OWNERSHIP, GOVERNANCE, & FIRM PERFORMANCE:

PRIVATE EQUITY IN RETROSPECT AND PROSPECT

by

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(Under the Direction of Dwight R. Lee)

ABSTRACT

In conjunction with the explosion of buyouts in recent years, financial economists have renewed their interest in empirical research on private equity. Because the vast majority of private equity investments are made by highly secretive private investment partnerships in a heretofore largely unregulated sector with no disclosure requirements, research has often been limited to information obtained through market research entities who collect macro financial data, or to *fund-level* analysis of investment performance. Further, most prior work on buyouts has of necessity focused on just that – *buyouts,* usually leveraged and usually going-private, of whole companies or conglomerate divisions which form new stand-alone firms. This study extends previous analysis via a unique, detailed, hand-collected data sample of 288 exited transactions, provided on a confidential basis by 13 private equity firms. In this unique format we are able to evaluate these investments at the detailed *transaction-level*, from the vantage point of the investor, and hence the capital efficiency of equity investment in all its varieties, including minority stakes. Further, for decent-sized subsets of the 288 transactions we are afforded a unique window into what happened to the target firm after PE firm investment, in terms of

changes in revenues, EBITDA, employment, and capital expenditures. After reporting out detailed descriptive statistics on the sample, we employ correlation analysis, regression modeling, and *chop-shop* benchmarking to examine returns to private equity, and how the governance and oversight of PE firms impacted their portfolio firms' performance. Our proprietary data sample and detailed practitioner interviews also allow us to compare differing investing strategies among PE firms, who now compete for investor capital and scarce high-IRR transactions in a very efficient market, thus requiring their differentiation. More broadly, we also summarize the growth and development of the private equity sector in the last 25 years, highlighting its impact on the market for corporate control, governance, institutional investing, entrepreneurship, and ultimately, economic growth. The next phase of this extended research project is also described.

INDEX WORDS**:** Leveraged buyouts; buyout specialists; active investors; corporate governance; private equity; ownership structure; entrepreneurship

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DEDICATION

I dedicate this research effort, and whatever may be subsequently published from it, to my parents: to my mother, who has courageously lived with and battled cancer and related health issues since the Fall of 2001 without once complaining about or bemoaning her fate; and, to my father, long vanished from this life, but whose self-described status as an "independent peddler" carried with it a quiet dignity of its own, and who espoused a colloquial but reverential respect for an economic system which allowed for the full expression of his entrepreneurial impulses. From them I learned, at long last, what it truly means to live: *anything worth doing is worth doing well*. For my part of it, whatever of value that eventually ensues from this effort is due to the fact that they cared.

John L. Chapman
January 2007
Alexandria, Virginia

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CHAPTER 1. INTRODUCTION & PREVIEW

As the year 2007 dawned, the United States stood in an enviable position in the world's economy – indeed, *astride* the world's economy. U.S. financial assets hit a record high of $47 trillion, growing some 15% in 2006.[1] U.S. Gross Domestic Product (GDP) reached a record high of $13.25 trillion, with preliminary real year-over-year growth of 3.39% in 2006. Meanwhile the unemployment rate hovered at 4.5%, and the federal budget deficit stood at 1.4% of GDP, roughly 40% lower than the post-1970 average of 2.3% of GDP.[2] By comparison, while global recovery brought the unemployment rate down in the Eurozone – to a "record low" of *7.5%* -- growth in Europe was half that of the United States.[3] Economist Brian Wesbury of First Trust Advisors also points out that in spite of hot wars on multiple fronts, rising international tensions, significant oil price shocks and supply uncertainty in the face of record global oil demand, rising commodity prices, and recent severe fiscal shocks to the U.S. federal budget, the year just ended portrayed a strong and underlying resiliency to the U.S. economy. Indeed, Wesbury states, 2006 was a year which, in addition to GDP and financial assets mentioned above, saw record levels in the Dow Jones Industrial Average, U.S. exports, industrial production, real hourly compensation, corporate profits, federal tax revenues, retail sales, productivity, the number of people with jobs, the number of students in college, and even airline passenger traffic.

Seemingly unrelated to all this salutary economic news, in early February 2007 a New York-based global merchant banking firm with a significant private equity presence, the Blackstone

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[1] Source: *Mapping the Global Capital Market*, McKinsey Global Institute, January 2007. They report global financial assets also at a record $125 trillion.

[2] Source: Bureau of Economic Analysis, U.S. Department of Commerce. Additionally, economist Michael Darda of MKM Advisors has forecast that the U.S. budget could be in surplus as early as May 2008.

[3] *Eurostat*, Statistical Office of the European Communities, www.eubusiness.com/FactsFig.

Group, announced the buyout of Equity Office Properties, a Chicago REIT, for $39.3 billion – nominally the largest buyout ever.[4] Relatedly, Blackstone had just set a record in 2006 by completing $101 billion in buyouts, in a year which also saw record levels of fund-raising and deal activity (in terms of both real dollars and number of transactions) in the U.S. and global private equity sectors. Indeed, at $487 billion, buyout deals comprised over 31% of all announced mergers and acquisitions (M&A) in the United States in 2006, a year in which tracked global M&A volume totaled $3.25 trillion.[5]

Some economists believe that in fact, this is no coincidence at all – that the continuing health of the U.S. and global economies is indelibly related to a vibrant, dynamic, and growing private equity sector. According to this view, private equity is part of (1) the array of financial institutions which are so conducive to the promotion of entrepreneurship in the U.S., (2) highly liquid (and increasingly interconnected) global capital markets, and (3) a (relatively) unfettered market for corporate control which promotes greater efficiency in the capital allocation process. Jensen (1993, 2000), for example, states that we are in the midst of a "third industrial revolution", and that buyouts and an unhampered M&A sector act as efficient and even superior change agents for declining industries in need of restructuring. Elsewhere, Jensen (1988, 1989, 2000) has focused on the broader ability of private equity and a dynamic environment for mergers and acquisitions to effectively and rapidly engender the flow of capital to more highly profitable growth industries, in the midst of changes wrought by deregulation, advancing technology, globalization, or more general strategic or management considerations.[6]

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[4] The $39.3 billion includes the assumption of $16 billion of debt, but in inflation-adjusted terms is over 25% lower than the Kohlberg Kravis Roberts & Co. (KKR) buyout of RJR-Nabisco in 1988.

[5] Sources: Thomson Financial, R.W. Baird M&A Market Analysis. The M&A dollar figure excludes Asia, so is much higher in reality.

[6] Kaplan (1991) and Wright, Hoskisson, Busenitz, & Dial (2001) would agree with this assessment and both frame the issue in describing two types of buyout deals: (1) *shock therapy* or restructuring deals, which are akin to the classic 1980s-variety agency-mitigating transactions, and (2) entrepreneurial *growth equity* placements, which

In contrast, other economists believe that the buyout sector is a prime example of self-aggrandizing Wall Street over-reach at best, and perhaps even harmful from a public policy standpoint, if in fact it really devolves to Lehn & Poulsen's (1988) memorable phrasing of the matter: wealth *redistribution* (from "Main Street to Wall Street", or from bond-holders, tax-payers, and employees to share-holders and deal-makers), as opposed to wealth *creation.* Margaret Blair of Vanderbilt Law School has stated, for example, that

> if in fact Jensen's major thesis is correct – that buyouts are primarily an efficient mechanism for restructuring and the correction of agency conflicts, then the huge spate of LBO activity we saw 15-20 years ago should have long since abated. Clearly that has not happened; not only has the phenomenon continued, it has grown in proportion of late. I confess I do not understand the reasons for this….. Whatever happened to the idea that you got rich in this country by building or inventing things, like Bill Gates? Now it is private equity and hedge funds – but I am not so sure private equity is not merely a story of the *mere trading of ownership claims*, as opposed to the creation of new wealth, in the manner of Henry Ford or Bill Gates. Where is the value-add in that? [7]

Garfinkel (1989) echoes the concerns of Blair, in raising the question of whether in fact buyouts are short-term-oriented and *transaction-driven,* for the sake of wealth redistribution and for the benefit of the deal-makers, as opposed to exemplifying the pursuit of long term value creation. Garfinkel also cites another common criticism of private equity still heard today: by

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involve the capitalization of growth opportunities. These often involve consolidating roll-ups in fragmented industries, but can also include organic growth opportunities in promising industry sectors. This research project has discerned a *third* type of PE transaction, which has intermediate aspects of both agency-mitigation and growth deals, but which is *sui generis.* Described subsequently below, we call these *coordination-based.* These represent sound businesses which are nonetheless in need of change in some aspect of the business model, or may be cases of re-invigoration, wherein energetic new management takes over an under-managed company in a recapitalization.

[7] Source: conversation with author, 2006. Professor Blair, a longtime economist at the Brookings Institution in Washington, D.C., coordinated a well-known conference on the "deal decade" of the 1980s, out of which came an oft-cited volume of papers on M&A and buyouts. Professor Blair's questioning of the economic efficacy of private equity is not to be taken lightly; she took her degree at Yale under the direction of Shiller, Winter, and current Yale President Levin, so has long studied these matters.

raising the level of corporate leverage, the buyout sector burdens the economy with increased risk of financial instability in the event a downturn, via rolling waves of insolvency.[8]

Theme and purpose of study

Jensen and Blair have neatly encapsulated the debate about private equity which still rages today, and which comprises the main theme of our investigative efforts. Stated succinctly, the primary goal of this paper is to make progress toward discernment of an unbiased assessment of the role and value of private equity in the modern capital-using economy. We seek to accomplish this primarily via unique access to proprietary transaction data (and for this study, 288 exited transactions across 19 two-digit industries) garnered directly from leading private equity firms, who also consented to detailed interviews about their investing and deal execution strategies. The long-run goal of this research effort is a comprehensive macro-assessment of the effects of private equity as a growing institutional feature of the global economy, and our investigations seek insights on issues including the following:

- What have been the important historical trends and developments in private equity? Why? What effect has PE had on corporate governance, M&A and the market for corporate control, institutional investing, entrepreneurship – and ultimately, economic growth itself? [9]

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[8] Interestingly, Garfield attributes this worry to such well-known economists as Alan Greenspan, Henry Kaufman, and Benjamin Friedman. Appendix 7, discussed later, depicts average long term debt levels in the U.S. since 1965 for the Fortune 500; as shown, there is no trend, and the idea that LBOs drove huge increases in debt across the economy may well be a spurious one.

[9] This is the canonical question regarding private equity, and it is rooted in the most venerable debate in classical political economy. Adam Smith (1994, I:i-iii and II:iii) held that a system of *natural liberty*, rooted in man's inherent nature to "truck and barter" and consequent propensity to specialize into a system-wide division of labor, promoted what he saw as the self-evident aim of political economy – the wealth of nations. For him, financial markets and institutions such as private equity would be logical extensions of this ever-increasing specialization, and by also providing liquidity which enhanced capital mobility, would be very beneficial to the economy. Karl Marx (1932 [1883]) however clung to Smith's labor theory of value, ascribing no worth to anything other than (manual) labor used in production. For him private equity investors would be akin to any and all financiers, who were part of the property-owning classes who exploited workers and reaped *surplus value* (i.e., profit) from their labor. In Marx's own words:

> Interest thus appears to the capitalist as surplus value which capital yields *per se*, and *which it would yield also even if the capital were employed unproductively* (emphasis mine)….in the case of joint stock companies a new swindle has developed – alongside of, and above,

- What are the key success factors (*KSFs*) in a private equity investment, or perhaps to say the same thing, the parameters driving successful deal-making? How do these *KSFs* correlate to the performance of a private equity investment?
- More specifically, how are successful private equity firms seemingly able to acquire and run businesses in multiple different industries, when in the literature in empirical corporate finance, *diversification* is considered to be value-destroying, and *focus* is now regarded as the better strategic concept? [10]
- What are the sources of value (i.e., aspects of governance, strategy, and/or operating execution) that are derived from a private equity firm's ownership of a company? How and why do portfolio companies benefit from being owned by a PE firm?
- What are the best of the many alternative strategies for private equity investing, and why (e.g., industry types, size of deals, transaction structures)? Do some investment strategies drive persistently superior returns, as Kaplan & Schoar (2005) imply?

> the real manager, a number of administrators and directors are appointed for whom superintendence is but a pretext for enriching themselves….The increment accruing to bankers by reason of the fact that they act as directors of 8 or 9 different companies [are] wages of superintendence generally in inverse ratio to the real superintendence effectually exercised by such directors. (1932, pp. 275-280)

In other words, capital begets profit *automatically,* with no inherent risk of loss or need for foresight by entrepreneurs, and as such, capitalists serving on boards of directors are exploiters of labor (and "real" managers/share-holders), and add no value to production. This sentiment is the logical progenitor of modern criticisms of private equity and notions about "mere trading of ownership claims", and thus our efforts here seek to examine the empirical validity of Smith's and Marx's underlying theses.

[10] This is a somewhat anecdotal comment on private equity upon which our study will shed insights. As discussed later, we had 13 firms invest in 288 transactions across 19 two-digit and 28 three-digit industries, with varying results but several abnormally positive to standard benchmarks. In any case, the debate on diversification is not fully closed. Lang & Stulz (1994), Comment & Jarrell (1995), and Berger & Ofek (1995) all offered validity to the thesis that conglomerates trade at a discount *per se*, because of diversification (General Electric is an example of an anomaly, regarding this thesis). However, Klein (2001) and Hubbard & Palia (1999) challenge the conventional view in offering an *institutional* explanation for the 1960s: internal capital markets may well have been more efficient then. Viewing PE firms from just such an *institutional* perspective will enhance our understanding of performance, as analyzed below.

- What data and conclusions can we show re: revenue and profit improvements, employment changes, capital expenditure changes, and strategy and management changes in the aggregate, and how do these compare to similar non-PE led companies? (prior research is mixed on many of these issues, as we shall see)
- What does the future hold for private equity? Are there regulatory or policy issues of concern? As the sector matures and becomes inherently more competitive, what and how will private equity firms need to change? [11]

Uniqueness & anticipated contributions of this research

Below in Chapter 3 we outline in detail prior relevant research which has directly impacted this study, from both the literature on buyouts and relevant antecedent work in corporate finance and industrial organization more broadly. Here we summarize how this effort is different from prior research, and how we intend to add to the existing stock of knowledge about private equity.

- ***Data source.*** Virtually all prior studies of private equity contain transaction data garnered from a public data base which collects deal data from self-reporting of firms or public sources such as the press or, say, SEC filings. A few studies have obtained data confidentially at the *fund level*, from institutional investors; one recent study obtained data from private placement memoranda prepared by buyout firms.[12] This study is unique in that our data sample is drawn directly from interviews and live meetings to pour through data from the PE firms directly. Obtaining detailed transaction data directly from the PE firm practitioners affords a rich level of detail into how these firms execute in these transactions (i.e., the "story" behind the numbers), and a level of depth to the transaction information that

[11] This paper is essentially an interim report on progress on these issues in a project now sponsored by the American Enterprise Institute; the paper closes with a summary of the effort to date and the next evolution of work to be done.

[12] See Groh & Gottschalg (2006).

surpasses its "twice-removed status" as part of, say, the Thomson M&A data base. We are not aware of any other study with a data sample so constructed in this line of research.[13]

- ***Details of transaction parameters.*** Because we interacted directly with the practitioners themselves, we obtained more intensive detail than many data collection efforts. For all 288 transactions in this study, we have obtained data on these key variables to the following degree:

Variable/item	## Observations
PE firms	13
Transactions	288
Industry type	288
Transaction amount (logsize)	288
Transaction's Internal Rate of Return (IRR)	288
Ingoing leverage in each deal	288
PE firm equity amount (%)	282
MGMT equity amount (%)	255
Minority or control stake?	288
Any add-on acquisitions?	271
Any divestitures?	189
Syndicate deal or not?	281
Employment change (number)	59
Employment change (up or down)	250
Capital expenditure change (number)	126
Capital expenditure change (up or down)	230
Holding period	288
Revenue change during holding	254
EBITDA change during holding	255 [14]
Debt pay-down (Total debt/EBITDA)	255
Entry multiple	238
Exit multiple	241
Change in management at deal closing?	In process (not included here)
IRR of S&P 500 for each deal	288
IRR of Fama-French 10 for each deal	279
Public company benchmarks for all parameters	288

In short, we have developed a unique ability to analyze these transactions from new and detailed perspectives.

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[13] We believe that the sample as currently constructed contains the fourth largest number of transactions ever assembled for this type of analysis if one includes Loos (2006); in any case, the detailed content of our data is among the very highest at the transaction level.

[14] "EBITDA" refers to "Earnings Before Interest, Taxes, Depreciation, and Amortization", or operating earnings. Some people refer to EBITDA as "operating cash flow", though technically that is not correct, as Fridson & Alvarez (2002) make clear in their excellent discussion of its uses and abuses. EBITDA is *the* key metric in private equity valuation today (and all corporate finance, for that matter).

- ***Unique analytics afforded by this data set.*** With the richness of this data, we can report descriptive statistics on these transactions at a new level of detail. For our regression framework, we use transaction IRR as our dependent variable, and will have independent variables which have not been used in most prior studies. Knowing the leverage for each deal, its size, and industry type will afford richness (and a higher level of quality) to benchmarking. Our detail also allows for an *intra-PE firm* comparison, which will be as unique as it is detailed.
- ***A view of the private equity (buyout) sector in its totality.*** Most prior studies have focused on going private buyouts, since that is the most prominent deal data that is available from traditional sources. Our sampling methodology and data sources allow us to examine private equity investing across the varying range of deal structures and scenarios. Minority stakes, syndicate deals, consolidating roll-up or add-on strategies, and performance change comparisons may all now be analyzed in detail, by firm, by industry, or as benchmarked against pubic company matches.

Lastly, this paper constitutes an *interim report* of a project carried on through 2007. We report here 13 PE firms and 288 transactions, but estimate a tripling of these figures in the next 4 to 6 months. Our goal is a comprehensive assessment of PE investing as practiced and evolved over the past quarter century up to the present.

Outline of this paper

With the foregoing as preamble, this paper is laid out as follows: in the remainder of this section we first present important epistemological considerations which motivate our research plan and methods, and Chapter 1 closes with an executive summary of empirical results. Chapter 2 first highlights prior research and concepts from the relevant fields in economics

(finance and industrial organization, or IO) which are fundamental to a proper understanding of the evolution of private equity and its place in the economy. This is followed by a brief summary of the historical development of private equity, definitions and a current taxonomy for the sector, and enumeration of key unsettled issues of interest to researchers and practitioners alike. Chapter 3 is a summary review of the prior literature on buyouts, with a focus on the specific papers that this effort complements or extends. Chapter 4 contains the main body of empirical analysis – an intensive review of private equity transaction performance relating to several deal parameters (e.g., amount of leverage in the capital structure, ownership splits, industry type), with index-adjusted transaction IRR as the main dependent variable. Chapter 5 offers a unique window into private equity firm operations, investing strategy, and execution via an *intra-PE firm* comparative assessment, which our proprietary data sample affords. Chapter 6 summarizes our findings and describes the next phases of this research effort here in 2007.

Epistemological and heuristic issues underlying this research

The literature on buyouts dates at least to DeAngelo, DeAngelo, and Rice (1984) and their study of 42 (72 announced) going-private transactions back in the 1970s.[15] Since then, more than 150 papers have been published in the major academic journals, with two spikes in research activity by financial economists: 1988-1993, and 2003-present, with the latter timeframe being led by researchers in Europe.[16] Most of these papers have dealt with whole company buyouts,

[15] At least this research effort was able to identify no LBO-focused paper in the empirical literature published prior to DeAngelo et al., and they themselves cite no previous work focused exclusively on buyouts – still known then, as per their paper, as "minority freeze-outs" from the legal literature (of which LBOs were defined to be a subset of these "pure" going private deals).

[16] *EconLit* lists 138 papers on "leveraged buyouts", 129 on "private equity", and 2583 on "venture capital" as of December 2006. Orebro University in Sweden hosts econpapers.repec.org, which lists 63 papers on "LBOs", 97 on "buyouts", 97 on "private equity", and 100 on "venture capital". A rough skimming of these listings makes the 150 number conservative, even given over-lap; the number of papers on buyouts potentially expands considerably when factoring in papers in other sources (e.g., law journals such as Lowenstein, 1985) or in cases where the main topic of the paper is on, say, corporate governance, with buyouts prominent in the discussion (e.g., see ECGI's website at www.ecgi.org and their series on finance working papers). Whatever the number, it is

generally of public companies, with data coming from *public* data bases or sources (e.g., Thomson Financial) about these transactions, as Chapter 3 of this document describes below. While studies from such public sources have proven useful and informative, researchers have found that the data bases themselves are often incomplete or noisy.[17]

Alternatively, a strand in the literature on private equity performance has also accessed data at the *fund level,* with data provide on a confidential and blinded basis by anonymous limited partner/institutional investors.[18] However, a detailed *transaction-level* analysis of private equity investments, garnered directly from the general partner investors themselves, and inclusive of details surrounding the operating, strategic, and funding decisions they made while invested, provides a unique modality for analysis of private equity.[19] This research effort entails pursuit of PE analysis along these lines, and hence seeks to add to knowledge of actual transaction returns by also understanding the underlying drivers of those returns.

The motivation for this research effort was spawned from two sources. First, there is an unmet need for a rigorous, empirically-based, and dispassionate assessment of buyouts and private equity, which would detail the myriad effects PE has had on the U.S. economy over the last quarter century. In spite of academic research which was in many respects supportive of the idea that private equity had a positive economic impact, the aftermath of the 1980s buyout

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interesting to note that empirical research on buyouts follows a bimodal distribution which correlates well with the sector's fund-raising and deal-making, and that research activity and interest has increased especially in Europe in recent years.

[17] Anderson and Lee (1997) looked at source data for ownership studies from four different data bases and found considerable variation in data quality and accuracy. More recently, Kaplan, Sensoy, & Stromberg (2003) examined VC investments in two data bases and found omissions – "unbiased but noisy" transaction data. Anecdotally, from Thomson SDC-Platinum this author sought to find KKR's first deal of note (Houdaille Industries – it is not there) and its deal history; SDC lists only 30-some deals with KKR as the named buyer, whereas the firm has done 150 transactions. Admittedly, many are now in syndicates so the data base contains many which are coded as "Investors" as the buyer, and Thomson is very useful in many ways. But there are gaps in public data bases.

[18] See, for example, Bull (1989) or Ljungqvist & Richardson (2003).

[19] Of course such studies are rare because by definition, private investment partnerships have no incentive or interest in sharing detailed "secrets" behind their investing or operating strategies. Hence our study seeks to contribute to the literature on private equity in an *epistemological* as well as an *empirical* sense.

explosion led to a prodigious outpouring of *anti*-LBO (and anti-capitalistic) books and articles appearing in the popular and business press, the tone and tenor of which were not only negative, but harshly so. Perhaps the most famous example of these was Burrough and Helyar's *Barbarians at the Gate*, the inside story of KKR's going-private buyout of RJR-Nabisco – still the largest buyout of all time in real terms. On the back cover to the 2003 Harper Collins edition of this book, the *New York Times Book Review* has a quote which perfectly captures the prevailing sentiment in the press on buyouts, then and now:

> ……one of the first, most compelling accounts of what happened to corporate America and Wall Street in the 1980s. *Barbarians at the Gate* has been called one of the most influential business books of all time – the definitive account of the largest takeover in Wall Street history. Bryan Burrough and John Helyar's gripping account of the frenzy that overtook Wall Street in October and November of 1988 is the story of deal-makers and publicity flacks, of strategy meetings and society dinners, of boardrooms and bedrooms – giving us a detailed look at not only how financial operations at the highest levels are conducted, but also a richly textured social history of wealth at the twilight of the Reagan era.

Without in any way conferring a bias on the empirical analysis of PE which is contained in Chapters 4-5 below, it is nonetheless fair to say that that this negative caricature of buyouts -- which developed in the late 1980s and has persisted – is misplaced precisely *because* it is empirically vacuous.[20] Yet many other books with equally colorful names appeared during the same timeframe to guarantee this bias, all carrying at least an implicit message that leveraged buyouts were a malignant new phenomenon in American business, and moreover that the culture

[20] This is not to say that anything Burrough & Helyar talk about in their entertaining account is not *per se* true in terms of its descriptive element, or that there is never any unseemly greed or avarice witnessed on Wall Street or elsewhere in business (or in Hollywood or *academe*, for that matter). But if these be failings, they are of human nature itself, and not specific to LBO deal-makers. Meanwhile, the *modus operandi* for this study subscribes to the honorable tradition of *wertfreiheit* first enunciated in detail by Max Weber a century ago. Section II below addresses our specific heuristic approach in the context of the appropriate antecedent literature from relevant fields in economics.

and practices which dominated Wall Street were uniformly bad.[21] This was hardly the first time that the professions of journalism or entertainment were seen to be anti-business in their messaging, and in fact the attack on business interests from these quarters has been renewed in the current decade.[22] Additionally, to the degree that there was an "uptick" in negative publicity about finance and business at the time, it may well have been associated with the lingering resentment which some in these quarters had for the political philosophy espoused by President Reagan. But there is significance in the fact that in going through the business-related books and populist press of that era, one cannot fail to note that the criticism of buyouts and takeovers *dominated* all other issues pertaining to business and finance.[23] Thus, the present study seeks to develop a *fact-based* and *empirically-validated* assessment of the totality of the private equity phenomenon, in contrast to the polemical assertions made in so much of this prior press.[24]

The second motivation for the present study lies in the works of economist George Baker. Baker and Wruck (1989) presented a detailed description of the organizational and strategic changes which ensued following the leveraged buyout of O.M. Scott, and delineated the ways by which the LBO as a governance structure was able to create (unlock) economic value by driving needed change. Changes in ownership, capital structure, strategic direction, and a re-invigorated

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[21] Among these were *Merchants of Debt: KKR and the Mortgaging of American Business* (by George Anders), *The Predators' Ball: the Inside Story of Drexel Burnham and the Rise of Junk Bond Raiders* (Connie Bruck), *Liars' Poker: Rising through the Wreckage on Wall Street* (Michael Lewis), *and Den of Thieves* (James B. Stewart). A popular movie carrying the same message came out of Hollywood around the same time; named *Wall Street,* a euphemism came out if it that entered the American lexicon for a time: "Greed is good."

[22] Mises (1956) offers a succinct but detailed exposition as to why it has long been so, that certain classes in the arts, education, or journalism professions are so virulently anti-business.

[23] This is in contrast to the present era, when a host of issues are blamed on the business classes beyond Wall Street: global warming, oil industry profiteering, Wal-Mart and union-busting, corrupt contracting, big pharma/health care and insurance industry exploitation, and Enron-type corporate scandals are only a few which come to mind.

[24] For example, not all writing of the early and mid 90s was in this anti-business vein. McKenzie and Lee (1991) do not specifically address private equity, but they concurrently surveyed the same landscape as Burrough & Helyar and came to an opposite conclusion about private enterprise: largely a force for good, the business and investor classes would usher in an era of accelerating productivity growth and wealth creation via new and disruptive (and networked) technologies, which would change industry scale and scope, decentralizing economic and political power at the same time. Their pre-Internet era predictions have been largely borne out in this regard, at least in terms of global productivity and hence wealth creation.

management all combined to produce success in this transaction. Later, Baker and Smith (1998) presented a history of KKR, coincidentally around the occasion of its 20th year in existence. At the time the firm had done some 75 deals (a number which has since doubled), and KKR gave the authors rich inside access to its end-to-end deal execution processes and governance philosophy.[25]

While not receiving the acclaim of the books and articles in the populist literature, here were examples of a more dispassionate and scholarly view of the economic efficacy of buyouts. In essence, then, the present work is part of a developing project to extend Baker's useful line of research to a wide swath of the private equity sector, to many PE firms instead of just one, and to many hundreds of deals analyzed at the transaction level, rather than just one.[26] For in replicating Baker & Wruck to cover a number of industries, transaction structures, and deal sizes, and in turn, by extending Baker and Smith to review the performance and investment and execution strategies of a larger sample of PE firms, we should be able to contribute materially dispositive knowledge to this literature, and toward certain unresolved debates among practitioners, and/or controversies brought on by the critics of PE.

Executive summary of empirical results

While deferring the explanatory details until later in the document, the following is a brief summary of the empirical analysis of private equity investment as described in the following Chapters:

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[25] Baker & Montgomery (1994), an operating and organizational comparison of publicly-traded conglomerates and PE firms (known then as "LBO associations", and which in many instances are tantamount to privately-held conglomerates), offers another interesting and useful line of inquiry, more from an industrial organization (IO) than a finance perspective.

[26] Of course there have been many other excellent academic papers on buyouts which we will review in Section III, but these works involving Baker are noted because the outcome of this research effort – a detailed *transaction level* analysis of private equity investing, conducted in quasi-panel data format involving multiple firms and several hundred deals across time – owes its genesis to him.

- Our data sample consists of 288 exited transactions, undertaken between 1984 and 2006. 19 two-digit industries and 28 three-digit industries are represented. Mean sample return is 40.1%, for mean deal size of $78.3 million. The sample beat the S&P 500 (9.91% IRR) and all other small-cap indexes we investigated. Mean leverage is 65.5%, debt pay-down ratio (total debt/ingoing EBITDA) is 3.71X, management equity is 19.3%, and PE firm equity is 55.8%. Mean holding time is 1752 days (4.8 years), and there are 35 bankruptcies (12.1%).
- 62.8% of the deals are control investments, and 55.7% involve ancillary (*add-on*) acquisitions.
- Over three quarters of the sample exhibit increased revenues and operating profits, and those transactions which do, in either case, vastly outperform those which do not. The same is true of increases in both capital expenditures and employment levels.
- Insights from agency-theory (e.g., Jensen 1986) and transaction-cost economics (e.g., Williamson 1988) are both substantiated here. Low-tech, slow-growth consumer goods manufacturers had the highest return transactions, highest leverage, highest levels of management equity, PE firm equity, and were controlling stakes deals. And, higher industry *betas* are significantly correlated with more equitized capital structures.
- IPOs had the highest returns as an exit type, followed in serial order by progressively *more knowledgeable buyer-types*: industry sales, PE firm sales, and then recapitalizations.
- Controlling stakes deals are characterized by twice the return levels, one-third to one-fourth the size, shorter holding times, much higher leverage, and lower debt pay-down ratios than their counterparts. They are also far more heavily concentrated in slow-growth manufacturing.

- *Add-on* acquisitions are the single most important determinant of transaction IRR for equity, and by proxy, firm performance.
- *Leverage* affects *equity* IRRs positively (+), and *asset* returns negatively (-), in a statistically significant way, across the entire sample.
- Management and PE firm equity amounts are not significant factors in firm performance on a sample-wide basis, but the former is highly statistically significant for firm-level regression analysis. Further, regression analysis at the firm level appears to indicate the existence of an *entrenchment* effect for management equity. Both variables are influential in explaining differences in performance between club/solo or minority/controlling stakes deals.
- In terms of driving operating performance improvement, ancillary acquisitions (via the *Add-ons* (+) variable) and *Leverage* (-) are significant in explaining revenue growth, and leverage (-) is key to understanding growth in EBITDA. That is to say, the fastest growing firms are burdened with the least amount of debt, supportive of Williamson (1988).
- Across the major industry groups of low-tech manufacturing, retail & distribution, and professional services, different parameters affect performance significantly *within* each industry in a different way. For consumer goods manufacturing, *debt pay-down* (-) (total debt/EBITDA) is determinative; *leverage* (-) is also important. For retailing and distribution, *leverage* (+) impacts returns in exactly the opposite way to consumer goods manufacturing. Secondly, *PE firm equity* (-) is a negative driver of equity IRR for this industry sector**.** For professional services businesses, ancillary acquisitions (+) are significant parameters leading to higher equity IRRs.
- In a statistically significant way, PE firms follow different *strategies* and have varying *execution models*, in pursuit of the common objective of optimizing transaction IRR of

equity. Deal parameters such as revenue and profit growth or exit multiple uplift are different in a highly significant way across the entire data sample, as are sub-samples based on deal type (e.g., solo versus club deals) for return on equity.

- Via intra-PE firm comparison, it is seen that the level of industry focus does not matter in terms of ultimate transaction IRR, nor does the specific industry-types which are the focus for each firm. Table 9 (at end of paper) bears this out, portraying the vastly different investing strategies pursued by each firm.
- What *does* matter in a crucial way is the PE firm's ability to exploit market knowledge, based on internal PE firm dynamics and the firm's *execution model.* Some firms appear to be simply *better* than others in the *deal process,* end-to-end, from deal procurement through to close, governance, and exit. Our continued research this year seeks to discern details of the drivers of these differences.
- Regression analysis at the *firm level* followed the same general patterns as for the whole sample, but not completely so. At the level of the entire sample, add-on acquisitions are seen to be an important driver of transaction IRR, but at the level of individual firms, while *economically significant* in many cases, their impact is superseded by the traditional governance and ownership parameters.
- At the individual firm level, leverage was seen to be positively related to value creation in some cases, and negatively in others. The results were consistent with the various firms' strategies and execution models, however.
- Prior researchers in private equity have consistently distinguished between two types of buyouts: agency-mitigating deals which often involve restructuring in mature, low-growth, low-*beta* industries; and growth-equity transactions in which the PE firm invests in a

company in a growing industry. There is a third categorical type as well, quite prevalent in this data sample and intermediate between these two but of its own kind: *coordination-improving* deals. These are often sound businesses which nonetheless can benefit from PE firm ownership due to resource access, specific expertise in a given (needed) area of the firm's value chain, capital availability for recombination of assets (most prominently, consolidation in a fragmented industry), or recapitalization and ownership transition. The intended result of these transactions is better *coordination* of deployment of a firm's assets, often in recombination with market-based resources.

CHAPTER 2. BACKGROUND ON PRIVATE EQUITY & CONTEXT OF RESEARCH

In order to illuminate the empirical results and analysis from our study as reported in Chapters 4 and 5 below, this section and the next provide background and context via relevant prior research and on the sector's historical development, current state, and current issues of import. Chapter 3 below briefly reviews the empirical literature about PE and buyouts which our research *specifically* follows. In this chapter, more *generally*, we first show the importance of understanding private equity to economists in two related fields. Any study concerning the history and impact of private equity necessarily touches both finance and industrial organization (IO), and there are indeed significant issues relating to PE in both. Hence a summation is first offered here of the themes and governing frameworks from these relevant research fields which pertain to this effort, and why they are important to PE. Then, before turning to the *specific* prior literature in the next section, a brief historical background and discussion of the current state of the sector provides appropriate context for our empirical investigations. We also enumerate potential contributions sought from our particular study that may inform these broader fields of specialty in economics, based on our novel approach to data collection and unique access to strategic detail.

Private equity, financial economics, and industrial organization [27]

In this section we develop the linkage between finance and IO with respect to private equity, and highlight common core concepts emanating out of research in both areas which influenced

[27] The following discussion, in which is it shown that private equity touches deeply upon key themes in these two major areas of research, is part of a more general point made about the commonality of key issues between the two (especially from Coase [1937] to Berle & Means [1932] onward) by Bolton and Scharfstein (1998), among others.

the design of the present study.[28] Because the term is used in different contexts to mean different things (or can be all-encompassing in categorizing equity investments which are fundamentally different), we begin with a delineation of the term *private equity*: it is simply an equity investment in a corporate entity which is not openly tradable on a liquid *public* stock market.[29] There are two primary flavors of private equity, based on stage and maturity of the investee company: *early-stage* venture capital ("VC") and later stage "growth equity" or buyouts of companies in more mature industries.[30]

Regardless of the type of private equity investment, there are three dimensions of analysis in these transactions which are informed by both industrial organization and corporate finance: (1) how the PE investors contract with their investee companies to monitor their activities such that they receive a return on their capital investment (that is to say, issues pertaining to *governance*); (2) the strategies and operating initiatives pursued by the leadership of the investee company (and this leadership is, in many cases, one and the same, or co-partnered with, the PE investors, particularly in the case of VC but in many cases in buyout deals as well) to grow the company and achieve profit and return targets (that is to say, the *entrepreneurship* – or as Knight (1921) would have preferred it, and perhaps more exactly apropos for our context in analyzing later stage buyout investing, the *entrepreneurial judgment* – that is inherent in these transactions); and (3) thirdly, the *coordination* of assets and resources in these transactions, both human and

[28] Megginson (1997), Williamson (1988), and Zingales (2000) are a few of the many excellent discussions of the links between finance and IO in broader contexts than private equity, but the buyout arena offers an almost perfect laboratory to see this linkage "in action", as will be seen later in this study. When considering private equity specifically, the most common linkage between the two fields clearly concerns issues surrounding corporate *governance*, but as is now discussed, *entrepreneurship* and *coordination of firm assets* are also, at least indirectly, aspects of interest in both literatures.

[29] While highly illiquid, private equity is not completely so; according to the Chicago Fed Letter (November 2006), there is an emerging secondary market for Limited Partnership (LP) interests which traded approximately $9 billion of marked-to-market shares in PE funds in 2006; this number is growing.

[30] As stated earlier, our sole focus in this study is on later stage buyouts or growth equity, but both forms of PE are structured in a similar format in terms of capital raising via a limited partnership which has a limited life. This discussion also ignores as not germane related PE categories such as mezzanine financing or distressed debt; we discuss the taxonomy more fully in the next section as it pertains to the history of the sector.

physical, both inside the investee company and outside it, which drive optimality in execution and hence maximize profits and investment return.[31] Our analysis of private equity transactions lends strong support to the thesis that the best investment deals are ones which score well on all three dimensions, and as we next show, the three concepts are part of the literature in both IO and finance (implicitly in the case of *coordination*).

Industrial organization involves applied microeconomics at the industry level, and is classically thought of as investigations into the "structure, conduct, and performance" of industries and markets, and firm behavior within them.[32] Issues involving the nature of competition in a given industry, varying competitive strategies or business models pursued by firms and analyzed via game theory (e.g., spending levels on advertising by oligopolists), and regulation in the face of market power are common in modern IO research. The line of inquiry directly relating to private equity, however, follows from the seminal article by Coase (1937), and has spawned deep research into the economics of organizations – often known as the *theory*

[31] *Coordination* is a concept which is not often discussed explicitly seen in the literature in economics; or, it is subsumed in discussions regarding the first two concepts, either *governance* or *entrepreneurship,* to both of which coordination is related. But it is a distinct concept from either. Kirzner (2000, Ch.7) hails it as the best criterion in welfare economics (for use in an economy-wide macro sense), and discusses it in connection with entrepreneurial alertness in his 1973 book, while for Hayek (1937, 1945) it referred to the fundamental service rendered by the movement of free prices. For Hayek coordination is *the* economic problem, involving the economization of dispersed knowledge by agents, and involves action both within and between firms and markets. Coase, the father of modern research on the firm's existence, boundaries, and internal organization, would agree with this concept, and it is what we refer to here. As we detail in Chapters 4-5, the ability to judiciously coordinate both human and physical assets, internal to the organization and with outside constituents such as suppliers, customers, or other investors, is a key driver of success in private equity investing. To say this differently, the most successful buyout investors are well-networked in terms of human capital, and know where to draw from in terms of resource needs up and down the firm's value chain, as they oversee their investments. This concept was found to be so important operationally in the deal-making of our participating firms that we discerned it is a *categorical driver* of PE transactions (i.e., the ability to better coordinate the portfolio firm's human and physical resources is a key decision point in whether or not to make the investment; this is apart from, say, ability to mitigate agency problems). We explain in detail below.

[32] See, for example, Carlton & Perloff (2004). Modern IO had its origins with investigations into why the neoclassical model of perfect competition breaks down, and oligopolistic behavior was more the norm that needed analysis (e.g., Chamberlin (1933) and Robinson 1969 [1933]).

of the firm -- and the new institutional economics.[33] The literature on the theory of the firm, which deals directly with the questions raised by Coase (why are there firms in the first place, and given that they exist, what delimits their size and boundaries) has in turn spawned research into the nature of *entrepreneurship*, which is an important driver of developments in private equity. Williamson's research on institutions, meanwhile, moves beyond the institutional *environment* (e.g., things such as legal and regulatory backdrop, commercial culture) and focuses even more so on institutional *arrangements* – what he calls *governance structures* – which arise in commerce between trading parties to effectuate transactions at the lowest cost.

As stated, IO research on *coordination* within the firm and its operating environment is less explicit, and not seen expressly very often outside the Austrian literature. However, Demsetz (1997) broaches this point in discussing new developments in the theory of the firm as moving beyond the "black box" of neoclassical theory (where the cost of using the price system – and all transactions for that matter – is zero) to incorporate use of the price system along with Coase's concept of *managed coordination*; this is categorically similar to our use of the term. More directly, Brickley, Smith, and Zimmerman (2004) describe an organization's *architecture* as comprising three aspects of the firm's organization: the decision rights assigned to various functionaries inside the company; the rewards and incentives built into the firm's compensation system geared to motivating certain behaviors; and the performance measurement (monitoring) system across the company. This concept of organizational architecture entails, or at least implicitly parallels, the concept of optimal coordination of the firm's resources, and involves all

[33] Hart (1995) has an excellent discussion on the evolution of the theory of the firm in its modern variants, and proceeds to link his property-rights theory to the firm's capital structure (which is in essence a series of contracts with suppliers of capital), in a way parallel to our approach here. Klein & Foss (forthcoming, 2007) update Hart via a comparative assessment of alternative theories of the firm, and focus on a key linkage between IO and finance regarding private equity: entrepreneurship (see below). O. Williamson (1975, 1985, 1996) is the father of modern transaction cost economics, which "operationalizes" Coase's questions concerning firm boundaries and internal organization models – and in 1975 formalized his conception of the *new institutional economics*. An excellent discussion and survey of the new institutional economics is found in Klein (2000).

internal touch points within the firm, as well as external relations (e.g., incentive plans for business partner distributors, or decision authority on make-versus-buy issues).

