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Corporate mergers and financial performance: A new assessment of Indian cases

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Corporate mergers and financial performance: A new assessment of Indian cases

Abstract

Purpose: It is worth mentioning that mergers and acquisitions (M&As) have become a popular vehicle for emerging-markets firms to rapidly access new opportunities and market capabilities. Indeed, privatization and multi-nationalization have given a greater shore up in raising global and domestic merger deals. Certainly, these factors are motivated us to investigate “does mergers produce abnormal returns around the announcement; conversely, does they improve financial performance in the long-run”.

Design/Methodology/Approach: The study applies earnings management approach (event study) to compute average abnormal returns (AAR) around the merger announcement for select Indian M&A cases. Further, accounting ratios are considered to assess the long-run financial performance. Thereafter, *t-stat* is applied for testing the proposed hypotheses. In particular, it has performed a later test to the means of financial ratios and variables for both services and manufacturing sectors in accounting ratios and cylinder models respectively.

Findings: The select Indian M&A cases show superior performance during the post-merger period for both manufacturing and services sectors, and observe a balance sheet improvement in the long-run.

Research limitations: Sample is one of the limitations to the study. Due to small sample of merger cases, this paper has limited scope to generalize the results. Hence, academic researchers may employ the suggested assessment (cylinder)-models on large sample.

Practical implications: The research work would help financial analysts, stockbrokers, M&A advisory and regulatory bodies while designing takeover and open offer policies.

Originality/Value: This is an original contribution, which has developed new assessment (cylinder)-models to examine the post-merger long-run financial performance of acquiring firms, especially sector-wise evaluation.

Keywords: Acquisitions and mergers; Accounting ratios; Financial performance; Event study; Financial analysis; Financial modeling; Asian emerging markets; BRIC nations; India.

Paper type: Research paper

1. Introduction

In this competitive economy, local firms and multinational enterprises aim to perceive a significant benefit from different corporate strategies: [organic and inorganic choices](#), for instance, [entering new markets](#), [improving market share and brand promotion](#), and [joint ventures, mergers, alliances, acquisitions and takeovers](#). In addition, firms reshape for being: competitive scope (Hitt *et al.*, 2007), revitalizing the firms for long-run success (Vermeulen & Bakerma, 2001) and synergy benefits (Vaara, 2002). Therefore, the model that discussed in this paper is mergers and acquisitions (hereinafter, M&A). In order to gain sustainable growth, more financial flexibility is required when firms expand through organic growth or acquisitions (Johnson & Soenen, 2003). To penetrate the universal competitiveness and explore opportunities, firms are choosing inorganic strategies such as M&As, strategic alliances and joint ventures (e.g. Kumar & Bansal, 2008). More importantly, M&A activity has received a greater attention from scholars in multiple disciplines because of the propensity of firms to engage in restructuring choices (e.g. Collins *et al.*, 2009). In the financial economic literature, it is found that mergers have two competing approaches. First, value-maximizing theory, which predicts merger consequences as a motive thus maximize shareholders wealth. Second, managerial theory increases shareholders wealth by managing big-size acquisitions (Roll, 1986 In Franks & Harris, 1989).

In the Indian context, merger is defined as an ‘amalgamation’ that interprets “if all assets and liabilities of one company are transferred to the transferee company for consolidation of payment in the form of equity shares, debentures, cash, or mix of these options” (Kumar, 2009, p. 145). [In Reddy *et al.* \(2011, 2012a\)](#), the authors argue that the given economy institutional laws have been amended in light of the 1991 liberalization policies, which have created a significant market for corporate control activities. As Ernst & Young, the Indian division reported that M&A deal value (number of deals) has barely declined by 14% (8%) in 2012, reached at US\$ 31.4 billion (809) from US\$ 36.6 billion (880) in 2011 (Economic Times, 2012). In fact, the slowdown is because of domestic factors, for example, depreciation of the Indian rupee, slow economic growth, and high bank interest rates. In addition, it is observed that material sector has been reported significant amount of deals at both domestic and overseas in recent years (see Business Standard, 2013). More specifically, in view of international M&As India is next to China in BRIC group (see Times of India, 2012).

In the recent past, the authors of this paper found a great deal of raise in M&A research, especially the scholars from Asian emerging economies spotlight on case study

development (Nangia *et al.*, 2011; Reddy *et al.*, 2012b), business valuation (Reddy *et al.*, 2013a), and empirical investigation (e.g. Chi *et al.*, 2011; Kohli & Mann, 2012; Nagano & Yuan, 2013). However, scholars ignore the conceptual foundation that relates to financial assessment of acquiring companies during pre-merger and post-merger period. Therefore, this study aims to fill the void by introducing sector-wise financial assessment methods [cylinder models] to investigate the long-run accounting performance of acquiring firms. These models build on the guidelines propounded by Healy *et al.* (1992), Kumar and Rajib (2007), Kumar and Suhas (2010), and Mantravadi and Reddy (2008). Thus, it employs the aforesaid models on four Indian merger cases completed in 2005. Thereafter, *t-stat* is applied for testing the proposed hypotheses to the means of financial ratios, and variables for both services and manufacturing sectors. The key results indicate that acquiring firms show better performance during post-merger period for both manufacturing and services sectors, and observe a balance sheet progress in the long-run.

More particularly, this paper contribution to the existing M&A literature is twofold. First, it suggests a new financial/accounting performance (assessment) models that would be an important contribution to the accounting and corporate finance literature. It is crucial because of two basic issues: (a) the proposed models evaluate a given acquiring firm based on the primary nature of business, thus services or manufacturing, and (b) the each sector-wise model has developed six parameters and incorporated the stock performance to examine the long-run accounting performance of acquiring firms. In other words, a further study may use these models on a larger sample to find a better method in evaluating the performance of acquiring firms compared to traditional accounting ratio approach. Of course, it has shown some fruitful results that would motivate future researchers in M&A research, especially in emerging countries setting. Second, it adds some case evidence from emerging markets like India to the established M&A paradigm. In fact, the study aims to test and validate new financial assessment models on few cases before investigating a larger sample size. Hence, it helps future scholars in both modifying and testing the suggested models.

Last but not least, it would help policy makers, financial advisors, and bankers in various financial restructuring decisions, for example, assessment of a project, estimating the credit risk, and evaluation of merger deals, joint ventures and strategic alliances. Further, sector-wise models would help project consultants, industry researchers, and investment bankers while estimating the firm value based on manufacturing and services business. In addition, it is a novel approach of this paper that teaching instructors are strongly recommended to discuss and test the proposed sector-wise models as a part of teaching

pedagogy in courses like *Financial Accounting, Corporate Finance and Business Valuation*. For instance, a lecturer may choose some past merger cases, collect the relevant data, and then practice/test the models in the lecture hall. At the same time, faculty may instruct the students that do similar assignment, which would help in further improvement of teaching pattern, grading and progress.

The remainder of the paper is organized as follows. Section 2 presents relevant M&A literature from developed and developing economies, and hypotheses development. Research method and data is described in Section 3. Results and discussions are presented in Section 4. Section 5 concludes the paper.

2. Literature review and Hypotheses development

Historically, merger waves were noticed in developed economies, for example, U.S., UK and other European countries (see Weston *et al.*, 1998). In 2004, 30000 M&A deals were completed globally that was equivalent to one transaction in every 18 minutes (Cartwright & Schoenberg, 2006). In the Asian perspective, most M&A activities have been occurred only after the Asian financial crisis in 1997. In fact, these activities were not only captured the interest and attention of the community, but also attracted the scrutiny of governments in Asian economies (see Wong & Cheung, 2009). Thus, there have been studies since the early 1970s aimed at developing conceptual models to measure financial aspects of mergers, acquisitions and takeovers, and their impact on balance sheet of acquiring, target, or both in the post-acquisition period. Most studies related to acquisitions during 1980s and early 1990s report roughly 65% (35%) negative (positive) stock reactions (Sirower & O'Byrne, 1998). Indeed, an extensive review performed by Bruner (2002) mention that merger activity is highly unprofitable.

The existing literature shows that academicians follow two distinct ways to evaluate merger related gains. First, scholars examine stock price behaviour of acquirer and target firm around the merger announcement by using event study method. Second, investigate pre-merger and post-merger accounting information by computing financial ratios and applying various statistical techniques: t-test, correlation, regression, and so forth of advanced tools. Therefore, this section presents relevant M&A literature in two markets: developed and developing economies.

