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On February 14, 2013, it was announced that Heinz was being taken private for approximately $23 billion (or $72.50 per share) by Berkshire Hathaway and its Brazilian private equity partner, 3G Capital (3G).[1] This price could be described as somewhat rich in that it represented a 20% premium to Heinz's February 13, 2013, stock price (Jargon and Ng [2013]) and was approximately eight times its book value. Is such a price consistent with a "margin of safety," or significant discount from estimated value, which Berkshire's Chairman and CEO, Warren E. Buffett, has long espoused, or is it excessively high in much the same way that Berkshire's $22 billion price was for General Re in 1998?[2] We seek to provide an answer to this question, as the insights derived from doing so could prove useful to future private equity acquirers, especially in today's low interest rate/higher valuation environment.

In formulating our opinions, we first value Heinz using the modern Graham and Dodd valuation approach, which is a school of thought that Mr. Buffett has long been affiliated with. As will be shown, this approach can shed significant light on this deal's value, as well as its risks. We then discuss how contractual terms and conditions, and rigorous operational management, could be employed to mitigate value realization risk. First, however, we profile the remarkable history of the H.J. Heinz Company.

H.J. HEINZ COMPANY (HEINZ)

According to its 2012 Form 10K, "H.J. Heinz Company was incorporated in Pennsylvania on July 27, 1900. In 1905, it succeeded to the business of a partnership operating under the same name which had developed from a food business founded in 1869 in Sharpsburg, Pennsylvania by Henry J. Heinz. H.J. Heinz Company and its subsidiaries (collectively, the 'Company') manufacture and market an extensive line of food products throughout the world. The Company's principal products include ketchup,[3] condiments and sauces, frozen food, soups, beans and pasta meals, infant nutrition and other food products" (p. 2). This bland description, unfortunately typical of many official filings, masks the significance of Heinz's strategy over time, which Koehn [2001], in contrast, captures extremely well:

> When Henry Heinz was growing up in the middle decades of the 19th century, there was no national market for processed food. Most U.S. households grew or made the bulk of what they ate at home. When Heinz died in 1919, virtually all households

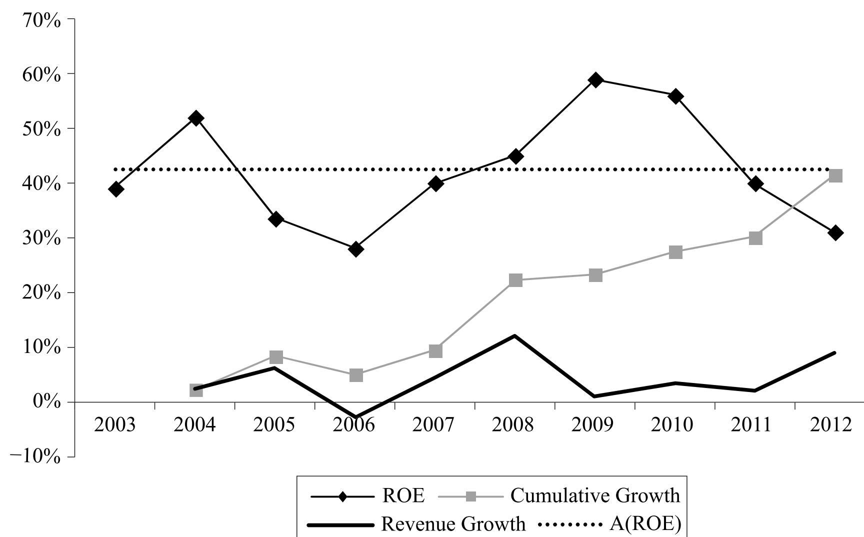
purchased some form of value-added foodstuffs, many of which—like Borden's condensed milk, Pillsbury flour, or Heinz ketchup—were relatively new products. By the early 20th century, the food manufacturing industry had become one of the most important in the United States, and the company Heinz founded, H.J. Heinz, one of the largest in the world (p. 1).

A key element of Heinz's strategy was positioning its products to benefit from both emerging supply-side changes (e.g., technology, transportation, productivity advances, and so on) and demand-side changes (e.g., urbanization, increasing job opportunities, increasing incomes, and so on).[4] Interestingly, these are the same dynamics that Heinz leveraged to successfully expand from a national market to a global one from the late 20th to the early 21st century. This is not to say that Heinz's current strategy is a mirror image of its historical one: Modern developed markets have different dynamics from emerging ones. To mitigate the risk in this difference, Heinz's current CEO, Bill Johnson, derived an entrepreneurial growth strategy worthy of Henry Heinz himself, which was based on the following four elements: 1) products that are designed for local markets, 2) products that are efficiently available to customers (i.e., distribution management), 3) products that are appropriately priced (i.e., pricing emerging market products differently from the products of more mature markets),[5] and 4) establishing and continuously building brand equity.[6]

Successful implementation of the above strategy produced impressive results. For example, in 2011 more than 20% of Heinz's revenue came from emerging markets (such as China, India, Russia, and so on) compared to less than 5% only a few years before (Johnson [2011]), and as indicated in Heinz's 2012 Annual Report, the firm ranked first among all 225 companies across 47 industries in the 2011 American Customer Satisfaction Index (p. 4).[7] It was also the number one global producer of ketchup and the number two global producer of other sauces.

