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Viability and Irish Credit Unions

Prepared by the Credit Union Advisory Committee[1][2]

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[1] The Credit Union Advisory Committee (CUAC) is a statutory committee, established under Section 180 of the Credit Union Act 1997. Its primary task is to advise the Minister for Finance on credit union matters. The members of CUAC are Professor Donal McKillop (Chair), Ms Denise O'Connell and Mr Joe O'Toole.

[2] CUAC are indebted to Dr Barry Quinn (Queens University Belfast) for the computation of the viability measures (Z-Scores) upon which this discussion is based.

EXECUTIVE SUMMARY

What is this research about?

This research defines and measures credit union viability. The analysis suggests that the surplus generated by a credit union and the capital strength of that credit union can be used together to measure a credit union's viability. The analysis is then extended to explore the factors which may positively or negatively influence the calculated measure of viability. In the development of this discussion document the Credit Union Advisory Committee (CUAC) undertook interviews with six credit unions. The views of the credit union representatives are quoted throughout the document. The development of the discussion document also benefited from an analysis of quarterly financial data for 377 credit unions between 2011 and 2013. This financial data is used to construct the measure of credit union viability.

How do credit unions define viability?

The interviews with the six credit unions revealed significant differences when it came to defining viability. Most considered the ability to generate a surplus as fundamental. A number felt that viability was also forward looking and required having sustainable future plans. Others, influenced by the current pressures faced by many credit unions, thought of viability in terms of survival and independence. Drawing from these views CUAC believes that the following broad definition of viability is most meaningful:

Viability is where a credit union is in a position to generate enough surplus to both meet its regulatory capital requirements and support its growth ambitions, while maintaining existing service levels.

CUAC believes this definition of viability to be appropriate as it stresses that both the surplus and the capital position of a credit union are important in the determination of viability.

Why is surplus so important to the determination of viability?

Setting income against expenditure (net income) reveals whether a credit union has made a surplus (or deficit). The generation of a surplus is critical in enabling a credit union to provide a dividend and/or interest rebate, replenish or build capital levels, as well as in supporting the growth ambitions of the credit union. A key ratio for credit unions is that of the Return on Assets (ROA) defined as Net Income (Surplus) / Assets. A measure such as ROA essentially encapsulates the efficiency and effectiveness of the credit union's business model.

Why is capital strength so important to the determination of viability?

Capital strength ultimately determines the degree of robustness of a financial institution to withstand shocks to its balance sheet. Generally, credit unions are expected to absorb losses from their normal earnings. But there may be some unanticipated losses which cannot be absorbed by normal earnings. Capital is important in such abnormal loss situations to cushion off the losses not covered by current earnings. In this way, capital plays an insurance function. Having adequate capital is a confidence booster. It provides members, the public and the regulatory authority with confidence in the continued financial viability of the credit union. Capital strength can be defined as Reserves / Assets. A Capital Ratio in excess of regulatory

requirements suggests that the credit union is in a strong position to withstand unexpected shocks to its balance sheet.

How is capital strength and surplus combined to create a measure of viability?

We use a measure called *Z-Score*. The *Z-Score* is defined as $\frac{\text{ROA+Capital Ratio}}{\text{Variability of ROA}}$. For example, at the end of the year the credit union calculates its ROA and its Capital Ratio, adds them together and then divides through by the variability of ROA which is in turn calculated as the standard deviation of a series of historic ROA values. This simple measure highlights that the viability of a credit union deteriorates if the ROA declines or the Capital Ratio declines or the ROA becomes more variable. Conversely the measure highlights that viability is improved when ROA increases, when ROA becomes less variable and when the Capital Ratio increases.

In terms of the *Z-Score* how have credit unions fared?

The analysis highlights that *Z-Score* values have increased for Irish credit unions over the period Quarter 1 2011 to Quarter 3 2013. This means that viability has improved for the average credit union over this period. It was also found that the key driver of this improved viability is the strengthening capital position of credit unions rather than an improvement in their surplus. The analysis also highlights that viability is better for larger credit unions. Those credit unions with assets of €100 million and above were identified as the most viable while those with assets of €20 million and less were identified as the least viable.

How else might the *Z-Score* measure be interpreted?

The *Z-Score* measure can be transformed into the probability that a credit union becomes *non-viable*. Assume *non-viability* is the situation where a credit union's Capital Ratio falls below 7.5%. Under this scenario it was found that the average *Z-Score* value for Quarter 3 2013 was 9.35. This means that the average credit union at that time had only a marginally greater than 1% chance of its Capital Ratio falling below 7.5% and being classified as *non-viable.*

Are there any credit union specific factors that influence the viability of credit unions?

The empirical analysis identified three credit union specific factors as important – asset size, cost efficiency and income diversification. Larger credit unions were found to have better viability compared to their smaller counterparts. Credit unions with superior levels of cost efficiency, as measured by their cost to income ratio, were classified as being more viable. Diversification also proved important with a credit union that achieved a healthy mix of interest income, fee income and commission income highlighted as more viable.

Are there any factors outside the control of credit unions that impact on their viability?

Interviews with the six participating credit unions highlighted a number of external factors impinging on credit union viability. However, the major challenge was the regulatory environment. The participating credit unions suggested that Central Bank regulation and all the additional requirements on credit unions is a heavy burden both financially and administratively. They argued that there is a need for a regulatory regime that is supportive and enabling in terms of the change process. They also suggested that the one size fits all approach to regulation adopted by the Central Bank is not working, with a differentiated approach, depending on credit union business model sophistication, preferred.

What is the key message from this discussion paper?

The key message is that viability can be measured and that it is a function of two things. The surplus generated by the credit union's business model and the capital position of that credit union.