2.1 Studies in developed economies

The market for corporate control was born in the United States, and related research has undertaken by many contributors in various fields. For example, in the U.S. (e.g. Weston

& Mansinghka, 1971; Jensen & Ruback, 1983; Lubatkin, 1983; Cornett & Tehranian, 1992; Healy *et al.*, 1992; Sirower & O'Byrne, 1998; Ghosh, 2001; Ramaswamy & Waegelein, 2003), UK (e.g. Firth, 1979; Powell & Stark, 2005; Cartwright & Schoenberg, 2006), Australia (e.g. Sharma & Ho, 2002), Germany (e.g. Koetter, 2008), Japan (e.g. Ikeda & Doi, 1983; Kruse *et al.*, 2003), and pertinent early studies in other developed nations. Most studies conclude that long-run assessment reveals negative returns during post-merger period (e.g. Ghosh, 2001; Sharma & Ho, 2002). By contrast, few scholars find positive cash flows (e.g. Cornett & Tehranian, 1992; Switzer, 1996; Powell & Stark, 2005).

Enormous contributions in developed economies, for instance, Jensen and Ruback (1983) describe corporate takeovers generate positive gains in which target firm shareholders benefit and bidding firm shareholders do not lose (p. 47). Similarly, Lubatkin (1983) investigates that do mergers provide real benefits to the acquiring firm. He suggests acquiring firms benefit from mergers because of technical diversification and pecuniary synergies. While comparing industry relatedness, Healy *et al.* (1992) find the improvement in operating performance of merging firms. Cornett and Tehranian (1992) show positive abnormal returns and examine positive correlation between market reaction and improvement in the post-merger 'return on assets'. Additionally, in relation to stock and operating performance, Sirower and O'Byrne (1998) report high correlations between acquirer's short-term stock returns. Ramaswamy and Waegelein (2003) observations are analogous to Switzer (1996), which suggests mergers led to synergetic gains and better performance in long-run.

More interestingly, similar results are observed for UK mergers. Powell and Stark (2005) find that operating performance improves following the takeover. In Germany, Koetter (2008) evaluates post-merger concert in two parameters: cost and profit efficiency. The author argues that merged banks exhibit efficiency level above the average of non-merging banks. In Japan, Ikeda and Doi (1983) notice that return on equity and return on total assets have improved for fifty percent of the sample. In the same course, Kruse *et al.* (2003 In Mantravadi & Reddy, 2008) find positive correlation between pre- and post-merger, and observe significant increase in operating efficiency.

On the contrary, merging firms do not show any testimony of raise during the post-acquisition (Ghosh, 2001). Likewise, Cartwright and Schoenberg (2006) notice failure rates of M&A have remained consistently high. In Australia, Sharma and Ho (2002) describe corporate acquisitions do not led to noteworthy progress in the post-acquisition. Equally, in the UK, Firth (1979) suggests takeovers do little apart from redistributable and shareholder

wealth. Exclusively, mergers related to conglomerates express post-merger earnings have underperformed in the control group (Weston & Mansinghka, 1971).

In summary, major research on M&A has reported in the U.S. followed by UK because of available merger data and efficient academic scholars. However, most scholars evidence that there is a significant improvement in the operating performance of merged/acquiring companies in the long-run. Table 1 portrays the wide summary of western studies on merger performance. The next sub-section presents previous contributions reported in the developing economies.

[Insert Table 1]

2.2 Studies in developing economies

There are modest contributions in the M&A field that focus on post-merger evaluation in developing nations: India (e.g. Beena, 2004; Das, 2000; Kaur, 2002; Kumar, 2009; Ramakrishnan, 2008; Rao & Rao, 1987; Selvam *et al.*, 2009; Sinha *et al.*, 2010), Singapore (Tanuwidjaja, 2007), Malaysia (Marimuthu, 2008; Rahman & Limmack, 2004), Greece (Mylonidis & Kelnikola, 2005) and Pakistan (Ullah *et al.*, 2010).

Rao and Rao (1987) study 94 Indian mergers during 1970-86 that govern by the Monopolies and Restrictive Trade Practices (MRTP) Act, 1969, which inspect on various grounds, motives, and performance analysis. Thereafter, there is a stocky gap between 1988 and 2000, conversely could not find the research even in domestic amalgamations; though, it would have been shifted the focus on takeover regulations that is Securities and Exchange Board of India's (SEBI) Takeover Regulations, 1997 (see Reddy *et al.*, 2011). Subsequently, Das (2000) reports progress in 6 out of 14 merging firms. Pawaskar (2001) analyzes 36 acquiring firms during 1992-95 and find merging firms perform better than industry average, hence no augment in the post-merger profits compare to prime competitors.

Correspondingly, Kumar and Bansal (2008) examine 74 deals during 2000-06 and fifty percent of sample exposes improvement in the post-merger. Further, Ramakrishnan (2008) suggests that mergers create financial synergies in long-run. Likewise, shareholders of acquirer companies amplified their liquidity efficiency after the merger that has evidenced from 13 deals during 2005-06 (Selvam *et al.*, 2009). Particularly, Sinha *et al.* (2010) investigate 17 financial institutions during 2000-08. They observe considerable changes in shareholders earnings, but report no change in liquidity and observe positive correlation between accounting results and M&A deals. Kumar and Rajib (2007) state average sales, profit and cash flow for ten years is higher in merger firms compare to control group. In the

industry relatedness, Mantravadi and Reddy (2008) describe type of industry does seem to make a difference during post-merger operating performance.

There are important studies that oppose improvement in post-merger performance are trivial, for example, Kaur (2002) concludes that both profitability and efficiency of target companies decline. Likewise, no momentous progress reported in the post-merger period (Beena, 2004; Kumar, 2009; Kumar & Suhas, 2010; in Singapore: Tanuwidjaja, 2007). In Malaysia, Rahman and Limmack (2004) examine 94 publicly listed acquiring and 113 private target companies during 1988-92, argue that the progress in operating performance does not come to the cost of long-term investments; equally, Marimuthu (2008) analyzes financial characteristic of non-financial firms (low and high sales) and observes no difference between two groups.

In other regions, in Turkey, Akben-Selcuk and Altiok-Yitmaz (2011) investigate 62 deals during 2003-07, and analyze both stock and accounting data. They conclude stock and operating performance weakly support that mergers negatively affect acquiring firms. Mylonidis and Kelnikola (2005) find no enrichment in operating performance after bank merger in Greece. More interestingly, individual cases in Pakistan, Ullah *et al.* (2010) explore the effect of mergers on financial institutions. For one case, profitability improves irrelevantly and capital adequacy decreases immaterially. In other case, insignificant drop off in profitability and capital adequacy, and decline in solvency. Kemal (2011) analyzes Royal Bank of Scotland (RBS) after acquisition of ABN-AMRO shows rise in profitability, liquidity, assets management, leverage and cash flows.

In a nutshell, research in developing nations concludes that most studies report negative results or no improvement during post-merger. Further, number of studies undergone for post-merger performance investigation is found to be small sample, petite deal value and lack of advanced statistical tools. Table 2 presents the structural review of existing studies from developing economies.

[Insert Table 2]

Moreover, it is fact that the M&A literature continue to be conquered by financial and market studies with a high deliberation of interest in the U.S. and the UK (as cited in Cartwright & Schoenberg, 2006). This paper aims to build sector-wise conceptual cylinder models by using different accounting ratios. Further, it tests these models in the Indian context on four merger deals and applies t-stat to find significant difference among the means of variables both in general ratios and in cylinder models. Indeed, it identifies considerable momentum during post-merger for both services and manufacturing.

2.3 Hypotheses development

The study develops hypotheses related to existing studies that can be testable and scientifically evident. It is widely agreed that the success of an acquisition may be defined as the creation of synergy when the value of the combined firm is greater than that of two firms individually. More notably, Megginson *et al.* (2004) find positive relationship between corporate performance and long-run acquisition. Taking this relation further, does operating performance really improve following acquisitions (Ghosh, 2001), or whether mergers and acquisitions are value-creating activities (Kumar & Suhas, 2010). The two inquiries inspire us to continue for an auxiliary development of related hypotheses in reference to cylinder models (*a new financial assessment*). In particular, Malatesta (1983) formulates three general hypotheses for concerning mergers: investment hypothesis (IH), size-maximizing hypothesis (SMH) and improved management hypothesis (IMH). Certainly, hypotheses is supported by the SMH and test accordingly. It presents general hypothesis like previous studies (Ghosh, 2001; Pawaskar, 2001; Powell & Stark, 2005).