Meanwhile, financial economics as a separate and formal sub-discipline of the profession is relatively new; most economists credit the beginning of the field to the 1950s, primarily with the work of Modigliani and Miller (1958) in corporate finance on capital structure, and with Markowitz (1952) as the father of modern portfolio theory.[34] Prior to this time, Jensen and Smith (1984) say the field of finance consisted of mostly *ad hoc* theories or rules of thumb from practitioners, but in the latter part of the 20th century great strides were made theoretically (and by extension, empirically). They define financial economics in the modern era to consist of five building blocks: efficient market theory (the analysis of equilibrium behavior of price changes through time in speculative markets); portfolio theory (analysis of optimal security selection procedures for an investor's entire portfolio of securities); capital asset pricing theory (the analysis of the determinants of asset prices under conditions of uncertainty); option pricing theory (the analysis of the determinants of the prices of contingent claims such as call options and corporate bonds); and our major focus with respect to private equity, *agency theory*, which studies the control of incentive conflicts in contractual relations.[35] Agency theory is core to developments in corporate governance, and the *nexus-of-contracts* view of the firm which it embodies is steeped in the concept of intra- and inter-firm coordination of human and physical assets.

Zingales (2000) picks up on this theme and argues that much of modern corporate finance is indelibly linked to the theory of the firm. He asserts that three main areas of corporate finance –

[34] Corporate finance and investments are still the two primary sub-fields within financial economics.

[35] Jensen & Meckling (1976) authored the seminal work on agency theory, delineating the costs inherent in a principal contracting with an agent. Formalizing the argument of Berle and Means, they focus on the firm as a *nexus of contracts*; for Jensen, solving agency issues is foundational in any theory of organizations which is tractable, and was a primary focus for him in analyzing the 1980s LBO wave.

financing, governance, and valuation – are central issues in the main theories of the firm, which he reviews *in seriatim*. Thanks to various exogenous forces (globalization, technologies which shift scale and scope, deregulation, etc.) the nature of firms is changing, and for Zingales, ferment in the mix of firms, or start-up competitors entering an industry, is emblematic of entrepreneurship. And since entrepreneurship is this "process by which new firms are created", by definition to pursue *growth opportunities*, how they are valued and capitalized are central problems in corporate finance. Similarly, whether the firm is viewed as a nexus of contracts, a set of growth options, or a collection of assets, the allocation of decision and control rights is a central problem of governance now, with rapidly changing organizational form, scale, and scope of operation.[36]

The finance literature addresses the idea of *coordination* rather as indirectly as in IO, but it is pronounced in related research on compensation and incentives, and mechanism design which flows from the research on agency costs. For example, Baker, Jensen, and Murphy (1988) highlighted what at the time were growing areas of interest for economists in the theory of the firm (e.g., governance, agency conflicts, markets versus hierarchies) but pointed out that *incentive systems*, which at their core are the main drivers of the *coordination* of human resources within a firm, were not aligned with the goal of optimal profit generation. They made a very prescient prediction in 1988: that the coming era would see vast improvement in pay-for-performance systems designed to better coordinate and align the firm's internal resources with profit growth goals; Hall & Liebman (1998) reported years later that that had happened to a

[36] Rajan and Zingales (2001) make similar points, and argue that there has been a veritable "revolution" in finance itself, which, alongside changes in technology and deregulation, have made old ways of thinking about the firm obsolete. For example, new financial instruments, new modes of gauging creditworthiness, and new markets for access to finance have made the finance of a project – i.e., a growth opportunity – technologically *separable* from the firm itself. This can only lead to a reconstruction of firm boundaries, and has implications for governance, entrepreneurship, and coordination. Rajan and Zingales do not mention private equity and buyouts specifically, but the linkage is clear.

significant degree.[37] Ofek & Yermack (2000) confirmed this trend as well through the 1990s, but reported that incentive motivation for stock–based compensation was not linear across the management structure: low ownership managers retain and build their options, but already-high ownership executives routinely sell shares when awarded options (for diversification purposes). It is clear that incentive issues are complex, but are drivers of coordination and control within organizations. This is a key theme in the buyout phenomenon.

Coordination of firm resources is also implicit in the long literature on the incentive effects of capital structure. The classic presentation of this is Jensen (1986), the authoritative statement on the agency costs of excess free cash flow which still drives empirical research in finance and on buyouts today. More generally, Hart (1988) shows that the choice of capital structure can be analyzed from the agency-theoretic perspectives of bonding and signaling, but that a third rationale – *control and coordination* of corporate resources – is equally as important. As per the paradigm for which he is best known, Hart explains that in a world of uncertainty, contracts will per force be incomplete. Investors do not want to be saddled with incompetent management teams, for example, and capital structure can be designed as a mechanism which bypasses incumbent management. This potentiality for control can explain both the capital structure choice and the allocation of voting rights across various security types.

Finally on this point, the idea that the economics of organization crosses corporate finance can be made most prosaically merely by pointing out that in 2006, there were over $1.5 trillion in M&A transactions in the United States; more globally, $3.25 trillion worth of deals across 29,800 transactions are the totals when all of Europe is added.[38] Organizational strategies and

[37] Kaplan (1997) and Holmstrom & Kaplan (2001) argue this is precisely *due to* the influence of the buyout phenomenon in inducing governance changes in corporate America.
[38] Source: Thomson Financial, R.W. Baird & Co.

structures are in constant ferment as markets change, and this is a prime reason for the growth of the private equity sector, which is now a large subset of all M&A.

To summarize, the point of the foregoing discussion is that the study of private equity at the *transaction level* can inform two sets of researchers: those concerned with agency-theoretic issues (and, information asymmetries as well) in corporate finance, and those concerned with internal firm organization and the drivers of shifting firm boundaries in IO. Our review of 288 exited buyouts discussed below, along with accompanying discussions with the deal-makers, showed repeatedly that three key aspects to these transactions driving firm improvements were (1) changes in *governance* (e.g., higher equity pay for management – though in our sample this was economically, but not statistically, significant); (2) changes (or deep assistance) in *coordination of firm assets* by the PE firm (e.g., Board level assistance with internal control systems, banking relationships, procurement of new suppliers, employees, or business partnerships); and, (3) *entrepreneurial initiatives* (e.g., execution of a roll-up series of acquisitions in a fragmented industry). Of these three, governance changes tend to command attention of observers, perhaps as a legacy of the buyout boom in the 1980s, when in fact governance changes *were* the key driver of these deals.[39]

However, both for our PE sample, which contains mean transaction size of $78.3 million, and for the mega-deals announced in the press to great fanfare, increasingly the rationales presented for the transactions pertain to growth opportunities, or entrepreneurial initiative. The high-return opportunities of under-managed businesses riddled with agency issues have been dissipated in an

[39] The best survey of the literature on corporate governance remains Shleifer & Vishny (1997); see also Zingales (1998) and Denis & McConnell (2003); the latter focuses on non-US governance practices across the world, where there are major differences. Kochhar (1996) compares the underlying theory of governance changes effectuated through capital structure shifts from two competing vantage points: finance (agency-theory) and IO (transaction cost economics), and this work awaits empirical exploration. Our research indicates that while *governance* is still a motivating force in buyouts, issues of improved *coordination* of firm assets or *entrepreneurial exploitation* of growth opportunities are now increasingly a rationale for PE deals (heavily so at least, at the smaller end of the deal-size spectrum).

efficient market for corporate control and the impressive macro-productivity of the U.S. economy in the last 20 years.[40] Both currently and moving forward, then, the U.S. should see PE deals done more on the basis of entrepreneurial growth or improved coordination of firm resources. In this case the thesis posited by Malmgren (1961) becomes important: the major reason for the existence of differential rates of profit in an industry – and by extension in a PE deal based on better coordination or entrepreneurial growth -- is the *division of knowledge* in that industry. Because a firm's market knowledge is often contained within internal silos or isolated pockets, those who possess it must have some incentive or positive motivation to share and disseminate it enterprise-wide. Thus, firms which are structured to better exploit (that is to say, better *coordinate*) their market knowledge will see competitive success in a relative sense (as an example from PE, it is not uncommon to see investment in an already fundamentally sound firm which might nevertheless entail change of management to an industry insider – an entrepreneur – who has superior knowledge of strategic growth opportunities).[41]

One final comment on the IO literature as it pertains to private equity is worth noting. Williamson (1988, 1996) encourages analytical conclusions on organizations to be drawn through the transaction cost economics "lens" of incomplete contracts. For Williamson, incompleteness of contracts is a *given* in a world dominated by *bounded rationality*, in which there are limits to individual cognition (Kirzner [1973] calls this radical or *sheer* ignorance, in which not even the probability distributions of future possible events are known). As such,

[40] This is less true of Europe, where market inefficiencies are still considerable relative to the U.S. and hence the buyout business is booming there.

[41] The best formulations of entrepreneurship as it is seen in the private equity sector are Klein (1999) and Foss & Klein (2004). Both papers build from Frank Knight's conception of the entrepreneur as a bearer of risk, and hence with capital invested in forward-looking ventures, and in need of *judgment* about future prospects to successfully engage in forward-looking investment. Similarly, Rothbard (1962, pp. 464-470) describes the economic role of the *capitalist-entrepreneur*: "Do profits have a social function? Yes, profits are an index that maladjustments are being met and combated by entrepreneurs. Capital does not beget profit (as Marx held). Only wise entrepreneurial decisions do that." This captures PE's essence.

during the contracting process which ensues in commerce, institutional arrangements – governance structures – will arise to address the problem posed by pervasive uncertainty (or more broadly, market imperfections), and these will over time be transaction cost minimizing. Seen in this light, private equity *itself* is an institutional response to mitigate a vast array of contracting problems in organizations, or posed by situations facing entrepreneurs. This offers one answer to Margaret Blair's query at the outset of this essay: why is private equity still so pervasive, long after agency problems have largely been ameliorated? The next section traces out the history of PE's persistence and growth as a financial institution in the modern economy.

Summary background and historical development of private equity [42]

The term "private equity" is a relatively recent moniker, and is but the latest variant used to describe an ancient and venerable practice: the placement of risk capital in support of funding enterprise growth. Said equivalently, it is the joining of the *capitalist* and *entrepreneur*, the marriage of finance and operations in pursuit of business growth and profit, via the placement of *patient capital* (often accompanied by the PE professional's strategic advisory services) in highly illiquid form into an enterprise to support its growth.[43] The forerunner to the modern era of private equity has its origins in the Italian city-states of the Middle Ages, when family-owned

[42] The following section was greatly enhanced via discussions with Josh Lerner, who also sent me his lecture notes, and practitioners Brian Simmons (Code, Hennessy, & Simmons), Kevin Callaghan (Berkshire Partners); Chip Walker (Riverside Cos.), Tully Friedman (Friedman, Fleischer & Lowe), and Scott Warren (Milestone Partners), all of whom are most knowledgeable regarding the history of the sector. Fenn, Liang, & Prowse (1997) offer a concise but thorough overview of the private equity sector's industry structure and underlying economics. Lerner, Hardymon, & Leamon (2005) is an excellent text in terms of background information and how the private equity sector operates today. See also Craig (2001).

[43] Rothbard (1962, Chapter 8) contains an excellent discussion of the duality inherent in these concepts; Mises would agree with this. He argues that because man is a *praxeological* being, acting purposively to remove a *felt unease* about the future, there is an element of entrepreneurship in all action. Meanwhile capitalists also face an uncertain future and hence "place bets" with their funds in tandem with entrepreneurs (1949, page 502). Hart (1995) pays appropriate due deference to the formal models of neoclassical price theory, which have utility in various settings via their analytical tractability. But he decries the *theory of the firm* arising from neoclassical theory; it is a "black box" into which inputs are placed, yielding outputs which conform to the laws of marginalism, but devoid of the entrepreneurs (and capitalists) who effectuate production – who "make things happen", according to Brian Simmons.

trading houses began to use their excess capital to finance trading ventures in return for a share of the profits. As specialization and the division of knowledge spread with the development of capitalism, banking institutions became adept at *merchant banking* – the practice of both funding ventures based on credit analysis, taking on an advisory role in the business, and having "equity upside" in these transactions as well.

In the modern era, the private equity sector dates to 1946 and the advent of the American Research and Development Corporation (ARD). As Fenn, Liang, and Prowse (1997) describe it, General Georges Doriot, a Harvard Business School professor, teamed up with the Federal Reserve Bank of Boston Chairman Ralph Flanders to found ARD as a publicly-traded closed end fund. ARD was formed in response to the need perceived by the founders that there were inadequate institutions in place to support entrepreneurs in need of both growth capital *and*, as importantly, strategic advisory services to support the execution of the business plan.[44]

Over its 25 year history, ARD proved successful, returning to investors an IRR of 15.8%. But these investment returns were back-loaded and the concept was not proven through the 1950s; hence there were no follow-on entities, and the general concern of inadequate capital availability for small businesses continued.[45] As a response, in 1958, Congress passed the Small Business Investment Act, formally authorizing the chartering of Small Business Investment Companies (SBICs), governed by the Small Business Administration (SBA). The SBIC model calls for equity capital to be matched by government-backed lending at up to a 2-to-1 ratio, and targets small businesses meeting certain criteria. Within five years there were 47 publicly traded

[44] As an interesting side note, ARD's founders also feared the development of New Deal-like government funding agencies – a concept being heavily discussed after the war -- which would ostensibly be set up to support the development of small business; they founded ARD to promote the concept of private sector-based growth equity.

[45] The exception to this was in the growth of formal *family offices* after World War II – the investment vehicles of wealthy families such as the Rockefellers or the Whitneys (and J.H. Whitney & Co. is still an ongoing and successful private equity firm in New York today). Beyond traditional asset classes, these entities invested in what today are furcated into venture capital, buyouts, real estate, hedge funds, and other alternative assets (e.g., oil & gas partnerships or timberland, commodities, etc.)

SBICs which had raised over $350 million, and in spite of problems over time (e.g., poor investment managers), the program channeled record amounts of capital to small businesses.[46]

By the early 1970s, after some of the SBIC-backed investments had gone public during a booming stock market, investment professionals saw the opportunity to form limited partnerships to undertake the same ventures with both more flexibility and better compensation, and the modern format for PE was born. Up until the mid-1980s, the early stage venture capital (VC) partnerships received the majority of funding, but since 1986 only two years have seen more VC funds raised than buyout funds.[47] The structure of these limited partnerships has changed little since their advent in the early 1970s: typically 10 years in life with extensibility to 14 or more, they consist of a general partnership run by a PE firm, and limited partner investors, which today can be premier institutions (endowment funds, pension funds, insurance companies, etc.) as well as high-net worth individuals or family offices. The PE firm charges a management fee – typically 1.5% to 2.5% of funds committed (or in later years of the partnership, funds placed) -- and captures a percentage of resultant profits, typically 20%. The general partner pays out the other 80% of fund profits to the limited partner investors, and in recent years they also have

[46] The oldest publicly-traded SBIC still in existence, Allied Capital Corp. of Washington, D.C., dates to 1958 and has been interviewed pursuant to this research, as has Capital Southwest of Dallas.

[47] This brings us to a quick digression on the taxonomy of the private equity world as mentioned on page 13 previously. "Private equity" as a term is today used in two ways. Some use it as an all-encompassing turn of phrase to describe all formalized (i.e, limited partnership format, or equivalent) equity funding of businesses, from early stage venture capital to later stage buyouts. Other people use the term "private equity" or "PE" in reference only to later stage buyouts (as we are wont to do herein), as distinct from VC. The term "Leveraged Buyout", or "LBO", was the way the latter were described beginning in the mid 1980s, but this came to be a term of opprobrium after the bad press of the late 1980s and early 1990s; hence "private equity" was born. "Private equity" is a better descriptor for late stage investing in the sense that today, many transactions are *not* buyouts, though studies of same predominate in the academic literature due mainly to data accessibility. But today, minority growth investments that may well not involve a change in control are common, as are forms of "strip financing" in which debt-equity hybrids are sourced from the same PE funding entity. There are also specialists in debt funding who are within the PE orbit today, as an option (or complement) to growth equity. Lastly there are new transaction types (e.g., PIPEs, or "private investment in public equities") as well as the encroachment of hedge funds into the illiquid world of PE as new developments which are growing in the sector. The main reason for the agglomeration of early stage VC and later stage buyout investing into a discussion of private equity is that the structure of investing via limited life limited partnerships, and the provision of capital accompanied by Board oversight and strategic advisory services, is common to both.

demanded and gotten preferred return provisions as well (e.g., 8% per annum guaranteed, before the 20-80 formula kicks in).

The modern era for private equity with respect to later stage buyouts dates to 1979, when Kohlberg Kravis Roberts & Co. (KKR) bought Houdaille Industries for $355 million. It is worth briefly recounting the Houdaille story here as an archetype and harbinger of the explosion in LBOs which were to follow.[48] As a general (stylized) matter, an LBO is an acquisition in which borrowed funds comprise a substantial total of the transaction value involved, and hence the new owners are saddled with large amounts of debt in their capital structure. These borrowings are most able to be procured when the firm is in a stable, mature industry, with low variability to cash flows, and physical assets which may be used as collateral for the borrowings. Products market developments, customer lists, distribution partnerships, the use of technology, and intensity of competition are also preferred to be low-variability and unchanging by lenders, to ensure loan repayments.[49]

Houdaille Industries of Fort Lauderdale, Florida met many of these criteria. Founded in 1925, by the time of the KKR deal Houdaille was a conglomerate corporation ranked among the *Fortune* 500, and produced automobile bumpers, machine tools, steel and a variety of other

[48] This account of the Houdaille deal is gleaned from Anders (1992) and Baker & Smith (1998). The leveraged buyout was not "born" with Houdaille; indeed, KKR's founding troika had arranged these transactions while working together at Bear Stearns after 1968. And businesses have been acquired on leverage from time immemorial, with bankers such as J.P. Morgan adept at the art. But the heavy leverage employed in a cyclical company buyout in the midst of a recession, with the various tranches of debt provided by institutions who were specialists in a particular form of risk-bearing, took the LBO art form to a new level of visibility with this transaction. Additionally Houdaille was effectively a *Fortune* 500 multi-divisional conglomerate, which might see more value realized when reorganized.

[49] According to Jensen (1986), businesses in mature industries with excess free cash flow, which often meet all the above criteria, are perfect candidates for LBOs – and hence the theory expects that we should witness them in industries with a low human capital–to-assets ratio. Jensen went on to say that the main problems in these companies were associated with poor *governance* – specifically, the owner-shareholders and the managers did not have aligned interests. In Jensen's view, a recapitalization involving higher leverage would bond the managers by restricting their ability to burn excess cash flow on sub-optimal projects; higher pay-for-performance via equity would incite better managerial output; and tighter board monitoring by *active investors* would engender focus. These are of course the key governance features wrought by an LBO.

products. It employed 7700 people and had annual revenues hovering near $400 million. Houdaille had a conservative capital structure due to the cyclicality of its businesses, with only 16% of debt to total capital (much lower than its industry average), and considerable cash reserves on its balance sheet. In the modern parlance, there was considerable value to be "unlocked", with the only concern being the cyclicality of the automotive parts industry.

Kaplan (1989a, 1989b) and others find that buyouts derive their value from multiple sources, including the disgorgement of excess free cash flow, and the tax benefits of debt finance.[50] Congruent with the theory, Houdaille was therefore a prime candidate for an LBO; it had all the desired attributes except for industry stability (which was one reason this transaction became so famous and spawned the explosion in leveraged private equity investing). KKR saw the value to be unlocked via the debt alone: the firm had after-tax profits of $28.5 million, but paid $22 million in corporate taxes. The interest-deductibility alone on the debt would procure major tax savings and improve cash flow.[51]

The resultant capital structure was highly leveraged: $300 million in various tranches of debt (one senior and three subordinated in various ways and on various terms); $25 million in equity capital, and $25 million in preferred stock raised from institutions. KKR itself put in only $1 million of equity and assumed control of the firm. Both because of the heavy leverage and the fact that it happened for a firm which experienced industrial cyclicality, the deal sent shockwaves across Wall Street, and the modern buyout boom was born.

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[50] See the next chapter for a review of relevant research.

[51] KKR also benefited from the fact that Houdaille was being sought by other purchasers who were disliked by incumbent management – they could thus act as a "white knight" in their acquisition. This raised the potential of a conflict of interest between the firm's managers and outside share-holders, who might have preferred the other bidder paying a higher price (and this is a point receiving heavy criticism from writers unfavorable to private equity). But in fact, over time, target share-holders have been shown to not only not suffer welfare losses due to this conflict, but to be rewarded with handsome market premia in valuations (see, e.g., Andrade, Mitchell, & Stafford 2001). In Houdaille, the transaction was executed with a premium over 50% above the pre-announce price.

Evolution of the buyout sector to current state [52]

The private equity sector has evolved in dramatic ways since the Houdaille transaction that ushered in the modern era, and in this section we highlight trends and changes. First, the industry boomed throughout the 1980s, with the number of buyout transactions growing from 4 recorded in 1980 to 484 in the peak year of 1989 (which was unsurpassed in terms of deal numbers until 2005 and 2006). After the collapse of the junk-bond market, tax law changes, and war and recession, buyout activity receded in the early to mid 90s, but witnessed a renaissance after 1997 which was only briefly interrupted by the 2001 recession. Summary points on the last quarter century's evolution of private equity are as follows:

- First let us dispel a myth which has been promulgated by critics: the leveraged buyout wave did *not* cause an "over-leveraging of corporate America". By the late 1980s this was heard so often that Merton Miller felt compelled to address it directly in his Nobel Lecture (1991 – entitled, appropriately enough, "Leverage"). Miller pointed out that the success of buyout investing in the 1980s had certainly been derived from the large operating efficiency increases as well as from tax-advantages to debt in these deals. And, in any case, both the *total risk* to the firm, as well as the *social risk* to the economy, are independent of average leverage levels of firms. If leverage in corporate America had increased, Miller asserted, one could know via M&M that all this meant was that risk was being partitioned differently throughout the system – not that systemic risk itself had increased. As shown in Appendix 7, the mean levels of long term debt (via 3 different stock universes, small-cap to large) show no pattern since 1965, and certainly no peaking during the height of the buyout waves.

[52] Virtually all material in this section comes from Thomson Financial, whose M&A and VentureXpert data bases are useful but not considered extremely reliable. Kaplan, Berg, & Sensoy (2002) use the phrase "unbiased but noisy" for VentureXpert; the same appellation could describe to SDC-Platinum. However, at least trends and magnitudes of change are captured, and "true" numbers may not be materially off what Thomson presents.

- Appendix 8 depicts buyouts as a percentage of GDP, a useful barometer of the relative importance of private equity in the economy. It is interesting to note that in terms of both inflation-adjusted dollars and number of transactions, 2006 was a record year for buyouts: 671 transactions and nearly $400 billion.[53] However this was 2.97% of GDP, as compared to 4.12% in 1988. This is testimony to the growth and resiliency of the U.S. economy in the modern era, and also to the growth of private equity in the funding of America's businesses. At $497 billion in 2006, private equity would represent over 31% of all M&A transactions. Lastly, Appendix 8 shows that after the heyday of buyouts from 1984-89, there was a lull in the 1990s, but the sector is prominent again.
- The 1980s transactions were dominated by restructuring low-risk industries, allowing for the high degree of leverage, which after asset sales and a reconfigured business model often led to an IPO or sale to an industry buyer. Appendix 9 breaks down the 7500 announced deals in the Thomson data base since 1979 by industry type and number of deals per year. Three SIC codes dominated the 1980s, and they are the three which agency theory would predict: 3000 (plastics, basic manufacturing, heavy machinery -- e.g., old line industrials), 2000 (food/beverage/chemicals), and 5000 (wholesale/distribution/retail industries). There has been no industry trend per se since then, though the service industries (7000 and 8000) received attention from deal-makers as time and experience were gained. But as a general proposition, buyouts tend to be better suited to industries were the ratio of human capital to total assets is lower rather than higher, and the ratio of physical assets to total capital (yielding a low-beta stock) is generally higher rather than lower.

[53] R.W. Baird estimates total buyout deals at $487 billion inclusive of small and middle-market deals not captured by Thomson.

- Appendix 10 confirms the trend of deals to have come in two waves, and the current era is the peak of the second. In inflation adjusted dollars it is shown that 2006 was the biggest year ever for buyouts (as well as for number of deals); what is also of interest are the last two columns of Appendix 10 – the percentage of deals done, and percentage of dollar spending on buyouts, adjusted for inflation. 2005-2006 represent one quarter of *all* transaction dollars spent since 1979, but only 15.3% of the 7500 announced transactions, meaning that dollars per deal has increased dramatically. In fact, average transaction value doubled from 2005 to 2006, from $293.4 million to $585.7 million (in inflation-adjusted terms, this is second only to 1988, which contained the RJR transaction – if it is excluded from 1988, the two years are only 3% apart, again in inflation-adjusted terms). Appendix 12 shows this trend by listing the ten largest buyouts of all time – eight of the ten have come in 2006.
- The growth of the industry can also be shown by amounts of fund-raising, and professionals and firms in the industry. 2006 was a record year for global capital committed to private equity of all types, and $215 billion was raised for buyout funds alone in the U.S. and Europe.[54] Fundraising for the US and Europe has grown steadily since 1980; growth in funds spiked in the late '80s, and after a few years' lull commitments accelerated through the 1990s and into the new century. Excepting the 2001 recession and 2002 global slow-down, then, growth has continued throughout the time depicted. What is striking about the strong growth in private equity funds raised is the comparison between these figures and the amounts raised in *public equity*, via IPOs. Table 1 below lists IPO data since 1998, with the lower row carrying U.S. buyout funds raised, according to Thomson Financial:

[54] Source on fundraising: Thomson Financial. One industry observer indicated to us that over $700 billion was committed last year, including distressed debt, mezzanine, and the broader categories including real estate.

TABLE 1. IPO DATA MATCHED AGAINST PE FUNDS RAISED (U.S.)

Summary IPO Data 1998-2006									
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
No. of Deals	247	486	406	83	70	68	216	194	198
Total Proceeds (billions)	$45	$93	$97	$41	$24	$15	$43	$34	$43
Average Deal Size (millions)	$181	$191	$240	$491	$338	$224	$198	$175	$217
Source: Renaissance Capital									
Private equity $ from US only:	$62	$62	$78	$44	$24	$29	$50	$95	$105

What this shows is that in the last four years, more private equity than public equity (for IPOs) has been raised, and the difference grows in recent years. To be sure, seasoned offerings are not included in these figures, but this highlights the growing clout of private equity and its importance as an asset class.

- Other parameters which portray the growth of the private equity sector are the number of firms which have formally raised funds, and the number of professionals in the industry. There is no central repository of information on these numbers, but there have been reasonable figures published recently from which estimates can be drawn. Alston & Bird, LLP published a report in mid-2006 in which they claimed there were now 1800 buyout firms in the United States, up from 1000 in 2002. *Private Equity Analyst* runs an advertisement for access to a data base containing 1250 buyout firms; either way, this is a considerable increase from the 1990s. Brian Simmons of Code Hennessy & Simmons LLC informed us there were 15,000 professionals in private equity now in the United States; we could find no source to confirm this, and organizations such as the National Venture Capital Association (NVCA) do not break out buyout versus early stage venture funds. However, the

British Venture Capital Association (BVCA) does, and they claim there are currently 5500 personnel in the buyout business in the UK, of which 3500 are investment professionals. A number three times this figure seems reasonable for the United States based on deal volumes, so Simmons may not be far off. Perhaps more telling, Alston & Bird report that in 1989 there were only 5 firms who had raised a collective total of more than $1 billion; today there are over 200 in the U.S. (and we have 4 in this study).[55] By any measure, private equity *is* an industry sector now.

- This growth in PE has led to a secular decline in returns as committed funds have increased. The business is more formalized today, with even the smallest firms put up for competitive auction as orchestrated by boutique investment banking firms.[56] At the same time, the 1980s-style deals involving restructuring and high amounts of leverage have given way to a much larger variety of transaction types. The maturation of the buyout sector has forced firms to seek new modes of execution, and there has been a marked strategic differentiation

[55] As of this writing, Blackstone is in the midst of raising a $20 billion fund; Carlyle Group, Texas Pacific Group, and KKR are all seeking to do the same. Silver Lake raised a $10 billion fund in 2006 exclusively for *high tech* buyouts, which in general are thought to be a riskier industry class; Providence Equity Partners raised a $12.5 billion fund for media and telecommunications last year. There is now conjecture on Wall Street as to when the first $100 billion buyout will occur; it would require $30 billion or so in equity, and hence would be done by a consortium of the bigger PE firms; perhaps the challenge would be in finding $70 billion in debt in the case of some sort of restructuring. The largest merger deal of all time was the AOL/Time Warner $160 billion deal in 2000; it seems possible that a $100 billion buyout could occur in comparison.

[56] Kaplan & Stein (1993) describe this effect for the 1980s; as funds committed grew in the buyout arena, concurrent with rising equity markets (and hence P/E ratios) in the U.S., prices paid for LBO deals rose accordingly, and returns fell. Gottschalg & Zipser (2006) find the same results in analyzing 684 buyout transactions from 1981-2003, from data garnered primarily from LP investors (and a few GPs); Gompers & Lerner (2000) corroborate these findings for venture deals as well. The secular decline in returns has resulted from increasing liquidity and the efficient allocation of capital in the U.S. wrought by private equity; there is now an effective market for corporate control for small private businesses as well as greater access to expansion capital. One anecdotal example of this involves two participants in our study: in our data analysis we came across a Florida company, Arr-Maz Custom Chemical, bought by PE Firm D for $19 million in 1993 and sold in 1997 for $40 million; the same company was bought by Firm J for $113 million in 2003, and sold in 2006 for $157 million. Firm D told us that yet another PE firm was the buyer to whom they sold in 1997, and hence owned the company between 1997-2003 and our two firms. These PE firms fueled the growth of Arr-Maz through ancillary acquisitions in a fragmented industry, and investments in marketing and operations, growing the company eight-fold in 13 years. This is an example of the wealth-creating potential of private equity: increasing jobs, incomes, capital expenditures, tax base, corporate profits, and hence efficiency.

among firms (and we describe this in our own study participants in Section V). GTCR, for example, is well-known for seeking to consolidate fragmented industries in "roll-ups", by finding a platform company and then making "add-on" horizontal acquisitions to build scale, prior to an IPO. Our study results in Chapter 5 confirm this is a superior investing strategy, but it is the source of great debate in the buyout world today, as skeptics claim that ancillary acquisitions can drain resources in small companies, and the yield is not necessarily any better than public company acquisitions. Bain Capital meanwhile is noted for seeking target acquisitions in which there is a clear opportunity for value-capture based on undervaluation of existing assets, or in which a change in strategy (better *coordination*) would yield better results; Thomas H. Lee seeks growth stories in fast-growing industries.

- Therefore, for the dual reasons of "more money chasing deals" (as per Gompers & Lerner's phrasing) and increased process efficiency in M&A transactions, private equity returns have been in decline. Indeed, virtually all major PE firms who have been in private equity since the 1980s have witnessed this secular decline in fund returns. This is seen dramatically in the quarterly reports from Thomson Financial, and their returns tracking from the VentureXpert data base. Table 2 below lists the short and long run pooled IRRs of major PE classes of investments (buyouts are furcated by size; VC investments by stage of deal):

TABLE 2. IRRs FROM THOMSON FINANCIAL ON P.E. & V.C.

Source: VentureXpert data base. Through September 30, 2006.

Fund Type	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr
Early/Seed VC	2.90	5.50	-5.40	38.30	20.50
Balanced VC	10.70	12.80	1.80	16.80	14.60
Later Stage VC	27.80	10.50	2.70	9.40	13.90
All Venture	**10.80**	**9.40**	**-1.00**	**20.50**	**16.50**
Small Buyouts	11.30	9.40	5.00	6.00	25.20
Med Buyouts	37.20	12.30	6.10	10.90	15.30
Large Buyouts	23.10	16.40	8.30	8.30	12.40
Mega Buyouts	23.40	16.20	10.10	8.90	11.60
All Buyouts	**23.60**	**15.60**	**9.20**	**8.80**	**13.20**
Mezzanine	-8.10	4.70	2.90	5.90	8.40
All Private Equity	**19.00**	**13.20**	**5.90**	**11.20**	**14.00**
NASDAQ	5.50	7.80	8.70	7.10	11.40
S & P 500	9.70	9.90	5.20	7.50	9.70

Source: Thomson Financial & National Venture Capital Association
These are the latest quarterly statistics from Thomson Financials' *VentureXpert* database analyzing the cash flows and returns for over 1860 U.S. venture capital and private equity partnerships, with a capitalization of $678 billion. Sources are financial documents and schedules from Limited Partner investors, and General Partners. All returns are calculated by Thomson Financial from the underlying financial cash flows. Returns are net to investors after management fees and carried interest. Buyout funds sizes are defined as the following: Small: 0-250 $Mil, Medium: 250-500 $Mil, Large: $500 million to $1Billion; Mega is 1 Bil +. Note: these are *pooled IRRs*.

As described below in Chapter 3, Kaplan & Schoar (2005) claim that net of fees, buyout funds *under-perform* the S&P 500, and certainly cannot be justified in terms of reward for illiquidity. Here in 2007, a few years after Kaplan & Schoar was published, we see that buyout return numbers appear to have improved after two excellent years of exits in strong and rising markets.

However, we close this discussion by noting that this hardly settles the ongoing debate about returns, and certainly does not negate the industry's reality that this sector is now highly competitive and will see declining returns over time. For one thing, the calculations above are

noisy due to marked-to-market non-exited returns from some firms, especially for the close-in years to the present (all data are self-reported); a corollary to this is that no serious limited partner monitors its PE portfolio by looking at "one year returns" on these highly illiquid investments. Secondly, the Kaplan & Schoar result concerning persistence of returns has caused a stir in the industry, as GPs compete for limited LP commitments. The net result of this will be increased standardization of reporting and better intra-PE industry returns information for all participants, which will help to liquefy this sector over time. Finally, we discerned a curious point in discussion with GPs during this research; this industry is populated by the brightest finance professionals in the world, but true discounted cash flows (and resulting valuations) are not used). IRRs are reported as, generally, arithmetic means. It is easy to construct a simple example of the potential faultiness of ignoring *value-weighted* IRRs, as well as fully discounting the time value of money. Until the PE sector codifies uniform reporting utilizing these concepts, the discussion of IRRs will always be somewhat "apples-to-oranges", as one industry veteran remarked.[57]

Context of private equity vis a vis key issues in modern finance

The just-mentioned controversy about the reporting of returns, and Kaplan-Schoar's unsettling findings in 2005, is an issue of major concern in the PE sector at the present time. As

[57] We leave the exercise to the reader, as it is familiar to any first year finance student, but we note the issue here because there is such pervasive *mis*-reporting of performance and investment returns in the industry. We also bring it to the attention of the discerning reader because this is probably one contributing reason to the returns *persistence* which Kaplan & Schoar (2005) identified, and for the persistence of LP investor returns which Lerner, Schoar, & Wong (2007 forthcoming) have in corollary fashion reported. The "smart LPs" know who the "smart" buyout firms are, and feel no need to divulge returns information; they do not want to lose their coveted slots in line to participate in the best GPs' next fund-raises. The same is true for the best GPs; their track record sells itself. Hence there is no uniform institutional pressure for better information on returns or standards to be developed. And the lack of adherence to the optimal way to report investment returns means that poor-performing funds can "tell a better story" than their real track record might admit. Rothbard (1962, Chapter 8) however points out that the competitive whip of free markets will soon correct this: "the capitalist who earns losses will witness society pulling its resources away from him in short order". And in private equity, we have seen formerly premier firms stumble (e.g., Hicks Muse, Forstmann Little), and lose the ability to raise follow-on funds. The PE sector is *weak-form efficient*, after a fashion.

we are in the midst of this extended research project on the history and impact of the private equity sector, we note the following issues which are also controversial, and upon which our investigation hopes to shed light:

1. ***Agency costs of overvalued equity*** **–** Given record levels of global fund-raising for buyouts in 2005-2006 ($400 billion combined in the last 2 years, following a strong 2004), there is approximately $1 trillion in *conservatively* capitalized funds available for acquisition by buyout firms. But the explosive growth in buyout fund dollars available for placement has not been matched by a corresponding increase in the supply of quality target companies available. This ensures heightened competition and rising valuations for deals in the near term, and poor prospects for returns for funds raised in the 2005 and 2006 vintage years. Jensen (2005) analyzes the significant failures in governance in recent years (that led to Sarbanes-Oxley) and the inherent incentives ("organizational heroin") to maximize a firm's short term stock price, and notes that Warren Buffett is the only public company CEO he is aware of who gives explicit warning when he believes markets have overshot on Berskshire Hathaway's share prices. Jensen does not explicitly mention private equity in this article, but his conclusions apply. There is no question that there are now significant *agency costs* in PE firm/limited partner relationships, and the "organizational heroin" problem has hit private equity as well. For, say, Blackstone to raise a $20 billion fund at their requested all-in 1.9% management fee, they thus guarantee a $380 million annual pay-in for fees alone, irrespective of fund performance. Further, with those vast sums which must be put to work, they are almost assured of over-paying in multiple cases; every transaction now in the mega-buyout world is run via competitive auction. Finally, Blackstone now often enters into transactions in syndicate, or so-called "club deals"; our research findings as shown in

Chapter 4 confirm what some in the industry believe: syndicated deals have not performed as well as stand-alone deals where the PE firm has full decision control.[58] It is highly ironic that the private equity sector, which grew in the 1980s partly as an impetus to mitigate agency problems in large American corporations, is now the repository of serious conflicts of interest itself, at the high end of the sector and involving some of the most storied names in private equity. Our research over time will investigate this matter.[59]

2. ***Long term competitive shift in industry regarding deal types*** – The 1980s witnessed a large number of "Jensen (1986)-style" agency-mitigation transactions in the U.S., in contrast to U.K.-based growth equity deals, according to Renneboog & Simons (2005), who further argue that this type of transaction continues to predominate in the U.S. To the degree that they are correct, it is in any case also true that there are now many more cases of growth equity or *coordination*-improvement deals now available in the U.S. This requires new skills (e.g., operating managers resident in the PE firm) and a new operating paradigm for long term survival in a higher-risk, lower-return PE sector which is far more mature (competitive) than 20 years ago. "Financial engineering has become a commodity, " said Scott Warren of Milestone Partners when commenting on the matter. New ways to add value must in operations, strategy, or execution must be developed.
3. ***Implications of shifting deal types*** – A corollary of the competitive pressures to differentiate is driving strong debate within the private equity community about how best to accomplish this. Munari, Cressy, & Malipiero (2006) show that IRRs increase when led by industry-

[58] Nikoskelainen & Wright (2007) report the same result as our finding.
[59] One trend emblematic of the growth of capital placed in private equity is the rise of *fund-of-funds*. Similar to their counterparts in the hedge fund world, these are pools of capital which place investment dollars in multiple PE firms' funds; this affords the limited partner/institutional investor an added level of diversification. It has led to greater capital inflow and liquefaction of private equity, as these funds are especially able to trade interests in a given PE fund on a secondary-market basis.

focused PE firms; that dimension, or geographically-focused for middle-market firms who can therefore effectuate better governance of their portfolio holdings, are among possible investing strategies to anchor. Transaction structuring specialty is another area of debate: some firms demand control (i.e., >50% equity), while others openly tout flexibility in taking minority positions. Some firms seek to pursue consolidation; others eschew that as non-value adding deal-making for its own sake. Increasingly PE transactions are being done by syndication, for both small and large deals; as we detail below, these earn lower IRRs (mean value of 42% IRR for stand-alones versus 25% IRR in club deals, and this was significantly different) in our sample, and there is reason to believe this holds more broadly. Another dimension differentiating returns and the subject of much debate is *transaction type* specialty: "MBOs" versus "MBIs". In the former case, a "friendly" PE firm backs incumbent management who become new significant owners, as per the classic 1980s deals in the U.S. In an MBI, a new team of manager/owners is installed by the buyout firm.[60]

4. ***Threat of regulation*** – William Kovacic, head of the Federal Trade Commission, has stated that the growth of private equity syndicates "almost certainly" raises troubling issues with respect to anti-trust law in the United States, and that he expected a regulatory regime to develop in the near future for this industry.[61]
5. ***Blurring of public and private governance --*** KKR raised $5 billion on the Amsterdam exchange in early 2006, and Fortress Investments, a private equity and hedge fund complex in New York, raised $630 million in an IPO in February 2007, the first time a private equity

[60] Nikoskelainen & Wright (2007) segregate their sample by MBOs and MBIs and regress transaction IRRs for each on governance and operating variable; curiously they do not report which set of deals performed better; our research seeks to shed light on this.

[61] Source: January 27, 2007 *Wall Street Journal*, p.B4. Hedge funds have also received wide scrutiny in recent years, and though they are often even more secretive than PE firms, have begun consideration of various "voluntary compliance" measures on reporting issues.

firm has gone public in the U.S. Many other PE firms are now studying this issue, including Blackstone Group, which is mulling an offering of 10% of its core partnership capital on U.S. markets. Related to public sources of capital, PIPEs (private investment in public equity) are now becoming more common as well.

