
(2) Includes only observations corresponding to a buffer lower than 30.5%, which corresponds to the lowest quarterile of the population.
(3) Prob > χ^2 (degrees of freedom).
(**) Statistically significant at 5%.

TABLE 5. Determinants of banks' capital ratios(1)

Variable	All sample	Firms with trading book	Firms that have experienced an increase in capital requirements	Firms that have experienced a decrease in capital requirements	Firms with a low buffer(2)
kreq	0.28 (0.14)**	0.43 (0.23)*	0.49 (0.23) **	0.19 (0.10)**	0.41 (0.15)**
size	-0.23 (0.06) **	-0.38 (0.07)**	-0.25 (0.04)**	-0.26 (0.06)**	-0.13 (0.06)**
risk	-0.22 (0.07)**	-0.23 (0.05)**	-0.17 (0.04) **	-0.25 (0.07)**	-0.12 (0.06)**
ggdp	-0.04 (0.02)**	-0.11 (0.04)**	-0.08 (0.04)**	-0.01 (0.02)	-0.04 (0.02)**
peer	0.07 (0.02)**	0.06 (0.03)*	0.08 (0.03)**	0.06 (0.03)**	0.01 (0.01)
dep	0.02 (0.03)	0.02 (0.01)**	0.02 (0.01)*	-0.03 (0.03)	-0.02 (0.06)
trade	-	-0.06 (0.03)**	-	-	-
foreign	0.005 (0.005)	0.008 (0.007)	-0.002 (0.007)	0.01 (0.007)*	0.0005(0.006)
k_{t-1}	0.32 (0.09)**	0.30 (0.06)**	0.31 (0.07)**	0.24 (0.05)**	0.22 (0.07)**
Const	0.007 (0.003)**	0.006 (0.006)	0.01 (0.005)*	0.006 (0.004)	-0.02 (0.004)**
Sargan test(3)	0.93 (201)	1.00 (242)	1.00 (201)	1.00 (201)	1.00 (190)
H_0 = No 1st order autocorrelation Prob > z	0.000	0.005	0.009	0.0004	0.05
H_0 = No 2nd order autocorrelation Prob > z	0.92	0.99	0.75	0.78	0.47
Number of observations	2052	646	821	1180	403
Number of firms	182	59	72	97	76

(1) Quarterly data from second quarter 1997 to second quarter 2002. First difference regressions. First-step robust standard errors in brackets. All equations include quarterly dummies. *Risk, dep, roe* have been instrumented with their 2nd ,3rd and 4th lags and the lagged differences of the exogenous variables.
(2) Includes only observations corresponding to a buffer lower than 30.5%, which corresponds to the lowest quarterile of the population.
(3) Prob > χ^2 (degrees of freedom).
(*) Statistically significant at 10%.
(**) Statistically significant at 5%.

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