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Banks' Sustainable Growth Challenge under Economic Recessionary Pressure

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Abstract

This study's findings could identify important signals that could promptly warn of an impending bank failure by sustainable growth paradigm and seemingly unrelated regression (SUR). The sustainable growth model provides us with a linkage between bank growth and corresponding financial performance indicators. These signals could identify specific areas of concern that need to be more carefully monitored and/or plans or strategies modified for the sake of averting economic failures or disasters. Moreover, this study conducts its SUR analysis on two banking classifications: agricultural and non-agricultural banks (as classified using the FDIC criterion).

Key Words: Agricultural bank, Bank failure, Sustainable Growth, Survival analysis

Motivations

In early 2019, prognoses of an evolving recession have surfaced in economic discussion circles as several warning signs were noted. Employment reports indicated fewer new jobs created than expected; the Federal Reserve Banks downgraded economic growth forecasts, while contemplating on reducing the federal funds rate; and interest rate trends supported a persistent inversion of the yield curve (Ghilarducci, 2019; Keoun, 2019).

Looking back to the Great Recession of 2008, this article focuses on the plight of the U.S. banking sector that was then hardly hit by the economic downturn. According to the Federal Deposit Insurance Corporation (FDIC), the banking industry registered a total of 509 bank failures from January 2007 to December 2014, with nearly 60% of these failures occurring in 2009 and 2010. In contrast, there were only 24 U.S. bank failures over a seven-year period prior to 2007(FDIC, 2019). Moreover, the FDIC maintained a watch list of banks operating under some stress as determined by its set of critical financial performance indicators. In 2014, the FDIC closely monitored around 290 banks as these banks received either “poor” or “very poor” ratings using such standards (Liu, 2014).

These bank failures were caused by, among others, faulty investment and lending decisions. In the banks’ residential real estate loan transactions prior to the recession, speculative borrowing easily tolerated subprime mortgage transactions (Demyanyk and Hasan, 2010). The prevailing industry conditions at that time allowed for easy access to credit while interest rates were low, and the economy was experiencing an influx of foreign funds. These conditions encouraged a housing market boom whereby home prices increased dramatically since 2002. This housing bubble, however, could only be sustained till late 2006.

As real estate prices started spiraling down, inflationary and tight market conditions brought about hundreds of thousands of loan defaults (Isidore, 2009). The default rate increased over just a short period of time. Hence, accelerated levels of loan defaults and mortgage foreclosures led to an alarming rate of bank failures experienced in the industry for the first time since the 1980s.

Amidst such financial crises, other banks weathered pressures and challenges of survival either through some remedial strategies to mitigate adverse repercussions of erroneous operating decisions or by adopting a more cautious, conservative stance in making earlier business decisions. This article dwells on such specific business decisions made by banks for the sake of survival or realizing growth potentials, if any were existent during the few years around and during the recessionary period. An analytical model is developed to discern whether banks have continued pursuing aggressive growth plans or made some adjustments in their business strategies causing deceleration of overall business activity reflected through their more sluggish growth trends during such period.

This study adopts Higgins' sustainable growth model to ascertain the nature of U.S. banks' operating strategies in the years around and during the Great Recession of 2008. Higgins' model is used to address the important empirical question of whether banks have aggressively exhausted growth potentials during the pre-recession period or whether their subsequent operating decisions affecting revenue growth during and after the recessionary period were tempered with caution and prudence for the sake of survival.

This article's analytical approach features an interesting dichotomy of agricultural and non-agricultural banks. These banks are primarily distinguished by their client specialization

tendencies with agricultural banks more closely allied with the agribusiness sector than their peers. Moreover, agricultural banks usually have more liquidity concerns and are typically smaller than regular banks as about one third of all agricultural debts are held by rural banks with assets of less than $50 million (Li, Brewer and Escalante, 2018). As a result, funding constraints inhibit agricultural banks to diversify their clientele to accommodate non-farming clientele.

The agricultural banks' affinity to its farm clientele, which is usually faced with high market volatility and vulnerable to natural sources of risks, further diminishes confidence in these institutions' ability to withstand risk and uncertainty. However, despite such pessimistic view on agricultural banks, this sector's overall financial performance throughout the last economic downturn was commendable. Specifically, empirical evidence suggests that agricultural lending activities of banks did not significantly increase banks' probability of failure during the last recession (Li *et al.*, 2013). The farm lending sector comprising 30.1% of all banks operating in the U.S. banking industry only experienced 27 bank failures since 2007 (ABA, 2012), which is equivalent to only 5.5% of all bank failures registered during the period. This can be attributed to the high level of credit conscientiousness among farm borrowers as delinquency rates for agricultural loans were consistently one of the lowest among loan categories during the recessionary period (Kauffman and Akers, 2013). Moreover, Ellinger and Sherrick (2010) confirm that agricultural lenders maintained better financial health due to this sector's lower exposure to real estate lending transactions. Notwithstanding such stance, farmland values have not necessarily yielded to recessionary pressures in the late 2000s (Nickerson et al., 2012) in contrast to the farmland value trends in

the late 1980s when they declined by about 50% and ushered in a period of farm financial crises (Thomson, 1991).

Given this backdrop, this study will shed light on the two bank categories' differentiation of growth strategies and business decisions. The analysis will be conducted under two time perspectives (recessionary and recovery periods) to compare business operating decisions made by these two banking groups. As discussions of an imminent recession resume, this study's results could provide implications worth considering by existing banks that seek to fortify their survival potentials with more cautious operating decisions and growth plans.

Bank Failure and Survival Studies

A number of studies on bank failure and survival covering various economic episodes establish links between previous operating decisions and resulting bank performances. Several studies examine cost considerations in managing operating inputs, financial capitals, and fixed assets while others analyzed the banks' liquidity and risk management strategies. For instance, Cole and Gunther (1995) assert that the length of the duration before a bank's eventual failure is not necessarily affected by the bank's liquidity conditions and business size. Belongia and Gilbert (1987) contend that failed banks in their study's sample invested higher percentages of assets in agricultural production loans and lower percentages in federal government securities. Demirgüç-Kunt, Laeven, and Levine (2003) find that tighter regulations and inflationary pressures actually exert a positive impact on banking business survival and viability. Another study analyze the profit efficiencies of "de novo" banks (those in operation for five years or less) and contends that evolving efficiencies would usually take

a longer time to reach established bank levels and the relatively lower profit efficiency levels at the embryonic business stage might cause excess branch capacity and reliance on large deposits (1998). According to Cornett, McNutt, Strahan, & Tehranian (2011), banks' efforts to manage a liquidity crisis would lead to a decline in credit supply. An interesting result of this study shows that bank liquidity and bank size are not associated with the failure time (Cole and Gunther, 1995).

