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## **The effect of ex post risks on post-MA performance efficiency**

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# **The Effect of Ex Post Risks on Post-M&A Performance Efficiency**

## **Abstract**

This article undertakes an empirical analysis of M&A-related risks based on evidence from eight listed U.S. bank holding companies over the period 2000-10. The research model is designed as an inter-domain risk matrix encompassing idiosyncratic and systematic risks underlying horizontal and conglomerate M&A. Risk impact is measured by critical performance metrics at corporate and environmental levels in the pre- and post-M&A periods. It was found insignificant relationship between synergy and concentration and marginal priority of financial over operating synergy in the post-M&A realm. While systematic risk can be mitigated by horizontal M&A followed by majority ownership, its adverse effect is insurmountable for institutions resulted from conglomerate M&A.

*JEL classification:* D02; E02; G21; G28; G34

*Keywords:* Mergers and acquisitions (M&A); U.S. banking industry; Idiosyncratic risk; Systematic risk; Synergy; Concentration; M&A paradigm shift

## 1. Introduction

The banking industry critically depends on macroeconomic dynamics and is rigorously regulated. To survive in volatile environment and maintain competitive advantage, banks strategize higher productivity and efficacy through organic or inorganic, or combination of both, evolution. One of the regularly employed elements of inorganic growth is mergers and acquisitions (M&A), which to date have demonstrated a proven significance in facilitating growth at a firm-specific level as well as in tailoring industry landscape.

Despite general positivism, a number of M&A produce inconsistencies and detract or destroy value of the resulting (post-M&A) institutions. M&A failures are of serious concern of corporate executives, shareholders, and regulators. Macroeconomic tumultuousness further exacerbates risk of post-M&A value deficiency thus challenging consolidation movement at large. It is therefore obvious that M&A enable, and not secure, banks to amplify their growth capabilities and sustainability to systematic risk<sup>1)</sup>. The odds of deteriorating scenarios bring to the forefront the issue of risk management at both micro- and macro-levels with the purpose to minimize adverse effect of economic uncertainty and turmoil. In fact, criticality of risk management is oftentimes understated owing to lopsided focus on primarily micro-level aspects of M&A and excessive prioritization of instantaneous post-M&A benefits. Such an approach not only is flawed by predominantly short-run quantitative effects but also misses other fundamentals of the M&A process, especially in its integration phase.

This article is an attempt to narrow down the risk-related gap in the M&A knowledge and practice and to systematize important risk factors from risk management heights. It suggests some

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<sup>1)</sup> Hereinafter systematic risk is viewed through its two domains – systematic risk at macroeconomic (upper) level and systematic risk of the banking industry (lower) level.

sensitive aspects that complement the existing risk evaluation criteria and reinvigorates their relevance for post-M&A sustainable performance.

The research delves into idiosyncratic risk through horizontal M&A while impact of systematic risk is assessed by post-M&A ownership and conglomerate consolidations. The empirical analysis is based on a panel of 8 listed U.S. bank holding companies over the period 2000-10. They gained a remarkable M&A experience in deregulated economy: horizontal and conglomerate, national and cross-border. This unique evidence of multidimensionality is a decisive platform for examining M&A's ex post risk factors as well as ex ante effect on macroeconomic environment, stakeholders, and society at large.

Based on the above premises, this article addresses the following questions:

- What types of risks underlie M&A processes and what is their probabilistic effect on strategic objectives of the resulting banks?
- Whether and to which extent post-M&A concentration attributes to synergetic effect?
- Whether geographic diversification enhances post-M&A resilience to systematic risk?
- Whether and to which extent conglomerate M&A (between bank and non-bank institution) affects acquiring bank's sustainability to systematic risk and how to measure its effect?
- Do M&A mitigate risk of deteriorating performance ensued from environmental uncertainty and turmoil?

The following hypotheses are tested in this article aiming to enlighten aspects put forth in the above panel of questions:

*Hypothesis 1. Post-M&A synergy meaninglessly depends on capital market concentration of the resulting bank.*

*Hypothesis 2. Post-M&A diversification withstands systematic risk, if and when a consummated M&A deal results in acquiring bank's majority ownership in the acquired bank.*

*Hypothesis 3. Post-M&A integration is exposed to the risk of failure unless it is sustained by adequate stock market performance of the resulting bank.*

*Hypothesis 4. Post-M&A conglomerates mitigate endogenous fluctuations and decline in the banking industry thus contributing to market equilibrium.*

The research model is designed as a cross-domain risk matrix embedding idiosyncratic and systematic risks and horizontal and conglomerate M&A transactions. Risk impact is measured by critical performance parameters at micro- and macro-levels in the pre- and post-M&A periods of the panel banks.

The remainder of this article is organized as follows. Section 2 covers literature review highlighting theories and empirical findings of the previous investigations in the subject area. Section 3 presents research methodology applicable to the innovative methods of M&A risk measurement. Section 4 is a place of testing hypotheses based on research methodology followed by analysis and discussion of the results. Section 5 summarizes the research outcome and concludes on recommendations to banks and regulators, while Section 6 sets scope for further research.

## **2. Literature Review**

Extant academic literature demonstrates conflicting findings on measuring post-M&A outcome while scarcely elucidates how M&A risks could be mitigated. Some core M&A aspects like whether operating or financial synergy<sup>2)</sup> is superior in contributing to post-M&A value creation as well as links to regulation and macroeconomic parameters are still missing their holistic analysis and understanding. Moreover, findings are short of unbiased and comprehensive realization of other environmental factors challenging post-M&A realm. This academic gap coupled with fragmentary

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<sup>2)</sup> Post-M&A operating synergy is defined by the accounting-based performance measures and is expressed by profitability of the resulting institution that exceeds profitability of each of the pre-M&A institutions taken together. Post-M&A financial synergy is defined by market capitalization of the resulting institution that exceeds market capitalization of each of the pre-M&A institutions taken together.

and episodic research of M&A-driven forces (Larsson and Finkelstein, 1999, pp.1, 3) triggers indetermination and misconception of risk-originated factors underlying M&A. On the other side, dearth of relevant theoretical basics and bases aggravate further synthesis of various academic foci in the field (Haleblian *et al.*, 2009) thus refraining their validity for organizational settings and industry regulators.

### *2.1. Capital Market Concentration and Synergy.*

In recent decades, expeditious development of M&A processes and avalanching post-M&A challenges have dramatically changed the landscape of post-M&A concentration, market configuration, and competition. Search for logics in measuring relationship between concentration and synergy urged Berger and Hannan (1989) to synthesize ‘price–concentration’ relationship. They observe that higher concentration engenders inadequate performance behavior resulting in mispricing<sup>3)</sup> and abnormal returns due to poor adjustment of deposit rates in concentrated markets followed by completion of the M&A deal. Later on, Berger and Hannan (1998) observe that higher concentration instigates corporations to mechanistically exercise maximization of profits and shareholder value and again come to conclusion that such a simplified approach elicits cost inefficiency, mispricing, and welfare loss and may ultimately ruin strategic intent. Chatterjee (1992) further posits that synergy depends on concentration thus multiplying bank’s competitive capabilities; he however provides no evidence of attainability of synergy in isolation from concentration. Houston, James and Ryngaert (2001) observe that value creation attributes to post-M&A cost efficiency while Peltzman (1977) states that the latter determines ‘concentration–profitability’ correlation. Cogman and Tan (2010) conclude that ‘maximization of post-M&A return

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<sup>3)</sup> Higher rates of fees and commission (that is, exceeding the average level in a particular market), which is a direct consequence of increased market concentration and poorer competition.

– minimization of risk of failure’ dilemma urges banks to set a balanced combination of post-M&A benefits, including concentration, and costs.

Although causal relationship between concentration and profitability is acceptable to risk-efficient policy, Smirlock (1985) draws an inference that concentration is secondary to market capitalization and is associated with competition, while abnormal returns stem from lower costs and higher prices are linked to accounting measures only. At the same time, his study is limited by one-bank corporations and lacks analysis of bank holding companies (BHC). Some other findings also gravitate to efficiency, rather than performance-structured, doctrine. Thus, by analyzing linkages between concentration and increased competition, Demsetz (1973) suggests that concentration derives from corporations’ (and industry’s)

*“...superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms” (p.1).*

Overall, past researches on ‘concentration–synergy’ relationship results in conflicting findings and are not less than fragmented by region or industry analyses. To overcome this gap, it is attempted to determine sensitivity of this relationship through focused and deeper analysis of dependence of synergy on concentration. Their relationship is tested in *Hypothesis 1*.

## *2.2. Ownership, Diversification, and Systematic Risk.*

There are handful academic works on intrinsic value of synergy gain for the M&A parties. Among them is Lubatkin’s (1987) who observe shared benefits for shareholders of the acquirer and the acquired companies upon M&A deal consummation. Sudarsanam (2003) expands these findings to shareholder wealth increment analysis concluding that M&A outcome has a disadvantageous effect for acquirer’s shareholders while shareholders of the target company are benefited by abnormal returns. According to Houston and Ryngaert (1994), this effect sometimes is attained at the expense of the acquiring bank’s owners. Zollo and Singh (2004) and Bogan (2009) summarize the above

corroborating that deficient synergy for the acquirer puts at significant risk the M&A results, through to deal failure.