As Exhibit 1 illustrates, Heinz's strategy generated significant levels of profitability (e.g., average ROE of 42.4%) and powerful growth (e.g., cumulative growth of 41.4%). Heinz's performance does, however, exhibit some cause for concern: First, its ROE has declined every year following the 2009 high of 59% to 31% in 2012, which was the second-lowest return in the years profiled. Additionally, and as illustrated in Exhibit 2, Heinz's risk-adjusted margin declined to a period low in a pattern somewhat reminiscent of General Re's at the

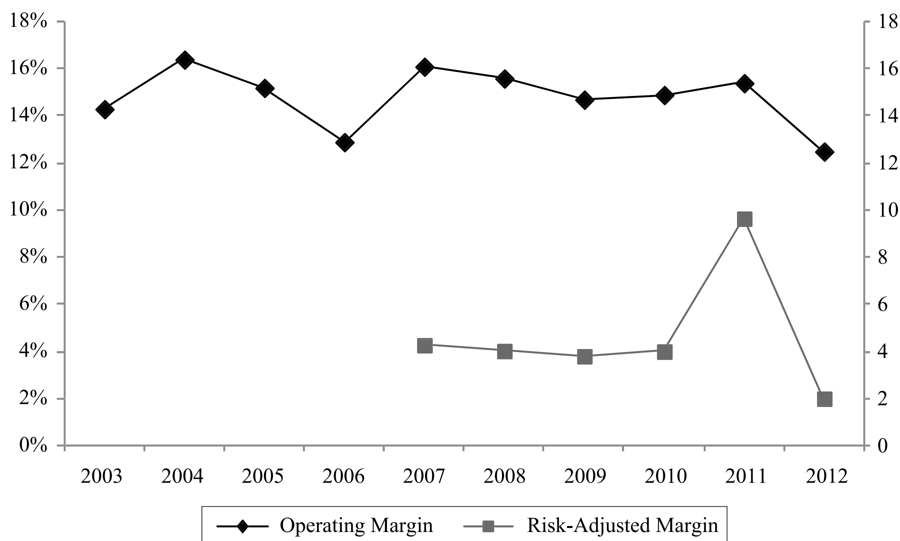
Exhibit 1
Heinz Historical Performance



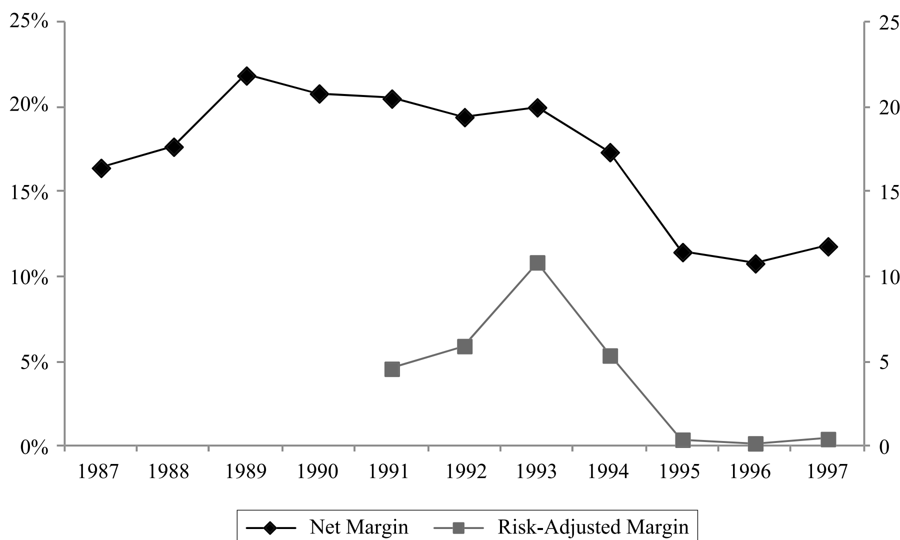
Data source: Morningstar where A(ROE) equals average ROE. The revenue growth line at the bottom of the graph illustrates annual changes.

EXHIBIT 2
Risk-Adjusted Margin Comparison

Panel A: Heinz—2013



Panel B: General Re—1998



Data source: Morningstar for Heinz, and Calandro [2009, p. 98] for General Re. The calculations are the author's and are based on operating margin for Heinz and net margin for General Re, a target margin of 10% for each, and a five-year sample standard deviation of the differential margin for each. For information on the mechanics of the calculation, see the Appendix.

time of its acquisition. Therefore, the challenge at this point in the case is to conservatively estimate Heinz's value at the time of its acquisition and determine if the $72.50 per share price contained a reasonable margin of safety, and if so, why.

