

MARKET DISCIPLINE IN NEW ZEALAND REGISTERED BANKS

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Abstract

The effectiveness of New Zealand's prudential regulation of registered banks is of broad interest as it relies upon the actions of individual depositors. There is no direct prudential supervision by any statutory body, and whilst the RBNZ has an oversight role, it has no private information. The safety and soundness of New Zealand banks depends on the public disclosure of information and resultant market discipline to moderate possible excessive risk taking. The government, until recently, offered no guarantees either explicit or implicit, and no system of deposit insurance was in place to protect depositors.

We judge the 1996 bank disclosure regime to be effective, finding a significant relationship between deposit risk indicators and bank risk premiums. However, as the relationship is strongest prior to disclosure publication we suggest it is a result of self-discipline, rather than market discipline. New Zealand's 1996 disclosure regime provides evidence of disclosure effectiveness, in a market essentially free from regulatory distortions. Under these conditions, market-discipline is a viable alternative to regulator supervision for the moderation of excessive risk taking in banks.

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Introduction

A well functioning bank system is of critical importance to the health of our economies. This is often the reason given for government regulation of banks. Bank customers must have confidence in the banking institutions they entrust funds to, in order to trust the financial system as a whole. If a bank fails, the cost is not born entirely by its investors, the economy as a whole may be damaged. For this reason bank management cannot be left entirely to their own devices.

In 1996, the Reserve Bank of New Zealand (RBNZ) moved from what would be considered a traditional regulatory model, where banks are subject to regulatory discipline, to a model with greater emphasis on self and market-discipline, believing this would ensure a healthy banking system. Regulation of banks in New Zealand appears to be light-handed in comparison to others, in a 1998 World Bank survey (Barth, Caprio, & Levine, 2001, p. 55, figure 6) ranks New Zealand equally with Aruba as the least restrictive of 107 countries in an index of bank activities and ownership.

New Zealand maintains some traditional regulation, for instance minimum Basel pillar one capital ratios are retained. However, the RBNZ relies on published disclosure for its pillar two supervisory role, supplemented by an annual meeting with bank management. There is no onsite inspection of banks, although the RBNZ retains the power to intervene where bank distress or failure, threatens the soundness of the New Zealand financial system.

What sets New Zealand's regulation apart, is its reliance on the third Basel pillar of market-discipline, with RBs issuing two forms of quarterly. The Key Information Summary (KIS) designed primarily for retail depositors, contains the bank's credit rating, Basel capital ratios, peak exposure concentrations and exposures to related parties, asset quality, and profitability. Second, the General Disclosure Statement (GDS), adds considerable detail to the KIS; including corporate information, financial statements including a five-year summary, detailed information on capital adequacy and risk exposures, as well as fund management, securitisation, management systems, and market risk exposure. The GDS is the subject of a full external audit at balance date and a limited audit on a six monthly basis.

Self-discipline is stressed, with bank directors required to sign all disclosure statements, attesting they comply with RBNZ prudential regulations, risk management systems are properly applied, there are no exposures to related parties that are contrary to the interests of the bank, all required disclosures are contained, and that they are not false, or misleading. Directors who sign a false or misleading disclosure statement may be jailed for up to three years, and/or face personal liability for creditor's losses.

We examine the effectiveness of this alternative regulatory model to determine if the country is well served by it. Ultimately, the underlying research question answered is; can depositors in New Zealand RBs have confidence in the institutions they entrust their capital to?

Literature

Market-discipline is a solution to moral hazard incentives caused when traditional regulations result in the provision of either explicit, or implicit, safety nets. Market-discipline must penalise unwarranted risk taking, or poor management, in ways government regulation is unable to (Calomiris, 1999). Market-discipline is the absence of interference in bank markets by non-market participants, formally defined by De Ceuster and Masschelein (2003, p. 753) as, *“a regulatory mechanism that delegates the monitoring and disciplining task not only to the national and international regulator but also to the market participants whose wealth is affected by the banks’ conduct. Consequently the continuous ‘curse’ of disciplinary measures by these market participants creates strong incentives for management to run their banks in a safe and sound way”*.