- ♣ *H1: No significant difference among the means of accounting ratios of acquiring firms between pre- and post-merger period in both services and manufacturing.*

On the other hand, the following hypothesis aims to test sector-wise pre- and post-merger performance related to cylinder models and general ratios. Hence, no study considers post-merger assessment in sector-wise, but few studies specifically focus on banking and financial institutions (see Cornett & Tehranian, 1992; Kemal, 2011; Koetter, 2008; Mylonidis & Kelnikola, 2005; Olson & Pagano, 2005; Ullah *et al.*, 2010). They report a greater augment in post-merger bank performance as well as negative impact of mergers on banks. Therefore, it develops hypothesis to contemplate the services sector.

- ♣ *H2: No significant difference among the variables of 'Services Cylinder Model' between pre- and post-merger period.*

The minority studies spotlight on manufacturing industry (Ikeda & Doi, 1983; Kruse *et al.*, 2003) and observe progress in operating efficiency during post-acquisition period. Thus, it presents another hypothesis to test the variables in manufacturing cylinder model.

- ♣ *H3: No significant difference among the variables of 'Manufacturing Cylinder Model' between pre- and post-merger period.*

3. Research method and data

3.1 Research method

In this paper, the method that is being developed and used plays a key role in both producing and understanding the test results. In view of financial performance, Cochran and Wood (1984) argue that there is no real consensus on the identity of proper measure, or a better approach. Hence, it falls into two broad dimensions: stock returns and accounting profits. Mostly, academic researchers and corporates use accounting and stock information to assess pre- and post-merger performance. In financial economics literature, it is found that most authors have applied event study method to assess both stock signalling and financial performance of firms around various corporate and financial restructuring announcements, for example, dividend distribution, stock splits, takeovers, joint ventures, share repurchases, and so forth (e.g. Reddy *et al.*, 2013b). In general, researcher community computes abnormal returns of both merging and merged firm in the short-run around the public announcement of share acquisition or stock sale agreement. Alternatively, they also compute accounting ratios and apply various statistical tools to measure operating performance in the long-run period. More specifically, King *et al.* (2004) states that accounting measures offer an assessment of the effectiveness and efficiency of top management, and reflect the reality of corporate concert. Thus, this paper uses accounting ratios in general perspective, which is similar to previous contributions (Beena, 2004; Healy *et al.*, 1992; Pawaskar, 2001; Sharma & Ho, 2002; Sinha *et al.*, 2010). Then, to meet the premise of article, it constructs sector-wise cylinder models by using various categories of financial ratios (see Table 3), and tests the hypotheses accordingly.

[Insert Table 3]

3.1.1 Cylinder models – a conceptual foundation

The sector-wise cylinder models are developed and used to evaluate the financial performance of acquiring companies, thus services and manufacturing sectors (see Table 4).

Simply, it defines the Cylinder Model (C) as follows.

“A model that defines a conceptual fraction based on the various sets of measurement variables, for example, accounting ratios and market performance indicators in which those given variables are transformed into natural logarithm (ln)”.

In other words, simply convert the given variables into natural logarithm, then sum up to find the conceptual fraction. Of course, it denotes each variable by a cylinder, for instance, C₁, C₂, C₃, C₄, C₅...ⁿ

[Insert Table 4]

3.2 Data set and data analysis

The study has found significant amount of M&A transactions at both local and international in the given institutional setting-India, which is an Asian emerging economy after China (Reddy *et al.*, 2012a). At the outset, this paper selects four domestic deals randomly, which have occurred between 2000 and 2005 (see Appendix 1). The deals are selected based on the criteria, in other words, the given deal should meet the following two guidelines: (a) a deal should meet the time period, and (b) acquiring firm should trade on the respective stock exchange at least three years before and after the acquisition. In addition, deals must produce financial facts timely and have good governance; however, no criterion to select small, medium or large firms. Hence, it ignores financial institutions, banks, insurance companies, mutual funds and other investment/bank based firms. It is because of two important reasons: (a) banks and financial institutions in India are controlled by the Reserve Bank of India (RBI), which is a central bank of the country to look after banking and investment transactions at both domestic and overseas, and (b) financial reporting and corporate disclosures submitted by banks and investment firms are (strictly) different from non-financial firms. Briefly, the sample includes two firms each from manufacturing and services sectors respectively. Nevertheless, it is not the objective to assess each firm; hence, it sets the aim to test and validate proposed cylinder models, separately.

Regarding data accumulation, both accounting and market information have collected from the India's leading financial data provider, which is a *Capitaline Database*, and then chosen income statement, balance sheet and stock market information that suits to test the cylinder models. Lastly, data analysis proceeds as follows. It accumulates data in reference to selection criteria and compute ratios and abnormal returns for each case during the period of three years, in other words, before and after the merger. Afterward, it takes average for each ratio, and introduces these values in both general hypothesis and cylinder model approach. According to hypotheses development, it produces statistical results by employing t-stat that is two-tailed test is used to measure the significant difference among the means. Further, correlation is being found among the variables for both the sectors.

4. Results and discussions

4.1 Accounting ratios and t-stat results during pre-merger and post-merger period

The motive behind merger or acquisition is to create and generate synergistic value (e.g. Weston *et al.*, 1998). Most researchers interpret that surge in profit margin, conversely in operating ratio as well as return on equity are the key indicators of post-merger value that

have added synergy. It finds similar results in previous studies (e.g. Akben-Seluck & Altiook-Yitmaz, 2011; Das, 2000; Kruse *et al.*, 2003; Kumar & Bansal, 2008; Powell & Stark, 2005; Ramaswamy & Waegelein, 2003; Sinha *et al.*, 2010; Switzer, 1996) for select cases in the study. The sector-wise pre- and post-merger financial and statistical results are as follows (see Table 5). In the Indian context, it also finds surge in profit margin (NPM) during post-merger period (similar to Kumar & Rajib, 2007; Ramakrishnan, 2008; Switzer, 1996). More interestingly, in services sector, ROE jumps nearly 13 times (17.831) during post-merger compared to pre-merger (1.428) and higher than ROE rise in manufacturing. Correspondingly, ROA reports 6 times amplify in services during post-merger and higher than the jump in manufacturing (3 times). Further, analogous results found in RONW, ROCE, and ROFA. Thus, it infers that mergers improve post-merger shareholder earnings for services sector, because most of the government policies favour services business due to its major contribution to the economic growth, for example, in terms of gross domestic product (GDP).

[Insert Table 5]

Likewise previous studies, this paper reports long-term debt burden (leverage) by computing debt-equity ratio and results notice that leverage has come down during post-merger period in both services (3.150 to 0.087) and manufacturing (0.309 to 0.191). From this observation, one could understand that firms have restructured their capital structure and shifted to equity against interest risk during post-merger. As a result, it can improve further ROE, ROA, and earnings per share (EPS). The study also undertakes current ratio to examine liquidity position, therefore results states that no remarkable change is reported in liquidity arrangement for both services and manufacturing. To fulfil the need of study, it investigates turnover efficiency by calculating turnover ratios: DTR, ATR, and FATR. More surprisingly, DTR has improved proportionately during post-merger in both sectors; though, on one hand, it mountain sales through credit mode while it affects on nonperforming assets or bad debts.

In general and efficient markets perspective, academic researchers, stockbrokers, shareholders and fund managers utilize P/E ratio as a market indicator. In this study, results describe that P/E ratio has plunged in both sectors during post-merger. However, it is possible when firms' errand more equity against interest risk; thus, affects EPS directly. Like very few studies (Cornett & Tehranian, 1992; Healy *et al.*, 1992; Kumar & Suhas, 2010; Sirower & O'Byrne, 1998), it also determines abnormal returns around the merger announcement by employing event study method. Likewise P/E ratio, average abnormal returns (AAR) have collapsed in both sectors during post-merger period.

In a summary of the aforementioned results, a researcher could observe that there is no major significant difference among the means of accounting ratios between pre- and post-merger as well as overall composite results in both sectors. In other words, services (manufacturing) firms have not shown ample variations across accounting ratios between pre- and post-merger situation. The authors of this study argue that the insignificant is due to small sample size. Further, results are not statistically significant to reject null hypothesis; therefore; alternatively it accepts null hypothesis (H1) in services at p-value 0.305 (>0.05) and p-value 0.230 (>0.05) in manufacturing. In the context of valuation, it also computes Tobin's q ratio to notice any difference among the means (Ray, 2010).

4.2 A new financial assessment (cylinder models): results and inferences

This section reports core-output of new financial assessment models: services and manufacturing. In fact, it is an original attempt at testing differences among the means of pre- and post-merger by dividing the sample into two cylinders. Here, it has chosen very few samples, then categorizes like services (*CYLINDER S*) and manufacturing (*CYLINDER M*) models (see Table 6). In brief, *CYLINDER S* considers services entities and *CYLINDER M* undertakes product based firms. Further, each cylinder has six sub-cylinders (*CYL_{SA}*, *CYL_{SB}*, *CYL_{SC}*, *CYL_{SD}*, *CYL_{SE}*, and *CYL_{SF}*) and each sub-cylinder builds by employing accounting ratios, which states the objective of cylinder (refer Table 4).