HEINZ VALUATION

There are four phases of modern Graham and Dodd valuation: assessing the reproduction value of a balance sheet to derive a more economically consistent

net asset value (NAV), estimating the perpetual value of sustainable earnings to derive an earnings power value (EPV), evaluating franchise value in cases where a firm's EPV is materially greater than its NAV, and estimating the value of growth. Beginning with NAV, our valuation of Heinz is illustrated in Exhibit 3.

Note (1A) of the exhibit simply adds back the allowance for doubtful accounts for trade receivables and other receivables. It is necessary to add this provision back for reproduction purposes because, "A new firm starting out is even more likely to get stuck by customers who for some reason or another do not pay their bills, so the cost of reproducing an existing firm's accounts receivables is probably more than the book amount. Many financial statements will specify how much has been deducted to arrive at this net figure. That amount should be added back" (Greenwald et al. [2001], p. 56).

Note (2A) represents subjective estimates of the reproduction values of Heinz's building and leasehold improvements as well as its furniture and equipment. If this were a live valuation, real estate appraisers could be retained to validate estimates like these.[8]

Note (3A) is an estimate of Heinz's *goodwill*, which in a modern Graham and Dodd context refers to intangible assets such as brands and product portfolios, which for Heinz are significant. To derive this estimate, analysts should "add some multiple of the selling, general and administrative line, in most cases between one and three year's worth" (Greenwald et al. [2001], pp. 61–62). Multiplying Heinz's 2012 selling, general, and adminis-

EXHIBIT 3
Heinz NAV

	$ in 000s			
	4/29/2012	**Adjustment**	**Reproduction Value**	**Notes**
Cash and cash equivalents	$1,330,441		$1,330,441	
Trade receivables	$815,600	$10,680	$826,280	(1A)
Other receivables	$177,910	$607	$178,517	(1A)
Total inventories	$1,329,351		$1,329,351	
Prepaid expense	$174,795		$174,795	
Other current assets	$54,139		$54,139	
Total current assets	$3,882,236		$3,893,523	
Land	$81,185		$81,185	
Buildings and leasehold improvements	$1,009,379	75%	$757,034	(2A)
Equipment, furniture, and other	$4,175,997	50%	$2,087,999	(2A)
Property, plant, and equipment	$5,266,561		$2,926,218	
Less accumulated depreciation	$2,782,423		N/A	
Property, plant, and equipment, net	$2,484,138			
Goodwill, Trademarks, Other	$5,616,919	$2,028,167	$7,645,086	(3A)
Total Assets	**$11,983,293**		**$14,464,827**	
Total current liabilities	$2,647,961		$2,647,961	
Long-term debt	$4,779,981		$4,779,981	
Deferred income taxes	$817,928	0.873	$714,410	(4A)
Non-pension post-retirement benefits	$231,452		$231,452	
Other non-current liabilities	$581,390		$581,390	
Redeemable non-controlling interest	$113,759		$113,759	
Operating Leases	-	$492,524	$492,524	(5A)
Deferred Pension Loss	-	$1,700,000	$1,700,000	(6A)
Options Outstanding	-	$393,290	$393,290	(7A)
Management Warrants	-	$494,011	$494,011	(8A)
Total Liabilities	**$9,058,712**		**$12,148,778**	
Net Asset Value (NAV)	$2,810,822		$2,316,048	
Shares	320,337,764			
NAV per share	**$8.77**		**$7.23**	

Data source: Heinz 2012 Form 10K, all calculations are the author's and have been rounded.

trative expense of $2,548,362 by three—the maximum value given above—gives our goodwill estimate.[9]

Note (4A) discounts deferred tax liabilities at an assumed rate of 7% over an assumed duration of two years.[10] If this were a live valuation, tax accountants and/or attorneys could be consulted to validate these assumptions.

Notes (5A) to (8A) add operating leases, deferred pension losses, options, and warrants onto the balance sheet based on information found in the 2012 Heinz Form 10K.[11]

Subtracting the reproduction value of the assets ($14,464,827) from the reproduction value of the liabilities ($12,148,778) gives a net asset value (or NAV) of $7.2 per share.[12] As this value is driven by significant assumptions, such as our goodwill adjustment, it will be validated by an earnings power value (EPV).