Lane (1993) lists four conditions necessary for effective market-discipline. First, financial markets must be free and open. New Zealand’s financial markets have been open to new entrants since 1980s deregulation. Second, adequate information must be available about existing debts and the prospects of repayment. Quarterly disclosure statements (KIS and GDS), containing relevant risk information, ensure adequate information is available in a timely manner and all New Zealand RBs have international credit ratings. The third condition is no possibility of a bail out in the event of a default. Although the RBNZ was explicit when introducing the 1996 disclosure regime they would shoulder no responsibility if a RB collapsed, there is, the possibility they might intervene if the RB was considered to be systematically important. Last, financial institutions must respond to market signals before exclusion from the market, this subject to empirical testing. An institution not responding to market-discipline signals could only do so for a limited period, once liquid assets are exhausted failure must occur.

Handicapping empirical research of market-discipline is the availability of suitable data. A standard methodology employed is to take equity, or debt, market prices for a group of banks and attempt to find a relationship with a variable which proxies risk. Traditional risk indicators are extracted from bank financial statements, downgrades in the banks’ credit ratings, or the ultimate risk indicator bank failure.

Extensive tests have been undertaken using US wholesale debt obligations, Flannery and Sorescu (1996) report, for US banks (1983-1991), accounting measures of risk impact subordinated debentures yields. Flannery (1998) concludes, in a survey of market-discipline research, that although there was some variation in results most researchers found a relationship between market rates of CDs and bank risk

indicators. Outside of the USA researches also provide evidence of market-discipline. Sironi (2000), finds European bank credit ratings to be sensitive to subordinated debt spreads. In Italy, Cannata and Quagliariello (2005), find abnormal returns of bank stocks seem to anticipate ratings assigned by the Bank of Italy. In European banks, Distinguin et al. (2006), use a logit model and suggest accounting data and market indicators can improve the prediction of future bank financial distress.

Problematic however is existing empirical market-discipline research has been conducted in markets where banks are subject to significant supervisor discipline, deposits insurance, and implicit or explicit guarantees, lessening the effectiveness of market-discipline if not completely negating it. Imai (2007, p. 1443) found it was only after the Japanese Government allowed Hokkaido Takushoku Bank to fail that subordinated debt holders required higher interest rates from riskier banks. New Zealand, with no deposit insurance, limited regulatory presence, and a stated policy of no Government guarantee, provides an ideal environment to empirically testing market-discipline.

Analysis

As elsewhere, the testing of market-discipline in New Zealand banks is constrained by a lack of suitable data. Most banks are either branches or subsidiaries of foreign banks; therefore, no equity data is available. Wholesale deposit data is at best patchy, what bonds NZDX listed are seldom traded. While New Zealand bank debt is traded internationally, the variety of offerings combined with guarantees by parent banks makes construction of a reliable interest rate series impossible. To overcome the lack of equity or wholesale data an alternative was to test for market-discipline using retail deposit data². Retail market-discipline research is limited, with most researches maintaining retail depositors are unable to apply market-discipline.

The IRG database provides term-deposit rates for the period June 2001 until June 2006³. New Zealand newspapers publish this data weekly, in tables of New Zealand retail deposit and mortgage rates. The 3-month deposit rate was used, New Zealand banks (shown in Figure 1) rely heavily on short term funding, with NZ\$37 billion in retail deposits of maturities between 2 days and 90 days, suggest there is strong competition amongst banks for 3-month term deposits. From this deposit rate data the 3-month bank bill rate was subtracted to generate a risk premium series. The bank bill rate was used in preference to other rates such as the 3-month Treasury bill rate or the OCR as it is more actively traded. Although the bank bill rate already includes a risk premium this is the same for all banks so will not alter results other

² Restricting the sample to retail banks reduced the number of banks in the sample, but the sample still covers over 80% of total bank assets (Table 2).

³ In 2006 IRG was sold, the new owner discontinued collection interest rate data.

than changing the constant value. The mean risk premium for 3-month deposits was -0.79%. Although it appears to be a contradiction in terms to have a negative risk premium, this is a result of retail investors being unable to invest in the Bank Bill market. Effectively, banks are able to attract funds at a discount to the risk free rate, which depositors are prepared to accept for the convenience of ready access to bank deposits. We have no way of knowing the magnitude of this discount, and as it is likely to be the same for all banks it does not influence results. This risk premium will be the dependent variable in regression analysis.

Independent variables were KIS risk indicators, apart from liquidity calculated from GDS data. To assist in understanding their likely impact on bank risk premiums they were fitted into a CAMEL framework. The first CAMEL component, capital, is measured by tier1 capital and total capital. Tier1 is equivalent to ordinary equity, with lower levels of equity considered as indicators of increased risk, a conclusion reached by Cole and Gunther (1998) and confirmed by Koetter et al. (2007). As tier1 and total capital measure the same risk factor, we excluded total capital to avoid multi-collinearity problems.

