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JEL Classification: G21, M40
Keywords: Stakeholder Corporate Governance; Credit Unions; Regulatory-Capital Arbitrage; Accounting Manipulations.

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Abstract

This study examines the extended stakeholder corporate governance model in credit unions and the extent to which inherent managerial entrenchment impacts upon their operational decisions. Using Australian credit union data and the introduction of Basle-type capital adequacy regulations as a case study, we demonstrate that credit union management will opt to manage capital adequacy ratios through the application of accounting manipulations instead of applying policies that increase operating margins. In particular, credit unions with capital adequacy ratios below the Cooke Ratio of 8% will undertake risky accounting reclassifications. Our results support the view that regulators should consider the heterogeneity of financial institutions before imposing (possibly) inappropriate template regulation with a one-shoe-fits-all regulation.

JEL Classification: G21, M40
Keywords: Extended Stakeholder Corporate Governance; Credit Unions; Regulatory-Capital Arbitrage; Accounting Manipulations.

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1. Introduction

The co-operative philosophy of credit unions can have two very different effects on managerial behavior and firm strategy. The first effect arises because, compared to pure profit-seeking firms such as banks, credit unions have an extended stakeholder approach to corporate governance based upon cooperative principles. Their operating philosophy is derived from mutual collaboration encompassing the provision of services to members at cost, the equitable treatment of members, and a broad notion of firm and community service. This favorable view of credit unions is further developed in Smith, Cargill and Meyer (1980), Smith (1984, 1988) and Davis (2001).

The second effect occurs because of the structural nature of credit unions. Since their governance policy is determined by a one member-one vote approach, managers of credit unions can become significantly entrenched, especially in larger institutions when ownership is highly diverse. As Fama and Jensen (1983a,1983b) note, members of cooperatives are less likely to remove incumbent management and vote at general meetings. Managers are consequently insulated from external and internal governance discipline, can become entrenched and exert undue control on the direction of the credit union.

Due to the increasing importance of credit unions worldwide,[1] it is important to study the impact of corporate governance on issues like performance and risk strategy. There is little such research in financial cooperatives, especially credit unions. Exceptions include Karels and McClatchey (1999), who find that managers do not increase risk taking as a result of deposit insurance on US credit unions but that risk-taking decreases as membership base expands [Frame, Karels and McClatchey (2002)]. Davis (2001) argues that the one member-one vote system protects the cooperative philosophy of credit unions by constraining the ability of powerful members (as proxied by invested wealth) from converting the credit union to a stock based institution. On the other hand, research has shown that credit union managers are more likely, compared to their profit-seeking corporate counterparts, to act in their own interests. In particular, Leggett and Strand (2002) show that agency issues in credit unions increase as institutions become larger. In addition, Frame,

[1]To illustrate, the total assets of US credit unions in 2004 amounted to 647 billion dollars compared to 438.2 billion dollars in 2000 [National Credit Union Administration (2004)]. In 2003, there were 40,421 credit unions worldwide in 84 different countries with total assets of 758.4 billion dollars [The World Council of Credit Unions (2003)].

Karels and McClatchey (2003) find that credit union managers expropriate cash arising from the tax advantages of cooperative institutions.

This paper presents new evidence on the effect of corporate governance on credit union managerial behavior by examining the impact of external discipline on operating performance. Specifically, we investigate how managers react to the imposition of new capital reserves legislation, an innovation that puts severe pressure on credit unions with low capital adequacy ratios. Two behavioral tendencies may manifest themselves. One, credit unions can improve their capital reserves to acceptable levels through increasing lending rates, and/or decreasing deposit rates, or cutting costs. We show that this approach will be unacceptable because it is contrary to the cooperative and extended stakeholder philosophy of equitable treatment, managerial interests and, more pragmatically, the credit union will likely lose business to competing institutions. Alternatively, managers could seek the least costly solution and undertake some form of accounting arbitrage by manipulating their accounting ratios without changing business policy [Jackson (1999:19)]. This would have little impact on the endogenous allocation of member services, but does not, in the short term, address the underlying risk issue.

The specific case studied is the imposition of the 1992 Australian Financial Institutions Code (AFIC) on credit unions in New South Wales, Australia. AFIC is particularly interesting because for the first time, credit unions were governed by the capital adequacy rules of the 1988 Basle Accord. At-risk credit unions, those with capital ratios below the standard Cooke Ratio of 8%, were forced to meet those capital adequacy ratios within a maximum period of three years and faced further censures in the meantime. The introduction of AFIC coincided with a period of reformation in the regulation of financial service providers that emphasized the preeminent role of risk capital and a call for 'prompt corrective' action in contrast the previous policy of regulatory forbearance [Dahl and Spivey (1995)]. As a result, during this period the cooperative philosophy of credit unions and the utility of entrenched managers were put under severe strain.

Moreover, this is now a global issue. Capital adequacy regulations are not unique to Australia. Over one hundred countries have now imposed some form of capital requirements on their financial institutions. Further, the treatment of risky capital is likely to become more homogenized across the financial sector with the introduction of the new Basle Accord in 2007. What makes Australian credit unions particularly well suited for this study is they faced a distinct

deadlines for adherence to the new capital adequacy regulations, and had operations distinctly different from other financial institutions. Thus managers had to choose a response that counterbalanced the requirements of regulators and the needs of both members and themselves. This posed an extreme test of the extended stakeholder/cooperative philosophy of credit unions.

This paper builds upon the model of Smith (1988) by presenting two potential strategies that credit unions can follow - increase profitability or window dress through accounting manipulations - and test our data to see which is most prevalent. The results reveal that managers of at-risk credit unions (Cooke Ratio below 8%) are more likely to engage in accounting manipulations than implement efficiency improvements. In particular, the most common approach is to reclassify risky assets on the balance sheet so as to appear that capital ratios are improving, when in fact business strategy is unchanged.

The remainder of this paper is structured as follows. The next section describes the salient governance features of credit unions and the institutional aspects of the Australian Financial Institutions Code. Section 3 presents the data and reports univariate statistics. Section 4 introduces the econometric model and estimates the impact of AFIC on credit union operational efficiency. Section 5 examines the accounting manipulations that credit unions used in response to AFIC and section 6 contains the conclusion.