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Section 1: Introduction

Credit union viability can be viewed from different perspectives. A relatively narrow view of viability is whether the credit union is in a position to generate sufficient surplus to meet its regulatory capital requirements. A somewhat broader definition, focusing more on an assessment of financial sustainability, is whether the credit union can generate sufficient surplus to both meet its regulatory capital requirements and support its growth ambitions, while maintaining existing service levels. This latter definition accords with the Commission (2012) view that a variety of interrelated factors should be taken into account when making a determination as to the viability of a credit union.

"These factors should include capital adequacy, the dominant factor in determining the viability of a credit union, as well as, for example, factors relating to loan impairment and delinquency, investment impairment, high and rigid cost base, liquidity and the structure of liquidity, loan-to-asset ratio and governance capacity, and inability to present a feasible plan to restore capital reserves. The tendency for capital to lag behind other indicators of financial viability was noted." (Report of the Commission on Credit Unions, pp. 98)

The purpose of this discussion document is to consider the viability of Irish credit unions. In part this is because a recent survey (February 2015 – May 2015) by the Credit Union Advisory Committee (CUAC) highlighted that many credit unions wanted a better understanding of what constitutes a viable credit union. Issues that were considered as important included, can viability be quantified; what factors drive viability; is there a relationship between scale and viability; what mix of product offerings and access channels does a credit union need to be competitive and therefore viable in the future. A secondary reason for the discussion document is that the Commission (2012), while highlighting factors that should be considered when making a determination on viability, did not attempt to quantify viability nor assess the relative importance of potential viability drivers. Furthermore, the Commission's view that a wide spectrum of factors is important in a viability assessment makes it difficult to assess viability and of course begs the questions whether a proxy for the *myriad* of factors can be identified.

In the development of this discussion document CUAC undertook a series of interviews with the Chief Executive Officers (CEOs) and Chairs of six credit unions.[3] The credit unions were a mix of common bond type (two industrial and four community); affiliated to one of the two trade associations (ILCU and CUDA); and were broadly spread in terms of their asset size. The views of these representatives are highlighted anonymously throughout the discussion

[3] Each credit union had completed the CUAC survey and had indicated that they would be willing to meet with CUAC at some stage over its three year term. Thereafter the six credit unions were chosen at random. Five credit unions were represented by the CEO and Chair while one credit union was represented solely by the CEO.

document.[4] The document has also benefited from engagement with representatives from the Central Bank, ILCU and CUDA.[5] A further input element was an analysis of quarterly financial data which enabled the construction of viability measures (*Z-Scores*) at an individual credit union level. This quarterly information was provided by the two representative associations. Having calculated the viability measures the empirical analysis then proceeded to assess whether factors such as credit union size, product diversification, efficiency and liquidity influenced a credit union's viability. It must be emphasized that this viability assessment, based on *Z-Score*, is aimed primarily at illustrating the importance of a credit union's capital adequacy and its ability to generate a surplus. The calculated *Z-Scores* have limitations in that they are based on unaudited data, the data is quarterly and requires annualized approximations and is over a relatively short time period Quarter 1 2011 to Quarter 3 2013.

The discussion document proceeds as follows: - Section 2 provides a commentary of what viability meant to those credit unions which participated in the interviews with CUAC. Section 3 presents a diagrammatic description of how a credit union generates a surplus and the ensuing uses of that surplus. Whether a credit union is in a position to generate a surplus is key in any assessment of credit union viability. Section 4 profiles two key measures in the assessment of credit union viability namely capital adequacy as measured by the Capital Ratio (regulatory reserves / assets) and Return on Assets (ROA) defined as Net Income (Surplus) / Assets. Section 5 outlines the methodology used to calculate credit union viability and is based on the concept of *Z-Score*. Section 6 provides empirical estimates of *Z-Score* for Irish credit unions over time and by asset size categories. Section 7 considers factors specific to the credit union which may influence viability. Section 8 reports a broader debate around external factors which might impinge on a credit union's viability. Finally, Section 9 summarizes and concludes.

[4] In the document we label the credit unions as follows (i) Large Community Credit Union A (this credit union had assets > €100m); (ii) Large Community Credit Union B (this credit union had assets > €100m); (iii) Large Industrial Credit Union (this credit union had assets > €100m); (iv) Medium Community Credit Union (this credit union had assets between €60m and €100m); (v) Small Community Credit Union (this credit union had assets between €20m and €40m); and (vi) Small Industrial Credit Union (this credit union had assets < €20m).

[5]CUAC met with representatives from the Central Bank to explore issues around credit union viability (22nd June 2015). The Chair of CUAC presented on credit union viability at a meeting arranged by CUDA (22nd June 2015) and at a Risk and Compliance Conference organised by the ILCU (18th August 2015).

Section 2: What Does Viability Mean to Credit Unions?

In the interviews with representatives from the six credit unions the initial question posed by CUAC was 'what does credit union viability mean to you?' A variety of responses emerged. The two industrial credit unions stated that viability means

"To be able to function independently into the future; to be in a position to pay a market rate dividend to members; being in a position to charge competitive interest rates; delivery of services that our members require." (Large Industrial Credit Union)

"Meeting our goals and mission as set out in our strategic plan; providing a reasonable return on savings; being in a *position to provide the services required by members; credit union should have a good ethical focus and good governance systems in place." (Small Industrial Credit Union)*

The community based credit unions expressed the following views as to what viability means

"The main point is financial stability; the ability to meet member needs is important as is the ability to provide a dividend to members and provision of fair value in respect of loans, savings and transactions." (Large Community Credit Union A)

"Having a sustainable business plan going forward and a well thought out strategic plan. Having a good healthy loan book and making a good surplus." (Large Community Credit Union B)

The Chair and the CEO of one of the participating credit unions had somewhat different takes on what was meant by viability. The CEO focused more on survival going forward while the Chair stressed the importance of generating a surplus. In aggregate their comments were

"Being able to survive into the future; to be able to cover provisions and all expenses; having adequate reserves; making a surplus each year." *(Medium Community Credit Union)*

"To be able to stay in existence on its own without recourse to restructuring. Making a sufficient surplus to ensure the credit unions survival. [Credit Union] returns a surplus of approx. €60,000 - €70,000 a year which it considered sufficient." (Small Community Credit Union)

An array of perspectives shines through in these comments. However, most consider the generation of a surplus to enable the provision of the services required by members as fundamental. A subset feels that viability is also forward looking and requires having sustainable future plans. A number, perhaps influenced by the current pressures faced by many credit unions, couch their responses in terms of survival and independence. Only one links viability explicitly to the capital position of the credit union.