Despite moderate clarity of the relatedness between synergy and ownership, findings are constrained by endogenous factors and idiosyncratic risk domain. Needless to emphasize fundamentality of systematic risk in shaping industry developments that recently has evolved to a 'master' element qualifying survivability of most M&A. Besides, gone are the times when U.S. banks were expanding within their home states or adjacent territories, which required comparatively simpler set of post-M&A performance efficiency metrics. During almost two recent decades, the U.S. banking sector has witnessed an exponential variety of cross-industry, cross-border, and cross-product diversifications, each with unique parameters and strategic rationale. In their impressive work, Berger and DeYoung (2001) found that diversification had both positive and diminishing effects on post-M&A efficiency, and that the negative effect is escalating along with subsidiaries' increasing distance from their headquarters. Nevertheless, network economies outstrip negative effect by benefits from risk transfer. Grabowski, Rangan and Rezvanian (1993), conversely, posit that geographic diversification increases post-M&A risk of failure proving it by comparative analysis of BHC and branch banking institutions. Their stance on riskier activity mirrors in Demsetz and Strahan (1997) who observe the same pertaining to the changed structure of the combined assets. Cornett and Tehranian (1992) respond to this discussion by comparative study of intrastate and interstate pre- and post-M&A performance applying both accounting and market performance appraisals and stating that diversification positively affects profitability. Their conclusion is consistent with Rhoades (1993) who found that improved performance was a consequence of combined deposit base as well as cost reduction. Mishra *et al.* (2005) observe that horizontal M&A significantly reduce idiosyncratic risk, while risk diversification is a main driving force of consolidations. Keeley's (1990) conclusion summarizes the above findings in that diversification



has little exposure on market concentration but provides banks with higher returns. Strengthening this kaleidoscope of opinions by Lubatkin's (1987) stance that shareholders' gain from consolidation is subject to majority ownership, it becomes undoubtedly clear that there still remains gap in understanding the relationship between synergy and ownership, on the one side, and diversification and systematic risk, on the other side. Realization of this linkage in *Hypothesis 2* will help comprehend whether diversified M&A coupled with majority post-M&A ownership withstand systematic risk.

### *2.3. Risks in Post-M&A Value Creation.*

Post-M&A synergy is a tacit primary objective of any consolidation and realization of synergetic effect is an indispensable element of sustainable development. However, binary (operating and financial) synergism is yet to be rationalized by as to which of its components more realistically reflect post-M&A efficacy. In other words, dilemma of superiority of the measuring instruments is opened for possible alternate considerations. An array of findings favoring or denying their significance still keeps the space vacated for additional, more conclusive arguments.

Among the proponents of operating synergy are Akhavein, Berger and Humphrey (1997) who found stable increase of profits of the resulting banks and observed decrease of total risk due to diversification. In contrast, Pilloff (1996) did not find any improvements in profitability. Devos, Kadapakkam and Krishnamurthy (2009) conclude on insignificant role of financial synergy in generating post-M&A total synergy owing to its meager (17%) portion compared to operating synergy (p.1181). Besides, Aharony and Swary (1981) and Isimbabi and Tucker (1997) by linking both types of synergies validate operating benefits as a factor encouraging investors' confidence. However, Meeks and Meeks (1981) warn on excessive reliance on operating synergy stating that

*'... no inferences for efficiency could be drawn solely from evidence of improved profitability after merger'* (p.335),

which is partly consistent with Templeton and Severiens (1992) arguing that market return data

*‘... serve as indicators of investor perceptions about BHC conditions and prospects’* (p.5).

Further, Demsetz and Strahan (1997) by analyzing operating synergy in conjunction with post-M&A risks opine that increased credit portfolios, which are associated with expected returns and consequently operating synergy, may signify riskier performance. Their observation is consistent with Akhavein, Berger and Humphrey’s (1997) findings in that refocus to high risk strategy may impair revenues. The above discussion urges to solidify the issue of superiority of either type of synergy and to investigate whether inadequate post-M&A stock market performance affects post-M&A value creation that is a centerpiece of *Hypothesis 3*.

#### *2.4. Conglomerate M&A and Systematic Risk.*

Despite the fact that banking industry dynamics is highly vulnerable to systematic risk, this phenomenon has received scarce academic attention. Its significance for stakeholders is proved by high (20-30%) contribution to corporations’ aggregate return (Chatterjee, Lubatkin and Schoenecker, 1992, p.139; Demsetz and Strahan, 1997, p.301), deficiency of which may seriously weaken post-M&A integration. Academic discussions in the field are ramified by proponents of related M&A (Palepu, 1985; Hoskisson *et al.*, 1993) as the only platform for ‘M&A-making’ in the banking industry that can sustain systematic risk, and unrelated consolidations with their resilience to macroeconomic uncertainties (Chatterjee, 1986; Chatterjee and Wernerfelt, 1988). Among other scholars doubting the capability of conglomerate corporations to minimize detrimental effect of systematic risk are Templeton and Severiens (1992) and Demsetz and Strahan (1997).

In *Section 2.2*, the discussion was centered on interrelatedness between systematic risk and horizontal M&A. Regulatory liberalization in the late 1990s raises criticality of conglomerate M&A for steady development of the financial sector. Supported by evidence from the unrelated M&A wave in the U.S. banking industry in the first decade of 21st century, recent investigations into

conglomerates capture more plausible results. Thus, Bösecke (2009) believes that unrelated M&A decrease systematic risk due to less erratic profit fluctuations and incongruous revenue cycles that are front line factors securing continuous liquidity, cost-efficiency, and competitiveness. In development of these findings, Ng (2007) further concludes that acquirers with heterogeneous resource base receive comparatively higher synergy than their peers from horizontal M&A. Bajtelsmit and Ligon (1996) opine that banks' penetration to insurance sector reduces shareholders' risk through economies of scope. While some academic studies hesitate effective exposure to non-bank activities (Boyd, Graham and Hewitt, 1993), Brewer's (1989) conclusions are further strengthened by specific methodology linking risk measurement to market-based, not to accounting-based, indicators. Obi and Emenogu (2003) observe reduction of total risk and enhanced performance followed by conglomerate M&A while Ravenscraft and Scherer (1987) complement positive 'conglomerate M&A – risk reduction' linkage by evidence from 13 conglomerate deals, which manifested post-M&A returns 2.7 times higher of non-conglomerate M&A deals of S&P500 companies from 1965-83.

At the same time, many experts associate the most recent recession with financial liberalization originated from Gramm-Leach-Bliley Act<sup>4)</sup> (GLBA) that legitimated M&A between banks and non-bank financial institutions. Their concern was ultimately materialized in some provisions of Dodd-Frank Act<sup>5)</sup> (DFA) that has imposed certain restrictions on banks' M&A resulting in conglomerates. However, strategizing synergies generated from different industries seems to remain a strong platform in effective immobilization of macroeconomic risks; in other words, conglomerates mitigate adverse effect of systematic risk through inter-industry diversification and enhanced capability of resource redeployment that is consistent with Amihud and Lev (1981). Besides,

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<sup>4)</sup> Also known as the Financial Services Modernization Act of 1999.

<sup>5)</sup> Also known as the Wall Street Reform and Consumer Protection Act of 2010.

emergence of conglomerates are dictated by increasingly challenging and rapidly changing environmental scenarios and trends in the global finances, and regulatory limitations on inorganic growth may diminish the non-diversified resource base of the U.S. banks compared to their overseas peers, discourage M&A continuum in the U.S. banking industry and ultimately aggravate competitiveness of U.S. credit institutions. That is why *Hypothesis 4* is a place to test the extent to which conglomerate M&A sustain systematic risk and whether their regulatory supervision requires further improvements.

### **3. Research Methodology**

The research was conducted on evidence from eight listed U.S. bank holding companies<sup>6)</sup> each with equity/assets exceeding \$100 billion and customer deposit base covering almost 80% of the national banking industry. They have evolved to industry leaders through multiple sophisticated M&A, and inorganic expansion is believed to be a solid contributor to their sound performance and shareholders' wealth increment. Statistical data were obtained from annual reports and financial statements of the panel banks as well as from *EDGAR*, *COMPUSTAT*, and statistical periodicals and publications of U.S. regulators. Analysis is based on statistical observations of the M&A transactions encompassing three years prior to the M&A event and three years afterwards (3+3 research horizon) within 2000-10 with only a few exceptions when the deal was commenced before 2003 or consummated after 2007. Macroeconomic data for measuring systematic risk are sourced from the websites of U.S. regulators and *Dow Jones & Company* and is comprised of combination of descriptive and inductive statistics. The research embeds multivariate analysis of core M&A determinants. Statistical inference is based on testing hypotheses 1 through 4. Description of

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<sup>6)</sup> Bank of America Corporation, Citigroup Inc., J.P. Morgan Chase & Co., Wells Fargo & Co., PNC Financial Services Group, Inc., U.S. Bancorp, SunTrust Banks, Inc., Fifth Third Bancorp.

hypotheses variables is presented in Table 1. All data related to statistical observations are parametric and are based on Bayesian theory of hypotheses probability (logics of the applied objectivist principles) and have continuous normal distribution.

place Table 1 about here

### *3.1. Statistical Instrumentation for Testing Hypotheses.*

*Hypothesis 1* testing applies *Spearman rank correlation coefficient* computed as a non-parametric statistical dependence between capital market concentration variable (*CAPCON*) represented by *Herfindahl-Hirschman Index (HHI)*<sup>7)</sup> and synergy variables represented by two subpopulation variables: operating synergy (*OPERSYNER*) represented by return on assets (ROA) and financial synergy (*FINSYNER*) represented by market capitalization of the sample banks. It is expected to reveal no evidence against *null Hypothesis 1* assuming that the acquired resources can be allocated within the bank's network to maximize total synergy and that the increase or decrease of post-M&A concentration does not affect performance of the resulting bank. Correlations are computed for *OPERSYNER/CAPCON* and *FINSYNER/CAPCON* pairs of variables for each of the observed 14 M&A deals of the sample banks.