6. ***Globalization of private equity*** – All the biggest PE firms now are global businesses, with significant presence in Europe, and growing deal flow in Asia. This complicates long term and strategic decision-making for some firms who must decide if the relative costs and benefits are worth it. But as transaction IRRs are in long term decline in the U.S., many will be forced to seek international growth.
7. ***Hedge fund convergence*** – Fortress Investment Group, just mentioned above, is an example of ultimate convergence of PE and hedge funds, into one firm. But competitively, hedge funds are now routinely entering bidding against private equity firms, in spite of the different liquidity and risk profiles of the respective investment vehicles (and in many cases, different appetites of the LPs in each type of fund). Nonetheless it is expected this will continue.

In sum, the private equity sector is in a state of ferment, but has grown to a place of prominence now in global finance. In this sense our "timing" for this research was serendipitous, given the scrutiny and levels of debate on several issues. Several of the issues above are at root empirical questions upon which our research can provide insights, while others are indirectly related to our investigations. The end aim for this project is to advance our understanding of private equity with respect to these crucial issues:

(a) <u>Market for corporate control</u> – private equity was 31% of U.S. M&A in 2006, 21% globally. How exactly will this matter in the long run, as these percentages will

certainly be at higher levels than in the past given the explosive growth of capital under management in this sector?

(b) Corporate governance – Jensen (2000) and Holmstrom & Kaplan (2001) assert that private equity played a strong *indirect* role in the way governance practices led to changes in corporate America in the past two decades. What are the implications for governance moving forward of a more mature, bigger, and changing private equity sector?

(c) Entrepreneurship – Kirzner (1973, 1985, 1992, 2000 *et al.*) calls entrepreneurship the *driving force of the market*. Rothbard (1962) agreed, and noted that while capital in a Walrasian economy was a mere factor of production, it is in reality the *controlling factor*. He went beyond Kirzner and inferred it was the *capitalist-entrepreneur* who was the material factor in economic growth. Private equity is at its essence a story of the capitalization and strategic support of entrepreneurs. The PE sector has become more liquid, specialized, and flexible as it has grown, and should witness even more of this moving forward. How will this develop, and how will it affect the ability to pursue entrepreneurial plans in the future?

(d) Capital markets and institutional investing – Yale University's endowment has led the way in investing in "alternative assets", of which private equity is a major category. David Swensen, a student of James Tobin at Yale, returned from Wall Street and grew the endowment nine-fold (index-adjusted) to over $18 billion in the last 20 years, and is now copied by many other institutions (which is a prime reason for the explosion in PE funding). Given the huge influx in capital, it will be

important to note how the GP/LP relationship changes over time, and how contracting details change.

(e) Economic growth – This is the ultimate issue to understand with respect to private equity, and all other issues are subsumed in this in terms of PE's impact. Hubbard (2005) asserts that when assessing the economic efficacy of financial markets or institutions, analysis should ensue along three lines to determine full effects: (1) the degree to which liquidity is enhanced; (2) the degree to which risk-bearing is improved; and (3) the information-generating capabilities of the given institution. It is clear that with respect to the allocation of capital in a market economy, the institution of private equity, as it has developed most prominently in the U.S., has had an impact in all three areas. Our research seeks to understand the details and extent of this, and what policies regarding PE will further aid in macroeconomic growth.

CHAPTER 3. SUMMARY OF PRIOR RELEVANT RESEARCH

The work on buyouts now constitutes a considerable separate edifice within the literature on empirical corporate finance, and is estimated to contain more than 150 empirical papers (if an expansive view of related topics is the criterion).[62] The first widely cited empirical paper on buyout performance is DeAngelo, DeAngelo, & Rice (1984), and the theoretical background paper by Jensen (1986) sparked the first wave of interest on this matter, because buyouts can be a near-perfect laboratory for examining certain costs of agency. The most common topic in the literature is indeed the measurement of performance and returns from private equity investing, and the most common theme therein is the effect of ownership changes on financial performance (a subset of papers on this topic now focus on returns at the *fund* level, or from the limited partner/institutional investor perspective, as well as the specific *sources* of value in PE investing -- which is also a theme of the present study). Because of the data availability, many of the published papers deal with going-private transactions of public companies or large divisions.[63]

Ancillary topics of importance have also been dealt with in sets of multiple papers. The most important of these include work on tax effects of private equity; effects of buyouts on bond-

[62] See Footnote 21, page 12. In terms of books detailing academic research on buyouts (in contrast to the populist literature cited earlier), beyond Baker & Smith (1998) mentioned earlier, the list is not long. Most prominently, Amihud (1989) put together a series of mostly empirical papers after a conference at NYU in 1988; Lerner, Hardymon, & Leamon (2005) developed a popular casebook on VC and buyouts; and Blair (1993) edited a series of essays after a conference at the Brookings Institution. Slee (2004) produced a volume on small-deal buyouts within a corporate finance framework; this is geared mainly as a text for MBA students and toward practitioners. Loos (2006) has published his doctoral dissertation – whose theme is *exactly* parallel to this effort -- in book form, and it is inclusive of his statistical analysis. NBER has sponsored essay collections on related topics (e.g., corporate takeovers, and mergers and productivity, edited by Auerbach [1988] and Kaplan [2000], respectively); there have also been many books by researchers with themes addressing relevant issues for private equity at least indirectly (e.g., Roe [1994], Jensen [1998], or Jensen [2000], the latter two being collected essays). But a systematic treatment of the history and impact of late-stage investing remains to be written.

[63] As described in the following sections, one of the intended contributions of this research effort is to break into the secretive circle of PE firms and analyze *transaction-level* details as per Baker & Smith (1998), but across a much bigger sample and cross-section of firms in the industry.

holders; reverse-LBO performance; financial distress issues; transaction capital structure; effects of insider information and interest conflicts in the bidding phase; and, leveraged recaps versus LBOs. Other topics of interest to our efforts here have included the performance of Employee Stock Ownership Plan (ESOP)-based buyouts, post-LBO industrial productivity and industry pricing, and operating improvements post-LBO.[64]

The volume of literature on buyouts has corresponded to developments in the private equity sector almost perfectly. In both the United States and in Britain, there was a spike-up in buyout activity in the mid/late 1980s, and again ten years later (both were more pronounced in the United States, though the U.K. has sustained its deal activity level now for some years; Asia is now seeing PE activity but continental Europe less so, for cultural, regulatory, and governance reasons); in terms of academic research, there were a number of studies done after the first wave of deals, and in recent years interest from financial economists has been re-stoked (this time led more by European researchers). In 1990 and 1992, respectively, the *Journal of Financial Economics* and *Financial Management* published special issues dedicated to buyouts, as has the *Journal of Applied Corporate Finance*; in 2007 the *Journal of Corporate Finance* will do the same. And now, for the first time since Palepu (1990), Renneboog & Simons (2005) have produced a comprehensive literature review of buyout research. Both because of their excellent work and because it is beyond the scope of the present essay, this section is not intended to be a full literature review of all papers and topics on private equity. Rather we will do two things

[64] On these issues, see especially and respectively: Chaplinsky, Niehaus, & Van de Gucht (1998); Lichtenberg & Siegel (1990) and Harris, Siegel, & Wright (2005); Chevalier (1995); and Opler (1992). These papers all influenced the present study at least indirectly: Chaplinsky et al., Lichtenberg & Siegel, and Harris et al. all raised the issue of employee motivations post-buyout (albeit from different vantage points); Chevalier broaches the issue of intra-industry strategic behavior as it affects the buyout firm post-buyout; and Opler (1992) motivated usage of the key metric commonly found in PE deals (operating profit/revenues improvement) for our analysis utilized in Section VI below, on PE firm versus industry-matched benchmarking. Our long-run goal in this study is to understand financial *and* operating performance results, including the ways in which PE firm governance changes strategy and execution.

which set up the empirical analysis to follow: first, we exploit Renneboog & Simons by commenting on their analysis in the areas appertinent to our study. Of interest to this investigation, they reviewed over 70 empirical papers, most of which relate directly to our theme of evaluating private equity investment performance, beginning with DeAngelo, DeAngelo & Rice (1984)[65] and extending straight through to most of 2005. They also offer a categorical framework for reviewing this literature which is useful and worth noting. Following this, we briefly summarize the major articles in the literature which *specifically* engendered the present study.

General issues and themes of relevance from important prior work

Renneboog & Simons divide the prior literature on buyouts into four "strands" of research corresponding to the linear timeline of events across the end-to-end buyout cycle, from announcement of *intent to buy* through *post-deal exit* or liquidity event; they also include analysis of the duration of the holding period itself.[66] For each of the four strands they then cross-reference commentary on empirical papers, which are further subcategorized into eight *sources of transaction value* in the buyout. These eight sources of value include *tax-avoidance benefits* and *wealth transfers* (from, say, bond-holders, tax-payers, or employees, to share-holders and deal-makers), which critics of private equity claim are the main motivations for the persistence of deal volume over time. Other sources of value are three dealing with agency mitigation: *incentive realignment, free cash flow absorption, and control/monitoring improvement.* Finally, buyouts may occur due to the opportunity for *transaction cost reductions*

[65] While this paper is the first which was widely cited on buyout performance, Maupin, Bidwell, & Ortegren (1984) also published on this topic in 1984. Like much of the research on buyouts, the focus in Renneboog & Simons is on going-private transactions exclusively.

[66] The four strands are "Intent", the time period before a formal offer is made; "Impact", the time between the offer being announced and the de-listing of the stock (and hence the subject of most of the event studies in this literature); "Process", the time between entry and exit, and then "Duration", which refers to the holding period of the buyout and has seen limited empirical work to this point.

(including the costs of being a public company – post-Sarbanes Oxley in the U.S., this rationale has been much in the news), for *take-over defenses,* or due to implicit *undervaluation.*[67]

Some key conclusions drawn from Renneboog & Simons' analysis are germane to our efforts in this study. In brief:

- ***Need for research which analyzes PE firms' oversight***. In categorizing all prior research into four tranches based on a deal's timeline (again, *Intent*, the time period *before* announcement of the buyout offer; *Impact,* the time between announcement of the offer and transaction closing date; *Process,* the period of time between transaction entry and exit [liquidity] dates; and *Duration,* an ex post facto analysis of factors driving the holding period [i.e., the *Process* time]), they show that there has been an abundance of research done around the first two time periods, much less on the third (which is our focus), and practically none on the fourth.[68] Writing at a time when phases one (*Intent*) and two (*Impact*) were the periods being predominantly analyzed, Fox & Marcus (1992) point out the need to understand the third, *Process* phase, in spite of the challenge inherent in data collection once the firms became privately held. After all, this is the period of time of PE firm ownership and governance, and as such this was when the ability to add or create value could best be judged. *Happily, this is precisely the focal point of our data sample and ensuing analysis*.
- ***Most prior studies show positive returns to buyout investing.*** Via the event studies and premiums-paid analyses in the early stages of a deal, they re-affirm that much of the prior research on buyouts is supportive of value creation, at least for the pre-buyout share-holders.

[67] This is another example in corporate finance of an instance of asymmetric information, where the firm's managers know more than outside investors; taking the firm private will allow for fuller value capture of growth opportunities. See Myers & Majluf (1984) for the original model in this literature.

[68] For the *Intent* phase of studies, discriminant analysis and likelihood models of going private are the most common tools. In the *Impact* phase, where the impact of the LBO announcement on the firm's stock price is analyzed, event studies and an analysis of premiums paid are utilized.

Event studies average an approximate 20% lift in the days following an announcement, and premiums paid around 45% (several explanations are offered for this difference, including DeAngelo et al.'s point that the former yield abnormal returns which are inclusive of market expectations about a deal's likelihood – and hence possibility for failure – while the premiums paid do not; in any event these are not comparable analytical modalities for going-private transactions but are still directionally the same, and significant). While a discussion on returns and performance was held in Chapter 2 and is referred to here below, we should note here that there are studies showing decline in post-buyout performance (e.g., Long & Ravenscraft [1993] show operating performance declines in years 4 and 5; there are also studies such as Asquith & Wizman [1983] which document losses for bond-holders, though these are generally seen to be insignificant), and there is a small literature which analyzes buyout and buyout attempt *failures.*[69] Related to the theme of gauging performance in difficult transactions, there are studies which attempt to document the efficacy of restructuring; see, e.g., Smart & Waldfogel (1994), who document improvements in firm performance via LBO-driven restructuring.[70]

- ***However, there is mixed agreement, at best, as to the sources of value in buyout investing, and hence need for ongoing research.*** The most useful aspect of Renneboog & Simons' analysis, for one who has studied this literature for an extended time, is their categorization along the eight drivers of value in buyouts; this affords real-time comparison of specific papers' results. What is clear from this review is how broad are the disagreements on several

[69] See, for example, Ofek (1994), or Wright, Wilson, Robbie, & Ennew (1996). Ofek studies 120 failed buyout attempts to determine if there were *post hoc* operating performance improvements; if there were, this would be indicative of private information on the part of the managers (he did not, lending credence to the thesis that successful buyouts are due to governance or organizational changes). Wright et al. look at actual failures and examine reasons why – and find too much leverage, or restructuring begun too late, are explanatory for failure.

[70] Although interestingly, they find that the existing buyout literature has specified models with estimation approaches as per industry-adjusted comparisons which may incorrectly specify benchmark comparisons. Our analysis attempts to avoid this.

issues, a quarter century into empirical research on this topic. There is no unambiguous support for any of the eight sources of value mentioned above (though a side result, that competitive bidding increases share-holder returns, is 100% supported), though some generalizations can be made about the most controversial items:

- ***Tax-transfer debate.*** Renneboog & Simons report that researchers are divided on the motivation of tax-savings as being paramount in buyouts, and cite work on both sides of the issue (e.g., Lehn & Poulsen [1989] do not find tax driven motivations, but Kieschnick [1989, 1998] reports results on *both* sides of this debate in two separate papers).[71] Tax-driven benefits to PE transactions are an important debate to settle, given the current threat of industry regulation. Supporters of buyouts argue that in an efficient market, tax benefits are in fact obvious for public firms when they exist, and via a leveraged recapitalization may be obtained without an LBO transaction involved. Typical of PE skeptics is Lowenstein (1985), who launches forth in an anecdotal fashion:

> *Truffles from the Tax Man* – If an MBO is *largely an internal or financial re-arrangement in an otherwise unchanged business* (italics mine), where do the large profits come from? The most visible as well as the most easily quantified source is the tax benefits. These benefits may result in the elimination of federal income taxes at the corporate level, and in some cases, the creation of substantial tax deductions at the personal level as well….Their combined effect [of the tax savings] is that the management of a company can, with suitable backing, purchase its business from the public and finance much of the price…out of tax-generated cash flows. The newco can expect to operate on a tax free basis for five or six years…time enough to reduce leverage from four to one to one to one. (1985:759-760).

[71] Here is one weakness to Renneboog & Simons' analytics: their review is *dominated* by prior papers which focused almost exclusively on buyout performance and returns, and the sources of value for these. This is a key focus of this paper as well, and hence RS is highly useful. But there are many other papers in the literature which analyze important subsidiary issues (e.g., optimal capital structure or efficacy of a given transaction type rather than zealous focus on IRR) as well, and in fact many of the papers cited here recognize these.

Lowenstein offers mostly vignettes in this article in support of his assertions, but in fact his thesis is confirmed in his point by Kaplan (1989b), the most thoroughgoing review of this issue.[72] Kaplan looked at 76 buyouts from 1980-86, and found the tax benefits on a *pro forma* basis to be 21-143% of the premium paid to pre-buyout share-holders (and ex-post tax obligations for 48 of the deals confirmed strong tax savings), confirming the importance of tax benefits to the transaction's justification, even post-1986 Tax Reform Act changes. While the efficient market argument holds, the reality is that *perception* of an opportunity – in this case, available tax benefits via leveraging -- still requires execution for the benefit to be garnered.[73] Seen in this light, while the degree to which the U.S. Treasury is helped or harmed by buyouts is an empirically open question, the motivation of tax savings as a rationale for these transactions seems unambiguous.[74]

- ***Agency mitigation issues***. The agency mitigation issues (free cash flow [FCF] hypothesis, incentive re-alignment, better control/monitoring) all are categorized by Renneboog & Simons as "mixed", FCF very much so; by contrast, incentive alignment issues in almost all studies support the theory.[75] Lehn & Poulsen (1989) is the leading study of the FCF debate, and in spite of Kieschnick's (1998) methodological objections, their significant findings across 263 observations are corroborated best, perhaps, in such

[72] There are several interesting studies to examine on this issue: Kosedag & Lane (2002) support Lowenstein's charge via an empirical study of 21 reLBOs, as do Roden & Lewellen (1995); Jensen, Kaplan, & Stiglin (1989), however, analyze this issue from the macro-perspective of US Treasury receipts and enumerate several ways by which federal receipts *increase* as a result of LBOs (e.g., dynamic behavioral changes, capital gains, et al.). Newbould, Chatfield, and Anderson (1992) support the idea of tax-advantages as a motivator for buyouts but claim that post-1986 tax law changes, federal receipts will be harmed less, a finding corroborated in Chatfield & Newbould (1996) across multiple different tax treatments.

[73] This duality – perception plus the ability or will to act -- is an example of *entrepreneurial alertness* emphasized by Kirzner (1973), which is emblematic of private equity professionals, and as we show in Section VI, is one method by which they add value in transactions. .

[74] One of the top buyout professionals in the United States, Brian Simmons of Code Hennessy Simmons, indicated that tax benefits are calculated in *every* pro forma for a potential deal, but are not the determining factor. Hence one might say Lowenstein was correct on the letter but wrong in spirit.

[75] This is a surprising result in light of interviews with practitioners, who still claim incentives and optimizing asset deployment are factors in most transactions of any scale.

intensive case analyses as Baker & Wruck (1989), which chronicled the O.M. Scott buyout and all subsequent organizational changes to clearly delineate operating improvements; and Denis (1994), which examined Kroger's leveraged recap concurrent with Safeway's LBO.[76] Opler and Titman (1993) also provide an innovative analysis lending support to the FCF and incentives hypotheses via a comparison of 180 LBO firms to non-LBO firms with matched characteristics.

- ***Wealth transfer rationales***. While mentioning above that the studies on bond-holder wealth transfers showed small losses (particularly to creditors with no covenant protection) that were economically insignificant, and government tax receipts are a subject of intense debate, the other potential constituency alleged to lose out are employees. Relatively little research has been done in this area, and hence it is a focus for this study as detailed in Chapters 4-5 ahead. Kaplan (1989a) reports a statistically insignificant gain of employment in his sample post-buyout, as does Smith (1990); Muscarella and Vetsuypens (1990) report no net lay-off wave in their study of reverse LBOs. Lichtenberg & Siegel (1990) examine manufacturing plan productivity post-LBO and find white collar job loss, but not blue-collar – they also document productivity gains.

Countering these observations is the trenchant criticism of hostile take-overs (which were often buyout driven in the 1980s) offered by Shleifer & Summers (1988). They argue in vignettes about such buyouts as Dan River, Youngstown Sheet & Tube, or Carl Icahn's buyout of TWA that share-holders directly benefit from breach of implicit

[76] Both organizations ran into operating and financial problems years later, however.

contracts with employees.[77] Hence discussion of this issue, though an empirical question, seems mostly anecdotal; further research is needed, and is a goal of our study.

- ***Similarities and differences to the U.S. and U.K. development of the buyout sector.*** Renneboog and Simons observe that while the PE phenomenon appeared at roughly the same time as in the United States, it was not as pronounced in the 1980s wave, but took off in the late 90s (coincident with the revival of the buyout sector in the U.S.). Continental Europe is only now beginning to witness private equity activity; for legal and cultural reasons, as well as more inflexible governance systems, the continent has seen little in the way of PE until now. That is changing, and as the sector globalizes, many U.S. firms have established multiple offices in Europe, including middle-market buyout firms. One big *difference* between the U.S. and U.K. experience with private equity is that in the U.S., the first wave of deals from the 1980s, and many still in the second, are driven by agency-mitigation issues in mature industries; the U.K., by contrast, has always been more oriented toward entrepreneurial growth opportunities.[78]

Lastly, it should be mentioned that there are notable gaps in the literature on private equity investing. These include: (1) a *more comprehensive* look at later-stage private equity investing (i.e., move beyond the focus on buyouts and look at the substantial variety of transaction structures involving privately placed capital, from private investments in public equity [PIPEs] to minority stakes to mezzanine or strip financing); (2) the role of PE firms on boards of directors

[77] Their case examples are uniformly in declining or excess capacity industries, however, and it is unclear in such cases whether in fact a buyout may on net *preserve* jobs, as our study documents in the following sections.

[78] Though we cannot speak to the U.K. buyouts' industry mix over time, we are hesitant to agree with this observation re: either the U.S. or the U.K. experience, but repeat it as a key finding of Renneboog and Simons. As stated earlier, there is a third class of PE deals, oriented around improving or exploiting opportunities for better firm *coordination*, that are a significant part of U.S. deal volumes now. Also, other researchers have said the U.K. has its share of ossified industrial concerns in mature industries which may represent candidates for agency-mitigation buyout transactions.

in terms of governance and strategy;[79] (3) an analysis of financial contracting within modern PE firms in all its variants; (4) analysis of the many transactions which are not driven by pure agency-mitigation or growth opportunities so much as the need for better intra- or inter-firm *coordination*; (5) examination of small business funding to pursue growth opportunities (apart from venture capital); and lastly, (6) some of the central issues of this research effort (e.g., effects of buyouts on operating decisions such as CapEx spending or employment levels, drivers of success in consolidating roll-ups of fragmented industries, etc.).[80]

Enumeration of specific prior papers which inform this study

The transcendent goal for this research project is to add to the literature on value creation in private equity investments by addressing the questions and issues enumerated on Pages 4-5 above. This is accomplished in a unique format, via access to detailed transaction-level analysis of private equity deals, along with practitioner insights into specific details of deal-making. The study's design was specifically influenced by prior research from two sets of papers: (1) material from the corporate finance literature on mergers and acquisitions, as buyouts are a subset of this

[79] Related to this issue, Yermack [1996] found evidence that comports to theories of smaller boards being more effective and value-additive; in private equity, with the growth of syndicate or *club deals*, the trend is the other way now, even though heretofore small boards had been a hallmark of LBO investing. And, parties in PE syndicates often do not have full goal congruence on post-deal investment, execution strategy, or exit timing issues.

[80] Lee, Rosenstein, Rangan, & Davidson (1992) study Board-level functioning in the narrow case of the point of transaction closing itself, in mitigating conflicts between shareholders and managers of going-private firms. For ongoing Board monitoring and governance, more appropriate works are (1) Cotter & Peck (2001), who offer an excellent analysis of PE firm Board level monitoring and its interaction with portfolio firm capital structure; and (2) Lerner (1995), who analyzes VC Board activity in various contexts. These themes need expansion as the PE sector changes (more capital, more PE firms, club deals, lower holding times for deals, etc.). Regarding contracting, Hart (2001) makes the case succinctly: "firm value depends on the allocation of decision or control rights" (p.1098); per this, Kaplan & Stromberg (2001, 2003, 2004) look at the details of VC interaction with their funded entrepreneurs, and rights allocations. The same needs to be done with later stage buyouts due to the changing nature of deal-making (e.g., much greater prevalence of syndicate deals now, huge variation in structure of mid-sized deals, etc.). Related to Hart's theme and that of O. Williamson (1996, ch.14), Sahlman (1990) published an extensive study of *intra-firm* operations and execution of venture capital firms – i.e., of the VC firm as a *governance structure*; he only mentioned buyout firms in passing, and hence the same work needs doing for the buyout sector due to the evolution (and varying organizational designs) of later-stage private equity firms. Meanwhile Klein (1999) calls for research on small business funding and strategy-advising; the data sample and participants in the present study allow for such an examination as follows below.

transaction type; and, (2) from the antecedent literature on value creation in LBOs, which our study directly extends via a proprietary transaction data sample.

i. Merger & Acquisition Literature

Prior research on M&A influences this study's aims in two ways:

(1) ***Discernment of idiosyncratic knowledge of deal-making.*** First, major surveys in modern empirical finance have almost uniformly shown that (1) mergers are accretive to wealth in the aggregate, but that (2) returns are largely captured by the target's shareholders.[81] To the first point, Jensen (2000) states that between 1976-1994, there were 45,000 M&A transactions in the U.S. totaling $3.3 trillion in 1994 dollars, while real values of public equity doubled in the 1980s alone. For him, the former begets the latter: total M&A spending included approximately *$959 billion* in premiums paid to target shareholders, by his calculations.[82] This represents a starting point for understanding the real wealth increases due to merger activity which Jarrell, Brickley, and Netter (1988) report, and does not even include any gains that might have accrued to acquirors. Nor does it take into account, from a "macro-societal efficiency" standpoint, the economies garnered by firms who were forced to change and improve operations or *become* targets in this hyper-active market for corporate control.[83]

[81] Detailed surveys of the empirical literature reviewed pre-1980s, 1980s, and 1990s developments, respectively, in Jensen & Ruback (1983), Jarrell, Brickley, & Netter (1988), and Andrade, Mitchell, & Stafford (2001). Jarrell, Brickley and Netter report that the gains in M&A deals do not appear to come at the expense of losses from another economic entity, and hence real wealth is created. Healy, Palepu, & Ruback (1992) offered a clinical exploration of *how* mergers improved corporate performance in 50 large deals by eschewing traditional event studies of stock price movements and favoring instead an analysis of operating cash flow (EBITDA) return data (which relatively improves post-merger, compared to industry medians), a concept we borrow in Section VI (though EBITDA/Revenues is our specific metric).

[82] Scanning the M&A data for the years since Jensen's exercise assures that repeating the same calculations today would yield the same magnitude of wealth creation.

[83] Manne (1965) offers a succinct but classic explanation for why such an active market for corporate control represents an economic *good* – in essence it offers institutional protection to share-holders from the Berle-Means problem; a lousy management team's company becomes a target. Manne's paper launched studies on measuring gains and losses in M&A deals via modern statistical methods.

The second point – that the acquiring firms' shareholders on average earn a return statistically insignificant from zero -- has puzzled economists. Manne (1965) hypothesizes that a deal which would create operating synergies -- say, via economies of scale in production or distribution – would see the share prices of both firms rise; most often, in 1965 as is true today, the acquiror's shares suffer. In spite of the usual list of reasons given for M&A deals (operating synergies via scale or scope economies, expansion to obtain market (pricing) power, et al.), the question is still open empirically.

Bittlingmayer (1996) offers a conjecture that leads us to the point of why this is of interest for this (and any) research project on private equity performance. He argues that merger is a form of corporate investment, akin to a *make-versus-buy* decision writ large. He also presents empirical data for the United States and Germany showing statistically significant co-movements of mergers with corporate capital expenditures, R&D expenditures, and productivity increases. And, holding other factors constant, industries with greater investment of physical capital also have higher rates of merger, which lends credence to the idea of merger as investment.

If one accepts this thesis, then there is no concern about the lack of abnormal returns to acquiring firms: an acquisition would be looked upon by capital markets as no different than, say, expansion of a manufacturing plant. It is merely the result of a make-versus-buy analysis, and capital markets factor this in, in the long run, in assigning value to the firm. Hence if in the long run there were zero abnormal returns to acquirors, this should not surprise us.

This perspective is germane to our present study for two reasons: first, whereas corporate acquirors look upon any M&A transaction from both a *financial* and an *operating* perspective (in terms of where the synergies are, say, and how firm operations will be affected), PE firms look at

everything as strictly financial. For them an acquisition *is* an investment. This is a subtle but important distinction in paradigm.

Secondly, it points to a path of inquiry for future research which may yield answers to Manne's inference that there are "good" acquisitions and "bad" acquisitions, which the acquiror's stock price reaction telegraphs *ex ante* with respect to the deal's consummation and execution. That is to say, the core competence of Hewlett-Packard is, in theory, designing and offering information technology solutions. Meanwhile the core competence of Kohlberg Kravis Roberts is in *active investing* – acquiring, monitoring, and then exiting businesses. In theory, H-P should or would be willing to pay more for a business than KKR because of the ability to co-opt synergies in operations. But as per Malmgren (1961), KKR evidently possesses unique knowledge or internal firm-specific skills with respect to acquisitions *vis-à-vis* H-P; or, said even more precisely, KKR garners competitively superior *tacit knowledge* in deal-making.[84] Jensen (1998, ch.4) discusses a similar concept in distinguishing between general and specific, or *idiosyncratic,* knowledge in his description of designing a decision rights schema within organizations. The point here is that as Andrade, Mitchell, and Stafford (2001) point out, we do not have a good explanation for the *sources* of value creation in mergers and acquisitions – it is, they say (p. 118), a "wide open field spanning research in corporate finance, industrial organization, strategy, and organization theory." This presents a significant opportunity for our research effort, given our unique access to several leading (and, normally secretive) private equity firms, to seek progress on this issue.[85] As is discussed below, Kaplan and Schoar (2005)

[84] See Polanyi (1967) on this concept – skills which are possessed but which cannot be rationally explained.

[85] Discussion below shows *why* PE firms *are unusually secretive.* In theory, H-P could hire KKR personnel and have them run the firm's corporate development function, and manage acquisitions. As Polanyi points out, though, it is not that simple to spread tacit knowledge and skills. As a side note which makes this point, H-P, which has a full corporate development/M&A team staffed with highly paid and competent professionals, and access to the finest strategy consulting advice in the world, offered $18 billion to buy PriceWaterhouseCoopers (PwC) Consulting in 2001; 9 months after PwC partners turned the offer down as inadequate, IBM paid $3.5 billion for PwC. A few

report that over all, net of fees, the private equity sector has performed only at the S&P 500 level over the last 20 years, and the buyout sector has slightly *underperformed.* However, certain PE firms have done very well, and there is marked *persistence* in returns through time (in direct contrast to the mutual fund industry, where there is long run regression to the mean for most all industry participants).[86] While mindful of Polanyi's thesis, this research project has unique access to proprietary data and hence an opportunity – and a goal – to advance our ability to describe sources of value creation in private equity investing.

(2) ***Understanding the nature of the relationship between ownership and performance as it pertains to private equity firms.*** Since Berle & Means (1932) the linkage between ownership and firm performance has been an object of study and debate in both industrial organization and finance. Beginning with the revolution in agency theory, important theoretical papers on the relationship between ownership and performance formed an analytical substructure which subsequently motivated important empirical work on this issue. Three of the more significant were, first, Jensen and Meckling (1976), who formally described the costs of outside equity to total firm value. They noted that by increasing managerial equity holdings, the manager would equi-marginally bear increasing costs of his non-pecuniary benefits consumption; the relationship between firm value and perquisite consumption is presented as concave but increasing over a wide range. Secondly, Leland & Pyle (1977) develop a model based on asymmetric information in which an entrepreneur who needs financing (but will not reveal the

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months later, H-P paid $19 billion for Compaq, which had operating losses of $700 million the prior year and was in negative cash flow. H-P's stock dropped 50% in the 6 months after the merger with CPQ. Five years later new management has improved the firm's performance considerably, but it is highly probable that KKR would not have offered either amount for PwC or Compaq.

[86] Lerner, Schoar, & Wong (forthcoming 2007) find a similar result holds on the other side of the investors' table in private equity; there is evidence of persistence in investment return patterns among limited partners as well. Endowment funds, for example, do much better than bank trust advisors, when it comes to success in private equity investing. The authors speculate as to the reasons behind the significant differential, but the end result is that endowments evidently pursue a formula which yields superior monitoring as an active investor.

true situation regarding his project for moral hazard reasons) can achieve desired outside funding via his own equity investment, *signaling* his appraisal of his own prospects, and establishing a link between managerial equity and performance. This has significant implications in the buyout world, as we detail below.[87] Thirdly, Stulz (1988) developed a model which showed that the value of a firm was, in relationship to the voting rights (ownership) of the firm's managers, curvi-linear; this paper was a significant building block in development of a subsequent literature which noted a *managerial entrenchment* effect.

Subsequent empirical papers built upon these foundations by utilizing differing techniques, and differing results have obtained. Morck, Shleifer & Vishny (1988), McConnell & Servaes (1990), Hubbard & Palia (1995), and Han & Suk (1998) all posit a curvi-linear, non-monotonic relationship as predicted by Stulz (1988).[88] If this relationship is valid, it has significant implications for private equity, where typically, portfolio firm management is undiversified in share-holdings, and so at some point private benefits of control obtain, if not pre-dominate.

However Himmelberg, Hubbard, & Palia (1999) argue that variables representing ownership and performance (or firm value) are endogenously determined. Following Demsetz & Lehn (1985), who in a paper examining the linkage between accounting profits and the equity held by the five largest block-holders in 511 large U.S. corporations had shown no significant relationship, Himmelberg *et al.* use a fixed effects model on a panel data set, and instrumental variables to control for possible unobserved firm heterogeneity. Employing alternative modeling specifications, they find that ownership changes cannot explain performance as defined by

[87] Beyond negating the irrelevance result obtained in Modigliani & Miller (1958), this important paper highlighted a rationale for financial intermediation, which traditional models of financial equilibrium had difficulty in explaining.

[88] Servaes & Zenner (1994) offer a concise review of the literature on this topic in general.

Tobin's q (or return on assets), and highlight endogeneity as a serious issue in this literature.[89] Demsetz & Villalonga (2001) come to a similar conclusion via a specification which defines ownership variables as endogenous and multi-dimensional.[90] They conclude that ownership structures are a product of their contracting environment, and that those found in, say, management buyouts would and should be categorically different from what we observe in publicly traded equities. While seeming to contradict the Berle & Means thesis, they in fact hold that there may well be serious agency costs to the separation of ownership and control, but an economic system which permits adaptation to differing environments will also offer *benefits* of dispersed ownership.[91] In sum, these two papers argue that one cannot expect to establish any empirical regularity between ownership and firm value, based on firm heterogeneity.

A recent paper by McConnell, Servaes, and Lins (2006) disputes this, however. In their key empirical result they defend the causal relationship to which private equity investors also adhere, via a specification which regresses *changes* in firm value against *changes* in insider ownership. Their study's design acknowledges the endogeneity issue raised by Himmelberg *et al.* and they employ firm fixed effects, but analyzing *changes* over a short horizon controls for unobserved

[89] The Himmelberg, Hubbard & Palia results are an important issue about which we are mindful in the regression modeling in the next Section; one possible difference is in the nature of the ownership holding. Private equity is for the most part "long term" and highly illiquid (compared to public equity markets), and the character of the relationship between private equity and firm value is fundamentally different from one involving publicly traded issues.

[90] Demsetz & Villalonga (2001) review the empirical literature since Demsetz & Lehn (1985), and in a telling graphic (2001, p. 212), depict the relationship between Tobin's q and inside ownership via 12 different model specifications in 7 different studies; there is no consistent story to the relationship, as their chart makes clear (everything from an inverted-U to a near-linear relation is shown). Attacking the problem methodologically, they point out that there are three categories of difference in specification: how performance is measured, how ownership is defined, and whether or not the endogeneity of ownership structure is taken into account. Their model for the first time measures ownership structure endogenously, and also as comprising multiple owner-blocks, each with differing interests.

[91] Alchian (1950) offers a schema for how economic institutions absorb new advances via an adaptive, *trial and error,* entrepreneurial learning process. As knowledge and information are developed and transmitted to economic agents, the "fittest" institutional forms (in this case, varying ownership structures, and from our study, LBO-driven governance mechanisms) survive and grow in prominence. Demsetz is thus perfectly comfortable with no systematic relationship between ownership and firm performance; as we detail below, this is at extreme odds with observations in private equity investing.

heterogeneity. Observing share purchases over a large sample of firms from 1994-1999, they establish a causal curvilinear relationship.

In a different study of the same issue, Wruck (1989) comes to a similar result: she looks at the relationship of abnormal returns to announcement of a *private placement* of equity of a public firm. While not usually involving a change of control, these private placements are often of significant size: they average 19% share blocks in her sample. In contrast to public seasoned offerings, which typically cause 2-3% share declines, these private equity placements generate abnormally positive returns of 4.5% in Wruck, and the two are strongly correlated, supporting the thesis that *ownership matters*.

In summary, the present research project is undertaken while fully cognizant of the debate about the link between ownership and performance, and the application of prior analytical techniques to a private equity data sample proves enlightening, as we show below.[92]

ii. LBO Performance Literature

Because of the now vast literature on buyout performance, a full review here is beyond our scope.[93] Rather in this section we detail and comment upon the prior publications in this line of

[92] The inquisitive reader will wonder why there is no formal discussion here of the literature on the linkage between *governance* and firm performance, akin to the foregoing regarding the ownership/performance relationship. The short answer is, the prior LBO performance literature, which we summarize next, is replete with implications derived from governance issues; most prominently, changes in leverage, along with active investor monitoring and at-risk pay, are the recurring themes. Please refer back to Footnote 39 on page 25 for recent surveys. Additionally, while the literature on governance is growing, particularly with respect to Board of Directors and incentive/compensation issues, the study by Gompers, Ishii, and Metrick (2003) offered findings of interest to our efforts. Analyzing a data sample of 1500 firms across the 1990s, They constructed an index of governance based on 24 parameters, including such issues as whether or not the firm carries poison pill or anti-greenmail measures to whether the Board is classified. In addition to finding a significant relation between good governance rankings and firms' equity prices, they found that their governance index *increased* significantly throughout the decade of the 1990s. Holmstrom & Kaplan (2001) and Jensen (2000) both hold that one impetus to this is an *indirect* effect of the pressure which the private equity sector has placed on corporate America. Gompers *et al.* influenced the interview sets we have conducted with practitioners, in terms of asking them to detail *how* specifically their governance mechanisms create value in portfolio companies.

[93] The reader is again referred to Renneboog & Simons (2005), Tables 1-7 and associated commentary, for an excellent listing of all the key prior research on buyout performance; Palepu (1990) reviewed the 1980s research. Also, for a review with strict focus on UK and European buyout activity, and which contains a listing of just the

research which *directly* influenced the present study. Following this, we highlight three recent papers and a book which are very similar to this effort.[94]

Within the financial economics literature the line of research dealing with buyouts dates to 1984 with both DeAngelo, DeAngelo & Rice and Maupin, Bidwell, & Ortegren, with bimodal spikes in research roughly corresponding to the funding waves in the sector; important papers drawn from both eras influenced this work. As stated, research on private equity is by definition burdened by access to data, and hence most published papers have analyzed a relatively small sample of buyouts.[95] As a general proposition, this body of research has found solid improvements in performance, value of the firm, and productivity, all measured in various ways (e.g., abnormal returns to the stock post-announcement date, or uptick in various accounting measures). For our research design, the studies of Kaplan (1989a, 1991), Lehn & Poulsen (1988, 1989), Singh (1990), Smith (1990), and Long & Ravenscraft (1993) were influential from the "first wave" of buyout research.[96] In recent years, issues were identified for our study from Cotter & Peck (2001), and then a series of papers dealing specifically with the calculation of PE

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key papers on European buyout returns alongside those dealing with the U.S., see Wright, Renneboog, Simons, & Scholes (2006).

[94] Footnote 33 on page 21 lists papers which contained themes from which we *indirectly* borrowed, but we enumerate here only those papers or publications from which we borrowed specific research ideas for further investigation.

[95] Sample sizes have ranged from N=1 (e.g., Baker & Wruck [1989], a case study) to N=263 (Lehn & Poulsen, 1989) prior to recent years. Since 1998 three studies have contained over 300 deals, including Nikoskelainen & Wright (forthcoming 2007) described below, which is very similar to our analysis in Chapter 4. Loos (2006) has published a multi-faceted study comprised of transaction data from multiple sources, and claims that for part of his study he analyzes 1,746 exited buyouts. The most cited paper in this literature on operating performance improvements in leveraged buyouts is Kaplan (1989a), who analyzed 76 large buyouts from 1980-86, but only 48 had information post-buyout.

[96] The ultimate origin for this research in terms of kindling our interest lies in the antithetical essays by Jensen (1989) and Rappaport (1990). Jensen extolled the virtues of the LBO wave in the 1980s; he emphasized the widespread pervasiveness of agency problems, which the LBO organizational form solved via active investor monitoring, pay-for-performance compensation, and leveraged capital structures to encourage disgorgement of excess free cash flow. Rappaport took the opposite view: he held that LBOs were, by construction, a transitory form of organization, created too much debt-laden inflexibility, and abolished the daily stock price, the ultimate check on managerial discretion. He believed an active take-over market and other competitive pressures would force any necessary restructuring, and promote share-holder value maximization in a more balanced and sound manner. If Jensen was wrong about the public corporation's "eclipse", Rappaport was equally wrong in predicting the LBO phenomenon was a passing fad.

investment returns.[97] Lastly, we comment on Lang & Stulz (1994), which is not an analysis of buyouts but which offered methodological insights.[98] We now summarize the points from these papers germane to this work *in seriatim*:

Kaplan (1989a, 1991): concepts of capital expenditure changes, holding period relationship to performance. In 1989a, Kaplan analyzed 76 buyouts from 1980-86, finding an increase in net income and cash flow along with decreased capital expenditures. He tested agency-theoretic explanations against both wealth transfer and asymmetric information rationales, and found Jensen's thesis to predominate (though in the same series of papers he found tax effects to be a significant source of value creation) . This study aided our efforts in identifying CapEx changes as a key parameter of deal-making change to investigate empirically. After all, efficient capital markets would discount a firm's market value if managers were systematically short-changing growth opportunities for the sake of near term improved cash flow. On the other hand, a cut in wasteful CapEx spending would not be inconsistent with the theory, nor deleterious to firm value or long term macro-economic growth; it is an empirical question needing to be settled. Kaplan (1991) examined the longevity of buyout investments and their ultimate disposition; he found median holding time of 6.82 years.[99] This finding led us to investigate holding time in transactions, and to inquire of practitioners their strategies in this regard. Our sample has mean holding time of 4.85 years in contrast to Kaplan.