Section 3: The Importance of Surplus to Credit Union Viability.

This Section presents a simple diagram of a credit union's income and expenditure to emphasize the importance of generating a surplus. Income minus cost of funds minus operating costs minus provisions for losses equals surplus. CUAC is of the view that the first question in any viability assessment is whether the surplus is sufficient to meet the credit union's regulatory capital requirements. A follow-up question is whether the surplus can additionally support the growth aspirations of the credit union including the fulfillment of its wider social mission.

Figure 1: Surplus Generation

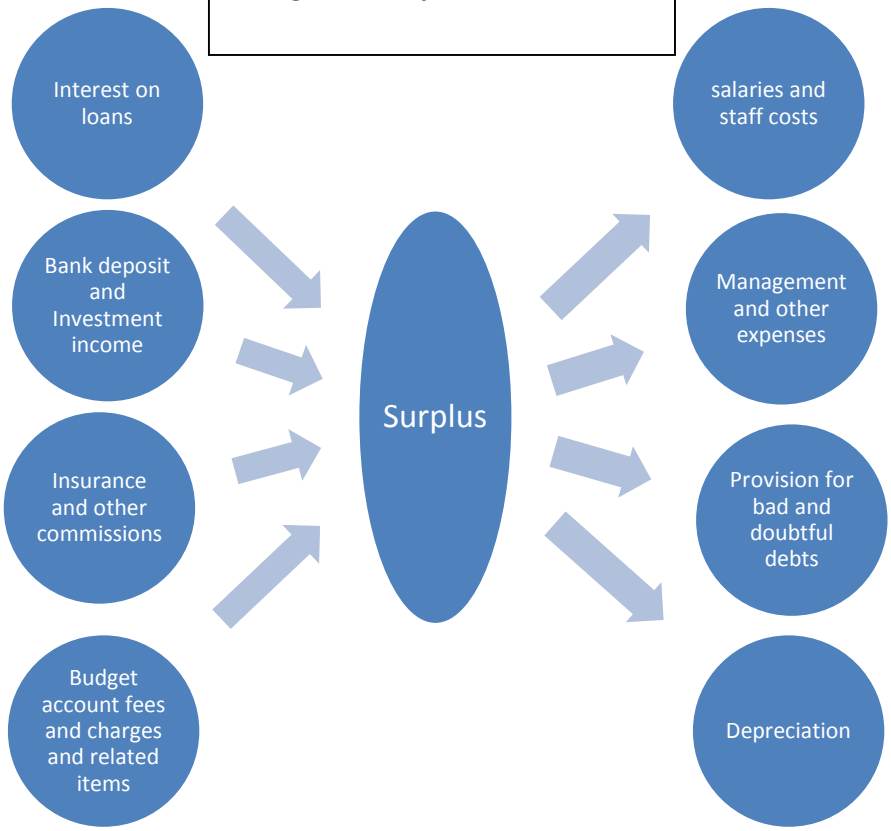
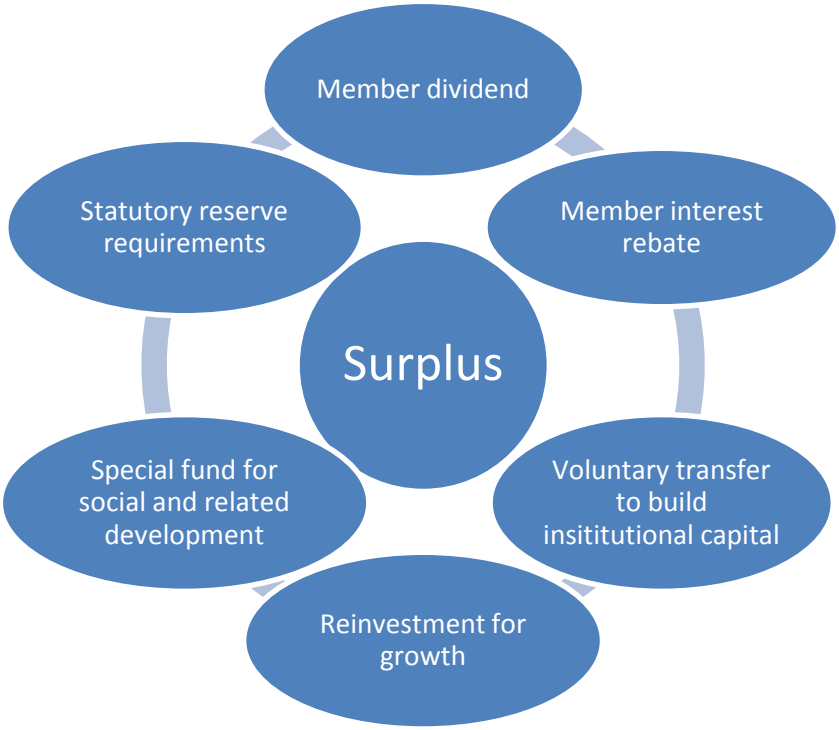


Figure 1 presents a simple diagrammatic exposition of the manner in which most credit unions generate a surplus. On the left-hand side of Figure 1 is the means through which income is generated. The main elements are (i) interest on members' loans; (ii) bank deposits and investments; and (iii) other income which encompasses items such as insurance and other commissions, budget account fees and charges and related items. For the majority of credit unions, member loans is the dominant income generator, although the falling loan book post 2008 has severely reduced its relative importance. The fall in the loan book has led to a resultant increase in the relative importance of bank deposit and investment income. In the future, the income category 'other income' will become increasingly important for credit unions. However, as yet it contributes a relatively small share of total income for the majority of credit unions.

