

# **Did Aggressive Business Growth Strategies Lead to Bank Failures? Lessons from the Late 2000s Great Recession**

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## **Abstract**

This article traces back to pre-2007 conditions to scrutinize operating strategies and decisions of banks that either survived through or failed during the last recession. Using the sustainable growth paradigm, this analysis isolates components of operating strategies under either an aggressive or a conservative growth stance to shed light on the type of business decisions that eventually led to either survival or failure when economic conditions became highly volatile. The distinction between the surviving and failed banks' growth decisions becomes more apparent in their profitability, earnings retention, and financial leverage decisions. Results indicate that surviving banks' conservative and regulated growth decisions led to higher profit margins and more earnings retained. For these banks, faster growth aspirations require sourcing of cheaper external funds, instead of relying on equity funds with higher transaction costs. Smaller banks need to accumulate adequate financial strength and capability before considering aggressive growth strategies.

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## 1. Motivations

The COVID-19 pandemic has compelled many communities to observe social distancing and implement lock-down regulations. Many businesses either temporarily closed down or continued operations under limited clientele patronage. Social mobility was further restricted by government mandates on travel bans, border entry restrictions, and heightened medical screenings at all ports of entry. These restrictions substantially decreased overall economic activity and further bolstered speculations of a looming recession already circulating in early 2019 [1]. Under current conditions, a recession is not just probable, but an evolving reality. As the economy deals with the impending economic crisis, this article looks back to the late 2000s great recession for lessons on business survival and endurance. The last recession seriously hampered the operations of global and U.S. financial markets as economies dealt with high unemployment rates, declining real estate values, and the proliferation of enterprise bankruptcies. This article's interest has a specific focus on the banking sector that, at that time, registered a surge of business failures that the industry has not experienced since the 1980s. From January 2007 to December 2014 509 bank failures were recorded whereas only 24 banks failed over seven years prior to 2007 [2] [3].

This article traces back to pre-2007 conditions to scrutinize operating strategies and decisions of banks that either survived through or failed during the last recession. This analysis employs Higgins' sustainable growth challenge (SGC) paradigm [4] that allows for the separate evaluation of component operating strategies that altogether could define a firm's overall growth stance. In other words, Higgins' SGC model could distinguish between a firm's aggressive growth strategy from another firm's relatively more cautious, conservative growth stance. This study will shed light on the empirical question of identifying specific precedent business decisions that eventually led to either survival or failure when economic conditions became highly volatile.

This study takes on this perspective by pushing back the time frame to be analyzed in the early 2000s. Some previous studies have investigated the determinants of bank failures in previous financial crises. For instance, Belongia and Gilbert [5] used the 1980s farm financial crises as backdrop in their study. Their results indicate that bank failures could be attributed to higher percentages of asset investments in agricultural production loans and lower percentages in federal government securities. Another study's results indicate that tighter regulations and inflation exert a positive impact on banking business survival and viability [6]. Cole and Gunther [7] applied the split-population model and found that bank liquidity and bank size are not associated with the failure time.

Other studies single out banks that survived the late 2000s recession to show how these banks dealt with the impending liquidity crisis at that time [8]. Berger and Bouwman [9] emphasize the importance of high liquidity creation during such period of high economic volatility. In their other study [10], they clarify the need for more capital infusion into small banking operations to increase these banks'

probability of survival and market share during the recession. Laeven and Levine [11] analyze the nature of conflicts between bank managers and owners of surviving banks, and find that the comparative power of shareholders could affect a bank's propensity for risk-taking.

This study follows through an earlier application of Higgins' SGC model in banking analysis. Zheng and Escalante [12] present a comparative analysis of operating strategies employed by agricultural and non-agricultural banks that were in operation from 2006 to 2011. This precedent article emphasizes the role of agricultural loan concentration on the growth decisions of banks that survived the last recession. In contrast, this current article recalls banks that closed down and contrast their operating decisions with those made by surviving banks. The sample period extends the pre-recession time period to as early as 2001.