Lehn & Poulsen (1988, 1989): wealth creation versus wealth redistribution theme; revenue growth characteristics of buyout candidate firms. Lehn & Poulsen (1988) took up the challenge to empirically analyze the source of value gains in buyouts in the 1980s during the time, as noted earlier, LBOs were receiving such bad press. They tested for whether the gains were driven by "wealth-creating" agency mitigation, or "wealth redistribution" from tax-payers, bond-holders, or

[97] Because of the commonality to their theme, we discuss these as a group, and they include: Kaplan & Schoar (2005), Ljungkvist & Richardson (2003), Moskowitz & Vissing-Jorgenson (2002), and Phalippou and Gottschalg (2006). Cochrane (2005) offered no influence to our inquiry *per se*, but he attempts to tackle a pervasive problem in this line of research from which the present work may suffer: selection bias. He attempts to overcome this by developing an algorithm for measuring the risk and return in venture capital, and proceeds to test it via the Venture One data base.

[98] We do not comment here on the set of papers dealing with reverse leveraged buyout (rLBO) performance, though the theme of those is related to this study. See Cao & Lerner (2006) for the latest paper on rLBOs.

[99] This finding "splits the difference" between Jensen's and Rappaport's view of LBOs; they were shown to be more than transitory as Rappaport had charged, but they were not permanent of course.

preferred stock-holders to share-holders (and implicitly, the private equity deal-makers involved). They found support for the agency mitigating and tax-effect theses, consistent with other researchers; their theme carried with it a felicitous phrasing of what pundits may well effectively hold to be more of a *normative* issue, but which our research treats in strictly positive terms, and carries into new dimensions (e.g., employment level changes during PE firm governance). Lehn & Poulsen (1989) had revenue growth variables in their statistical analysis of LBO transactions, and our research takes the level of sales growth during PE firm ownership as an open empirical question. Our prior supposition is that PE investors today are more oriented toward top-line growth than in the past.

Singh (1990): Benchmarking the performance of PE firms' portfolio companies against an industry-matched sample. Singh analyzed firms which had ben taken private against publicly-traded industry-matched benchmarks, using data made available fom rLBO offerings. Hence his focus moved beyond investment returns and toward an operations comparison; he found that LBO governance positively impacted firm performance (though criticism of rLBO findings will always remain that only the best performers are returned to the public equity markets in the first place). In any case we borrow from his concept in later benchmarking work.

Smith (1990): Detailed review of operations focus. Smith reviewed 58 buyouts from 1977-86, collecting data on company operating performance during PE firm ownership (mostly from re-IPO announcements or SEC filings for publicly traded debt). She analyzed accounting and financial results data, such as EBITDA per employee and per dollar of assets, changes in working capital, or changes in employment. Her findings were that the PE firms' governance was materially contributory, and her analytical mode of detailed operating parameter analysis during PE firm ownership is one incorporated here.

Long & Ravenscraft (1993): Long term performance of buyout deals. Long & Ravenscraft analyzed 209 whole company buyouts, and utilizing Quarterly Financial Report (QFR) data from the U.S. Census files, they followed long term results from firms post-buyout (the Census data access via the QFR allowed them to see how firms did while owned by PE firms). They susbstantiated other papers in that era as to operating performance gains along several dimensions, but found that the firms' performance often dropped off after 3 years of PE firm ownership. We therefore seek to track operating performance of

sales, EBITDA, employment levels, and capital expenditures throughout the PE firms' holding period, and determine if this drop off has empirical validity.

Cotter & Peck (2001): Post-transaction governance mechanisms employed by PE firms during their tenure of ownership. Cotter & Peck explicitly model the capital structure and board governance of 64 LBO transactions from 1984 thru 1989. Their focus is on the differences in characteristics and performance between PE firm-controlled deals (40 in all), management-controlled (14), and 3rd party investor-controlled (10 in all). They found that the active monitoring of PE-firm majority control deals led to superior returns, and did not require the extensive use of debt the way non-PE firm controlled deals did. Our findings as detailed in the next section were similar, and our method of inquiry owes a debt to this perspective. Nikoskelainen & Wright (2007) have also advanced the theme of Cotter & Peck.

PE investment returns sub-literature: Analysis of returns to private equity investment against benchmarks. As discussed in Chapter 2, there is a substantial (and controversial) debate in the PE sector as to how to categorize returns; this has been fueled by recent academic research on the subject, a few papers from which are profiled here. Private equity firms have long held that their sectoral returns are vastly superior to standard benchmarks such as the S&P 500, but in a very important paper, Kaplan & Schoar (2005) held otherwise. They obtained proprietary access to the Thomson Venture Economics data base of *fund-level* returns (comprising funds for both early stage venture capital as well as buyouts) and had two primary findings of interest to us. First, similar to what we saw in Chapter 2 (from the Thomson *VentureXpert* data base, using pooled IRRs, buyout funds perform slightly above the S&P 500 in the long run in terms of *gross* performance, but *under-perform* the S&P on net.[100] Secondly they find that there is marked *persistence to returns* for PE firms; this is in contrast to the mutual fund world where there is long term regression to the mean. They hypothesize that this may be due to the fact that in private equity, general partners (GPs) are materially involved in their investment deals' governance and strategy development; GP skill-set is a scarce resource. Secondly, *winner* funds are better networked and can garner proprietary access to deal flow. Our investigations will seek insight into these issues.

[100] Kaplan & Schoar report, however, that they *over-sample* first time funds by 25% as compared to the data in the Venture Economics data base; first time funds under-perform follow-on funds in general.

Ljungqvist and Richardson (2003) examined returns to PE fund investing garnered from a large, anonymous institutional (limited partner, or LP) investor. Utilizing a different methodology for data analysis, they conclude that returns to PE investment beat public-market equivalents by over 5% per annum over the long term, which is consistent with a theory predicting illiquid assets should garner higher returns. This result directly contradicts Kaplan & Schoar, but for purposes of our research design, they examined actual cash flows to the limited partners, and we seek to do the same at the level of the individual transaction from private equity firms.

Moskowitz & Vissing-Jorgenson (2002) take a broader view of "private equity" than is commonly used: they define it as *any and all* forms of non-publicly traded equity, and focus on entrepreneurial ventures driven from consumer or household finances. In line with the Kaplan-Schoar findings, they were able to detect no level of superior returns to private equity, in spite of higher risk levels; they attribute this to such items as non-pecuniary benefits or entrepreneurial zeal which results in over-estimation of a venture's realistic prospects. Phalippou & Gottschalg (2006) investigate returns from a data set of 1579 mature PE funds from the same source as Kaplan & Schoar at Thomson; they find, in a similar result, slight gross-of-fee out-performance of the S&P 500, and net-of-fees underperformance, based on such issues as inflated values of present holdings.

The private equity sector has witnessed a lively debate about this issue for several years now. Given the controversy and mixed findings, for our purposes it need only be said that a better contribution which can ensue from an inherently biased (self-selected) data sample is to discern the *sources of value creation* in PE deals.

Lang & Stulz (1994): Chop-shop benchmarking. Lang & Stulz delivered a very important contribution in the debate about the existence and extent of any "diversification discount" for publicly traded holding companies. Here we borrow from their methodology, which they labeled *chop-shop benchmarking*. They matched the independent business units of conglomerates with median publicly-traded competitor pure-play firms, by as close to industry-type and size as possible. A private equity firm is in one sense a "privately-held conglomerate" (see Baker & Montgomery 1994), and in theory the same

analysis can be effectively used.[101] Because of the continuing controversy in terms of net IRR measurement on an industry basis, Lang & Stulz-type analytics can be helpful.

Recent parallel research efforts on private equity investment value and impact. In the course of this research we were apprised of ongoing research in Europe which directly parallels this effort. First, Nikoskelainen & Wright (2007) examine the effects of governance and operating variables on transaction IRR, which is exactly akin to our mode of analysis in Section IV below. Their methodology, data collection, and set of variables were so similar to this effort, that we defer discussion of this paper until Chapter 4, wherein we utilize Nikoskelainen & Wright as a vehicle for comparison.[102]

Loos (2006) has a multi-dimensional analysis of buyout value creation, with the same theme and many of the same empirical techniques as employed here. Because he uses global data from multiple data bases, inclusive of European deals, and also non-exited deals for many of his analyses, his methods and results are not comparable to our efforts here. However he asks many of the same questions, and one of his empirical chapters deals with what he terms "the GP effect", which is the subject of our Chapter 5.

Groh & Gottschalg (2006) examine the determinants of buyout performance for 133 U.S. buyouts (but 199 "deals" based on cash flows for add-on acquisitions), with transaction data gleaned from PE firm private placement memorandums, from which they obtained prior deal results. Their analytical format is again very similar to our efforts here, in assessing transaction IRR *at the individual deal level*. Attacking what they assert is a shortcoming in the literature, they develop an algorithm to calculate *risk* appropriate to this asset class, and are able to assess *operating* as well as *financial* risk in doing so. Their results showed significant out-performance in these deals, which they attribute to the PE firms' ability to buy into low-operating risk (e.g., mature industries) companies and transfer financial risk to lenders.[103]

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[101] This is the subject of the empirical analysis in future benchmarking work; here we set up the methods to be employed in our ongoing research of PE deals; practically speaking, our mean sample size in this paper is too small for the public company benchmarking to be statistically valid.

[102] The characteristics of the data sample in Nikoskelainen & Wright are also similar to ours; they have 321 exited deals, with virtually the same median size transaction, but double the mean. They also have 100 bankruptcies, a far higher percentage than in our sample of 288 (35 bankruptcies, or 12.2%); their mean IRRs for both equity and assets are far higher than ours for the whole sample.

[103] Mike Wright has pointed out that this paper exemplifies the challenges inherent in determining returns to private equity investing; the Groh & Gottschalg result of *outperformance* of the S&P index is well opposite that of the aforementioned Phalippou & Gottschalg (2005), though both papers were completed almost simultaneously by the same co-author.

Lastly, Munari, Cressy, & Malipiero (2006) examine a sample of 89 buyouts from the U.K., seeking to discern differences *by PE investor characteristic*. They look at deals done and analyze them along three dimensions: the type of PE firm (e.g., stand-alone, or bank- or other institution-affiliated), industry-type, and stage-of-deal focus. Their key finding is that PE firms who pursue a focused investment strategy, specialized by stage of investment or industry, outperform more generalist deals, and independent PE firms outperform bank-affiliated PE firms (at the 10% level in their sample on this dimension). Their methodology is different but similar in spirit to our intra-PE firm comparison in Section V below.

In sum, the literature on private equity and buyouts is vast and growing, and this study benefits from techniques or research issues which others have utilized.

CHAPTER 4. TRANSACTION ANALYSIS OF PRIVATE EQUITY

Hayek (1937) asserts that economic theory can be turned into formal propositions of cause and effect in the real world only in so far as we fill those propositions with definite statements about *how knowledge is acquired and communicated*. That is to say, research in empirical corporate finance, say, consists at root of *a priori* propositions about knowledge. If the overarching theme of this research is to discern private equity's impact on the economy, a subsidiary goal of the effort is to better understand when and how PE firms are most effective; what are the *key success factors underlying the transactions* which created most value? At root this devolves to understanding PE firms' specific investment strategies and modes of execution, including, per Hayek, an important differentiator in this business -- their acquisition and exploitation of market knowledge.[104]

It is with this in mind that we designed the unique research modality which forms the basis of this and the next two sections, all comprising an empirical analysis of our data sample of 288 exited PE transactions, between the years 1983-2006. Specifically, prior research has lent support to the Jensen (1986, 1989) thesis that governance mechanisms involving higher leverage, increased incentives, and improved monitoring by *active investors* should lead to improved corporate performance, productivity, operating profits, and ultimately firm value.[105] But most of

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[104] And, Polanyi (1967) would add, *know-how.* Malmgren (1961) makes much the same point more formally; his message is, essentially, that the superior exploitation of market knowledge confers larger share of profits in any industry.

[105] However as Renneboog & Simons (2005) indicate, there is hardly agreement on how or even to what degree this in fact happens. Our research can add insights on agency-mitigation as well as examine other rationales for PE. Recall also that Renneboog & Simons divide past research into four stages, and contend that the third stage, the

these studies were fairly small data samples, gleaned primarily from public sources (e.g., Compustat, Thomson Financial). Our aim in terms of our methodology is to attack the controversies in private equity via a rarely-utilized information source: the PE deal-makers themselves.

Secondly, to the degree the Jensen thesis is true, it is less important today than 20 years ago; more buyouts today involve what Wright et al. (2001) call "entrepreneurial upside", or what we call "coordination-based" (explained below), than merely involve agency problems. Thus the *character* of our focus is different from Jensen's: our underlying predicate assumption is that private equity, as an institution in modern finance, provides liquidity, information-generating, and entrepreneurial-support functions more broadly than the theme of agency-mitigation; or else, as per Alchian (1950), it would not have grown in magnitude as it has. Our task therefore is to apprehend and describe the *nature* of the private equity sector's impact, on corporate control and corporate governance in the first instance, and more broadly, on the economy itself. In the final analysis we seek to examine how *effective* PE is as an institutional vehicle to promote growth in the economy.

To accomplish this we designed a research modality which to our knowledge is unique in this line of inquiry (again, per Hayek): we accessed those engaged on the "front lines" of knowledge acquisition and exploitation directly – the deal-makers themselves. In this section, we first describe the research design and how the data sample was created, and enumerate the methods of analysis and variables utilized. We then proceed to discuss the sample's descriptive statistics, and follow this with a Pearson correlation analysis and some regression models examining the determinants of transaction IRR. In Chapter 5, we continue the analysis by examining the

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time of PE firm ownership and governance, has received a dearth of attention in the literature on buyouts. This and the following sections are dedicated entirely to this stage of PE activity.

differing characteristics and operating performance of the PE firms who participated in this study. In later empirical analysis we benchmark our PE transaction sample against industry-matched publicly traded companies.[106]

For the analysis which follows in this section, we compare where appropriate our sample statistics, correlations, and regression results with Nikoskelainen & Wright (2007). Their data sample of 321 buyouts in the U.K. is qualitatively similar to ours, and the regression framework they develop parallels our own to a large degree.

Research design, data sample, and variables in analysis

Research design and data sample. The data sample was constructed with live field interviews with professionals in 13 private equity firms. The goal was to delve into the specific details of their transactions in terms of their governance and execution model, board oversight, strategic and financial advisory services, methods or strategies by which each firm differentiated its services in adding value, and any other pertinent issues specific to each transaction. Data was collected for investments for all of each firm's investments, and our initial intent was to conduct analyses along the lines of Loos (2006), who includes current, non-exited transactions in some of his IRR and other analyses. But after analyzing each firm's portfolio and the varying amounts of information provided, it became clear that the best path for statistical analysis was to include *exited* transactions only. There were 288 of these for the 13 firms.

The main dependent variable in this study is the transaction's IRR, and we used both index- and industry-adjusted versions in regression. Table 3 lists the deal parameters sought for each

[106] Our model for this effort is Lang & Stulz (1994).

transaction during the interviews, and Appendix 8 lists and defines variables as translated for the statistical work.[107]

TABLE 3. TRANSACTION PARAMETERS SOUGHT FROM P.E. FIRMS

Transaction entry date
Transaction exit date
Industry description
Deal value at entry/exit
Percent of target equity acquired
Percent of equity to management
Options to management and fully vested totals
Target firm's sales revenues at deal entry (12 mos. run rate)/exit
Target firm's EBITDA at deal entry (12 mos. run rate)/exit
Target firm's employment level at deal entry (12 mos. run rate)/exit
Target firm's capital expenditures at deal entry (24 mos. ave. run rate)/exit
Any add-on acquisitions with this deal? YES or NO
Any divestitures with this deal? YES or NO
Syndicate "club deal" with other PE firms, or are you sole investor? YES or NO
Management changes with this deal within 6 mos. of entry? YES or NO
Explanation of intermediate cash flows
IRR of transaction

Details on variables. As described above on page 7, we received great detail on a solid majority of the 288 transactions.[108] Changes in revenues, EBITDA, employment levels, and capital expenditures form the basis for some interesting analyses of what occurred during the tenure of PE firm governance and ownership – the phase of the deal business which the survey of Renneboog & Simons (2005) showed to be largely lacking in the empirical literature. Additionally, our method of inquiry allowed us to capture insights into the critical decision-points of PE deal-making in the modern era:

- Does the PE firm take a controlling stake, or a minority stake? And in either case, what are the equity splits and why? What works with equity share splits and what has not?

[107] Various methods were employed to retrieve transaction data from firms who agreed to participate; eventually we settled on a simple Excel spreadsheet that involved time-efficiency for the participants, and still allowed for deal by deal discussion to understand the underlying particular facets of each deal.

[108] Confidentiality agreements were signed with all firms who participated in this study. Consequently this document cannot be distributed to anyone beyond the present readership; later on or for publication or wider dissemination we will blind firm names, etc.

- Does the PE firm make add-on acquisitions in an attempt to consolidate a market segment and achieve scale or scope economies? If not, what are the ways in which organic growth was pursued?
- Were any divestitures of business units made, as part of a restructuring? Why?
- Was this investment made as part of a syndicate of PE firms, or *club deal*, in industry parlance? How did that arrangement work out? In actual practice what are the pro's and con's of syndicates versus stand-alone transactions?
- Was senior management changed at the point of entry or soon thereafter? What were the circumstances surrounding this if so?[109]

Beyond these specifics for each transaction, we obtained insights into the general investment strategy for the firm as it applied to each deal. Most prominently this involved the choice of industry type, but also included size of transaction, deal structure, whether or not a firm preferred turn-arounds (which could be acquired relatively cheaply) or healthy businesses, and in general, the *sources of added value* each firm brings to their transactions.[110]

We also were able to *parameterize* some of the deal data to make it tractable for our statistical analysis. In the case of revenue, EBITDA, and especially for employment and capital expenditures, where firms did not track (or for transactions farther back in time, had lost) specific changes during the time of their ownership, we sought to at least understand the

[109] Well into our data collection process, we discerned that this variable was of great import to deal-makers in their analysis of the potential value-add in a business before they acquired it. Thus we have begun asking for information about it from all interviewees moving forward, and went back to all past participants to include it for transaction data we had received. We were not able to activate this data for this analysis, but will later in the year.

[110] It is generally true that this used to involve, say, in the 1980s, capital and "financial engineering" more than anything else; now, various operating management services or specialties, industry knowledge or focus, marketing strategy or execution assistance, or turn-around skills are also often the basis for PE firm added value. Many practitioners report that "financial engineering" has now become a commodity in this industry, and value must be derived from other sources.

direction of such change, and turned this information into binary variables. For example, in the cases of employment and capital expenditures, we received hard numbers for 59 and 126 transactions, respectively, out of the 288 (meaning that we had both deal entry *and* exit totals and hence could measure percentage changes. But when asked whether employment and CapEx went *up* or *down*, the responses grew to 250 and 230, respectively. So, we captured these variables both in hard number terms for their change levels, and in larger subsets, as binary variables. We also turned the equity percentage owned by the PE firm into a *Minority* or *Control* binary; and of course coded *Add-on* acquisitions and *Club deals* as binaries, in terms of whether or not the PE firm had pursued consolidating acquisitions or not, and whether this transaction was part of a syndicate or not.[111]

Other variables of interest in the analysis to be described below are as follows:[112]

- *Industry* -- The 288 transactions in this data sample contained 28 three-digit industries, 19 two-digit, and 8 one-digit industries. After studying the sample's distribution of industries at the two-digit level, we discerned an opportunity to achieve parsimonious efficiency in the

[111] We also sought information on divestitures, and received responses for 189 transactions. However there were only 14 which had sold off a part of the business after deal entry, versus 175 who responded in saying that there had been none. Because we inferred that the vast majority of the 99 non-respondents to this question did *not* make any divestitures, we did not include the *divest* variable in this analysis beyond reporting descriptive statistics for the 14 deals which contained them. Because we will continue to build our transaction data base over the course of 2007 with some of the mega-PE firms coming into the study, we expect to activate this variable in our next rounds of analytics with the larger data sample.

[112] We now enumerate the key variables collected in the PE firm interviews. For the most part, they track those as collected by Nikoskelainen & Wright (2007), the closest comparable study to the analysis conducted here in Section IV (in Section III above, we mentioned our indebtedness to prior studies circa 1988-1993 which informed the data design in this study). Three sets of variables we did *not* collect that we would like to have had were Board of Directors variables (as Nikoskelainen & Wright 2007 did), General Partner (GP) data for a detailed intra-PE firm "human capital" analysis (as Loos 2006 did), and details of compensation and incentives for key manager/owners in the target companies, which is an issue we were asked about often in terms of what we were learning. It became obvious over time that we had to limit our request for data and PE firm GP's time; we decided that Board of Directors issues, and the advantage of having smaller boards, has been well-covered – the parallel issue of advantages of what Jensen refers to as *active investors* for better monitoring is also established (see, e.g., Carleton, Nelson, & Weisbach 1998, or M. Smith 1996). Compensation and incentives also has a deep literature, though along with the issues Loos has addressed on GPs, we are to cover in a later phase of this effort.

analysis while still allowing for an industry view of the data. The mix of businesses fell almost perfectly into five "buckets" of similarity:

- 8 businesses were in agriculture, construction, or utilities (or, "outdoors production");
- 61 transactions were consumer goods manufacturing: e.g., food/beverage processing or packaging, clothing, furniture, tire-making, book printing;
- 80 transactions were in capital goods or equipment manufacturing: e.g., steel, aluminum, metal stamping, heavy-equipment, auto/truck manufacturing, electronics equipment making;
- 44 deals were in wholesaling, distribution, or retailing trades of all kinds; and
- 95 deals were in professional services businesses: information, finance/insurance/real estate, technical or administrative, health care, recreation or entertainment.[113]

While the division is not perfect, we coded these "industry groups" as 1 to 5, respectively, intending to move from low-value added labor to higher-value added; and in some respects from higher capital-intensity to lower capital intensity (though again, this is not perfect). Among other things we wanted to test the thesis posited by O. Williamson (1988), who argued that debt and equity were tantamount to a form of *governance structure,* and each would be utilized according to industry/transaction conditions immanent in each deal. Specifically, Williamson's transaction cost explanation would argue debt is suitable for low-beta, slow growth, mature-industry, stable cash flow businesses, and hence would concur with Jensen (1986), who argued such businesses would be most suitable for LBOs in the 1980s. Conversely, a business with a high human capital-to-assets ratio (e.g., a biotech, software, or engineering consulting firm) should have a higher *beta* and more equitized

[113] See Appendix 3 and discussion below, for details about the differential aspects of transaction results by industry.

capital structure. We also intend to analyze results by *industry*, and utilize *industry* as a control variable.

- *PE Firm* – The thirteen PE firms in our sample ranged from 5 professionals and $25 million under management (Firm A), to 140 professionals and $6.5 billion across 20 years (Firm J).[114] In order to analyze each firm *vis a vis* other important deal variables, they were coded from 1 to 13, in ascending order of capital under management. This correlated perfectly with firm size, almost perfectly with tenure in the business, and with prior transactions ("firm experience") as well. Loos (2006) posits the existence of a "GP effect" on the success of transactions, conducting his analysis at the individual professional level within a sample of firms; meanwhile Munari, Cressy, and Malipiero (2006) find firm-specific causality in performance and results in terms of specific PE firm focus (e.g., by industry). We hope to add to these insights via *intra-PE firm* benchmarking in Chapter 5, and here to see if firm size or tenure in the business matters relative to investment performance (we also captured investment strategies, industry focus differences, and so on for each firm – see Appendix 6 and Appendix 14 below for summary information on PE firms).
- *Logsize* – To examine the relationship of deal size to various relationships, we utilize the natural log of transaction value at deal entry.
- *Leverage* – The percent of all debt to assets in the initial capital structure.
- *PE Equity* – The amount of equity our sample PE firm controls at deal entry.
- *MGMT Equity* – The amount of equity *plus* options possible, fully vested, for management at the time of entry. This proved to be a more complex issue than previously thought, because there are a variety of formulas employed for the vesting of options or related bonus-with-

[114] A discussion of the PE firms in detail is deferred until Chapter 5, when we analyze intra-firm comparative performance, but a summary table on the participants is in Appendix 14.

equity pay-for-performance arrangements. We coded this variable in order to capture the full incentive effects of possible payouts and equity awards, so determined what the maximal amount of equity could be at the time of deal entry, assuming there were full vesting based on agreed-upon performance metrics being achieved. In other words, if the ingoing equity split were 90% PE firm-owned and 10% management (and there were no other investors), but that in 3 years' time it would be possible if EBITDA growth targets were hit for management to own 22% of the company, then we coded the deal at 78% and 22%. This allows for full incentive effects to be captured; interestingly, there was considerable variability across PE firms into how to handle this, and very different philosophies.[115]

- *Debt Pay-down* – Following Nikoskelainen & Wright (2007), we coded this variable as total debt/EBITDA at entry. We arrive at total debt by subtracting total equity invested from transaction value at entry. This measures the EBITDA multiple of debt owed, and is thus an inverse of a traditional interest coverage ratio. Nikoskelainen & Wright utilize this variable as a proxy for the controlling effect of debt, to measure debt's disciplinary effect. Like them, we convert negative EBITDA at entry to the 99th percentile of coverage. They also analyze the leverage to debt pay-down relationship, noting that it can be dependent on interest rate and funding cycles; we ignore this relationship because our investing horizon is 23 years to their 10.
- *Add-ons, Club deal, MinorCon* -- Mentioned above, these are key variables concerning the strategic choices PE firms make concerning their investments with respect to ownership, syndication (governance) and growth. These variables are coded as binaries: 0 if there were

[115] We were careful not to let this skew analysis of returns on equity. Where we had access to detailed cash flows, we looked at cash on cash returns and timing to derive equity IRRs. In other cases IRR is self-reported but foots with published performance data in places where we could obtain information. Appendix 6 contains summary statistics on PE firms; Appendix 15 shows an example of cash flow accounting at the PE firm level, utilized in managing portfolio companies.

no add-ons, *no* other PE firms in the deal, and a minority stake, respectively; 1 if otherwise. Appendix 5 offers summary statistics of these choices.

- *Exit type* – To investigate how exit type affects exit valuation and thus investment return, we coded exit types as follows: 1= IPO; 2= Sale to industry buyer; 3= Sale to another PE firm; 4= Recapitalization, usually involving effective sale or relinquishment of control to management (but occasionally involves a liquidity event or dilutive restructuring); and 5= Bankrupt (in this case, the portfolio firm may well *not* have entered actual bankruptcy proceedings – though in some cases they did – but a de facto "fire sale" of assets or similar break-up, which would involve the loss of most or all the PE firm's investment, was coded as a failed transaction). We attempted to obtain valuations and IRRs for all transactions, including bankruptcies, and coded as able; if not available for bankruptcies, we assumed full loss of equity and coded it as -100%, as well as enterprise value of zero. This probably made our sample's mean IRR lower than the reality, but we have 35 bankruptcies out of 288 transactions, whereas Nikoskelainen and Wright had 100 out of 321. With this data we seek to confirm or refute both Loos (2006) and Nikoskelainen & Wright (2007), who found that returns were highest for IPOs, second highest for trade or industry sales, and lowest for exits to other PE firms. This would be predicted by a theory taking into account relative qualities of knowledge possessed by buyers; in turn, we can take it one step further by including recapitalizations to incumbent management, who would have even more knowledge than another PE firm interested in the business.[116]

[116] Appendix 4 below shows that our data do indeed confirm the findings of Loos (2006) and Nikoskelainen & Wright (2007).

- *Beta* – Industry betas were found for each transaction and utilized in analysis against leverage levels, to examine the thesis of Williamson (1988).[117] For our entire sample, mean *beta* is 0.92, which comports perfectly with the industry spread of the sample: 140 mostly low-tech manufacturing businesses, 44 distribution or retail deals, 8 in agriculture, construction, or utilities ("outdoor production"), and the remaining 95 in higher beta services.
- *Entry and Exit Multiples*—Where possible we obtained firm data on the transaction values as a multiple of EBITDA, as this is the key valuation metric in the buyout world today. PE practitioners argue that their negotiation skills and knowledge of industry buyers and market conditions can optimize firm value at exit, and one measure of this is "uplift" in the value/EBITDA multiple. Loos (2006) argues that private equity markets for corporate control are efficient, and hence there is no value to the PE firm's negotiating prowess. We will investigate this, based on a modified *DuPont Formula* depicting sources of adding value in a transaction:

Classic DuPont Formula: $\frac{\textbf{Net income}}{\textbf{Sales}} * \frac{\textbf{Sales}}{\textbf{Assets}} * \frac{\textbf{Assets}}{\textbf{Equity}}$

….where the three ratios signify, respectively, measures of efficiency in operations, marketing, and the finance of the firm, and of course amount to return on equity. The modification for PE is as follows:

[117] For each firm, publicly-traded matched stocks are found by industry code. CAPM betas are estimated by regressing the contemporaneous excess monthly stock returns over the market excess returns (excess return being the difference between monthly return and the risk-free rate). Each year for each stock, the slope coefficient *Beta* is estimated using an OLS specification for the CAPM equation. Risk free rates and excess market returns are from Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html).

PE firm value creation: $\frac{\text{EBITDA}}{\text{Sales}} * \frac{\text{Sales}}{\text{Firm value(n)}} * \frac{\text{Firm value(x)}}{\text{EBITDA}}$[118]

…where the product always totals the ratio of exit value to entry value, but can be broken into the constituent pieces of value creation in this business: operations efficiency, marketing effectiveness, and negotiating prowess (if we enclosed the multiplicands in brackets and took their product to the power of days-held/365, and then subtracted 1 from this amount, we would have the transaction IRR if we assume no intermediate cash flows). These are three key metrics of value creation in private equity, and we seek to measure the change in EBITDA margin (EBITDA/revenues) and in the change in multiples.[119]

The dependent variables in this analysis are variants of IRR results, and as per Nikoskelainen & Wright, we measure both return on equity and "return on assets" (what he calls enterprise value change, measuring the transaction values at entry and exit) – which is really the IRR of the target company's whole set of assets. In both cases, we ran models based on unadjusted values, S&P 500-adjusted, and Fama-French 10 (index for lowest 10% market capitalization stocks, based on the relatively small company size in our sample); with negligible and insignificant differences, we report here the S&P 500-adjusted results, which is an ultimate economy-wide barometer.

The determination of transaction IRR deserves comment. In the course of interviewing 13 firms for inclusion in this analysis, wide variability was observed in the quality and organization of their record-keeping. In 5 of the 13 firms we had access to detailed intermediate cash flows,

[118] (n) signals "at entry", and (x) signals "at exit".

[119] Of course deal professionals understand there are limits to the usefulness of uplift in multiples, because private equity tracks the S&P 500 and publicly-traded multiples. Hence a good economy can bring a higher multiple, *ceteris paribus*. But it is useful to track this metric because in the long run the economy-wide P/E ratio is a random walk, and hence if this measure is consistent over time one way or another, it is insightful.

and in a few more cases high-level background documentation was provided to ascertain if the numbers reported would "foot" the data shown. An example of one such transaction's cash flows from PE Firm B is included as Appendix 15. We are happy to report that there was a high degree of accuracy in data as reported from the firms and in the underlying math, with one exception. Firm H's transactions are reported here with an arithmetic mean IRR of 106%, when in their marketing materials for their latest fund-raise they advertise a 59% gross IRR; they gave us data for 17 exited transactions whereas they advertise 26; they also gave us current holding data marked-to-market which does bring the 106% figure down.[120] In all other cases the reported figures matched our calculations very closely (e.g., Firm D reports on their website a gross IRR of 49% whereas we calculated 44%), within a solid range of reasonableness, and hence we have high confidence in the numbers contained herein. Earlier we raised the more general challenge of cross-comparisons of PE deals with other investments when *value-weightings* are not utilized, but again, there are no inherent incentives or forces impelling a change from current gross IRR reporting of arithmetic means.

Lastly we must mention the potential for (and in fact, probability of) sample bias. The nature of this kind of research raises the possibility of *self-reported* errors by firms, either of omission or commission, though our confidence level is high that we received accurate deal data after unusual levels of cooperation and interaction, and the ability to review source files. The *self-selection* of participating firms, however, is more problematic, because the 13 firms in the current sample are hardly the result of a random draw. To this our reply is that, first, the potential

[120]We spent an entire day in their offices in New York and went through their data, only later discovering the discrepancy. We have high confidence that they were not "cherry-picking" deals to show us, due to extensive interaction at the time and the fact that they did give us transactions that had done poorly. We have not followed up to solve this issue but will. In any case they represent 5.9% of the data base and so the data sample's mean IRR is at most skewed by almost two percentage points (e.g., if we assume Firm H's "true" gross IRR were 59% and apply it here instead of 106%, the entire sample mean equity IRR falls from 40.1% to 38.35%.

of selection bias is less of a concern if our main focus is not so much on drivers of *relative* performance as on those of *absolute* performance. That is to say, this research seeks to understand primarily *how* and *where* and *when* private equity firms add value in transactions, what effect they have had collectively, as an institution, in our economy, and how they indirectly, at least, impact growth. The question of relative performance as compared to other investment options is a complex one, as addressed above, and not easily settled; however it is not a primary focus in this effort.

The other types of bias that may be inherent in this type of analysis are those of *survivorship* and *specification*. By definition, buyout firms who remain in business to raise new funds across time can only do so because of the strength of their investment *reputation;* prior track record is a key determinant and criterion among limited partner investors in the deployment of funds for alternative assets such as private equity. Those PE firms who have not done well in their portfolio cannot expect to raise new funds in the future, and we have an example of that in our sample. So, to properly account for PE transactions in the past which were executed by firms who no longer exist is therefore problematic. Specification bias is more amenable to correction but must be apprehended through careful analysis. The link between ownership and performance has a long literature as we have shown, with controversies over methodology recently published (e.g., Himmelberg et al. 1999, Demsetz & Villalonga 2001, McConnell et al. 2006).

That being said, it should be pointed out that this representation is a good start toward a *dispassionate* view of private equity. On the one hand, some poorly performing firms, as it turned out, did agree to participate once they understood data will be kept confidential in terms of publishing; the obverse of this was also true, probably to a far greater extent, in that many

good firms turned down requests to participate in this study.[121] More prosaically, the one driver of participation in the study which these 13 firms have in common is linkage via personal contact to the author (often indirectly or by introduction), which *is* a randomized phenomenon.

Additionally, one way to mitigate inherent selection bias in the case of benchmarking performance, as we do in later analysis, is to benchmark against the 100th (top) percentile performer, not the median as did our prototype, Lang & Stulz (1994).[122] Thus, while there is selection bias in the nature of the exercise, for the purposes of our analysis it is not a major concern.[123] We now turn to a discussion of the sample descriptive statistics.

Descriptive statistics [124]

Returns. Appendix 1 below reports the descriptive statistics for the whole sample. On returns, our sample has an *unadjusted* mean IRR for equity ("EQ" for return on equity) of 40.05%, with a median of 30.90%; not shown, this distribution has skewness of 3.42 and kurtosis of 26.69.[125] For the IRR of the firm's assets ("EV", or enterprise value), the mean IRR is 15.03%, and median EV IRR is 13.58%. By comparison the pooled IRR for the S&P 500 for our

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121 However, thanks to the sponsorship now of the American Enterprise Institute, firms who turned us down initially (e.g., KKR) are now reconsidering; we expect our data sample to grow considerably this year.

122 There is however a potential issue regarding *size* in the public company benchmarks, which we defer to later analysis.

123 Curiously, as we report below, our IRR returns were far *lower* than Nikoskelainen & Wright (2007), though 31.1% of their sample were bankruptcies, and only 12.2% of ours were.

124 Again, where appropriate in this and the next few sections, we compare our results to Nikoskelainen & Wright (2007) due to the similarity in data samples and research agenda.

125 The standard deviation of the sample EQ IRR is 89.3%, typical for high-variance leveraged investing or venture capital. Discussion of the third and fourth moments are not common in many statistical applications, but are utilized in the investment world. As the head of Berkshire Partners told us, "We sell *skewness*", when describing how institutional investors are approached during fund-raising. The Jarque-Bera test confirms this is a non-normal distribution, which means OLS regression results must be interpreted carefully in terms of broader applicability (however, assuming the residuals are normally distributed in our regression framework, we proceed as usual here and OLS results obtain). High skewness coupled with high kurtosis provide an institutional investor with the opportunity to diversify into alternative assets which offer the potential for superior returns. With respect to non-normality, in future iterations of this exercise we will investigate sample variable transformations if warranted.

data sample is 9.81%, with a median 10.09%;[126] for sensitivity, we also reviewed Russell-2000 and Fama-French (FF) smallest 30%, 20%, and 10%, and the IRR ranges go from 7.5-14%, with FF-10 as the highest.[127] The S&P 500 *index-adjusted* IRR for equity (EQ) is 27.2% (down from 40% unadjusted), and the median adjusted value is 23.6%. Lastly, Swensen (2000, p.230-) points out that the ultimate best way to analyze private equity returns against an index is on a full *risk-adjusted* basis, accounting for leverage in buyout deals. Investing the same dollar amounts in each of our 288 transactions with equal amounts of leverage in the S&P 500 index triples equity returns, from 9.8% to 25.82%, with median of 21.93%.[128]

These equity (EQ) and asset (EV) returns deserve comment. First, the unadjusted gross EQ IRR of 40.05% is of course prior to fees; Swensen (2000) says all-in fees to the GPs average 12%. Using his figure, this brings the net IRR down to approximately 28%, for our sample of 288 deals from 1983-2006. As we reported in Table 2 on page 29, the 20-year pooled IRR (net of fees) for small buyouts (<$250 million) from 1986 through most of 2006 was 25.2%; this gives us further confidence that our data is solid as it was reported, or determined after analysis.[129] Swensen conducted a retrospective analysis of most of the 1980s-1990s on 542 buyout deals in which Yale had either invested, or had access to via PPM data, and his gross and net IRRs for these deals were 48% and 36%, respectively. Measured against the pooled IRR of

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[126] And, standard deviation, skewness and kurtosis for the S&P 500 for our sample transaction matches are 10.9%, -0.15 and -0.40, respectively, so the volatility of our sample is, as expected, high.

[127] Hence for this exercise we will index-benchmark against the S&P 500; the index-adjusted equity returns are brought down to 19.97% with FF-10 as the denominator, but results in various tests do not change in magnitude to the S&P.

[128] The other return figure to note here is the *value-weighted* IRR for EQ for this sample; it is 43.90%, up nearly 4 percentage points from the arithmetic mean.

[129] Note as well in Table 2 that the IRRs for buyouts *fell,* moving from small deals to larger deals, for the long-term 20 year figure. This is in contrast to the finding of Nikoskelainen & Wright (2007) , Loos (2006), and this paper, where the larger deals have *higher* IRRs. This is a subject for our further investigation; economic theory would predict that the smaller buyout arena would have *greater* market inefficiencies, higher number of bankruptcies (hence higher risk), and thus higher returns in the long run. But these three recent papers all show a *size effect* to returns (which Nikoskelainen & Wright explicitly model; we do not go through the exercise here).

the S&P 500 from 1980-1998, matching deal by deal as we did at each entry and exit point in the same amounts, these buyout investments did well; the S&P figure is 17% per annum. However, Swensen then *levered* these investments in the S&P 500 index in equi-proportional amounts to his 542 transactions, and the levered S&P 500 returns were 40 percentage points higher than his gross IRRs for the buyouts.

For Swensen, this is indicative of private equity being mean-variance *inefficient* as an asset class; for risky, highly illiquid investments, the returns under-performed the risk-adjusted S&P 500 by a wide margin.[130] Our results (or his) in this regard are puzzling, as our gross IRR beats the risk-adjusted S&P 500 (40%-25%), as does our hypothetical net IRR (28%-25%), slightly. The 20-year IRR of the S&P 500 reported on page 29 above is 9.70% from 1986-2006, very close to our unlevered 9.81% over almost exactly the same timeframe. Swensen's S&P returns are considerably higher because his timeframe is early 1980s through the late 1990's (before the post-2000 correction, recession, and war), but without having his data we cannot judge why there is such a huge differential. But his points are well-taken, that *risk-adjusted* returns analysis is preferable if one has the data on leverage amounts.

Nikoskelainen & Wright (2007) have a data sample of 321 U.K. buyouts from 1995-2004, the latter half of our timeframe, and have a very different pattern to IRR returns. They report *only* FTSE100-adjusted returns, of 70.5% for equity, and 22.2% for assets; their unreported unadjusted returns may be higher or lower, because of the wide variance in their sample distribution (100 of 321, or 31.1% of their transactions are bankruptcies, most of which they conservatively coded at -100%; by contrast, 12.2% of our sample were bankruptcies). However,

[130] He goes on to argue that this is doubly troublesome because while limited partners have been relative losers as private equity investors, or at least have not been compensated commensurate with their risk, the general partners in these buyout firms have been over-compensated. Among other things Swensen recommends paying 20% of the residual based on *value-added,* and not on profits – i.e., on a risk-adjusted basis, and not on an unadjusted basis. This is interesting commentary coming from one of the great PE investors in the last 20 years.

their adjusted figures are much higher than our 27.2% (EQ) and 23.6% (EV), respectively. They do not report their sample standard deviation but it is invariably higher than our 89.3%, given their 177 transactions earning < 0% IRR and 56 which earned > 100%; in fact, their median IRR returns for both EQ and EV are negative, whereas ours our 30.9% and 13.5%, respectively.