Expenditure is detailed on the right-hand side of Figure 1. In this instance there are two main elements plus a number of somewhat smaller elements. The two dominant elements are (i) salaries and staff costs and (ii) management and other expenses. The latter category dominates for the majority of credit unions with insurance fees (general insurance, life savings and loan protection insurance and death benefit insurance), and other fees (audit fees, accountancy fees, and legal, reporting and affiliation fees) particularly onerous expenditures categories under (ii). The smaller expenditure items include (iii) reduction/increase in provision for bad and doubtful debts; (iv) depreciation and (v) less bad debts recovered.

Setting income against expenditure reveals whether the credit union has made a surplus (or deficit). Assuming the credit union has generated a surplus this is then used to establish and maintain reserves in accordance with the prudential rules on capital adequacy established by the Regulatory Authority (Central Bank). A deficit is assumed to result in a reduction in reserves. Following compliance with the capital adequacy requirements, the credit union may allocate any remaining surplus in the following manner: (i) payment to members of dividends on the amount of their paid up shares; (ii) for borrowing members, a rebate of some of the loan interest paid over the year; (iii) creation of a special fund to be used by the credit union for social, cultural or charitable purposes (including community development); (iv) as a voluntary transfer to further develop the institutional capital of the credit union. More generally, any surplus not distributed can be retained to be re-invested into the credit union's operations to facilitate future growth. Figure 2 depicts the manner in which a credit union may use its surplus.

Figure 2: Surplus Use



From Figure 2 it can be observed that the generation of a surplus is critical in enabling credit unions to provide a dividend and/or interest rebate, replenish or build capital levels, as well as in supporting the growth ambitions of the credit union. Therefore, most of the key ratios considered by credit unions either feed into or emanate from the surplus position of the credit union. To that end a key ratio for credit unions is that of the Return on Assets (ROA) defined as Net Income (Surplus) / Assets. In terms of priority, any surplus must first be used to ensure that capital levels are appropriate, with the residual then used to provide a return to saving and borrowing members and/or fund growth plans. Consequently a further ratio of fundamental importance is the capital adequacy ratio (Capital Ratio) defined as regulatory reserves / assets. Having adequate capital is a confidence booster. It provides members, the public and the regulatory authority with confidence in the continued financial viability of the credit union. Confidence to the saving member that their money is safe; to the borrowing member that the credit union will be, or is, in a position to give genuine consideration to their credit needs in good as in bad times and to the regulatory authority that the credit union will remain, in continuous existence.[6]

[6] Capital adequacy ultimately determines the degree of robustness of a financial institution to withstand shocks to its balance sheet. Generally, credit unions are expected to absorb the losses from normal earnings. But there may be some unanticipated losses which cannot be absorbed by normal earnings. Capital comes in handy on such abnormal loss situations to cushion off the losses not covered by current earnings. In this way, capital plays

Section 4: Return on Assets and Capital Adequacy.

The credit unions that met with CUAC were asked specific questions about capital adequacy and surplus generation. More specifically they were first asked, in the determination of credit union viability how important is capital adequacy? Secondly, they were asked in the determination of credit union viability how important is surplus / (Return on Assets)? With respect to the former question the responses included

"[The Credit Union] does not necessarily focus on return on assets. The key for [The Credit Union] is maintaining a good surplus. [The Credit Union] looks to the market and hopes to be in the top 25%."(Large Industrial Credit Union)

"Return on Assets/Surplus is key to credit union viability. Generally, current ROA levels are driven by a limited business model and are too low. [Credit Union] business model needs major change but requires regulatory acceptance and support." (Large Community Credit Union A)

"[The Credit Union] considers that having a good surplus is critical. [The Credit Union] is satisfied with the state of ROA which is currently showing returns of approx. 1.5%. (Medium Community Credit Union)

Replies to the question on the importance of capital adequacy included

"The capital reserve requirement should depend on the financial strength and risk profile of each credit union. [The Credit Union] does not think that the capital reserve ratio of 10% is too high." (Small Industrial Credit Union)

"[The Credit Union] thinks capital adequacy is important. "[The Credit Union] thinks that the capital reserve requirement of 10% is appropriate. "[The Credit Union] try to keep their capital reserve at 12.5% and feel that keeping it at this level puts them in a comfortably viable situation. (Large Community Credit Union B)

"[The Credit Union] thinks that the percentage of the capital reserve requirement should be related to the level of risk that a credit union has." (Small Community Credit Union)

Two messages emerge from these comments. First, capital adequacy is clearly highlighted as important with credit unions viewing a 10% ratio as appropriate. Given that credit unions are subject to prescribed capital requirements such comments come as no surprise. Secondly, all credit unions are focused on producing a surplus however, not all benchmark their performance in terms of computing performance metrics such as ROA.

an insurance function. Opinion differs among banking and finance experts as to what constitutes adequate capital.