This article also distinguishes itself from a related article by Li et al. [3]. While the earlier article identifies early warning signals of bank failures during the last recession, it accomplishes such goal through basic binomial dependent variable regression using a host of financial and structural variables. In contrast, this current study's emphasis revolves around sustainable business growth and a bank's preference for a specific overall growth stance. This analysis provides a more meaningful discussion of operating decisions as they relate to a bank's revealed business growth construct. To our knowledge, the application of the Higgins' SGC model in explaining either bank survival or failure has never been demonstrated in literature.

## 2. The Sustainable Growth Challenge Model

This study's analytical model employs the sustainable growth challenge (SGC) model [4] that allows isolated scrutiny of operating decisions comprising a business' growth strategic profile. Higgins' SGC model is derived by initially defining a firm's sustainable growth rate (SGR), which Higgins express as the percentage change in a firm's equity under the assumption that firm does not use external equity financing, such that an increase in equity can only be achieved through an increase in retained earnings. As the initial identity is expanded with substitutions, SGR can be expressed equivalently then as a firm's return on beginning equity, as shown below:

$$SGR = \frac{\Delta Equity}{Equity_{beg}} = \frac{Equity_{end} - Equity_{beg}}{Equity_{beg}} = \frac{Net\ Income - Dividends}{Equity_{beg}} \quad (1)$$

The rightmost expression in equation 1 can be expanded further into several components that actually represent measures capturing important operating and financial decisions usually made by a firm. Equation 2 shows the resulting expanded form whereby a firm's SGR is actually determined by four levers of growth: profit margin, retention ratio, asset turnover, and financial leverage (equations 3 to 6):

$$SGR = \left[ \frac{Income}{Revenue} \right] \times \left[ \frac{Income - Dividends}{Income} \right] \times \left[ \frac{Revenue}{Assets} \right] \times \left[ \frac{Assets}{Equity_{beg}} \right] = g_s \quad (2)$$

Where:

$$\text{Profit margin (PM)} = \frac{Income}{Revenue} \quad (3)$$

$$\text{Earnings Retention (ERR)} = \frac{Income - Dividends}{Income} \quad (4)$$

$$\text{Asset turnover (ATO)} = \frac{Revenue}{Assets} \quad (5)$$

$$\text{Financial leverage (LEV)} = \frac{Assets}{Equity_{beg}} \quad (6)$$

A firm's SGR is regarded as the firm's affordable rate of growth given its physical and financial resource endowments. This baseline growth rate is then compared to the firm's actual growth rate (AGR) in order to determine its overall growth stance. The difference between SGR and AGR defines a firm's sustainable growth challenge (SGC) as shown below:

$$SGC = \ln \left( \frac{Revenue_t}{Revenue_{t-1}} \right) - g_s \quad (7)$$

SGC analysis allows for the determination of an aggressive business growth behavior (positive SGC levels) when AGR exceeds SGR. Aggressive growth could lead to, among others, liquidity shortfalls, depleted and inadequate resource endowments, and financial inefficiencies. Conversely, under a more conservative growth scenario (negative SGC), AGR is slower than the prescribed SGR, thus reflecting under-utilization of available resources. The model's ideal scenario is balanced growth (SGC=0), whereby the pace of growth is adequately afforded by existing financial and physical resources as determined by the four growth levers.

### 3. Seemingly Unrelated Regression

The SGR model's banking application is analyzed using seemingly unrelated regression (SUR) techniques. SUR uses an asymptotically efficient, feasible generalized least-squares algorithm [13] that effectively addresses the interference of autocorrelation and heteroscedasticity by using an efficient GLS estimator. The SUR model was developed to allow non-zero covariance between error terms.

$$E(\varepsilon_{it}, \varepsilon_{js}) = \begin{cases} \sigma_{ij}, & t = s \\ 0, & t \neq s \end{cases} \quad (8)$$

$$y_{ij} = X_{ij}\beta_j + \varepsilon_{ij}, \quad \text{where } i = 1, \dots, N; j = 1, \dots, M \quad (9)$$

In this study, an SUR model is developed as a system of five equations that identify determinants of SGC and each of the four growth levers. The growth levers are the

dependent variables in the first four equations. Following Zheng and Escalante [12] and Escalante, Turvey, and Barry [14], each equation is regressed against a lagged measure of the dependent variable, *SGC*, and other variables. The fifth equation regresses *SGC* against year-to-year changes in the growth levers and other variables. These equations are defined as follows:

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

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

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

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

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

In the above equations, *PM* is Profit margin ratio; *ERR* is the Earnings retention rate; *ATO* is asset turnover ratio; *LEV* is financial leverage (calculated as asset-beginning equity ratio); and *AG* is agricultural loan ratio variable. The ag lending variable's inclusion will shed light on how this study reinforces previous studies' assertions that the farm sector showed greater resilience and economic strength during the recession period [3] [12].