One reason for the difference in sample returns is that while our median deal sizes at entry are almost perfectly equal to theirs ($29.2 million), their mean deal size at entry is $110 million, versus our $78.3 million. They also had 52 IPOs, to our 37, which carry far higher returns. Additionally, their timeframe, 1995-2004, truncates our timeframe by half – and in the U.S., private equity returns as a general proposition have been in a long term secular decline.[131] Great Britain, meanwhile, still had a trove of buyout opportunities available for acquisition in the 1990s with characteristics of 1980s-style U.S. buyouts, and the U.K. market was less efficient over time than the U.S. (until recently at least); related to this, their data sample was leveraged far more than ours, increasing both volatility and return. In any case, there is no question that their sample characteristics differ from ours in some respects, and we raise the issue only in estimating how representative our (or their) sample is from the universe of PE transactions.

One final point to note on our sample returns: Swensen (2000) states that at the time of his publication, top-quartile buyout funds reported mean net returns of 23.8% (for 1980-1997 LBO funds), and a standard deviation of 35.7%. It is hard to compare our data with these figures due to timeframes, but it is likely the quartile figure has not changed all that much, and hence, our

[131] This point was alluded to earlier in terms of the changing nature of the industry and the need for differentiating strategies among PE firms now to create value. To make this point differently, the fund returns of all the repeat-funds in this study decline almost uniformly for the firms who have raised follow-on funds. KKR, the originator of the modern era of buyout investing, shows this as well across a dozen funds and almost 30 years; there is almost a straight line downward slope across their fund performance graph. The same phenomenon does not seem to hold as strictly for venture capital, which is more cyclical and prone to disruptive technological growth periodically.

data sample does contain leading firms in the sector.[132] Our standard deviation is higher than the universe of buyouts long term because our transaction size is smaller.

Strategic or operating choices: size, leverage, ownership, syndication, growth. Moving to other key variables in the study, mean size of deal was $78.3 million, but with a median of $29.2 million. Our transactions contained average leverage of 65.5% (with a range of 0 to 94.3%), compared to Nikoskelainen & Wright's at 77.2% (our median, however, was 70%, compared to their 58.3% -- we had a larger number of conservatively capitalized transactions and they had outliers with huge leverage; again, this makes sense given the sample timeframes and their probable industry mix versus ours, which as stated earlier was well-spread across higher-beta service businesses as well as low-tech manufacturing or distribution). Our debt/EBITDA ratio had a mean of 3.71X and median of 3.01X, which was lower than their median of 4.2X. Our sample PE firms averaged a 55.7% controlling stake in these transactions (range of 2.8% to 94.5%), with a median of 64.25%.[133] This is emblematic of two things: our sample, containing small and mid-sized firms, are those that typically offer equity to third party investors (if not other PE firms) as well as decent portions to management; and, this is the private equity world of today versus 20 years ago, when *go-it-alone* deals were much more prevalent for smaller buyouts as well. 44.1% of our sample were transactions involving PE firm syndicates, a remarkable number given the sample transaction sizes, but it shows the nature of the business today.

In terms of strategic choices PE firms make regarding their execution model as it concerns profit growth, of 271 deals reporting on this parameter, 55.7% contained at least one *add-on* acquisition. This is perhaps the feature in the modern private equity world which is most singularly responsible for PE's impact with respect to driving growth in the U.S. economy.

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[132] The 20 year pooled *mean* IRR for PE/buyouts is 13.20%, 1986-2006. We will soon have access to VentureXpert and will update the discussion via noting current quartile splits.

[133] The sample itself contained transactions which were nearly 63% control stakes, and 37% minority.

Porter (1980, pp.191-215) outlines the nature of fragmented industries in terms of industry structure and characteristics, and even enumerates a long list of over 100 4-digit SIC-code manufacturing sectors in which top-4 and top-8 market shares were extremely low.[134] He was the first to formally identify executable strategies for consolidation *given* an industry's underlying economics, and his work helped to usher in the subsequent wave of mass consolidation the U.S. economy has witnessed in the intervening era of massive growth in private equity and buyouts.[135] Prior to the leveraged buyout wave of the 1980s, growth via consolidation of an industry sector containing multiple small firms was much harder to accomplish due to the lack of liquidity in capital markets serving deal-makers in the middle market. Private equity has singularly changed and improved accessibility to capital for consolidation (and thereby made easier the unlocking of previously unrealized value in capital assets), thus increasing what Keynes (1936, p.135 ff.) referred to as the *marginal efficiency of capital.*[136] As we detail below, transactions involving add-on acquisitions performed in a significantly superior way to those in which organic growth is the intended strategy.

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[134] And, Porter's list contained *no* distribution or service industries, arguably more fragmented than most manufacturing sectors.

[135] The work of economists like Porter who pointed out the opportunities inherent in industry consolidation also coincided with explosive developments in information and communications technologies in the 1980s and onward, which made the exploitation of scale and scope economies in businesses easier to achieve. Additionally, an era of deregulation led to a more benign anti-trust environment for transactions larger enough to warrant review. Finally, research in financial economics in the early 1990s led to empirical findings that *diversified* companies were not valued as highly as industry-focused *pure plays;* horizontal consolidation to reap economies across the firm's value chain were however seen as accretive to market value (see Footnote 10 for cites). In the last two decades PE has capitalized the growth of acquisitions based on this strategic concept.

[136] It is not idle to speculate what Keynes would have thought about private equity, as his disciples may be its leading critics today. *The General Theory* has long discussions of capital investment in multiple places and contexts; for our purposes the germane insight from these is that Keynes will admit to neither any *special* function for the role of capital in economic growth, nor concede its nature as being one of heterogeneity. But both of these distinctions are crucial to an apprehension of the role of private equity in a modern capitalist economy, and are seen most prominently in the nature of the composition of firms' assets, the productive combination and exploitation of which is the core pursuit of private equity professionals. Further, beyond evincing sympathy for the "pre-classical labor theory of value, in which everything is produced by labor….or the results of past labor" (i.e., capital assets), Keynes decries high interest rates (especially since they stifle economic booms), the corollary of which is the resultant scarcity of capital. He then goes on to argue that in essence, capital scarcity is *artificial* (unlike the scarcity of land), and that policies to eradicate the scarcity of

The converse of a strategy based on consolidation via ancillary acquisitions is one of restructuring a firm with an uneconomic mix of assets via divestiture, in an effort to rationalize the core business. We received 189 responses to our request for data about this, and 175 had not pursued any divestitures, whereas only 14 had. Therefore we did not utilize this parameter in modeling for this exercise, but will in extensions of this work later this year.[137] We shall only note here that the 14 divestiture deals we *did* receive details about involved a mean IRR of 98.4% (*double* the returns of non-divestitures, though too small a sample to be a material fact), had only 1 bankruptcy, and 7 of the deals also involved add-ons in complex restructurings. Mean revenue growth was flat, but EBITDA increased 7.7% and hence EBITDA margin improved by over 12%. Employment and capital expenditures were down for firms reporting, 7% and 15% respectively. In spite of the small sample, these impressive investment results display the viability of private equity-led restructuring in mid-sized and smaller companies, as well as larger firms (Jensen 1993).

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capital through permanently low interest rates will vitiate the *rentier*. This is proper, Keynes implies, because this agent is a parasite, for whom rent from capital is only available due to the artificial scarcity of capital which involves "no real sacrifice". Further, once this "functionless investor" is removed from the economy, a scheme of "direct taxation" will yield maximal benefits to the community, because "financiers and entrepreneurs" can be induced to produce in service to the community on more "reasonable terms of remuneration", because they are in fact "so fond of their craft that their labor could be obtained much cheaper than at present" (1936, ch. 11, 16, & 24). Keynes' thesis bears resemblance to that of Marx (see Footnote 9, page 4), in implying no special role of, or need for, foresight by entrepreneurship, and the concomitant *direction* of investment capital in search of wealth-creating profit (though to be fair, elsewhere Keynes is more supportive of the role of financiers and entrepreneurs). But both writers, in viewing entrepreneurship so dimly (as it relates to capital investment, including, here, M&A and PE as per Bittlingmayer, op. cit., p.46 above) and capital as a homogeneous *fund* whose scarcity *could be eradicated* merely by appropriate policy, would perhaps see no primary role for private equity in the economy. Mises, who was criticized in the *General Theory* for misapprehending the linkage between the marginal efficiency of capital and the rate of interest which induces investment, pointed to this later as *Keynes' own* misunderstanding of the seminal role of saving and capital accumulation in fostering economic growth (and by extension, that the fuel of private equity investing is, indeed, the passive and undeserving *rentier*, via pension funds and related institutions, and its driving force the entrepreneur), and of the folly in thinking (real) interest rates and the scarcity of capital can be lowered or eradicated as a matter of government policy (1949, p.464 *et al.*). On a similar note, Garrison (2001, p.205 ff.) refers to Keynesianism as "labor-based macroeconomics", devoid of a proper theory of capital.

[137] And, larger PE firms coming into the study will have more divestiture-based deals to analyze. The nature of the data sample as utilized for this exercise was such that mostly smaller deals are involved, where building scale is the operative goal in the transaction. were

Management equity. MGMT Equity averaged 19.3% in our sample, ranging from 3.2% to 80%, but was 37.6% for Nikoskelainen & Wright. This is a surprising difference, considering that our sample contains more small transactions, which in theory should (and usually do) consist of larger management stakes. Nikoskelainen & Wright do have 18.4% higher leverage in each deal on average than our sample transactions, which will always mean higher management stakes. And, they obtain their data through the CMBOR (Centre for Management Buyout Research) data base there, which conducts quarterly surveys of PE firms and has been set up to be a "quasi-Thomson Financial" for the U.K. Via such methods of information gathering, data from exits may skew the MGMT equity number northward, because in any recapitalization the ownership for managers tends to increase, so ending equity is reported, as opposed to beginning. But the difference is still a large one. [138]

Holding time of transactions. Finally in direct comparison to Nikoskelainen & Wright, they report mean and median holding times of 3.5 and 3.3 years, respectively. Our figures are 4.8 and 4.33 years, respectively (or 1752 and 1583 days). Their sample contains larger buyouts, which in recent years tend to exit sooner than smaller deals; additionally, our sample goes back in time ten years further than theirs, to the early 1980s, when transactions were held for longer periods. Kaplan (1991) reports mean holding time of 6.82 years, though again, these are for larger company deals at the time and not comparable to our sample.[139] But what that number *does* further show is how the private equity sector has evolved: more capital in play, more firms, more speed to the process in order to get exits and raise another fund. Over time PE firms came to learn that operating and strategic changes (as well as those dealing with governance,

[138] The other possibility with this difference is, UK deals are structurally different than U.S. deals for lower middle market buyouts; we are not aware of details of their approach to equity, leverage, etc.

[139] In this case though, it is interesting to note that the *larger* transactions were held for that long back then.

management, and monitoring and control) were front-loaded in the deal process, and via a *learning effect*, the PE sector has gravitated toward shorter holding times.[140]

Operating performance. Our data collection also afforded us insight into transaction parameters which have not often been captured in the recent literature:

- *Revenue growth*: 83.1% of 255 transactions reported saw revenue growth, with a mean of 13.94% per annum.
- *EBITDA growth*: 75.6% of 256 reported transactions saw growth in operating profit, with a median growth of 11.6%.[141]
- *EBITDA margin* (EBITDA/revenues) *growth*: 45.2% of 254 transactions reported showed growth in operating profit margins, with median change being -0.33%. This is a key metric of operations efficiency in the PE world, and the figures were not higher because of our sample containing half low-tech manufacturing companies, and another 15% in distribution or retailing in competitive businesses.
- *Employment levels*: Of 250 transactions with data, 71.6% saw increased levels of employment; and, for 59 deals which had *specific* numbers on employment, growth averaged 13.44% annually during PE firm investment.
- *Capital expenditures*: 230 transactions reported data on CapEx, and 60.4% of them saw an increase in spending levels versus pre-deal levels. For 119 deals which had tracked specific spending levels, CapEx growth averaged 8.3% annually.

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[140] In our sample, the Pearson correlation between *holding time* and *entry year* is -.3800, and significant at the 1% level; Nikoskelainen & Wright make much the same point. And, in his interchange with Jensen, Rappaport (1990) referred to LBO firms almost disparagingly as "transitional", which ultimately may have been a *double entendre* in terms of both quick holding periods and the LBO association fading away in the long run, as he predicted in the last paragraph of his essay. The truth is, he was correct to the extent his thesis concerns the changes effectuated by PE firm governance, but the *institution* of private equity itself is now imbedded in our economic system, as a provider of liquidity, risk-bearing, and change-agency services to corporate America, small and large.

[141] We report median figures for EBITDA and EBITDA margin growth, because outliers and growth from negative numbers skewed average numbers for these parameters.

If our sample may be taken as representative of small buyouts over time, these figures suggest that in this size range of transaction, at least, the Jensen (1986) agency-mitigation rationale is less important than either *growth equity* opportunities, or, as we describe in the next Section, *coordination-improving* opportunities in fundamentally sound businesses. We are not able to compare our results to prior work (e.g, Kaplan 1989 or Long & Ravenscraft 1993) which showed a decline in CapEx spending, because in those larger transactions involving smokestack industries, the Jensen thesis may have applied. But it appears a large percentage of these transactions are geared toward investment in revenue and/or profit growth as a competitive opportunity, as opposed to agency mitigation.

Comment on operating performance. Appendix 2 presents further enlightening information on operating performance for the sample, detailing results of PE firm governance for these middle market-sized transactions. Revenue and operating profit increases drove strong performance which led to high-IRR exits (51.3 and 62.3%, respectively), while transactions in which revenues or profits *decreased* led to negative-IRRs. These data are of course not surprising in sign, but they are in terms of *magnitude.* Slow-growth and mature businesses that were the focus of 1980s leveraged buyouts were by definition not expected to grow revenues; they threw off steady cash flows and hence were leverage-able. But in this case, smaller companies which contain under-managed assets contain unlocked value of surprisingly large degree, even in cases where the subsequent growth itself is modest. Additionally, the nature of this sample, in which many companies were held by senior owner/managers in fragmented industries and thus operated at a scale which was commensurate with resources available,

guarantees that growth in revenues and/or profits will yield high-IRRs via the preponderance of scale-enhancing consolidation.[142]

Operating profit margins exhibited an equally stark differential: 115 transactions which saw EBITDA/Revenues increase had a mean return on equity of 75.9%, while 139 deals with EBITDA/Revenue decreases had only a 14.9% equity return. This makes the point that in competitive markets value gains can be achieved without efficiency as expressly captured in the metric for operating profit, but that EBITDA/Revenues is still a strong predictor of value accretion in private equity.

Because our sample contained mostly smaller middle-market companies, over half of which were involved in add-on acquisitions, our prior assumption had been that employment and capital expenditures would see increases; indeed, the transactions where this was true were also the biggest gainers via growth. Where employment and CapEx increased (178 and 139 deals, respectively), mean equity returns were 60.6% and 52.8%; where they decreased (72 and 91 deals, respectively), returns were much lower, and negative for employment.[143] For this sample, at least, strong firm performance and returns are associated with growth in employment and CapEx; this is again consistent with the size of companies in the sample, and the degree of consolidation.

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[142] This brings to mind the criticisms of private equity which are subsidiary to the larger populist complaint about mergers and acquisitions: they are exercises in "trading of ownership claims" which "add no value to the economy as a whole", destroying jobs via efficiency gains which reward only the managers and deal-makers. This point is beyond our scope here, where we will merely say that Schumpeterian *creative destruction* wrought by private equity is axiomatically wealth-enhancing in the long run, by optimizing the efficiency of the asset base in place and, in the case of consolidations, freeing up resources for other deployment. Said differently, private equity (and venture capital) are institutions which promote and extend the vibrant dynamism inherent in a market economy in which entrepreneurs are endlessly discovering more efficient and productive ways to serve consumer needs.

[143] We view these results more cautiously than other returns data because there were sizable sub-sets of deals for both employment and CapEx, which were unsure of the direction of these parameters during the deal's holding time. And in both cases the *unknowns* exhibited strong returns. A larger data sample will shed light on these. It must also be remembered that declines in Capital Expenditure especially, but also potentially employment, are not inconsistent with a strategy to optimize investment returns and firm performance (and in some cases, survival). This fact often gets lost in discussions about restructuring via private equity.

As previously mentioned, EBITDA multiples are, like price/earnings ratios, subject to broader market swings, and exit multiple "uplift" is not significantly related to return on equity. However, multiple expansion *is* clearly indicative of value creation: 170 transactions where EBITDA multiples increased from entry to exit yielded a 67.8% return, while 87 deals experiencing EBITDA multiple decreases yielded -1.7% return on equity. Companies that have had solid performance during PE ownership can expect to see some uplift.[144]

We list deal holding times in Appendix 2 due to an observed anomaly: holding time is significantly negatively related to equity returns for our sample: the Pearson correlation coefficient is -0.2907 (at 1% -- see Appendix 16 below), and this is consistent with what many practitioners tell us: holding times have *decreased,* as the *deal process* and execution have become more efficient over time.[145] Yet from our data, holding time is longer for four of the key operating parameters in which returns were strongest; most prominently, this is the case for revenues and operating profits, but also for employment and CapEx (interestingly the four with strong positive returns fall in between 1835-1868 days, or 3-4 months beyond the mean of the entire sample. This indicates outliers in the data, and offers mixed evidence with respect to the debate in the sector about this issue which a more robust data sample can help to settle.

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[144] Causality remains an issue for further investigation; PE professionals attribute their superior negotiation skills and market knowledge to EBITDA multiple expansion. Clearly their governance and strategic oversight can position deals which perform well for uplift at exit, but in an increasingly efficient market for corporate control wrought by PE, the incremental value derived from their negotiating skills at exit is more problematic to identify.

[145] However this is not a unanimous view in private equity; especially for those firms organized as open-ended funds (including a few in our sample), their claim is that they offer truly *patient capital*, and can optimize the exit without pressure of a fund's contractual life end. It is probably true for larger deals that holding times are shorter; here, for growth-oriented investments often involving consolidating roll-ups of smaller firms, holding time to an attractive exit may involve longer periods.

Comment on industry performance. Appendix 3 below breaks down key descriptive statistics by industry type, with some interesting issues discerned.[146] First, for industries "2" through "5", there are predictable patterns to transaction structure for some parameters which correlate to industry type, and which economic theory would predict. Roughly speaking, ingoing leverage declines from 74% to 54%, as the industry-type moves from physical asset-intensive manufacturing to high-value adding human capital-intensive businesses. PE firm's equity also decreases, from 64% to 45%, meaning that other PE firms or investors assist in equitizing the capital structure of more complex industry deals which exhibit higher growth (and volatility). The percentage of control-position deals likewise drops sharply, from 80 to 43%. Meanwhile the percentage of risk-spreading club-deals increases to the same degree, from 27% to 63%, while add-on acquisitions drop from 63% to 51%.

These results comport perfectly with the tenets of both agency-theory and transaction cost economics (see, e.g., Jensen 1986, and Williamson 1988; Kochhar 1996 looks at both theories side by side in examining capital structure specifically). The riskier deals become, the less leverage is employed; at the same time the more there are *ex post* bargaining possibilities in future uncertain states, the more equity is both employed and spread across multiple owning

[146] As mentioned, for reasons of parsimony in analysis we took advantage of the 8 one-digit industries (and 19 two-digit, 28 three-digit) in our deal sample falling perfectly into an array of four industry groupings that were quite similar, with predominant commonality around a broad theme. Those four were: 61 deals in consumer goods manufacturing (food, beverage processing, book binding, furniture making, rubber tires, plastic products), coded "2"; 80 in capital goods, heavy durables, and industrial equipment manufacturing (steel, metal stamping, automotive, electronics, IT equipment), coded "3"; 44 transactions in distribution, wholesaling, and retailing of all types, coded "4"; and 95 deals in services (mostly professional, as in real estate, financial, information technology, administrative), coded "5". Eight transactions were coded "1", in agriculture, utilities or construction, for "outdoors production", which did not fit neatly into the other four categories. But as a rough measure, the deals were coded with a rough "index measure" of 1 to 5 from least human-capital/assets up to most, and from more capital intensive to less (again, roughly speaking). The arithmetic mean of this industry index for the sample is 3.54; based on where this came out for each PE firm, we had a very rough way to compare their investment preferences or styles by industry, and their degree of focus, if any.

entities or PE firms.[147] Lastly, because future states are so much less predictable in more dynamic, high growth industries (e.g., professional services in industry group 5), there is both: [1] greater opportunity for organic growth (i.e., in a high-growth industry, a company can grow in value merely by growing with the industry); and, [2] added complexity to any deal-making in these industries. Hence we would expect to see the percentage of add-on acquisitions to decline, moving from industry group 2 through 5, and indeed, add-ons drop from 63% to 51%.

Other deal variables here do not show any established pattern, marking the broad homogeneity of the data sample with respect to some parameters. Revenue and profit (EBITDA) increases are strongest for professional services (where over all growth opportunities are highest), but employment and capital expenditures each grow in four of the five segments. Equity returns are highest in manufacturing segments 2 and 3, which is predictable based on the ability to leverage in these businesses as well as the latent growth available via consolidation. The exit multiple is noticeably higher in segment 5, fast-growing professional services, versus the other 4 mature industries, which again is predictable and based on future prospects. Lastly, segments 2 through 5 all had healthy positive returns compared to the eight transactions in segment 1, agribusiness and construction deals. While too small a sample, the eight averaged a transaction size of $29.1 million, the smallest of the 5, in "outdoors production" industries which are becoming increasingly capital-intensive. It may not be coincidental that the eight transactions in our sample in these industries fared so poorly as a group, having neither the scale

[147] In terms of industry risk, we are referring here to the general *typology* of businesses across categories 2 through 5, moving from low-tech manufacturing to, say, professional IT consulting. Industry *beta* is not a good comparative measure of risk for our sample because most of these businesses across all segments were, relatively speaking, mature; sample mean *beta* is .92, and the *beta moves* from .79 to .99 moving from category 2 to 5; this is the *direction* predicted by theory, but not a large magnitude in terms of absolute differentials in practice. As a general proposition, though, deals in groups 2 through 5 have predictable characteristics based on industry group.

nor scope of operation to compete effectively, and hence revenues and profits both declined during PE ownership.

Comment on exit type. Appendix 4 analyzes the data sample clustered into five *exit types,* and some distinct and interesting patterns emerge. For this discussion we focus on exit types 1 through 4 (exit type 5 was reserved for the 35 bankruptcies in the sample), which are, respectively: [a] IPO; [b] sale to an industry buyer (another company broadly competing in this industry segment – or entering it via this acquisition); [c] sale to financial buyer (most often, another private equity firm); and, [d] recapitalization, usually involving a sale to incumbent management. These exit types were coded in descending order from what was predicted to be both biggest to smallest, as well as highest to lowest return deals, based on both effective information asymmetries regarding firm value, and the liquidity of the buyer market.[148] IPOs are the ultimate in market liquidity, and having many (individual) buyers means that few will be well-informed about the company's intrinsic value. Industry buyers, by degree, have more knowledge about the sector, and typically in these kinds of industry segments there are relatively many potential buyers. PE firms, as buyers, are typically not as aggressive as industry buyers, both because they are more discerning and because they do not have *operating* synergies to co-opt. There are also a smaller universe of them as potential buyers, versus competitors in the industry. Fourthly, a recapitalization, often involving the firm's incumbent management as new controlling owners, is the least liquid of the four exit types, and be definition involves those who are able to most clearly discern intrinsic firm value (and hence will be the most aggressive buyers).

[148] Both Loos (2006) and Nikoskelainen & Wright (2007) had shown IPOs, industry sales, and PE firm sales to be the highest-to-lowest order in terms of returns.

Interestingly, across types 1 through 4, there were straight line relationships as predicted by economic theory for return on equity, leverage, holding time, management equity, revenue and profit growth, profit margin growth, employment and capital expenditure changes, and nearly so for exit multiple. In seriatim:

- *Return on equity*—IPOs had returns of 101%, declining to 54.2%, 44.2%, and 28.2%, respectively, for trade sales, PE firm sales, and recaps. IPOs were also far and away the biggest transaction size, at $227 million. These data are perfectly consistent with theory and prior observation.
- *Leverage* rose from 59.8% for IPOs to 65.3, 68.7, and 71.1% for the next three exit types. Again this comports well with the prediction that smaller deals are more leverageable, more amenable to management having eventual control, and exploitable industry knowledge.
- *Management equity* declined from 20.5% for IPOs, down to 14.7% for recaps, in linear fashion. This is the obverse of leverage; in our sample management equity and leverage were negatively correlated at the 5% level, due to the fact that PE firm equity is strongly *positively* correlated with leverage (at 1%), and higher PE firm equity usually implies lower management equity. Additionally, the best performing deals led to IPOs, and management often can maximize their equity bonuses under such a scenario. At the other extreme, recaps might involve businesses which are marginal from the vantage point of the PE investor (though they returned a positive IRR for our sample), and at the same time offer incumbent management great uplift in equity in return for the PE firm's liquidity.
- *Holding time* increased from 1693 days for IPOs, to 2080 for recaps, in linear fashion. This is in line with practitioner feedback that deals get exited more timely in the current era, and

also with prior empirical work showing an inverse relationship between returns and holding time.

- *Revenue* and *EBITDA* increases were most pronounced for IPO deals (32% and 45.2% per annum, respectively), decreasing serially to 10.4% and 2.5% respectively, for recaps. Again, the best performing deals went public, based on strong operating results. EBITDA margins (EBITDA/Revenues) also increased dramatically for IPOs at 19% per annum; this decreased serially to -9.7% for recaps.
- *Employment* and *capital expenditures* also both increased in very healthy terms for IPOs, by 49.4% and 8.9% for the firms reporting; this decreased in linear fashion for both variables to -3% and 16% for the recaps. Exit multiples were highest for IPOs at 11.7X, and decreased to 7.11-.7.73X for the other exit types.

What these data show are the manifestation of PE deals which witnessed strong degrees of success (IPOs) down to average-to-good levels for the recaps, exactly in accord with economic theory. For buyouts in the size range as contained in this sample, the most common strategy is *buy-and-build*, via add-ons in the same or related markets (73.5% of the cases for IPOs), achieving economies across the value chain of the firm, and seeing growth in both revenues and cost efficiencies. These in turn allow for increases in employment levels and capital investment, all of which comprise a truly "virtuous circle." The industry sales (exit type 2) and PE firm sales (#3) were less than 25% of the scale of the IPOs ($48 and $51 million versus $227 million for IPOs, but exhibited strong returns and were "mini-versions" of the IPO scenario. Even recaps, which were more likely to be cases of firms with industry or growth challenges and hence viability issues, nonetheless exhibited positive returns (28.2% mean IRR).

Other deal parameters exhibited no similar pattern to those above, across the exit types, but were instructive in any case. IPOs had lower PE equity, were therefore usually minority stakes, and had higher degrees of syndicate structures and add-ons. Lowest in financial leverage, they were highest in debt pay-down (total debt/EBITDA), which indicates they were businesses with high operating leverage capacity available (which would be expected where consolidating acquisitions are appropriate and feasible), and at the same time funded conservatively in order to execute the growth plan. But in no case were add-ons less than 50% of deal-making for each exit type, while club deals ranged from 38-63%, and controlling stakes from 43-71%.

The 35 bankruptcies were in the aggregate cases of business plans that did not materialize; mean leverage at deal entry for these was 61.5%, and Debt pay-down was below the sample mean at 3.48X, so they were not over-leveraged. Industry *beta* is below the sample mean as well, so there was no ingoing industry-specific risk, and none to the firm detectable from Appendix 4. Management equity was in the 20% range, the amount preponderantly seen in this sample, and PE firm equity just under 50%, so resources appear adequate at deal entry. However, all operating performance measures are highly negative, and this indicates that growth strategies just never materialized. These deals had the shortest holding times, lending support to Jensen's thesis that private equity is a highly efficient institutional form of restructuring; either the firm was pushed to bankruptcy if there were no alternatives, or was quickly rationalized and broken up.

Comment on PE firms' key choices: ownership, syndication, and growth. Appendix 5 depicts key statistics for three strategic choice points – and the respective alternate choices made – which each PE firm faces in constructing its investment strategy for each target acquisition. These are whether or not to acquire a controlling stake (ownership) in the target; whether or not

to enter into a syndicate of PE firms to acquire the target, an increasingly common occurrence (syndication);[149] and whether or not to pursue growth organically, or via ancillary acquisitions. Economic theory would predict no superior strategy *a priori,* in terms of these three dimensions of PE firm governance and execution. Consolidation of fragmented industries has merits in terms of the strategy's underlying economics, but in practice many attempts have failed in execution. And, PE firms have advertised all choices among these three dimensions as beneficial to investors or target firms they are courting.[150] As can be seen in Appendix 5, however, the results of the paired opposite strategies have been significantly different in each of the three cases. A few points are worth noting:

First, while not appreciating this until the data came in fully, it is now apparent that *ownership* and *syndication* choices are mutually dependent. The results for *minority* ownership deals parallel very close those of syndicated *club deals*, in almost every parameter. Except for EBITDA margin change (for minority stakes it improved, for club deals it declined), the numbers are almost *exactly* the same, starting with return on equity (25%) and transaction size ($125-$134 million), through leverage, holding time, add-ons, *beta,* revenue growth, exit multiple, and industry index (at 3.92 and 4.04, these deals involve higher risk human-capital intensive businesses, which are generally faster growth than low-tech manufacturing, but may require more risk-sharing and more equity). There is a slight difference only in PE firm and management equity amounts; indeed, 90.5% of minority stakes *are* club-deals. So, there is a strong propensity for these two choices to be linked in deal-making.

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[149] So common now, in fact, that FTC Commissioner William Kovacic stated in January 2007 that PE firms would almost certainly now come under anti-trust scrutiny for anti-competitive (collusive) practices.

[150] For example, in Atlanta, Peachtree Equity Partners openly touts its preference for taking minority stakes and flexible terms in deal structuring; less than a mile or so away, Arcapita Inc. insists on control positions; the two firms cross paths in pursuit of middle market transactions and have even cross-pollinated in terms of personnel.

Likewise, the transactions involving controlling stakes are mirror images of those in which there is no syndicate (*solo* deals as opposed to club deals); 94% of solo deals are controlling stakes deals, and 84% of controlling stakes deals are solo deals. Again, in every case but EBITDA margin, the results numbers are very similar, starting with equity returns (48% and 52%). These transactions are smaller in scale at only one-third the size of minority or club deals, and their industry index (3.25-3.28) is much lower; again, this comports with the theory – most of these transactions were in low-tech manufacturing, which offers higher leverage opportunities, more fixed assets, often steady cash flows, and slower change. Other things equal, the higher the industry index, the faster growing and more complex the industry dynamics, and hence the need for risk-sharing; the solo and controlling stake deals were predictably in slow-growth businesses.

The slow growth of these industries means that employment increases much more slowly, and as is depicted, is a small fraction of employment growth in more dynamic industry settings (4-5% versus 24-25% per annum). Capital expenditures also increase at less than half the rate of the minority-stakes or club deals. Additionally, revenue growth is slower, and exit multiples and holding times are lower for these control deals in slow-growth manufacturing, than they are in club deals in service or marketing businesses. What is highly interesting to note, however, is the equity returns differential juxtaposed with these operating and performance variables. The returns to private equity for solo or controlling stakes deals are *double* those in club deals and minority stakes (48-52% versus 25%). Thus, growth in revenues, employment, CapEx, or a high exit multiple do not guarantee a strong equity return.

Transactions involving add-on acquisitions performed significantly better than organic growth deals – 50-33% in terms of IRRs. Add-on deals were double the size ($98-50 million), half the debt pay-down, and far superior in generating increases in revenues, profit margins,

employment, and capital expenditures. Interestingly, between these two there were no appreciable differences in leverage (65.4%), equity splits to either the PE firm or management, number of control/minority deals, or number of club or solo deals, or exit multiple. These data certainly lend credence to the idea that consolidating acquisitions *can,* when executed properly, create material value for equity holders.

One minor note on this is important. PE practitioners in interviews distinguish between *bolt-on* acquisitions (which are add-ons to fill out a product line, achieve economies of scope in marketing or distribution, or expand service offerings), and consolidating *roll-up* deals, which are fragmented industry deals wherein the strategic goal is to achieve economies of scale. These latter types of deals are sound in theory, but have proven tough to execute in practice.

Pearson correlations of key variables in study

Appendix 16 lists correlations for key variables in the study. The results generally comport with similar observations found in Nikoskelainen & Wright (2007) and Loos (2006), and we note the following of especial interest:

- *Returns to equity* correlate positively at the 1% level with revenue, employment and capital expenditure growth, but not at all with EBITDA growth (though there is a moderately significant [.4352 at 1%] positive correlation with the binary variable of whether or not EBITDA increased). Holding time is negative and significant at 1%, confirming practitioner feedback, and equity IRR is positively related to the amount of PE firm equity and leverage at 5% and 10%, respectively. No correlation was found for management equity, and for our sample, returns correlated positively with the S&P 500 at 1% (but not at all with any of the Fama-French small cap indexes). The correlation between equity and asset returns is .8213, highly positive and significant at 1%; for Nikoskelainen & Wright this figure was .6200,

portraying the lower leverage levels in our sample (15 percentage points lower than their sample), and thus the tighter alignment of interests between the PE firms and other share-holders. In spite of a low coefficient, the dummy variable for add-ons is significant at 1%, showing this to be a key element of strategy for growth and profitability in middle market buyouts. Controlling stakes and divestiture dummies turn significant at 10%, while club deals is negatively correlated at 5%. Returns to equity are negatively correlated and significant (at 5%) with *Exit Year,* suggesting long term secular decline in returns, due to a continuing influx of capital and professionals seeking transactions (however this effect is far milder in the small-capitalization transaction arena, of which our data sample is a part, than for large-cap deals).[151]

- The *PE Firm* variable was coded to represent an index from smallest to largest, and was indeed correlated highly significantly (1%) with both transaction size and leverage, confirming other empirical findings that larger enterprises are more highly leverage-able. The add-on dummy is modestly correlated with PE firms at 1% (.2279), suggesting the attractiveness of this investment thesis with a larger capital base.
- The *Industry* variable was coded 1 to 5, as an index moving roughly from lower human capital-to-assets to higher, and higher capital intensity-to-lower (e.g., low tech manufacturing to white collar professional services). Leverage, PE firm equity, and the dummy for controlling stakes were all negatively correlated and significant at 1%, as theory would predict.[152] Club deals (as a mitigator of risk), annual revenue growth (as a parameter signifying industry dynamism), and the exit multiple were positive and significantly

[151] The equity IRR is also correlated positively to the IRR of the S&P 500 (at 1%, though *not* with any of the small cap indexes constructed from Fama-French data or the Russell-2000), and the S&P-adjusted equity IRR is not as significant to exit year, though still negative.

[152] This is a primary point of O.Williamson (1988).

correlated at 1%, as expected. Industry *beta* is correlated to the Industry index parameter at 5%, as would be expected, though again, the entire sample is low-beta over all.

- Transaction size is captured by the natural log of entry value, *Logsize*, and is positively correlated (and significant at 1%) to leverage, add-ons, and club deals, and negatively related to PE firm equity and the dummy for controlling stakes.
- *Leverage* is significantly correlated with PE firm equity (.3355 at 1%) and controlling stakes, and highly negatively correlated with club deals, entry multiple, and annual revenue growth. This confirms that high leverage is best employed in slow-growth, mature industries, where majority stakes afford the PE firm the ability to implement tight controls. *PE firm equity* amounts are further correlated strongly with controlling stakes (.8755 at 1%), and equally negatively with club deals and management equity. Beyond the above mentions, *Management equity* was not a significant variable in this study sample-wide, correlating with club deals negatively, at 1% significance.
- Of the governance and ownership variables, *add-ons* appears to be most significantly related to others and potentially explanatory of performance (which we confirm below in regression analysis). There are also interesting relationships between operating performance variables (e.g., employment, CapEx, revenues) and other deal parameters we will not discuss here, but are depicted in Appendix 16. Of interest, though, *add-ons* is positively correlated with *exit year* at the 1% level, and as our transaction data sample is only slightly skewed to more recent times, it is certainly true that part of that effect is due to the strategy of consolidating roll-ups becoming more fashionable in the small-cap buyout world in recent years.
- Lastly, *Entry year* is not shown in Appendix 16, but is correlated positively and with high significance to deal size and related indicators of growth in scale (e.g., revenues, operating

profits), and negatively to holding time, confirming trends in private equity as reported by practitioners.

In summary, the variables in the study relate to each other almost exactly as theory would predict. The one significant surprise from Appendix 16 is the *lack of* relationship between *MGMT Equity* and other variables; as we note below, this holds true in regression analysis as well.[153] Theory would predict (and many studies elsewhere in empirical finance confirm; see McConnell & Servaes 1990, *inter alia*), for example, that equity returns would improve with increasing management equity percentages (up to a pre-entrenchment inflection point, at least), and hence there should be some co-movement of these variables. However, there is no relationship at all (-.0165). What this indicates is that for our data sample, and size and structure of transaction, management equity is *not* an indicator (or, as we will see, a driver) of performance, as it might be in other scenarios. For a data sample like the one in this study, where there were few public-to-private buyouts, it was most commonly the case that senior managers *already were* significant owners in their companies. Typically, the private equity firm leading the transaction became engaged to provide expansion capital, pursue allied acquisitions, help with a succession/liquidity problem, or as part of a recapitalization. Seen in this light, our data make sense – it is the equity held by the *private equity firm,* and the associated structure of the transaction, that are more determinative.

Regression modeling

Several ANOVA tests were run to detail significance of hypothesized differences regarding certain deal parameters. In addition, in order to determine the nature of any causality associated with returns to private equity investing, various regression specifications were tested, with the

[153] Nikoskelainen & Wright (2007) report significance for MGMT equity in *some* of their regression specifications, and none in others; their results with this variable therefore differ only marginally from ours.

dependent variable most often being the S&P 500-adjusted return on equity.[154] As a rough benchmark, we followed the regression specifications in Nikoskelainen & Wright (2007), simplifying where able; though their sample variables were not perfectly congruent with ours, there was similarity in many cases.

Nikoskelainen & Wright's base case (2007, Table 2, p.39) addresses the totality of the ongoing debate within the PE sector about drivers of performance: if transaction IRR is a function of various governance or ownership (and control) variables, which ones matter, and what are their magnitudes? Following them we start by testing index-adjusted equity IRR as a function of the deal's ingoing leverage, debt pay-down, management equity, and PE firm equity. Leverage obviously is both a discipline mechanism and a vehicle for concentrating equity ownership, and hence should motivate performance. Debt pay-down (total debt/EBITDA) is used following Nikoskelainen & Wright (2007), as a proxy for the controlling effect of debt; it is correlated positively with leverage but directly measures the burden on operating cash flow. We also measure PE firm and management equity, natively initially, then by squaring the management equity variable to examine any "entrenchment effect".[155]

Table 4 here below lists initial specifications for this test, first with the base case, and then secondly, examining for any entrenchment. This is the same basic modeling framework utilized in Nikoskelainen & Wright (2007), and we analyze these key governance and ownership variables throughout our analysis. Again, this analysis recognizes the warning expressed in

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[154] We used an index-adjusted dependent variable to correct for factors affecting general economic conditions which might impact transaction IRR purely by fortuitous timing. While the focus in this study is on return on equity, we also examined the IRR of the firm's assets (or, "enterprise value, which we loosely call "RoA" though it is strictly the IRR of the whole firm value) as a function of the same variables, to illuminate "value creation" beyond the narrower concerns of the equity investors. Equity IRRs were positively correlated with enterprise value IRR as shown above, though not perfectly. For each regression specification, tests were run to determine the extent to which variance inflation factors for each independent variable would indicate any collinearity issues. Breusch-Pagan and White tests were run to test for heteroskedasticity in the variance of residual terms.

[155] See, for example, Han & Suk (1998).