2. Institutional Background

2.1. Credit union structure and philosophy

Credit unions, with antecedents, philosophies and operating procedures that vary significantly from other financial and banking intermediaries, have several unique agency relationships. Their philosophy is developed from mutual collaboration, with the main purpose to provide services to members at cost, the equitable treatment of members, and a broad notion of community service to an extended stakeholder set based on co-operative principles (see for example, Westley and Shaffer (1999), Ralston, Wright andGarden (2001), and Goddard, McKillop and Wilson (2002)). This approach is reflected in their modus of operations, which is founded on a one member - one vote basis. Further, member borrowers and savers are treated equally with the view that there be no

conflict between these two classes of members.[2]

Credit unions have traditionally drawn membership from narrow restrictive bonds, usually based on geographical boundaries and common occupational employment or associations [Frame, Karels and McClatchey (2002)]. They focus on providing credit in the form of personal unsecured loans, previously difficult to obtain from banks and significantly less expensive than from other sources. Theoretically their restrictive bonds lower individual agency search costs and reduce the risk of bad debt, and Kohers and Mullis (1987) empirically show that credit unions have an agency cost advantage over banks in consumer finance.

There are other agency relationships that arise due to the institutional structure of credit unions. Davis (1994) documents that credit unions have unrefined corporate governance structures with policy and board agenda dominated by managers. As a result, a number of moral hazard problems develop that results in weak bonding covenants between management, the membership, and the board of directors. First, there is weak governance by members. Because of the one member-one vote policy, the incentive and ability of members to generate a concentration of voting power is limited and member attendance and voting at general meetings is very low.[3] Second, there is weak board governance. Board directors are internally appointed with no outside board members; more often they are volunteers, not remunerated, frequently drawn from a narrow employment bond and, therefore, lacking in skills related to the management and monitoring of a financial institution. However, whilst generally lacking in financial skills, board members bring to the table a strong co-operative *esprit de corps*. Third, a combination of extended stakeholder and cooperative principles, gives rise to internal management that has a propensity to over-staff and to establish generous employee-manager relationships, and a strong bond between the general manager and staff develops. In this way managers obtain a potentially large and influential voting block. In combination, these factors give rise to an entrenched and relatively powerful management structure.

At least as early as Berle and Means (1932) there is a recognition that, in the face of diffused member and board power, managers have considerable discretion to further their own interests by hiding poor performance, diverting cashflow to preferred investments, giving themselves overly generous salary and perquisites, and in capitalising these benefits by job

[2]Whilst credit unions are normally considered to treat borrowers and depositors equally some previous research has examined the possibility that they may be either borrower dominated or saver dominated [see Smith, Cargill and Meyer (1980), Smith (1984, 1988) and Fried, Lovell and Yaisawarng (1999) for more discussion].
[3]The Credit Union National Association (1999) stated that voter turnout for small credit unions was only 26.1%

entrenchment. More recently, Davis (1994), Leggett and Strand (2002), and Frame, Karels and McClatchey (2003) confirmed this is the case for credit union managers. Whilst the possible inefficient use of individual credit union resources is a micro failing for those members, the perpetuation of failings across an industry that has a possible contagion impact, presents a macro problem for regulators.

In this sense, the corporate governance systems of credit unions are significantly different from other profit seeking financial institutions because they do not conform to the standard principal-agent models [Keasey, Thompson and Wright (2004)]. Instead, they have a dual governance system that reflects a very weak principal-agent relationship between members, the board of directors and the general manager, in combination with a strong cooperative-extended stakeholder view of the world. This distinction is particularly interesting given that financial co-operatives must compete with banks, whose internal governance is more closely aligned to a Jensen and Meckling (1976) shareholder principal-agent perspective. An important distinguishing aspect is the entrenchment of credit union managers and the proprietorial power they attain within the co-operative institution.

2.2. The 1992 Australian Financial Institutions Code

In July 1992, the Australian Financial Institutions Code (AFIC) was introduced to provide template prudential regulation for all Australian financial co-operative societies.[4] The AFIC prudential requirements emulated the minimum capital ratios of Basle Accord I and those imposed on US banks by the Federal Deposit Insurance Corporation Improvement Act of 1991 (see Kim and Kross (1998) and Ahmed et al. (1999) for more details). In addition, market, credit data and operations risk are required to be managed and reported together with the provision of guarantees, management contracts, and funds under external management. The stated primary objectives of the AFIC legislation are: (i) to protect and promote financial integrity and efficiency, and (ii) to protect the interests of depositors.

Given the restriction on credit union markets implied by their common bonds, they can be subject to significant shifts in the demand for loans or supply of funds caused by income and demographic changes in membership. These factors, in conjunction with small size diseconomies,

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whereas for large credit unions, it was even lower at 6.2%.

mean they have higher overall risk management problems in the form of exposed liquidity and interest rate risk [Goldsworthy, Schulz and Shuetrim (2000)]. The proposals for the AFIC regulatory reform of the Australian cooperative financial sector was based on these perceptions of higher relative risk structures compared to banks, with the sanctions intended to encourage the rehabilitation of under-capitalised institutions.[5]

Credit union prudential standards are backed by the force of law under the AFIC Code. The penalties for falling below minimum capital requirements include sanctions on loan portfolios and investment activities, monitoring of activities,[6] increased reporting requirements, the placing of credit unions under direction (with an outside manager gaining control), or even forced merger. Any of these sanctions would result in the loss of managerial and board reputation and possible dismissal of the manager. Hence, it is costly for managers to violate and remain below minimum capital requirements set out under AFIC. Prior to AFIC, financial co-operatives were regulated by a range of legislation that differed across Australian states, acknowledging differences between building societies and credit unions, and required significantly lower capital ratios (3% in NSW).

3. Strategies to Improve Capital Adequacy

Given that the prudential standards under AFIC impose high potential costs on both the credit union and managers' personal reputation and future returns, we predict that at-risk credit unions will significantly increase the capital adequacy ratio at or around the introduction of AFIC in September 1992. This behaviour is consistent with Kane's (1988) description of 'regulatory dialectic' in which regulation is followed by avoidance behaviour on the part of regulated firms and with capital increases in the banking literature [Beatty, Chamberlain and Maglioli (1995), Collins, Shackelford and Whalen (1995), Shrieves and Dahl (2003)]. We first test for significant changes in risk weighted capital.

