Using Variance Analysis to Evaluate M&A performance: examining positive and negative synergies in United's acquisition of Continental

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This paper examines strategic tradeoffs in M&A. Using strategic variance analysis (SVA) to examine United Airlines acquisition of Continental Airlines, this paper demonstrates the existence of strategic trade-offs that complicate M&A research and strategies. M&As are complex strategic actions with many motives, strategic intents, and types. M&As are influenced by competing stakeholder groups. Investors and managers generally focus on M&A to improve cash flows and economic value. Regulators scrutinize horizontal acquisitions for anti-competitive effects such as reduced sales volumes and higher unit prices. Managers, while promoting the value enhancing potential of acquisitions, often fail to deliver on their predictions.

INTRODUCTION

M&As are complex strategic actions that can affect all aspects of the combining companies' operations and management. Companies executing acquisitions develop sophisticated models predicting changes in the target and combined company that result in post-acquisition changes in cash flows. These forecasts are used to justify valuation estimates, raise capital for the deal, and communicate the strategic value to shareholders. In the case of publicly traded firms, the companies involved in the deal are required to announce the acquisition publicly and distribute a prospectus to shareholders to inform a vote on whether to support the proposed acquisition. The prospectus, filed with the Securities and Exchange Commission (SEC), outlines the rationales and risk associated with the merger, which generally include changes in the general economy, losses of key executives, losses of customers, labor problems, technology problems, etc.

Along with "selling" the M&A to investors, management must also sell the M&A to other significant stakeholders whose interests are likely to diverge from those of shareholders. For example, while shareholders may desire improved revenues from price increases, customers would prefer the acquirer to pass along savings from cost efficiencies in the form of price reductions. In horizontal acquisitions, investors often expect cost reductions from closing facilities and reducing staff levels, while employees desire job retention and opportunities resulting from post-acquisition growth.

Reflecting the complexity and challenges inherent in M&A, decades of research studies have found no significant correlation between making acquisitions and realizing economic gains. As a result, it is not unusual to see references that the majority of M&As fail. Indeed, Christensen et al (2011) recently commented on the issue: "When a CEO wants to boost corporate performance or jump-start long-term growth, the thought of acquiring another company can be extraordinarily seductive. Indeed, companies spend more than $2 trillion on acquisitions every year. Yet study after study puts the failure rate of

mergers and acquisitions somewhere between 70% and 90%". In 2015, M&A deal volume exceeded $4.3 trillion.

This paper argues that one of the primary limitations of existing research on M&A is its focus on aggregate measures of performance, such as abnormal returns to shareholders or post-acquisition changes in aggregate accounting performance. Given that an acquisition can impact literally all aspects of a merged company's activities in positive and negative ways, "coarse-grained" measures are not able to adequately show some of the "fine-grained" performance changes that occur within a merger. Previous research, spanning hundreds of papers and over 80 years of research, has shown no conclusive relationship between a company's action to acquire a company and its economic value (King et al 2004). Despite the questions raised about the efficacy of M&A (King et al 2004; Bower 2001; Christensen 2011), acquisition activity remains strong.

This paper explores M&A performance in greater detail than previous research. Specifically, its use of strategic variance analysis (SVA) as an accounting methodology examines fine-grained data on M&A performance by partitioning changes in operating income into specific variances. It isolates performance variances resulting from: 1) changes in the number of units sold, 2) changes in unit prices and unit costs, 3) changes in productivity, and 4) changes in the cost of excess capacity (Horngren et al 2009; Sopariwala 2003; Sopariwala and Mudde 2008). Table 1 summarizes the four components of SVA. Thus, SVA provides a tool for identifying positive synergies, negative synergies, and strategic tradeoffs in M&A and examining which of the competing interests most influence the realization of synergies in M&A.

The next section reviews previous theory and empirical research. Section three applies SVA to the United Airlines-Continental Airlines merger[1]. Section 4 provides discussions and conclusions.

TABLE 1
SUMMARY OF STRATEGIC VARIANCE ANALYSIS COMPONENTS

SVA Component	Focal Variable	Variables Held Constant	Performance Measure
Growth Component	Sales Volume	Unit prices, unit costs, productivity, and capacity	This variance measures performance changes associated with a change in sales volume between two periods holding price, cost, productivity and capacity constant at the levels experienced in the benchmark period.
Price-Recovery Component	Unit Prices, Unit Costs	Sales volume, productivity, and capacity	This variance measures performance changes associated with a change in unit prices and unit costs between two periods holding sales volume, input-output relationships, and capacity constant at the levels experienced in the benchmark period.
Productivity Component	Input-output relationships	Sales volume, unit prices, unit costs, and capacity	This variance measures performance changes associated with a change in the input-output relationships between two periods holding sales volume, unit prices and unit costs, and capacity constant at the levels experienced in the benchmark period.
Cost of unused capacity	Excess capacity volume and cost	Sales volume, unit prices, unit costs, and productivity	This variance measures performance changes associated with a change in the volume and unit cost excess capacity between two periods holding sales volume, unit prices and unit costs, and productivity constant at the levels experienced in the benchmark period.

PREVIOUS THEORY AND EMPIRICAL EVIDENCE ON M&A PERFORMANCE

There are many reasons companies implement M&As. The primary rationales for M&A activity are associated with changing competitive environments. M&As have occurred in environments experiencing de-regulation, technological change, changes in industry structure (new entry by foreign competitors or M&As of direct competitors), industry maturity, innovations in new products, among many other issues. Thus, M&A have often been prompted by external market stresses as well as market opportunities. Regardless, M&As have been expected to act as a mechanism to help companies adapt to changing market conditions and result in positive impacts on operating profit.

Economic Perspectives on Horizontal M&A

Economic value resulting from acquisitions is tied to improved cash flows in the post acquisitions period. There are many ways that horizontal M&As can potential improve operating cash flows. Generally, M&As are expected to result in cost savings as the resulting larger company can take advantage of greater economies of scale and increased purchasing power (Gaugin 2013). Revenue increases are expected to result from post-acquisition sales growth and increased market power (Clemente and Greenspen 1998). Productivity is expected to improve when an acquirer evaluates redundant assets and eliminates less efficient plants, personnel, and service locations. M&As can also create economic value by eliminating excess industry capacity. These "restructuring synergies" occur when an acquirer sells off assets or business units that either become redundant as the result of the merger or are evaluated as lacking strategic fit. Restructuring synergies impact operating earnings by reducing excess capacity and the cost associated with unused capacity.