Himmelberg, Hubbard, & Palia (1999) concerning inherent endogeneity in this type of analysis, and the difficulty of finding adequate instrumental variables. We replicate Nikoskelainen in any case, and leave specifications following Himmelberg for subsequent analysis. Here is Table 4:

Table 4. Base Case Regression of Equity IRR on Key Governance, Ownership Variables

Dependent variable: ***IRR of EQ-S&Padj*** #N obs. = 230 S.E.s in (★)

	(1)	(2)	Correlation to ***IRR of EQ***
Leverage	.2663 (.2719)	.2719 (.2727)	**.0988*** **
Debt pay-down	-.0005 (.0009)	-.0005 (.0009)	-.0190
MGMTequity	.2304 (.3725)	.6918 (1.128)	-.0167
PE firm equity	.2549 (.0009)	.2454 (.2079)	**.1509** **
$MGMTeqty^2$		-.7396 (1.707)	--
Constant	-.0586 (.2126)	-.1051 (.2386)	
R-Squared:	**.0163**	**.0171**	

Statistical significance: *=1% **=5% *=10%**

Though the coefficients have the signs as predicted by theory (including the signal of a potential entrenchment effect for managerial equity – though here in the case of private equity, it is not statistically significant, as can be the case in publicly traded companies), as specified, none of the variables is statistically significant as a regressor in explaining transaction IRR. Nikoskelainen & Wright did not have very different results for their base model for key governance variables,

though they did have MGMT equity as significant at the 10% level when including PE Firm cumulative deal-making and capital under management as control variables.[156]

Following Nikoskelainen & Wright, we next extend the model specification to include *size* of transaction as a control, PE Firm (index for capital under management), and added the strategic decision variables we had collected: dummies for add-ons (Add-ons), controlling stakes (MinorCon), and syndicated "club" deals (Club deals).[157] We iteratively changed the specification as they did in their Table 2, to test for marginal effects, in Table 5:

Table 5. Regression of EQ IRR on Governance, Ownership Variables

Dependent variable: ***IRR of EQ-S&Padj*** #N obs. = 230 S.E.s in (★)

	(3)	(4)	(5)	Correlation to ***IRR of EQ***
Leverage	.3079	.2951	.2909	**.0988*** **
	(.2907)	(.2873)	(.2725)	
Debt pay-down	-.0004	-.0004	-.0004	-.0190
	(.0009)	(.0009)	(.0009)	
MGMTequity	.1001	.1248	.1269	-.0167
	(.4845)	(.4770)	(.4740)	
PE firm equity	.2729	.2912	.2969	**.1509** **
	(.5315)	(.5272)	(.5122)	
MinorCon	-.0958	-.1027	-.1033	**.1199** **
	(.2152)	(.2136)	(2127)	
Club deal	-.0616	-.0497	-.0496	**-.1427** **
	(.1946)	(.1905)	(.1901)	
Add-ons	**.1988**	**.1973**	**.1963**	**.1294** **
	(.1008) **	**(.1005)** **	**(.0979)** **	
Logsize	.0057	-.0022		-.0442
	(.0542)	(.0476)		
PE Firm	-.0055			.0165
	(.0176)			
Constant	-.1434	-.0618	-.1012	
	(.9499)	(.9118)	(.3888)	
R-Squared:	**.0336**	**.0332**	**.0332**	

Statistical significance: *=1% **=5% *=10%**

[156] See their Table 2, page 40. The main reason their MGMT Equity variable turned significant at 10% is that the level of management equity in their sample is almost double what it was in ours (19.5% versus 37%).

[157] Nikoskelainen & Wright collected add-ons and divestiture information as we did, and they also have a dummy variable for *type* of deal, based on whether incumbent management was replaced or not ("Buyouts" versus "Buyins").

Congruent with Nikoskelainen & Wright in a few of their models, all three of our specifications show significance at the 5% level for Add-on acquisitions. This comports with feedback we received from practitioners in middle-market buyouts, who indicate the breadth of opportunities available in fragmented industry sectors is still considerable, particularly in basic manufacturing, wholesale distribution, and various business services.[158] A *buy and build* strategy with add-on acquisitions, as followed by several PE firms in our study, has yielded solid returns over time in this industry. Our results are also somewhat similar to Nikoskelainen in that they showed weak or no significance for most other variables: our model showed *no* significance to other parameters in Table 5.[159] The reality is that, with respect to return on equity, *several* factors combine to yield success in a PE transaction, and none pre-dominate beyond add-ons.[160]

Again consistent with Nikoskelainen, we sought to examine the effects on IRR of the firm's assets ("EV", or *enterprise value*, or again, as we loosely [and incorrectly] refer to it, *return on assets*). Nikoskelainen is the first paper of which we are aware in this literature which examines IRR on the firm's assets, but they are quite correct to do so. As they point out, private equity investing focuses on leveraged returns to *equity,* and a simple arithmetical exercise can demonstrate that solid returns can be garnered on equity with little or no change in firm value (indeed, our data sample contained some such deals). From the vantage point of the broader

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158 See the discussion around Footnotes 134-135, page 71-2.

159 In seeking to understand this, we wished to guard against *over-fitting* the model; a collinearity test on all three models yielded mean V.I.F.s of 2.69-2.87, with that due only to a 6+ reading for *PE Equity*. The larger issue may be that with this set of regressors all included, causal effects are diluted beyond Add-ons; and, there are in actuality multiple factors (and strategies) that lead to deal success in P.E. investing. So in this sense our results, along with Nikoskelainen & Wright, are capturing the reality of the private equity sector of today, particularly in the middle-market arena.

160 Not shown here, we proceeded to try more parsimonious specifications, with and without add-ons, to see if significance results were different; consistently, add-ons is the main explanatory driver of return on equity in this study, and no other variables show significance inside the 20% level. This was less an exercise in data mining than based on the realization that some of our variables, while not collinear, are correlated (and hence we checked for any confounding in the specifications): e.g., Debt pay-down and leverage; Controlling stakes dummy (MinorCon) and syndication dummy (Club deal). Consistently, it was shown that the only significant regressor is Add-ons, and we are confident we have captured the reality of the middle-market buyout world at present.

economy and macro growth, however, it is of interest to examine how private equity governance affects firm value.[161]

We therefore set up a regression framework in which S&P 500-adjusted IRR of firm assets, or *enterprise value,* is the dependent variable; our regressors are the same major governance, ownership, and control variables as models (1) through (5) above. Table 6 gives the results:

Table 6. Regression of Enterprise (Asset) IRR on Key Governance, Ownership, Strategy, and Control Variables

Dependent variable: ***IRR of EV-S&Padj*** #N obs. = 227 S.E.s in (★)

	(6)	(7)	(8)	Correlation to ***IRR of EV***
Leverage	**-.2533**	**-.2792**	**-.2779**	**-.1006*** **
	(.1301)**	**(.1269)****	**(.1265)****	
Debt pay-down	-.0000	-.0000	-.0000	-.0345
	(.0004)	(.0004)	(.0004)	
MGMTequity	.0163	. 0542	.1563	.0327
	(.2167)	(.5254)	(.1733)	
PE firm equity	-.0784	.1272	.1251	**.1242****
	(.2378)	(.0967)	(.0960)	
$MGMTequity^2$		.1635		--
		(.7948)		
MinorCon	.0393			**.1134****
	(.0962)			
Club deal	-.0488			**-.1197****
	(.0870)			
Add-ons	**.1684**			**.2508***
	(.0451)*			
Logsize	-.0020			-.0173
	(.0242)			
Constant	.2071	.1706	.1603	
	(.4250)	(.1110)	(.0989)	
R-Squared:	**.0883**	**.0277**	**.0275**	

Statistical significance: *=1% **=5% *=10%**

[161] Additionally, as Nikoskelainen & Wright point out, PE investors today increasingly partake of *strip financing,* in which tranches of each layer of the capital structure are doled out to the same investor set (thus, a subordinated debt provider such as Allied Capital Corp. of Washington, D.C., will also hold an equity stake and perhaps preferred stock as well), with the express intent of fostering greater goal congruence among investors and lenders. Looking at IRR on the firm's assets thus provides for a balanced review of the effect of PE firm governance.

In contrast to the regression models for equity returns, enterprise IRR is driven by leverage, regardless of the framework, significant at the 5% level, *and with negative coefficients*. Here our results are interesting, both in comparison and in contrast to Nikoskelainen. Their leverage coefficients also flipped from positive to negative between equity and enterprise IRR, but all were close to zero in any case, and only a few of their specifications had leverage as significant, and then only at 10%. In our models the leverage coefficients were far greater (or lesser) than zero, and *all* specifications were significant at 5% for enterprise IRR (none for equity). Our sample's mean leverage level is 12 points lower than theirs (65-77%), and the more conservative capital structures in our sample do not impact equity returns as positively as theirs.

However with respect to enterprise IRR, from Modigliani & Miller (1958) we know that in a frictionless world capital structure is irrelevant, and hence from the vantage point of *all* of a firm's assets, value is derived solely from the operating cash flows thrown off from those assets. Hence leverage, which at high enough levels induces insolvency in a downturn, is *negatively* related to enterprise IRR (or, the bundle of firm assets in totality). In our sample, 59 of 288 transactions (20.4%) earned negative returns, but in terms of equity IRR, leverage induced several "home runs"; the sample is thus highly skewed for equity returns (3.24 skewness and 26.69 kurtosis). For enterprise IRR, however, leverage has no such impact (0.24 skewness, and 5.39 kurtosis), and is thus a deleterious effect on IRR of total firm assets. [162]

[162] We confess, though, to an open question regarding our output versus Nikoskelainen. Regression of IRR of enterprise value on leverage shows that it is significant at the 5% level regardless of our specification, and coefficients are correspondingly negative. But again, our mean leverage for this sample is 65%; as these things go, that is fairly conservative capitalization. And, only 12% of our sample ended in bankruptcy, with 20% having negative returns; Nikoskelainen & Wright did much the same analytics, had 77% leverage in their 321 deals to our 65% in 288, and they had 100 bankruptcies out of 321 deals (31%) to my 12%. Their leverage regressor was not nearly as negative and significant. Without knowing details of their sample distribution, we are unsure as to what drove these results.

The *Add-on* variable is once again seen to be highly significant as well; again, building scale through acquisitions which are profitable is certainly accretive to firm value. In these specifications, as well as for others not reported here, no other variables achieved 10% significance levels, though the amount of *PE firm equity* is substantively important. Given that leverage is seen to be important to asset returns and highly correlates to equity returns as well, we specified a parsimonious model with three key regressors which in effect have all major *governance, ownership,* and *strategy* decisions subsumed within them, in order to gauge relative importance to both EQ and EV investment returns. *Leverage* is of course the key governance parameter, binding management to produce profits; *Club deal* is a parameter which effectively tells us at once about both ownership and syndication, as it correlates highly negatively with PE firm equity (-.7710) and lower returns for syndicates (and, is an important variable because of the increasing prevalence of syndicated deals in the industry today); and *Add-ons,* as a strategic decision about the optimal path to growth (organic, versus scale-consolidating ancillary acquisitions) has been pointed to by practitioners of middle market buyouts as a key driver in growth and operating profits (and hence deal returns, as our results confirm for both EQ and EV IRR). We modeled EQ and EV returns on these three variables to determine their relative effect, and Table 7 below shows the results:

Table 7. Regression of EQ (Equity) and EV (Asset) IRR on Summary Governance, Ownership, & Strategy Variables

Dependent variables: ***IRR of EQ and EV-S&Padj*** #N obs. = 271 S.E.s in (★)

	EQ	EV	Correlations to ***IRR of EQ &EV***	
	(9)	(10)		
Leverage	.3079	**-.2039**	**EQ: .0988*** **	**EV: -.1086*** **
	(.2268)	**(.1045)*** **		
Club deal	**-.1755**	**-.0966**	**EQ: -.1427** **	**EV: -.1197** **
	(.0898)* **	**(.0414)** **		
Add-ons	**.1869**	**.1715**	**EQ: .1294** **	**EV: .2508***
	(.0867) **	**(.0400)***		
Constant	.0599	**.1541**		
	(.1747)	**(.0805)*** **		
R-Squared:	**.0434**	**.0884**		

Statistical significance: *=1% **=5% *=10%**

In terms of the modality of this study, for both EQ and EV IRRs, the ability of the firm to execute add-on acquisitions -- consolidating market segments and achieving economies of scale and/or scope across one or many of the firm's areas of operation -- is the single most important driver of success in private equity investing and value creation at the firm level. In this model, the *Club deal* variable has embedded within it both ownership and oversight features, and it is seen to be highly significant in both EV and EQ return specifications; our data sample's returns confirmed the negative effect of club deals in performance versus stand-alone transactions . Lastly, leverage is a significant factor affecting enterprise value negatively; in the case of the 59 transactions in our sample which delivered negative returns, several were sound businesses in cyclical sectors which were, indeed, over-leveraged at the wrong point in the cycle. However our modeling again confirms the empirical reality that leverage is associated with strong equity returns in a positive way (albeit not in a causal sense *statistically*, though the t-statistic here was 1.36 and hence fairly significant in an *economic* sense).

As a check on the importance of the decisions captured by leverage, add-ons, and club deal variables, Table 8 shows how growth in revenues and operating profits is impacted by these variables:

Table 8. Regression of Revenue and EBITDA Growth on Summary Governance, Ownership, & Strategy Variables

Dependent variables: "***IRR" of Rev and EBITDA Changes*** S.E.s in (★)

	Revenues	***Profits***	Correlations to ***Revs & Profits Change***	
Number of obs:	**248**	**249**		
	(11)	(12)		
Leverage	**-.5398**	**-.4136**	**Revs: -.3480***	**Profits: -.1234****
	(.0942)*	**(.1886)****		
Club deal	.0137	-.1004	Revs: .0905	Profits: -.0519
	(.0383)	(.7664)		
Add-ons	**.1722**	.5886	**Revs: .2643***	Profits: .0499
	(.0375)*	(.7512)		
Constant	**.3859**	**.3214**		
	(.0734)*	**(.1471)****		
R-Squared:	**.1895**	**.0242**		

Statistical significance: *=1% **=5% *=10%**

These results are of interest on a few counts. First, improvements in revenues and profits during PE firm ownership are driven more by *lower amounts of leverage,* and this is highly significant in both cases. This comports well with the finding in this study (as reported in Appendix 3) that the fastest growing transactions in terms of both revenues and operating profits were in the marketing and service industries associated with our industry codes of "4" and "5" – these were also the least leveraged. The highest leveraged deals in our sample were in the slow-growth manufacturing sectors, where high returns were garnered via the (Jensen 1986) investment thesis that greater operating efficiencies could be wrung from these firms, irrespective of growth. And, recalling Williamson (1988), faster growth industries should see a more equitized capital structure in relative terms.

Add-ons were, as would-be predicted, a highly significant driver of growth for revenues, as they universally add to the top line. For operating profits, interestingly, add-ons have a positive coefficient but are not significant; one factor in this is that over half of the transactions in our sample with add-ons were in slower growing industry segments which, in our case, involved lower profit growth. Additionally, it is often the case in practice that add-on acquisitions are initially more accretive to the top-line than to profits; conversely, some transactions in which EBITDA improvements are the most pronounced are restructurings in which there are no add-on acquisitions. Finally, while the club deal variable is not a significant factor with respect to revenue and profit growth, the constant terms were both significant and positive, indicating the firms in our data sample have growth momentum in any case.[163]

This brings up an interesting issue for our further research as this project unfolds: do transactions in differing *industries* exhibit different structural characteristics such that different factors affect transaction IRR? We do not report details here, but we have begun this investigation, and are modeling IRR as a function of deal parameters by industry. Industry "1", with only 8 transactions, is not included in this analysis. But in industries 2 through 5, singular patterns emerge:

[163]We should mention that in a different specification of independent variables which looked at some of the same issues in determining what drives EBITDA growth (the same dependent variable we use in Model 12 of Table 14), Long & Ravenscraft (1993, Table 6) found that one of the two most influential variables impacting profit growth was *leverage, but in the exact opposite manner* as our result. In all their models, their leverage variable "GOPRIVATE" was significantly related in the *same* direction as post-LBO EBITDA growth. They also had a variable measuring pre-LBO EBITDA growth which was significant, and also negative. At the time of their paper, in 1993, their empirical findings regarding profit growth were backed by prevailing theory *for the predominant types of buyouts which occurred back then*: high leverage disciplined management and forced efficiencies and the disgorgement of excess profits and cash flow, while the businesses that went private in highly leveraged buyouts were frequently *inefficient* in terms of operations, and hence the LBO was the "shock therapy" which corrected the prior inefficiency. Our sample is comprised of healthier firms which often-times have momentum in sales and profits to a certain degree, and the private equity investment is made to co-opt growth opportunities, resolve succession issues, or provide liquidity to owners. Hence the opposite findings between our results in Table 14 and Long & Ravenscraft (1993) are not necessarily incongruous.

Table 9. Regression of Transaction IRR on Deal Variables by Industry

Industry	Key explanatory variable*	Comment
2 Consumer goods mfg.	Debt pay-down (-)	61 deals in low-tech mfg., with classic Jensen (1986) efficiency enhancement opportunities
3 Capital goods mfg.	No significant patterns	80 deals with wide variety of industry sectors (e.g., steel to computers) means different influences on EQ IRR, so no explanatory power emerges in regression analysis
4 Retail/distribution	Leverage (+), PE equity (-)	44 deals in businesses with stable cash flows and physical assets to borrow against; along with improving efficiencies due to new technologies
5 Professional services	Add-on acquisitions (+)	95 deals in professional services, highest growth in part due to rapid consolidation plays. Least leveraged to fuel expansion and maintain financial flexibility.

*** Variable is statistically significant in regression models.**

In addition to further analysis by *industry* type, as well as intra-*PE firm* analysis in the next section, we are also conducting comparative transaction analysis by *exit type.* As previously discussed, IPOs performed the best of all exits, with nearly double that of industry sales, so we seek to discern the drivers of deal success by exit type.

We close out our transaction analysis of PE deal performance by analyzing the distinctions between the alternate choices made regarding ownership (via *MinorCon*, the controlling stakes dummy), syndication (via *Club deal*, the syndicate dummy), and growth (via *Add-ons,* the ancillary acquisitions dummy), the three key strategic dimensions to any PE firm's overarching competitive design in the deal business. As previously enumerated and shown in Appendix 5 (at the end of the paper), there were surprising differences in performance and characteristics of transactions as "0" or "1" for all three variables. Our task is to discern any causality behind these manifest differences, because deal professionals have affirmative opinions on *both* sides of all three choices, in spite of the obvious differences in transaction results. Table 10 looks at a regression specification of index-adjusted transaction IRR on key deal variables for cases when

the transaction was resultant from a club deal, versus when a solo PE firm controlled the transaction:

Table 10. Regression of Equity IRR on Key Deal Variables Sorted by *Club Deal* (syndication dummy)

Dependent variable: ***IRR of EQ-S&Padj***			S.E.s in (★)
	Solo deal =0	***Club deal=1***	
Number of obs:	**138**	**89**	.
	(13)	(14)	Correlation to ***Club Deal***
Leverage	**.8673**	.0090	**-.2484***
	(.4598)***	(.3414)	
Debt Paydown	-.0305	-.0002	.0028
	(.0285)	(.0007)	
MGMTeqty	**.3151**	.2342	**-.1853***
	(.1071)*	(.6676)	
PEequity	**.3201**	-.3975	**-.7710***
	(.1113)*	(.5432)	
MinorCon	.1592	.0203	**-.7279***
	(.3766)	(.2245)	
Add-ons	.1456	**.3462**	-.0029
	(.1411)	**(.1283)***	
Logsize	-.0080	.0537	**.2434***
	(.0775)	(.0535)	
Constant	**-.3218**	-.8263	**--**
	(.1818)***	(.9687)	
R-Squared:	**.0974**	**.1266**	
Statistical significance:	***=1%**	****=5%**	*****=10%**

Club deals, which have become increasingly popular as vehicles to both spread risk and increase transaction size, and which have ardent defenders from among some very famous PE practitioners (e.g., Henry Kravis, who advertises the efficacy of club deals to an over-inflated degree, if our sample is representative), are also prevalent in the middle market buyout arena. However, as we saw from Appendix 5, they have equity returns in our sample of 25.2% (from a sub-sample of 124 deals), vastly underperforming solo stand-alone deals done by a single lead PE firm (52% equity IRR in a sub-sample of 157 deals). An F-test confirmed the existence of

significantly different characteristics of the two decision tracks for club deals, and Table 16 offers explanation.

For solo deals executed and led by a single PE firm, variables dealing with leverage, management equity, and PE firm equity amounts are significant at the 10%, 1%, and 1% levels, respectively. Again, this makes perfect sense and represents what practitioners report; in fact, it is the fundamental essence of the "story" behind private equity. Equity splits to management provide incentives, equity to the PE firm ensures active monitoring and strategic support, and leverage provides both discipline and, where it applies, fuel for expansion (when unlocking firm value and resources via a recapitalization). As was the case throughout our analysis, the deal's size is not determinative (nor was the PE firm variable, though not reported in this specification) of performance, nor were add-ons (which, in many cases involving controlling stakes deals, were few in number, though they comprised 55.8% of all solo transactions).

For club deals, the sole variable with statistical significance is *Add-ons,* at 1%. Again this makes sense, even though the percentage of club deals executing add-on acquisitions is virtually the same as that for solo deals – 55.5%. Because club deals are undertaken primarily to spread risk and combine resources to effectuate growth, they are a solid vehicle for making scale-building ancillary acquisitions. As we detail below, however, their execution often falls short of expectations because of incongruence of the agendas of multiple PE investors.

Controlling stakes versus minority stakes. As we saw from the data in Appendix 5, transactions in which our PE firm had a controlling stake (>50.1%) significantly outperformed those which had a minority stake (48.1% EQ IRR in 181 deals, versus 25% EQ IRR in 107 transactions). One can also discern in the data a strong similarity to the *Club deal* dummy variable set, as many of the descriptive statistics are mirror images between these two, for

obvious reasons grounded in their economics. Thus we specified a regression of transaction return on equity on the same transaction variables as previously, to compare these coefficients to those in Table 10. Table 11 presents the results:

Table 11. Regression of Equity IRR on Key Deal Variables Sorted by *MinorCon* (controlling stakes dummy)

Dependent variable: ***IRR of EQ-S&Padj*** S.E.s in (★)

	Minority deal =0	***Controlling deal=1***	
Number of obs:	**78**	**149**	.
	(15)	(16)	Correlation to ***MinorCon***
Leverage	.1415	**.9184**	**.3000***
	(.3476)	**(.4707)*** **	
Debt Paydown	-.0003	**-.0452**	-.0035
	(.0007)	**(.0263)*** **	
MGMTeqty	.3397	**2.771**	**-.1337****
	(.6681)	**(1.015)***	
PEequity	-.5433	**3.005**	**.8755***
	(.5725)	**(1.017)***	
Club deal	.2071	.3632	**-.7279***
	(.3695)	(.2542)	
Add-ons	**.2665**	.1537	.0029
	(.1434)* **	(.1310)	
Logsize	.0629	.0146	**-.2379***
	(.0585)	(.0718)	
Constant	-1.209	**-3.218**	**--**
	(1.224)	**(1.692)*** **	
R-Squared:	**.1124**	**.1058**	

Statistical significance: *=1% **=5% *=10%**

The results in Table 11 for the *MinorCon* variable are indeed a strong mirror to those of Table 10 for Club Deals. Here, for controlling stakes, the four major governance variables are all significant, including *Debt pay-down* (at 10%). The amounts of equity garnered by both management and the PE firm are seen to be determinative, and it is interesting to note that management equity, which is slightly negatively correlated to the amount of control the PE firm

has, comes with a positive coefficient in the case of controlling stakes.[164] Leverage is again positively associated with controlling stakes' deal success, again showing its utility in terms of improved performance and returns to *equity;* in most all our regression analysis involving *asset* IRRs, leverage has a negative coefficient. When the deal involves our PE firm in a deal with a minority stake, only *Add-ons* are seen to be significant. As with Club deals, different factors influence returns in syndicated deals, and their variegated effects show no determinative causal effects; even *Add-ons,* in this case, is less significant than for Club deals directly.

Add-on acquisitions. Because of the high degree of significance add-on acquisitions have in terms of determining equity returns, we repeated the foregoing regression exercise for the binary values for *Add-on.* We regressed deal returns on our key transaction variables, and also ran the same specifications for *asset* IRRs. We summarize results here in Table 12:

Table 12. Summary of Regression of Transaction IRR on Deal Variables Sorted by Binary Values for *Add-ons*

Organic growth deals (no add-ons)	95 deals as observations (out of 120 in the sample) which had achieved 33% return on equity. Key differentiators for this subset: Debt pay-down = 5.06X, mean transaction size = $50.7mm. No regressors were significant, nor were t-statistics very high. These results are consistent with the idiosyncratic nature of individual PE investments across the range of industries and transaction types in the sample; different factors matter in different situation–dependent cases.
Consolidating add-on deals made	132 deals as observations (out of 151 in the data sample), which achieved 50% return on equity. Key differentiators for this subset: Debt pay-down = 2.72X, mean transaction size = $98.3mm. For the IRR to equity as the dependent variable, no explanatory variables were significant, though *leverage* was consistently in the 12-15% range with a positive coefficient and relatively high t-statistic. For the IRR of firm *assets* (EV IRR) as the dependent variable, *leverage* is significant in the 5-10% range, with a *negative* coefficient. No other variables are significant in either case.

As Appendix 5 had shown, the results of the two values for the *Add-on* variable were remarkably similar, even to the point of having *exact* matches in many parameters (e.g., leverage, level of employment growth, percentage of control deals, percentage of club deals, PE firm equity, etc.). The *only* differentiating characteristics between the two sub-samples (which are therefore perhaps determinative) are the *Debt pay-down* and *transaction size*. Even though leverage is the exact same for both subsets (65%), the deals with add-on acquisitions had much higher profit margins and ingoing returns on equity. They also were double the size, with therefore more resources and options to undertake scale-enhancing acquisitions. As a result, add-on deals saw highly improved revenues and EBITDA margins, affording better returns. This is a key insight for this study, and explains the explanatory power behind *Add-ons* as an explanatory variable for the entire sample.

[164] In related specifications of regression analysis on values of *MinorCon,* MGMTeqty^2 had negative coefficients as would be predicted, but was not significant. PE practitioners have not spoken to us of any concern about an *entrenchment effect*, but there is great debate about the optimality of the contract with management in terms of the "right" equity splits and type of incentives.

Summary of PE transaction analysis

Transaction analysis of this data sample of 288 private equity investments yielded several interesting insights:

- Between 1984 and 2006, this sample of PE transactions across 19 two-digit industries beat the S&P 500 (and other small-cap indexes) with adjusted mean annual equity returns of 27.2%. Return on equity for PE transactions, measured by each deal's IRR for equity, is negatively correlated with the *Exit year* (and significant at 5%), suggesting the long term secular decline of returns (and, increasing competitiveness of private equity as an *industry*) applies to the lower middle market arena for small-cap transactions as well. This is part of the relentless Schumpeterian efficiency wrought from dynamic, innovative, and competitive markets.
- Fundamental insights from agency-theory (Jensen 1986, 1988) and transaction-cost economics (Williamson 1988, 1996) are both substantiated here. Industry group 2, primarily consisting of low-tech, slow-growth consumer goods manufacturers, had the highest return transactions, highest leverage, among the lowest debt pay-down ratios (and hence, were a relatively profitable set of firms to begin with), and had highest levels of both management equity, PE firm equity, and controlling stakes deals. More broadly, the slow-growth manufacturing businesses in groups 2 and 3 did not grow as fast as marketing and services businesses in groups 4 and 5, but were more heavily leveraged and exhibited better returns (well above the sample mean). Groups 4 and 5 had less leverage, more syndicate club deals, more minority stakes deals, and exhibited higher revenue and profit growth (and, more organic growth deals than add-ons, in contrast to groups 2 and 3, where fragmented mature industry sectors are in need of consolidation). The higher industry *betas* of groups 4 and 5,

and their more equitized capital structures, comport perfectly with O. Williamson's fundamental thesis that debt and equity act as governance structures optimized according to each specific transaction's circumstances (i.e., industry, or growth prospects). Over all, however, the *beta* for the entire sample was low (.92), comporting with the theory that would see this set of firms as ripe for improved efficiencies and consolidation (as 55.7% of the sample was).

- Several empirical findings of other recent papers (Nikoskelainen & Wright 2007, Loos 2006) were confirmed or extended. IPOs had the highest returns as an exit type, followed in serial order by progressively *more knowledgeable buyer-types.*[165] The serial differences in results across IPOs, industry sales, PE firm sales, and recapitalizations applied as well to leverage (increasing), holding time (increasing), revenue, profit, and employment growth (decreasing), CapEx growth (increasing), and management equity (decreasing).[166]
- *Club deals* were found to be the mirror image of minority-stakes deals (*MinorCon* = 0) in terms of statistical characteristics; their respective converses, solo deals and majority-control stakes transactions, were also therefore highly similar. Controlling stakes and solo deals are characterized by twice the return levels, one-third to one-fourth the size, shorter holding times, much higher leverage, and lower debt pay-down ratios than their counterparts. They are also far more heavily concentrated in slow-growth manufacturing. This is not to deny the

[165] See Hayek (1937, 1945). It is also true that the serial order of declining returns follows most- to least-well capitalized buyer types, but the proliferation of leveraged financing availability has made this less of an issue over time.

[166] The case of management equity goes against some theoretical arguments that highest leverage levels are associated with highest levels of concentrated equity holdings. This theory has support in the "traditional" literature on buyouts, in which public firms are taken private and management acquire substantial equity stakes. In our data sample, which were mostly private-to-private deals, management equity was already held in substantive amounts pre-transaction. At *exit,* however, it may become a motivator and driver of performance again (e.g., management recaps looked to vastly increase their holdings). In any case, the nature of the differing characteristics which comprised firms based on exit type and/or industry type validate the thesis that the tenets of transaction cost economics lend support to organization theory (see, e.g, O. Williamson [1996, pp. 219ff.]).

growing importance of syndication in private equity investing, or its utility as an arrangement to mitigate deal risk, permit greater leverage, and pursue larger transactions and/or consolidations. However, our data clearly show the superiority in long term performance of control transactions focused on low-beta industries and amenable to leverage.

- For this data sample, the variable *Add-ons*, signifying the pursuit of ancillary consolidating acquisitions, is the single most important determinant of transaction IRR for equity (and by proxy, firm performance). This shows the extent of available "slack" in fragmented industries ripe for exploitation by small- and mid-cap private equity investors. As a driver of performance (i.e., growth), *Add-ons* is most important, with a (+) sign, followed by the strategic decision variable *Club deal* (-), and followed in turn by the key governance variable, *Leverage*. Leverage affects *equity* IRRs positively (+), and *asset* returns negatively (-), in a statistically significant way.
- Management equity and PE firm equity are for the most part not significant as drivers of performance across the sample, though both are influential in explaining differences in performance between club/solo or minority/controlling stakes deals. This is not surprising, given the private-to-private nature and size of transactions of most deals in our sample. The $MGMTeqty^2$ variable was modeled in search of an *entrenchment effect,* and while the coefficient was almost always negative, it is not seen to be significant for his sample.
- In terms of driving operating performance improvement, *Add-ons* (+) and *Leverage*(-) are significant in explaining revenue growth, and leverage (-) is key to understanding growth in EBITDA. That is to say, the fastest growing firms are burdened with the least amount of debt – again, supportive of Williamson (1988).

- In this sample, different parameters affect performance significantly *within* each industry in a different way. For consumer goods manufacturing, *debt pay-down* (-) was seen to be determinative – the healthier the business at the outset, the better the returns to equity. *Leverage* (-) was an economically, if not statistically, significant parameter for this industry sector; more financial flexibility allowed time for PE firms' business plans to be executed. Capital goods manufacturing displayed no causal patterns to returns at all – not even remotely. This is due to the wide variation of sectors in this broad category from steel or high tech electronics manufacturing to metal stamping businesses. Different parameters govern outcomes in each instance. For marketing, retailing, and distribution businesses, *leverage* (+) impacts returns in exactly the opposite way to consumer goods manufacturing. Here, high leverage *supports* equity IRRs.[167] Secondly, *PE firm equity* (-) is a negative driver of equity IRR for this industry sector.[168] Finally, for professional services businesses, *Add-ons* (+) were significant parameters leading to higher equity IRRs. Interestingly they accounted for only 51% of transactions in this industry group, but as a general matter these transactions exhibited 50% higher returns than organic growth deals.

[167] This is a somewhat counterintuitive result, because in fact, consumer goods manufacturers were more highly leveraged than retailers and distributors at the outset of PE firm governance and ownership. The explanation may well consist in the fact that some *over-leveraged* manufacturers earned negative returns or ended in bankruptcy, skewing the explanatory impact of leverage; conversely, for retailers or wholesale distributors, already conservatively leveraged for the most part, it may have been the case that those transactions which were slightly *more* leveraged (probably as a result of PE firm insight, that there was slack in the target's capital structure) earned higher equity IRRs than those with even less debt. That is to say, the coefficients in these two respective industry regression models to not negate the received theory.

[168] This result does not comport with other study findings, because the implication is that minority stakes and club deal formats outperformed control transactions for retail and distribution businesses in the sample. There were only 39 transactions (or 44 in the industry group) modeled, however, and only 44% of transactions in this group were club deals; if some of them did very well in terms or equity returns, the result would obtain.

We now turn in Chapter 5 to a comparative performance assessment of the PE firm participants in this study, to determine the extent to which there are *firm-specific* factors which may explain performance in private equity investing. As shown in the analysis below, we set up a modeling framework in which the pooled IRR of individual PE firms were regressed against the governance and ownership variables as utilized in the present chapter. In future work, we will utilize this modeling framework with bigger data samples of transactions, by grouping firms according to investment style.

CHAPTER 5. AN INTRA-FIRM COMPARISON OF PRIVATE EQUITY INVESTING

Competitive differentiation of private equity firms

As described in Chapter 1, in the last quarter century the private equity sector has grown from a side-line activity on Wall Street into a veritable industry in its own right, with some 25,000 investment professionals around the world in a few thousand firms, managing $2 trillion in leveraged capital. As private equity investing has matured, competitive forces have driven down rates of return and rationalized the entire *process* of acquiring and selling in the market for corporate control. Much to the benefit of business owners, even for transactions involving companies valued at less than $3 million, formal representation by investment bankers in an auction format is now often the norm rather than the exception.

Additionally, thanks largely to the institution of private equity, the ever-increasing liquefaction of the market for corporate control, along with concurrent improvements in both its information-generating capabilities and more efficient bearing of risk across industries, have had profound consequences for the American economy.[169] The productivity of capital expands enormously when assets are *more liquid* and efficiently directed to their highest valued marginal uses. The *diffusion of knowledge* about (1) specific industry sectors, (2) value-enhancing methods of organization and processes of production, marketing, and management, and (3) access to value-adding human, financial, or material resources has greatly enhanced the operating performance of U.S. businesses in the era of private equity's growth and maturation.[170]

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[169] This is a main theme in Hubbard (2005).

[170] It is true that concurrent with this ever-improving and productivity-generating diffusion of market and industry knowledge, there have been rapid advances in industrial, information, and communications technology, which some analysts claim is the primary driver of advances in macro-productivity. As Professor Hubbard points out,

And, more efficient risk-bearing (and mitigation) ensue both from better designed corporate capital structures and increased access to risk capital for innovative entrepreneurs, provided by willing investors.

While the expansion of the sector and its increasing competitiveness have fueled growth and productivity improvements with economy-wide benefits, they have also sparked a debate *within* private equity investing circles as to the optimal paths to high returns and successful deal exits. As Porter (1980, 1985) explains, with any maturing industry comes divergence in competitor strategies and execution models in an effort to garner market advantage, and this has indeed happened across the private equity sector. For example, while the heavy emphasis in the 1980s was on financial engineering and heavy leverage, New York-based Clayton, Dubilier & Rice was almost alone in touting its focus on operating performance improvements via a deep bench of senior general managers with specialties in marketing, manufacturing, operations, and corporate strategy. Likewise, the Carlyle Group touted its singular ability to obtain superior deal access or more beneficial industry resources through powerful connections in government or targeted industry sectors.[171] Today, as ever more capital has rushed into the buyout sector of private equity, these are common modes of competing for both deal flow and new investor capital, as PE firms seek to stake out unique value propositions for their limited partner and investment banker (deal supplier) clienteles.

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however, these improvements in technology are quickly replicated or even developed elsewhere. So one must look to the *institutional environment* for explanatory differences in performance across countries. Without question the U.S. has the most developed private equity and venture capital sectors, and the most efficient *institutional* support mechanisms for entrepreneurship, both for start-ups and for mature businesses in need of strategic or operational revampment. It is fair to add, of course, that public policies with respect to anti-trust, free trade, and other regulatory issues also affect economic growth; these also differ starkly across countries.

[171] For example**,** Jack Welch is now an operating partner at Clayton Dubilier in a program which continues there; Carlyle has executed paid advisor deals with the likes of former President George H.W. Bush, and former U.K. Prime Minister John Major. The current President George W. Bush has been a Board member of a Carlyle-owned company in the past.

A key competitive dimension in this environment of increasing capital placements and decreasing returns – an era which Gompers & Lerner (2000) describe as "money chasing deals" – is the quality of the investing paradigm. More prosaically, the PE firm's *execution model*, based on track record and/or articulated strategy, is a key determinant both for fund-raising and deal-closing and success. Key aspects to investing strategy which form the totality of the PE firm's differentiable business model are enumerated in Table 13:

Table 13. Dimensions of Competitive Differentiation among Private Equity Firms

Size of transaction	In large part a function of capital raised, but also a strategic decision to focus on given transaction value ranges. Some firms (e.g., PE Firm H in this sample) eschew larger deals, believing there are still greater inefficiencies to exploit in small-deal arena.
Industry focus	Increasingly, PE firms are specializing by industry, and hiring operating partners with specific knowledge, experience, and contacts in the sector with customers, suppliers, and partners (Jensen 1998, pp. 103 ff.).
Management "bench"	Economist Mike Wright distinguishes management buyouts (MBOs) versus *buyins* (MBIs), in which outside managers align themselved with a private equity firm to acquire a company and displace incumbent management. Some PE firms have formalized this as a program, and have either full-time operating partners ready to run companies, or consultants in place for part-time portfolio company assistance. Others insist upon working only with incumbent management, believing their tacit or unrevealed knowledge of the business is the lodestone of exploitable value inherent in any deal, along with re-aligned incentives.
Structure of transaction	PE Firm G in this sample *insists* upon full control rights in any transaction in which they invest – and their style is almost always investing solo. At the opposite extreme are firms who tout their partnering-friendly culture, and will always invest as a minority share-holder only, alongside others, requiring only a board seat. The degree of rights granted management, trade-offs in capital structure choices, length of holding, and so on are often part of an explicit strategy set forth by the PE firm.
Value creation paradigm	As mentioned above, some firms specialize in buying a platform business and pursuing ancillary acquisitions, in "rolling up" fragmented industries via consolidation. Many of these roll up plays have not worked well, however, and other firms prefer buying a solid business with an organic growth story (which might include restructuring). Other examples see firms investing for reasons of managerial change and succession, exclusively in under-valued plays (if not outright turn-arounds), or to execute specific programs in marketing or operations.
Geographic focus	Smaller firms especially sometimes explicitly serve a given area, for economies in managerial oversight.
General Partners' backgrounds	The GP's backgrounds, business relationships, network, and experience are points of differentiation which are emphasized.
Future collaboration	Some PE firms advertise the opportunities for further investment opportunities for both limited partner investors and portfolio company management teams, either in *along side* investment deals or more acquisitions in the future.

The strategic differentiation of private equity firms thus begs the question: are there firms in the industry who have performed in a systematically superior way, *vis a vis* other PE firms? Do some investing strategies in private equity consistently outperform others? Kaplan & Schoar (2005) found that in contrast to the mutual fund sector, where there is long run regression to the mean for performance across the industry, that the private equity sector does show *persistence* in performance over time – the better firms *do continue* to be better, over long periods and multiple funds. In this section we seek to add insights into this question, by reviewing the differing strategies of PE firms and their respective investment results (in terms of equity IRRs). While this is a continuing investigation which can only ultimately be answered via detailed cross-sectional benchmarking of a sufficiently large data sample of PE firms, the following analysis sheds light on this issue, as we see evidence of the results of strategic differentiation.

First, Appendix 6 enumerates the descriptive statistics for the thirteen firms in our sample, and merits comment. Gross IRR returns ranged from 10.2% to 106% (for Firm F, though firm-wide history was 59% in this case) for the sample, though top IRR firms were themselves not uniform in investing strategies. Most of the parameters describing the characteristics of each firm's transactions varied widely: mean transaction size ($7.5-178mm); mean leverage (44-78%); average management equity (16-40%); and, preferences for *control*, *solo/club deals*, and *ancillary acquisitions* for growth all differed considerably. Holding time even varied by almost two years for the most established firms, and industry index went from 2.5 (focused on consumer goods manufacturing) up to 4.47 (highly focused on services and marketing/growth businesses). Even in our small sample of thirteen firms and 288 deals, there are wide variations in approaching the private equity investment process.

Appendix 14 lists the thirteen firms in our sample, and gives brief commentary on key facts for each firm. Summary comments pertaining to this analysis are as follows:

- Five of thirteen firms in this sample advertise themselves as "top-quartile" performers, based on long-run cumulative deal history; this is usually the result of rankings based on gross IRRs for each deal, as published by a third-party consulting firm such as Cambridge Associates (which will not share any of their data, even in blinded form). Size ranges from the boutique PE Firm F, a small-company buyout shop with $25 million under management, to PE Firm J, a $7 billion firm with a track record dating to 1984.
- Investing styles and strategies vary considerably across the 13 firms, along the lines enumerated above in Table 13. PE Firm J, the largest firm in our sample, is really six "miniature PE firms" focused around discrete industry sectors, in which the GPs specialize in a few. They are flexible in terms of managerial compensation and ownership, co-investing, and exit timing, as well as in deal structuring. PE Firm G, on the other hand, is an equally successful firm of similar scale, but with a diametrically opposite strategy: they demand control, shun co-investing opportunities, and focus on a far narrower set of industries (primarily low-tech manufacturing) than PE Firm J.
- Other areas of focus or specialty in our sample were geographic, deal structure type, services businesses and consumer products focus, and growth strategy. Beyond each firm's varying *strategic intent*, the single common denominator to the top firms was *depth of knowledge* and experience surrounding *their particular model.* From deal acquisition through to exit, the best-performing firms have well-honed *systems*, comprised of the necessary resource availabilities, human capital, industry contacts or experience, relationships, and controls in place to capitalize on received opportunities over time.