Other relevant studies identify determinants of bank failures based on evidence from previous episodes of financial crises. These studies focus on effects on bank failures of different facets of the banking operations, such as the nature and consequences of management decisions(Belongia and Gilbert, 1990), the effect of insider loans (Graham and Horner, 1988, Seballos and Thomson,1990, Belongia and Gilbert,1990, Thomson, 1991), overhead costs (Demirguc-Kunt, et al., 2004, Seballos and Thomson, 1990, Thomson, 1991), level of industry concentration (Thomson 1991, and DeYoung and Hasan, 1998), capital ratios as predictors of bank performance(Estrella, Park and Peristiani, 2000), and audit quality failure (Jin *et al* ., 2011).

Some empirical works prescribe early warning indicators in the hopes that costly lessons from past businesses would not be replicated in future periods. Li, Brewer, and Escalante (2018) used an Input Distance Stochastic Frontier function to estimate the technical efficiency (TE) and allocative efficiency (AE) of agricultural and non-agricultural banks. Their findings suggest that banks that lean more towards utilizing cheaper inputs during a seven-year pre-recession period were more likely to survive through the developing economic crisis. An earlier related study (Li et al., 2013) suggests that decisions involving

costly arrangements in the procurement of financial inputs, increasing interest rate risk, and declining asset quality made about two to three years before an impending bank failure could be important early warning signals. Berger and Bouwman (2017) warn that a developing financial crisis could be predicted by tracking banks' decisions on liquidity reserves whereby more aggressive accumulation trends, especially among off-balance sheet accounts, could indicate an imminent economic shock ahead.

The Sustainable Growth Paradigm

The sustainable growth model, which was introduced by Higgins (1977) in corporate finance literature, is a useful construct for defining "affordable" growth or a firm's pursuit of a growth target feasible within a set of operating parameters and resource endowments. This paradigm can aptly be described as "growing within one's means." A firm's sustainable growth rate (g_s) is defined as the product of four levers of growth – profitability, earnings retention, asset productivity, and financial leverage – as laid out in the following:

$$g_s = \left[\frac{Net\ Income}{Revenue}\right] \times \left[\frac{Net\ Income - Dividends}{Income}\right] \times \left[\frac{Revenue}{Assets}\right] \times \left[\frac{Assets}{Euity_{beg}}\right] = SGR \quad (1)$$

Where

$$\text{Profit margin} = \frac{Income}{Revenue} \quad (2)$$

$$\text{Retention ratio} = \frac{Income - Dividends}{Income} \quad (3)$$

$$\text{Assets turnover} = \frac{Revenue}{Assets} \quad (4)$$

$$\text{Financial leverage} = \frac{Assets}{Equity_{beg}} \quad (5)$$

Higgins' model revolves around the sustainable growth challenge (SGC) concept that relates sustainable growth rate to actual/expected revenue growth rates. SGC is calculated as follows:

$$\text{SGC} = \ln\left(\frac{Revenue_t}{Revenue_{t-1}}\right) - g_s \quad (6)$$

The model is flexible in its applications. On one hand, the SGC can be a prescriptive parameter for planning purposes when target (instead of actual) levels of the four growth levers and a forecasted $Revenue_t$ are used. In this case, g_s is the target rate the past year's revenue. On the other hand, SGC can be used to diagnose historical growth experiences as either aggressive (when actual revenue growth rate exceeds g_s) or sluggish (actual revenue growth rate is lower than g_s). Under an aggressive growth scenario, the firm grows beyond what can be afforded by its financial resource endowments and increases the risk of liquidity shortfalls and insolvency. In contrast, a sluggish growth scenario translates to unrealized opportunities and wasted idling of excess available financial resources. In both prescriptive and diagnostic perspectives, a firm's goal is to achieve balanced goal whereby the firm grows at a pace its available resources can sustain, thus the term "sustainable growth".

Originally conceived in corporate finance literature, the SGC's relevant application in agricultural finance was introduced by Escalante, Turvey, and Barry (2009) using national and regional (Illinois grain and livestock farm) data on financial performance indicators. Their results produce positive and negative SGCs over time reflecting business decisions according to SGC principles. An SGC application to banking finds that growth in banking revenues can be constrained by equity growth and external regulations on leverage (Vasiliou and Karkazis, 2002). Using the same SGC construct, Deloitte Consulting (Kobler, Brandes, Schlotmann and Fischer, 2015) defines appropriate growth targets for banks that will add to their value and identify effective business strategies that can sustain such growth. Kumar (2018) analyze the level of financial distress of Indian banks employing the SGC model to

establish benchmarks for financial and operating policies that could bring about the desired pace of business growth.

Empirical Design

This study's dataset represents a representative cross-section of U.S. commercial banks that operated before, during, and after the last recession. This study's analytical model presents some slight modifications of the Escalante, Turvey, and Barry (2009) application of the SGC paradigm to agricultural finance.

Data Measurement

A panel dataset is compiled from the call report database published by the Chicago branch of the Federal Reserve Board (FRB). The call reports' quarterly data are annualized and filtered to retain only banks that remained in operation and consistently filed their quarterly financial reports during the years 2006 to 2011. As the starting and end points of the Great Recession of 2008 are set at December 2007 and June 2009, respectively (Rich, 2013), this study's sample period includes annual observations from the pre-recession and post-recession (recovery) periods. Given the selected sample period and filtering condition applied, this study's dataset consists of 6,133 commercial banks. Using the classification criterion employed by the FDIC in distinguishing agricultural banks (i.e. banks whose portfolio of agricultural production loans and real estate loans secured by farmland exceeds 25 percent of its total loans and leases), this study's dataset consists of 647 agricultural banks and 5,486 non-agricultural banks.