A Herfindahl index (HI) measures the extent of diversification in a bank's loan portfolio among various types of loan accommodation. *DL* is the deposit to liability ratio that captures liquidity effect. *SIZE* is the bank size variable (log of Total Assets). *MER* is a dummy variable for bank mergers activities (taking a value of 1 if a banking observation is a result of a merger acquisition; a value of 0 for the absence of a merger decision).  $\Delta$  denotes year-to-year changes for the given variables.

The SUR model analyzes two subsets of banks that either survived through or closed down during late 2000s recession. The Breusch Pagan test of independence justifies the adoption of the SUR modeling technique for this empirical study (Table 2). The test yielded a significant  $\chi^2$  statistic that signify the existence of significant contemporaneous error correlation among the equations.

## 4. Data Measurement

This study utilizes a panel dataset collected from the call report database published online by the Federal Reserve Board of Chicago (FRB). The call reports' quarterly data are annualized. This study's SUR model is applied to two subsets of banking observations – the banks that eventually failed during the late 2000s recession and a randomly selected dataset of banks that successfully survived through the financial crisis. Recalling that the recessionary period officially took off in December 2007, this study's time period captures several years of pre-recession conditions extending back to 2001 until year-end of 2007.

The FDIC list of failed banks was used as a guide in developing a contrasting subset of failed banking observations [15]. After filtering banking quarterly data and retaining only observations without missing information, 262 failed banks were identified and used for this analysis. On the other hand, a subset of surviving banks of almost comparable sample size (308 banks) was compiled using a random selection procedure in SAS (PROCSURVEYSELECT).

## 5. Descriptive Statistical Trends

The descriptive statistical summary in Table 1 presents interesting contrasts in the 6-year mean values of the variables used in the empirical model for the two subsets of banking observations. For instance, in terms of their structural attributes, failed banks, compared to their successful banking peers, tend to be larger on average, more specialized (larger H index), and less involved in agricultural lending.

In order to fully understand the differing growth strategies of both banking categories, we need to scrutinize the intertemporal trends in the four growth levers. The plots in Figures 1 and 2 provide a comprehensive view of the contrasting trends in each financial measure. In these plots, double arrow lines indicate statistically significant differences in pairs of mean values calculated for surviving and failed banks.

Relative to failed banks, surviving banks register significantly higher profit margins (in four years) but lower earnings retention in the last three years (Figure 1). A cursory look at the plots indicate that the surviving banks' profit margins show less fluctuation in contrast to the failed banks' higher margin volatility. Compared to profit margin differentials, wider disparities in earnings retention are also noted, thus suggesting that surviving banks tend to redistribute more realized earnings to their shareholders and re-invest less into their operations than failed banks during the last three years of the sample period. Apparently, the surviving banks' more highly profitable conditions allow them to consider dividend policies favorable to their owners.

Surviving banks also had lower asset turnover ratios than failed banks in three of the six years in the sample period. In three of the four years immediately preceding the onset of recession (end of 2007), these two banking groups' asset turnover ratios actually were not significantly different from each other. Notably, surviving banks' financial leverage ratios were significantly lower (translating to relatively higher

use of external debts over equity) throughout the entire six-year period. The differentials in financial leverage conditions are larger than differences noted in their asset productivity levels.

The combined effects of these intertemporal trends in the four growth levers are portrayed in the SGR time plots for the two banking groups (Figure 3).

Failed banks consistently registered higher SGRs than surviving banks during most of the time period, except in 2007. This means that the latter's resource and physical endowments translate to growth potentials lower than those estimated for failed banks, although a cursory look at the plots indicate that the gaps in the SGR levels for both banking groups are narrower than their AGR differentials.