Section 5: *Z-Score* as a Measure of Viability

Our next question is whether the Capital Ratio and ROA can be combined to provide a proxy for the viability of a credit union. To that end we draw on work by Lepetit and Strobel (2013; 2015) which defines various *Z-Score* measurement techniques. The *Z-Score* in its pure form is a solvency measure that represents the probability that an individual financial institution's losses exceed its capital base. For example in the context of credit unions it would measure the probability that a credit union's returns decline beyond expectations exhausting member's equity capital. A higher *Z-Score* implies a decreased risk of insolvency and thus indicates increased stability for the credit union being analysed.

Z-Score is calculated as $\frac{\text{ROA+Capital Ratio}}{\text{Variability of ROA}}$, where (1)

The credit union's Return on Assets (ROA) is defined as surplus / assets;

The credit union's Capital Ratio is defined as regulatory reserves / assets;

Variability of ROA is defined as the standard deviation of the credit union's ROA based on historical data.

The probability of insolvency is the situation where the ROA is so negative (the credit union is running a deficit) depleting the capital of the credit union. In this situation $(\text{ROA} + \text{C} \leq 0)$.

It can be shown that a measure for the probability of insolvency for the credit union is then given as $\Pr(\text{ROA} \leq \text{Capital Ratio}) = \frac{1}{(Z-Score)^2}$

The *Z-Score* measure described by equation (1) highlights that the higher the Capital Ratio, the higher the ROA and the less variable the ROA the lower the probability of insolvency. Conversely the lower the Capital Ratio, the lower the ROA and the more the ROA fluctuates the less is the risk that the credit union will become insolvent. In essence, the greater the Z-Score value the lower the probability that the credit union will become insolvent.

Of course it is extremely unlikely that the Central Bank will ever allow a credit union to get into a position of becoming insolvent. Before that situation occurs the credit union concerned will either be encouraged by the Central Bank to seek a transfer of engagements or alternatively it will be subject to resolution.

However, the *Z-Score* measure can be easily transformed from a solvency metric to a measure of viability. We consider two viability scenarios. The first scenario is the situation where the Capital Ratio falls to the regulatory minimum (10%). The second scenario is where the Capital Ratio falls to 7.5%. The latter scenario is probably the more pertinent in that the Commission (2012) stated

"Where the assessment (of viability) indicates the capital shortfall will result in a regulatory reserve ratio above 7.5%, the credit union will be directed to make up the capital shortfall

ensuring that the credit union's reserves return to the regulatory reserve requirement. The credit union must demonstrate that this can be achieved within an appropriate time-frame. Where a credit union's regulatory reserve ratio falls below 7.5% the credit union should be considered for the resolution process" (Report of the Commission on Credit Unions, pp. 104).

Scenario 1: ROA + Capital Ratio ≤ 10.0%

Scenario 1 is where the credit union's Capital Ratio falls to the present regulatory reserve requirement of 10%. The probability of the credit union becoming unviable in this instance is $\Pr(\text{ROA} \leq 10.0\%) = \frac{1}{(Z-Score)^2}$.

Scenario 2: ROA + Capital Ratio ≤ 7.5%

Scenario 2 is the situation where capital depletion results in the Capital Ratio declining to 7.5%. In Scenario 2 the probability of the credit union becoming unviable is $\Pr(\text{ROA} \leq 7.5\%) = \frac{1}{(Z-Score)^2}$.

In both scenarios credit union viability reduces when ROA declines, ROA becomes more variable and when the Capital Ratio declines. Conversely a credit union's viability is enhanced when ROA increases, ROA becomes less volatile and the credit union's Capital Ratio increases.

Section 6: Empirical Estimates of the Viability of Irish Credit Unions

The two main pieces of information the *Z-Score* is based on is the Capital Ratio and the Return on Assets (ROA). In Table 1 we have presented an average value, measured by the mean, and a variability value, measured by standard deviation, for both ratios. These values are calculated for the 377 credit unions that were in continuous existence from Quarter 1 2011 to Quarter 3 2013. The ROA ratios are based on year-to-date numbers annualized to facilitate comparison over time.

Table 1: Return on Assets, Capital Adequacy (Quarter 1 2011 Quarter 3 2013).

	Return on Asset (ROA)			Capital Ratio		
Quarter	Mean (%)		Standard deviation (%)	Mean (%)		Standard deviation (%)
2011 Q1	0.59		3.41	12.6		3.62
2011 Q2	0.92		2.23	12.5		3.98
2011 Q3	0.84		2.02	12.59		4.06
2011 Q4	2.03		4.33	12.89		4.00
2012 Q1	2.6		2.33	12.65		4.08
2012 Q2	2.48		1.83	12.65		4.00
2012 Q3	2.27		1.71	12.64		4.05
2012 Q4	2.37		1.94	14.01		4.35
2013 Q1	1.99		1.53	13.72		4.39
2013 Q2	2.00		1.36	13.68		4.02
2013 Q3	1.88		1.24	13.61		4.00
2011 Q1 -2013 Q3	1.81		2.43	13.05		4.09

In Table 1 it can be seen that the average ROA increases sharply until Quarter 1 2012 and thereafter trends around 2 percent while the variability of ROA has reduced over the period falling from 3.41% to 1.24%. The average Capital Ratio has trended upwards over time while its variability has experienced little change. As earlier highlighted it is not clear what constitutes adequate capital. What can be said however is that since capital is a cushion against which to charge off losses, the riskier the asset composition, the more capital is required to maintain a given level of soundness. Similarly, the more concentrated and volatile the liabilities, the greater the risk, the greater the amount of capital adequacy required. While we have only chosen to present a relative short span of information and have focused only on average values for the sector it is clear that ROA and the Capital Ratio have increased and the variability of ROA has fallen suggesting that the viability of credit unions may have improved over the period.