In this study, financial information compiled from the call report database namely, net income, total assets, equity capital, gross revenue, preferred dividends, and common

dividends.[1] are used to calculate the four components of the sustainable growth model: profit margin (PM_t), earnings retention ratio (ER_t), asset turnover (AT_t), and financial leverage (LEV_t).[2] Dividend payments to the banks' common and preferred shareholders capture earnings withdrawals.

Moreover, the banks' loan balances for four different types of credit accommodations (agricultural, industrial, real estate, and consumer loans) are used to construct a loan diversification variable using the Herfindahl index (HI_t) approach. As shown in the equation below, the index is calculated by first calculating the relative contribution (share) of each loan category to the total of all four loan accommodations; then the index value would then be derived as the sum of the squares of the loan category shares.

$$\text{HI} = \sum_{i-1}^{n} (Loan\ share_i)^2$$

A lower index value reflects a higher the level of loan diversification while an index value closer to 1 constitutes a greater tendency towards loan specialization.

Deposits to liabilities ratio (DL_t) captures each bank's static liquidity condition. Natural logarithm of total assets is used as proxy variable ($SIZE_t$) to account for business size effect. Bank mergers, which possibly could have been relied upon as remedy to salvage failing banks during the recession, are also considered in this analysis.[3] A dummy variable (MER) is included to capture this activity.

Seemingly Unrelated Regression

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[1] The use of nominal values for these variables, which are then used in the calculation of ratios that, in turn, resolves the issue between nominal versus real valuation.

[2] Risk weighted assets, instead of nominal assets are used. Off-balance sheet transactions will not be a significant factor in this analysis since this study's sample banks do not conform to the typical bank types that engage heavily in such transactions, as established by Kashyap, Stein, and Hanson (2010)

[3] Merged banks were identified in this analysis indirectly by using asset growth rate as the indicator as suggested by Kowalik *et al.* (2015).

In a system of equations where each unit can be estimated through linear regression techniques and each individual observation i has M cross-sectional units, it is further assumed that strict exogeneity of the regressors and homoscedasticity are satisfied (Greene, 2007). Estimating the equations using the ordinary least squares (OLS) regression method would require zero correlation among error terms to avoid heteroscedasticity. If such condition is not satisfied, the OLS method will lead to inaccurate estimation results.

The seemingly unrelated regression (SUR) method was conceived to address the violation of such condition. The basic SUR system can be expressed as equation (8).

$$X_i = X_j = X \Rightarrow X_i' X_j = X'X \tag{7}$$

$$y_{ij} = X_{ij}\beta_j + \varepsilon_{ij}, \qquad where\ \ i = 1, \dots, N, \qquad j = 1, \dots, M \tag{8}$$

The SUR model was developed to properly allow non-zero covariance between error terms.

$$\mathrm{E}(\varepsilon_{it}, \varepsilon_{js}) = \begin{cases} \sigma_{ij}, & t = s \\ 0, & t \neq s \end{cases} \tag{9}$$

In this study, an SUR system is developed to identify the determinants of SGC and each of the four growth levers. We apply Stata's sureg procedure that uses an asymptotically efficient, feasible generalized least-squares algorithm (Greene, 2007) that effectively addresses the interference of autocorrelation and heteroscedasticity by using an efficient GLS estimator.

This study's SUR system consists of the five equations (10 to 14) defined below. The first four equations are formulated with each of the four growth levers of financial performance as the dependent variable. Following Escalante, Turvey, and Barry (2009), each of these equations is regressed against a lagged measure of the dependent variable and SGC. This analysis introduces four new variables HI, DL, $SIZE$, and MER to account for loan diversification, liquidity, business size, and merger activity effects, respectively. In the full

sample equation, each bank's agricultural loan portfolio ratio (AG) is also included in each equation as a way to discern the effect of agricultural lending activities on the growth levers. Consistent with Escalante, Turvey, and Barry (2009), a fifth equation is also included in the SUR system where SGC is regressed against the year-to-year changes in each growth lever. AG and the four new variables are also included in the fifth equation. Specifically, the estimating equations are defined as follows:

$$PM_t = \beta_{01} + \beta_{11}PM_{t-1} + \beta_{21}SGC_t + \beta_{31}HI_{t-1} + \beta_{41}DL_{t-1} + \beta_{51}SIZE_{t-1} + \beta_{61}MER_t + \beta_{71}AG_t + \varepsilon_1 \quad (10)$$

$$ER_t = \beta_{02} + \beta_{12}ER_{t-1} + \beta_{22}SGC_t + \beta_{32}MER_t + \beta_{42}AG_t + \varepsilon_2 \quad (11)$$

$$AT_t = \beta_{03} + \beta_{13}AT_{t-1} + \beta_{23}SGC_t + \beta_{33}DL_{t-1} + \beta_{43}SIZE_{t-1} + \beta_{53}MER_t + \beta_{63}AG_t + \varepsilon_3 \quad (12)$$

$$LEV_t = \beta_{04} + \beta_{14}LEV_{t-1} + \beta_{24}SGC_t + \beta_{34}DL_{t-1} + \beta_{44}SIZE_{t-1} + \beta_{54}MER_t + \beta_{64}AG_t + \varepsilon_4 \quad (13)$$

$$SGC_t = \beta_{05} + \beta_{15}\Delta PM_{t-1tot} + \beta_{25}\Delta ER_{t-1tot} + \beta_{35}\Delta AT_{t-1tot} + \beta_{45}\Delta LEV_{t-1tot} + \beta_{55}HI_{t-1} + \beta_{65}DL_{t-1} + \beta_{75}SIZE_{t-1} + \beta_{85}MER_t + \beta_{95}AG_t + \varepsilon_5 \quad (14)$$

In the above equations, the four levers of growth are represented by the financial ratios defined in equations 2 to 5 and the prefix Δ in the fifth equation denotes the year-to- year change for the given variables. The SUR model is applied to three datasets: the entire dataset and two data subsets for agricultural and non-agricultural banks. In order to isolate the time trend (macroeconomic) effects associated with the periods during and after the recession, the SUR model is separately estimated for two time periods: the recession years (2007 to 2009) and the initial recovery period (2010 to 2011). The Breusch Pagan test of independence, the requisite diagnostic test for establishing the validity of the SUR estimation, yielded significant χ2 statistics for all six versions of the model (recessionary and recovery models

for the full sample and the two specialized banking datasets). Thus, these results suggest the existence of significant contemporaneous correlation among the error terms of the equations as defined above and justifies the relevance of employing SUR estimation techniques.