For research objectivity, observations of variables are randomly distributed among U.S. regions in a manner that the distribution would include wider range of indices of capital market concentrations (from 'overbanked' states such as California, Illinois, New York to comparatively 'underbanked' states like Colorado and Montana). Further, to understand resulting effect of concentration on synergy, relationships between pairs of variables are analyzed in both pre- and post-M&A periods. Normal *CAPCON* ( $Y_{it}$ ) is associated with official *HHI* published annually; however, to delve into behavioral aspect of the relationships between variables and to reduce

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<sup>7)</sup> *HHI* is an official measuring instrument of capital market concentration as stipulated by Horizontal Merger Guidelines. It is a sum of squares of deposit shares of each bank operating in a particular state.

observational errors stem from concentration sampling error, frequency of *HHI* was increased from annual to quarterly basis through linear interpolation of *CAPCON*<sup>8)</sup> ( $Y_{i2}$ ). As such, *Spearman's* normal ( $N$ ) and interpolated ( $I$ ) rank correlation coefficients ( $\rho_{i(N;I)}$ ) are applied to each M&A observation specified by *OPERSYNER* ( $X_{i1}$ ) and *FINSYNER* ( $X_{i2}$ ) covering the entire (pre- and post-M&A) research horizon ( $X_{i1H}$  and  $X_{i2H}$  in case the acquiring bank was presented in the local market prior to the M&A event), and post-M&A period ( $X_{i1P}$  and  $X_{i2P}$ ) for the remainder M&A deals:

$$\rho_{i(N;I)} = 1 - \frac{1}{n(n^2 - 1)} \times \left[ 6 \times \sum \left\| \begin{array}{c} R(X_{i1H} - Y_{i1}) \\ R(X_{i1P} - Y_{i1}) \\ R(X_{i1H} - Y_{i2}) \\ R(X_{i1P} - Y_{i2}) \\ R(X_{i2H} - Y_{i1}) \\ R(X_{i2P} - Y_{i1}) \\ R(X_{i2H} - Y_{i2}) \\ R(X_{i2P} - Y_{i2}) \end{array} \right\|^2 \right] \quad (1)$$

where  $R$  is rank of the engaged variables, according to Spearman's rank distribution criteria, as of particular date in the observed M&A period;  $n$  is number of calendar quarters in the observed M&A period.

Based on criteria of credibility of intervals of high and low correlations, coefficient's intervals  $\rho_{i(N;I)} \in \{-1; -0.75\} \cup [0.75; 1]$  signify high correlation while interval  $\rho_{i(N;I)} \in [-0.75; 0.75]$  denotes low correlation. Computed correlations as per variables, specified research horizons, and normal and interpolated statistical distributions for each M&A event of the panel banks are

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<sup>8)</sup> Interpolated *HHI* for a specific calendar quarter is a product of *HHI* between two nearest years according to formula:  $X_n = X_0 + \sum_{t=1}^n \frac{X_1 - X_0}{n+1}$ , where  $X_0$  and  $X_1$  are *HHI* as of 30th June of the two nearest years,  $n$  is a number of the observed sub-periods (quarters) within the period to which  $X_0$  and  $X_1$  belong to.

presented in Table 2 and further grouped in Table 3 according to homogeneity of variances of each type of correlation.

In *Hypothesis 2*, testing applies continuous normal distribution of stock market indicators variable (*USPRI*) as a measure of systematic risk and a series of accounting indicators variables (*OWNER\_ROA*, *OWNER\_CFEA*, *OWNER\_ER*, and *OWNER\_CLR*) as a measure of firm-specific risk followed by *Student's t-test* for statistical significance. In 2000-09, 143 out of 177 (or 80.8%) M&A deals of the panel banks were categorized as geographically diversified. Since all of them were consummated with majority ownership, statistical inference of testing should be treated with some caution due to infeasibility of causal effect of minority (that is, less than 50%) ownership. Observations of firm-specific variables are further complemented by observations of analogous variables of the U.S. peer banks with compatible asset size that is, exceeding \$10 billion. Relevant statistical population of variables of the banks that fit to the remaining size categories (less than \$10 billion) are not included into this model due to estimated distortion of the research results stem from incompatibility of economies of scope and scale. All data are distributed within both entire research period and recession sub-period for each subpopulation of variables according to sampling.

Based on mean indicators of each variable of the sample and peer banks for the relevant research horizons, it is found volatility of the variables, which when compared between sampling groups trigger evidence of the degree of their vulnerability to systematic risk from the heights of post-M&A ownership. Mean volatility ( $\bar{V}_{i(H;R)}$ ) shows sample banks' degree of sustainability to systematic risk based on combine measurement of the involved populations of variables.

$$\bar{V}_{i(H;R)} = \frac{1}{4} \times \sum \frac{STD_{i(H;R)}}{M_{i(H;R)}} \quad (2)$$

where  $STD_{i(H;R)}$  is standard deviation of mean indicators for each of the above variables for the entire research horizon and recession sub-period;  $M_{i(H;R)}$  is arithmetic mean of mean indicators for

each variable for the research period as above,  $H$  and  $R$  denote entire research horizon and recession sub-period respectively. Formula (2) is further transformed to demonstrate inclusion of specified variables of the two sampling groups:

$$\bar{V}_{i(H;R)} = \frac{1}{4} \times \frac{\sqrt{\left[ \sum_{i=1}^n OWNER\_ROA(CFEA;ER;CLR)_{(H;R)}^{(S;B)} - \frac{OWNER\_ROA(CFEA;ER;CLR)_{(1...n)(H;R)}^{(S;B)}}{n} \right]^2}}{OWNER\_ROA(CFEA;ER;CLR)_{(1...n)(H;R)}^{(S;B)}} \quad (3)$$

where  $S$  and  $B$  denote sample banks and peer banks;  $n$  is number of observations. Importance of mean volatility is in its aggregated single indication of variables' volatilities that is comparable with identically single volatility of the stock market indicators variable.

This hypothesis is further tested for statistical significance by *Student's t-test* for the entire research period and recession sub-period. Stem from inequality of statistical population of the sample banks and U.S. peer banks *t-test* ( $t_{i(H;R)}$ ) is specified for unequal sample sizes with equal variances:

$$t_{i(H;R)} = \frac{M_{i(OWNER\_ROA(CFEA;ER;CLR))_{(H;R)}^{(S)}} - M_{i(OWNER\_ROA(CFEA;ER;CLR))_{(H;R)}^{(B)}}}{\sqrt{\frac{[(n_1 - 1) \times STD_{i(S)}^2] + [(n_2 - 2) \times STD_{i(B)}^2]}{n_1 + n_2 - 2}} \times \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad (4)$$

where

$M_i$  is mean of each observed variable of the sample as well as peer banks for both the entire research horizon and the recession sub-period;

$STD_{i(S)}$  is standard deviation of the sample banks ( $n_1$ ) pertaining to each variable computed for the research horizons as above; and

$STD_{i(B)}$  is standard deviation of the U.S. peer banks ( $n_2$ ) pertaining to each variable computed for the research horizons as above.



Denominator ( $n_1+n_2-2$ ) applies to degrees of freedom ( $DF$ ) of different sample sizes<sup>9)</sup> in testing statistical significance. Although chosen arbitrarily, a statistical significance level is:  $\alpha=0.05$ .  $P$ -value is computed for each variable for the entire research horizon and recession sub-period aiming to find the extent to which M&A consummated with majority ownership of the acquiring bank withstand systematic risk. Computed indicators of volatilities and  $t$ -test are presented in Table 4.