Second, and our main focus, is to determine how at-risk credit unions met the required risk-weighted capital requirements. We also note that credit unions cannot raise external equity to satisfy

[4]The codes encompass permanent building societies (PBS's) and credit unions (CUs).
[5]This criticism is reflected, in part, by the failures of the Pyramid Building Society in Victoria, the State Bank of South Australia, Western Australian Teachers Credit Union and the MOE Credit Union in Victoria.
[6]Credit unions below the 8% capital target and also below a 1% return on assets are placed on active watch by AFIC.

any sudden changes in regulatory capital requirements such as banks are able to do - capital is restricted to one share per member and these cannot be exchanged or traded. Thus, risk weighted capital can only be accumulated through retained profits obtained from operating activities or window dressing by the use of manipulative accounting techniques. We argue constraints imposed by cooperative philosophies together with internal power issues, will provide incentives for credit union managers to not increase risk weighted capital by increasing raw profitability. Instead, credit union management will utilize accounting manipulations to meet the AFIC capital target and view this as the least cost option. Moreover, because of entrenched management issues, these manipulations will be aggressive. The theoretical bases for our hypotheses are outlined below.

3.1. Profitability

In AFIC there is a presumption that regulation will promote efficiency and this will be reflected in increased profitability as a surrogate for efficiency. This is backed by regulatory sanctions determined by the level of risk-weighted capital, which is predicated on the normative belief that efficient behavioural changes can be imposed on under-capitalised cooperatives in such a way so as to reduce inherent risk factors with a simultaneous reduction in losses to depositors. The AFIC prudential reforms therefore emphasise the pre-eminent role for risk capital in the regulatory process. Activities deemed to be higher risk require a larger backing of capital.[7] In turn, this implies that the risk of those activities is borne by equity-holders rather than depositors, and reflects the philosophy generated by the Basle Accord.

However, profit maximising behavior is incompatible with a co-operative philosophy. Smith, Cargill and Meyer (1981) highlight two major factors affecting the objectives of a credit union: (i) the value of a credit union should be maximised with respect to both borrower and depositor, and (ii) any probability of conflict arising between borrowers and depositors should be minimised. Thus, the accrual of capital from members through operating profits poses a serious philosophical problem for management. Increasing profits impose direct costs on members (by increasing the operating margin) and decisions have to be made as to whether the costs are borne by member depositors, member borrowers, or shared in some manner.

[7]For example, a credit union with assets of A$1.0 million, comprised of only business and personal loans (with a risk weighting of 1.0), would be required to have A$80,000 in capital in order to meet the 8% requirement. On the other hand, if the same credit union had assets comprised of residential mortgage loans (with a risk

There are implicit cross-subsidies in such capital creation. Whilst current members receive the benefits provided by capital reserves that accrued at the expense of past members, they in turn bear the costs of current surpluses, which are then retained for the benefit of future members. If capital accrues at a constant rate then the intertemporal burden on members is shared evenly. However, current members who are forced to bear sudden and large jumps in capital creation will 'over-subsidise' future members without any return for these costs. Besides these considerations, there are pragmatic reasons for not altering current deposit and loan rates. Credit unions must compete in the mature banking industry and any change in rates risks a flight of current members, not willing to subsidise future members, to other financial service providers. As a result, managers are unlikely to discriminate against any class of members.

Another way to increase profitability is to cut operating costs. The major costs faced by financial service providers, other than interest expense, is salaries. In credit unions, during the period of this study, the average cost of salary as a proportion of total expenses was 16% compared to 58% for interest expense. This is significantly larger than banks[8] and this group represents political leverage for credit union managers as well as firmly fitting within the extended stakeholder philosophy of credit unions. Managers could turn to other expenses but the empirical evidence for bank institutions suggests efficiency through these expense classes is not an easy short-term recovery path [Dahl and Spivey (1995)]. Hence, we predict that profitability is unlikely to be increased by the endorsement in a reduction of these costs by managers or boards.

There are other issues that support a null hypothesis of no increase in raw profitability. Credit union managers have a high incentive to maintain the going concern of operations and have a comparative advantage in managing personal loan debt. Because of their restrictive membership covenants they have lower agency costs and bad debts compared to banks [Davis (1994)] and hence a viewpoint that Basle risk weightings are incorrect. Consistent with an extended stakeholder philosophy they also view consumer lending activities as providing a low cost externality to society. Further, whilst the role of capital adequacy requirements in constraining the portfolio risk of profit maximising institutions such as banks is perceived to be beneficial, it is not clear whether the same argument can be applied to co-operative institutions. For example, concern has been raised with respect to the effectiveness of various regulations, their impact on the competitiveness of financial

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weighting of 0.5), then only A$40,000 of equity capital would be required.

co-operatives, and the wisdom of forcing niche financial providers into newer markets. For example, Wolken and Navratil (1981) examining the impact of the federal credit union usury ceiling on consumer credit availability, reported that credit unions lost business in the market for deposits as a result of changes in operations. In addition, Brewer, Jackson and Mondschean (1996) showed that in the face of regulation affecting portfolio risk levels, savings and loan institutions that diversified into non-traditional assets increased rather than reduced their risk exposure.

To summarize the above, given credit unions' inability to raise outside equity an obvious approach is to immediately increase raw profitability by increasing the operating margin. However, this is unlikely for several reasons: (i) it goes directly against co-operative culture and requires unpalatable decisions about cross-subsidisation that is unlikely to be endorsed by the board and members; (ii) the empirical evidence for bank institutions suggests efficiency is not an easy short-term recovery path; and (iii) the internal organisational culture is geared to (over)providing services to members through higher staffing levels and this provides significant political capital to managers. Thus, in addressing the question of how AFIC affected the profitability performance of credit unions, it is important to recognize these confounding impacts. Hence, our first null hypothesis is posed in the negative.

H1: At-risk credit union managers will not meet the Cooke 8% risk weighted capital ratio by implementing policies so as to increase raw profitability around the introduction of AFIC.