Results

Table 1 presents a summary of the descriptive statistics of relevant financial performance and structural variables over the sample period. Figures 1-3 depict the annual trends in the values of the four levers of growth, gs, actual growth, and SGC of agricultural and non-agricultural banks. The SUR results for all banks and for each of the two bank categories for each of the time period models (during and after recession) are summarized in Tables 2 and 3, respectively.[4]

Sustainable and Actual Growth Trends

Based on the plots in figures 1 and 2, non-agricultural banks' profit margins have shown more fluctuations compared to the relatively more stable trend among agricultural banks. The plots also indicate that agricultural banks' profit margins seem to have recovered quickly after the financial crisis. In contrast, non-agricultural banks' profit margins fell sharply during the recession and only began to recover in 2010.

Earnings retention trends for both banks appear to be less volatile, with each bank seemingly making deliberate decisions to increase retention in the midst of the crisis's years. Financial leverage decisions for non-agricultural banks reflect a declining trend over the sample period, thus suggesting a gradual reduction in reliance on external debts. In contrast, the financial leverage conditions of agricultural bank generally improved, although in small

[4] In order to get rid of outliers, we employ winsorization using the 99.5% and 0.5% criteria.

increments, during the same period. Both banking groups also registered overall reductions in asset turnover ratios from 2007 to 2011, which could be the combined or separate results of less growth in revenues and retention of its fixed asset base, if not the acquisition of new additions that probably would be infeasible or impractical during such period of economic slowdown.

As can be gleaned from the plots in Figure 3, the path of sustainable growth for agricultural banks is consistently upward, without being disrupted even during the recession years. This implies that their financial resource endowments were adequate to warrant continued growth even during periods of economic crises. In the case of non-agricultural banks, a dip in their sustainable growth rate occurs from 2008 to 2009, thus signaling the need to re-calibrate strategies to a slightly lower growth target.

Actual revenue growth rates for both types of banks plunged down to negative levels after 2007. Their revenues would continue to decline even during the recovery years captured in the sample period. Consequently, these banks' SGCs would reflect the same trend observed in their actual growth rates, although agricultural banks' SGCs were slightly better in certain years. This means that when the recessionary period commenced, both agricultural and non-agricultural banks operated with caution as actual revenue growth rates were below levels attainable with optimal use of available financial resources. At certain points during such period of slow, calculated growth, agricultural banks showed relatively slight aggressiveness through actual revenue growth rates that were much closer to sustainable levels than non-agricultural banks.

Regression Results

Discussion of the regression results will be thematically organized with each sub-section devoted to an estimated equation in the SUR system. A comparison of coefficient results obtained under the two time-period models will also be highlighted.

Profitability

Under both time periods, the lagged profit margin variable is significantly positively correlated with the current year's profit margin for all three banking groups (full sample and subsets of specialized banks). This suggests that the profit margin in the previous period will lead to a positive effect on the profit margin this year and, based on the results, such effect for agricultural banks will be even greater. The SGC coefficients in all bank models for both time periods are all significant, however yielding different effects (consistent across periods). For agricultural banks, SGC is negatively correlated with the profit margin, which indicates that an aggressive business growth stance would push profit margins downward. The full sample and non-agricultural bank models produce contrasting results. In terms of loan diversification, significant negative coefficients for the Herfindahl index are obtained for the full sample and non-agricultural bank models during the two time periods, thereby suggesting that loan diversification generally enhances these banks' profit generation. The bank size variable has a significant negative effect only for non-agricultural banks during the recession. This means that larger operations during that period result in diminished returns. In contrast, the bank size variable is significantly positive for all three banking groups during the recovery period. Merger activities also increase the bank's profit margin potentials across all three models during and after the recession.

Earnings Retention

Momentum in earnings retention is validated as significantly present in all banking groups across time periods. Negative SGC coefficients are significant for both agricultural and non-agricultural banks during the recession, thus implying that more cautious business growth decisions would lead to earnings retention. Merger activities lead to increased earnings retention for both groups of specialized banks during and after the recession. In the full sample model, lower agricultural lending exposure leads to higher earnings retention in both time periods. Asset Productivity Management

In the area of asset management, the coefficients for lagged asset turnover ratio and SGC variables are significantly positive for both agricultural and non-agricultural banks during and after the recession. The lagged variable result suggests the presence of a momentum effect, whereby effective asset management strategies in the previous year could most likely be carried over to the succeeding year. The positive SGC results for both models imply that under more aggressive growth strategies, banks tend to adopt more efficient asset management strategies. The deposit-liabilities ratio's significant negative coefficient results across all bank and time period models indicate that banks exhaust their liquidity reserves and sourcing capabilities in order to realize higher asset productivity levels. The bank size effect is consistently negative for non-agricultural banks during the two time periods, thus suggesting that high levels of asset management efficiency are associated with smaller banks. The same is true for agricultural banks only during the recession as the coefficient becomes significantly positive during the recovery period. Merger activities also lead to better asset productivity levels for agricultural banks during the recession and for non-agricultural banks during the recovery period.

Financial Leverage

In terms of financial leverage decisions, the lagged leverage variable is significantly positive for both agricultural and non-agricultural banks across the two time periods. The higher coefficient in agricultural banks shows that agricultural banks' past financial leverage decisions have a stronger impact on the current year's financial leverage position. The SGC variable is also significantly positive in all three models in both time periods. The SGC effect is a bit higher for agricultural banks. The positive SGC effect suggests that banks with aggressive growth strategies that usually exceed sustainable growth levels usually have higher financial leverage ratios or a higher tendency to rely more on external debts. A positive liquidity effect for agricultural banks is obtained only for the recovery period models, thus suggesting that more liquid agricultural banks tend to rely on external debts more. A reverse liquidity effect, however, is obtained for non-agricultural banks during and after the recession. The bank size result suggests reliance on non-equity funds among smaller agricultural banks during the recession and smaller non-agricultural banks during and after the recession. As before, merger activities significantly increase reliance on non-equity fund sources for all banks across time periods.