[Insert Table 6]

In services (e.g. Koetter, 2008; Sinha *et al.*, 2010), *CYLINDER S* has been improved by 14.028 during post-merger compared to pre-merger value 10.736; though, statistical results state that there is no significant discrepancy among the values of sub-cylinders. Therefore, it accepts null hypothesis (H2) at p-value 0.809 (>0.05). On the other hand, in manufacturing (e.g. Ikeda & Doi, 1983; Kruse *et al.*, 2003), *CYLINDER M* has shown considerable progress during post-merger by 26.087 against pre-merger at 22.490; however, it has notices that there is no significant variation among the values of sub-cylinders. Consequently, it accepts null hypothesis (H3) at p-value 0.845 (>0.05). In sum, the above two cylinders describe that results are not statistically great to reject null hypothesis, so alternatively it admits null hypothesis H2 and H3.

In addition, this paper also argues and provides possible explanations to the following noticeable findings. For example, (a) service sector proxy of leverage and interest coverage ratio (*CYL_{SE}*) decreases during post-merger while the same measure (*CYL_{ME}*) increases in manufacturing sector, and (b) Five year profit growth rate declines after merger completes both in services (*CYL_{SF}*) and in manufacturing (*CYL_{MF}*). Here, one could possibly argue that

there is a significant change in capital structure and earnings distribution decisions during post-merger (long-run), especially in services sector. Regarding profit decline, promising observations like high interest rates, inflation, tax structure, and other firm-specific and country-specific factors. For better inference of the facts, Figure 1 and Figure 2 show graphical view of both cylinder model results. Besides, results keenly notice generous improvement after-merger for both sectors.

[Insert Figure 1] and [Insert Figure 2]

5. Concluding remarks

The paper has suggested sector-wise financial assessment methods [cylinder models] to examine the long-run accounting performance of acquiring firms during pre- and post-merger period. It has used cylinder models on four Indian merger cases. Subsequently, *t-stat* has applied for testing the hypotheses to the means of financial ratios and variables for both manufacturing and services sectors. The key findings of the paper are as follows. It is worth mentioning that acquiring firms show better performance during the post-merger period for both sectors and indicate a balance sheet progress in the long-run. Hence, the article observations are re-produced like previous studies performed in the Indian perspective (e.g. Das, 2000; Kumar & Rajib, 2007; Kumar & Bansal, 2008; Selvam *et al.*, 2009), and do agree with western scholars (e.g. Ikeda & Doi, 1983; Switzer, 1996; Kruse *et al.*, 2003; Ramaswamy & Waegelein, 2003; Powell & Stark, 2005; Koetter, 2008). More importantly, it has reported a real improvement in NPM, OR, ROE, and ROA. By contrast, AAR has declined around the merger announcement both in short-run and in long-run. Lastly, it concludes that there is no significant difference among the means of variables for services and manufacturing, thus neither in cylinder models nor in accounting ratios. It is further argued that the insignificance is likely due to the small sample, though it can improve when a future study considers large sample.

Concisely, this study has investigated do mergers produce abnormal returns around the announcement, and do they improve financial performance in the long-run in case of mergers in India. Finally, it has reported superior performance during the post-merger period for both manufacturing and services sectors. Nevertheless, this research has few limitations. Sample is one of the limitations of study. In fact, due to small sample size this paper could not suggest that the proposed cylinder models likely to be validated, and have limited scope to generalize the results. Hence, it suggests academic researchers and doctoral scholars' modify and test these cylinder models by increasing the sample size. Therefore, the work (models) would continue (validate) through case-by-case or comparative studies. In

particular, further studies are suggested to consider these assumptions: (a) benchmark the indicators with those companies without acquisition/merger, to identify if the improvement over time is significantly out-performed or not, and (b) consider risk-adjusted performance indicators to reflect a more holistic view of risk before and after merger.

References

- Akben-Selcuk, E. and Altiok-Yitmaz, A. (2011), "The impact of mergers and acquisitions on acquirer performance: Evidence from Turkey", *Business and Economics Journal*, Vol. BEJ-22, pp. 1–8.
- Basu, D., Dastidar, S.G. and Chawla, D. (2008), "Corporate mergers and acquisitions in India: Discriminating between bidders and targets", *Global Business Review*, Vol. 9 No. 2, pp. 207–18.
- Beena, P.L. (2004), "Towards understanding the merger wave in the Indian corporate sector: A comparative perspective", Working paper, Centre for Development Studies, JNU, Trivandrum, India.
- Bhattacharyya, A.K. (2011), "Financial Accounting for Business Managers", 3rd ed., PHI Learning, New Delhi, India.
- Bruner, R.F. (2002), "Does M&A pay? A survey of evidence for the decision maker", *Journal of Applied Finance*, Vol. 12 (Spring/Summer), pp. 48–68.
- Business Standard (2013, January 4), "India M&A activity up 12% in 2012", Retrieved from: http://www.business-standard.com/article/companies/india-m-a-activity-up-12-in-2012-113010400043_1.html (accessed 2 March, 2013).
- Cartwright, S. and Schoenberg, R. (2006), "Thirty years of mergers and acquisitions research: Recent advances and future opportunities", *British Journal of Management*, Vol. 17 (S1), pp. S1–S5.
- Chi, J., Sun, Q. and Young, M. (2011), "Performance and characteristics of acquiring firms in the Chinese stock markets", *Emerging Markets Review*, Vol. 12 No. 2, pp. 152–70.
- Cochran, P.L. and Wood, R.A. (1984), "Corporate social responsibility and financial performance", *Academy of Management Journal*, Vol. 27 No. 1, pp. 42–56.
- Collins, J.D., Holcomb, T.R., Certo, S.T., Hitt, M.A. and Lester, R.H. (2009), "Learning by doing: Cross border mergers and acquisitions", *Journal of Business Research*, Vol. 62 No. 12, pp. 1329–34.
- Cornett, M.M. and Tehranian, H. (1992), "Changes in corporate performance as associated with bank acquisitions", *Journal of Financial Economics*, Vol. 31 No. 2, pp. 211–34.
- Das, N. (2000), "A study of the corporate restructuring of Indian industries in the post new industrial policy regime – the issue of amalgamations and mergers", Unpublished Ph.D Thesis, University of Calcutta, Kolkata, India.
- Economic Times (2012, December 30), "Mergers and acquisitions activity expected to see sharp jump in 2013: Ernst & Young", Retrieved from: http://articles.economictimes.indiatimes.com/2012-12-30/news/36063553_1_m-a-activity-indian-m-a-m-a-deal-value (accessed 2 March, 2013).
- Firth, M. (1979), "The profitability of takeovers and mergers", *The Economic Journal*, Vol. 89 No. 354, pp. 316–28.
- Franks, J.R. and Harris, R.S. (1989), "Shareholders wealth effects of corporate takeovers: The UK experience, 1955-1985", *Journal of Financial Economics*, Vol. 23 No. 2, pp. 225–49.
- Ghosh, A. (2001), "Does operating performance really improve following acquisitions?", *Journal of Corporate Finance*, Vol. 7 No. 2, pp. 151–78.
- Healy, P.M., Palepu, K.G. and Ruback, R.S. (1992), "Does corporate performance improve after mergers?", *Journal of Financial Economics*, Vol. 31 No. 2, pp. 135–75.
- Hitt, M.A., Ireland, R.D. and Hoskisson, R.E. (2007), "Strategic Management: Competitiveness and Globalization Concepts", South-Weston, London.
- Ikeda, K. and Doi, N. (1983), "The performance of merging firms in Japanese manufacturing industry: 1964-75", *The Journal of Industrial Economics*, Vol. 31 No. 3, 257–66.