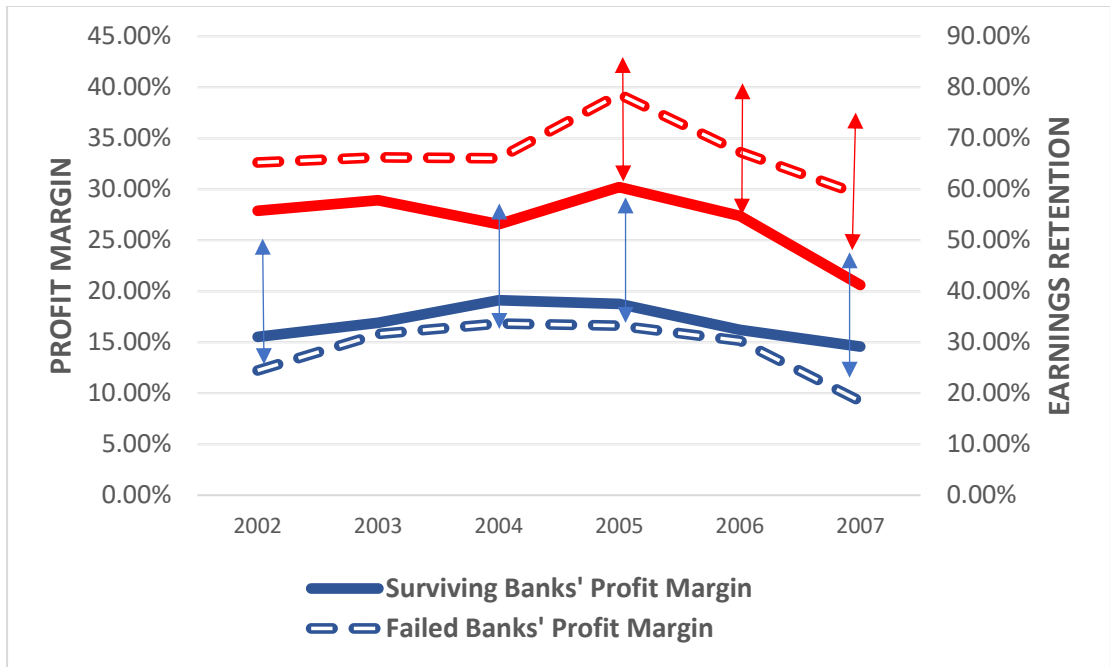
In terms of their realized or actual growth, both banking groups registered negative AGRs from 2002 to 2004. The growth pace has been much slower for surviving banks during this period. Both banks' AGRs would reach their peak in 2006 and start to decline in 2007. Interestingly, failed banks' AGRs were consistently higher than those calculated for surviving banks for the entire sample period.

Intertemporal trends on the interplay between SGRs and AGRs are depicted in Figure 4 that plots the banks' SGC levels. As can be gleaned from the plots, surviving banks' SGC levels indicate more cautious growth from 2002 to 2004 when they registered negative SGCs. These banks shifted to a more aggressive growth stance from 2005 to 2007, although such boldness was more subdued compared to the relatively more aggressive growth strategies consistently implemented by failed banks throughout the study period.