As an example of how a M&A's type, strategic intent, and industry conditions interact to shape the expected economic value created by an acquisition consider Bower's industry over-capacity acquisition (2001). Weston, Chung and Hoag (1990) connect the concept of the industry life cycle with different types of M&A, specifically arguing that firms undertake horizontal mergers during the decline stage of an industry's evolution. In the decline phase of an industry, sales growth reverses typically to a level between 2% and negative 10%, which results in excess industry productive capacity (Weston *et al* 1990, pp. 101). Over-capacity acquisitions are argued to focus primarily on cost, productivity and restructuring synergies. "The acquirer closes the less competitive facilities, eliminates the less effective managers, and rationalizes administrative processes. In the end, the acquiring company has greater market share, a more efficient operation, better managers, more clout, and the industry as a whole has less excess capacity (Bower 2001, pp. 95).

Bower also notes, "These are usually win-lose games: the acquiring company keeps open more of its own facilities, retains more of its own employees, and imposes its own processes and values. Employees of the acquired company don't have much to gain. As with any win-lose scenario, the loser doesn't make it easy for the winner (pp. 95)". Some integration decisions may have unintended consequences or result in resistance from internal and external stakeholder, causing actual performance improvements to be different than those forecasted when the M&A was proposed.

Acquisitions also occur in the growth phase of industries where competition is fragmented and economies of scale exist in back office functions and technology. In some cases, companies with promising growth opportunities but resource constraints (limited sales and marketing capabilities, capital constraints, limited ability to scale operations) will sell to an acquirer with resources to support growth. Bower (2001) suggests a significant percentage of acquisitions are "geographic-roll-up M&As". The larger acquirer can bring growth capital, specialized products and services, and advanced technology, and management expertise to a smaller acquired firm, addressing constraints to growth. Thus, geographic roll-up acquisitions support greater growth, brands and premium products that support higher prices, lower costs from scale, and improved productivity by using technology to automate manual processes. Argued to support win-win outcomes, an SVA of a geographic roll-up acquisition is expected to show a positive growth component, favorable price-recovery component, and a positive productivity component.

But acquisitions are complex and involve different, competing interests. This type of M&A may fail as geographic roll-up acquirers treat their acquisitions with a heavy hand causing turnover of locally connected sales staff, problems with system conversions, and customer problems from standardizing products and pricing.

In conclusion, horizontal acquisitions are argued to support sales growth by combining the sales and marketing capabilities of the combining companies, by allowing increases in unit prices due to greater market power, by reducing unit costs as a result of purchasing larger volumes of inputs, efficiency improvements from scale, and reductions in the cost of excess capacity through restructuring. Complexity in executing horizontal acquisitions may interfere with realizing particular synergies. SVA provides a tool for researchers, managers, and investors to better understand which of these theoretical performance improvements are actually realized and where negative synergies and strategic tradeoffs occur.

Regulatory Perspectives on M&A

M&As have been examined for anti-competitive outcomes by the U.S. Department of Justice (DOJ), the Federal Trade Commission (FTC), and specific industry-sector regulators. Merger Guidelines developed by the DOJ and FTC are based on enforcing the Clayton Act when the effect of an M&A "may be substantially to lessen competition, or to tend to create a monopoly (DOJ 2010)." In practice, the guidelines focus on the level of industry concentration. Horizontal M&As result in higher industry concentration where fewer competitors control greater market share. At the extreme, a single company controls the market as a monopolist, reducing units available to customers and increasing prices.

Regulators examine market shares of horizontal acquisitions to determine their effect on industry concentration. If too much market power is created by a proposed acquisition, the merger may be contested or the acquirer may be required to divest specific businesses or geographic markets that have excess market concentration. Market concentration is used to predict the market power that could result from an acquisition. Firms using market power in a post-acquisition period would be expected to increase unit prices and reduce sales volume.

In many cases, regulators are attempting to weigh the economic value created by an acquisition (based on the issues discussed in the previous section) and the potential for an acquisition to result in excessive market power. In the last decade of the U.S. airline industry, regulators have both contested horizontal acquisitions and allowed horizontal acquisitions. If the potential for improvements in operating earnings from improved economies of scale and productivity exceed the potential for the use of anti-consumer market power, regulators generally support acquisitions, particularly in industries experiencing poor profitability. In 2001, regulators contested the potential combination of United Airlines and U.S. Airways. After a decade of poor performance in the airline industry and the bankruptcies of several of the largest competitors, regulators changed their position and allowed significant acquisitions involving the largest carriers in the industry including United-Continental, Delta-Northwest, and American-U.S. Airways. To assist regulators with these decisions, SVA provides a tool for regulators and researchers to better understand the relationships between M&A and post-acquisition sales volume and changes in unit pricing.

Managerial Perspectives on M&A

One of the primary motives for applying SVA to M&A research is the issue of managerialism in M&A. As research has examined M&As seeking a connection between economic value and acquisitions, researchers have been puzzled by the lack of empirical evidence showing post-acquisition performance improvements. This has led to conclusions that executives fall prey to a “synergy trap” (Sirower 1998) or hubris (Roll 1986). Others have suggested that managers pursue acquisitions due to self-interest, since acquisitions typically result in increased management compensation and prestige as the size and complexity of a company increases.

A paradox related to a managerial perspective on M&A involves the fact that managers and executives seem convinced that M&As have significant impacts on their company’s operating performance. At the time an acquisition becomes public, managers involved in an acquisition often

announce intentions to implement performance improvements in the post-acquisition period, i.e. grow sales, reduce staffing levels, close facilities, discontinue unprofitable products, eliminate redundant information systems, etc. During integration, they meet with staff to inform them of job losses. They make tough decisions about which products will be eliminated and address complaints from distributors. They initiate communication and marketing plans to boost sales of surviving products. They make tough decisions to standardize business processes and information systems. They see and feel the effects of M&As first-hand.