Exhibit 4 illustrates our EPV for Heinz. By way of background, EPV is a perpetual value, based on a level of earnings that are expected to be sustainable into perpetuity. To derive this estimate for Heinz we multiplied their 2012 revenue (note (1E)) by their average operating margin of approximately 15% (note (2E)), which gave operating income of $1,724,064 (note (3E)).[13]

Note (4E) is an estimated options expense, which was derived by multiplying the given $0.02 per share dilution by the amount of Heinz's shares outstanding.[14]

Note (5E) is the pension expense and note (6E) is depreciation and amortization.[15] With regard to depreciation, growth CAPEX is frequently deducted from it when estimating EPV; however, and as Exhibit 5 shows, Heinz's growth needs exceed an estimate of its maintenance CAPEX. In cases like this, depreciation and amortization can be added back, dollar-for-dollar, which gives an estimate akin to EBITDA (earnings before interest taxes depreciation and amortization), which is often used in private equity deal valuation.[16]

Note (7) pertains to the interest income found on Heinz's income statement,[17] which is deducted from operating income because its capitalized value is the amount of cash on the balance sheet, which will be added to capitalized earnings to derive EPV, as shown below.

Pre-tax earnings (note [8E]) are based on operating income (note [3E]) less the options expense (note [4E]) and pension expense (note [5E]) plus depreciation and amortization (note [6E]) less interest income (note [7]).

Heinz's tax rate (note [9E]) of 20.6% is the ratio of its 2012 taxes ($243,535) to its income from continuing operations before income taxes ($1,183,443),[18] which when multiplied by pre-tax earnings (note [8E]) gives Heinz's estimated taxes (note [10E]). Subtracting from pre-tax earnings gives estimated earnings (note [11E]). The multiple used to capitalize earnings is the reciprocal of the 7% rate that was used earlier to discount Heinz's deferred tax liabilities or 14.3 (note [12E]), which

EXHIBIT 5
Heinz Maintenance CAPEX

Calculation		$ in 000s
(a)	Property, plant & equipment (gross)	$5,266,561
(b)	Sales in 2011	$10,706,588
(c)	Sales in 2012	$11,649,079
(d) = (c) – (b)	Change in Sales	$942,491
(e)	CAPEX	$418,734
(f)	Depreciation	$295,718
(g)	Amortization	$47,075
(h) = [(a)/(c)]∗(d)	Growth CAPEX	$426,101
(i) = (e) – (h)	Maintenance CAPEX	($7,367)

Data source: Heinz 2012 Form 10K; all calculations are the author's and have been rounded.

EXHIBIT 4
Heinz EPV

	$ in 000s	Notes
2012 Revenue	$11,649,079	(1E)
Average Operating Margin	15%	(2E)
Operating Income	$1,724,064	(3E) = (1E)∗(2E)
Option Expense	$6,407	(4E)
Pension Expense	$25,000	(5E)
Depreciation & Amortization	342,793	(6E)
Interest Income	$34,615	(7E)
Pre-tax Earnings	$2,000,835	(8E) = (3E)−(4E)−(5E)+(6E)−(7E)
Effective Tax Rate	20.6%	(9E)
Taxes	$411,742	(10E) = (8E)∗(9E)
Earnings	$1,589,093	(11E) = (8E)−(10E)
Multiple	14.3	(12E)
Earnings Power	$22,701,326	(13E) = (11E)∗(12E)
Cash	$1,330,441	(14E)
Earnings Power Value	$24,031,767	(15E) = (13E)+(14E)
EPV per Share	**$75.02**	(16E)

Data source: Heinz 2012 Form 10K; all calculations are the author's and have been rounded.

is less than the well-known Graham and Dodd multiple threshold of 16.[19]

Earnings power (note [13E]) is simply the product of earnings (note [11E]) and the aforementioned multiple (note [12E]), which when added to the amount of cash on the balance sheet (note [14E]) equals EPV per share of $75.02 (note [16E]), which is very close to the quoted deal price of $72.50 per share.

One unique feature of Graham and Dodd valuation is the insight that can be derived from comparing NAV-to-EPV patterns (Calandro [2011b]). Most of the time these two values will relatively reconcile; however, when EPV is materially greater than NAV it signals the existence of a possible *franchise*, which is a firm operating with a sustainable competitive advantage. The existence of a franchise must be validated through strategic analysis.

In the case of Heinz, its competitive advantage lies in three mutually reinforcing areas: 1) the formulas it uses to produce its popular line of products, 2) efficient marketing to establish and sustain brand equity (e.g., the Heinz commercials demonstrating the thickness, and thus quality, of its ketchup), and 3) management that has effectively recognized, and capitalized on, both demand- and supply-side trends.[20] The profitability that has been generated from this strategy is significant (see Exhibit 1), but the size of the NAV-to-EPV spread (10 times) is very large, thus posing a considerable value realization risk. We will address this risk after concluding our valuation.

As noted above, EPV is a perpetual value based on sustainable (or nongrowth) earnings. To the extent growth will create value it must be valued separately, which is a significant advantage of Graham and Dodd valuation over more common forms of valuation (discounted cash flow, multiples, and comparables), which tend to blend the two values (nongrowth and growth). Such a blending tends to result in generally higher valuations, and thus deal prices, which have significantly contributed to deal failures in the past.[21] Our growth valuation of Heinz is illustrated in Exhibit 6.