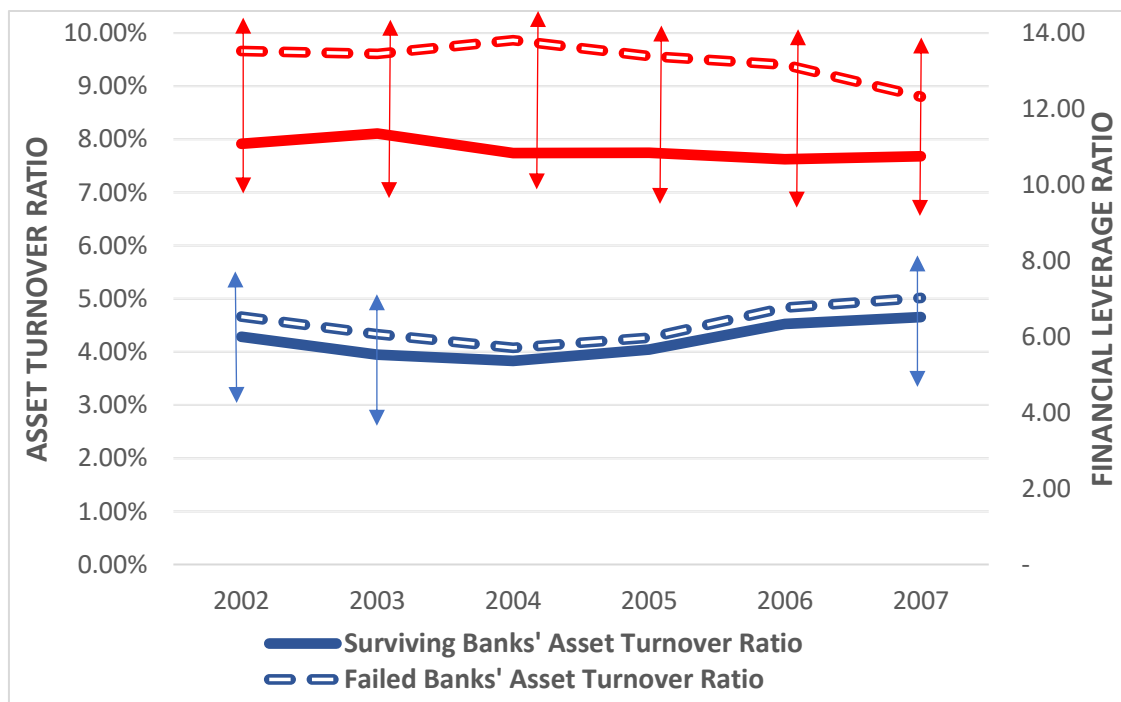
**Table 1: Descriptive statistical summary, financial performance and structural variables of failed and surviving banks. 2002-2007**

Variable	Failed bank		Survived bank	
	Mean	Std. Dev.	Mean	Std. Dev.
Profit Margin	0.1479	0.1045	0.1728	0.1027
Earnings retention ratio	0.6919	0.5477	0.5477	0.5533
Assets turnover	0.0450	0.0123	0.0409	0.0092
Financial leverage	13.1177	3.3850	10.8348	3.2596
SGC	0.1363	0.2184	0.0390	0.1537
Lagged profit margin	0.1542	0.0974	0.1753	0.1051
Lagged earnings retention ratio	0.7248	0.4493	0.5668	0.4942
Lagged assets turnover	0.0442	0.0134	0.0403	0.0077
Lagged financial leverage	13.3263	3.6014	10.8923	3.2672
Deposits to liabilities ratio	0.9067	0.0910	0.9290	0.0788
Bank size	13.3100	1.3109	12.6299	1.1254
Herfindahl index	0.8529	0.1496	0.7049	0.1872
Agricultural loan ratio	0.0212	0.0597	0.0808	0.1294
Change in Profit	-0.0060	0.0878	-0.0019	0.1068
Change in Earnings Retention rate	-0.1128	5.4311	-0.0291	0.9482
Change in Assets turnover	0.0007	0.0078	0.0007	0.0097
Change in Financial leverage	-0.2402	6.0271	-0.0667	3.7151