In Table 2 an overview of the ROA and Capital Ratio is presented for credit unions by asset size bands. This analysis is presented for the period as a whole. It is noticeable that credit unions which have an asset size in excess of €100 million have a much stronger and much less

variable ROA than credit unions in the smaller asset categories. Larger credit unions are also marginally better capitalised with their capital ratio subject to much less variability. This would suggest that credit unions with assets greater than €100 million are potentially more viable than credit unions in other asset bands.

Table 2: Return on Assets and Capital Adequacy (By Asset Category).

		Return on Asset (ROA)			Capital Ratio		
Asset Size Category	Number of quarterly observations	Mean (%)		Standard deviation (%)	Mean (%)		Standard deviation(%)
<€20M	2,088	1.86		2.16	13.21		4.41
€20M-€60M	1,422	1.68		3.08	12.71		4.18
€60M-€100M	328	1.76		1.52	13.08		2.39
>€100M	305	2.22		1.23	13.52		2.16
All	4,143	1.81		2.43	13.05		4.09

In Table 3 we have presented average values for *Z-Score.* In this discussion document the formulation of the *Z-Score* employed utilises the mean and the standard deviation of the credit union's ROA that are calculated over the full sample [1 …..T] and combines these with current period *t* values of the Capital Ratio.[7] The resultant measures are presented under three scenarios. First, the situation when the credit union becomes insolvent, that is $(\text{ROA} + \text{Capital Ratio} \leq 0)$, second the situation when the Capital Ratio falls to 7.5% and below, (ROA + Capital Ratio ≤ 7.5%) and third, when the Capital Ratio falls to 10.0% and below (ROA + Capital Ratio ≤ 10.0%). As might be expected the *Z-Score* declines as we move across the three scenarios indicating that there is an increased probability that poor performance will erode the capital position to trigger the capital benchmark.

Over the period it can be seen that there is a slight upward drift in the *Z-Score* suggesting that Irish credit unions are on average becoming more viable (a rising Z-*Score* suggests that viability is improving). For example in Quarter 3 2013 the *Z-Score* mean value for the average credit union using the benchmark (ROA + Capital Ratio ≤ 7.5%) was 9.35 this suggests that the average credit had a probability of becoming non-viable (Capital Ratio falling below 7.5%) of

[7] Lepetit and Strobel (2013) detail five different approaches to construct time varying *Z-Score* measures. They conclude that the most appropriate measure in a given context is an inherently empirical question and depends on the data under consideration. In an empirical assessment, based on commercial, co-operative and savings banks data, they concluded that the measure used in this study is best.

$\Pr(\text{ROA} \leq 7.5\%) = \frac{1}{Z^2} = \frac{1}{9.35^2} = 1.14\%$. This compares with a probability of becoming non-viable at the start of the period Quarter 1 2011 of $\Pr(\text{ROA} \leq 7.5\%) = \frac{1}{Z^2} = \frac{1}{7.86^2} = 1.62\%$. [8]

In Table 4 the *Z-Scores* for the three scenarios are again detailed with, in this instance the analysis presented for asset bands. The clear picture that emerges for each of the scenarios is that the *Z-Score* value increases as the size band rises. This firmly suggests that viability is better for larger credit unions.

Table 3: *Z-Score* (Quarter 1 2011 Quarter 3 2013).

	Z-Score (Solvency)	*Z-Score* (Viability at 7.5%)	*Z-Score* (Viability at 10.0%)
Quarter	Mean	Mean	Mean
2011 Q1	16.24	7.86	5.07
2011 Q2	16.20	7.84	5.05
2011 Q3	16.27	7.92	5.14
2011 Q4	17.00	8.64	5.85
2012 Q1	16.74	8.38	5.60
2012 Q2	16.73	8.38	5.59
2012 Q3	16.71	8.36	5.57
2012 Q4	18.14	9.78	7.00
2013 Q1	17.48	9.12	6.34
2013 Q2	17.79	9.43	6.65
2013 Q3	17.70	9.35	6.56
2011 Q1 -2013 Q3	17.00	8.64	5.86

Table 4: Z-Score (By Asset Category).

	Z-Score (Solvency)	*Z-Score* (Viability at 7.5%)	*Z-Score* (Viability at 10.0%)
Asset Size Category	Mean	Mean	Mean
<€20M	15.58	8.04	5.52
€20M-€60M	18.11	8.99	5.95
€60M-€100M	18.64	9.53	6.50
>€100M	19.88	10.26	7.06
All	17.00	8.64	5.86

[8] It should be noted that the data period for this study ends at 2013 Q3. When the analysis was undertaken this was the most up-to-date data available. Since the study was completed there has been a further decline in the ROA which may adversely impact on the viability improvement identified in the study.

Section 7: What Credit Union Specific Factors Drive Viability?

In the semi-structured interviews with the Chair and CEO from the six credit unions, CUAC asked 'focusing on the credit union itself as opposed to outside influences what do you consider are the main factors influencing credit union viability?' Credit union responses were many and varied. Most notably, however, they cited the importance of a healthy loan book, the problem of rising costs, in particular the cost of regulatory adherence, having a well-developed strategic plan and constraints placed by the membership mix and the common bond. The following is a flavor of their comments.

"The main factor is the loan book – if there is a healthy loan book this will lead to a viable credit union; investment income – although in recent times this is not guaranteed." (Large Industrial Credit Union)

"We consider the loan book to be the engine of the credit union. …… Engagement with younger members and being able to provide the services they require." (Medium Community Credit Union)

"Loan demand is falling. We are looking at increasing the interest rates from an average of 9.5% to 10.5% ..... Credit union costs have increased due to the employment of additional staff required by additional legislation/regulation e.g. compliance and risk officers etc." (Small Community Credit Union)

"Having a strategic plan with good strategic clarity…" (Large Community Credit Union A)

"New regulatory requirements have a huge impact on credit union costs. The Credit Union is in favour of regulation but there needs to be a balanced approached." (Large Community Credit Union B)

"Strong membership of the credit union;… age profile of members i.e. having an age profile that consists of young, middle-aged and older members…. common bond – our bond does not include opening up our membership to family members." (Small Industrial Credit Union)

In the semi-structured interviews CUAC also asked specifically how important was *size* and *diversification* in enhancing credit union viability. "How important is credit union size in maintaining/improving credit union viability? How might size improve viability? Do you consider there to be an optimal size for a credit union?" and "How important is diversification by a credit union (for example, product diversification and/or membership diversification) in maintaining/improving union viability? How might diversification improve viability?"