The calculations for estimating growth in the exhibit are straightforward,[22] except for one: note (d) in the exhibit refers to Heinz's 10-year average ROE, which was used in lieu of its discount rate, estimated previously at 7%.

Exhibit 6
Heinz Growth Value

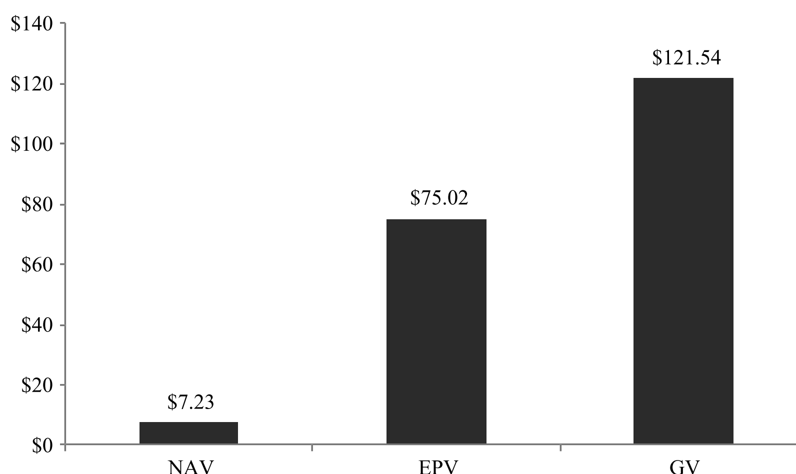
Calculation		$ in 000s	Source
(a)	NAV	$2,316,048	Exhibit 3
(b)	Earnings	$1,589,093	Exhibit 4
(c) = (b)/(a)	Return on NAV (RNAV)	68.6%	
(d)	10-year average ROE	42.4%	Exhibit 1
(e) = (c)/(d)	Growth Multiple	1.6	
(f)	EPV	$24,031,767	Exhibit 4
(g) = (f)∗(e)	Growth Value	$38,934,437	
(h)	**Growth Value per Share**	**$121.54**	

Notes: Calculations are the author's, have been rounded, and assume 100% reinvestment. There are a variety of ways to adjust for less than total reinvestment, the simplest being to adjust RNAV (note (c) above) by (1 - payout) following the popular DuPont equation.

This substitution was made given the tremendous returns that Heinz's franchise has generated over the years, which resulted in a return on net asset value (or RNAV) of nearly 69% (note [c]). Given such performance and its assumed continuance, it is logical to benchmark marginal growth against historical returns, which in this case led to a growth multiple of 1.6 (note [e]). When applied to Heinz's EPV, this multiple produces a growth value of $121.54 per share, as illustrated in Exhibit 7.

Given a purchase price of $72.50 per share, which is slightly less than our EPV of $75.02 per share, this

Exhibit 7
Heinz Value Profile



Notes: All calculations are the author's and have been roundeds NAV is net asset value, EPV is earnings power value, and GV is growth value. Franchise value, or the difference between EPV and NAV, is not explicitly shown.

deal equates to a growth-based margin of safety of 68% (= ($121.54 − $72.50)/$72.50), which is greater than Greenwald et al.'s [2001] margin of safety threshold of "about one-half, and not less than one-third" (p. 4). However, there is significant risk associated with this estimated margin: As noted above, the NAV-to-EPV spread in this case is very large and therefore prone to value realization risk. This risk is material, given the recent 50% decline in Heinz's ROE over the preceding four years (illustrated in Exhibit 1).

Significantly, this is the same kind of risk that our growth value is exposed to in as much as that value is based on assumed perpetual returns of 69% (note [c] in Exhibit 6). Frankly, this is not the kind of assumption frequently attributable to one of the world's foremost value investors. However, the Heinz franchise is a compelling one, and as such the question in this case now becomes whether Heinz can be acquired in a manner that mitigates the deal's risk.

MANAGING VALUE REALIZATION RISK

Contracts are composed of terms and conditions, and many acquirers generally do not give terms and conditions the attention they deserve. A contemporary example of this is the Credit Support Annexes (i.e., collateral requirements) to various credit default swaps that AIG contracted to, and which contributed to their failure during the 2007–2008 financial crisis.[23,24] Such an example is relevant here because some value investors seem to excel in identifying investments with terms and conditions-enhanced margins of safety.