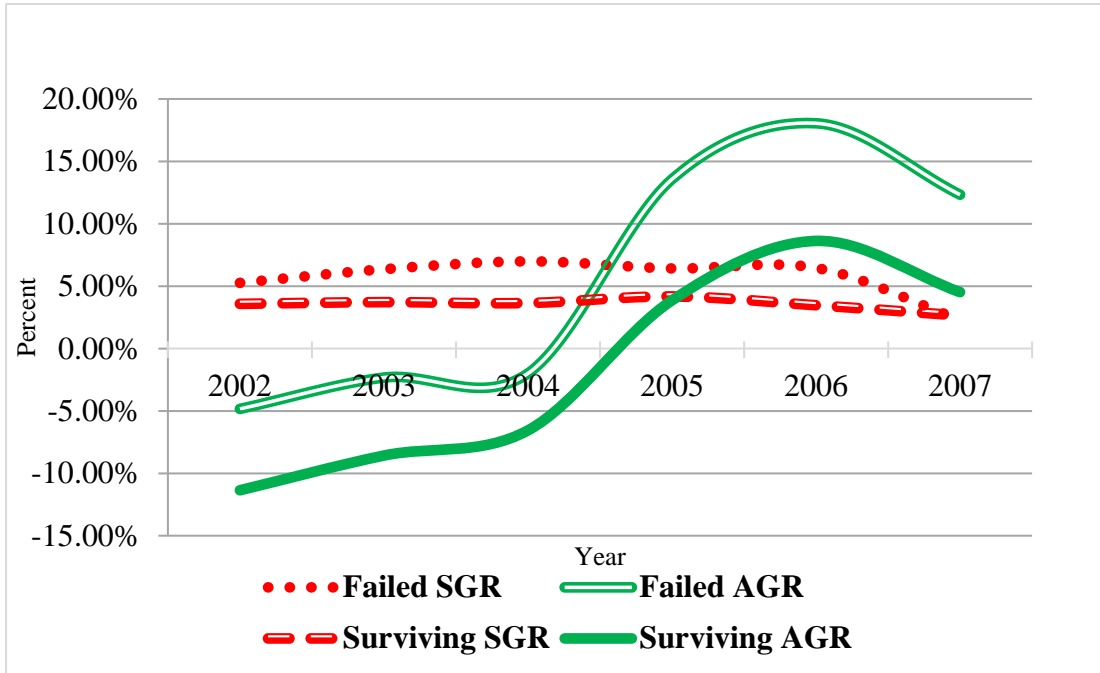




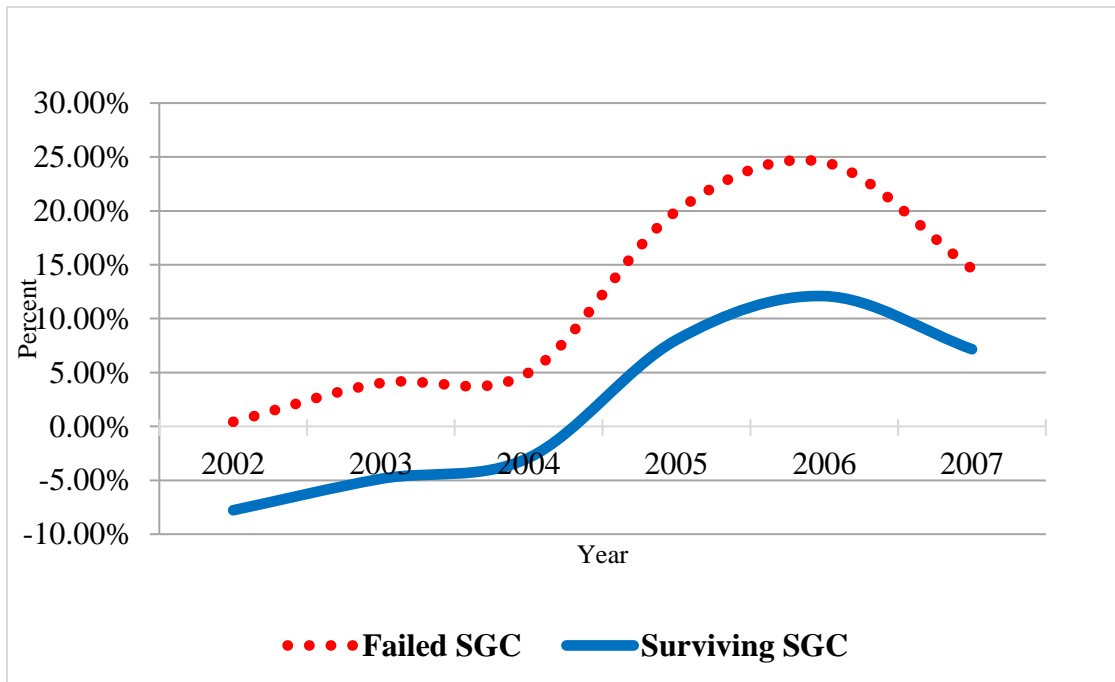
**Figure 1: Annual trends in banks' profit margin and earnings retention ratios. 2002-2007**



**Figure 2: Annual trends in the banks' asset turnover and financial leverage ratios. 2002 – 2007**



**Figure 3: Sustainable Growth Rates (SGR) and Actual Growth Rates (AGR) for failed and surviving banks. 2002 – 2007**



**Figure 4: Sustainable Growth Challenge (SGC) levels for failed and surviving banks. 2002 - 2007**

## **6. Regression Results**

Table 2 summarizes the results of the SUR models for the two banking groups. In the profit margin equation, the current period's profitability can be influenced by profitability momentum (positive lag effect), higher liquidity, and merger decisions, regardless of the banks' status after the recession. Loan portfolio diversification is validated to enhance profitability (significantly negative H index coefficient), but only among surviving banks. Differing SGC effects, however, separate failed and surviving banks whereby the former's aggressiveness and the latter's conservatism in their revenue growth plans lead to higher profit margins.