*Hypothesis 3* pinpoints conflicting academic findings as to whether stock market performance is a superior measuring instrument of post-M&A consistency. For this purpose, testing involves discrete statistical distribution of market capitalization and revenue of the sample banks stratified by pre-M&A research period ( $PREREV$  and  $PRECAP$ ) and post-M&A period ( $POSTREV$  and  $POSTCAP$ ). To ensure research compatibility, this model employs the same M&A patterns as in *Hypothesis 1*. The following formula applies for measuring volatility of each of the above population of variables by using continuous statistical distribution according to 3+3 research horizon approach:

$$V_{i(P_1;P_2)} = \frac{STD_{i(P_1;P_2)}}{M_{i(P_1;P_2)}} \times 100\% \quad (5)$$

where  $STD_{i(P_1;P_2)}$  is standard deviation of revenue and market capitalization of the sample banks in the pre-M&A period ( $P_1$ ) and the post-M&A period ( $P_2$ );  $M_i$  is arithmetic mean of each variable pertaining to the observed M&A patterns. Formula (5) is further transformed to demonstrate inclusion of variables:

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<sup>9)</sup> In this case,  $DF=121$  ( $8+115-2$ ). In the available FDIC resources, the number of the peer banks (with assets greater than \$10 billion) varies from 110 to 120 over the period 2007-2010. As such,  $n_2 = 115$  as an arithmetic mean of the above dispersion.

$$\begin{aligned}
V_{i(P_1;P_2)} &= \frac{\left( \sqrt{\sum_{i=1}^n \left| PREREV(POSTREV;PRECAP,POSTCAP) - \frac{PREREV(POSTREV;PRECAP,POSTCAP)_{(1...n)}}{n} \right|^2} \right)}{PREREV(POSTREV;PRECAP,POSTCAP)_{(1...n)}} \\
&= \frac{\sqrt{\sum_{i=1}^n \left| PREREV(POSTREV;PRECAP,POSTCAP) - \frac{PREREV(POSTREV;PRECAP,POSTCAP)_{(1...n)}}{n} \right|^2}}{PREREV(POSTREV;PRECAP,POSTCAP)_{(1...n)}}
\end{aligned} \tag{6}$$

where  $n$  is number of observations of a particular variable in the relevant research horizon.

Volatilities of variables pertaining to each M&A transaction are grouped in Table 5. *Student's t-distribution* (Table 6) applies equal statistical populations of the sample banks (that is, equal sample sizes with equal variances):

$$t_{i(P_1;P_2)} = \frac{M_{i(PREREV;PRECAP)} - M_{i(POSTREV;POSTCAP)}}{\sqrt{\frac{STD_{(PREREV;PRECAP)}^2 + STD_{(POSTREV;POSTCAP)}^2}{2}} \times \sqrt{\frac{2}{n}}} \tag{7}$$

where

$M_i$  is mean of each of the observed variables of the sample banks in the pre-M&A period (either *PREREV* or *PRECAP*) and post-M&A period (either *POSTREV* or *POSTCAP*) (mean indicators of variables of more than one M&A event are averaged to an aggregated mean);

$STD_{(PREREV;PRECAP)}$  is standard deviation of homogeneous variables for the pre-M&A period; and  $STD_{(POSTREV;POSTCAP)}$  is standard deviation of homogeneous variables for the post-M&A period.

$DF$  equals to 14<sup>10)</sup>. *P-value* is computed for each pair of homogeneous population of variables to reveal which of the variables more realistically measure post-M&A performance consistency.

Although volatility of operating and financial variables at different stages of the M&A process explicitly demonstrates the degree of their significance in measuring post-M&A integrity, it would be judicious to complement this model by identification of superior measure in relation to *CAPCON*

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<sup>10)</sup>  $2n-2$  where  $n=8$ .

by linking mean correlation coefficients of each pair of variables (*OPERSYNER/CAPCON* and *FINSYNER/CAPCON*) within the specified variances pertaining to the correlation interval, which shows the highest frequency of occurrences (see Table 3). The following formula applies:

$$V_i = \frac{STD_{i(Y_{i1};Y_{i2})}}{M_i} \times 100\% \quad (8)$$

where  $STD_{i(Y_{i1};Y_{i2})}$  is standard deviation of normal and interpolated correlation coefficients as per Table 3 for the entire (*H*) and post-M&A (*P*) research horizons for *OPERSYNER/CAPCON* and *FINSYNER/CAPCON* for the each observed M&A deal;  $M_i$  is arithmetic mean of correlation coefficients pertaining to each pair of variables for the research horizons as above. Based on basics of formula (6), formula (8) is further transformed to include rank correlation coefficients ( $\rho_i$ ) for both pairs of variables for normal and interpolated distributions for the research horizons as above:

$$V_{i(H;P)} = \frac{\sqrt{\sum_{i=1}^n \left| \rho_i[(X_{i1}; X_{i2})(Y_{i1}; Y_{i2})(H)][(X_{i1}; X_{i2})(Y_{i1}; Y_{i2})(P)] - \frac{\rho_{(1...n)}}{n} \right|^2}}{\rho_{(1...n)}} \quad (9)$$

where  $n$  is number of observations of each pair of variables for each M&A pattern.

In *Hypothesis 4*, testing is based on comparative analysis of variables of the acquiring bank (*NONROA*, *NONCAP*, and *NONPRI*) and their aggregated equivalents at macroeconomic level. Specifically, variables of the upper level systematic risk are distributed by market capitalization of the 25 peer banks, which have assets/equity exceeding \$10 billion (*USCAP*) and by stock market indices represented by S&P500 SMI (*USPRI*); variables of the lower level systematic risk are represented by ROA of the above peer group (*USROA\_L*), of the group of the large U.S. banks with foreign offices (*USROA\_F*), and of all U.S. scheduled commercial banks (*USROA*). Following post-M&A continuous normal distribution of variables, their volatilities applicable to each conglomerate M&A occurrence are found based on the following formula:

$$V_{i(N;U)} = \frac{\sqrt{\sum_{i=1}^n \left| (ROA; CAP; PRI)_{(N;U)} - \frac{[(ROA; CAP; PRI)_{(N;U)}]_{(1..n)}}{n} \right|^2}}{[(ROA; CAP; PRI)_{(N;U)}]_{(1..n)}} \quad (10)$$

where  $N$  and  $U$  denote variables at micro- and macro- (both upper and lower macroeconomic segments) levels respectively;  $ROA$  is a universal abbreviation for  $NONROA$ ,  $USROA\_L$ ,  $USROA\_F$ , and  $USROA$ ;  $CAP$  is a universal abbreviation for  $NONCAP$  and  $USCAP$ ;  $PRI$  is a universal abbreviation for  $NONPRI$  and  $USPRI$ ;  $n$  is number of observations of each pair of variables in the post-M&A research horizon. Found volatilities are summarized in Table 7, based on which it is concluded on the degree of volatility of conglomerate M&A to systematic risk.

Since testing involves unequal sample sizes with equal variances,  $t$ -test is based on formula (4) for each pairs of homogeneous variables ( $NONROA/USROA$ ,  $NONCAP/USCAP$ , and  $NONPRI/USPRI$ ) for the observed period. However, to minimize observational error,  $DF$  of each group of variables for each sample bank differ depending on sample sizes implying that  $DF_{(NONROA/USROA\_L)} = 115^{11}$ ,  $DF_{(NONCAP/USCAP)} = 25^{12}$ , and  $DF_{(NONPRI/USPRI)} = 500^{13}$ :

$$t_{i(N;U)} = \frac{M_{i(ROA;CAP;PRI)_{(N)}} - M_{i(ROA;CAP;PRI)_{(U)}}}{\sqrt{\frac{[(n_1 - 1) \times STD_{i(N)}^2] + [(n_2 - 2) \times STD_{i(U)}^2]}{n_1 + n_2 - 2}} \times \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad (11)$$

### 3.2. Limitations of the Research.

The research results are affected as per Berger *et al.*'s (2004) findings that synergies differ in short- and long-run depending on actual materialization of the increased market power of the resulting institution. Although the research horizon of M&A activity of the U.S. banks covers a period of ten

<sup>11</sup>) Is an arithmetic result of 2+115-2.

<sup>12</sup>) Is an arithmetic result of 2+25-2.

<sup>13</sup>) Is an arithmetic result of 2+500-2.

years, equally important are the latest specifics of environmental dynamics, which are tailoring the contemporary factors, facets, manageability of the M&A transactions, and sustainability of post-M&A institutions. This vigor is increasingly challenging traditional but still shortsighted foci on tangible post-M&A benefits omitting implicit but determinative factors that immensely contribute to successful M&A realization. Macroeconomic uncertainty and multiplying variety of elements underlying systematic risk urge risk managerism to become a priority in conducting the M&A processes. This is a focal point of M&A paradigm shift, which will be discussed in details in Chapters 5 and 6.

Another aspect of research limitations relates to biases of statistical inference. It is unfeasible to quantify synergetic effect as incurred costs are a matter of managerial accounting and therefore are not available for public use. At the same time, all the analyzed M&A deals of the sample banks are considered as having been accomplished, according to the official sites of U.S. regulators where there was no any information or statement regarding abandoned deals or unfavorable post-M&A outcome. It is therefore strongly believed that the examined M&A deals have been consummated with synergetic gain and thus testing hypotheses reflects plausible results.

Turbulent macroeconomic environment has significantly affected the U.S. banking industry to the detriment of market capitalization of the credit institutions. However, it is impossible to determine whether worsened post-M&A stock market performance of the panel banks was affected by tightened industry regulation. In this case, compartmentalization of systematic risk into upper and lower levels would provide more evidence on causal effect of environmental conditions on critical indicators of post-M&A performance and would further comprehend underlying risk factors. Such an approach would also facilitate modeling of hypothetical M&A between banking/financial and non-financial industries (this type of consolidation is nowadays legally banned) to understand whether and the extent to which the restrictive provisions of Glass-Steagall

Act<sup>14)</sup> could be modified so that to expand economically-driven principles of organizational growth and to elevate competitive advantage of the U.S. banks to a more sustainable level during economic meltdowns.