3.2. Accounting Manipulations

Another strategy to increase required capital under AFIC is to window dress by the use of accounting manipulations. We propose that at-risk credit union managers will be forced to use a portfolio of three basic accounting techniques. We first rely on the 'regulatory dialectic' theories put forward by Shrieves and Dahl (2003), Ahmed, Takeda and Thomas (1999), Beatty, Chamberlain and Magliolo, (1995), Collins, Shackelford and Whalen (1995), Dahl and Spivey (1995), in which bank regulation is followed by accounting arbitrage. Two potential techniques have been widely covered, the use of discretionary accounting and dirty surplus accounting, with most of the literature concentrating on loan loss provisions. These techniques directly address the numerator in the risk weighted regulatory capital ratio. We examine the extent to which unexpected accruals - bad debts,

[8]The comparable cost in the four largest banks was 10%.

long service and holiday leave expense - increase reported income; and the impact that dirty surplus accounting adjustments - asset revaluations, extraordinary items, and loan loss provisions – directly affect the numerator.

We also concern ourselves with the denominator and our third potential accounting management technique is to reclassify the risk weighting of assets into a lower risk class. These accounting reclassifications are risky and would only be attempted if managers were highly motivated to do so. We rely on three key theoretical postulates of Fudenberg and Tirole (1995) and the empirical research by Kanagaretnam, Lobo and Mathieu (2003), with regard to job security concerns, and argue that managerial entrenchment provides such a strong motivation. As a group credit union managers have captured an influential power base, supernormal salaries and perquisites based on size and unrelated to performance, and entrenched positions (Davis 1994). Thus, there is a very strong incentive to minimise the risk of institutional failure in order to maintain this future stream of supernormal salary and perquisites. Whilst these window dressings are risky, Bishop and Lys (2001) propose that the expected costs of regulatory violation are larger than the reputation costs of censure from capital management. Hence, we predict that managers with greater job security concerns and higher levels of comparative salary and perquisites will more aggressively engage in accounting manipulations to meet AFIC targets.

Credit union managers also have the option to rapidly change the asset composition of their loan portfolio by the switching of business lines from high risk personal or business loans into lower risk mortgage loans, or by holding higher levels of cash deposits. We reject this approach on several grounds. First, such strategies are difficult and costly to achieve in the short run. It takes considerable time and resources to refocus the balance sheet (Dahl and Spivey 1995), and re-alignment too quickly into non-traditional areas can be inefficient (Brewer et al. 1996). Second, to progressively turn aside from the high return personal loan area where credit unions have a comparative advantage in agency monitoring is an inefficient reallocation of resources and, arguably, not in the public interest. Hence, our second hypothesis is:

H2: At-risk credit union managers will use aggressive accounting manipulations that affect both the numerator and the denominator to meet the Cooke 8% risk weighted capital ratio.

4. Data and Summary Statistics

The data used was sourced from the Registrar of New South Wales (NSW) co-operative societies and consists of summary accounting data that is lodged with the Registrar each quarter-year. The data set consists of a sample of one hundred and thirty-seven credit unions out of the full sample of one hundred and forty-four NSW credit unions,[9] representing almost half of the two hundred and eighty-eight credit unions in operation in Australia at the time of AFIC introduction. The sample period covers thirty-one quarterly reporting periods from June 1987 through to December 1994. From this data we construct a quarterly return on assets ratio by dividing operating earnings before tax by total assets (QROA). This ratio was then used to evaluate the impact of increased capital adequacy regulations on operating efficiency and/or the willingness of managers to increase operating margins.

In order to calculate the risk weighted capital adequacy ratio the breakdown of total assets into the designated AFIC risk classes was obtained from the quarterly financial reports of all credit unions. These assets were then weighted by the AFIC risk weighted ratios in order to estimate the total risk weighted assets (RWA). The quarterly risk adjusted capital adequacy ratio (QCAR) was then calculated according to the principles outlined in section two as follows:

$$QCAR = \frac{T_1K + T_2K}{RWA} \qquad (1)$$

where T_1K is tier one capital, T_2K is tier two capital and RWA is risk weighted assets.

Following Kim and Kross (1998), we determine those credit unions that were deemed to be at-risk and more likely to engage in earnings and risk capital accounting management techniques. AFIC required a minimum of 8% risk adjusted capital and this legislation was operative from the September 1992 reporting quarter. Hence, at-risk credit unions were defined to be those whose risk-adjusted capital was lower than the required 8% threshold one year before the enactment date, 30 June 1991. In total, there were 32 credit unions deemed to be at risk. We obtained all 31 quarterly financial reports over the research period and proceeded to decompose total assets into the various risk classes in order to calculate the CAR per equation (1) for each quarter. Credit unions were stratified according to size. Small (large) credit unions were defined as having total assets less than (greater than) A$20 million as at 30 June 1992 (per Fried et al. 1993). Small credit unions accounted

for 95 or 69% and large credit unions represent 42 or 31% of the full sample.

INSERT TABLES 1 (DESCRIPTIVE STATS) ABOUT HERE

Decomposition was undertaken for two reasons. First, the research of Fried et al. (1993) suggests that the financial performance of credit unions is related to size, since size influences asset structure (especially the extent of diversification of the loan portfolio), and the ability to quickly generate profits. From Table 1, average assets were $68million for large and $6.4million for small credit unions. Small credit unions had a higher quarterly return on assets than large credit unions (37.58% v 35.51%) and a higher percentage of risky assets (personal loans compared to total loans 93% v 85%). A second reason is the view that size acts as a proxy for the strength of the financial agency relationship between directors and managers [Legget and Strand (2002)]. Along with the possible gains from economies of scale from size [Esho (2000)], it is possible that large credit unions have a more developed governance structure and generally increased financial accountability.[10] Given that large credit union managers have higher salaries and perquisites[11] and, hence, face a larger loss function from being placed under direction, it is also interesting to examine whether possible stronger governance structures inhibit the proclivity to engage in aggressive accounting manipulations. Figures 1 and 2 provide a visual indication of the QROA_t and $\Delta QCAR_t$ over the research period and whilst there was very little change in QROA, $\Delta QCAR_t$ increased dramatically around the quarter that AFIC was introduced, which provides preliminary support for our two hypotheses.