- A key learning from this study, only noted here but to be expanded upon via future inquiry, was the typology of portfolio firms as investments for many of the PE firms in our sample. Kaplan (1991) expands upon the differing viewpoints of Jensen (1989) and Rappaport (1990) to note that there are two *types* of LBOs: *shock therapy* deals in which agency-mitigation of 1980s-style entrenchment or restructuring is the main investment thesis; and, growth-oriented "entrepreneurial" deals, in which the PE firm invests in a firm participating in a growing sector. In theory, the holding time of the former should be far less than the latter. As the industry has expanded and matured, however, shock therapy deals have become less prominent (in part, as Holmstrom & Kaplan [2001] argue, due to the relentless *indirect* pressure applied by private equity on corporate America to "run lean"), and growth equity opportunities have been priced ever higher. Our research has effectively uncovered a *hybrid* (third) investment model which involves aspects of both agency-mitigating and growth deals, but is effectively its own type: *coordination-based* transactions. Several of our sample firms pursed coordination-improving deals, which we define as a fundamentally sound, even highly profitable business, in which there are nonetheless one or a few aspects of its execution or strategy which may be improved to reap greater gains (in short, the investment strategy's aim is better *coordination* of existing firm resources, or aligning them with new resources of a particular type, to increase firm value; this is a quintessentially Hayekian [and Kirznerian] concept). PE Firm K, for example, is not afraid to invest in a firm with a 70% market share in its niche, and already double the gross margins of its industry, to capitalize significant equipment purchases (or other whole firms) which would allow expansion into related businesses in order to reap considerable scale economies. PE Firm C invested in a retail service business with healthy margins in order to bring in new management who could

expand geographically based on prior knowledge and contacts. In short, via pure entrepreneurial alertness (or Knightian *judgment*), whether the improved coordination of firm (and/or market-based) resources occurs in production, operations, or sales & marketing, the perceived opportunity consists of discerning an area of an otherwise healthy firm, even one which competes in an industry with no growth prospects, in which better coordination will yield higher operating profits. This aspect of investing has become one of the hallmarks of the PE sector, and is one of the most beneficial attributes of the entire institution of private equity. While long term returns are in a secular decline as private equity matures, the ever increasing rationalization of American business as a result of PE yields enormous unseen benefits to the macro-economy via better intra-firm coordination.

Comparative analysis of PE firm performance

In order to detect the presence of systematic differences in private equity investing strategies, we ran a series of F-tests, some of which are shown in Appendix 17. Not shown there, the IRR of equity for the entire sample had a 1.56 F-statistic but was not statistically significant at the 10% level; this was an indication that our investigations into this issue had merit, however. And as Appendix 17 shows, by several related measures there *are* statistically significant differences in PE firm investing strategies: for the entire sample, both (i) EBITDA margin growth and (ii) the ratio of exit/entry EBITDA multiples (i.e., the EBITDA multiple "uplift"), which is highly correlated with portfolio firm value creation, showed significant differences among PE firms. And, the transaction IRR *is* significantly different among firms doing solo deals or controlling deals; ANOVA for profit growth also showed significant differences across the sample in terms of solo and club deals, or minority-stakes and controlling deals.[172]

[172] Not shown here, perhaps the most telling F-test of all consisted in analyzing differences in performance parameters for different *groups* of PE firms in our sample with investing strategies common to each group. We

To examine the nature of PE firm differences in garnering high equity returns via alternate routes, we ran a series of regressions *for each PE firm,* analyzing transaction IRR as a function of our key governance and ownership variables; the purpose of these exercises is to examine the degree to which different factors influence the performance of different firms.[173] We started with the simplest specification, and show the biggest firms in Table 14:

Table 14. Regression of Equity IRR on Key Transaction Variables for PE firms….(1) Basic Model

Dependent variable: ***IRR of EQ-S&Padj*** for biggest firms in sample; S.E.s in (★)

PE Firm:	**J**	**H**	**D**	**F**	
# Deals:	47	43	15	27	Correlation to ***IRR of EQ***
Leverage	.8580	-.8055	**1.645**	**-1.172**	**.0988*** **
	(.8336)	(.8214)	**(.5009)***	**(.6469)***	
Debt pay-down	.0374	-.0205	**-.1141**	.0010	-.0190
	(.0327)	(.0606)	**(.0360)***	(.0034)	
MGMTequity	.5799	1.241	**-1.556**	-2.154	-.0167
	(.6270)	(.8840)	**(.8924)*** **	(1.781)	
PE firm equity	.0893	1.867	.7104	.2286	**.1509** **
	(.4575)	(1.497)	(.5833)	(.3966)	
Constant	-.6791	-.6721	-.0460	**1.203**	
	(.6357)	(1.193)	(.4044)	**(.4875)** **	
R-Squared:	**.0793**	**.0788**	**.5818**	**.1537**	

Statistical significance: *=1% **=5% *=10%**

grouped PE Firm J together with PE Firm H in one group, and looked at differences in means *vis a vis* PE Firm C and K in the other group. The former firms are broader in their investment focus (in terms of industries and structure types, willingness to co-invest, etc.) and more flexible in deal terms (e.g., minority stakes, add-on deals, etc.) The latter two firms are very narrowly focused on specific industry and deal types, and need for control. We also added a third firm to each group (PE Firms D and A, respectively), again with common investing characteristics to the first two in each. In both cases, for the 2-firm and the 3-firm groups, there were insignificant differences in return on equity; this was to be expected given the strong performance of these 6 leading firms in private equity. However, there *were* significant differences in both revenue and profit growth between the groups in each test, especially in the 3-firm groups (F-statistic of 7.54 {<1%} and 3.56 {<5%} for operating profit and revenue growth, respectively). This lends support to the idea that differing investment strategies can manifest themselves in terms of performance, over time, in private equity. Again, though, the *commonality* to these firms was depth of knowledge/expertise *within their own business system and execution model.*

[173] The five smallest firms in our data sample had too few transactions with a complete set of parameters, so the analysis consisted of examining what drives returns for the largest firms in our sample. Even in the case of the larger firms where we have 20-40 or more observations, these results should be viewed with caution. The small-N sample sizes analyzed against more than 1-2 regressors violates precepts of best practices in multiple regression modeling; econometricians indicate that in a model such as this there should be many more transactions for each firm as there are independent variables. With too few deals being analyzed (as in most cases here), the estimated regression lines may well be unstable and not valid. However we pursue the exercise as a simulation for larger firms and a much bigger data sample later in 2007.

Table 14 depicts the four largest firms in our sample in terms of capital raised, and some interesting results emerge. First, R^2 is relatively high for Firm D, portraying a solid degree of explanatory power for this simple model for this firm. Three of the four major governance and ownership parameters are significant for Firm D, especially leverage and debt pay-down.[174] Leverage is also highly significant for Firm H, but what is rather fascinating to see is that the coefficients for leverage vary between these two firms, which in many other respects show similarities.[175] Leverage is strongly *positive* for Firm D, meaning that the judicious way in which they have capitalized firms in the past is such that their transactions which *are* more leveraged have seen superior returns. Firm F, by contrast, has a significant *negative* coefficient for leverage, indicating that some of their many cyclical businesses have perhaps been over-leveraged.[176] Management equity is also significant for Firm D, with a negative coefficient. Of the 13 firms in the sample, Firm D confers the second highest amount of equity to managers in their transactions, but their best transactions have involved relatively more debt and lower management equity. The two biggest firms in the sample, Firms J and D, have no statistically significant variables affecting transaction IRR. Again though it is instructive that leverage affects the two firms in opposite ways.

[174] It is noteworthy that leverage and debt pay-down for Firm D have coefficients with opposite signs while being strongly significant. For many firms the two variables are positively correlated; here higher leverage has meant higher returns, but their best deals have been investing in high-margin businesses.

[175] Indeed, as indicated in Footnote 56 (page 31), the two have owned firms in common before, and have collaborated in club deals. Their investing styles are broadly similar, and they seek firms of the same size and industry type. There are telling differences, however: Firm D is one of the lowest leverage-using firms in our sample; they utilize the firm's capital in each deal in roughly the same amounts as Firm F but cede twice the amount of management equity. They also control deals 43% of the time, compared to Firm F's 59%. Lower leverage and less control has meant smaller returns for Firm D as compared to Firm C and others.

[176] Of 27 transactions, Firm C had at least one total bankruptcy, and 7 of 27 earning negative concerns.

Because two of the four MGMTeqty variables had negative coefficients in Table 14, a model was tested using the MGMTeqty^2 variable, to see if there were evidence of firm-specific managerial entrenchment effects in play. Table 15 gives the results:

Table 15. Regression of Equity IRR on Key Transaction Variables for PE firms....(2) with MGMTeqty^2

Dependent variable: ***IRR of EQ-S&Padj*** for biggest firms in sample; S.E.s in (★)

PE Firm:	**J**	**H**	**D**	**F**	**K**
# Deals:	**47**	**43**	**15**	**27**	**16**
Leverage	.8160	-.5344	**1.442**	**-1.460**	2.829
	(.8100)	(.8869)	**(.3552)***	**(.8192)*****	(1.939)
Debt pay-down	.0272	-.0295	**-.0712**	.0015	-.1502
	(.0322)	(.0618)	**(.0282)****	(.0035)	(.2702)
MGMTequity	**4.768**	.5239	**12.92**	5.095	**17.33**
	(2.316)**	(2.301)	**(4.323)****	(12.44)	**(9.438)*****
PE firm equity	-.2194	1.647	-.9136	.1961	-.5228
	(.4739)	(1.526)	(.6296)	(.4064)	(1.165)
MGMTequty^2	**-7.091**	-3.565	**-20.90**	-22.76	**-47.47**
	(3.784)***	(4.289)	**(6.173)***	(38.67)	**(25.06)*****
Constant	-.8227	-.5127	**-1.407**	.8993	-1.584
	(.6222)	(1.213)	**(.4915)****	(.7158)	(1.410)
R-Squared:	**.1519**	**.0957**	**.8161**	**.1674**	**.3806**

Statistical significance: *=1% **=5% *=10%**

Again, the model for Firm D has high R^2 and high significance to the regressors. Three of the five firms have a significant *entrenchment* variable; again the sample sizes are small, but this is a topic of concern in the industry. *Leverage* again has both positive and negative coefficients, a result of interest to those practitioners who do believe there is an *optimal* amount of leverage in the buyout business. True for most of the analysis in this study, PE firm equity amounts are, once again, not significant here.

Because add-on acquisitions have played such a central role in the strategy underlying growth for so many PE firms, we wanted to test this variable as well, given the potential impact

of entrenchment of management in platform acquisitions.[177] Table 16 gives the results, and we include Firm F, a firm known to prefer add-ons and pay-for-performance:

Table 16. Regression of Equity IRR on Key Transaction Variables for PE firms....(3) with MGMTeqty^2 and Add-ons

Dependent variable: ***IRR of EQ-S&Padj*** for biggest firms in sample; S.E.s in (★)

PE Firm:	**J**	**K**	**D**	**F**	**L**
# Deals:	**44**	**14**	**15**	**27**	**16**
Leverage	.8690	**3.204**	**1.448**	**-1.485**	2.872
	(.7515)	**(1.784)*** **	**(.3862)***	**(.8547)*** **	(1.910)
Debt pay-down	.0326	-.1215	**-.0713**	.0015	-.2662
	(.0302)	(.2735)	**(.0300)****	(.0036)	(.2846)
MGMTequity	**5.788**	**27.03**	**12.93**	5.709	**20.24**
	(2.177)**	**(12.63)*** **	**(4.586)****	(13.38)	**(9.633)*** **
PE firm equity	-.4321	1.773	-.9039	.2137	-.9034
	(.4809)	(2.243)	(.6843)	(.4323)	(1.194)
MGMTequty^2	**-8.731**	**-27.36**	**-20.92**	-24.69	**-54.92**
	(3.555)**	**(14.58)*** **	**(6.561)****	(41.62)	**(25.51)*** **
Add-ons	.2665	.9882	.0131	.0386	.4523
	(.1729)	(.5593)	(.2039)	(.2566)	(.3943)
Constant	**-1.007**	**-6.539**	**-1.424**	.8339	-1.395
	(.5928)* **	**(2.970)*** **	**(.5891)****	(.8523)	(1.398)
R-Squared:	**.2851**	**.5603**	**.8162**	**.1684**	**.4596**

Statistical significance: *=1% **=5% *=10%**

In contrast to other specifications in this study above, *Add-ons* were not statistically significant in models with *MGMTeqty^2*. *Add-ons* is economically significant for Firm D and Firm K in this specification (at just beyond 10%), but is overshadowed by other variables pertaining to ownership and governance (in all cases, as expected, the coefficient is positive). This is an interesting result because for the study as a whole, *Add-ons* is a significant determinant

[177] The two issues are not unrelated: practitioners debate the relative merits of the *buy and build* strategy along with its relative effectiveness via compensation mechanisms of the managers involved. *Add-on* acquisitions is seen to be a key variable in this study, but as per the literature on mergers writ large, the efficacy of acquisitions is debatable, in terms of gains to acquirors.

of transaction outcome. At the firm level, where there is enough of a mixture of cases of both high- and low-returning deals involving add-ons, it is seen to be an important parameter with fairly high t-statistics, but only once out of 13 cases is it seen as statistically significant. [178] Other deal variables are seen as more important to deal outcome at the firm level.

In all cases except for Firm F, the management equity and *entrenchment* variables are significant , and it would appear that there may be cases of too much equity going to managers; this result, if true, comports with accepted empirical findings in empirical corporate finance.[179] PE firm equity amounts are again not determinative of deal success; the amount of leverage is, again, positively and significantly related to deal outcome in many cases. Again though, for Firm L, we see the interesting result of the opposite (-) sign for leverage as being significant; while for most PE firms increasing amounts of leverage are associated with higher returns to equity (and this is a long-standing belief among PE professionals), there may be a point of optimality to the capital structure decision. Lastly there is again the interesting tension between leverage and the debt pay-down ratio (total debt/EBITDA) for Firm D; increasing debt levels are a positive governance mechanism via the leverage coefficient for Firm D, but work in the opposite direction based on the businesses they buy in terms of operating profit levels. Again there is evidently a point of trade-off for Firm D.

Lastly, following Nikoskelainen & Wright (2007), we want to gauge the impact of PE governance and ownership on the value of the firm as a bundle of assets (IRR of firm *assets*), as opposed to IRR of the firm's equity. We utilize the same specification as Table 16, given that

[178] *Add-ons* is statistically significant (but only at 10%) for Firm J when the specification does not include the *entrenchment* variable. Other than this, for analysis at the PE firm level, it is swamped by other factors affecting deal IRR.

[179] See McConnell & Servaes (1990), *inter alia.*

the entrenchment variable is significant, and *add-ons* is a variable that was seen to impact firm value in our analysis in Chapter 4. Results are shown in Table 17 below:

Table 17. Regression of Asset IRR on Key Transaction Variables for PE firms....(4) with MGMTeqty^2 and Add-ons

Dependent variable: ***IRR of Asset-S&Padj*** for six firms in sample; S.E.s in (★)

PE Firm:	**J**	**H**	**W**	**C**	**B**	**L**
# Deals:	**44**	**14**	**15**	**27**	**16**	**17**
Leverage	-.2013	**.9324**	.3132	**-1.483**	.5802	-1.625
	(.2493)	**(.5239)*** **	(.2148)	**(.3573)***	(.8078)	(1.426)
Debt pay-down	-.0002	-.0710	-.0174	.0011	-.0712	.3126
	(.0100)	(.0803)	(.0167)	(.0015)	(.1203)	(.2926)
MGMTequity	**1.785**	**10.06**	**7.255**	3.284	5.221	6.081
	(.7226)**	**(3.710)****	**(2.551)****	(5.596)	(4.074)	(6.053)
PE firm equity	.0219	.1010	**-.8274**	.0576	-.2719	**3.088**
	(.1596)	(.6584)	**(.3806)*****	(.1807)	(.5051)	**(1.301)****
MGMTequty^2	**-2.668**	**-10.46**	**-10.87**	-17.87	-14.71	-6.753
	(1.179)**	**(4.280)****	**(3.649)****	(17.40)	(10.79)	(10.68)
Add-ons	**.1395**	.3308	.0891	.0662	.1612	.2617
	(.0573)**	(.1642)	(.1134)	(.1072)	(.1668)	(.3512)
Constant	-.0705	**-1.703**	-.6430	**.9325**	-.1644	-2.822
	(.1967)	**(.5891)*****	(.3277)	**(.3563)****	(.5916)	(1.779)
R-Squared:	**.2711**	**.6376**	**.6845**	**.5819**	**.2404**	**.4710**

Statistical significance: *=1% **=5% *=10%**

Table 17 indicates that just as for return on equity, the IRR of the firm's assets depends on different variables for varying PE firms. Leverage ranges in significance, and based on the particular deal history of each firm, can change signs as a coefficient. Management equity is always positively related to firm value, and its squared version, used to gauge entrenchment, is always negative – for some of the firms in our sample these are significant parameters. The evidence from our sample is consistent with prior literature on this issue, and a subject for our future investigations with a bigger data set. PE firm equity amounts have not mattered in the aggregate in this study, nor in analysis of returns to equity, but it is a significant variable for two

firms in terms of total firm value. For Firm H, which is a firm with a heavy emphasis on control transactions and a large equity stake, the amount of PE equity positively impacts firm value (at the 5% level of significance). This makes sense, because they have had some triple-digit "home runs" with large equity stakes. Conversely, Firm C averages 43.6% equity in their deals, and takes minority positions 57% of the time; their highest return deals have come in syndicated transactions, and for them the PE Equity variable has a negative coefficient (significant at 10%). Though always positive as a coefficient, add-ons are highly significant only for Firm J, the biggest firm in our sample, in terms of overall firm value. This is somewhat surprising given the importance of this vehicle in terms of growth for many PE firms, though again, we may consider this variable to be *economically significant* based on consistently high t-statistics.

Summary comments on PE firm comparison

This section introduced what will be the subject of an ongoing investigation in 2007, and more determinative with a bigger data sample. We have shown the following:

- In a statistically significant way, PE firms follow different *strategies* and have varying *execution models*, in pursuit of the common objective of optimizing transaction IRR of equity. Deal parameters such as revenue and profit growth or exit multiple uplift are different in a highly significant way across the entire data sample, as are sub-samples based on deal type (e.g., solo versus club deals) for return on equity.
- The level of industry focus does not seem to matter in terms of ultimate transaction IRR, nor does the specific industry-types which are the focus for each firm (though as we saw in the previous Section, returns by industry type have greatly differed in the aggregate). Appendix 6 bears this out, portraying the vastly different investing strategies pursued by each firm. However what *does* matter in a crucial way is the PE firm's ability to exploit market

knowledge, based on internal PE firm dynamics and the firm's *execution model.* Some firms appear to be simply *better* than others in the *deal process,* end-to-end, from deal procurement through to close, governance, and exit. The PE industry has now become a competitive one such that firms attempt to differentiate themselves before their clienteles via the totality of their execution models.

- Regression analysis at the *firm level* followed the same general patterns as for the whole sample, but not completely so. At the level of the entire sample, add-on acquisitions is seen to be an important driver of transaction IRR, but at the level of individual firms, while *economically significant* in many cases, their impact is superseded by the traditional governance and ownership parameters. Conversely, management equity, which across the entire data sample was not seen to be significant even in an economic sense (nor, for the most part, was PE firm equity), is highly statistically significant for firm-level regression analysis.
- Regression analysis at the firm level appears to indicate the existence of an *entrenchment* effect for management equity; beyond a certain level, managers may "consume perquisites" associated with their office, to the detriment of transaction IRR and firm value. This is certainly something that many in the PE sector fear; more research on this topic is warranted.
- Most regressors which explain equity returns and firm value behave according to received theory, but at the individual firm level, a few changed signs in their coefficients. Most notably, leverage was seen to be positively related to value creation in some cases, and negatively in others. The results were consistent with the various firms' strategies and execution models, however.
- Prior researchers in private equity have consistently distinguished between two types of buyouts: agency-mitigating deals which often involve restructuring in mature, low-growth,

low-*beta* industries; and growth-equity transactions in which the PE firm invests in a company in a growing industry. There is a third categorical type as well, quite prevalent in this data sample and intermediate between these two but of its own kind: *coordination-improving* deals. These are often sound businesses which nonetheless can benefit from PE firm ownership due to resource access, specific expertise in a given (needed) area of the firm's value chain, capital availability for recombination of assets (most prominently, consolidation in a fragmented industry), or recapitalization and ownership transition. The intended result of these transactions is better *coordination* of deployment of a firm's assets, often in recombination with market-based resources.

- Results here should be viewed with caution, due to the small size of the data sample. More firms and more transactions garnered in the next few months will enhance our ability to quantitatively analyze PE firm investing strategies in terms of greater confidence in the statistical validity of a large industry cross section.

CHAPTER 6. SUMMARY & NEXT STEPS IN RESEARCH PROGRAM

This research has entailed detailed analysis of 288 private equity investments made and exited by thirteen participating firms from 1984-2006. The sample encompasses 28 three-digit SIC code industries; 62% are controlling stakes, 44% are in syndicates, and 55.7% involve "platform" acquisitions which make subsequent scale-building add-on acquisitions. The mean IRR of invested equity is 40.1% for the sample, with a median of 30.9%. The S&P 500 returned 9.81% during the comparable holding periods, while the leveraged S&P 500 returned 25.9%; the S&P-500 index-adjusted return for the sample is 27.2%. In the aggregate, target companies saw increased revenues and profits, and employment and capital expenditure increases.

The analysis in this research project takes three inter-related tracks: (1) a transaction-level review of these deals via statistical analysis and regression, to better discern the drivers of IRRs to equity and the target firm's assets; (2) an intra-PE firm comparison of deal-making strategies and execution, to discern patterns of "best practices" and the various ways in which PE firms achieve return on their investments; and (3) a statistical benchmarking comparison between PE firms and publicly traded companies, matched by industry (and size, as closely as possible), by various measures of performance and deal results.[180] The goal of this analysis is less to shed light on the ongoing debate about the relative returns performance of private equity, than to better understand the drivers of *absolute* performance of later-stage/buyout investing.[181]

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[180] This third piece is *in process* and will be completed soon.

[181] See Table 2, page 32 above, and associated discussion. Also see, *op. cit.*, Kaplan & Schoar, Ljungqvist & Richardson, discussion pp. 55-56. Given the incongruous nature of PE returns tracking and reporting across the sector, this debate will not easily be settled soon. Our thesis is that a research modality which emphasizes *understanding* private equity investing from a vantage point which is "*within* the deals themselves" (what Max Weber referred to as *verstehen*), garnered by live deal data directly from the practitioners (in order to glean the

This paper constitutes an *interim report* of a project which will encompass most of the remainder of 2007; we are in the midst of significantly expanding the data sample, and hope to have true cross-sectional representation of the sector, on a global basis, in the next few months. The three analytical tracts taken in Chapters 4, 5, and the one in process (which is not quite complete and will be sent soon) form the basis for this detailed investigation into the efficacy of private equity investing, and a multifaceted method for the analysis. Reiterating the discussion of pages 12-14 (and, findings as presented in Appendices 1 through 6), and in Chapters 4 and 5 above, in the transaction-level analysis and in the intra-PE firm comparative performance assessment, we showed the following:

1. Over three quarters of the sample exhibit increased revenues and operating profits, and those transactions which do, in either case, vastly outperform those which do not. The same is true of increases in both capital expenditures and employment levels.
2. Insights from agency-theory (e.g., Jensen 1986) and transaction-cost economics (e.g., Williamson 1988) are both substantiated here. Low-tech, slow-growth consumer goods manufacturers had the highest return transactions, highest leverage, highest levels of management equity, PE firm equity, and were controlling stakes deals. And, higher industry *betas* are significantly correlated with more equitized capital structures.
3. IPOs had the highest returns as an exit type, followed in serial order by progressively *more knowledgeable buyer-types*: industry sales, PE firm sales, and then recapitalizations.
4. Controlling stakes deals are characterized by twice the return levels, one-third to one-fourth the size, shorter holding times, much higher leverage, and lower debt pay-down ratios than their counterparts. They are also far more heavily concentrated in slow-growth manufacturing.
5. *Add-on* acquisitions are the single most important determinant of transaction IRR for equity, and by proxy, firm performance.
6. *Leverage* affects *equity* IRRs positively (+), and *asset* returns negatively (-), in a statistically significant way, across the entire sample.
7. Management and PE firm equity amounts are not significant factors in firm performance on a sample-wide basis, but the former is highly statistically significant for firm-level regression analysis. Further, regression analysis at the firm level appears to indicate the existence of an *entrenchment* effect for management equity. Both variables are influential in explaining differences in performance between club/solo or minority/controlling stakes deals.
8. In terms of driving operating performance improvement, ancillary acquisitions (via the *Add-ons* (+) variable) and *Leverage* (-) are significant in explaining revenue growth, and leverage (-) is key to understanding growth in EBITDA. That is to say, the fastest growing firms are burdened with the least amount of debt, supportive of Williamson (1988).
9. Across the major industry groups of low-tech manufacturing, retail & distribution, and professional services, different parameters affect performance significantly *within* each industry in a different way. For consumer goods manufacturing, *debt pay-down* (-) (total debt/EBITDA) is determinative; *leverage* (-) is also important. For retailing and distribution,

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"story" behind the "numbers"), will assist us in better comprehending the value-added of PE investors in the modern era.

leverage (+) impacts returns in exactly the opposite way to consumer goods manufacturing. Secondly, *PE firm equity* (-) is a negative driver of equity IRR for this industry sector**.** For professional services businesses, ancillary acquisitions (+) are significant parameters leading to higher equity IRRs.

10. In a statistically significant way, PE firms follow different *strategies* and have varying *execution models*, in pursuit of the common objective of optimizing transaction IRR of equity. Deal parameters such as revenue and profit growth or exit multiple uplift are different in a highly significant way across the entire data sample, as are sub-samples based on deal type (e.g., solo versus club deals) for return on equity.
11. Via intra-PE firm comparison, it is seen that the level of industry focus does not matter in terms of ultimate transaction IRR, nor does the specific industry-types which are the focus for each firm. Appendix 6 bears this out, portraying the vastly different investing strategies pursued by each firm.
12. What *does* matter in a crucial way is the PE firm's ability to exploit market knowledge, based on internal PE firm dynamics and the firm's *execution model*. Some firms appear to be simply *better* than others in the *deal process,* end-to-end, from deal procurement through to close, governance, and exit. Our continued research this year seeks to discern details of the drivers of these differences.
13. Regression analysis at the *firm level* followed the same general patterns as for the whole sample, but not completely so. At the level of the entire sample, add-on acquisitions are seen to be an important driver of transaction IRR, but at the level of individual firms, while *economically significant* in many cases, their impact is superseded by the traditional governance and ownership parameters.
14. At the individual firm level, leverage was seen to be positively related to value creation in some cases, and negatively in others. The results were consistent with the various firms' strategies and execution models, however.
15. Prior researchers in private equity have consistently distinguished between two types of buyouts: agency-mitigating deals which often involve restructuring in mature, low-growth, low-*beta* industries; and growth-equity transactions in which the PE firm invests in a company in a growing industry. There is a third categorical type as well, quite prevalent in this data sample and intermediate between these two but of its own kind: *coordination-improving* deals. These are often sound businesses which nonetheless can benefit from PE firm ownership due to resource access, specific expertise in a given (needed) area of the firm's value chain, capital availability for recombination of assets (most prominently, consolidation in a fragmented industry), or recapitalization and ownership transition. The intended result of these transactions is better *coordination* of deployment of a firm's assets, often in recombination with market-based resources.

It must be reiterated that all results in this study are per force *preliminary;* in some cases the data sample is too small to "universalize" the results to any firm conclusions. We intend to expand the data set considerably in the next few months thanks to the support of the American Enterprise Institute, and will seek to drive to firmer conclusions about the issues raised above.

More broadly than the initial findings enumerated above, however, some lessons about private equity have emerged in the course of this investigation which serve as both our closing comment to this essay, and a set of guiding axioms for the future course of this research project:

i. The modern era of private equity began in 1979, and from modest beginnings has exploded to a global scale; PE is now seen as a key element of the class of alternative investments, and a necessary part of any well-balanced institutional portfolio. There is now up to $2 trillion in leveraged capital under management by private equity firms worldwide, directly leading or influencing changes in governance and strategy in virtually every industry sector.[182] The details of these changes, and the history and impact of private equity more broadly, need to be chronicled.

ii. Perhaps even more influential than *direct* ownership and management of portfolio companies has been the private equity sector's *indirect* influence on corporate governance and strategy among *all* firms, including publicly traded companies. Manne's (1965) thesis applies equally well in the PE world of today: a liquid and ever more-efficient market for corporate control impels continuous cost control, innovation in products and processes, and services augmentation. Jensen (1993) decried the failure of internal control systems in rationalization and restructuring of inefficient industry, but private equity, even as it has provided an *external* impetus to such needed change, has also motivated improvements in internal control as well.

iii. Hubbard (2005) encourages judgment about the efficacy of financial markets and institutions to be based on three inter-related issues: liquidity, information-generating, and risk-bearing services delivered by such institutions. Kirzner (2000) would agree with this formulation and add that the cornerstone of any growing market economy, *entrepreneurship,* flourishes best when economic institutions provide these three services

[182] Even the information technology sector, previously thought to be impervious to leveraged investing due to the needed flexibility of capital structure in rapidly changing industries, is now seeing heightened activity. Silver Lake Partners, a Silicon Valley firm dedicated to the tech sector, has recently raised a $10 billion fund focused on the tech sector.

efficiently. On this note, holding all else equal, private equity has been of singular importance to the U.S. economy *vis a vis* other OECD economies in the modern era. While this is a subject of our further investigation, it is clear that private equity has greatly enhanced the ability of entrepreneurs to pursue their business plans. Kirzner would add that entrepreneurship is advanced not only through the profit growth engendered by successful ventures, but through the immediacy of feedback of the *trial-and-error* process itself, in correcting prior error and redeploying assets quickly to higher-valued uses. PE has become a superior institution promoting *trial and error*-based business activity which leads to better *coordination* of assets across firms and markets, as new organizational methods and combinations, structures, and processes are adaptively tested and deployed. All of this concomitantly generates new knowledge which is quickly transferred by the agency of private equity across industries, globally. This process generates never-ending advances in productivity.

iv. The debate about comparative or relative returns to private equity investment will not easily be settled for aforementioned reasons, but given the points just mentioned is not a focus of this research effort *per se.* Our larger task in coming months is to build a cross-sectional data base of global PE firms, and detail the portfolio-firm level changes wrought by PE ownership or investment, the nature of entrepreneurial initiatives such as *buy-and-build* strategies which effectively restructure fragmented industries over time, and the changes in PE contracting itself.[183] All of these are subsidiary to our ultimate research agenda, of detailing how changes in ownership, governance, corporate control, and entrepreneurship impact economic growth.

[183] Blackstone Group, for example, may soon issue a public stock offering on U.S. markets.

v. On this point, Reisman (2000) reminds us that economic growth is maximized under a regime of liberal, limited government. Once this is in place, all other institutions of capitalism arise spontaneously: private ownership of the means of production; the division of labor and exchange (which, along with the appurtenant division of knowledge, greatly enhances the *productivity* of labor); indirect exchange and money, which in turn further extends the division (and hence productivity) of labor; saving and capital accumulation; and ultimately, the price system itself, which is a product of the profit motive and competition for resources.[184] Private equity is a key institutional feature of a modern capital-using economy, promoted by both saving and capital accumulation and the division of knowledge in society, which itself furthers the division of labor and the productivity of all economic resources. As such, it is an important part of modern economics which needs clear elucidation, free of the polemical disputes regarding its history. This is the ultimate goal of our research effort here in 2007 at the American Enterprise Institute.

Finally, it should be reiterated that private equity, however important an institution, is in a state of rapid evolution. Fortunately, the tools of economics afford us with the analytical architecture to assess the impact of this key facet of modern finance, which is now a part of the web of institutions which buttress a growing market economy. Rapid change, of course, often brings forth calls for regulation and even repression of the causal institutions. While our research investigations are ongoing, we are nonetheless unequivocal in asserting that to stem the evolution and growth of private equity would be deleterious to the long term growth and health

[184] *Entrepreneurship* may be regarded as a key institution of the market economy, and is embodied in the division of labor.

of the U.S. and global economies.[185] And so we end with words of Mises which are appropriate to the story of private equity:

> The body of economic knowledge is an essential element in the structure of human civilization; it is the foundation upon which modern industrialism and all the moral, intellectual, technological, and therapeutical achievements of the last centuries have been built. It rests with men whether they will make the proper use of the rich treasure with which this knowledge provides them or whether they will leave it unused. But if they fail to take the best advantage of it and disregard its teachings and its warnings, they will not annul economics; they will stamp out society and the human race.[186]

[185] This is not to deny that there are aspects of private equity contracting and governance which are in need of improvement, as implicitly suggested by Jensen (2005). But private equity is no different than the *trial-and-error* processes of change and improving coordination which it fosters in portfolio companies in this regard.

[186] Mises (1949, p.880).

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APPENDICES

APPENDIX 1. Key Sample Descriptive Statistics

App 1.1 Returns	#N	Mean	Median	Standard Deviation	MIN	MAX
Gross IRR, Return on Equity (EQ)	288	40.10%	30.90%	89.30%	-100%	849%
Gross IRR, Asset Value (EV)	288	15.10%	13.60%	42.70%	-100%	223%
S&P 500-Adjusted R.O.E. (EQ-adj)	288	27.20%	23.60%	72.90%	-100%	635%
Value-weighted R.O.E.	288	43.90%	--	--	--	--
IRR of S&P 500	288	9.81%	10.10%	10.80%	-21%	31%
Leveraged S&P 500 IRR	288	25.90%	21.90%	34.60%	-68%	182%
Value-weighted IRR of S&P 500	288	6.74%	--	--	--	--
App 1.2 Governance						
Leverage	288	65.50%	70%	19.50%	0	94.40%
Debt Pay-down	255	3.71x	3.01x	--	--	--
Mgmt. Equity	255	19.30%	15%	12.80%	3.21%	80%
PE Firm Equity	282	55.80%	64.30%	25.20%	2.80%	94.50%
App 1.3 Control Variables						
Transaction Size	288	$78.3mm	$29.2 million		$1.4mm	$4.51Bn
Holding Time	288	Mean 4.8 yrs (1752 days), Median 4.3 yrs (1583 days)				
Bankruptcies	35	(12.1% of total)				
Minority or Control Stake?	288	(62.8% are controlling investments)				
Is this a Club Deal?	281	(44.1% are in syndicates)				
Were there Add-on acquisitions in this deal?	271	(55.7% have add-ons acquisitions)				
Industry Beta	288	0.924				
App 1.4 Performance Variables						
Revenue Growth	254	13.90%	83.1% saw revenue increase (this is Median);			
EBITDA Growth	255	11.60%	75.6% saw EBITDA increase (this is Median);			
EBITDA Margin Growth	254	-0.33%	45.2% saw increase			
Employment Change	59	13.40%	71.2% of 250 deals increased employees			
Capital Expenditures	119	8.30%	60.4% of 230 deals saw CapEx rise			
Entry Multiple	238	7.54x				
Exit Multiple	241	7.58x				

APPENDIX 2. PE Deals: Operating Performance Summary

Variable	N#	Mean Return on Equity	Holding Period
Revenue Down	43	-2.60%	1368
Revenue Up	211	57.30%	1858
Revenue change reported as unsure	34	28.70%	1583
EBITDA Down	57	-28.50%	1656
EBITDA Up	177	62.30%	1849
EBITDA change reported as unsure	54	40.10%	1538
EBITDA/Revenue Down	139	14.90%	1966
EBITDA/Revenue Up	115	75.90%	1535
EBITDA/Revenue reported as unsure	34	25.78%	1614
Employment Down	72	-13.10%	1645
Employment Up	178	60.60%	1868
Employment change reported as unsure	38	48.50%	1412
Capital Expenditure Down	91	15.30%	1577
Capital Expenditure Up	139	52.80%	1835
Capital Expenditure change reported as unsure	58	50.5%	1820
Exit Multiple Down	87	-1.70%	1788
Exit Multiple Up	170	67.80%	1773
Exit Multiple change reported as unsure	31	10.30%	1538

APPENDIX 3. Descriptive Statistics by Industry

Variable	Outdoors Production	Consumer Goods Manufacturing	Capital Goods Manufacturing	Retail & Distribution	Professional Services
Industry description & examples	Agriculture, mining, construction	Food/beverage, furniture, rubber, plastics, et al.	Steel, industrial machinery, electronics	Wholesale distributors and retailers	Consulting, admin. services, real estate
Number of Observations	8	61	80	44	95
Return on Equity	-13%	59%	40.50%	34.10%	36.30%
Transaction Size	$29.1 million	$86.4 million	$39.8 million	$74.1 million	$112 million
Leverage	55.50%	74.30%	70.30%	69.80%	54.70%
Debt Pay-down	3.69x	4.28x	8.1x	4.35x	1.80x
Management Equity	20%	20.60%	20.20%	17.90%	18.50%
PE Firm Equity	61%	64.30%	62.10%	55.60%	44.90%
Holding Time	1657	1820	1775	1879	1638
Number of Bankruptcies	3	5	7	9	11
% Control Deals	75% (8)	80.3% (61)	75% (80)	56.8% (44)	43.1% (95)
% Deals as Club Deals	50% (6)	27.1% (59)	34.1% (79)	44.1% (43)	63% (92)
% Deals as Add-ons	33% (6)	63.1% (57)	57.8% (76)	55% (40)	51% (92)
Industry Beta	1.00	0.73	0.99	0.90	0.99
Revenue Δ (#)	-9.4% (5)	9.8% (56)	9.2% (73)	8.8% (40)	25.1% (80)
EBITDA Δ (#)	-5% (5)	6.3% (56)	4.8% (74)	-1.9% (40)	10.2%* (80)
EBITDA Margin Δ (#)	4.8% (4)	-3.6% (56)	-1.3%* (med. of 74)	-4.9% (40)	-2.1%* (80)
Employment Δ (#)	1% (2)	10.6% (9)	17.1% (13)	1.9% (12)	21.5% (23)
CapEx Δ (#)	-11.3 (3)	9.9% (30)	11% (28)	5.2% (25)	8.6% (33)
Exit Multiple	7.17x (4)	6.96x (55)	6.66x (67)	6.71x (40)	9.32x (76)

APPENDIX 4. Descriptive Statistics by Exit Type

Variable	IPO	Trade Sale	PE Firm	RECAP	Bankruptcy
Number of Deals	37	123	65	28	35
Return on Equity	*101%*	*54.20%*	*44.20%*	*28.2*	-68.20%
Transaction Size	$227mm	$48.8mm	$51.2mm	$115mm	$45.4 million
Leverage	*59.80%*	*65.30%*	*68.70%*	*71.10%*	61.50%
Debt Pay-down	7.37x	1.79x	4.86x	5.06x	3.48x
Management Equity	*20.50%*	*19.80%*	*19.40%*	*14.70%*	19.80%
PE Firm Equity	41.40%	59.70%	59.50%	56%	49%
Holding Time	*1693*	*1733*	*1760*	*2080*	1604
% Control Deals	43.2% (37)	71.5% (123)	64.6% (65)	60.7% (28)	51.4% (35)
% Deals as Club Deals	63.8% (36)	38% (121)	38.4% (65)	51.8% (27)	50% (32)
% Deals as Add-ons	73.5% (34)	52.9% (119)	53.1% (64)	64% (25)	44.8% (29)
Industry Beta	0.99	0.90	0.95	0.95	0.86
Revenue Δ (#)	*32% (34)*	*17.7% (112)*	*11.2% (56)*	*10.4% (24)*	-14.7% (28)
EBITDA Δ (#)	*45.2% (34)*	*18.4% (112)*	*14.9% (56)*	*2.5% (24)*	-56.2% (29)
EBITDA Margin Δ (#)	*19% (34)*	*7.2% (112)*	*2.9% (56)*	*-9.7% (24)*	-36.6% (28)
Employment Δ (#)	*49.4% (9)*	*13.1% (25)*	*11.9% (17)*	*-4% (3)*	-34.2% (5)
CapEx Δ (#)	*8.9% (20)*	*10% (43)*	*11.6% (35)*	*16% (13)*	-29.75% (8)
Exit Multiple	*11.7 (34)*	*7.62 (110)*	*7.11x (55)*	7.73x (23)	1.11x (19)

Italics indicates trend across exit type

APPENDIX 5. Descriptive Statistics of Private Equity Strategic Choices

Strategic choices:	Ownership		Syndication		Growth	
Variable	Minority	Control	Solo	Club-Deal	Organic	Add-on
Number of Deals	107	181	157	124	120	151
Return on Equity	25%	48.10%	52%	25.20%	33%	50%
Transaction Size	$134m	45.5m	43.6m	125m	50.7m	98.3m
Leverage	57.90%	70.10%	69.70%	59.80%	65.30%	65.40%
Debt Pay-down	3.93	3.56	3.57	3.86	5.06	2.72
Management Equity	21.70%	18%	21.20%	16.40%	18.80%	19.70%
PE Firm Equity	27.40%	72.90%	73.10%	33.80%	57%	56%
Holding Time	1828	1707	1662	1849	1628	1857
% as Control Deals	0%	100%	93.60%	22.60%	63.30%	63.60%
% as Club Deals	90.50%	16%	0%	100%	43.3%	43%
% as Add-on Deals	55%	55.80%	55.80%	55.50%	0%	100%
Industry BETA	0.98	0.89	0.91	0.93	0.87	0.95
Revenue Δ	16.30%	12.45%	11.30%	17.10%	4.10%	21.30%
EBITDA margin Δ	UP 24.7%	Down 5.1%	Up 4.1%	Down 25.2%	Down 13.4%	Up 13.4%
Employment Δ	(25)	(34)	(33)	(26)	(28)	(31)
CapEx Δ	12.50%	5.80%	5.30%	12.60%	-1.20%	14.30%
Exit Multiple	8.46	7.04	6.8	8.51	7.41	7.68
Industry index	4.04	3.25	3.28	3.92	3.65	3.5

Note: As explained in Chapter 4, we asked for data on another key strategic option for PE firms, divestitures (typically as part of a restructuring), as well. However we received information on only 14 affirmative transactions out of 189 responses. We therefore did not include this variable in the current analysis, but will have occasion to in the future . As discussed, returns performance on the 14 deals with divestitures was impressive.