There is more consensus in the results for the two banking groups under the earnings retention equation. Earnings retention momentum, merger decisions, and more cautious growth strategies also lead to higher earnings retention for all banks.

In terms of asset productivity, both types of banks register significant momentum tendencies as their current period's ATO directly relates to the previous period's ATO level. Moreover, asset productivity for both banks is also significantly promoted by more aggressive growth strategies and among relatively smaller banks. Among failed banks alone, higher agricultural loan portfolios are associated with higher asset productivity.

The merger effect produces contrasting results as such activities lead to higher ATOs among surviving banks while the reverse effect is realized among failed banks. This implies that even if merger decisions made by surviving banks substantially expanded their asset bases, such activities effectively brought revenue enhancement benefits that translate to overall improvements in asset productivity. In contrast, the revenue enhancement effect was not significantly realized in mergers involving failed banks.

For both surviving and failed banks, financial leverage conditions are positively influenced by previous year's leverage decisions and higher for smaller banks. The points of departure lie in the positive SGC effect for surviving banks, thereby suggesting that aggressive growth requires more reliance on external funding, considered as a relatively cheaper funding alternative compared to deposit generation and equity market sourcing alternatives [16]. Failed banks with lower exposure to agricultural borrowers and are not involved in mergers also tend to depend more on liabilities, instead of equity fund sources.

In the SGC equation, results indicate that higher asset productivity, financial leverage ratios, and engaging in mergers lead to aggressive growth strategies (positive SGC) for both banking groups. This means that these banks' bold revenue promotion efforts to levels exceeding sustainable growth limits result from merger decisions that effectively expands a firm's resource capabilities. Such decisions may be motivated further by more favorable asset productivity levels and the existence of larger equity funding endowments.

The rest of the significant results in the SGC equation provide interesting implications. Among these notable contrasts, more conservative growth decisions among surviving banks result from better profit generating conditions and regulated

earnings retention policies. This suggests that surviving banks continue to regulate their growth trajectory even when profitability conditions are improving and higher proportions of earnings are reinvested back into operations from year-to-year. Moreover, failed banks that launched aggressive growth campaigns are usually more specialized banks (positive H index). Bank size also has figures differently in the two models as smaller failed banks and larger surviving banks tend to grow more aggressively.

**Table 2: Seemingly unrelated regression results, 2002-2007**  
(Standard errors in parentheses)

Variables	Failed banks	Surviving banks
<b>Profit Margin Equation</b>		
Intercept	-0.0508 (0.0428)	0.0030 (0.0303)
Lagged profit margin	0.7333*** (0.0227)	0.7840*** (0.0150)
Sustainable growth challenge	0.0244** (0.0123)	-0.0512*** (0.0127)
Herfindahl index	-0.0141 (0.0187)	-0.0273** (0.0114)
Deposits to liabilities ratio	0.0503* (0.0266)	0.0591*** (0.0203)
Bank size	0.0030 (0.0021)	-0.0005 (0.0016)
Merger	0.0118** (0.0056)	0.0150*** (0.0041)
Agricultural loan ratio	0.0313 (0.0449)	-0.0127 (0.0164)
<b>Retention Ratio Equation</b>		
Intercept	0.2929*** (0.0319)	0.2770*** (0.0242)
Lagged retention ratio	0.4703*** (0.0308)	0.4077*** (0.0264)
Sustainable growth challenge	-0.3087*** (0.0794)	-0.8040*** (0.1079)
Merger	0.1635*** (0.0367)	0.2192*** (0.1051)
Agricultural loan ratio	-0.3316 (0.2279)	-0.1645 (0.1051)
<b>Asset Turnover Equation</b>		
Intercept	-0.0082** (0.0030)	0.0038** (0.0017)
Lagged assets turnover	0.9032*** (0.0114)	0.9673*** (0.0108)
Sustainable growth challenge	0.0261*** (0.0009)	0.0197*** (0.0007)
Deposits to liabilities ratio	-0.0021 (0.0019)	-0.0014 (0.0011)
Bank size	-0.0006*** (0.0001)	-0.0002* (0.0001)
Merger	-0.0014*** (0.0004)	0.0009*** (0.0002)
Agricultural loan ratio	0.0097*** (0.0026)	0.0010 (0.0007)