- Jensen, M.C. and Ruback, S. (1983), "The market for corporate control: The scientific evidence", *Journal of Financial Economics*, Vol. 11 No. 1/4, pp. 5–50.
- Johnson, R. and Soenen, L. (2003), "Indicators of successful companies", *European Management Journal*, Vol. 21 No. 3, pp. 364–69.
- Kaur, S. (2002), "*A study of corporate takeovers in India*", Unpublished Ph.D Thesis, University of Delhi, New Delhi, India.
- Kemal, M.U. (2011), "Post-merger profitability: A case of Royal Bank of Scotland", *International Journal of Business and Social Science*, Vol. 2 No. 5, pp. 157–62.
- King, D.R., Dalton, D.R., Daily, C.M. and Covin, J.G. (2004), "Meta-analyses of post acquisition performance: Indicators of unidentified moderators", *Strategic Management Journal*, Vol. 25 No. 2, pp. 187–200.
- Koetter, M. (2008), "An assessment of bank merger success in Germany", *German Economic Review*, Vol. 9 No. 2, pp. 232–64.
- Kohli, R. and Mann, B.J.S. (2012), "Analyzing determinants of value creation in domestic and cross border acquisitions in India", *International Business Review*, Vol. 21 No. 6, pp. 998–1016.
- Kruse, T.A., Park, H.Y., Park, K. and Suzuki, K. (2003), "Long-term performance following mergers of Japanese companies: The effect of diversification and affiliation", *Proceedings at American Finance Association*, Washington D.C., pp. 1–40.
- Kumar, B.R. and Rajib, P. (2007), "An analytical study on multiple mergers in India", *IIMB Management Review*, Vol. 19 No. 1, pp. 1–11.
- Kumar, B.R. and Suhas, K.M. (2010), "An analytical study on value creation in Indian bank mergers", *Afro-Asian Journal of Finance and Accounting*, Vol. 2 No. 2, pp. 107–34.
- Kumar, R. (2009), "Post-merger corporate performance: An Indian perspective", *Management Research News*, Vol. 32 No. 2, pp. 145–57.
- Kumar, S. and Bansal, L.K. (2008), "The impact of mergers and acquisitions on corporate performance in India", *Management Decision*, Vol. 46 No. 10, pp. 1531–43.
- Lubatkin, M. (1983), "Mergers and performance of the acquiring firm", *Academy of Management Review*, Vol. 8 No. 2, pp. 218–25.
- Malatesta, P.H. (1983), "The wealth effect of merger activity and the objective function of merging firms", *Journal of Financial Economics*, Vol. 11 No. 1/4, pp. 155–81.
- Mann, B.J.S. and Kohli, R. (2009), "Impact of mode of payment and insider ownership on target and acquirer's announcement returns in India", *Vikalpa*, Vol. 34 No. 4, pp. 51–66.
- Mann, B.J.S. and Kohli, R. (2011), "Target shareholders' wealth creation in domestic and cross-border acquisitions in India", *International Journal of Commerce and Management*, Vol. 21 No. 1, pp. 63–81.
- Mantravadi, P. and Reddy, A.V. (2008), "Post-merger performance of acquiring firms from different industries in India", *International Research Journal of Finance and Economics*, Vol. 22 (December), pp. 192–204.
- Marimuthu, M. (2008), "Mergers and acquisitions: some empirical evidence on performance, financial characteristics and firm sustainability", *International Journal of Business and Management*, Vol. 3 No. 10, pp. 8–15.
- Meggison, W., Morgan, A. and Nail, L. (2004), "The determinants of positive long-term performance in strategic mergers: Corporate focus and cash", *Journal of Banking & Finance*, Vol. 28 No. 3, pp. 523–52.
- Mylonidis, N. and Kelnikola, L. (2005), "Merger activity in the Greek banking system: A financial accounting perspective", *South-Eastern Europe Journal of Economics*, Vol. 3 No. 1, pp. 121–44.

- Nagano, M. and Yuan, Y. (2013), “cross-border acquisitions in a transition economy: The recent experiences of China and India”, *Journal of Asian Economics*, Vol. 24 No. 1, pp. 66–79.
- Nangia, V.K., Agarawal, R., Sharma, V. and Reddy, K.S. (2011), “Conglomerate diversification through cross-continent acquisition: Vedanta weds Cairn India”, *Emerald Emerging Markets Case Studies*, Vol. 1 No. 1, pp. 1–15.
- Olson, G.T. and Pagano, M.S. (2005), “A new application of sustainable growth: A multi-dimensional framework for evaluating the long-run performance of bank mergers”, *Journal of Business Finance & Accounting*, Vol. 32 No. 9/10, pp. 1995–2036.
- Pawaskar, V. (2001), “Effect of mergers on corporate performance in India”, *Vikalpa*, Vol. 26 No. 1, pp. 19–32.
- Powell, R.G. and Stark, A.W. (2005), “Does operating performance increase post-takeover of UK takeovers? – A comparison of performance measures and benchmarks”, *Journal of Corporate Finance*, Vol. 11 No. 1/2, pp. 293–317.
- Rahman, R.A. and Limmack, R.J. (2004), “Corporate acquisitions and the operating performance of Malaysian companies”, *Journal of Business Finance & Accounting*, Vol. 31 No. 3/4, pp. 359–400.
- Ramakrishnan, K. (2008), “Long-term post merger performance of firms in India”, *Vikalpa*, Vol. 33 No. 2, pp. 47–63.
- Ramaswamy, K.P. and Waagelein, J.F. (2003), “Firm financial performance following mergers”, *Review of Quantitative Finance and Accounting*, Vol. 20 No. 2, pp. 115–26.
- Rao, V.N. and Rao, P.V.K. (1987), “Regulation of mergers under the companies act: A critical study”, *Company News and Notes*, Vol. 25 No. 6, In K. Rabi Narayan and A. Soni, *Mergers and acquisitions in India: a strategic impact analysis for the corporate enterprises in the post liberalization period*. Retrieved from: <http://www.igidr.ac.in/money/MERGERS%20AND%20ACQUISITIONS%20IN%20INDIA.pdf> (accessed 14 April, 2011).
- Ray, K.G. (2010), *Mergers and Acquisitions – Strategy, Valuation and Integration*, PHI Learning, New Delhi, India.
- Reddy, K.S., Agrawal, R. and Nangia, V.K. (2013a), “Reengineering, crafting and comparing business valuation models—The advisory exemplar”, *International Journal of Commerce and Management*, Vol. 23 No. 3, In press.
- Reddy, K.S., Nangia, V.K. and Agarawal, R. (2011), “Review, rewriting and impact of Indian takeover code”, *International Journal of Law and Management*, Vol. 53 No. 4, pp. 241–51.
- Reddy, K.S., Nangia, V.K. and Agrawal, R. (2012a), “Indian economic-policy reforms, bank mergers, and lawful proposals: The ex ante and ex post ‘lookup’”, *Journal of Policy Modeling*, In press.
- Reddy, K.S., Nangia, V.K. and Agrawal, R. (2012b), “Mysterious broken cross-country M&A deal: Bharti Airtel–MTN”, *Journal of the International Academy for Case Studies*, Vol. 18 No. 7, pp. 61–75.
- Reddy, K.S., Nangia, V.K. and Agrawal, R. (2013b), “Share repurchases, signaling effect and implications for corporate governance”, *Asia-Pacific Journal of Management Research and Innovation*, Vol. 9 No. 1, In press.
- Roll, R. (1986), “The hubris hypothesis of corporate takeovers”, *Journal of Business*, Vol. 59 No. 2, pp. 197–215.
- Selvam, M., Babu, M., Indhumathi, G. and Ebenezer, B. (2009), “Impact of mergers on the corporate performance of acquirer and target companies in India”, *Journal of Modern Accounting and Auditing*, Vol. 5 No. 11, pp. 55–64.

- Sharma, D.S. and Ho, J. (2002), "The Impact of acquisitions on operating performance: Some Australian evidence", *Journal of Business and Finance*, Vol. 29 No. 1/2, pp. 155–200.
- Sinha, N., Kaushik, K. P. and Chaudhary, T. (2010), "Measuring post merger and acquisition performance: An investigation of select financial sector organizations in India", *International Journal of Economics and Finance*, Vol. 2 No. 4, pp. 190–200.
- Sirower, M.L. and O'Byrne, S.F. (1998), "The measurement of post-acquisition performance: Toward a value-based benchmarking methodology", *Journal of Applied Corporate Finance*, Vol. 11 No. 2, 107–21.
- Switzer, J.A. (1996), "Evidence on real gains in corporate acquisitions", *Journal of Economics and Business*, Vol. 48 No. 5, pp. 443–60.
- Tanuwidjaja, E. (2007), "Multi-factor SUR in event study analysis: Evidence from M&A in Singapore's financial industry", *Applied Financial Economics Letters*, Vol. 3 No. 1, pp. 55–62.
- Times of India (2012, October 3), "India's overall mergers and acquisitions' activity slows down", Retrieved from: <http://timesofindia.indiatimes.com/business/india-business/Indias-overall-mergers-and-acquisitions-activity-slows-down/articleshow/16654667.cms> (accessed 2 March, 2013).
- Ullah, O., Ullah, S. and Usman, A. (2010), "Post-merger performance of Atlas Investment and Al-Faysal Investment Bank Ltd. in Pakistan", *International Research Journal of Finance and Economics*, Vol. 60 (December), pp. 168–74.
- Vaara, E. (2002), "On the discursive construction of success/failure in narratives of post-merger integration", *Organizational Studies*, Vol. 23 No. 2, pp. 211–48.
- Vermeulen, F. and Bakerma, H. (2001), "Learning through acquisitions", *Academy of Management Journal*, Vol. 44, No. 3, pp. 457–76.
- Weston, J.F., Chung, K.S. and Hoag, S.E. (1998), "Mergers, Restructuring and Corporate Control", 2nd ed., Prentice Hall, New Delhi, India.
- Weston, J.F. and Mansinghka, S.K. (1971), "Tests of the efficiency performance of conglomerate firms", *Journal of Finance*, Vol. 26 No. 4, pp. 919–36.
- Wong, A. and Cheung, K.Y. (2009), "The effects of merger & acquisition announcements on the security prices of bidding firms and target firms in Asia", *International Journal of Economics and Finance*, Vol. 1 No. 2, pp. 274–83.