Sustainable Growth Challenge

In the consolidating final equation for SGC, we find that the annual change in the profit margin is positively significant for non-agricultural banks. This indicates that the momentum of maintaining favorable profitability and asset productivity levels leads to faster actual growth rates exceeding sustainable growth rates (positive, higher SGCs). A significant negative effect is obtained for agricultural banks in both time periods. This implies that more

declining profits usually induce these banks to adopt more conservative, calculated growth plans.

These two sets of banks have similar asset management results whereby more effective and efficient asset management strategies are associated with aggressive growth trends (positive SGCs). These two banking groups' greater reliance on debt (higher financial leverage ratios) is also associated with less conservative growth strategies.

A significant positive liquidity effect is obtained for both agricultural and non-agricultural banks only during the recovery period. This suggests that business growth during the recovery period is associated with more favorable liquidity conditions for both bank groups. Bank size has a significant positive effect in all banking models for both time periods, thus indicating that larger banks would tend to grow faster and either closer to or above their sustainable levels of growth. Higher proportions of agricultural loans are also associated with more cautious growth during the recession period, but this effect disappears during the recovery period.

Discussions and Conclusions

This study provides a closer look at the business growth decisions of agricultural and non-agricultural banks that operated during the Great Recession of 2008. Through the sustainable growth paradigm, these banks' decisions affecting four levers of growth (profitability, earnings retention, asset management, and financial leverage) are analyzed to determine whether their actual growth rates are below, within, or exceeded growth rates deemed affordable or sustainable. This study's two period models allow for the scrutiny of bank operating decisions made during a period of serious economic stress (the recession

years from 2007 to 2009) and the immediate period of recovery that followed in 2010 and 2011.

This study's findings indicate that agricultural banks tend to register steadily increasing sustainable growth trends from the pre-recession years until the recovery period. In contrast, non-agricultural banks are more constrained to grow during the recession years when their sustainable growth rates declined. Nonetheless, both banking groups tend to make cautious revenue growth decisions over the sample period. When these actual growth rates are related to their sustainable growth rates, both groups of banks register negative SGC levels from the onset of recession until the recovery period. Notably, however, agricultural banks' SGCs are slightly better in certain years. This means that even while the norm is to pursue regulated, calculated growth, agricultural banks display relatively some aggressiveness in raising slightly actual revenue growth to levels much closer to sustainable levels.

The growth rate plots (Figure 3) and regression results (Tables 2 and 3) confirm that during such difficult economic times, significant divergences in these banking groups' operating strategies can be noted in their profit margin conditions and leverage management decisions. Of the four levers of growth, non-agricultural banks' more volatile profit margin trends are incomparable to and lower than the agricultural banks' more stable trend during the sample period. Specifically, the Profit Margin and SGC estimation results indicate that non-agricultural banks' aggressive growth can occur only when their profit margin growth momentum is sustained. On the other hand, agricultural banks tend to make more conservative growth decisions during the recession and the immediate recovery period that follows.

The banks' financial leverage decisions also offer interesting implications. Both banks rely on their financial leveraging strategies in order to grow more aggressively. But their financial leveraging decisions are differentiated when liquidity conditions and business size are factored into their borrowing decisions. Smaller agricultural banks use of external (non-equity) funds is high only when these banks are highly liquid during the recovery period while less liquid smaller non-agricultural banks are usually drawn to rely on non-equity funds regardless of time period. These results only confirm the financial reputation of agricultural banks as relatively less liquid and with capital constraints such that their fund procurement capabilities are further constrained by the credit risk assessment standards of their fund suppliers.

This study's contributions are two-fold. First, this presents a practical application of concepts and issues not well explored in literature. The use of the SGC paradigm, while at the same time exploiting the dichotomous nature of non-agricultural and agricultural banking operations, fills in such gap. Second, this study results offer interesting and important implications for an industry that continues to confront risks of imminent heightening of business and financial risks. Through the SGC paradigm, this study has shown how inherent structural differences among agricultural and non-agricultural banks can determine their own separate stances in dealing with economic stress and defining recovery efforts thereafter. As our findings confirm, operating constraints arising from structural and industry conditions can induce certain banks to adopt more conservative growth plans, especially during more stressful economic times.

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Table 1. Descriptive Statistics of Financial Performance and Structural Variables, All Banks, 2007-2009 (Under Recession)

Variable	Mean	Standard Deviation
Sustainable growth rate	0.0163	0.0673
Dependent Variables		
Profit Margin	0.1080	0.1600
Earnings retention ratio	0.5448	0.9313
Assets turnover	0. 0417	0.0118
Financial leverage	10.6893	0.0673
SGC	0.0002	0.1798
Independent Variables		
Lagged profit margin	0.1395	0.1103
Lagged earnings retention ratio	0.5172	0.6980
Lagged assets turnover	0.0439	0.0122
Lagged financial leverage	10.7698	3.0581
Lagged Deposits to liabilities ratio	0.9200	0.0856
Lagged Bank size	12.9063	1.2637
Lagged Herfindahl index	0.7307	0.1907
Agricultural criterion	0.1055	0.3072
Change in Profit	-0.0351	0.3798
Change in Earnings Retention rate	0.0243	25.9495
Change in Assets turnover	-0.0023	0.0144
Change in Financial leverage	-0.1116	2.9184

Table 2. Descriptive Statistics of Financial Performance and Structural Variables, All Banks, 2010-2011 (After recession)

Variable	Mean	Standard Deviation
Sustainable growth rate	0.0135	0.0791
Dependent Variables		
Profit Margin	0.1036	0.2315
Earnings retention ratio	0.6857	0.4739
Assets turnover	0.0336	0.0102
Financial leverage	10.3688	2.7228
SGC	-0.0493	0.1629
Independent Variables		
Lagged profit margin	0.0774	0.2305
Lagged earnings retention ratio	0.6652	0.7969
Lagged assets turnover	0.0360	0.0100
Lagged financial leverage	10.5055	2.8000
Lagged Deposits to liabilities ratio	0.9295	0.0733
Lagged Bank size	12.9631	1.2495
Lagged Herfindahl index	0.7515	0.1890
Agricultural criterion	0.1055	0.3072
Change in Profit	0.0089	4.4326
Change in Earnings Retention rate	0.0297	4.5422
Change in Assets turnover	-0.0024	0.0079
Change in Financial leverage	-0.1275	2.2184