5. Statistical modeling and results

5.1. Statistical Model

To provide some statistical robustness to the analysis, we now estimate a polynomial lag model to capture the time series impact of AFIC on QROA_t and $\Delta QCAR_t$. Specifically, the following function is estimated:

[9]Seven credit unions were omitted because of incomplete financial data sets.
[10] Hautalvoma et al. (1993) report the degree of financial governance of chief executive officers (CEO) was positively related to size.
[11] Salaries and perquisites at the time were generally based on asset size and an agreed industry wide formula.

$$Y_t = m + \sum_{i=1}^{M} \frac{v_i(B)B^{bi}}{d_i(B)} X_{i,t} + \frac{q(B)}{f(B)} Y_t + e_t \qquad (2)$$

where μ is a constant, ϖ_i is an impulse function, B is the backward operator and i is the power function between a change in X and its effect upon Y at time t, M is the number of independent variables and e the uncorrelated noise term zero with mean zero and a normal distribution (Box and Jenkins 1976, Ch.11). The final term is an ARIMA mechanism that models the lag structure of dependent variable.

Equation (2) can be re-expressed so to allow for the one-off impulse from AFIC (v_i), with r the order of the response function, and p the order of an autoregressive process on Y_t.

$$Y_t = m_t + \frac{v_i}{1 - d_{i,1}B - \cdots - d_{i,r}B^r} AFIC + \sum_{p=1}^{4} Y_{t-p} + \sum_{j=1}^{n} l_j + e_t \qquad (3)$$

where Y_t is defined as either QROA $_t$, v_i tests for any spike in the data series at the introduction of AFIC in the September 1992 quarter, and d_i tests for any reversion effects from v_i. If d_i lies in the range ($0 < d_i < 1$), then the regulatory impact initially results in a spiked jump and has a reversion effect in the following form:

$$[1 + dB^1 + d^2B^2 + \ldots + d^kB^k]\ v \qquad (4)$$

The lag impact of AFIC on $\Delta QCAR_t$ is particularly important in determining the extent and speed of any accounting manipulations. If the lag is extended, then it is consistent with the hypothesis that the residual effects from the AFIC legislation impacted slowly across subsequent periods in its' effect on $\Delta QCAR_t$. Thus the size of the spike and the reversion effect provides evidence of the relative aggressiveness of accounting management. Finally, l_j is a dummy variable that represents any significant quarterly spikes in the two series outside the impact of AFIC. For example, if there are several significant spikes in profitability after AFIC then this is evidence that the legislation was associated with increased raw profitability.

5.2. Results on Profitability

Table 2 presents the results of the ROA analysis for both large and small 'at-risk' credit unions. There is weak evidence of an increase in raw profitability. For example, the results suggest an increase in efficiency for large credit unions in the June 1992 quarter [EQUATION] with a blip two

years later in June 1994 [EQUATION]. This is a slightly stronger case for small at-risk credit unions with profitability gains around AFIC [EQUATION], [EQUATION] and in the march 1993 quarter [EQUATION]. Overall, however, the results are not strong and if AFIC had a slight impact on raw profitability it was not sustained and/or remote from the impact quarter. In order to compare with the total sample we also ran our model across the full sample. The statistical results showed no consistent increases in raw profitability around the time of AFIC enactment.[12] The model coefficients suggest that large credit unions exhibited two significant increases in ROA (in September 1993) and another almost two years after AFIC (in June 1994). The intercept for large credit unions was 0.3562 compared to 0.3415 for large at-risk indication similar operating margins. On the other hand, small credit unions experienced significantly lower QROA's within a 2-year window after AFIC.[13] Further, the intercept for all small credit unions was 0.3867 compared to 0.2941 for at-risk credit unions indicating that there was some efficiency slack available to at-risk credit unions. Hence, we conclude that H1 is supported for large at-risk credit unions. But for small at-risk credit unions there is weak evidence that they increased profitability for a period around AFIC, and in combination with a drop in profitability for the total sample of small credit unions, we cannot support H1 for this group.

5.3. Results on Changes in the Capital Adequacy Ratio

Before examining the hypotheses that aggressive accounting techniques would be employed by credit union managers to rapidly increase capital adequacy ratios we determine if there is statistically significant increase in $\Delta QCAR_t$. The statistical analysis of $\Delta QCAR_t$ using equation (3) was next performed for both large and small at-risk credit unions. The results reported in Table 3 reveal significant and positive spikes [EQUATION] in the change in the capital adequacy ratios during the September 1992 quarters for both large and small at-risk credit unions. Large credit unions had a significantly higher jump in the September quarter CAR (2.81%) compared to a smaller spike for small credit unions (1.23%). But small credit unions had a comparatively more continuous evolution of their risk-weighted capital with it increasing by 1.61% above the expected

[12] Results available from authors on request.

[13] It may be possible that the AFIC legislation imposed substantial costs and the subsequent force majeure lead to the diversification of small credit unions into inefficient operating areas away from the personal loan area [Brewer, Jackson and Mondschean (1996) and Wolken and Navratil 1981].

time-series for the three quarters from September 1992 to March 1993.[14] These characteristics are also clearly shown by observing the unadjusted time-series plots in Figures 1 and 2. Figures 1 and 2 also reveal the unusual nature of the [EQUATION] around the introduction of increased capital adequacy requirements compared to the *QROA* ratio. For both small and large credit unions, the [EQUATION] plots below *QROA*, except around the imposition of increased AFIC capital adequacy requirements during the September quarter 1992. Hence, based upon our statistical and visual analysis, we conclude that there were significant and unusual increases in the capital adequacy ratio of at-risk credit unions around the enactment of AFIC. Further, the larger spike for larger credit unions and a slower reversion of the change in risk weighted capital for smaller credit unions, suggests a more aggressive approach by larger credit unions. We examine how the $\Delta QCAR_t$ was increased by credit union managers in the next section.

5.4. Results on Accounting Manipulations

In order to assess whether any abnormal accounting management occurred, we first require an expectations model that measures the expected [EQUATION], expected earnings and expected accruals. Our contribution here is to utilise cross-sectional time-series models to estimate expected accruals. We do so by using a fixed effect time series model for the full data set for each small and large credit union panel. That is, we constrain each panel to have a common intercept and allow the time-series coefficients to vary for each credit union. Thus, we incorporate common cross-sectional effects (intercept) and allow for individual firm policies (time-series coefficients), in combination, to determine expected accruals. An illustrative example of the full calculation is included at Appendix 1.

Results are reported in Table 4. We note that the reclassification of loans to reduce the risk weighting of assets was the most utilised manipulative accounting technique, being used by all 16 of the large credit unions and by 9 of the small credit unions. Large credit unions had a 26% higher net effect from accounting manipulations when compared to small credit unions and all asset risk re-classifiers had risk-adjusted capital above 8% by the end of December 1992. In addition to loan asset reclassifications, 7 of the 16 large credit unions used 'dirty surplus' and/or discretionary income manipulative accounting methods to increase equity and further boost their risk-adjusted capital. A higher proportion of small credit unions (15 of 16) applied such techniques.