Most credit unions considered size not to be a factor influencing viability.

"[Credit Union] considers that there is not necessarily an optimal size that would best suit a credit union in terms of viability. It is more about the business model and being able to provide

what members want– if a credit union has a good business model and can satisfy members." (Large Industrial Credit Union)

"They had no particular view on whether size effects the viability of a credit union." (Medium Community Credit Union)

"[Credit Union] sees the benefits of restructuring/mergers through the additional services and products that a bigger credit union can offer, but maintains that the [Credit Union] is also capable of carrying on alone and remaining viable into the future.." (Small Community Credit Union)

"No optimal size for a credit union. Size would depend on the business model of each individual credit union." (Large Community Credit Union A)

"[Credit Union] does not think that a certain size fits the bill best in terms of viability. It is very important to maintain the credit union ethos regardless of size. [Credit Union] sees the benefit of smaller credit unions in certain communities." (Large Community Credit Union B)

"[Credit Union] does not see size as an issue in terms of credit union viability." (Small Industrial Credit Union)

In contrast to size not being of importance most credit unions considered diversification to be critical in improving viability.

"[Credit Union] thinks that diversification is very important. Again [Credit Union] considers its diversification opportunities to be limited as it is not able to extend its common bond." (Large Industrial Credit Union)

"[Credit Union] said that diversification is important as the provision of additional services to their members will help maintain and improve their member base and in turn improve viability." (Medium Community Credit Union)

"[Credit Union] observed that it would depend on each individual credit union and the products and services required by members..." (Small Community Credit Union)

"Lending diversification – credit unions should be able to provide mortgages and commercial/SME lending. Non-interest income is important as is the provision of electronic card based services." (Large Community Credit Union A)

"[Credit Union] considers that in order for a credit union to improve its viability it must be open to exploring new products for its members and improve its membership base particularly among the younger age cohort of members. [Credit Union] is currently in watching and listening mode in relation to the introduction of debit cards. There is a need for credit unions to look at the general mortgage product arena." (Large Community Credit Union B)

"Have looked at product development, but [Credit Union] places a greater emphasis on growing the loan book. Have provided special rates for car loans, education loans and loans within shares. Have looked at market development as well e.g. looking at the common bond with a view to extending membership to family members, but decided not to go down this route for now due to deduction at source issues. Cost of setting some products up would not necessarily be worth it e.g. debit cards." (Small Industrial Credit Union)

Drawing from these comments we set up a number of regression models to statistically assess whether in fact the variables highlighted by the interviewees did in fact influence credit union viability. The variables we considered were a measure of income diversification ((1-interest income as a proportion of total income (interest income + investment income + other income), asset size (log of total assets), a narrow definition of liquidity (cash & current account assets/total assets) and credit union cost efficiency (cost to income ratio). We also included in the model a quarterly time indicator to allow for sector wide temporal patterns. We considered the impact of these variables for each of the three viability scenarios - (i) *Z-Score* (Solvency); (ii) Z-Score (Viability at 7.5%); and (iii) Z-Score (Viability at 10.0%). The coefficient estimates and their significance levels are detailed in Table 5 (See Appendix).

From Table 5 (see page 24) it is evident that a degree of uniformity emerges across the three estimated equations. The regression results reveal that viability (in terms of a higher *Z-Score*) has a positive relationship with size, cost efficiency and income diversity. The coefficient estimate for diversification is positive and significant in all specifications. The intuition is that a credit union that achieves a healthy mix of interest income, fee income and commission income is likely to be more viable. For all specifications the coefficient on asset size is positive and significant which emphasises that larger credit unions are more viable. The negative estimate on the cost-income ratio highlights that credit unions with higher costs as a percentage of total income are less viable. The liquidity ratio has a negative sign which highlights that the greater the percentage of funds tied up in non-earning cash or cash equivalent assets the less viable the credit union although this variable does not prove to be significant. Finally the time trend is significant and positive in one specification indicating that in this specification there is evidence of a statistically significant improvement in viability over time.

Section 8: What Factors outside the Control of Credit Unions Impact on Viability?

In this penultimate Section we again return to the views of the credit unions. CUAC asked the question 'focusing on outside influences what do you consider as the main factors impinging on credit union viability? And why?' The following is a snapshot of their comments.

"The main factors impinging on credit union viability for our Credit Union is Central Bank lending restrictions and a host of Central Bank regulations that have to be adhered to by credit unions'. The Central Bank one size fits all approach is not working. [Credit Union] made the point that there is no way to challenge the Central Bank/Regulator in decisions that it makes." (Large Industrial Credit Union)

"Central Bank regulations are the biggest factor impinging on credit union viability according to the [Credit Union]. We think the €100,000 savings cap proposed in CP88 is an absolute disgrace. Central Bank needs to row back on lending restrictions, investment restrictions and liquidity requirements." (Medium Community Credit Union)

"Central Bank regulation and all the additional requirements on credit unions is a heavy burden both financially and administratively." (Small Community Credit Union)

"[Credit Union] recognises the need for and welcomes robust and appropriate regulation, but feels there is a lack of clarity and transparency in regulatory requirements. There is a need for a regulatory regime that is supportive and enabling in terms of change. Credit union diversity slows progress." (Large Community Credit Union A)