On the other hand, researchers don't experience M&A directly. They examine M&A performance using large sample studies that focus on dependent variables measuring changes in return on equity or return on assets or changes in stock value. These studies focused on aggregate M&A performance within large samples of M&A generally fail to find significant performance changes in post-acquisition periods.

Managers are directly involved in actions that individually affect performance, but lack a holistic perspective to appreciate how strategic trade-offs interfere with overall improvements in operating performance. Thus, managers focus on integration activity such as laying off staff, eliminating redundant IT contracts, and/or altering product pricing to improve operating performance, but may not fully reconcile the impact of severance costs, termination penalties on contracts, and/or customer defections. We label this failure, the "fog of war" hypothesis – managers see the effect of combat first-hand but may not be winning the overall battle. SVA provides a better methodology than existing research to examine this phenomenon. By examining the effect of M&As in fine-grained detail, SVA provides a tool to see specific positive and negative synergies associated with changes in sales volume, price changes, changes in costs & productivity, and capacity management.

Previous Empirical Research

Generally, research on M&A has focused on finding associations between a range of independent variables and primarily two dependent variables measuring economic value: abnormal stock returns or post-acquisition accounting performance. Independent variables have included type of M&A (horizontal, related and unrelated diversification, or vertical), deal characteristics (size of premium, type of payment, contested, relative size of target), experience of acquirer, the acquirer's corporate governance (board ownership of stock, dispersion of board ownership, board size, combine CEO and board chair, etc.), and the quality of the acquirer's balance sheet.

Sirower (1997) provides an extensive review of empirical research on M&A performance and concludes that the research shows no statistically significant improvement in operating performance, market share, or growth in acquisitions occurring after 1980. King *et al* (2004) provides a meta-analysis of decades of M&A research. Looking at both abnormal returns and changes in post-acquisition financial performance (ROA, ROE, and ROS) in hundreds of studies with thousands of observations, they find that acquiring firms generally experience negative outcomes in their acquisitions (pp. 192). When examining the most common independent variables (conglomerate, related, method of payment – cash or stock, and acquisition experience), they find no significant statistical relationship with economic value creation, except for a negative relationship between conglomerate and abnormal returns.

Empirical research most relevant to this paper involves studies that examine changes in post-acquisition financial performance due to acquisitions. This research has evolved since Healy *et al* (1992) examined the effect of M&A on a company's industry adjusted operating cash flow. This approach, followed by many subsequent studies, defines industry adjusted operating income as sale, less cost of goods sold (COGS) less sales and administrative costs (SG&A), plus depreciation. This is scaled by the market value of company assets to adjust for size differences among firms. Pre-merger cash flow is calculated by aggregating the combined sales, COGS, SG&A, and depreciation for each of the companies involved in the merger. Each observation's change in operating income is adjusted by the median value of changes in operating income (as defined above) calculated for each industry taking into account changes in operating income for each of the firms within a single observation's industry. Their results show some statistically significant improvements in post-acquisition cash flow in the first, second and third year after the merger, but both the magnitude of the performance improvement and its statistical

significant decline as the period between the merger and the year of analysis gets longer. No significant changes in operating performance are found in years four or five post-merger.

Ghosh (2001) follows the research design of Healy *et al* (1992), but makes technical adjustments to account for the impact of above average operating performance to correct for biases demonstrated by Barber and Lyon (1996). Making these corrections, the study shows that the post-acquisition performance improvements in cash flow are not significant in the post-acquisition period. In a study focusing on M&A payment method and operating performance, Heron and Lie (2002) find a significant improvement in post-acquisition cash flow. This is supported by a study conducted by Carline *et al* (2009).

In conclusion, the results of decades of M&A studies do not provide strong support for improvements in post-acquisition operating earnings. These studies have largely examined post-acquisition operating earnings in aggregate making it impossible to identify how acquisitions fail to improve operating profit. Thus, they have not addressed the "fog of war" problem that managers experience, where managers are actively involved in post-acquisition integration activities that have effects on revenues and costs but the combined results of all these efforts show no significant effect on operating profit.

THE SVA METHODOLOGY APPLIED TO THE UNITED-CONTINENTAL M&A

The SVA methodology is complementary to the previously discussed research, but provides additional detail. Specifically, this paper's application of SVA demonstrates the existence of positive synergies, negative synergies, and strategic tradeoffs in M&A. These are findings that aren't available from research that examines more large-grained performance measures. SVA partitions changes in operating income into four components: 1) variances related to changes in volume (the growth component), 2) variances related to changes in unit prices and costs, (the price-recovery component) 3) variances related to changes in productivity (the productivity component), 4) variances related to changes in the cost and amount of unused capacity (the unused capacity component). Thus, applications of SVA to M&A can show more specifically how acquisitions result in positive and negative synergies. This can help managers and researchers move beyond basic conclusions about whether M&As are good or bad for operating performance. SVA shows where acquisitions create value and where they fail to create value. It also helps managers to better understand where strategic tradeoffs may occur so negative synergies can be minimized and net synergies maximized.

Following the methodology used in previous applications of SVA (Mudde and Sopariwala 2009) and the methods used in previous research on M&A, this paper uses the United Airlines-Continental Airlines merger to illustrate the detailed data resulting from a SVA of an acquisition. This application of SVA is based on those described in previous research (Mudde & Sopariwala 2008; Mudde and Sopariwala 2014). These applications discuss the steps of applying SVA and demonstrate the calculations of SVA to airlines. Table 2 shows the revenue and cost pools and defines the revenue and cost drivers used in an airline SVA.