Further reading

- Li, Q. and Wang, T. (2010), "Financial reporting quality and corporate investment efficiency: Chinese experience", *Nankai Business Review International*, Vol. 1 No. 2, pp.197–213.
- Machiraju, H.R. (2007), "Merger & Acquisitions and Takeovers", New Age International, New Delhi, India.
- Ramakrishnan, K. (2010), "Redistribution of wealth on merger announcements in India", *Management Research Review*, Vol. 33 No. 8, pp. 798–810.
- Zhang, X., Mahenthiran, S. and Huang, H.H. (2012), "Governance and earnings management implications of the Chinese delisting regulation", *Nankai Business Review International*, Vol. 3 No. 2, pp.108–27.

Table 1: Previous research on financial performance of corporate acquisitions in developed economies						
Contributors	Length of the period	Sample	Duration of the study	Method	Focus and sector	Results/Findings/Conclusions
<i>UNITED STATES OF AMERICA (USA)</i>						
Healy <i>et al.</i> (1992)	Long-run	50	1979–1984	Abnormal returns; cash flow model; regression	Merging firms; overall	Significant improvement in comparison to industry (+)
Cornett and Tehranian (1992)	Long-run	30	1982–1987	Use Healy <i>et al.</i> (1992) model	Overall	Positive CAR and improvement in ROA during post-merger (+)
Switzer (1996)	Long-run	324	1967–1987	Cash flow model; regression	Acquiring firms; overall	Synergetic gains in the long-run (+)
Sirower and O'Byrne (1998)	Long-run	41	1979–1990	Event study approach; accounting ratios; regression	Acquiring firms; overall	Correlation between short-term stock earnings and PV of first five years post-merger performance
Ghosh (2001)	Long-run	315	1981–1995	Use Healy <i>et al.</i> (1992) model	Merging firms; method of payment wise; overall	No improvement in post-merger financial performance (±)
Ramaswamy and Waegelein (2003)	Long-run	162	1975–1990	Cash flow model; accounting ratios; regression	Acquiring firms; overall	Improvement in the post-merger financial performance (+)
Olson and Pagano (2005 In Kumar & Suhas, 2010)	Long-run		1987–2000	Accounting ratios; event study approach; statistical tools	Publicly traded bank holding companies	Dividend pay-out ratio is economically significant in post-acquisition (+)
<i>UNITED KINGDOM (UK)</i>						
Powell and Stark (2005)	Long-run			Accounting ratios; regression	Takeovers, overall	Improvement in post-takeover period (+)
<i>GERMANY</i>						
Koetter (2008)	Long-run			Accounting ratios; regression	Merged banks	Efficiency level above than the average of non-merging banks (+)
<i>JAPAN</i>						
Ikeda and Doi (1983)	Long-run	43	1964–1975	Accounting ratios; statistical tools	Acquiring firms; manufacturing industry	Improvement in half-of the sample (+)/(-)
Kruse <i>et al.</i> (2003 In Mantravadi & Reddy, 2008)	Long-run	56	1969–1997	Accounting ratios; statistical tools	Acquiring firms; manufacturing industry	Correlation between pre and post merger results; improvement in operating efficiency (+)
<i>AUSTRALIA</i>						
Sharma and Ho (2002)	Long-run	36	1986–1991	Accounting ratios; statistical tools; regression	Acquiring firms; overall	No significant improvement in the post-acquisition performance (±)
Note: (a) Also, see Bruner (2002) for extensive review of M&A studies performed in different economic settings. (b) (+) refers to that significant improvement is noticed during post-merger period; (-) refers to that significant decline is observed during post-merger period; (±) refers to that no significant improvement/decline is reported during post-merger period; (+) (-) refers to that some percentage of sample firms show significant improvement and the remaining show decline during post-merger period.						

Table 2: Previous research on financial performance of corporate acquisitions in developing economies						
Contributors	Length of the period	Sample	Duration of the study	Method	Focus and sector	Results
<i>INDIA</i>						
Das (2000)	Long-run	14	Post-1990	Accounting ratios; t-test	Acquiring firms; overall	43% of sample improve their financial performance after merger (+)/(-)
Pawaskar (2001)	Long-run	36	1992-1995	Financial ratios; regression	Acquiring firms; overall	Perform better than industry average (+)
Kaur (2002)	Long-run	20	1997-2000	Financial ratios; t-test; other statistical tools	Target companies; overall	Decline in the post-takeover period, but it is not statistically significant (-)
Beena (2004)	Long-run	115	1995-2000	Ratios; t-test	Acquirers; manufacturing industry	No significant improvement in the post-merger period (\pm)
Kumar and Rajib (2007)	Long-run	53	1993-2002	Financial ratios; regression	Multiple mergers; control group	Sales, profits and cash flow efficiency is higher than control group (+)
Kumar and Bansal (2008)	Long-run	74	2000-2006	Financial ratios; chi-square test	Acquiring firms; overall	More than half-of the cases show improvement in operating performance (+)/(-)
Mantravadi and Reddy (2008)	Long-run	118	1991-2003	Financial ratios; t-test	Acquiring firms; various industries	Type of industry does seem to make a difference on post-merger performance
Ramakrishnan (2008)	Long-run	87	1996-2002	Cash flow model; ratios; regression	Acquiring firms; overall	Significant improvement (+)
Kumar (2009)	Long-run	30	1999-2002	Accounting ratios; t-test	Acquiring firms; private sector	No progress in post-merger asset turnover, profitability (\pm)
Selvam <i>et al.</i> (2009)	Long-run	13	2002-2005	Accounting ratios; t-test	Acquirers; target firms	Increase in liquidity efficiency (+)
Kumar and Suhas (2010)	Short-run; long-run			Event study; ratios; regression	Acquirers; banking firms	Favorable stock returns; but no improvement in operating performance (\pm)
Sinha <i>et al.</i> (2010)	Long-run	17	2000-2008	Ratios; Wilcoxon signed rank test	Acquiring firms; financial sector	Improvement in shareholders earnings, ROE, EPS; no change in liquidity (+)
<i>MALAYSIA</i>						
Rahman and Limmack (2004)	Long-run	207	1988-1992	Cash flow model; ratios; regression	Acquirers; target firms	Improvement does not come at the cost of long-term investments (-)
<i>GREECE</i>						
Mylonidis and Kelnikola (2005)	Short-run; long-run	9	1999-2000	Accounting ratios	Bank mergers	No improvement in operating performance after bank mergers (\pm)
<i>TURKEY</i>						

Akben-Seluck and Altiook-Yitmaz (2011)	Long-run	62	2003–2007	Abnormal returns; accounting ratios	Acquiring firms; overall	Positive impact of mergers on financial performance (+)
<p>Note: (a) Also, see some of the empirical studies performed in the Indian economic setting (Basu <i>et al.</i>, 2008; Kohli & Mann, 2012; Mann & Kohli, 2009, 2011). (b) (+) refers to that significant improvement is noticed during post-merger period; (–) refers to that significant decline is observed during post-merger period; (±) refers to that no significant improvement/decline is reported during post-merger period; (+)/ (–) refers to that some percentage of sample firms show significant improvement and the remaining show decline during post-merger period.</p>						