<b>Financial Leverage Equation</b>		
Intercept	7.4859*** (1.1931)	3.0660*** (0.6931)
Lagged financial leverage	0.6606*** (0.0161)	0.8506*** (0.0113)
Sustainable growth challenge	0.1773 (0.3489)	3.3717*** (0.2950)
Deposits to liabilities ratio	-1.1618 (0.7451)	-0.5529 (0.4732)
Bank size	-0.2127*** (0.0536)	-0.0881** (0.0360)
Merger	1.1295*** (0.1606)	0.0565 (0.0954)
Agricultural loan ratio	-2.4433** (1.0291)	-0.3419 (0.3089)
<b>Sustainable Growth Challenge Equation</b>		
Intercept	0.2409*** (0.0845)	-0.1139** (0.0485)
Change in profit margin	0.0363 (0.0442)	-0.2058*** (0.0221)
Change in retention ratio	-0.0001 (0.0007)	-0.0142*** (0.0023)
Change in assets turnover	16.7093*** (0.5558)	20.0423*** (0.5549)
Change in financial leverage	0.0020*** (0.0006)	0.0125*** (0.0006)
Herfindahl index	0.0634** (0.0354)	-0.0095 (0.0167)
Deposits to liabilities ratio	-0.0470 (0.0531)	0.0066 (0.0326)
Bank size	-0.0176*** (0.0039)	0.0091*** (0.0025)
Merger	0.1609*** (0.0098)	0.0891*** (0.0059)
Agricultural loan ratio	-0.1434 (0.0875)	-0.0350 (0.0257)
<b>Model's Statistic</b>		
Breusch–Pagan test of independence ( $\chi^2$ )	459.305***	463.212***
Note: *, **, *** denote significance at the 10%, 5%, 1% confidence levels, respectively.		

## **7. Conclusions**

This study's results provide timely warnings and reminders for an industry operating under a prevailing economic atmosphere marked by heightened market and economic volatility as pandemic conditions persist. This article addresses an important empirical question of understanding operating decisions made by banks in the years preceding a period of economic distress. This article provides a dichotomy of business decisions made by banks in the years leading to the late 2000s recession. Such decisions are correlated with their eventual business fate during the recession. This article's analytical approach allows for the scrutiny of the role of structural differences and conditions in explaining any discrepancy in overall business growth stances, operating strategies decomposed into four specific growth levers, and vulnerability to economic shocks between winners and losers.

This study's results validate momentum influence in all four determinants of growth in sustaining current period's financial conditions. However, the distinction between the surviving and failed banks' growth decisions becomes more apparent in their profitability, earnings retention, and financial leverage decisions. Surviving banks tend to employ more conservative (regulated) growth decisions regardless of the direction of the relationship. Specifically, more cautious growth plans are implemented by these banks even when such decisions lead to higher profit margins as well as when profitability momentum is sustained every year. Moreover, such growth stance among surviving banks remain unchanged even when higher proportions of earnings are retained or reinvested into the business (perhaps through more regulated dividend policies, among others). For these banks, faster growth aspirations require sourcing of cheaper external funds, instead of relying on equity funds with higher transaction costs. The influence of bank size on the pace of growth cannot be ignored. Smaller banks need to accumulate adequate financial strength and capability before considering aggressive growth strategies.

Although this study devotes its attention to a foregone economic episode, its implications cannot be understated. As another recession looms with the potential to usher in more difficult economic hurdles than its precedents, today's banks need to derive guidance from the experiences of previous banks that did not survive the last recession. Careful attention must be given to the choices of specific operating strategies and the formulation of an overall growth objective that may be crucial to business survival. Banking institutions should carefully assess its growth strategies and adopt a more cautious stance in making specific operating decisions in order to avoid committing its predecessors' same mistakes.

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