The acquisition of Continental Airlines by United Airlines was announced in 2009 and closed in 2010. The base year for the SVA is the year prior to United's acquisition of Continental (2009)[2]. An SVA is completed for each of the four post-acquisition years, comparing the post-acquisition performance of 2011, 2012, 2013, and 2014 to pre-acquisition performance in 2009. Table 3 provides the operational, fuel and financial data for 2009 and 2013 based on reports filed with the U. S. Federal Aviation Administration. This shows the raw data for the benchmark, pre-acquisition year of 2009 compared with the raw data for post-acquisition year of 2013. According to the acquisition announcement made by UAL in 2009, management expected the value of revenue and costs improvements related to the U-C merger to be realized in 2013. The comparison shown in Table 3 indicates operating profits improved by $1.44 billion, an amount consistent with the predictions of UAL's acquisition announcement. Without further analysis, this would indicate UAL met its goals for its acquisition. The following SVA shows in more detail where UAL realized positive synergies, where it experienced negative synergies, and indications of strategic tradeoffs in airline M&As. Despite its general improvement in post-acquisition operating profit, the SVA indicates problems in UAL's ability to predict and realize sources of positive synergies. Also of

concern, the SVA shows UAL realized large negative synergies where it predicted post-acquisition performance improvements.

TABLE 2
DESCRIPTION OF REVENUE AND COST TERMS AND DRIVERS

Revenue/cost Terms	Definition of Revenue/Cost Pool	Revenue/Cost Drivers	Definitions from TranStats Glossary (http://www.transtats.bts.gov/glossary.asp)
Operating Revenue	Revenues from the performance of air transportation and related incidental services. Includes (1) transport revenue from the carriage of all classes of traffic in scheduled and nonscheduled services, and (2) nontransport revenues consisting of Federal subsidy (where applicable) and revenues for services related to air transportation. (Air Carrier Financial Reports (Form 41 Financial Data))	Revenue Passenger Miles (RPM)	One revenue passenger transported one mile in revenue service. Revenue passenger miles are computed by summation of the products of the revenue aircraft miles on each interairport segment multiplied by the number of revenue passengers carried on that segment. (Small Air Carrier Statistics (Form 298C Traffic Data))
Fuels Costs	The cost of fuel consumed as a result of operating aircraft and other vehicles. (Form 41 Financial Data)	Available Seat Miles (ASM)	The aircraft miles flown in each inter-airport segment multiplied by the number of seats available for revenue passenger use on that segment. (Small Air Carrier Statistics (Form 298C Traffic Data))
Flight-related Costs	The cost of Flying Operations (less fuel costs) + Maintenance + Passenger Service + General And Administrative + Depreciation And Amortization + Transport Related Expenses (Form 41 Financial Data)	Available Seat Miles (ASM)	The aircraft miles flown in each inter-airport segment multiplied by the number of seats available for revenue passenger use on that segment. (Small Air Carrier Statistics (Form 298C Traffic Data))
Passenger-related costs	Aircraft And Traffic Servicing + Promotion And Sales (Form 41 Financial Data)	Passengers Enplaned	The number of persons on board a flight who is not a member of the flight or cabin crew. (Air Carrier Statistics (Form 41 Traffic)- U.S. Carriers, Air Carrier Statistics (Form 41 Traffic)- All Carriers)

The results of United-Continental SVA are shown in Table 4. The results show specific variances associated with growth (changes in unit volume), price-recovery (changes in unit pricing and unit costs), productivity (changes in input-output relationships), and capacity management (changes in the cost of unused capacity) for the four years period (2011-14) compared against the performance during the last complete pre-acquisition year before the United-Continental acquisition occurred (2009).

Examining the results of the United-Continental SVA, the growth component shows a steady decline in volume and market share. Many mergers expect improvements in market share and growth, but don't necessarily deliver (Mueller 1985). In the first year post-merger (2011), UAL's volume of RPMs declined

by 3.9%, resulting in a growth component of negative $143 million. In the second year post-merger, volume declined more. The 6.2% decline in volume resulted in a negative $228 million growth variance for 2012. In the third and fourth year respectively, UAL's RPMs declined 7.17% and 7.88% relative to 2009, resulting in growth variances of negative $264 million and $290 million. In aggregate, UAL experienced negative revenue synergies as a result in losses in volume that totaled $924 million over the four years post-merger.

TABLE 3
UNITED-CONTINENTAL FINANCIAL, TRAFFIC, AND FUEL RAW DATA FOR 2009 & 2013

Panel A: Selected Operational Data (Note a.)
Source: Air Carrier Summary Data (Form 41 and 298C Summary Data), Schedule T-1
http://www.transtats.bts.gov/Fields.asp?Table_ID=264

	2013	2009	Difference Amount	%
Revenue passenger enplanements	66,864,760	79,600,947	(12,736,187)	-16.00%
Revenue passenger miles (RPMs)	92,810,274,238	99,983,478,479	(7,173,204,241)	-7.17%
Available seat miles (ASMs)	108,239,157,873	118,685,838,282	(10,446,680,409)	-8.80%

Panel B: Selected Financial Data (Note a.)
Source: Air Carrier Financial Reports (Form 41 Financial Data), Schedule P-12
http://www.transtats.bts.gov/Fields.asp?Table_ID=295

	2013	2009	Difference Amount	%
Operating revenues	$ 36,741,095,580	$ 34,405,818,000	$ 2,335,277,580	6.79%
Operating expenses:				
Flying operations	$ 12,553,730,440	$ 10,940,563,000	$ 1,613,167,440	14.74%
Maintenance	$ 2,914,342,550	$ 3,171,620,000	$ (257,277,450)	-8.11%
Passenger service	$ 2,474,132,140	$ 2,647,023,000	$ (172,890,860)	-6.53%
Aircraft and traffic servicing	$ 4,729,761,870	$ 4,412,200,000	$ 317,561,870	7.20%
Promotion and sales	$ 1,533,344,340	$ 2,076,710,000	$ (543,365,660)	-26.16%
General and administrative	$ 2,338,489,010	$ 2,020,123,000	$ 318,366,010	15.76%
Depreciation and amortization	$ 1,588,634,550	$ 1,816,476,000	$ (227,841,450)	-12.54%
Transport related expenses	$ 7,440,331,970	$ 7,593,818,000	$ (153,486,030)	-2.02%
	$ 35,572,766,870	$ 34,678,533,000	$ 894,233,870	2.58%
Operating profit	$ 1,168,328,710	$ (272,715,000)	$ 1,441,043,710	-528.41%

Panel C: Selected Fuel Data (Note a.)
Source: Air Carrier Financial Reports (Form 41 Financial Data), Schedule P-12A
http://www.transtats.bts.gov/Fields.asp?Table_ID=294

	2013	2009	Difference Amount	%
Total scheduled gallons used	1,693,166,631	1,700,610,875	(7,444,244)	-0.44%
Total scheduled fuel cost	$ 4,451,295,249	$ 3,112,192,406	$ 1,339,102,843	43.03%
Average fuel cost per gallon	$ 2.63	$ 1.83	$ 0.80	43.66%

Next, we examine the price-recovery component of UAL's post-acquisition SVA. Theory predicts horizontal M&As result in increased market power and industry concentration, allowing the merged company greater bargaining power, both in pricing its airfares and purchasing its labor; property, plant, and equipment; fuel; food & beverages; contracted services; etc. Thus, the UAL merger is expected to result in price increases and lower units costs.