A fundamental reason for bank failures is the writing of bad loans. This is represented by the asset quality variables impaired asset provision and specific provision expense. Higher levels indicate a bank is having difficulty with its loan portfolio. Therefore, its risk level is greater, with Cole and Gunther (1998) expecting a positive relationship with the likelihood of bank failure. Again to avoid problems with multi-collinearity we excluded impaired asset provision. Clair (1992) finds increased lending, above what would be considered normal, lowers lagged loan quality, growth can also be classified an asset quality variable.

The impact of management is difficult to quantify. US bank examiners assess management and board directors on a range of qualitative factors, such as the level and quality of oversight, ability in respective roles, conformance with internal policies, and the adequacy of internal audit trails (Federal Financial Institutions Examination Council, 1996). Academic research has often used key performance indicators, such as the cost to income ratio to proxy management quality. Koetter et al. (2007) argues, this indicator is a poor proxy, as it is affected by market circumstances and external shocks.

The variable size affects more than one CAMEL component, playing a part in asset quality, managerial effectiveness, and earnings. While there can be some negative effects from size, the overall affect is expected to be positive. Increased size leads to greater diversification of loans, with loans spread over more customers and business sectors. Diversification reduces risk at little cost once an organisation is over a certain size. Therefore, size should increase asset quality, with larger banks having a lower risk premium.

Size could proxy managerial quality, it is expected larger banks are better managed, as they have improved reporting and other management systems in place and are likely to attract higher calibre staff. The cost of quality management is spread over a larger asset base, giving economies of scale, leading to increased efficiency. A counter view is large size leads, instead, to a reduction in management effectiveness and efficiency, due to increased bureaucracy, the prevalence of management perks, and the remoteness of the head office. Research employing efficiency techniques (DeYoung, 1998, p. 7) has yielded mixed results as to which viewpoint is correct.

The biggest impact of size is likely on the earnings component. Large banks exert market power, having the ability to maintain earnings while offering lower interest rates to depositors. The second Earnings component variable is profitability, we use net profit after tax for the previous year, as a percentage of assets. The expectation is that higher profitability allows banks to meet debt repayments.

The final variable included is liquidity. A normative expectation is banks with higher levels of liquidity should be able to cope with unexpected withdrawals and, therefore, be less risky. Peria and Schumkler (2001) and Ugan et al. (2008) provide support for this view, with depositors asserting market-discipline in response to reduced liquidity. However, several other studies have found liquidity does not serve well as an early warning indicator. Martin (1977), reports that liquidity predicts US bank failures in some periods (1971-72), but not in others (1975-76). A summary of the CAMEL framework is shown in Table 3.

Equation 1 Registered Bank Risk Premium at Publication

$$RP_{pub} = C - \beta_1 * Tier1_{bal} + \beta_2 * SpecProv_{bal} + \beta_3 * Growth_{bal} - \beta_4 * LnSize_{bal} - \beta_5 * Profit_{tbal} - \beta_6 * Liquidity_{bal} + \beta_7 * TSB + \varepsilon$$

Regression analysis in the form of Equation 1 will be used to analysis the relationship between disclosure risk indicators and bank risk premiums. Statistically significant beta coefficients of correct sign will be an indication of market discipline.

Results

Results in Table 2 show OLS model 1 explains 35.4% of variation in bank risk premiums, in Model 2 adding the highly significant TSB dummy variable increases the explanatory power to 41.1%. The coefficient of the Liquidity risk indicator (2.7741*** and 3.5801***) are the opposite sign to that originally expected (Table 3), other coefficients are as expected, apart from growth which is negative but not statistically significant. Although the explanatory value of model 2 increases, the tier1 coefficient is no longer significant. The lack of significance is an indication of the difference between the TSB and the other sample banks. TSB has a mean tier1 of 14.19%, whereas the mean of the remaining banks is 8%. The other change

in model 2 is increased significance of the profit coefficient, now statistically significant at a 5% level. Residual plots (Figure 2) confirm the regression error term is normally distributed and independent.

In summary, models 1 & 2 show a clear difference between TSB and other RBs, risk-premium variability can be explained by specific provisions, LnSize and liquidity. Profitability is of some importance, once the TSB has been controlled for, and growth is of no importance. An R-square of 41.1% confirms the value of disclosure risk indicators in assessing New Zealand banks. However, the liquidity coefficient is of the wrong sign to indicate risk. In a market-discipline context, it is nonsensical to believe that depositors would reward banks for reducing their liquidity.