Table 3: Financial/Accounting ratios used in the study			
Category	Code	Ratio	Formula
Profitability	NPM	Net profit margin	(Profit after taxes/net sales) ×100
	OR	Operating profit ratio	(Earnings before interest and taxes/net sales) ×100
	ROE	Return on equity	(Profit after taxes/shareholders equity) ×100
	RONW	Return on net worth	(Profit after taxes/net worth) ×100 Net worth = shareholders equity + retained earnings + reserves and surplus
	ROCE	Return on capital employed	(Earnings before taxes/capital employed) ×100
	ROA	Return on assets	(Earnings before taxes/total assets) ×100
	ROFA	Return on fixed assets	(Earnings before taxes/net fixed assets) ×100
Financial Structure	D/E	Debt-equity ratio	Long-term debt/total assets
	ICR	Interest coverage ratio	Earnings before interest and taxes/interest
Liquidity	CR	Current ratio	Current assets/current liabilities
	QR	Quick ratio	Quick assets/current liabilities
	FS	Financial slack (Johnson & Soenen, 2003)	Most liquid assets/total assets (Most liquid= cash+ bank+ market securities)
Turnover	DTR	Debtors turnover ratio	Total sales/(debtors + accounts receivables)
	ITR	Inventory turnover ratio	Cost of goods sold/average stock
	ATR	Asset turnover ratio	Total sales/total assets
	FATR	Fixed assets turnover ratio	Total sales/net fixed assets
Market	P/E	Price to earnings ratio	Market price per share/earnings per share
	AAR	Average abnormal returns	$\sum (AR_{it} \times \frac{1}{n})$, where $AR_{it} = \sum [R_{it} - R_{mt}]$ AR_{it} – abnormal returns of a given stock; R_{it} – earnings of a given stock; R_{mt} – market returns of a given index.
Growth	NPGR	Net profit growth rate	Last five years growth rate (year-on-year)
	FAGR	Fixed assets growth rate	Last five years growth rate (year-on-year)
Valuation	Tobin's q	Tobin's q ratio	(Market value of equity + book value of preference shares + book value of debt)/ book value of total assets
<p>Source: Compiled from Beena (2004), Bhattacharyya (2011), Johnson and Soenen (2003), Kumar and Suhas (2010), and Mantravadi and Reddy (2008).</p> <p>Note: (a) Tobin's q ratio is not used as a variable while computing cylinder models, but it is being used to test general hypotheses, simply as an accounting ratio. (b) Used BSE-500 Index as a proxy to estimate market returns.</p>			

Table 4: Sector-wise cylinder models

<i>Group I: Services cylinder model (CYLINDER_S)</i>			<i>Group II: Manufacturing cylinder model (CYLINDER_M)</i>		
Cylinder code	Formula	Purpose	Cylinder code	Formula	Purpose
CYL_{SA}	$\sum (\ln.C_2NPM) + (\ln.C_3ROE) + (\ln.C_4PE) + (\ln.C_5ROA) + (\ln.C_6RONW) + (AAR_{it})$	To measure the overall profitability in respect to accounting and market data	CYL_{MA}	$\sum (\ln.C_1ROFA) + (\ln.C_2NPM) + (\ln.C_3ROCE) + (\ln.C_4PE) + (AAR_{it})$	To measure the overall profitability in respect to accounting and market data
CYL_{SB}	$\sum \ln.C_8OPR$	Operating efficiency	CYL_{MB}	$\sum \ln.C_8OPR$	Operating efficiency
CYL_{SC}	$\sum \frac{(\ln.C_{12}FS) + (\ln.C_{13}QR)}{(\ln.C_{13}DTR)}$	Quick ratio and financial slack against debtors turnover ratio	CYL_{MC}	$\sum \frac{(\ln.C_{11}CR) + (\ln.C_{12}FS)}{(\ln.C_{13}DTR)}$	Current ratio and financial slack against debtors turnover ratio
CYL_{SD}	$\sum (\ln.C_{18}ATR)$	Asset turnover ratio	CYL_{MD}	$\sum (\ln.C_{16}FATR) + (\ln.C_{17}ITR)$	Fixed assets and inventory turnover ratio
CYL_{SE}	$\sum (\ln.C_{14}D/E) + (\ln.C_{15}ICR)$	Proxy of leverage and interest coverage ratio	CYL_{ME}	$\sum (\ln.C_{14}D/E) + (\ln.C_{15}ICR)$	Proxy of leverage and interest coverage ratio
CYL_{SF}	$\sum \ln.C_{10}NPGR_{YoY}$	Five years profit margin growth rate (year-on-year)	CYL_{MF}	$\sum \ln.C_9FAGR_{YoY}$	Five years profit margin growth rate (year-on-year)
$CYLINDER_S$	$\sum CYL_{SA} + CYL_{SB} + CYL_{SC} + CYL_{SD} + CYL_{SE} + CYL_{SF}$	Total of all cylinder models, $CYLINDER_{SA-SF}$	$CYLINDER_M$	$\sum CYL_{MA} + CYL_{MB} + CYL_{MC} + CYL_{MD} + CYL_{ME} + CYL_{MF}$	Total of all cylinder models, $CYLINDER_{MA-MF}$

Note: $CYLINDER_M$ is the final score of manufacturing model; $CYLINDER_S$ is the final score of services model. We use these scores to test the variables between pre- and post-acquisition performance.

Abbreviations: NPM – net profit margin; OR – operating profit ratio; ROE – return on equity; RONW – return on net worth; ROCE – return on capital employed; ROA – return on assets; ROFA – return on fixed assets; D/E – debt-equity ratio; ICR – interest coverage ratio; CR – current ratio; QR – quick ratio; FS – financial slack; DTR – debtors turnover ratio; ITR – inventory turnover ratio; ATR – asset turnover ratio; FATR – fixed assets turnover ratio; P/E – price to earnings ratio; AAR – average abnormal returns; NPGR – net profit growth rate; FAGR – fixed assets growth rate.

Table 5: Sector-wise financial assessment during pre-merger and post-merger period

	<i>Panel A: Services</i>						<i>Panel B: Manufacturing</i>						
	Pre-merger		Post-merger		t-stat [#]	p-value	Pre-merger		Post-merger		t-stat [#]	p-value	
	Mean	SD	Mean	SD			Mean	SD	Mean	SD			
<i>NPM</i>	0.215	1.622	3.991	5.581	0.919	0.455*	7.586	3.165	23.103	16.281	1.323	0.317*	
<i>OR</i>	3.407	5.876	6.598	9.121	0.416	0.718*	12.609	3.505	33.172	21.184	1.354	0.308*	
<i>ROE</i>	1.428	1.702	17.831	25.762	0.898	0.464*	111.964	40.569	400.208	316.304	1.278	0.329*	
<i>RONW</i>	6.394	8.937	10.402	14.996	0.325	0.776*	15.070	2.529	30.977	21.291	1.049	0.404*	
<i>ROCE</i>	1.367	1.054	15.420	21.722	0.914	0.457*	17.008	10.673	38.199	35.545	0.808	0.504*	
<i>ROA</i>	1.037	0.635	8.690	12.606	0.857	0.482*	8.871	2.847	20.256	13.818	1.141	0.372*	
<i>ROFA</i>	9.946	1.292	75.045	108.943	0.845	0.487*	111.092	56.627	450.540	583.994	0.818	0.499*	
<i>D/E</i>	3.150	4.280	0.087	0.030	-1.012	0.418*	0.309	0.426	0.191	0.264	-0.333	0.771*	
<i>CR</i>	11.327	11.661	11.477	13.396	0.012	0.992*	2.371	1.136	2.297	1.933	-0.047	0.967*	
<i>QR</i>	4.380	3.418	2.743	1.745	-0.603	0.608*	1.360	0.334	1.478	1.053	0.151	0.894*	
<i>DTR</i>	5.298	0.151	37.867	45.867	1.004	0.421*	8.215	6.448	16.478	18.577	0.594	0.612*	
<i>ATR</i>	1.010	0.625	1.933	0.826	1.261	0.334*	1.644	0.129	1.165	0.226	-2.606	0.121*	
<i>FATR</i>	5.399	0.752	17.226	7.134	2.332	0.145*	10.937	1.671	10.404	10.699	-0.069	0.951*	
<i>Tobin's q</i>	1.327	0.863	0.795	0.403	-0.790	0.512*	1.347	1.397	2.291	2.093	0.530	0.649*	
<i>P/E</i>	77.165	99.833	36.234	35.732	-0.546	0.639*	17.436	22.457	12.982	8.785	-0.261	0.818*	
<i>AAR</i>	0.168	0.292	-0.125	0.094	-1.349	0.309*	0.031	0.106	-0.096	0.026	-1.634	0.244*	
<i>Overall statistical results</i>													
Pearson's correlation						0.377	Pearson's correlation						0.992
t-stat **						1.043	t-stat **						1.226
p-value						0.305*	p-value						0.230*
<p>Note: *Statistically significant at 95% confidence level, i.e. p-value > 0.05; # computed t-test: two-sample assuming equal variances at α level 0.05 (t-critical value 4.302); ** computed t-test: two-sample assuming equal variances at α level 0.05 (t-critical value 2.042).</p> <p>Abbreviations: NPM – net profit margin; OR – operating profit ratio; ROE – return on equity; RONW – return on net worth; ROCE – return on capital employed; ROA – return on assets; ROFA – return on fixed assets; D/E – debt-equity ratio; CR – current ratio; QR – quick ratio; DTR – debtors turnover ratio; ATR – asset turnover ratio; FATR – fixed assets turnover ratio; P/E – price to earnings ratio; AAR – average abnormal returns.</p>													