Examining the price-recovery variance shows that airfare pricing increased substantially during the post-acquisition period. In 2011, fares increased by 12.8% relative to 2009 levels. In 2014, during the fourth year after the merger, airfares had increased 27.6% over 2009 levels. Figure 1 shows graphically the revenue effect on the price-recovery component during the four-year period following the Continental merger. In year one (2011) the revenue effect was $4.3 billion. It grew to $8.7 billion by 2014 (Year 4 post-merger). The revenue synergies resulting from increases in airfare are the largest positive synergies resulting from the merger.

TABLE 4
UNITED-CONTINENTAL STRATEGIC VARIANCES FROM POST-ACQUISITION PERIOD (VALUES IN MILLIONS)

		2011	2012	2013	2014	2011-2014
Impact of growth due to						
i.	Decrease in operating revenues	$ (1,337)	$ (2,128)	$ (2,468)	$ (2,712)	$ (8,646)
ii.	Decrease in expected fuel costs	$ 121	$ 193	$ 223	$ 245	$ 782
iii.	Decrease in expected flight-related costs	$ 821	$ 1,307	$ 1,516	$ 1,665	$ 5,309
iv.	Decrease in expected passenger-related costs	$ 252	$ 401	$ 466	$ 511	$ 1,631
Total of the Growth Component		**$ (143)**	**$ (228)**	**$ (264)**	**$ (290)**	**$ (924)**
Impact of price recoveries due to						
v.	Increase in air fares	$ 4,262	$ 4,883	$ 4,804	$ 8,732	$ 22,680
vi.	Increase in price per gallon	$ (1,960)	$ (2,001)	$ (1,261)	$ (1,519)	$ (6,742)
vii.	Increase in average flight-related costs per ASM	$ (387)	$ (2,210)	$ (1,705)	$ (2,616)	$ (6,917)
viii.	Increase in costs to service an average passenger	$ (492)	$ (818)	$ (898)	$ (2,599)	$ (4,807)
	Total of Price-Recovery cost effects	**$ (2,839)**	**$ (5,029)**	**$ (3,864)**	**$ (6,734)**	**$ (18,466)**
Total of Price-Recovery Component		**$ 1,423**	**$ (147)**	**$ 940**	**$ 1,999**	**$ 4,215**
Impact of productivity due to						
ix.	Decrease in fuel usage per gallon	$ 93	$ 102	$ (381)	$ 227	$ 41
x.	Decrease in fuel usage due to higher passenger load factor	$ 52	$ 39	$ 79	$ 88	$ 258
xi.	Decrease in costs due to higher miles per passenger	$ 347	$ 512	$ 658	$ 799	$ 2,316
Total of Productivity Component		**$ 492**	**$ 653**	**$ 357**	**$ 1,113**	**$ 2,615**
Change in the capacity underutilization		**$ 345**	**$ 43**	**$ 408**	**$ 375**	**$ 1,171**
Increase/(decrease) in operating profit		**$ 2,117**	**$ 322**	**$ 1,441**	**$ 3,197**	**$ 7,076**

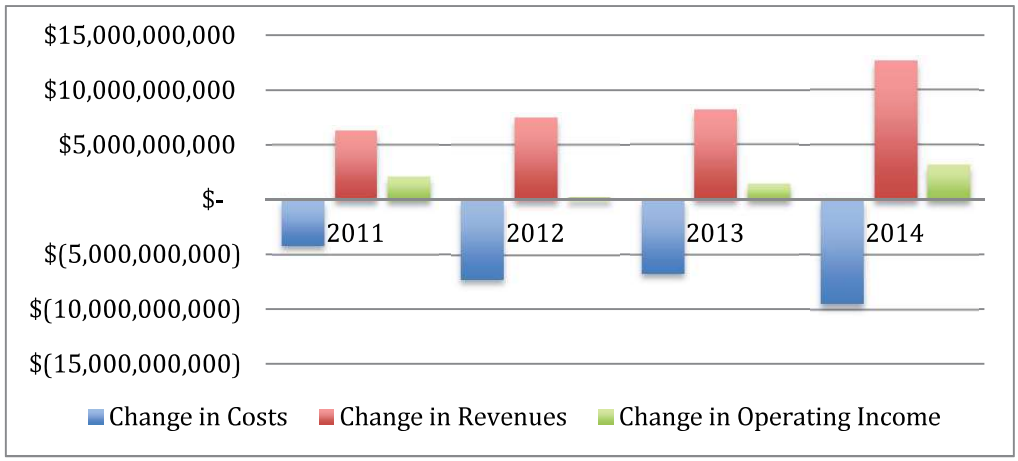
Price-recovery also examines unit costs. Again, theory suggests that horizontal acquisitions provide opportunities to reduce unit costs due to greater bargaining power and larger volume purchases. Also, unit costs can be reduced when fixed costs are spread over a larger number of units. The SVA shows three specific costs: 1) the price per gallon of fuel, 2) flight related costs, and 3) passenger service costs. UAL's reference to greater scale would seem to indicate some opportunity to reduce per unit cost. The results show no reduction in unit costs for any of the three specific categories of cost in 2011, 2012, 2013, or 2014. In all cases, fuel costs, flight-related costs, and passenger servicing costs increased in each of these years. No cost synergies affecting post-acquisition unit costs were found, despite the predictions of management and the increased scale of UAL. In fact, in 2012, increases in unit costs exceeded the

increases in unit prices, resulting in a price-recovery variance of negative $146.6 million. The other post-acquisition years had positive price-recovery variances, driven by large increases in unit pricing.