The Heinz acquisition is, in some ways, an example of this. To understand how, first consider that Mr. Buffett negotiated a 9% dividend for the $8 billion preferred stock portion of his investment in Heinz, which generates annual dividends of $720 million. As Mr. Buffett's total Heinz investment was $12 billion, this yield equates to a 6% annual return on investment, which on a relative basis is more than three times the 10-year U.S. Treasury yield.[25,26] Furthermore, Mr. Buffett negotiated warrants to acquire an additional 5% of the partnership's common stock for seemingly next to nothing. As he observed in Berkshire Hathaway's 2012 shareholder letter: "The preferred has two other features that materially increase its value: at some point it will be redeemed at a *significant* premium price and the preferred *also* comes with warrants permitting us to buy 5% of the holding company's common stock for a nominal sum" (p. 4; italics added).[27]

In sum, in exchange for providing financing, Mr. Buffett was effectively given warrants on 5% of the common. The margin of safety on something for nothing can, obviously, be very large. To understand how large, consider the warrants that Mr. Buffett negotiated as part of his distressed investment in Goldman Sachs during the recent financial crisis. In that investment, he bought $5 billion worth of Goldman preferred stock and received $5 billion in warrants to buy $5 billion worth of common stock over the next five years. According to one recent analysis, the profit on this portion of the investment equates to $1.35 billion which, when converted to stock, will yield 1.31% and make Mr. Buffett one of Goldman Sachs's top 10 investors.[28]

Incredibly, Mr. Buffett has been offered deals like this for decades. For example, Lewis [1989] describes the white-knight investment he made in Salomon Brothers in 1987:

> Investors around the world envied Warren Buffett, for he had it both ways. His security—known as a convertible preferred—bore an interest rate of 9 percent which was in itself a good return on his investment. But in addition, he could trade it in any time before 1996 for Salomon common stock at thirty-eight dollars a share. In other words, Buffett got a free play, over the next nine years, in the shares of Salomon. If Salomon Brothers continued to falter, Buffett would take his 9 percent interest and be content. If somehow Salomon Brothers recovered, Buffett could convert his bond into shares and make as much money as if he had stuck his neck out and bought [Salomon] stock in the first place.... Buffett was making only the safe bet that Salomon would not go bankrupt (p. 225).

Salomon Brothers, of course, almost did fail, as a consequence of a U.S. Treasury Bond scandal that occurred in the early 1990s. The consequences of the scandal were so dire that Mr. Buffett actually had to assume control of the firm in order to save it.[29] A lesson from this experience is that a seemingly "safe bet" can be heavily contingent upon operational management.[30] With respect to Heinz, operations are the responsibility of Mr. Buffett's business partner, 3G.

Looking back on Heinz's past performance (e.g., Exhibit 1) one can be skeptical that such performance could be continued, let alone improved upon, by managers who were not associated with the company. Geromel [2013] describes how 3G could approach this task:

> … [Jorge Paulo] Lemann [3G's founder] is known for imposing a lean structure and making deep and structural management changes in the companies he controls. In Burger King, Lemann's team replaced the CEO [and] cut staff. The main result: profits went up even as revenue fell. When Brazilian-Belgian InBev took over Anheuser-Busch in 2008, executives were sacked and more than 5% of its U.S. workforce was fired. That is how Brazil's richest likes to strike: together with his two inseparable peers [Carol Alberto] Sicupira and [Marcelo Herrmann] Telles, Lemann takes care of running the business while someone else [Mr. Buffett in this case] brings the cash to fuel changes.

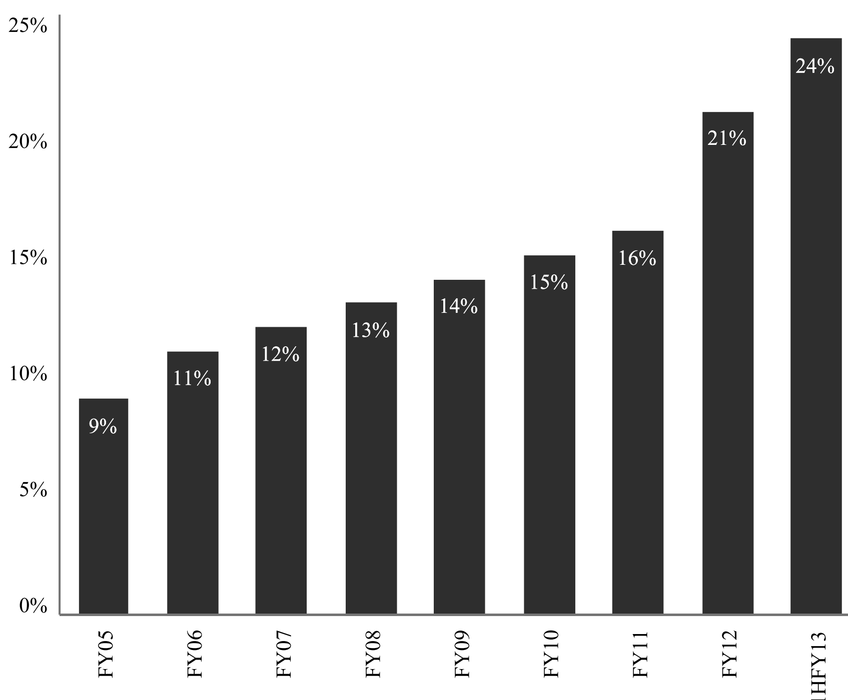
While the above is impressive, aggressive performance improvement techniques are fairly well known and widely practiced. The difference here could be in the way 3G implements its craft. By way of background, Stephen Schwarzman, in a discussion at *Grant's 2013 Spring Conference*, observed that 3G tends to identify future operational candidates at a very young age in Brazil. They then carefully mentor these candidates and even sponsor them at top business schools around the world, which has resulted in a stable of highly motivated, focused, and loyal professionals who have delivered exceptional performance over time.[31] If so, this model could be powerfully brought to bear at Heinz from a value realization perspective.