Table 6: Sector-wise cylinder results during pre-merger and post-merger period

<i>Group I: Services</i>			<i>Group II: Manufacturing</i>		
	Pre-merger mean	Post-merger mean		Pre-merger mean	Post-merger mean
CYL_{SA}	5.223	12.234	CYL_{MA}	12.460	15.361
CYL_{SB}	1.226	1.887	CYL_{MB}	2.534	3.502
CYL_{SC}	-0.559	-0.359	CYL_{MC}	-1.022	-0.887
CYL_{SD}	0.010	0.659	CYL_{MD}	2.806	2.769
CYL_{SE}	1.147	-0.394	CYL_{ME}	1.944	4.205
CYL_{SF}	3.688	0.000	CYL_{MF}	3.767	1.137
$CYLINDER_S$	10.736	14.028	$CYLINDER_M$	22.490	26.087
<i>Statistical results</i>					
Pearson's correlation		0.745	Pearson's correlation		0.951
t-stat**		0.249	t-stat**		0.201
p-value		0.809*	p-value		0.845*

Note: (a) *Statistically significant at 95% confidence level, i.e. p-value > 0.05.

** computed t-test: two-sample assuming equal variances at α level 0.05 (t-critical value 2.228).

(b) Purpose of given cylinder models: CYL_{SA}/CYL_{MA} – to measure the overall profitability in respect to accounting and market data; CYL_{SB}/CYL_{MB} – operating efficiency; CYL_{SC} – quick ratio and financial slack against debtors turnover ratio; CYL_{MC} – current ratio and financial slack against debtors turnover ratio; CYL_{SD} – asset turnover ratio; CYL_{MD} – fixed assets and inventory turnover ratio; CYL_{SE}/CYL_{ME} – proxy of leverage and interest coverage ratio; CYL_{SF}/CYL_{MF} – five years profit margin growth rate (year-on-year); $CYLINDER_S$ – total of respective sub-cylinder models in the given services sector; $CYLINDER_M$ – total of respective sub-cylinder models in the given services sector.

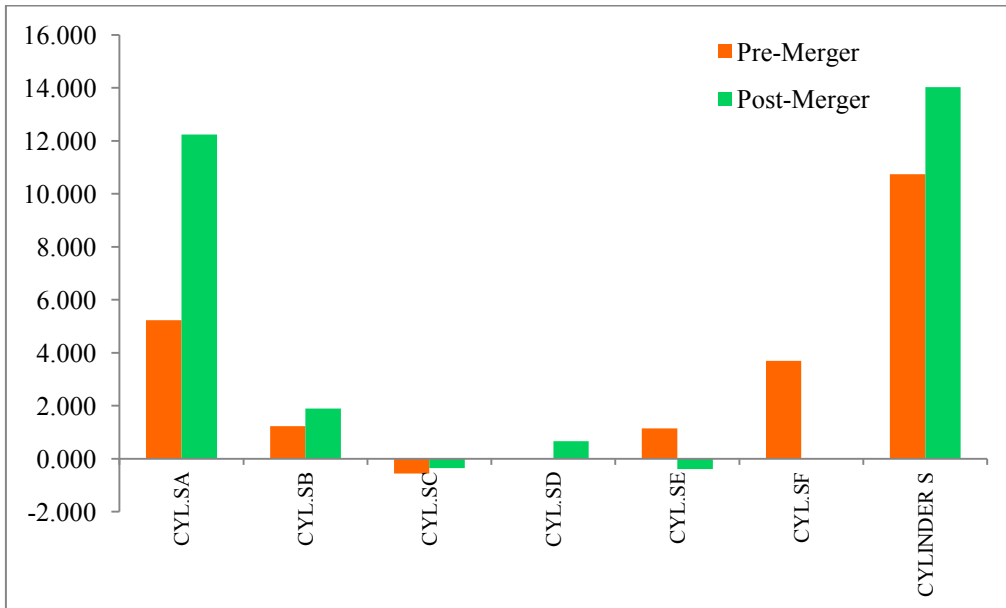


Figure 1: Services cylinder model results during pre-merger and post-merger

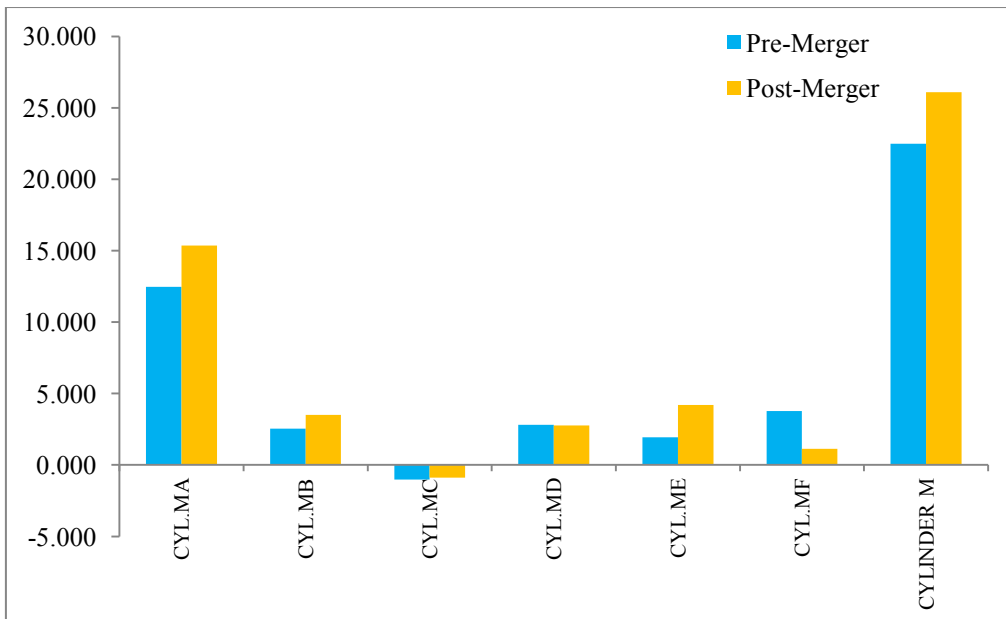


Figure 2: Manufacturing cylinder model results during pre-merger and post-merger

Appendix 1: Indian merger cases

Services sector

1. Ricoh India Ltd (Office equipment)

Ricoh India Ltd (Formerly RPG Ricoh Ltd) was incorporated in 1993 as a joint venture between RPG Industries and Ricoh, Japan. They manufacture office automation equipment. Its products are copiers and facsimile machines. Ricoh has 26% equity participation. They launched digital Copier models with brand name 'Aficio' in the Indian market. It has amalgamated Gestetner (India) Ltd in 2005.

2. Silicon Valley Infotech Ltd (Financial services)

Incorporated in 1983 as public limited company, Prashant Products & Holdings Limited was subsequently changed to Prashant Global Finance Limited in 1985, now Silicon Valley Infotech Ltd. Ram Babu Kabra originally promoted it. They engaged in the business of financial services. During 1996-97, firm had rolled over the existing stocks at a favorable price and booked substantial profits throughout the year.

Manufacturing/Production sector

3. Eastern Silk Industries Ltd (Textiles-silk)

Eastern Silk Industries Ltd, a Kolkata based company is the leading exporter of silk fabrics. It was incorporated in 1946 with the name Eastern Silk Manufacturing Company Ltd. In 1975, the company changed their name to Eastern Silk Industries Ltd. Their operations include manufacturing of silk yarn, home furnishings, fashion fabrics, and handloom fabrics, etc. The Government of India recognized the company as a Golden Star Trading House.

4. GlaxoSmithKline Pharma Ltd (Pharmaceuticals)

GlaxoSmithKline Pharmaceuticals Ltd (GSK India), a subsidiary of GlaxoSmithKline Plc established in 1924. The company's product assortment includes prescription medicines and vaccines. The prescription medicines range across therapeutic areas such as dermatology, gynecology, and diabetes, etc. It operates and has six products in the top 50 brands in the market leader.

Source: Compiled from Capitaline database, accessed on July 05, 2011.