It's important to note the magnitude of the unit price variances and the aggregate cost variances compared with the magnitude of the net price-recovery component. As shown graphically in Figure 1, the unit price variance for 2011-14 is over five times larger than the magnitude of the net price-recovery variance. The variance from changes in unit costs during 2011-14 is 81% of the price variance causing the magnitude of the price-recovery component to be only a fraction of the individual variances from changes in unit prices and costs. This clearly demonstrates how large-grained measures, such as CARs or ROA, can fail to capture the significant variability that can occur in M&A performance.

Theory predicts improvements in efficiency from horizontal M&A. Post-acquisition, acquirers can leverage the most efficient assets and processes of the combining firms while eliminating operations and activities with lower productivity. The productivity component examines variances associated with changes in input-output relationships. In the case of airlines, productivity involves three items 1) fuel efficiency of the aircraft, 2) fuel usage per revenue passenger mile (RPM) due to changes in passenger load factor[3], 3) passenger service costs resulting from number of passengers per RPM (longer passenger flights increases revenues with a fixed service cost). In aggregate, improvements in fuel efficiency resulted in $40.7 million in savings from 2011-14. Higher passenger load factors resulted in $258 million in fuel savings during that time. The largest productivity savings came from lower passenger servicing costs due to passengers taking longer flights ($2.32 billion over the four post-acquisition years).

FIGURE 1
UNITED-CONTINENTAL REVENUE VARIANCES, COST VARIANCES, AND NET OPERATING VARIANCES FOR 2011-14



UAL also reduced its capacity underutilization during the four post-acquisition years. Horizontal acquisitions are expected to involve a rationalization of the capacity of the combining companies with an aim to reduce capacity while retaining the most efficient property, plant, and equipment. UAL's reduction in the cost of unused capacity averaged $293 million during the four year post-acquisition period with a low of $42 million in 2012 and a high of $408 million in 2013.

Looking across SVA components, there appears to be an inverse relationship between pricing and volume. This is consistent with the general expectations of theories of supply and demand. Higher prices are expected to reduce demand. Strategically, companies experiencing a decline in sales may choose to increase prices to make up for the loss in revenues. This analysis can't identify causality between increased prices and reduced demand, but it does demonstrate a negative cycle during the post-acquisition period. UAL used price increases to offset negative synergies in unit costs, which were associated with reduced RPM volumes and market share. This cycle repeated itself each year – higher costs, higher unit

prices, losses in RPMs and market share. This does not appear to be consistent with the plans of UAL management per the information in their acquisition announcement.

SVA OF UAL: LESSONS FOR MANAGERS, REGULATORS, INVESTORS, AND RESEARCHERS

In this paper, we discussed the limitations of existing M&A research that has focused on large-grained performance data to identify significant changes in post-acquisition performance. We argued that M&As are complex strategic actions with many motives, strategic intents, and types. M&As are influenced by competing stakeholder groups that shape the goals of a particular M&A. Investors and managers generally focus on M&A as a means of creating post-acquisition synergies that result in improved cash flows and economic value. Regulators focus on the effect of M&As on competitive markets. Representing the perspective of consumers, regulators scrutinize horizontal acquisitions to reduce the anti-competitive effects of reduced sales volumes and higher unit prices. Managers, while promoting the value enhancing potential of acquisitions at the time of their announcement, can fail to deliver on their predictions. As an explanation for the paradox of why managers predict synergies but large sample studies fail to show that M&As result in improvements in operating profits, we propose a "fog of war" hypothesis, where managers witness isolated changes that improve revenues or reduce costs but don't have a complete understanding of the net performance effects resulting from an M&A.

To explore these issues, we used a SVA of the United Airlines acquisition of Continental Airlines. Management predicted a range of synergies expected from the United-Continental merger. We used the combined performance of United and Continental in the year prior to their merger (2009) as the baseline for the SVA, examining strategic variances from the four years following the merger (2011-14). As the previous section showed, the findings indicate declines in passenger volume and market share, increases in unit prices and unit costs, improvements in productivity, and improvements in capacity utilization.

Lessons for Investor - Economic Value Creation

Theory on M&A suggests economic value can be enhanced in each component examined by SVA. Horizontal M&As are argued to strengthen the market position of the combining companies, resulting in larger market share and growth. Horizontal M&As are also expected to increase the market power of the combining companies, resulting in higher unit prices. Market power can also be used to bargain for lower costs as a result of larger volume purchases and greater purchasing power. Greater scale can result in improved efficiencies. Lastly, capacity can be reduced in the post-acquisition period as the combining firms eliminate redundancies and rationalize capacity.

The SVA of United-Continental provides evidence of the creation (or destruction) of economic value in a single M&A case. The growth component of U-C's SVA shows a loss of sales volume and market share, resulting in a decline in economic value in each of the four post acquisition years. It also shows the losses growing over time rather than declining. This is not consistent with prediction of value creation resulting from strengthening the combined firm's competitive position. The price-recovery component provides evidence of economic value, resulting from U-C's ability to raise unit prices. This is the largest source of economic value in the post-acquisition period. In opposition to M&A theory, U-C's unit costs increased in each of the post-acquisition years in each category of expense. There was no evidence that U-C used scale to reduce the size of its cost pools or used its increased purchasing power to reduce unit costs. In aggregate, U-Cs inability to control its unit costs offset 81% of the value created from its price increases.

Lessons on Regulatory Issues

SVA provides information important to the regulatory perspective as well. Regulators from the FTC and DOJ are concerned with monopolistic behavior. Thus, SVA's ability to isolate changes in unit price and the variances associated with pricing changes is valuable to regulators. Regulators also focus on the impact of changes in unit sales – monopolists are expected to restrict sales volume to support higher

market prices. Thus, the SVA growth component and revenue effects within the price-recovery component are of primary importance to regulators. Generally, these impacts are estimated as part of the evaluation of whether a proposed M&A should be contested. Post-acquisition, SVA can provide data to validate the estimates made by regulators and provide an important feedback loop for improving estimated impacts for future regulatory decisions on M&As.