We also model the relationship between the risk premium and risk indicators at balance date, prior to publication. Coefficients are similar to those in models 1 & 2 apart from growth which is statistically significant, but opposite in sign to original expectations. The explanatory power of models 3 & 4, shown in Table 2 are surprising, as the R-square has increased in both regressions to 38.8% and 44.4%, indicating it is better able to explain the variability in the risk premium. This increase in explanatory cannot be ascribed to market-discipline as disclosure statements have not yet been published.

Discussion

Results in Table 2 show a significant relationship between bank risk premiums and disclosure risk indicators. However, this relationship is not due to market discipline applied by retail depositors. Retail market discipline cannot explain why the risk return relationship is stronger prior to disclosure publication or why the coefficient of liquidity is of the wrong sign. Thus, the risk return relationship found is due to bank self-discipline not market-discipline. The increase in explanatory power of risk indicators prior to their publication as well as the unexpected sign of the liquidity coefficient is the result of bank management action.

Bank disclosure statements offer no surprise information to management and directors. We presume that banks would be fully aware of their financial position on a daily basis. Management aware of changes in financial ratios are likely to move deposits rates in advance of information disclosure. This would suggest New Zealand's disclosure regime is effective in disciplining New Zealand banks and moderating bank risk as bank management moves in anticipation of market-discipline, practising self-discipline.

Positive coefficients for liquidity also have a straightforward explanation not due to risk. The measure liquidity (Equation 2) is sensitive to changes in the bank cash levels in the numerator. The positive relationship between liquidity and the risk premium is a result of banks managing their liquidity by manipulating their interest rates. For example, a bank that considers its liquidity to too high, could reduce

deposit rates (lower the risk premium), as deposit growth falls (or slows); it would consume existing liquid assets in place of deposits. From Figure 1 we see New Zealand banks rely heavily on short term funding. A bank managing its liquidity position will most likely do so by adjusting its 3-month term deposit rate. We contend liquidity only influences the risk premium if it falls to low levels threatening bank viability.

Equation 2 Liquidity Calculation

$$Liquidity = \frac{\text{Cash} + \text{Govt Stock} + \text{Bank} + \text{Public Sector Debt}}{\text{Total Assets}}$$

Of concern has been the lack of significance of tier1 capital as most recognize low levels of equity indicate higher risk. Tier1 was significant when TSB was included, but lost significance once the TSB dummy was included in the regression model. TSB with a mean tier1 of 14.19% is clearly different from the other banks in the sample with a mean Tier1 of 7.78%. Although TSB is riskier than the other banks, as measured by its S&P rating of BBB+ in contrast to the AA rating of other banks in the sample (Table 1), its high tier1 is likely a legacy of its history as a community owned savings bank and its lack of overseas funding rather than its riskiness. With regard to other banks in the study, there is little variability in equity levels. Management only has indirect control over equity levels and it would take time to change the level of equity. Finally, it may be normal for bank equity to be in a band of 6% to 8%, with equity only being of concern if it were to approach the mandated bank minimum of 4% and little benefit from levels of equity above 8%.

Conclusion

The aim of this research has been to assess the effectiveness of registered bank regulation in New Zealand. We judge it to be effective and provide valuable contributions to the ongoing debate as to the effectiveness of market discipline. Bank disclosure and resultant market discipline is effective in moderating excessive risk taking by banks, when depositors are unable to shelter behind deposit insurance and/or government guarantees. A secondary finding was, levels of tier1 capital and liquidity were not significant in determining a bank's risk premium. The only caveat to this finding is that tier1 capital and liquidity must be within normal bounds.

A fundamental precept of market discipline is for risky institutions to be required to pay an increased premium for risk. We provide evidence of the risk return relationship in New Zealand registered banks, confirming published disclosure statements can be a valuable resource for depositors wishing to make risk return comparisons among banks. As the risk return relationship is strongest prior to the publication of disclosure statements, we judge this a result of self-discipline by bank management, not the

application of market discipline by depositors. As, self-discipline is believed to be more effective⁴ than market (or regulator) discipline, New Zealanders can have confidence as to the safety and soundness provided by its bank disclosure regime. This finding is a significant and valuable contribution, especially in a time of financial turmoil when many are calling for greater regulation and supervision of banks. We suspect that the recent failure of a number of banks in overseas markets occurred because the market relied too much on regulation and regulatory supervision, a task the regulator was unable to complete satisfactorily. A better alternative is to subject banks to “the continuous ‘curse’ of disciplinary measures by market participants” as outlined by De Ceuster & Masschelein (2003, p. 753). Ultimately, market-discipline can impose penalties on risky banks more severely than any imposed by a government regulator.