Table 3. Seemingly Unrelated Regression Results, Full Sample and Two Banking Categories, 2007-2009 (standard errors reported in parentheses)

Variables	All banks	Agricultural Banks	Non-Agricultural Banks
Dependent Variable: Profit margin			
Intercept	0.1145*** (0. 0173)	-0.0046 (0.0514)	0.1264*** (0.0182)
Lagged profit margin	0.8827*** (0.0076)	0.8350*** (0.0177)	0.8839*** (0.0082)
Sustainable growth challenge	0.0498*** (0.0059)	-0.1120*** (0.0173)	0.0587*** (0.0063)
Herfindahl index	-0.0798*** (0.0054)	0.0133 (0.0282)	-0.0805*** (0.0057)
Deposits to liabilities ratio	-0.0132 (0.0115)	0.01970 (0.0342)	-0.0163 (0.0121)
Bank size	-0.0047 (0.0008)	0.0029 (0.0024)	-0.0053*** (0.0034)
Merger	0.0119*** (0.0032)	0.0333*** (0.0082)	0.0111*** (0.0034)
Agricultural bank criterion	0.0027 (0.0031)		
Dependent Variable: Retention ratio			
Intercept	0.4128*** (0.0094)	0.3126*** (0.0189)	0.4157*** (0.0098)
Lagged retention ratio	0.2118*** (0.0098)	0.2524*** (0.0226)	0.2070*** (0.0106)
Sustainable growth challenge	-0.4400 (0.0472)	-0.8266*** (0.1369)	-0.3874*** (0.0502)
Merger	-0.0828*** (0.0252)	0.2018*** (0.0653)	0.2549*** (0.0271)
Agricultural bank criterion	-0.0828*** (0.0220)		
Dependent Variable: Assets turnover			
Intercept	0.0097*** (0.0006)	0.0045*** (0.0016)	0.0096*** (0.0007)
Lagged assets turnover	0.8955*** (0.0029)	0.9852*** (0.0080)	0.8900*** (0.0030)
Sustainable growth challenge	1.7470*** (0.0706)	0.0299*** (0.0005)	0.0192*** (0.0002)
Deposits to liabilities ratio	-0.0021** (0.0004)	-0.0024** (0.0011)	-0.0019*** (0.0005)
Bank size	-0.0004*** (0.0000)	-0.0003*** (0.0001)	-0.0004*** (0.0000)

Merger	-0.0001 (0.0001)	0.3363*** (0.0941)	0.0000 (0.0001)
Agricultural bank criterion	-0.0002** (0.0001)		
Dependent Variable: Financial leverage			
Intercept	2.3668*** (0. 2069)	0.8777 (0.5512)	2.5082*** (0.2189)
Lagged financial leverage	0.8322*** (0.0035)	0.9259*** (0.0067)	0.8245*** (0.0038)
Sustainable growth challenge	1.7470*** (0.0706)	1.8354*** (0.1977)	1.7737*** (0.0752)
Deposits to liabilities ratio	-0.6296*** (0.1372)	0.4251 (0.3885)	-0.6857*** (0.1442)
Bank size	-0.0086 (0.0095)	-0.0416* (0.0274)	0.0090 (0.0101)
Merger	0.4457*** (0.0380)	0.3363*** (0.0941)	0.4462*** (0.0408)
Agricultural bank criterion	-0.0304 (0.0344)		
Dependent Variable: Sustainable growth challenge			
Intercept	-0.1070*** (0.0205)	-0.0671* (0.0403)	-0.1132*** (0.0216)
Change in profit margin	0.1005*** (0.0003)	-0.2042*** (0.0103)	0.1059*** (0.0038)
Change in retention ratio	0.0000 (0.0000)	-0.0001 (0.0001)	0.0000 (0.0000)
Change in assets turnover	4.7457*** (0.0977)	25.1454*** (0.3348)	4.4369*** (0.1010)
Change in financial leverage	0.0031*** (0.0003)	0.0321*** (0.0010)	0.0028*** (0.0004)
Herfindahl index	-0.0189*** (0.0067)	-0.0124 (0.0185)	0.0195*** (0.0070)
Deposits to liabilities ratio	-0.0089 (0.0136)	-0.0207 (0.0272)	-0.0053 (0.0143)
Bank size	0.0087*** (0.0010)	0.0099*** (0.0019)	0.0089*** (0.0010)
Merger	0.2625*** (0.0032)	0.0806*** (0.0061)	0.2682*** (0.0034)
Agricultural bank criterion	-0.0094** (0.0038)		
Breusch Pagan Test of Independence (χ^2)	3717.638	1167.463	3294.197

Notes: *, **, *** denote significance at the 10%, 5%, 1% confidence levels, respectively.

Table 4. Seemingly Unrelated Regression Results, Full Sample and Two Banking Categories, 2010-2011 (standard errors reported in parentheses)

Variables	All banks	Agricultural Banks	Non-Agricultural Banks
Dependent Variable: Profit margin			
Intercept	0. 0539 (0. 0330)	-0.1904*** (0.0658)	0.0625* (0.0357)
Lagged profit margin	0.6408*** (0.0067)	0.6684*** (0.0157)	0.6399*** (0.0072)
Sustainable growth challenge	0.0249** (0.0114)	-0.0498* (0.0257)	0.0246** (0.0124)
Herfindahl index	-0.1722*** (0.0102)	0.0186 (0.0361)	-0.1743*** (0.0109)
Deposits to liabilities ratio	0.0013 (0.0232)	0.0234 (0.0445)	0.0012 (0.0251)
Bank size	0.0096*** (0.0014)	0.0204*** (0.0029)	0.0091*** (0.0016)
Merger	0.0703*** (0.0087)	0.0575*** (0.0147)	0.0764*** (0.0097)
Agricultural bank criterion	-0.0002 (0.0057)		
Dependent Variable: Retention ratio			
Intercept	0.5948 *** (0.0061)	0.3794*** (0.0191)	0.6047*** (0.0062)
Lagged retention ratio	0.1412*** (0.0052)	0.2747*** (0.0200)	0.1300*** (0.0054)
Sustainable growth challenge	0.1453*** (0.0239)	-0.1348 (0.1388)	-0.0488 (0.0326)
Merger	0.1453*** (0.0239)	0.1982** (0.0796)	0.1385*** (0.0254)
Agricultural bank criterion	-0.1309*** (0.0134)		
Dependent Variable: Assets turnover			
Intercept	0.0045*** (0.0007)	0.0008 (0.0016)	0.0047*** (0.0007)
Lagged assets turnover	0.9413*** (0.0034)	0.9489*** (0.0087)	0.9364*** (0.0035)
Sustainable growth challenge	0.0134*** (0.0002)	0.0209*** (0.0006)	0.0320*** (0.0002)
Deposits to liabilities ratio	-0.0034** (0.0005)	-0.0021* (0.0011)	-0.0034*** (0.0005)
Bank size	-0.0001*** (0.0000)	0.0001* (0.0001)	-0.0001*** (0.0000)