"Moneylenders and the availability of 0% interest rates. This is not factually correct and credit unions need to educate their members/potential members in this respect e.g. 0% car financing for new cars – for instance in this case you do not actually own the car and will be given the opportunity to buy it out at a later point." (Large Community Credit Union B)

"Credit union investments should be reclassified and led by the Central Bank. [Credit Union] feels that there is a lack of leadership and direction coming from its representative body. Leadership within the movement (ILCU) is not good at the moment. Central Bank regulation - agrees with regulation but considers them inconsistent. Would like to see the Central Bank speed up the lifting of the lending restrictions." (Small Industrial Credit Union)

Section 9: A Final Comment

The purpose of this discussion document is to explore the concept of viability for credit unions. In the development of this document CUAC undertook semi-structured interviews with the CEO and Chair of six credit unions and analyzed quarterly financial data of 377 credit unions for the period Quarter 1 2011 to Quarter 3 2013.

From the discussion with the credit union representatives it was evident that there was a breadth of opinion as to the appropriate definition of viability. However, most considered the generation of a surplus to enable the provision of the services required by members as fundamental. A subset felt that viability is also forward looking and requires having sustainable future plans. A number couched their responses in terms of survival and independence. CUAC believes that a broad definition of viability is indeed most meaningful with viability essentially where a credit union is in a position to generate enough surplus to both meet its regulatory capital requirements and support its growth ambitions, while maintaining existing service levels.

The representatives were also of the view that a broad array of factors both internal and external to the credit union is likely to influence viability. Having a healthy loan book and investment portfolio, diversified product mix and a well-developed strategic plan were internal factors considered to enhance viability while rising costs, in particular the cost of regulatory adherence, an ageing membership profile and a constrained common bond could all be expected to hinder viability. The external factors thought to adversely impact on viability were competition as well as the new regulatory environment which has placed a heavy burden both financially and administratively on credit unions.

While the definition of a viable credit union necessitates breadth in its coverage and many internal and external factors can be viewed to influence viability, CUAC has nevertheless chosen to quantify viability using two measures – ROA and the Capital Ratio. The ROA, defined as surplus as a proportion of assets, encapsulates the efficiency and effectiveness of the credit union's business model. A credit union with a positive ROA can choose to add to its reserves, distribute as dividends and/or loan rebates to members, reinvest to facilitate future growth, create a special fund for social, cultural or charitable purposes. In essence it engages in those activities that reflect its viability. The second key element in the quantification of viability is the Capital Ratio. This reflects the fact that any surplus must first be used to ensure that capital levels are appropriate. Having adequate capital provides members, the public and the regulatory authority with confidence in the continued financial viability of the credit union.

The discussion document demonstrates that ROA and the Capital Ratio can be combined to provide a proxy for the viability of a credit union in the form of *Z-Score*. The *Z-Score* measure highlights that a credit union's viability reduces when ROA falls, when ROA becomes more volatile and when the Capital Ratio declines. Conversely a credit union's viability is enhanced when ROA increases, ROA becomes less volatile and the credit union's Capital Ratio increases.

Z-Scores were calculated for each credit union on a quarterly basis between 2011 and 2013. The analysis revealed that Irish credit unions are on average becoming more viable. It was also demonstrated that the *Z-Score* could be transformed to yield a probability of the credit union falling below a benchmark Capital Ratio. The probability of this happening was small, approximately 1%. We then sought to answer the question what internal factors statistically influence viability (*Z-Score*)? Asset size was identified as important with larger credit unions more viable. The degree of diversification proved important indicating that a credit union that achieves a healthy mix of interest income, fee income and commission income is likely to be more viable. Efficiency was important, with credit unions with higher costs as a percentage of total income less viable.

This quantitative assessment of viability structured around *Z-Score* is meant to be illustrative and should not be taken as providing a definitive assessment of a credit union's viability. The *Z-Score* highlights the importance of a credit union's capital adequacy and its ability to generate a surplus with the latter shining a light on the efficacy of the credit union's business model. The *Z-Score* also illustrates that viability is improved by a higher ROA, an ROA that is stable over time and a higher Capital Ratio. The latter of course raises a further complication in that a credit union with an excessively high Capital Ratio is in all probability too cautious or simply does not have appropriate opportunities to grow its business. The quantitative assessment also empirically assessed credit union specific factors which may influence viability. Again this is illustrative as the analysis only considered a relatively small subset of credit union specific variables due to data availability. It is also the case that viability is influenced by factors outside the control of the credit union which was evidenced by the representative credit unions focus on rising costs as a consequence of the new regulatory requirements.

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Appendix

Table 5: Factors Influencing *Z-Score* (Viability)

	Z-Score (Solvency)	*Z-Score* (Viability at 7.5%)	*Z-Score* (Viability at 10.0%)
	Coefficient Estimate (standard error)	Coefficient Estimate (standard error)	Coefficient Estimate (standard error)
Diversification (interest income/total income)	0.004*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Asset Size LN(Total Assets)	0.071*** (0.012)	0.079*** (0.015)	0.052*** (0.018)
Cost-Income (Expenditure/I)income	-0.002*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)
Liquidity (Cash & Current Account Assets/Total Assets)	-0.004 (0.004)	-0.002 (0.003)	-0.001 (0.005)
Quarterly Time trend	-0.005 (0.004)	0.001 (0.004)	0.012** (0.006)
Constant	2.541*** (0.951)	0.410 (1.125)	1.803 (1.363)
Observations	3,597	3,505	3,392
R-squared	0.066	0.050	0.042
Number of Credit Unions	377	377	377

Note: *** denotes significant at 1% level, two-tail test; ** 5% level; * 10% level.