[14]The functional form of the AFIC intervention was [EQUATION].

From Table 4, it can be seen that reclassifications, on average, contributed 97% of the unexpected changes in the risk weighted capital adequacy ratio for large credit unions compared to 39.8% for small credit unions. Small credit unions relied to agreater extent on dirty surplus and discretionary accounting (30.3% compared to 8.1%).

Overall, our analysis indicates that during the 12-month window period immediately surrounding the introduction of the AFIC legislation, at-risk credit unions employed accounting strategies to reduce the threat of being placed under 'direction'. The most frequently applied strategy was the aggressive reclassification of loans from high-risk personal/business loans to lower-risk housing loans. Small credit unions did not utilise this strategy as widely as their larger counterparts.

6. Conclusions

This study analysed the impact of increased capital adequacy requirements imposed by the Australian Financial Institutions Code (AFIC) in July 1992 on a sub-sample of Australian credit unions. In essence, the prime accounting ratio directive of AFIC required a minimum of 8% capital as a ratio of risk adjusted assets. We found that capital adequacy levels moved quickly to satisfy the risk-weighted capital requirements as laid down by AFIC. However, the process by which capital adequacy levels changed was not via increased operating profitability but through accounting manipulations in the form of asset reclassifications, followed by discretionary accounting methods and dirty surplus techniques. The results were stronger for large at-risk credit unions, reflecting the higher incentives for large firm management to quickly meet the Cooke ratio of 8% and the possible operating efficiencies that could be gleaned in small credit unions.

This research contributes to the regulatory capital-arbitrage financial services literature in a number of areas. First, it isolates a situation whereby managers have very limited ability to meet risk-capital standards in order to reduce potential transaction, monitoring and personal costs. Second, it highlights the importance of corporate governance. We examine governance in co-operatives and a case study where a corporate governance setting is jointly determined by a long standing internal co-operative philosophy and by abrupt banking regulation that was initially intended to monitor the activities of large banks operating under sophisticated shareholder agency relationships. Third, the importance of entrenched management and weak agency relations with regard to meeting regulatory hurdles is highlighted and analysed. In combination, these factors

inexorably gave rise to a strong motive to window-dress by using aggressive accounting manipulations. Hence, this paper establishes a link between accounting manipulations, corporate governance and entrenched management.

Finally, there are policy implications in our research. Regulatory bodies can make more efficient policies if they understand that corporations are not homogenous with regard to internal corporate governance and consider the impact of regulations on managerial incentives and behavior. An understanding of the different philosophy and culture of organisations can also guard against the issuance of template regulations that may be inequitable in their impact and hence require accounting manipulators to save the day for the firm. This is especially the case for co-operative societies.

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Appendix 1: Example of the Calculation of the Proportion of Unexpected Change in Risk-Weighted Capital Adequacy Ratio (CAR) Attributable to Accounting Manipulation Techniques

1. We begin by using equation (A1.1) to estimate the time series expectation of *DCAR* for each at-risk credit union and using the intercept and time series coefficients to calculate expectations. Each expected change is then estimated over the period March 1992 to December 1992.

$$E\Delta CAR_t = m_t + \sum_{t=1}^{4} \Delta CAR_{t-p} + e_t \qquad \text{(A1.1)}$$

2. The CAR is then reconstructed by directly calculating the expected ratio for December 1991 from the accounts.

3. The next step involved fitting an autoregressive time series model to estimate the expected dollar operating earnings for each Credit Union. Operating earnings are used as the anchor point because our previous analysis indicated that operating earnings was relatively stable and, hence, more robust to prediction.

4. The expected risk weighted assets was then derived from the above information.

5. An example of these calculations are set out below:

Expected Variables	Dec 91	Mar 92	Jun 92	Sep 92	Dec 92
+*E[DCAR]*	0.25%	0.25%	0.25%	0.25%	0.25%
**E[Operating earnings]*		$1000	$1000	$1000	$1000
#*E[Capital]*	$40,000	$41,000	$42,000	$43,000	$44,000
^*E[CAR]*	8%	8.25%	8.5%	8.75%	9.0%
^^*E[Risk weighted assets]*	$500,000	$496,970	$494,117	$491,429	$488,890

+ Expected ? QCAR estimated from intercept and autoregressive coefficients derived from equation (A2.1). * Expected operating earnings estimated from an autoregressive model. # Expected capital derived from observed capital in Dec 91 plus expected operating earnings in subsequent years. ^ Expected capital adequacy ratio derived from observed CAR in Dec 91 plus expected changes. ^^ Expected risk weighted assets estimated after deriving expected capital and expected capital adequacy ratio.
The above example shows stable expected earnings and falling expected risk weighted assets. This will change from firm to firm but is consistent with credit unions having *long term policies* to maintain current operating margins and to gradually lower risk profiles by switching into lower risk weighted loans.

6. Actual *DCAR* is then subtracted from expected *DCAR* to obtain unexpected *DCAR*. The actual change in capital is then observed for that quarter. To illustrate we take the September 1992 quarter and assume the capital increased to $46,000.

7. Expected accrual expenses are then estimated from a cross-sectional fixed effect time-series model. The full data set for each panel (small and large) is used to derive a common intercept with the autoregressive coefficients (lagged four quarters) allowed to vary for each credit union. The autoregressive coefficients for all the at-risk credit unions are retrieved and used to calculate expectations. Bad debt expense is divided by the change in loans and long service and holiday leave are divided through by salary expense. To derive the unexpected change we subtract the expected accruals ratio from the actual accruals ratio. We assume the total to be $500. We also directly observe from the accounts any dirty surplus flows and assume it is $1800.

8. The unexpected decrease (or reclassification) in risk-weighted assets is then calculated by subtracting observed ($460,000) from expected ($491,429).

9. The percentage contributions for each factor are then calculated.

i. Discretionary	$500/491,429	=	0.1017/1.25	=	8.14%
ii. Dirty surplus	$1800/491,429	=	0.3052/1.25	=	36.63%
iii.Reclassifications	$31,429/491,429	=	0.6395/1.25	=	51.16%
			Total		95.93%

10. Finally, we repeat this procedure for all firms in all the 1992 quarters and then sum and average the proportions from small and large at-risk credit unions.