#### **4. Empirical Findings and Analysis / Discussion of Results**

*Hypothesis 1* testing is based on 14 horizontal M&A occurrences over the period 2001-07.

place Table 2 about here

Analysis of correlations for *OPERSYNER/CAPCON* and *FINSYNER/CAPCON* revealed weakening effect of each of the synergy variables on concentration after the M&A event as well as their predominantly weak relationship between both pairs of variables at large (Table 3).

place Table 3 about here

High correlation is shown by marginal number of variances of both pairs of variables. This echo with Berger and Hannan (1998) and Rhoades (1982) observing no evidence of relationship between concentration and post-M&A value creation. Furthermore, increase of concentration may trigger diminishing effect for synergy, even if the acquiring bank was ‘resident’ of the local market prior to consolidation. This is illustrated by high correlation in case of increased concentration (Citibank/Citibank West; SunTrust Bank/Lighthouse Community Bank; PNC Bank/United Trust Bank; and Fifth Third Bank/Capital Bank mergers) as well as decreased concentration (J.P. MorganChase/Bank One and U.S. Bank/Weststar Bank mergers), which is evidence of incoherent, even entropic relationship between any type of synergy and concentration. In other words, concentration, whether it has changed or remained intact, plays insignificant role in post-M&A value creation, which is supported by Soledad, Peria and Mody (2004). Taking into consideration the above findings, *Hypothesis 1 is accepted.*

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<sup>14)</sup> Also known as the Banking Act of 1933.

Evidence of insignificant level of correlation is also associated with another aspect of quantitative outcome. It derives from dilemmatic behavior of M&A managers in strategizing concentration at a micro-level: Excessive maximization of customer deposit base is inevitably counterbalanced by concatenating regulatory requirements in the framework of mandating performance and prudential ratios, on the one side, and maintenance of competition in the banking industry, on the other side.

place Table 4 about here

*Hypothesis 2.* Despite wide-spread dispersion of individual volatilities of accounting variables, their mean indicator signifies post-M&A consistency, although all ratios of the sample banks, except of *OWNER\_ROA*, have higher volatility compared to the peer banks. Mean volatility of three remaining variables shows insignificant difference (13.2%) between their means. Higher volatility is associated with consolidations between strategically different institutions that require good deal of time for post-M&A alignment; another factor is attributable to broader dispersion of performance indicators of the sample banks compared to peers. Besides, although mean volatility of the sample banks exceeds volatility of *USPRI* during both observational periods, it is nevertheless less than volatility of variables of the peer banking group. Empirical results at this stage denote positive relationship between post-M&A economies of scope and growing capabilities during economic instability.

Further, test for statistical inference reveals that *p-value* of *OWNER\_CFEA* and *OWNER\_ER* are not statistically significant, especially in the indicative recession sub-period. *P-value* of the remaining variables is statistically significant. In general in this testing, *p-value* points lopsidedness of statistical significance among variables. Obviously, in terms of profitability and prudential ratios, sample banks demonstrate vulnerability to systematic risk. However, they effectively cope with it by asset redeployment and cost optimization. These merits overweigh statistical significance of

other variables: Mean *p-value* is 0.1141, which is comfortably higher the conventionally accepted threshold of 0.05. Following the above examination, *Hypothesis 2* is accepted.

*Hypothesis 3*. Although it is generally accepted that post-M&A efficiency depends on improved market capitalization of the resulting institution, the latter's stock market performance necessitates further examination as to whether it is a sole critical factor of post-M&A consistency and whether operating synergy should also receive equally important status in contributing to post-M&A smoothness.

place Table 5 about here

Significant increase of *POSTREV* against *PREREV* and negligible rise of *POSTCAP* compared to *PRECAP* is consistent with Akhavein, Berger and Humphrey (1997) who observed the increase in profits after consolidation. However, it conflicts with Pilloff's (1996) conclusion on no improvement of profitability followed by consolidation. Further insight into post-M&A indicators shows higher volatility of *POSTCAP* compared to *POSTREV*, although pre-M&A mean volatility displays the opposite scenario. Based on these results, *Hypothesis 3* should be refuted; however, to streamline this model, *Hypothesis 3* is further tested on sensitivity of *POSTCAP* to systematic risk. This idea originates from Leonard and Biswas (1998) who posit that balanced risk policy encourages direct investment, which increases profitability and capitalization during market equilibrium. However, almost one-third of the research horizon falls on recession sub-period that obviously had a deteriorating effect on market capitalization of corporations. Therefore, mean volatility of *POSTCAP* should be adjusted pro rata to the changed stock market volatility. Out of 14 M&A, six deals (42.9%)<sup>15)</sup> were consummated during the recession sub-period. Adjusted volatility

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<sup>15)</sup> Bank of America/MBNA, Bank of America/LaSalle Bank, Citibank/Citibank West, Wells Fargo/Pacific Northwest Bank, PNC Bank/Farmers & Mechanics Bank, and U.S. Bank/Weststar Bank.



( $V_{POSTCAP(A)}$ ) is found from contributing macroeconomic volatilities in pre-recession (equilibrium) and recession periods using the following formula:

$$V_{POSTCAP(A)} = V_{POSTCAP} - \frac{1}{2} \times \left( \frac{(V_{(2000-07)} \times 57.1\%) + (V_{(2007-10)} \times 42.9\%)}{100\%} \right) \quad (12)$$

where

$V_{POSTCAP}$  is mean volatility of *POSTCAP* (Table 5);

$V_{(2000-07)}$  is contributing volatility at macroeconomic level equal to 2.81% (S&P, 2010) computed for the period of market equilibrium (2000 – Q2-2007);

$V_{(2007-10)}$  is contributing volatility at macroeconomic level equal to 5.76% (S&P, 2010) computed for the recession sub-period (Q3-2007 – Q1-2010).

Using the above formula,  $V_{POSTCAP(A)} = 4.0\%$ . Compared to *PRECAP* volatility, adjusted *POSTCAP* volatility decreased by 0.88 basic points.

Another evidence of lower stock market performance volatility can be drawn from synergy–concentration analysis (see *Hypothesis 1*). Volatility of *FINSYNER/CAPCON* is lower to *OPERSYNER/CAPCON* by around 6 basic points (Table 3). This should favor financial synergy as a more decisive measuring instrument of the post-M&A realm; however, operating synergy should not be understated: Its endogenous factors complementarily underlie holistic risk management approach thus enhancing depth and expanding coverage of post-M&A control for successful integration.

place Table 6 about here

The results display almost equal relevance of both operating and financial synergies in measuring post-M&A risks. However, individual *p-value* indicators vary within both populations of variables causing some sort of research confusion. For higher research objectivity and to minimize observational error, the results are reassessed by means of aggregated means, following which *p-value* of market capitalization variables demonstrates that it is not statistically significant, and under these circumstances, *Hypothesis 3* is accepted.

For testing *Hypothesis 4*, it was selected 7 conglomerate M&A deals consummated by the sample banks (resulted in their transformation to financial holding companies, FHC) in the analyzed period. The confined research base is however outweighed by variables of different performance characteristics of the sample group so that the results would have the highest possible research objectivity (Table 7).

place Table 7 about here

Volatility of *NONROA* of the sample banks is lower compared to that of the peer banks, which signals that the sample banks possess higher operating sustainability in withstanding systematic risk. This conforms to Bösecke (2009) who found direct correlation between conglomerate M&A and the decrease of systematic risk that is a prerequisite of generating stable post-M&A revenue streams. However, her findings ramify with Templeton and Severiens' (1992) and Demsetz and Strahan's (1997) disbelief in conglomerates' operating elasticity. These polar conclusions may stem from time difference in research meaning that in the contemporary business environment, conglomerates have developed sophisticated and reliable mechanisms of post-M&A integration including future profits. In this circumstance, Bösecke's (2009) opinion implicitly specifies that at least operating synergy should be treated as a measuring instrument of post-M&A integration followed by cross-industry consolidations. Mean of individual volatilities of *NONCAP* is higher than of *USCAP*; however, volatility of their aggregated mean shows the opposite correlation. This once again testifies higher aptitude of FHC to macroeconomic challenges, mostly due to their ability of risk transfer by redistribution of resources and liquidity among their business units as well as higher flexibility in product management (types, prices, markets, etc). At the same time, volatility of *NONPRI* is significantly higher than *USPRI*. Nevertheless, it is assumed that dynamics of *NONPRI* stands secondary to *NONCAP*, since the latter incorporates consolidated market capitalization of the resulting FHC while *NONPRI* relates solely to the acquiring bank because the

target companies are not listed at the stock exchanges. Furthermore, higher volatility of *NONPRI* is attributable to economies of scope of the sample banks, since their extensive coverage of national and global markets increases their sensitivity to crisis developments, which during the most recent recession were characterized by omnipresence throughout the world.

place Table 8 about here

Analysis of *Student's t-test* shows that recession had a diminishing effect on post-M&A value creation: Despite relatively encouraging results from descriptive statistics, statistical test illustrates serious weaknesses in generating both types of synergy thus signifying FHC's exposure to adverse macroeconomic trends, although advantages of unrelated M&A discussed earlier might have had certain mitigating effect. Based on the outcome of statistical inference, *Hypothesis 4* is rejected and alternative hypothesis is accepted.