From the perspective of the UAL SVA, the growth component and the price effect of the price-recovery component should raise some concerns. The growth component shows a decline in RPMs post-merger and higher unit prices consistent with the concerns regarding monopolistic behavior. The DOJ and FTC accept some increase in market power in industries where competitors are experiencing poor profitability, when there are possible gains from scale efficiencies and other cost reduction opportunities. In competitive markets, companies implementing horizontal acquisitions can realize cost reductions in unit costs, from productivity improvements, and reductions in capacity, but a portion of the economic value from cost reductions is shared with consumers. In markets where competition is weakening, horizontal acquisitions allow competitors to generate costs savings and force price increases on consumers even when productivity is improved. This appears to be the case for UAL and the airline market, which may explain why regulators have begun investigating airlines for collusion in pricing (Koenig and Mayerowitz 2015).

Lessons for Managers

One of the main premises of this paper is the challenge facing managers as they attempt to reconcile the conflicting demands associated with M&A and execute M&A integration in the midst of external change and uncertainty, regulatory scrutiny, and potential internal conflict. Managers generally identify expected performance improvements at the time an M&A is announced, but conditions change.

At the time the deal was announced, United-Continental management made predictions of growth in revenue and market share. UAL's management emphasized the complementary networks of United and Continental, promising to maintain all hubs and routes, that would support "between $800 million and $900 million of incremental revenues, in large part from expanded customer options resulting from greater scope and scale of the network (UAL Press Release 2009)". This is interpreted to imply growth in passenger volumes, revenue passenger miles (RPMs)[4], and market share rather than revenue growth resulting from increases in prices. The growth component shows a decline in RPMs and market share post-merger, which is counter to UAL's claims that the complementary networks of United and Continental would attract more flyers and generate growth. This indicates a significant difference between management expectations and the actual results of the U-C merger.

The acquisition announcement was silent on any plans to increase ticket prices. The price-recovery component shows revenue synergies associated with significant price increases. This was not a source of post-economic value creation predicted by UAL management. If the value of the increases in air fares ($22.7 billion over four years) is removed from the overall improvements in operating earnings, the change in operating performance in the post-acquisition period changes from a positive $7.08 billion to a negative $15.6 million. This is a very significant reversal. It is curious that management did not predict the largest source of post-acquisition performance improvement, although expressing intensions to raise prices are likely to increase regulator scrutiny.

UAL management predicted improvements in its operating margins by reducing costs. "The combined company is also expected to realize between $200 and $300 million of net cost synergies on a run rate basis by 2013 (UAL Press Release 2009)". From this announcement, it is not clear whether these predicted cost savings would come from unit cost reductions, resulting from lower input costs, or cost reductions, resulting from improvements in productivity. The price-recovery component of UAL's SVA shows no reduction in costs. In fact, UAL's expense increased for all **unit** costs examined by SVA. But, UAL did reduce costs by improving its productivity ($2.62 billion for the four post-acquisition years). Unfortunately, these improvements are minor compared with the cost increases captured by the price-recovery variances ($18.5 billion over the same four years).

In the case of UAL, its acquisition announcement promised that it would maintain all its existing hubs and "continue to serve all the communities each carrier currently serves" (UAL Press Release 2009). Thus, the majority of post-acquisition capacity reductions were focused on the combining fleets of United and Continental. This appears to be an attempt by management to balance the stakeholder interests of communities, flyers, and employees (which could negatively affect ticket sales and revenues) with the need to cut costs and gain efficiencies. Rationalization of capacity and the elimination of excess capacity (even as passenger volume declined) provided a positive impact on operating earnings. This is a significant achievement by UAL management, since its post-acquisition plans called for passenger and volume growth. Holding capacity constant, growth would have reduced excess capacity; but since UAL's volume declined unexpectedly, cutting excess capacity required much more aggressive reductions in fleet size to make up for the reduced volume and the additional eliminations of pre-acquisition unused capacity.

Examining the realized performance changes from the U-C merger compared with the predicted synergies included in the acquisition announcement, there are a number of lessons for managers. First, managers shouldn't underestimate the challenges associate with growing sales volumes or market share after acquisition, particularly if they initiate price increases. Second, horizontal acquisitions appear to increase market power, supporting higher prices, even when industry concentrations are moderate. Third, reductions in post-acquisition unit costs based on greater scale and purchasing volumes are not certain. Fourth, horizontal acquisitions provide opportunities to improve productivity and capacity utilization and managers can be effective in realizing these types of synergies.

A favorable interpretation of the detailed findings of UAL's SVA suggests synergy realization that is well below the goals announced for 2013. Setting aside the improvements related to price increases and looking at the combined impact of growth, productivity and capacity management, the synergies realized in 2013 total $501 million or roughly half the target identified in UAL's announcement of its acquisition of Continental Airlines. This interpretation essentially allows for a neutral price-recovery component. This means that the acquirer is able to use the market power of the combined companies to increase prices to cover any cost increases that are experienced in the post-acquisition period. Generally, as in the case of UAL, acquirers expect cost reductions in the post-acquisition period, or a positive price-recovery component driven by reductions in unit costs. Thus, a neutral price-recovery, when the combined company experiences post-acquisition increases in costs, is a favorable assumption regarding synergy realization.

A less favorable interpretation of the SVA findings takes note of the differences between UAL's management predictions and the realized synergies. This perspective considers the difference between the expectation of revenue synergies from growth and the realization of volume declines and the negative synergies associated with it. The difference between U-C's $800-900 million goal for increased revenue from growth and the negative $264 million in realized losses due to declines in passenger volumes in 2013, results in a $1.1-1.2 billion gap in synergy realization associated with the loss post-acquisition sales volume.