(DAVID YOU NEED TO PUT IN TABLE 1 – DESCRIPTIVES)

Table 2: The Impact of AFIC on the Quarterly Return on Assets of 'At-Risk' Credit Unions

Panel A: Large 'At-Risk' Credit Unions

	Coefficient	Estimate	T Ratio	Variable
1	m	0.3415	10.86*	Mean *QROA*
2	f_1	0.5239	12.52*	*QROA* lag 1 period
3	f_2	0.2000	4.77*	*QROA* lag 4 periods
4	w_1	0.0684	1.75**	*QROA* June Qtr 92
5	l_1	0.1731	4.43*	*QROA* June Qtr 94
		AIC -246.37		SBC -226.21

Panel B: Small 'At-Risk' Credit Unions

	Coefficient	Estimate	T Ratio	Variable
1	m	0.2941	10.07*	Mean *QROA*
2	f_1	0.1883	3.87*	*QROA* lag 1 period
3	f_2	0.1068	2.19*	*QROA* lag 3 periods
4	w_1	0.2112	2.07*	Impact of AFIC Sep Qtr 92
5	w_2	0.1868	1.80**	*QROA* Dec Qtr 92
6	l_1	0.1921	1.88**	*QROA* Mar Qtr 93
		AIC 426.35		SBC 450.47

*Denotes statistical significance at the 5% level; and ** denotes statistical significance at the 10% level. Sample consists of 16 large and 16 small credit unions whose capital adequacy ratio was below 8% one year before AFIC (ie. 31 June 1991).

Model is : $$QROA_t = m + \frac{w_i}{1 - d_{i,1}B - \cdots - d_{i,r}B^r} AFIC + \sum_{j=1}^{4} f_j QROA_{t-j} + \sum_{j=1}^{n} l_j$$

The model was estimated simultaneously by maximum likelihood via nonlinear least squares. The adequacy of the fitted model was determined by checking the statistical significance of the coefficients and performing diagnostic checks on the residuals. Competing models were compared and chosen using the Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC). The MA term was not significant.

Table 3: The Impact of AFIC on the Change in Quarterly Capital Adequacy Ratio of 'At-Risk' Credit Unions

Panel A: Large 'At-Risk' Credit Unions

	Coefficient	Estimate	T Ratio	Variable
1	m	0.1295	4.22*	Intercept
2	f_1	0.1775	3.65*	$\Delta QCAR_t$ lag 1 period
3	v_1	2.8099	22.71*	Impact of AFIC Sep Qtr 92
4	l_1	0.2096	1.70**	$\Delta QCAR_t$ Dec Qtr 93
5	l_2	0.4288	3.47*	$\Delta QCAR_t$ June Qtr 94
Akaike IC		600.95	Schwartz BC	621.11

Panel B: Small 'At-Risk' Credit Unions

	Coefficient	Estimate	T Ratio	Variable
1	m	0.1712	3.81*	Intercept
2	f_1	0.1005	2.00*	$\Delta QCAR_t$ lag 1 period
3	v_1	1.2259	6.29*	Impact of AFIC Sep Qtr 92
4	d_2	0.2492	1.69#	Reversion Coefficient
		AIC 956.73		SBC 972.80

Denotes statistical significance at the 5% level; ** denotes statistical significance at the 10% level; and # denotes significance of the mean reversion coefficient to two lags at the 10% level. Sample consists of 16 large and 16 small credit unions whose capital adequacy ratio was below 8% one year before AFIC (ie. 31 June 1991).

Model is : $$\Delta QCAR_t = m + \frac{w_i}{1 - d_{i,1}B - \cdots - d_{i,r}B^r} AFIC + \sum_{j=1}^{4} f_j \Delta QCAR_{t-j} + \sum_{j=1}^{n} l_j$$

The model was estimated simultaneously by maximum likelihood via nonlinear least squares. The adequacy of the fitted model was determined by checking the statistical significance of the coefficients and performing diagnostic checks on the residuals. Competing models were compared and chosen using the Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC).

Table 4: The Impact of Accounting Manipulations on the Increase in Risk-Weighted Capital Adequacy – Two Quarters Before and After AFIC

Large Credit Unions		**Small Credit Unions**
Average Impact	**Type**	**Average Impact**
97.0%	Reclassification of assets (RA)	39.8%
3.1%	Dirty surplus accounting (DS)	9.0%
5.0%	Discretionary accounting (DA)	21.3%
105.1%		70.1%

The window period includes the quarters ended March, June, September and December 1992. Total is the attributed percentage that accounting manipulations explain of the deviation from the time-series expectations of ΔQCAR.

Figure 1 - Quarterly Return on Assets and Change in Capital Adequacy Ratio
Large 'at-risk' Credit Unions