Merger	0.0016*** (0.0002)	-0.0027*** (0.0004)	0.0019*** (0.0002)
Agricultural bank criterion	-0.0006*** (0.0001)		
Dependent Variable: Financial leverage			
Intercept	1.5821*** (0. 2841)	1.2259 (0.7932)	1.6701*** (0.3005)
Lagged financial leverage	0.8160*** (0.0048)	0.9261*** (0.0098)	0.8066*** (0.0053)
Sustainable growth challenge	2.0372*** (0.0982)	3.3018*** (0.3243)	1.9741*** (0.1036)
Deposits to liabilities ratio	-0.9961*** (0.1996)	1.6283*** (0.5616)	-0.9615*** (0.2107)
Bank size	-0.0484*** (0.0120)	-0.1500*** (0.0365)	-0.0450 *** (0.0127)
Merger	0.4873*** (0.0747)	0.6316*** (0.1859)	0.4321*** (0.0808)
Agricultural bank criterion	0.0610 (0.0436)		
Dependent Variable: Sustainable growth challenge			
Intercept	-0.1896*** (0.0221)	-0.1151** (0.0535)	-0.1866*** (0.0234)
Change in profit margin	0.0117*** (0.0002)	-0.2105*** (0.0159)	0.0119*** (0.0002)
Change in retention ratio	0.0002 (0.0002)	-0.0001 (0.0002)	0.0004 (0.0003)
Change in assets turnover	7.4475*** (0.1665)	22.1943*** (0.5667)	7.0599*** (0.1742)
Change in financial leverage	0.0141*** (0.0005)	0.0273*** (0.0014)	0.0138*** (0.0005)
Herfindahl index	0.0007 (0.0069)	0.0137 (0.0286)	0.0010 (0.0072)
Deposits to liabilities ratio	-0.0737*** (0.0156)	0.0040*** (0.0366)	0.0761*** (0.0165)
Bank size	0.0057*** (0.0010)	0.0092*** (0.0023)	0.0052*** (0.0010)
Merger	0.3437*** (0.0050)	0.1976*** (0.0103)	0.3528*** (0.0054)
Agricultural bank criterion	0.0029 (0.0039)		
Breusch Pagan Test of Independence (χ^2)	2062.615	620.697	1777.200

Notes: *, **, *** denote significance at the 10%, 5%, 1% confidence levels, respectively.