## **5. Conclusion**

The research results elucidate principally new aspects of measuring risks in post-M&A integration. It was found that neither type of tangible synergy depends or affects concentration, even if the latter is strategized to maximize post-M&A operating and financial benefits. It is maintained that excessive emphasis on concentration may entail a reverse effect in both the short-run period (for example, shrinkage of deposit base due to unexpected attrition of customers dissatisfied with those aspects of integration that lacked improvement as an inevitable result of concentration-minded policy; inflexibility in 'de-risking' sensitive performance areas such as loan products, and so on) and long-run perspective (threat of monopolization and adverse impact on market competition followed by non-compliance with regulatory requirements and deal abandonment).

It was revealed that post-M&A majority ownership coupled with geographic diversification of the resulting BHC protects U.S. credit institutions from environmental risks through risk transfer

and redistribution of assets. However, absolute control may seriously affect post-M&A performance owing to the fact that the sole major shareholder becomes entirely responsible for M&A deal conduct and strategy implementation while its inaccurate decision-making may put the M&A process at significant risk.

It was determined that financial synergy is a more reliable measure of post-M&A sustainable development. Nevertheless, statistically tiny difference of mean *p-value* between financial and operating synergies signals that criticality of the latter for post-M&A alignment should not be extenuated. Although aggregated true mean of *p-value* favors financial synergy as a decisive component in measuring risks of post-M&A integration, empirical findings show unique role of each of synergetic domains – operating synergy as a reflection of indigenous (accounting-related) factors is evidence of promising effect of the expected profitability and positive cash flow while financial synergy as a reflection of the alignment of various performance characteristics signifies investors' confidence as well as growth perspectives of the resulting institution.

Findings also show that FHC, compared to BHC and other types of traditional credit institutions, possess higher potential in coping with systematic risk due to stable revenue streams and adequate stock market performance ensued from cross-industry diversification and risk transfer. However, their well-balanced post-M&A strategy is weakened by overlooking or misconceptualizing a series of both evident and tacit risk factors at a macro-level, which means that their M&A conduct lacks holistic management. At the same time, there is no evidence the extent to which FHC might sustain crisis should it had been limited by their 'host' industries alone (that is, industries, which legal entities of FHC were initially originated from). As such, it would be premature to draw any inference from fallacy of their business models, as was suggested by experts doubting in financial liberalization and adequate performance of the U.S. banking conglomerates.

Generalization of the above findings puts on the agenda the issue of manageability of risks underlying M&A processes. A number of cogent factors demonstrate that systematic risk is sustained by combination of factors in the framework of horizontal M&A only, which means that conglomerates are inherently vulnerable to systematic risk putting post-M&A value creation at significant risk. Nevertheless, a number of M&A risk management areas are remaining underconceptualized and as such, are inadvertently left in the post-M&A alignment. In fact, M&A processes are intertwined by multiple factors that are distinguished by their extent on whether, how, and when they create value. The research results show that the above factors are mostly identifiable and manageable at a firm-specific level while their realization depends on managerial ability to diagnose risks at a macro-level as well. As a result, different and oftentimes contradictory M&A criteria and stimuli exacerbated by drawbacks in risk management proliferate risks of poor alignment during consolidation. Moreover, traditional M&A instrumentation has become an impediment in managing systematic risk by conglomerates.

The above merits urge to quintessentialize M&A processes and underlying factors by recalibrating evaluation criteria from instant quantitative benefits into risk-minded philosophy wherein M&A objectives are strategized through risk measuring and risk management prism. First attempts to conceptualize new M&A paradigm in the framework of financial regulatory reform are demonstrated by DFA. However, despite its focus on higher consistency of the U.S. financial sector, some of its provisions may inhibit M&A movement and as such, freeze synergy-driven factors followed by series of unrealized growth potential to the detriment of organizational health and competitive capabilities of the U.S. banks and non-bank financial institutions. In fact, the roadmap of DFA implementation requires further insight into systematic risk factors as well as mechanism of their early determination and ‘parametrization’ to avoid risk of risk oversight. In other words, risk managerism should become a focal point of M&A paradigm shift and should be synchronized with regulation thus ensuring cross-

elasticity between these risk domains. In this regard, the concerned U.S. authorities should refocus regulatory regime from rigorous to rational, adjustable to changing macroeconomic parameters, where prudential norms are grouped and classified according to the degree of explicit or tacit risk effect and are flexible to the changing risk factors. Additional quantitative and qualitative metrics underlying risk management should be developed to formalize risk probabilistic effect on post-M&A integrity. The higher the macroeconomic volatility the more expanded, detailed, and relevant should be the specified risk factors population. This sort of an ‘*M&A risk matrix*’ should become a platform in navigating corporations in ‘M&A-making’ in longer-term perspectives while maintaining their confidence in post-M&A value creation as well as M&A positivism at large. Besides, it will sanitize M&A governance from subjectivity and assessment biases.

Risk-oriented regulatory reality would not only facilitate ‘microeconomic–macroeconomic’ fit but also set an impetus for rethinking M&A with non-financial companies<sup>16)</sup>. Otherwise, the existing regulatory restrictions coupled with upsurge of globalization and expansion-minded economic regulations in the other countries may result in outperformance of U.S. credit institutions by their overseas rivals followed by serious weaknesses in their competitive advantage and growth perspectives.

## **6. Scope for Further Research**

### *6.1. Further Research as an Enabler in Overcoming M&A Gaps.*

Further insight into M&A’s behavioral aspects could be comprehended by comparative analysis of synergy of the resulting banks of specified assets/equity categories and further stratified by those with prior experience in the target market and those without that. This research would be a launch pad for rethinking strategies onto interstate M&A in that how to secure acquirer’s smooth post-

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<sup>16)</sup> M&A between financial and non-financial sectors are prohibited by Glass-Steagall Act.

M&A integration regardless its past exposure to the local markets but considering its size. Additionally, delving into interrelatedness between acquirer's size, its local market expertise, and adequacy of synergetic effect would enable to elucidate post-M&A factors that are the most critical in value creation in the mid- and long-term perspectives as well as in ensuring sustainability to systematic risk.

Investigation into 'synergy–diversification' relationship should be expanded over at least three earlier decades to understand the variety of M&A driving forces as well as sources of synergy during non-diversified activities under the ban on interstate consolidations. Based on new findings, more risk-related factors at micro- and macro-levels could be revealed and integrated into '*M&A risk matrix*' and risk management mechanism.

Another research aspect in the field is M&A continuum. Commonly, M&A decision-making is refrained by fears of macroeconomic uncertainty and poor liquidity. At the same time, decline of corporations' market value motivates high performers and growers to realize value creation through M&A-making. Such an antagonistic dilemma suggests that M&A yet will remain one of the primary tools of inorganic growth; however, to mitigate possible discouraging effect stemming from macro-level, further investigation into M&A processes should be focused on finding homogenous and heterogeneous risk factors, which would best fit during post-M&A integration.

In the course of M&A continuum is DFA's innovation in regulation of FHC. Thus, it treats company as predominantly financial (that is, subject to industry regulation), if its revenues from the main activity or from financial assets constitute not less than 85% of total revenues (DFA, Sec.102, p.17). It implies that the remaining FHC would be ill-supervised and become more vulnerable to systematic risk. To understand whether the above threshold would ensure stability of the U.S. financial sector, an optimal solution could be drawn from situational analysis on how other than 85% cut-off thresholds would impact FHC performance during macroeconomic instability.

Future research should more emphasize unrelated M&A and conglomerates' performance. Still, many scholars doubt in benefits of cross-industry M&A (see, for example, Thompson, 1984) or believe in their mediocre post-M&A performance as well as incongruity of earnings streams that may themselves alone exacerbate systematic risk (Gahlon and Stover, 1979). Testing results of *Hypothesis 4* are in conflict with revolutionary mission of GLBA in financial liberalization. On the other side, weaknesses of FHC are aggravated not only by shortage of their experience but also by value destroying effect of recent recession. The question of FHC's sustainability during hypothetical isolated banking crisis is still open and the relevant research could dissolve ambiguity of these findings through situational modeling and statistical simulation.

#### *6.2. Further Research as a Promoter of Paradigm Shift.*

In the recent decade, M&A patterns have reflected inflating mass of new and varying stimuli and impediments. It has become more difficult to maximize the number of post-M&A value-driven components. In addition, rapidly changing macroeconomic environment is perhaps the main perilous and unmanageable factor discouraging M&A continuum. As such, the latter cannot be further maintained unless the traditional quantitative and qualitative factors of M&A conduct are complemented by, and linked to, risk evaluation criteria and approaches. '*M&A risk matrix*' is an inevitable milestone in paradigmatic transformation from value-minded principles, which prioritize mostly immediate benefits to risk-minded business philosophy, which would highlight 'de-riskization' of post-M&A integration for a longer perspective. Indeed, hidden risks may destroy post-M&A value irrespective of its actual increment.