Governments and regulators, seeking to enhance bank safety and soundness, should do all within their powers to foster market discipline. A prescription as to how market discipline can be fostered, is found in Lane (1993), free and open financial markets, provision of adequate information to market participants and no possibility of a bail out in the event of a bank default. If these three conditions hold, then financial institutions have little option other than to respond to market signals, or be excluded from the market. Disclosure and market-discipline should make banks and economies more efficient in the long-run.

⁴ Self-discipline is superior as it is based on more timely and accurate information, resulting in prompt corrective action being applied directly.

Appendices

Table 1 NZ Registered Banks (Source: RBNZ Sept 2007 KIS)

| New Zealand Incorporated Bank | Total assets (NZ\$m) | % | First** Registered | S&P Rating |
|---|-------------------------|--------------|-----------------------|---------------|
| ANZ National Bank Limited | \$ 107,787 | 33.5% | 1/04/87 | AA |
| ASB Bank Limited | \$ 53,915 | 16.7% | 11/05/89 | AA |
| Bank of New Zealand | \$ 56,375 | 17.5% | 1/04/87 | AA |
| Kiwibank Limited | \$ 5,671 | 1.8% | 29/11/01 | AA- |
| Rabobank New Zealand Limited | \$ 4,830 | 1.5% | 7/07/99 | AAA |
| TSB Bank Limited | \$ 3,005 | 0.9% | 8/06/89 | BBB+ |
| Westpac New Zealand Limited | \$ 45,995 | 14.3% | 31/10/06 | AA |
| | \$ 277,578 | 86.2% | | |
| Overseas Incorporated Bank NZ Branch | | | | |
| ABN AMRO Bank NV | \$ 1,826 | 0.6% | 2/03/98 | AA- |
| Citibank N A | \$ 3,543 | 1.1% | 22/07/87 | AA |
| Commonwealth Bank of Australia* | \$ 5,556 | 1.7% | 23/06/00 | AA |
| Deutsche Bank A G | \$ 5,950 | 1.8% | 8/11/96 | AA |
| Kookmin Bank | \$ 406 | 0.1% | 14/07/97 | A |
| Rabobank Nederland* | \$ 1,622 | 0.5% | 1/04/96 | AAA |
| The Bank of Tokyo-Mitsubishi UFJ | \$ 608 | 0.2% | 1/03/04 | A+ |
| The Hongkong and Shanghai Banking Corp | \$ 6,386 | 2.0% | 22/07/87 | AA |
| Westpac Banking Corporation* | <u>\$ 18,712</u> | <u>5.8%</u> | 1/04/87 | AA |
| | \$ 44,609 | 13.8% | | |
| Bank Total Assets | \$ 322,187 | 100% | | |

Sample banks are highlighted in bold

*Adjusted for assets held in NZ incorporated subsidiary bank

**April 1987 was when the Registered Bank designation was first introduced

ANZ, BNZ, Westpac were Trading Banks prior to this. ASB and TSB were Savings Banks

Table 2 Regression Results Risk Premium in Registered Banks

| Expected | Model Risk Indicator | 1 β Coefficient | 2 β Coefficient | 3 β Coefficient | 4 β Coefficient |
|--------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | (Constant) | 3.3729** | 5.1419*** | 4.0308*** | 5.6881*** |
| -ve | Tier1% | -0.1532*** | -0.0615 | -0.1509*** | -0.0608 |
| +ve | SpecProv % | 387.58*** | 370.69*** | 360.01*** | 345.01*** |
| +ve | Growth% (adj) | -0.0038 | -0.0093 | -0.0140** | -0.0186*** |
| -ve | LnSize | -0.3044*** | -0.5347*** | -0.3244*** | -0.5453*** |
| -ve | Profit% | -0.3549 | -0.4506** | -0.5725*** | -0.6489*** |
| -ve | Liquidity% | 2.7741** | 3.7805*** | 2.4486** | 3.4312*** |
| | TSB Dummy | | -1.5079*** | | -1.4650*** |
| Dependent Variable | | RP _{pub} | RP _{pub} | RP _{bal} | RP _{bal} |
| Adjusted R Sq | | 0.354 | 0.411 | 0.388 | 0.444 |
| F Statistic | | 11.144*** | 12.062*** | 12.738*** | 13.651*** |

*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level.