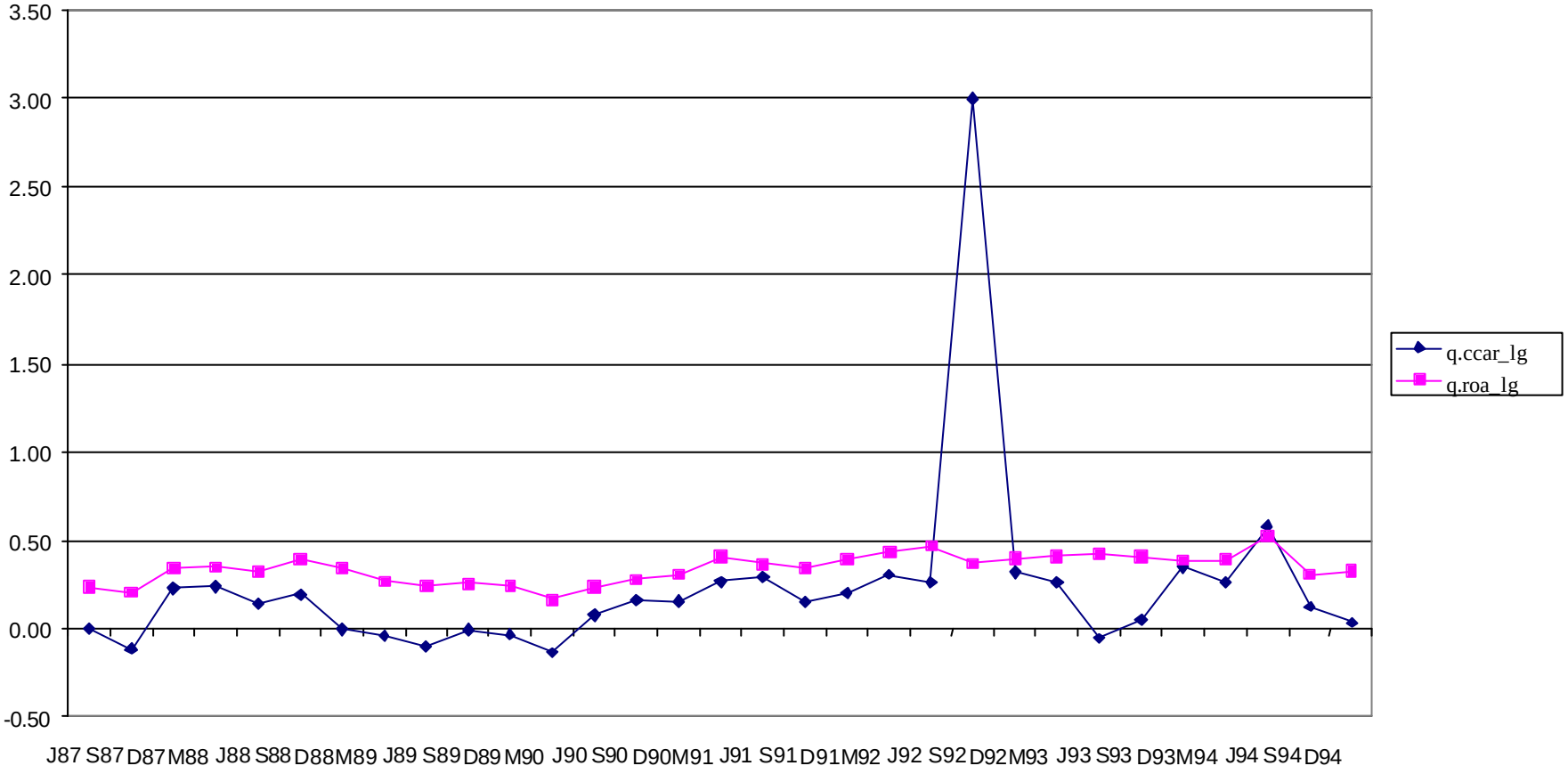
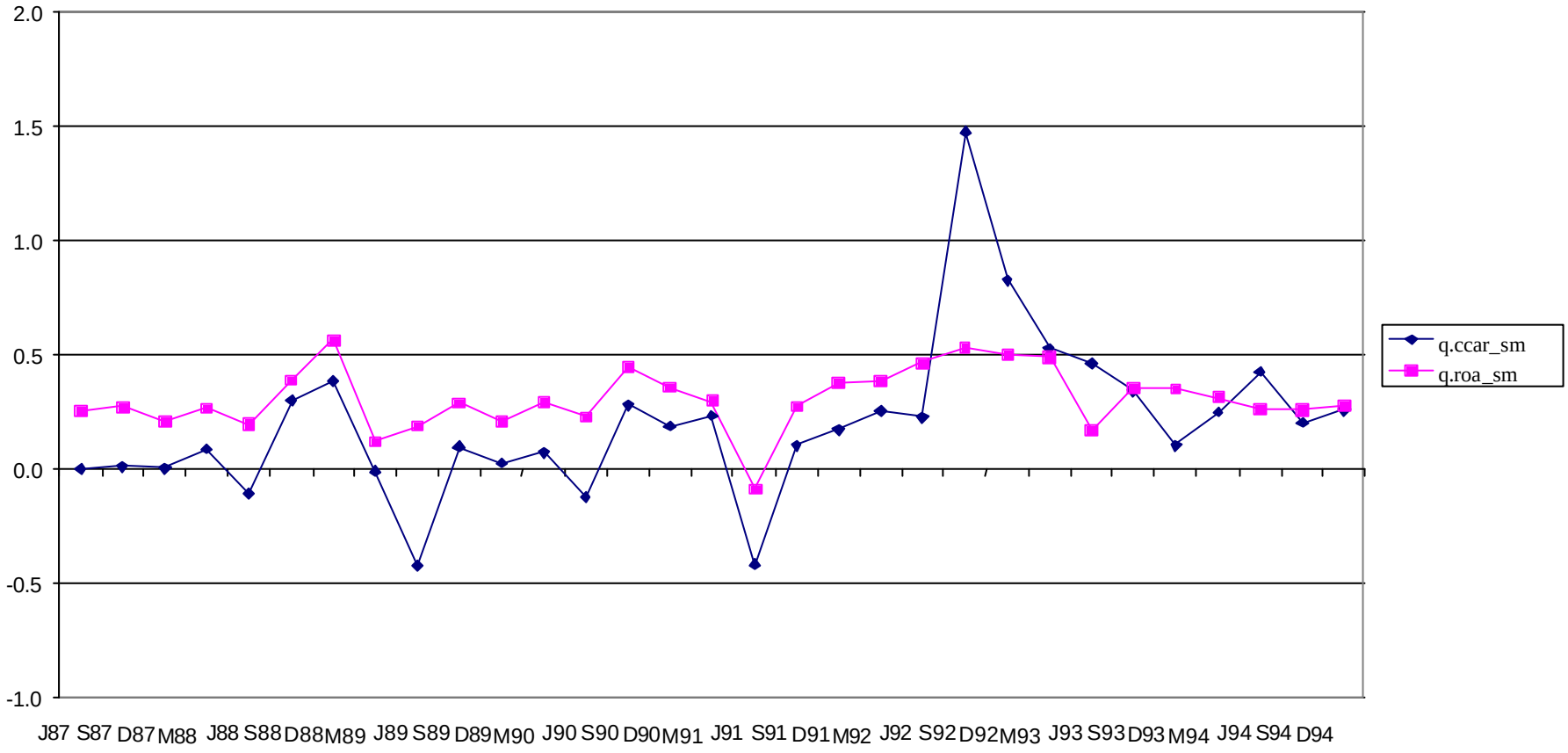
Figure 2 - Quarterly Return on Assets and Change in Capital Adequacy Ratio
Small 'at-risk' Credit Unions