The mounting challenges of new world economic order are radicalizing M&A aspects with principally new exogenous factors. Unawareness or misconception of their criticality significantly increases potential risk of post-M&A misalignment and failure. Expansion of M&A beyond the banking industry and rising number of complex M&A transactions would logically call on



systematization of industry regulation by bringing together regulatory functions that nowadays are dispersed among U.S. authorities (Bernanke, 2010). These circumstances demand principally new regulatory landscape that would match the challenges of paradigm shift. Specifically, institution of a separate official regulatory body – Federal Corporation on Mergers and Acquisitions (FCMA) – would benchmark a new era in regulation featured by risk managerism. Like prudential regulation secures safety of banks and the banking industry, M&A regulation will secure transitional safety, successful deal consummation, and industry and market positivism. Status of FCMA as a powerhouse of paradigm shift requires serious conceptualization as well as clear understanding of its functions as an overall promoter of competitive advantage of the U.S. banking industry.

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**Variables Definitions for Hypotheses 1 through 4**

Hypothesis	Variables
Hypothesis 1	<i>OPERSYNER</i> – operating synergy (Return on Assets (ROA), or profitability)
	<i>FINSYNER</i> – financial synergy (market capitalization)
	<i>CAPCON</i> – capital market concentration (HHI)
Hypothesis 2	<i>USPRI</i> – S&P500 Stock Market Index
	<i>OWNER_ROA</i> – ROA (before taxation)
	<i>OWNER_CFEA</i> – cost of funding earning assets
	<i>OWNER_ER</i> – efficiency ratio
	<i>OWNER_CLR</i> – capital (leverage) ratio
Hypothesis 3	<i>PREREV</i> – pre-M&A revenue
	<i>POSTREV</i> – post-M&A revenue
	<i>PRECAP</i> – pre-M&A market capitalization
	<i>POSTCAP</i> – post-M&A market capitalization
Hypothesis 4	<i>NONROA</i> – ROA following M&A with non-bank financial companies
	<i>NONCAP</i> – market capitalization following M&A with non-bank financial companies
	<i>NONPRI</i> – stock price dynamics following M&A with non-bank financial companies
	<i>USROA_L</i> – profitability of the large U.S. banks
	<i>USROA_F</i> – profitability of U.S. banks with foreign offices
	<i>USROA</i> – profitability of all scheduled U.S. commercial banks
	<i>USCAP</i> – market capitalization average of peer U.S. banks following M&A
<i>USPRI</i> – S&P500 Stock Market Index	

Table 2

**Spearman's Rank Correlation Coefficients for Synergy and Concentration Variables**  
(Hypothesis 1)

Acquiring/Acquired bank	Obs.	$\rho_{i(X_{i1H}; Y_{i1})}$	$\rho_{i(X_{i1P}; Y_{i1})}$	$\rho_{i(X_{i1H}; Y_{i2})}$	$\rho_{i(X_{i1P}; Y_{i2})}$	$\rho_{i(X_{i2H}; Y_{i1})}$	$\rho_{i(X_{i2P}; Y_{i1})}$	$\rho_{i(X_{i2H}; Y_{i2})}$	$\rho_{i(X_{i2P}; Y_{i2})}$
Bank of America/MBNA	62	NA	0.3242	NA	0.3242	NA	0.5275	NA	0.6264
Bank of America / LaSalle	148	--0.5218	0.2667	--0.4165	--0.1333	--0.4844	0.3697	-0.5286	0.7091
Citibank / American Bank SSB	64	NA	--0.0549	NA	0.3077	NA	0.2088	NA	0.6099
Citibank / Citibank West	62	NA	--0.4066	NA	--0.5879	NA	--0.6923	NA	--0.8407
J.P. MorganChase / Bank One	60	NA	0.3846	NA	0.0824	NA	--0.5879	NA	--0.8076
Wells Fargo / State Bank of Rogers	176	--0.1285	0.5105	--0.3562	--0.4406	--0.2700	0.5455	--0.5362	--0.2378
Wells Fargo / Pacific Northwest Bank	180	0.3954	--0.2198	0.5238	0.4780	0.6365	--0.2198	0.8715	0.3846
PNC Bank / United Trust Bank	170	--0.1323	0.2587	--0.0723	0.2727	0.9008	0.9930	0.8785	0.8322
PNC Bank / Farmers & Mechanics Bank	154	--0.2312	--0.0091	--0.3261	--0.1636	0.4427	--0.0091	0.4387	--0.1182
U.S. Bank / U.S. Bank NA MT	58	NA	0.5165	NA	0.2418	NA	--0.2637	NA	--0.5549
U.S. Bank / Weststar Bank	172	--0.0362	0.8881	--0.1085	0.7133	0.1554	0.5245	0.0854	0.4336
SunTrust Bank / Lighthouse Community Bank	62	NA	--0.1319	NA	--0.4286	NA	0.5769	NA	0.7967
SunTrust Bank / National Bank of Commerce	180	--0.2792	0.1484	--0.3608	0.1374	0.5746	0.1648	0.5192	--0.4066
Fifth Third Bank / Capital Bank	152	--0.8256	--0.8132	--0.8579	--0.8736	0.6120	--0.1044	0.6105	--0.3187
TOTAL:	1,700								
Absolute mean:		0.3188	0.3524	0.3778	0.3704	0.5096	0.4134	0.5586	0.5484

Notes:

1. Due to occurrence of some M&A events in early/late 2000s and unavailability of earlier/later statistical data, the research period for those instances is limited to less than 6 years as against 3+3 research horizon approach.

2. NA (not applicable) means that the acquiring bank was not present in the target market prior to the M&A event.

Table 3

**Summary of Correlation Coefficients (Hypothesis 1) and Volatility (Hypothesis 3)**

Variables	Variances	$\rho_{i(N;I)} = \{[-1; -0.75]; [0.75; 1]\}$		$\rho_{i(N;I)} = [-0.75; 0.75]$		$M_i$	$STD_i$	$V_i$	$\bar{V}$
		$i$	% to variances	$i$	% to variances				
$\rho_i(X_{i1H}; Y_{i1})$	8	1	12.5	7	87.5	0.3188	0.0852	26.73	
$\rho_i(X_{i1P}; Y_{i1})$	14	2	14.3	12	85.7	0.3524	0.0672	19.07	
$\rho_i(X_{i1H}; Y_{i2})$	8	1	12.5	7	87.5	0.3776	0.0813	21.53	
$\rho_i(X_{i1P}; Y_{i2})$	14	1	7.1	13	92.9	0.3704	0.0600	16.20	20.88
<b>TOTAL:</b>	<b>44</b>	<b>5</b>	<b>11.4</b>	<b>39</b>	<b>88.6</b>				
$\rho_i(X_{i2H}; Y_{i1})$	8	1	12.5	7	87.5	0.5096	0.0762	14.95	
$\rho_i(X_{i2P}; Y_{i1})$	14	1	7.1	13	92.9	0.4134	0.0692	16.74	
$\rho_i(X_{i2H}; Y_{i2})$	8	2	25.0	6	75.0	0.5586	0.0833	14.91	
$\rho_i(X_{i2P}; Y_{i2})$	14	4	28.6	10	71.4	0.5484	0.0668	12.18	14.70
<b>TOTAL:</b>	<b>44</b>	<b>8</b>	<b>18.2</b>	<b>36</b>	<b>81.8</b>				

Table 4

**Summary of Volatility and Student's *t*-test (Hypothesis 2)**

	Obs.	Period	$M_{i(S)}$	$M_{i(B)}$	$STD_{i(S)}$	$STD_{i(B)}$	$V_{i(S)}$	$V_{i(B)}$	$STD_{i(B;S)}$ <sup>17)</sup>	$t_i$	$p$ -value	Notes
<i>OWNER_ROA</i>	82	<i>H</i>	1.76	0.97	0.1129	0.0904	6.41	9.32	0.0920	23.5119	<0.0001	S
	22	<i>R</i>	0.76	0.13	0.2127	0.1458	27.99	112.15	0.1506	11.4338	<0.0001	S
<i>OWNER_CFEA</i>	73	<i>H</i>	2.11	2.54	0.1663	0.1732	7.88	6.82	0.1728	6.8038	<0.0001	S
	22	<i>R</i>	1.86	1.98	0.2823	0.2946	15.18	14.88	0.2939	1.1163	0.2665	NS
<i>OWNER_ER</i>	73	<i>H</i>	55.68	56.0	0.6553	0.4701	1.18	0.84	0.4828	1.8120	0.0725	NS
	22	<i>R</i>	56.52	56.2	1.7289	1.5407	3.06	2.74	1.5522	0.5638	0.5739	NS
<i>OWNER_CLR</i>	82	<i>H</i>	7.45	9.09	0.0546	0.0628	0.73	0.69	0.0620	72.2467	<0.0001	S
	22	<i>R</i>	7.65	9.30	0.1401	0.0415	1.83	0.45	0.0523	86.3874	<0.0001	S
<i>USPRI</i>	41	<i>H</i>	1182.13		30.4810		2.58					
	22	<i>R</i>	1157.72		66.7031		5.76					
$\bar{V}_{(H;R)}$		<i>H</i>					4.05	4.42				
		<i>R</i>					12.02	32.56				
Mean											<b>0.1141</b>	<b>NS</b>

Note: S – statistically significant; NS – not statistically significant.