Table 3 RB Risk Indicators Fitted into a CAMEL Framework

| Category | Risk Indicator | Expected Sign | Intuition behind expected relationship |
|---------------|----------------|---------------|--|
| Capital | Tier1 | -ve | Capital offers an alternative repayment source in a crisis, providing a buffer to debt investors. |
| Asset Quality | Spec Prov | +ve | Indicate doubtful debts and bad debts, with higher levels suggesting low asset quality. |
| | Growth | +ve | Financial institutions are expected to grow steadily, however, increased lending above the normal level lowers loan quality. |
| | LnSize | -ve | Greater diversification lowers risk. |
| Management | LnSize | -ve | Larger banks are expected to be better managed, with personnel of a higher calibre and improved reporting. |
| Earnings | Profit | -ve | Higher earnings mean the Bank is more able to make debt repayments. |
| Liquidity | Liquidity | -ve | Higher liquidity indicates the ability to meet obligations. |

Figure 1 NZ Registered Bank Funding by Maturity Sept 2007 (Source: RBNZ SSR Part b1)

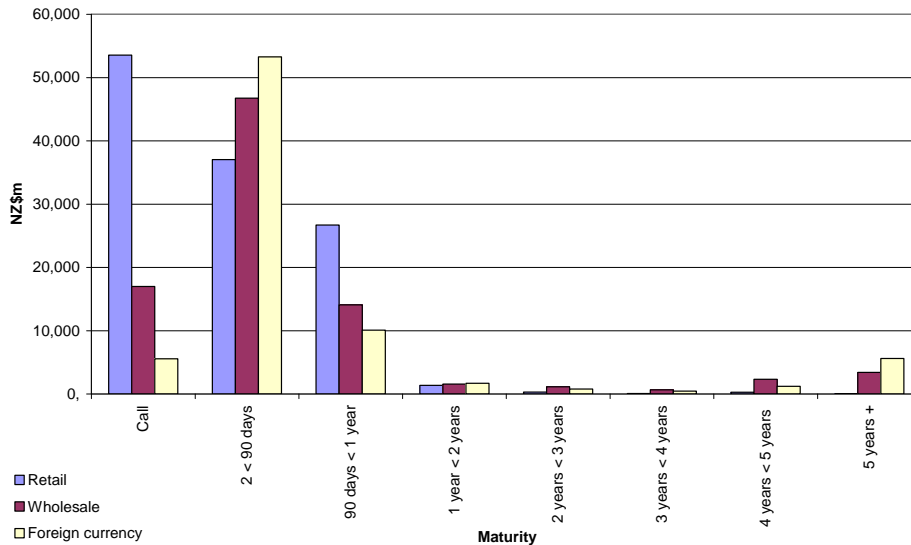
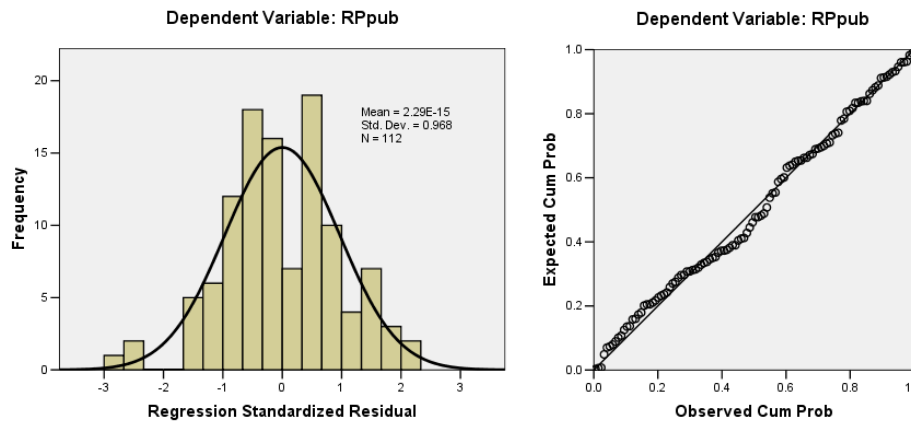


Figure 2 RP at Publication - Histogram Residual Distribution & Normal P-P Plot of Regression Standardised Residual



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