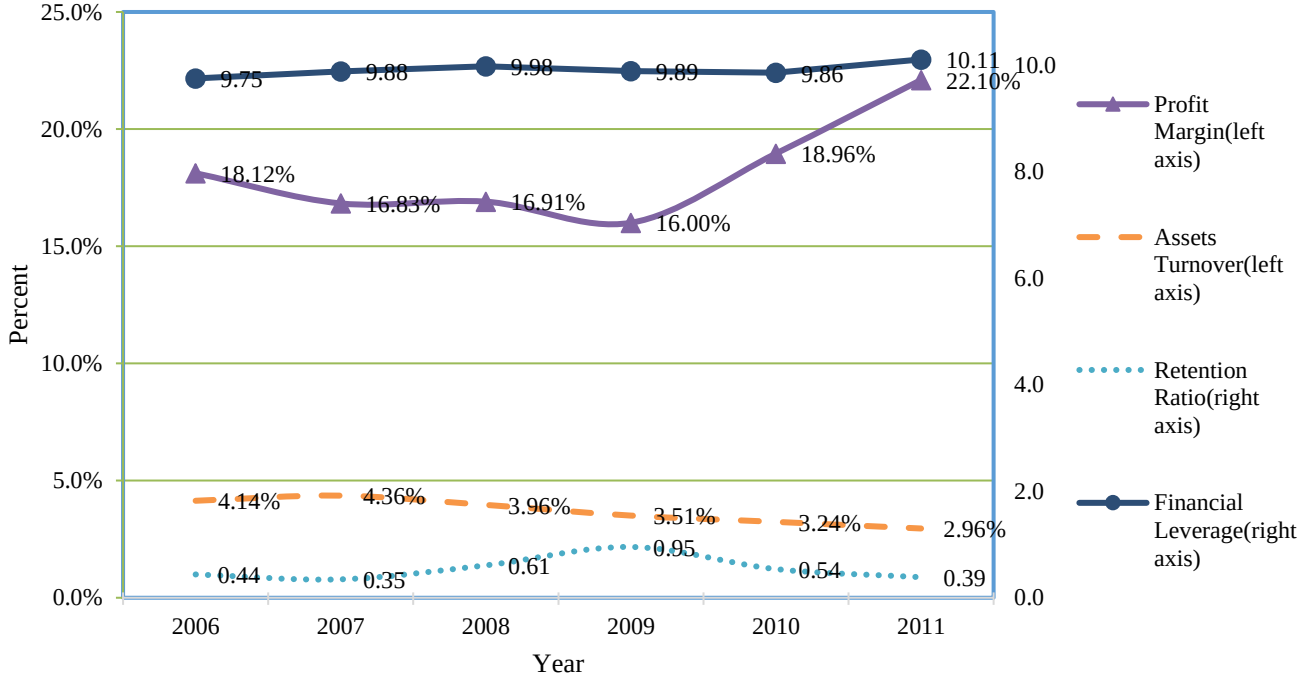

Figure 1. Annual Trends in the Growth Levers of Agricultural Banks, 2006-2011

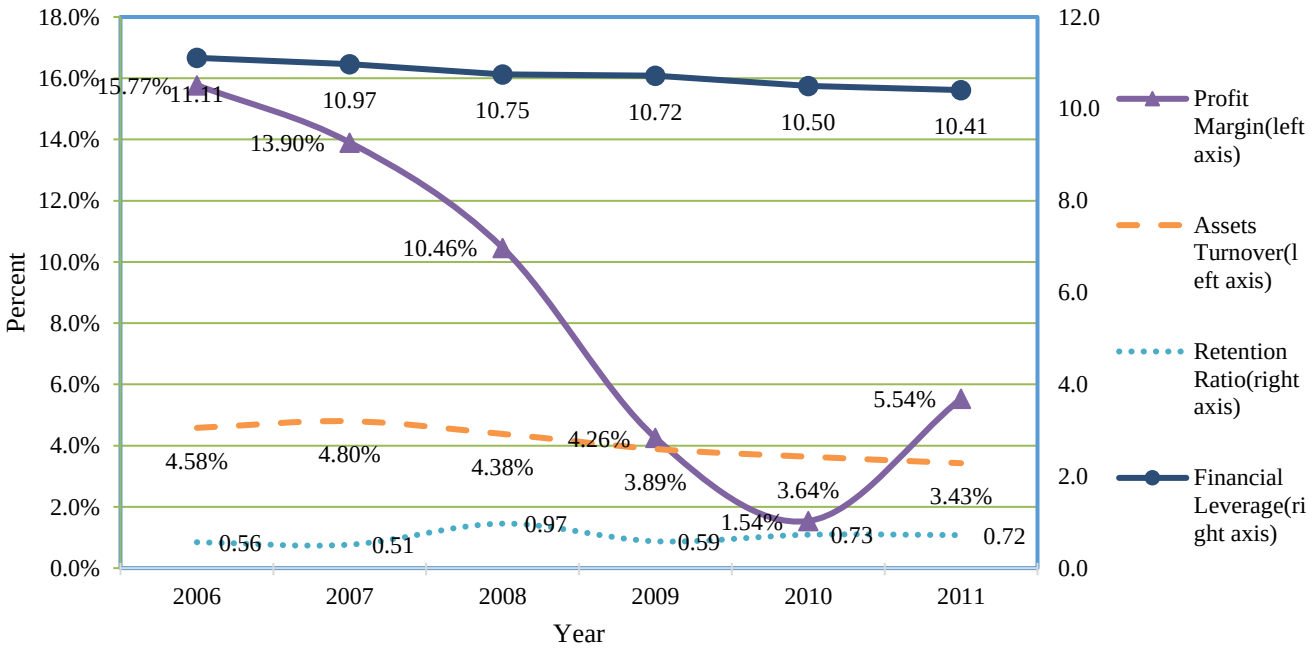

Figure 2. Annual Trends in the Growth Levers of Non-agricultural Banks, 2006-2011

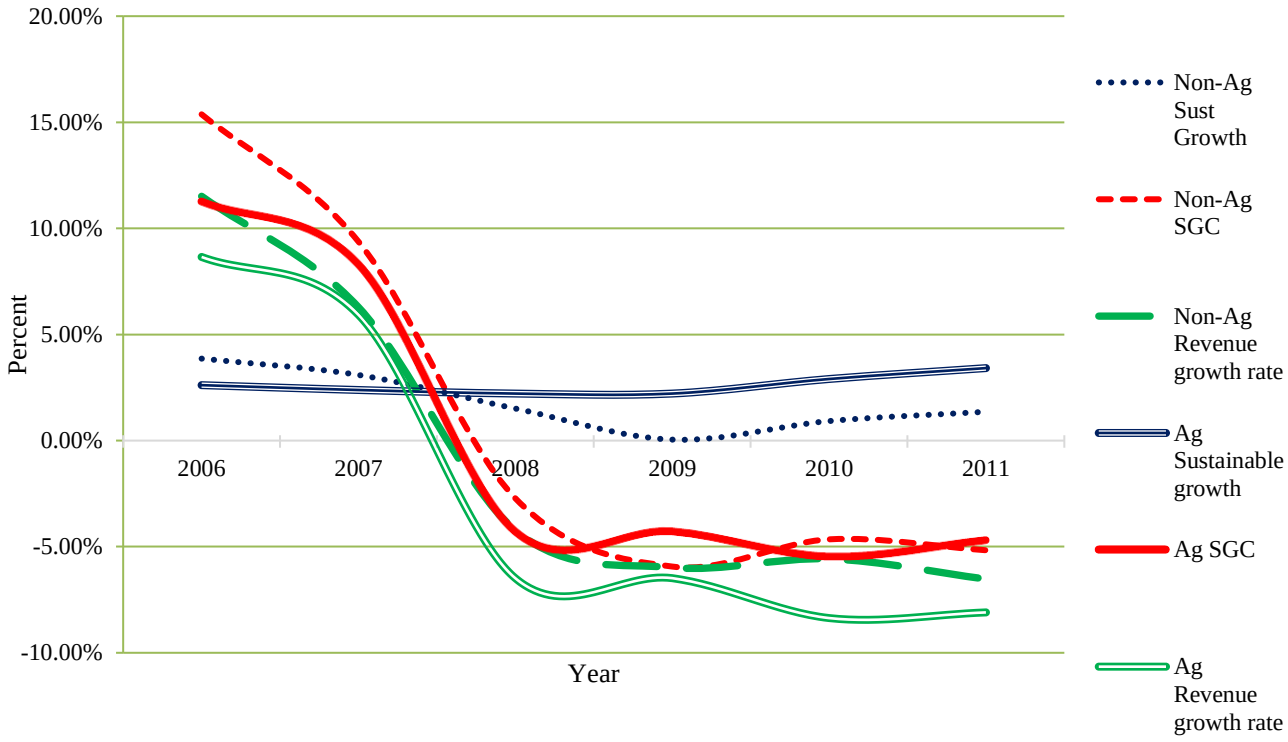

Figure 3. Rates of actual revenue growth, sustainable growth and SGC, Agricultural and Non-Agricultural Banks, 2006-2011