As noted above, Heinz has historically grown via a product-focused strategy that shrewdly capitalized on both demand- and supply-side trends.[32] Exhibit 8 profiles this success in emerging markets over the most recent nine years. To grow such performance, 3G could identify and exploit synergies across its various businesses, and it could also use Heinz as a platform to acquire other food and beverage companies. Such a strategy is not without risk, as synergies have proven incredibly difficult to achieve over time.[33] However, if 3G is able to operationally achieve synergistic benefits while it profitably grows, then the Berkshire–3G partnership will be well placed to realize significant value over time given the market dynamics in which it is operating.

Those dynamics were profiled in Heinz's Winter 2012–2013 Investor Presentation, "Driving Profitable Growth," which forecasted that emerging markets will contain 6 of the world's 10 largest economies (ranked by GDP) by the year 2050: China, India, Brazil, Russia, Mexico, and Indonesia.[34] If this forecast is proven cor-

EXHIBIT 8

Heinz Growth in Emerging Markets: Percentage of Total Company Sales from Emerging Markets



Data source: Heinz, "Driving Profitable Growth: Investor Presentation," Winter 2012–2013. Downloaded from company website, March 2013.

Exhibit 9
Heinz Growth Value: Sensitivity Analysis

	Return on Net Asset Value			
	27.4%	**68.6%**	**75.5%**	
Required Return of 42.4%	0.6	1.6	1.8	***Multiples***
	$48.62	$121.54	$133.70	***Values***

Calculation of multiples and values follow Exhibit 6; the shaded cells are the values from that exhibit. All calculations have been rounded.

Note: Given the historical strength of Heinz's strategy and the extent of 3G's operational expertise, it is logical (to me) to expect a growth return equal to Heinz's historical average of 42.4%. On the economics of growth, see Calandro [2009 and 2011a].

rect, efficient execution of an emerging markets, synergy-based growth strategy could result in performance justifying this deal's premium-to-book value, thereby mitigating its value realization risk.[35]

CONCLUSION

Our valuation supports a $72.50 per share acquisition price for Heinz based on an estimated 68% growth-based margin of safety. However, it will not be easy to continue growing at Heinz's historical levels of profitability. To illustrate, consider the sensitivity analysis reflected in Exhibit 9. This exhibit profiles the value of Heinz if its growth-based returns decline to 27.4% (which is 60% of the return on net asset value used in Exhibit 6, note [d]) or if returns increase by 10%. It is relatively easy to accept a 27.4% return for a mature firm like Heinz and to be highly skeptical of 60% plus returns.

That said, Mr. Buffett has experience realizing abnormal levels of profitability in strong franchises, the quintessential example of which is his 1995 acquisition of GEICO. In an earlier article for this journal, we commented on operational and managerial techniques that could have been used in GEICO to realize value (Calandro [2011a], pp. 10-13). With Heinz, Mr. Buffett is relying on his business partner, 3G, to operationally realize value; therefore, time will tell if it will be able to do so, as GEICO's management has, or if it will stumble, as Salomon Brothers' and General Re's management did.

Appendix

Exhibit A1
Heinz's Risk-Adjusted Margin (RAM) Calculations

Year (1)	Operating Margin (2)	Target (3)	Differential Margin (4) = (2) − (3)	Sample Standard Deviation (5)	RaM (6) = (4)/(5)
2003	14.3%	10%	4.3%		
2004	16.4%	10%	6.4%		
2005	15.2%	10%	5.2%		
2006	12.9%	10%	2.9%		
2007	16.1%	10%	6.1%	0.014	4.3
2008	15.6%	10%	5.6%	0.014	4.0
2009	14.7%	10%	4.7%	0.012	3.8
2010	14.9%	10%	4.9%	0.012	4.0
2011	15.4%	10%	5.4%	0.006	9.7
2012	12.5%	10%	2.5%	0.012	2.0

Note: Calculations are the author's and have been rounded. For General Re's calcualtions, see Calandro [2009, pp. 96-99].