<sup>17)</sup> Is first multiplier of denominator in formula (4).





Table 5

**Summary of Volatilities of Pre- and Post-M&A Variables (*Hypothesis 3*)**

Acquiring / Acquired bank	Observations	$M_{i(PREREV)}$	$STD_{i(PREREV)}$	$V_{i(PREREV)}$	$M_{i(POSTREV)}$	$STD_{i(POSTREV)}$	$V_{i(POSTREV)}$	$M_{i(PRECAP)}$	$STD_{i(PRECAP)}$	$V_{i(PRECAP)}$	$M_{i(POSTCAP)}$	$STD_{i(POSTCAP)}$	$V_{i(POSTCAP)}$
Bank of America / MBNA	48	14,766	1253.75	<b>8.49</b>	18,863	1262.28	<b>6.69</b>	152,289	9446.87	<b>6.20</b>	189,141	9874.42	<b>5.22</b>
Bank of America / LaSalle	44	18,286	700.28	<b>3.83</b>	27,932	3179.40	<b>11.38</b>	207,343	6903.50	<b>3.33</b>	126,750	13467.85	<b>10.63</b>
Citibank / American Bank SSB	48	23,384	1105.13	<b>4.73</b>	21,613	1839.33	<b>8.51</b>	219,239	9766.83	<b>4.45</b>	226,258	13024.05	<b>5.76</b>
Citibank / Citibank West	48	24,387	1199.32	<b>4.92</b>	20,217	1837.70	<b>9.09</b>	242,753	2751.67	<b>1.13</b>	137,534	26248.35	<b>19.08</b>
J.P. MorganChase / Bank One	48	9,092	541.72	<b>5.96</b>	15,732	569.98	<b>3.62</b>	76,976	8939.14	<b>11.61</b>	146,210	4947.05	<b>3.38</b>
Wells Fargo / State Bank of Rogers	48	7,276	205.05	<b>2.82</b>	10,573	436.43	<b>4.13</b>	83,599	2188.49	<b>2.62</b>	107,527	2304.57	<b>2.14</b>
Wells Fargo / Pacific Northwest Bank	48	9,116	340.45	<b>3.73</b>	13,329	989.22	<b>7.42</b>	98,904	1980.45	<b>2.00</b>	106,442	5399.60	<b>5.07</b>
PNC Bank / United Trust Bank	48	1,487	52.09	<b>3.50</b>	1,723	161.40	<b>9.37</b>	15,134	738.46	<b>4.88</b>	17,568	739.80	<b>4.21</b>
PNC Bank / Farmers & Mechanics Bank	46	1,761	158.35	<b>8.99</b>	3,113	404.39	<b>12.99</b>	18,832	884.35	<b>4.70</b>	21,680	1386.16	<b>6.39</b>
U.S. Bank / U.S. Bank NA MT	46	2,718	323.81	<b>11.91</b>	3,774	46.77	<b>1.24</b>	29,720	3105.97	<b>10.45</b>	47,421	2143.73	<b>4.52</b>
U.S. Bank / Weststar Bank	48	3,988	114.97	<b>2.88</b>	4,944	54.52	<b>1.10</b>	53,683	853.78	<b>1.59</b>	51,914	3277.33	<b>6.31</b>
SunTrust Bank / Lighthouse Community Bank	48	2,025	47.76	<b>2.36</b>	1,972	73.61	<b>3.73</b>	17,490	560.10	<b>3.20</b>	22,418	1143.41	<b>5.10</b>
SunTrust Bank / National Bank of Commerce	48	1,866	45.81	<b>2.45</b>	2,175	112.68	<b>5.18</b>	19,415	1046.44	<b>5.39</b>	26,463	906.17	<b>3.42</b>
Fifth Third Bank / Capital Bank	38	1,030	89.09	<b>8.65</b>	1,562	41.33	<b>2.65</b>	21,216	1424.11	<b>6.71</b>	33,715	1110.39	<b>3.29</b>
Mean Increase (+), decrease (--)		<b>8,656</b>	<b>441.26</b>	<b>5.37</b>	<b>10,537</b>	<b>786.36</b>	<b>6.22</b>	<b>89,757</b>	<b>3613.58</b>	<b>4.88</b>	<b>90,074</b>	<b>6140.92</b>	<b>6.04</b>
					<b>+21.73%</b>		<b>+0.85bp</b>				<b>+0.35%</b>		<b>+1.16bp</b>

Table 6

**Summary of Student's *t*-test (Hypothesis 3)**

Sample bank	$t_{i(PREREV;POSTREV)}$	<i>p</i> -value	Notes	$t_{i(PRECAP;POSTCAP)}$	<i>p</i> -value	Notes
Bank of America	4.0055	0.0570	NS	2.1705	0.1622	NS
Citibank	1.9365	0.1924	NS	3.3692	0.0779	NS
J.P.Morgan Chase	11.9418	0.0069	S	9.5835	0.0107	S
Wells Fargo	6.9578	0.0200	S	5.0800	0.0366	S
PNC Bank	3.7202	0.0653	NS	2.7929	0.1079	NS
U.S. Bank	6.3187	0.0241	S	3.3562	0.0785	NS
SunTrust Bank	1.7365	0.2246	NS	6.5036	0.0228	S
Fifth Third Bank	7.6613	0.0166	S	9.7884	0.0103	S
Mean <sup>18)</sup>	NA	<b>0.0759</b>	NS	NA	<b>0.0634</b>	NS
True mean <sup>19)</sup>	<b>7.8047</b>	<b>&lt;0.0001</b>	S	<b>0.1664</b>	<b>0.8702</b>	NS

Note: S – statistically significant; NS – not statistically significant.

Table 7

**Volatility of Conglomerate M&A and Macroeconomic Variables (Hypothesis 4)**

Acquiring bank / Acquired non-bank company	Observations	$V_{i(NONROA)}$	$V_{i(USROA\_L)}$	$V_{i(USROA\_F)}$	$V_{i(USROA)}$	$V_{i(NONCAP)}$	$V_{i(USCAP)}$	$V_{i(NONPRI)}$	$V_{i(USPRI)}$
Bank of America / U.S. Trust Corporation	81	6.79	91.13	96.60	150.90	11.14	9.29	16.17	5.18
PNC Bank / Hilliard Lyons Trust Co.	86	3.24	0.89	1.14	2.24	3.45	3.37	3.27	3.33
PNC Bank / Riggs National Trust Co.	104	8.08	10.25	9.88	9.37	3.34	3.32	2.58	2.17
PNC Bank / Mercantile-safe Deposit & Trust Co.	79	20.36	82.13	81.63	105.62	7.05	8.72	7.48	5.56
U.S. Bank / Mercantile Trust Co.	68	2.30	4.18	4.80	3.85	6.50	2.28	2.15	4.60
SunTrust Bank / STI Capital Management	46	3.31	5.00	5.86	4.63	4.49	3.34	2.78	5.22
SunTrust Bank / SunTrust Bankcard	104	5.17	10.25	9.88	9.37	5.18	3.33	5.05	2.17
$\bar{V}_i$		7.04	29.12	29.97	40.85	5.88	4.81	5.64	4.03
$STD_i$		2.1801	13.8270	14.2582	21.4094	0.9498	1.0142	1.7494	0.5114
$\bar{V}$		30.97	47.48	47.57	52.41	16.15	21.09	31.02	12.69

<sup>18)</sup> Is an arithmetic mean of *p*-value of *PREREV/POSTREV* and *PRECAP/POSTCAP* stem from *p*-values of each sample bank.

<sup>19)</sup> Is an aggregated mean which is calculated from arithmetic means of *PREREV*, *POSTREV*, *PRECAP*, and *POSTCAP* and their standard deviations as per Table 5.

Table 8

**Summary of Student's *t*-test (Hypothesis 4)**

Sample bank	$t_{i(NONROA; USROA\_L)}$	<i>p</i> -value	Notes	$t_{i(NONCAP; USCAP)}$	<i>p</i> -value	Notes	$t_{i(NONPRI; USPRI)}$	<i>p</i> -value	Notes
Bank of America	2.3038	0.0230	S	12.2776	<0.0001	S	26.7806	<0.0001	S
PNC Bank	2.3295	0.0216	S	28.5815	<0.0001	S	37.3532	<0.0001	S
U.S. Bank	16.1880	<0.0001	S	58.0120	<0.0001	S	30.1184	<0.0001	S
SunTrust Bank	0.8170	0.4156	NS	40.7437	<0.0001	S	37.8074	<0.0001	S
Mean	NA	0.1151	NS	NA	<0.0001	S	NA	<0.0001	S

Notes:

1. For M&A with two and more occurrences, variables and their standard deviations are averaged to their means.

2. S – statistically significant; NS – not statistically significant.