UAL's realized cost synergies from improved productivity and eliminating excess capacity exceeded their stated goals. Combined these cost synergies totaled $765 million in 2013, the year of focus in UAL's acquisition announcement. This is more than double the costs savings predicted by UAL management. Managers also expect horizontal acquisitions to support reductions in operating costs in a number of ways. First, economies of scale can reduce the size of cost pools while unit volumes are increasing. For example, airline mergers have been shown to reduce cost pools that include labor expense and the cost of food services and maintenance (Mudde and Sopariwala 2014). This results in lower unit cost. Second, by purchasing in larger volumes, the combined company can reduce the cost of inputs. In contrast to these expectations UAL's unit costs increased significantly in the post-acquisition period for all costs and years examined within the SVA. Unfortunately for UAL, if changes in unit costs are included along with the cost savings from productivity improvements and eliminating excess capacity, the net cost synergies in 2013 total a negative $4.33 billion.

Lastly, SVA provides information related to a managerial perspective of M&A. We argued that applying SVA to M&A would provide information that would address the "fog of war" issue facing managers. This is the difference between their experience with M&A integration where managers see first-hand the results of terminating employees, closing plants or service locations, re-negotiating supplier or labor contracts, eliminating redundant IT systems, etc. and the aggregate impact on operating performance. From their perspective, M&A produces significant changes that can be linked to cost savings and revenue growth. But, they may not have a complete picture of some of the negative effects on operating earnings resulting from M&A.

The UAL SVA provides an illustration of potential trade-offs that occur in M&A. The data shows UAL managers were successful in reducing the amount and cost of unused capacity during the years following their acquisition of Continental Airlines. This contributed positively to productivity – UAL's load factor increased, indicating its planes had more paying passengers and fewer empty seats. But, reducing the number of flights appears to contribute to a decline in their number of passengers and RPMs, reducing their market share and volume of business. Also, reducing capacity can cause operational problems. As a company's capacity utilization approaches 100%, its ability to respond to demand fluctuations or special orders is diminished. The airline industry is notorious for weather delays that require flexible capacity to rebook passengers to alternative flights. Generally, the airline load factors have ranged between 70-80%. As UAL has cut capacity and raised its load factor to over 85%, its customer complaints have increased and its customer service has declined.

According to J.D. Powers, in 2013, UAL's customer satisfaction scores were second to last in the industry (Carey 2014). Also, its on-time arrival and baggage handling performance had deteriorated post-acquisition, increasing customer complaints (Carey 2014). Other strategic trade-offs experienced in the UAL-Continental merger include the increase in unit costs and the need to raise airfares, which appears to have contributed to its loss of market share and passenger volume. It is unlikely that UAL's management is unaware of these changes in their business, but they may not have a complete understanding of the magnitude of each of the variances and their relationship to each other. SVA provides that important information.

Other managerial explanations for M&A include the hubris hypothesis (Roll 1986) and agency problems. The findings from the UAL SVA provides some evidence to support the existence of hubris with UAL's executive team. At closing, CEO Smisek shared that UAL's executives expected the integration process to take at least 18 months. The targets for providing stable improvements in operating earnings were tied to 2013 (the third full year post-acquisition). In 2014, UAL still struggled to unify the labor contracts with flight attendants, constraining it from mixing United and Continental cabin crews (Carey 2014). Its maintenance systems continue to operate under two separate IT systems (Carey 2014). Difficulties with integration of United and Continental resulted in many instances of delaying system conversions, labor contract negotiations, and implementing common business processes. As of June, 2014, CEO Smisek stated, "We have literally hundreds of people working on it right now. That drives a lot of costs (Carey 2014)". UAL has also reportedly hired McKinsey & Co. and Boston Consulting Group to assist in its ongoing merger integration efforts (Carey 2014). SVA can be used to analyze UAL's progress as its integration efforts continue and evaluate the cost and benefit of engaging external consultants.

Additional Research Opportunities

Looking at a single acquisition, we were able to demonstrate the type of "fine-grained" data provided by SVA and discuss its implications for the generation of improvements in post-acquisition operating earnings. A single case is valuable to demonstrate a methodology and raise some interesting findings that require additional research. SVA provides a rich perspective for studies with large sample sizes. Are the strategic trade-offs shown in the UAL merger common to M&As in general? Are the negative synergies associated with post-acquisition losses of sales volume and market share significant in larger samples of M&As? Do increases in unit prices make up the majority of the improvement in operating income for

most acquisitions? Are negative synergies associate ed with increases in unit costs significant in large samples of M&As? SVA can be applied to large samples of M&As to address these questions.

Another improvement that could be made to this research study is controlling for changes in industry-level performance. Relative strategic variance analysis (RSVA) is a tool that provides a methodology that adjusts strategic variances for industry average performance changes similar to previous studies of M&A that control for average changes in operating performance by industry competitors. For example, in 2011 the airline industry experienced growth in RPMs of 4.58% while UAL's RPMs declined by 3.89%. RSVA takes into account the changes that occur at the industry level to calculate its strategic variances. From the perspective of RSVA, UAL's growth variance should account for both its individual decline of 3.89% in RPMs and its failure to keep pace with industry growth of 4.58%. This would result in a much larger negative synergy associated with its change in volume. Related to unit prices and unit costs, RSVA would adjust UAL's pricing and cost changes by those experienced by the average industry competitor. Productivity and capacity variances would be calculated in a similar fashion. This approach is more comparable to the studies such as Healy *et al* (1992), Ghosh (2001), Heron and Lie (2002), and Carline (2009) but provides the greater detail of SVA.

SVA and RSVA also provide a mechanism for examining relationships between independent variables such as acquisition type, deal characteristics, and acquirer experience, etc. and the specific variances of SVA. This may provide interesting relationships that are not found when looking a post-acquisition operating profit in aggregate. There is much potential for additional research based on this methodology.

ENDNOTES

1. The terms M&A, acquisition, and merger are used synonymously to describe transactions that serve to combine two companies. The legal and technical differences between these different types of transactions are not the focus of this paper.
2. Spreadsheets showing the SVA calculations are available from the author by request at the email address listed for the author.
3. Load factor is calculated by dividing RPMs by available seat miles (ASMs). ASMs is a industry standard measure of passenger capacity calculated by multiplying the number of seats in an aircraft with the miles flown for each flight completed. Thus, load factor measures the percentage of seats filled with paying passnegers.
4. Revenue passenger miles are calculated by multiplying the number of paying passenger with the number of miles traveled by each passenger. It is a standard measure of sales volume in the airline industry.

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