ENDNOTES

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[1]The price was $28 billion if Heinz's debt was included.

[2]See Calandro [2009, Ch. 4] for more information on the General Re acquisition.

[3]According to Goldberg and Wilcox [2011], ketchup originated "in eastern Asia as a type of spiced fish sauce, the modern version of the tomato-based condiment was introduced in the United States in the early 19th century. By 1801, a recipe for tomato ketchup was printed in an American cookbook entitled *The Sugar House Book.* In 1824, a ketchup recipe appeared in *The Virginia Housewife,* an influential 19th century cookbook written by Mary Randolph, Thomas Jefferson's cousin."

[4]For more information, see Koehn [2001].

[5]For information on Heinz's product pricing, see Goldberg and Wilcox [2011] and Wilcox [2009].

[6]For more information, see Johnson [2011].

[7]According to the *American Customer Satisfaction Index* (ACSI) website (http://www.theacsi.org/about-acsi/about-acsi), "the ACSI is an independent national benchmark of customer satisfaction with the quality of products and services available to household consumers in the United States.... Each year, roughly 70,000 customers are surveyed about the products and services they use the most. The survey data serve as inputs to an econometric model that benchmarks customer satisfaction with more than 230 companies in 47 industries and 10 economic sectors, as well as over 100 services, programs, and websites of federal government agencies."

[8]As Warren Buffett has pithily and accurately stated, the goal of valuation is "to be approximately right rather than precisely wrong" (Buffet [1993]).

[9]Data source: Heinz 2012 Form 10K, p. 33.

[10]At 7%, this assumed discount rate is over four times the 10-year U.S. Treasury yield: On April 17, 2012, that yield was 1.71%. Source: http://www.bloomberg.com/markets/rates-bonds/government-bonds/us/. Thanks to Professor James Russell Kelly and Bill O'Farrell for questions and comments on this rate.

[11]The data for the first three entries are from the Heinz 2012 Form 10K, pp. 21, 26, and 54. The data for the warrant estimate is also from the Form 10K, p. 76, and was calculated as follows: number of securities approved by stockholders of 10,864,554 times an average price of $45.47.

[12]Share data are from the Heinz 2012 Form 10K, p. 1.

[13]All calculations are subject to rounding.

[14]Dilution data source is the Heinz 2012 Form 10K, p. 33.

[15]Data source: 2012 Heinz Form 10K, pp. 26 and 38.

[16]For example, see the EBITDA references in Akerman [2012].

[17]Data source: Heinz 2012 Form 10K, p. 33.

[18]Ibid.

[19]Graham and Dodd [1934] stated that "*about sixteen times average earnings* is as high a price as can be paid in an *investment* purchase of a common stock" (p. 453; italics original).

[20]See, for example, Johnson [2011] and Koehn [2001].

[21]See Koller et al. [2011], p. 173, and Carroll and Mui [2008], pp. 15-16 for examples.

[22]See Calandro [2011a, pp. 14-15] for the derivation, and Greenwald et al. [2001, Ch. 7] for background.

[23]See, for example, Boyd [2011], pp. 206-208.

[24]While AIG was selling CDSs, value investors such as Seth Klarman were buying them (Calandro [2011c], p. 40). For a real-time example of the margins of safety offered on investments like this, see Grant [2008], p. 171.

[25]On the U.S. Treasury yield, see footnote 10.

[26]Note that if the sources of funding for the preferred are Berkshire's insurance subsidiaries, which is highly possible, then the dividends it earns could be taxed at preferential rates.

[27]Source: http://www.berkshirehathaway.com/letters/2012ltr.pdf

[28]Source: "Buffett's Goldman Sachs Change Latest in Lucrative Warrant Deals." *GuruFocus.* March 26, 2013. http://www.gurufocus.com/news/214389/buffetts-goldman-sachs-change-latest-in-lucrative-warrant-deals. For information on this distressed investment, see Rose et al. [2011] and Rose and Ganzfried [2011].

[29]Mr. Buffett's crisis management culminated in a $290 million settlement with the S.E.C. on May 20, 1992. See Moreton and Crane [1992a] for information on the Salomon scandal, and Moreton and Crane [1992b] for information on Mr. Buffett's response to it.

[30]Operational and managerial failings also plagued the General Re acquisition (Calandro [2009], Ch. 4).

[31]Source: Author's conference notes.

[32]See Treacy and Wiersema [1995, Ch. 6] for an introduction to product-focused strategies.

[33]For more information, see Carroll and Mui [2008], Ch. 1, which is aptly titled "Illusions of Synergy."

[34]Source: Heinz, "Driving Profitable Growth: Investor Presentation—Winter 2012-2013. Downloaded from company website, March 2013.

[35]For more information on value realization and corporate management, see Calandro [2013, 2012, and 2011c]. Thanks to Robert Hagstrom for his many invaluable questions, comments and suggestions on this area of research.

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