APPENDIX
6. Descriptive Statistics For Private Equity Firms

Variable	P.E. Firms						
	A	B	C	D	E	F	
# of Deals	5	10	6	8	21	14	
Return on Equity	36.4%	10.2%	47.3%	14.6%	28.2%	59.3%	
Transaction Size	$7.95 MM	$18.4 MM	$18.6 MM	$31.9 MM	$23.1 M	$16.3 M	
Leverage	78.0%	50.0%	72.8%	46.1%	69.4%	68.9%	
Mgmt Equity	16.0%	20.0%	20.3%	40.6%	21.4%	18.2%	
P.E. Firm Equity	60.8%	15.0%	79.6%	45.8%	66.3%	71.4%	
Control Stakes	60.0%	0.0%	100.0%	37.5%	71.4%	85.7%	
Club Deals	60.0%	100.0%	0.0%	37.5%	85.7%	21.4%	
Add-On Deals	20.0%	20.0%	67.0%	75.0%	21.4%	71.4%	
Holding Time	2231	1762	1808	1309	1569	2202	
Industry	3.8	4.4	2.5	3.5	4.1	3.0	
Variable	P.E. Firms						
	G	H	I	J	K	L	M
# of Deals	23	17	16	27	30	43	68
Return on Equity	23.3%	106.0%	63.6%	44.3%	28.5%	31.1%	41.5%
Transaction Size	$34.2 M	$30.9 M	$34.1 M	$118 M	$47.8 M	$62.1 M	$178 M
Leverage	44.0%	68.5%	68.6%	61.1%	50.5%	75.6%	74.5%
Mgmt Equity	19.9%	17.8%	13.9%	13.4%	30.1%	17.1%	19.4%
P.E. Firm Equity	43.6%	75.7%	79.8%	47.2%	43.6%	71.0%	45.9%
Control Stakes	34.7%	88.2%	93.7%	59.2%	43.3%	100.0%	47.0%
Club Deals	69.6%	17.6%	12.5%	74.1%	67.0%	0.0%	62.2%
Add-On Deals	31.8%	29.4%	62.5%	77.7%	70.0%	67.4%	59.6%
Holding Time	2092	1184	1464	1583	1906	1788	1799
Industry	4.47	3.35	3.0	3.7	3.6	3.04	3.5

APPENDIX 7. Debt Levels in Corporate America, 1965 through 2005.

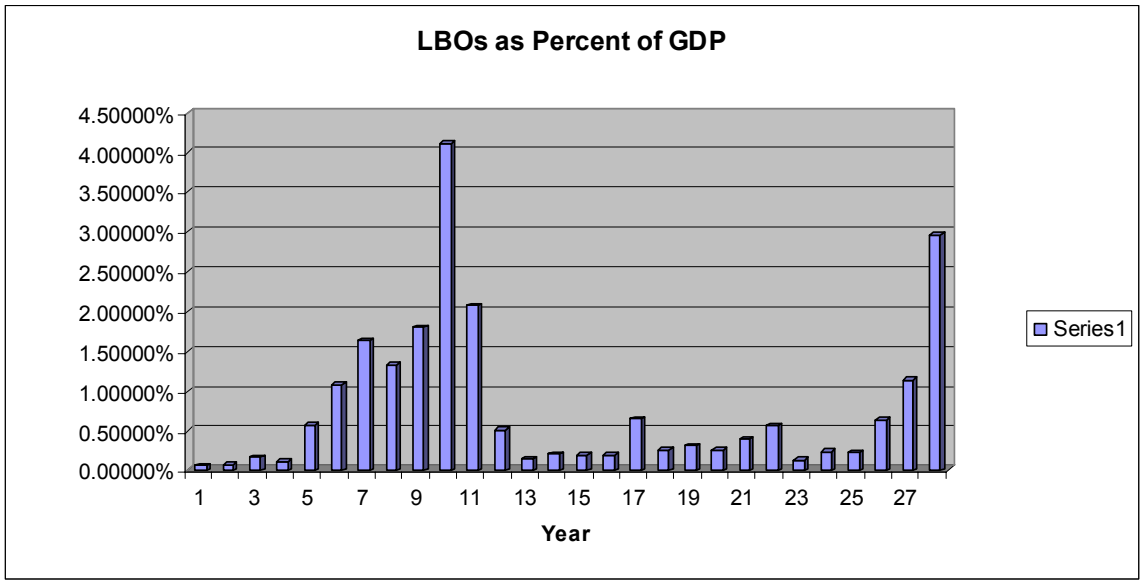
Sources: Thomson Financial, Compustat, Fama-French.

This chart shows market and book values of long term debt as a percentage to total assets for the S&P 500 (the Fama-French lowest 10% small-cap universe, and the Compustat universe were similar so are not reproduced here). What it most clearly depicts is that there is no pattern of change here for any index. The idea that the buyout wave caused a "leveraging of corporate America's balance sheet" is not true.

Year	Debt/BV of Assets	Debt/MV of Assets
1965	16.2%	15.9%
1966	15.6%	17.3%
1967	17.8%	18.5%
1968	18.2%	16.2%
1969	18.6%	15.1%
1970	21.5%	16.2%
1971	21.7%	17.4%
1972	21.6%	18.2%
1973	20.9%	18.9%
1974	20.2%	18.6%
1975	21.1%	18.5%
1976	17.6%	18.8%
1977	17.7%	18.9%
1978	16.8%	18.7%
1979	16.4%	18.3%
1980	17.0%	17.8%
1981	16.6%	14.0%
1982	16.9%	13.8%
1983	15.7%	12.3%
1984	16.2%	12.3%
1985	16.3%	12.1%
1986	17.8%	10.8%
1987	16.6%	10.3%
1988	17.3%	10.2%
1989	17.5%	9.8%
1990	17.6%	9.2%
1991	17.9%	8.2%
1992	16.5%	7.1%
1993	15.6%	4.6%
1994	15.5%	5.8%
1995	16.0%	6.0%
1996	16.6%	5.4%
1997	16.7%	5.8%
1998	17.1%	6.0%
1999	18.1%	6.3%
2000	16.6%	4.6%
2001	17.8%	3.7%
2002	18.7%	4.0%
2003	17.9%	4.2%
2004	15.7%	3.1%
2005	13.9%	3.2%

APPENDIX 8. Buyouts as perentage of US GDP, from 1979 through 2006.

Source: Thomson Financial.



This chart shows the waves of buyout activity in the U.S. 2006 was a record year for fundraising ($215 billion globally for later stage buyouts, half of that for U.S.-based activity) and deal activity ($487 billion in real dollar terms) – but not as a percentage of GDP. 2006 was second to 1988 as a percentage of GDP, which therefore shows how the U.S. economy has grown since 1988 (and indeed, throughout the LBO and private equity wave of activity since the early 1980s).

APPENDIX 9. Buyouts by Year and by Industry, from 1979 through 2006.

Source: Thomson Financial. Industries are as follows: 0=Agriculture. 1=Mining, oil, and gas. 2=Mostly consumer goods manufacturing (e.g., food, beverage, furniture, paper, printing, rubber, plastics). 3=Metals, machinery, instruments, capital equipment manufacturing. 4=Transportation & communications. 5=Wholesale & retail trades. 6=Finance, insurance, real estate. 7= Hotel, recreation, some business, transport services. 8= Health, legal, educational, social, engineering, research, miscellaneous services. 9= Public administration services.

Buyouts Since 1979 by Industry and Year (1st digit SIC Code)

Year	0	1	2	3	4	5	6	7	8	9	Total
1979	0	0	0	0	0	1	0	0	0	0	1
1980	0	0	1	1	0	1	0	1	0	0	4
1981	1	1	3	11	0	2	0	1	0	0	19
1982	0	1	16	9	1	6	3	1	0	0	37
1983	0	8	42	39	7	14	10	7	1	0	128
1984	1	6	46	89	7	41	19	8	5	0	222
1985	4	7	55	82	14	33	15	7	7	0	224
1986	2	7	71	93	22	53	16	22	10	0	296
1987	1	8	54	102	27	61	21	29	15	0	318
1988	1	11	92	132	25	89	42	41	14	0	447
1989	3	13	79	146	45	77	65	30	26	0	484
1990	1	6	46	85	24	35	52	41	13	0	303
1991	1	9	54	83	11	44	35	35	20	1	293
1992	2	12	55	99	18	49	49	36	23	1	344
1993	1	13	66	78	18	37	54	34	21	0	322
1994	2	8	42	62	11	43	15	39	17	0	239
1995	1	6	56	86	12	53	31	34	13	0	292
1996	0	8	47	71	22	41	29	36	22	0	276
1997	1	3	46	76	15	44	20	34	26	0	265
1998	1	9	35	68	22	45	14	22	14	0	230
1999	4	6	41	70	15	28	19	41	33	0	257
2000	4	3	65	114	24	49	33	66	29	0	387
2001	1	3	29	41	16	28	22	47	29	0	216
2002	2	11	34	59	14	28	23	49	18	0	238
2003	1	10	27	42	18	24	24	28	17	0	191
2004	0	15	58	84	23	40	35	65	25	1	346
2005	2	14	66	122	34	65	49	93	55	0	500
2006	3	15	92	184	48	81	62	121	60	0	666
2007	0	1	5	11	5	8	4	6	3	1	44
Total	40	214	1323	2139	498	1120	761	974	516	4	7589

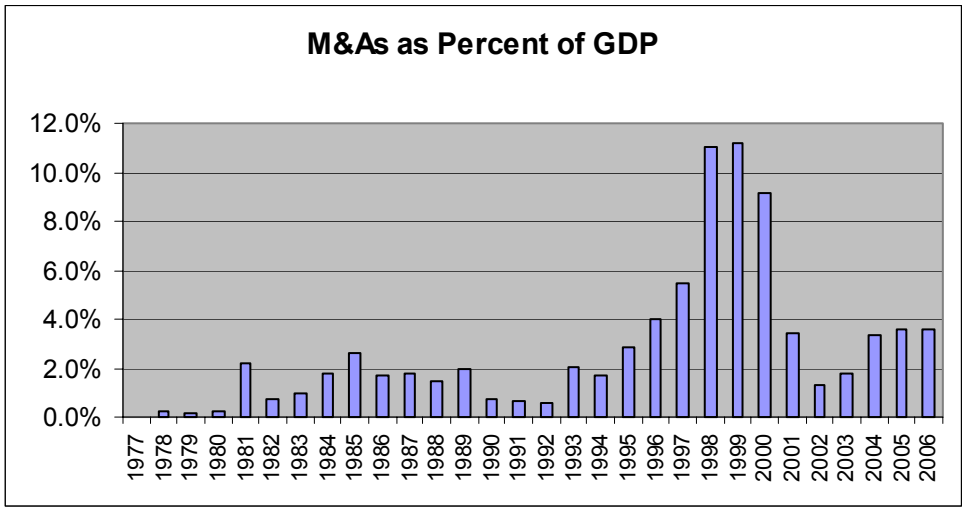
APPENDIX 10. Buyouts by Year and dollar amounts (current and constant dollar), from 1979 through 2006.

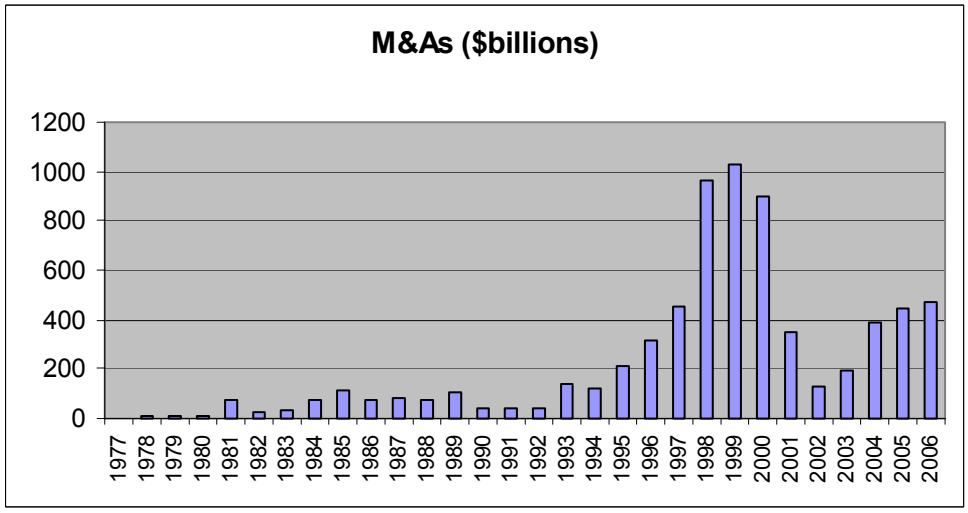
Source: Thomson Financial.

Year	Total # Deals	Total $MM Value	Ave. in ($mm)	Total in 2006 $$	Ave in2006 $	Percent of deals done	Percent of dollars
1979	2	$1,302.0	$651.0	$3,525.8	$1,762.9	0.03%	0.17%
1980	4	$1,652.8	$413.2	$4,017.9	$1,004.5	0.05%	0.20%
1981	19	$4,616.2	$243.0	$10,182.7	$535.9	0.25%	0.50%
1982	37	$3,465.3	$93.7	$7,104.2	$192.0	0.49%	0.35%
1983	128	$18,464.8	$144.3	$36,363.5	$284.1	1.69%	1.79%
1984	222	$38,495.0	$173.4	$72,894.0	$328.4	2.92%	3.58%
1985	224	$62,440.6	$278.8	$114,682.0	$512.0	2.95%	5.63%
1986	296	$54,475.8	$184.0	$96,951.0	$327.5	3.90%	4.76%
1987	318	$76,317.7	$240.0	$135,013.0	$424.6	4.19%	6.63%
1988	447	$188,965.2	$422.7	$322,369.4	$721.2	5.88%	15.83%
1989	484	$102,995.9	$212.8	$167,820.6	$346.7	6.37%	8.24%
1990	303	$27,336.9	$90.2	$42,381.0	$139.9	3.99%	2.08%
1991	293	$7,909.1	$27.0	$11,633.5	$39.7	3.86%	0.57%
1992	344	$12,352.7	$35.9	$17,778.3	$51.7	4.53%	0.87%
1993	322	$11,923.2	$37.0	$16,628.1	$51.6	4.24%	0.82%
1994	239	$13,551.0	$56.7	$18,473.5	$77.3	3.15%	0.91%
1995	292	$45,340.0	$155.3	$60,126.3	$205.9	3.84%	2.95%
1996	276	$19,524.3	$70.7	$25,284.8	$91.6	3.63%	1.24%
1997	265	$24,988.5	$94.3	$31,357.6	$118.3	3.49%	1.54%
1998	230	$22,148.9	$96.3	$27,011.0	$117.4	3.03%	1.33%
1999	257	$36,961.4	$143.8	$43,762.2	$170.3	3.38%	2.15%
2000	388	$55,394.5	$142.8	$64,300.8	$165.7	5.11%	3.16%
2001	216	$13,603.9	$63.0	$15,421.0	$71.4	2.84%	0.76%
2002	238	$25,474.4	$107.0	$28,310.9	$119.0	3.13%	1.39%
2003	191	$24,909.5	$130.4	$26,981.6	$141.3	2.51%	1.32%
2004	346	$74,769.2	$216.1	$79,245.5	$229.0	4.56%	3.89%
2005	500	$142,691.1	$285.4	$146,686.5	$293.4	6.58%	7.20%
2006	671	$393,018.5	$585.7	$393,018.5	$585.7	8.83%	19.30%
2007	44	$17,501.0	$397.7	$17,501.0	$397.7	0.58%	0.86%
Means	262	$52,503.1	$199.7	$70,235.4	$327.8	3.45%	3.45%
Medians	265	$24,988.5	$144.3	$31,357.6	$205.9	3.49%	1.54%
Total deals:	7596						

APPENDIX 11. All M&A by Year and dollar amounts (current and constant dollar), from 1979 through 2006.

Source: Thomson Financial. Note: In Baird (2007), Thomson is quoted as reporting M&A as roughly 12% of U.S. GDP in 2006: $1.5 trillion of $13.25 trillion economy. Private equity in the US was, in turn, 31% of M&A activity in U.S. in 2006 ($487 billion out of $1.5 trillion).





APPENDIX 12. Top Ten Buyout Deals of All Time

Eight of the top ten buyouts of all time (in current dollar terms) have occurred in the last year, and all since mid-2005. Note the range of industries and ownership structures.

1. **$39.3 billion. Blackstone buys Equity Office Properties Trust. February 2007. Fierce bidding war.**

2. **$32.7 billion. Bain, KKR, and Merrill Lynch buy Hospital Corp. of America in club deal. Summer 2006.**

3. **$31.1 billion. KKR buys RJR Nabisco. Spring 1989 – still largest deal in *real* terms of all time.**

4. **$27.4 billion. Apollo Group & TPG buy Harrah's Entertainment. Club deal paid 35% premium to equity price. 2006.**

5. **$25.7 billion. Thomas H. Lee and Bain buy Clear Channel Communications. 2006.**

6. **$21.6 billion. Carlyle, Riverstone, Goldman Sachs buy Kinder Morgan, energy conglomerate. Goldman is on both sides of this deal. 2006.**

7. **$17.6 billion. Blackstone, Carlyle, Permira, and Texas Pacific buy Freescale Semiconductor, largest tech buyout of all time. 2006.**

8. **$17.4 billion. Joining with CVS and SuperValu, Cerberus Partners buys Albertson's. 2006.**

9. **$15 billion. Carlyle, Clayton, Dubilier & Rice, Merrill Lynch buy Hertz Rental from Ford Motor Co.; IPO'd a year later.**

10. **$13.9 billion. Apax Group, Blackstone, KKR, Permira, Providence Equity buys TDC, Danish Telekom. Largest private equity deal in Europe.**

APPENDIX 13. Variables used in this study

Key dependent variables

Reteqirr -- "Return on equity IRR" of the deal. This is the key dependent variable, and it is *unadjusted* by any benchmarks.

Roairr -- "Return on assets IRR" of the deal. This is *unadjusted*.

SPadjroe – "S&P 500-adjusted return on equity IRR". This is same as *Reteqirr* above, adjusted for the S&P 500.

SPadjroa -- "S&P 500-adjusted return on assets IRR". This is same as *Roairr* above, adjusted for the S&P 500.

Levspadjroe -- "Leveraged S&P-adjusted return on equity IRR". This is same as *ReteqIRR*, adjusted for the *leveraged* S&P 500 index (I leveraged the S&P by same percentage amounts as each deal).

FF1adjeq -- Similar to *ReteqIRR* above, but adjusted for the Fama-French small cap index for lowest 10% of market by capitalization (i.e., small company index which may be better comparison than S&P 500, for my sample).

FF1djroa -- Similar to *RoaIRR* above, but adjusted for the Fama-French small cap index for lowest 10% of market by capitalization (i.e., small company index which may be better comparison than S&P 500 for my sample).

Other variables in STATA runs, listed as they appear on STATA print-outs:

Transaction number from 1 to 288, the number of the deal. It is associated with a matched-by-industry number for our public benchmarking samples of 50th, 90th, and 100th percentile performers.

PE Firm Numbered 1 to 13, in order from least to most # of capital raised (which correlates closely with transaction experience in the LBO sector, approximately).

Industry – coded 1 to 5, from least human-capital intensive to most, or from most capital-intensive to least. (e.g., 1 is, say, utilities, 5 is software consulting)

Entry year Year deal was bought into or invested

Size Dollar amount of transaction or what PE firm paid to buy the deal

Logsize Natural log of *Size* variable

Invest -- Dollar amount of equity invested in the transaction

Leverage -- percent of debt in the capital structure at the time the deal (100% minus *Leverage* % = equity percentage of deal, which is *Invest* divided by *Size*).

PE equity -- Amount of equity owned by PE firm at time of deal

MGMT Equity – Amount of equity owned by management at time of deal

MinorCon -- Binary variable: 0 = *minority* (<50%), 1 = *controlling* stake (>50%)

RevEntry -- Firm's revenues at time deal was bought

EBTEntry -- Firm's EBITDA at time deal was bought

EBrevBeg -- Firm's EBITDA/revenues ratio at time deal was bought

DebtPay -- Firm's debt pay-down (*[Size-Invest]/EBITDA* ratio) at time deal was bought

EntMulti -- Firm's entry multiple, or multiple of EBITDA (*Size/EBITDA* ratio), at time deal was bought

EmploEnt -- Firm's employee level at time deal was bought

CapExEnt -- Firm's Capital Expenditures spending at time deal was bought

ClubDeal -- Binary Variable: "0" if deal was done by one PE firm only; "1" if a syndicate of PE firms, or a "club", did the deal on a co-invested basis.

Add ons -- Binary variable: "0" if there were no add-on acquisitions; "1" if there were consolidating add-on deals (typically in a fragmented industry)

Divest -- Binary variable: "0" if there were no divestitures after acquisition of a part of the business; "1" if there were sell-offs of a business unit or division of the company

Holding -- Holding time of the deal, between entry and exit, in days

Exit year -- Year company was sold or investment ended

Exit type -- Coded "1" if deal was exited in an IPO; "2" if deal was exited through a sale to an industry or "strategic" buyer; "3" if deal was exited through sale to another PE firm or financial buyer; "4" if firm was recapitalized, usually though an LBO to the incumbent management; "5" if the deal ended in a bankruptcy

Bankrupt -- Binary variable: "0" if there was an exit via "1" through "4" above; coded as "1" if the exit was via a bankruptcy

RevsExit -- Revenues at time of exit

AnnRevGr -- Compounded annual growth (or change) in revenues since time of entry

RevenuUp -- Binary variable: "0" if revenue stayed the same or decreased; "1" if revenue increased during time of PE firm's investment

EBITExit -- EBITDA at time of exit

AnnEBTgr -- Annual growth (or change) in EBITDA since time of entry

EBITDAup -- Binary variable: "0" if EBITDA stayed the same or decreased; "1" if EBITDA increased during time of PE firm's investment

EBmargEx -- EBITDA margin at exit (EBITDA/revenues ratio, at exit)

EBmarGr -- Annual growth (or change) in EBITDA margin since time of entry

EBmarUp -- Binary variable: "0" if EBITDA margin stayed the same or decreased; "1" if EBITDA margin increased

EmploExt -- Employment level at exit

AnnEmpGr -- Annual growth (or change) in Employment level since time of entry

EmployUp -- Binary variable: "0" if Employment level stayed the same or decreased; "1" if Employment level increased during time of PE firm's investment

CapExExt -- Capital Expenditure level at exit

CapExGr -- Annual growth (or change) in Capital Expenditure level since entry

CapExUp -- Binary variable: "0" if Capital Expenditure level stayed the same or decreased; "1" if Capital Expenditure level increased during time of PE firm's investment

ExitValue -- Valuation of company at exit in sell-off or recapitalization

ExitMult -- Firm's exit multiple, or multiple of EBITDA (*Size/EBITDA* ratio), at time deal was exited

ExitEntr -- Ratio of Exit Multiple (*ExitMult*) to entry multiple (*EntMulti*)

MultipUp -- Binary variable: "0" if Exit multiple (*ExitMult*) is lower or the same as the Entry multiple (*EntMulti*); "1" if Exit Multiple is greater than entry multiple

irrSP500 -- IRR of S&P 500 (or return on S&P 500) index for my sample matches

LevSPirr -- IRR of *leveraged* S&P 500 (or return on *leveraged* S&P 500) index for my sample matches

irrRuss2 -- IRR of Russell 2000 (or return on Russell 2000) index for my sample matches

r2adjroe -- Russell-2000-adjusted return on equity (IRR) for my PE sample deals (similar to *RetEqIRR* from above, adjusted for Russell 2000)

r2adjroa -- Russell-2000-adjusted return on assets (IRR) for my PE sample deals (similar to *RoaIRR* from above, adjusted for Russell 2000)

Beta -- Industry betas (median firm's beta) for my sample of firms

MedCoIRR -- Benchmark median firm's return on equity (IRR), matched by industry for each of my deals

Medadjirr -- Median firm- or industry-adjusted return on equity (IRR) for my PE sample deals (similar to ***SPadjroe*** from above, only adjusted for benchmark firms in this case)

irrFF10 -- IRR of Fama-French lowest 10% of market cap stocks index

irrFF20 -- IRR of Fama-French lowest 20% of market cap stocks index

irrFF30 -- IRR of Fama-French lowest 30% of market cap stocks index

FF3adjeq -- Similar to *ReteqIRR* above, but adjusted for the Fama-French small cap index for lowest 30% of market by capitalization (i.e., small company index which may be better comparison than S&P 500 for my sample).

FF3djroa -- Similar to *RoaIRR* above, but adjusted for the Fama-French small cap index for lowest 30% of market by capitalization (i.e., small company index which may be better comparison than S&P 500 for my sample).

FF2adjeq -- Similar to *ReteqIRR* above, but adjusted for the Fama-French small cap index for lowest 20% of market by capitalization (i.e., small company index which may be better comparison than S&P 500 for my sample).

FF2djroa -- Similar to *RoaIRR* above, but adjusted for the Fama-French small cap index for lowest 20% of market by capitalization (i.e., small company index which may be better comparison than S&P 500 for my sample).

APPENDIX 14. Summary of PE firms in study

Firm, # deals in study, capital managed, and summary comments

* ***indicates Cambridge Associates (or other) has ranked as top quartile performer in private equity.***

***Firm A,** 68, $7bn. Seattle – 25 yrs. of success based on well-defined industry/situation focus *across six industry sectors,* $200mm-$1.5bn range; need *industry dynamics* to be strong, not just company. Increasingly willing to partner in deals. Believes international markets now better for PE investing.

***Firm B,** 27, $2 billion. New York – Spin off of REM's VC arm. Long tradition of doing club deals successfully though in lead capacity. Has spanned industries and transaction structures in past, but new focus on business services and higher margin, high value-add businesses now.

***Firm C,** 43, $4bn. St. Louis -- 20 yrs. narrow focus (basic manufacturing, >$10 mm EBITDA) and structure type (demand control, seek consolidation). Heavy investments in infrastructure to garner proprietary deal flow.

Firm D, 8, $150mm. Dallas – Since 1993 focus on closely-held businesses with $2-15 mm EBITDA, and have succession/liquidity needs, growth capital. Mfg., distribution, service businesses.

Firm E, 10, $69mm. Cincinnati – 3 small funds, all minority stakes in post-startup growth equity ,conservative capital structure. Heavy focus on IT services. 100% minority investor. Had SBIC license but poor showing led to inability to raise follow-on.

Firm F, 14, $275mm. Louisville – Focus on $5-15mm EBITDA manufacturing companies primarily in industrial Midwest. Usually control position, then consolidate fragmented industries.

***Firm G,** 17, $800mm. New Orleans – Middle market buyouts of companies $35-$300mm. Extremely well-thought out value proposition: require strong managers day one, sustainable competitive advantages, diversification in products, customers, markets. Mostly control, & manufacturing. Riddell Sporting Goods is emblematic deal. Latest fund over-subscribed.

Firm H, 6, $150mm. Minneapolis – Just closed on $120mm fund; background in control-oriented deals, mid-size consumer niche manufacturers up to $100 mm in value.

Firm I, 23, $300mm. San Francisco – Investment vehicle for Willis Jones and Jim Morris. Just raised first formal fund. Heavy focus on services businesses until now; changing strategies. $2-20mm EBITDA, California businesses only, avoid auctions.

***Firm J,** 16, $1.6bn. Detroit – Firm focused on smaller deals (<$100mm), almost carbon copy of B's strategy. Heavy focus on basic manufacturing, with ability to consolidate product lines or mfg. facilities.

Firm K, 5, $25mm. Charlotte – Small buyout firm focused on low-tech manufacturing or easy-to-understand distribution, business services businesses in southeastern U.S.. $1-3mm EBITDA, invest alongside management.

Firm L, 21, $50mm Las Vegas – 20+ years opportunistic investor does PE as ancillary to real estate. Focused on real-estate-related plays and services in western U.S.

Firm M, 30, $2.3bn Kansas City – Started in 1984 and for 10 years did earlier-stage tech related. Switched focus to late-stage buyouts; no industry focus, but seek a growth story and "management quality tells all". Increasingly doing club deals.

APPENDIX 15. Intermediate cash flows example

Monthly Date	Firm W	X	Y	Z
May-98	30	-	-	-
Jun-98	30	-	-	-
Jul-98	(8,750)	-	-	-
Aug-98	230	-	-	(5,000)
Sep-98	60	-	-	195
Oct-98	30	-	-	-
Nov-98	30	(379)	-	-
Dec-98	30	-	(13,767)	50
Jan-99	30	-	-	13
Feb-99	30	-	578	13
Mar-99	30	(188)	-	13
Apr-99	30	17	-	13
May-99	30	-	-	13
Jun-99	109	(193)	75	-
Jul-99	30	(211)	-	13
Aug-99	23,786	-	(6,195)	13
Sep-99	20	-	75	13
Oct-99	-	(2,864)	-	-
Nov-99	-	-	-	-
Dec-99	-	-	75	50
Jan-00	-	-	-	-
Feb-00	-	(1,685)	-	-
Mar-00	-	-	75	15,593

Here is an example of the cash flow tracking controls Firm B's has in place for continual monitoring of all portfolio companies. There is wide variability to cash burn rates and capital needs, as well as management and advisory fee arrangements due the private equity firm, across a portfolio. Tracking this is a non-trivial exercise, and in 5 out of 13 cases we received access to these details, as well as a higher-level summary look elsewhere. We computed IRRs where we were able to based on this information, and have high confidence in the veracity of our data in all cases, and completeness in 12 of the 13 participants. Insights into these details also leaves the observer with a renewed appreciation of the difficulty inherent in measuring returns to private equity investing: issues such as accounting for ancillary "add-on" acquisitions, mark-to-market accounting for non-exited deals and different ways of reporting results adds complexity to the issue, and explains the wide variability in academic research on this issue to date.

APPENDIX 16. Correlation Matrix of Key Variables in Study

VARIABLES	PE firm	Industry	Logsize	Leverage	PE Equity	MgmtEqty	MinorCon	DebtCove	EntMulti	ClubDeal	Add-ons	Divest	Holding	ExitType	AnnRevGr
pefirm	1														
industry	-0.1314*	1													
logsize	0.4366*	-0.0418	1												
leverage	0.2216*	-0.3247*	0.1719*	1											
peequity	-0.0278	-0.3063*	-0.3126*	0.3355*	1										
mgmteqty	-0.0917	-0.0715	-0.0181	-0.1248*	-0.2387*	1									
minorcon	0.0545	-0.3092*	-0.2379*	0.3000*	0.8755*	-0.1337*	1								
debtcove	0.0063	-0.0888	0.0394	0.1919**	-0.0097	0.0053	-0.0035	1							
entmulti	-0.0887	0.2039**	0.0602	-0.3661*	-0.3621*	0.1408***	-0.3182*	0.0934	1						
emploent	0.2860**	-0.0861	0.5733*	0.2220*	0.1971	-0.1116	0.1436	-0.0134	-0.1986						
clubdeal	-0.0053	0.2631*	0.2434*	-0.2484*	-0.7710*	-0.1853*	-0.7279*	0.0028	0.2310*	1					
addons	0.2279*	-0.0634	0.1897*	0.0013	-0.0213	0.0357	0.0025	-0.0226	0.0227	-0.0029	1				
divest	0.0738	-0.0258	0.1135	0.086	0.0994	-0.0755	0.0319	0.0057	-0.058	-0.0763	-0.0045	1			
holding	0.0087	-0.0547	-0.1086*	0.0315	-0.0224	-0.0186	-0.0603	0.0474	-0.0215	0.0967	0.1186***	0.0524	1		
exittype	-0.0309	-0.0527	0.0197	0.0469	0.0155	-0.0554	-0.029	-0.0009	0.05	-0.0061	-0.0846	0.002	0.0167	1	
bankrupt	-0.0178	0.008	-0.0174	-0.0761	-0.0957	0.0157	-0.0879	-0.0016	0.0885	0.0424	-0.0759	-0.0183	-0.0569	0.7351*	
revsexit	0.2718*	0.0117	0.6658*	0.1259**	-0.2039*	0.0726	-0.1871*	0.0135	0.0331	0.1488**	0.2227*	0.2184*	0.0375	-0.1904*	
annrevgr	-0.0526	0.2112*	-0.0948	-0.3480*	-0.1051*	0.1022	-0.0591	(0.1111)***	0.1983*	0.0905	0.2643*	-0.1459*	-0.0285	-0.3558*	1
revenuup	0.0103	0.076	-0.0469	-0.0334	-0.019	0.0647	-0.0127	-0.0066	0.04	0.0362	0.2350*	-0.3166*	0.1912*	-0.4320*	0.4573*
ebitexit	0.2455*	0.0399	0.6505*	0.0964	-0.2293*	0.0504	-0.1822*	0.0136	0.0737	0.1536**	0.1900*	0.0382	-0.045	-0.2247*	0.0477
annebtgr	-0.056	0.0868	-0.0533	-0.1234	0.0554	-0.0187	0.0422	-0.0305	0.2999*	-0.0519	0.0499	-0.0254	-0.0672	-0.0406	0.0266
ebitdaup	0.0358	0.0805	0.0308	-0.0347	-0.1007	0.1399***	-0.096	-0.0045	-0.0006	0.0295	0.2251*	-0.1152	0.0855	-0.5474*	0.3763*
ebmargex	0.0534	-0.0041	0.0359	0.0149	-0.029	0.1610***	-0.0696	-0.0006	0.012	-0.0476	0.0822	-0.0162	-0.0466	-0.0164	-0.0479
ebtmargr	-0.0722	0.0287	-0.0873	-0.1894*	-0.0674	0.0692	-0.0371	-0.024	0.2340*	0.0223	-0.0314	-0.0326	-0.0931	-0.0923	0.0857
ebtmarup	0.007	-0.0105	0.0698	-0.0401	-0.0407	0.1120***	-0.0502	-0.0016	0.1053	-0.0609	0.0272	0.0828	-0.2229*	-0.2154*	0.1415***
emploext	0.2757**	0.0391	0.4487*	0.0263	0.0404	-0.0367	0.0813	-0.0191	-0.1811	0.0423	0.3057***	-0.1046	-0.1666	-0.3513*	0.0557
annempgr	-0.0653	0.1208	-0.0327	(.2919)**	-0.4099*	0.2096	-0.3176*	-0.174	-0.1518	0.3460*	-0.0007	(0.2640)***	-0.0486	-0.6049*	0.5629*
employup	-0.0497	0.1084***	-0.0417	(0.1082)***	0.0016	0.0858	-0.0195	-0.0046	0.0192	-0.0186	0.2673*	-0.2524*	0.1041	-0.5273*	0.4165*
capexext	0.2977*	0.0168	0.6181*	0.1262	-0.3819*	-0.0911	-0.3095*	-0.0141	0.0663	0.3278*	0.089	0.2259***	0.1531***	(0.2330)**	-0.0624
capexgr	0.0116	0.0022	-0.0033	0.0919	-0.0105	-0.0201	-0.0842	-0.0424	(0.2063)**	0.0941	0.1977***	-0.102	-0.1342	-0.1216	0.2664**
capexup	0.0909	0.0497	0.0046	-0.0778	-0.0013	0.044	0.0033	-0.1106	-0.0019	-0.0163	0.3179*	-0.1325	0.1226***	-0.3931*	0.3365**
exitvalu	0.1957*	0.0902	0.5711*	0.015	-0.2629*	-0.0192	-0.1976*	0.0179	0.1209***	0.1807**	0.1694*	0.0303	-0.0595	(0.2252)**	0.0354
roairr	-0.0042	0.0117	-0.0901	-0.0855	0.1203*	0.0204	0.1031***	-0.0309	-0.0465	(0.1078)***	0.2061*	0.0569	-0.1644*	-0.6118*	0.4423*
reteqirr	0.0165	-0.0437	-0.0442	0.0988***	0.1509**	-0.0167	0.1199***	-0.019	-0.0804	(0.1427)**	0.1294*	0.1355***	-0.2907*	-0.4704*	0.2381**
exitmult	0.0716	0.1924*	0.1783*	-0.2218*	-0.2230*	-0.0194	(0.1432)***	-0.0167	0.2935*	0.1732*	0.0274	0.0148	-0.0289	-0.4182*	0.2605**
exitentr	-0.0211	-0.0302	-0.084	0.0947	0.1761**	-0.0833	0.1782*	-0.0239	-0.3360*	(0.1350)**	0.0234	0.1001	0.009	-0.3613*	0.1590**
multipup	-0.0366	-0.0391	-0.1057*	0.1342*	0.2610*	-0.0626	0.2762*	-0.0176	-0.3579*	-0.1713*	-0.0036	0.1018	-0.0075	-0.3844*	0.1191***

VARIABLES	RevenUp	EbitExit	AnnEBTgr	EBITDup	EbMargEx	EbtMarGr	EbtMarUp	EmploExt	AnnEmpGr	EmployUp	CapExExt	CapExGr	CapExUp	ExitValu	RoaIRR	RetEqIRR
revenuup	1															
ebitexit	0.0474	1														
annebtgr	0.0353	-0.0311	1													
ebitdaup	0.5842*	0.2460**	0.0459	1												
ebmargex	-0.0327	0.1254***	-0.0093	0.2399*	1											
ebtmargr	0.042	-0.0378	0.6046*	0.0561	-0.0124	1										
ebtmarup	0.1726***	0.1879***	0.0803	0.4848*	0.2052***	0.1029	1									
emploext	0.1819	0.5796*	0.1714	0.4272*	0.2022	0.1889	0.3301**	1								
annempgr	0.1657	0.0768	-0.0665	0.4612*	0.0878	0.1668	0.3505***	0.4177*	1							
employup	0.6998*	0.2334**	-0.0963	0.7399*	0.0424	-0.0282	0.2401***	0.2972**	0.5666*	1						
capexext	-0.0486	0.6676*	-0.0478	0.1451	0.093	-0.0365	-0.0453	0.4264*	0.1941	0.0923	1					
capexgr	0.2108**	-0.0102	-0.0239	0.2530**	0.2734***	-0.0674	0.1547***	0.1826	0.3595*	0.3119*	0.0437	1				
capexup	0.4997*	0.1392**	-0.0868	0.5282*	0.0265	(0.1232)***	0.2206*	0.2721***	0.3215*	0.6802*	0.2052**	0.5793*	1			
exitvalu	-0.0007	0.9124*	-0.0207	0.1555***	0.0511	-0.0186	0.1283***	0.5651*	0.1059	0.1482***	0.5947*	-0.0599	0.0701	1		
roairr	0.3825*	0.1173***	0.0684	0.5574*	0.1158***	0.2933**	0.3804*	0.3639**	0.6314*	0.5040*	0.01	0.3188*	0.3972*	0.1174***	1	
reteqirr	0.2366*	0.1467**	0.0269	0.4352*	0.0545	0.0835	0.3565*	0.3509***	0.5829*	0.3672*	0.116	0.4771*	0.2775*	0.1351***	0.8213*	1
exitmult	0.2526*	0.1982**	0.1360**	0.2362***	-0.0322	0.2274**	0.1256***	0.3746*	0.5026*	0.2437**	0.1327	0.0048	0.1519***	0.3484**	0.4590*	0.2686*
exitentr	0.1605***	0.0125	0.0446	0.11	-0.057	0.0089	-0.0492	0.2082	0.2121	0.1926***	0.0077	0.1226	0.1722***	0.0942	0.4918*	0.3592*
multipup	0.1782**	-0.067	0.0496	0.2194*	0.0266	0.0658	0.0058	0.2962**	0.3554**	0.3147*	(0.1598)***	0.0551	0.2046**	-0.0109	0.4352*	0.3623*

Statistical Significance:*=1%, **=5%, *=10%. Variables: PE Firm: Index from 1-13 of firms by capital under management. Industry: Coded 1 to 5, low human capital value added to high and low *beta* to higher *beta,* roughly. Logize: Natural log of transaction value at entry. Leverage: Debt to capital. PE Equity, MGMT Equity are amounts at deal entry, latter case assumes full vesting. MinorCon = 0 if Minority stake, 1 if Control. Debt Cove (i.e., Debt Pay-down) = Total debt/EBITDA. EntMulti = Entry Multiple of EBITDA. Club deal = 0 if stand-alone deal, 1 if a syndicate of PE firms. Add-ons = 0 if organic growth, =1 if ancillary acquisitions to consolidate industry. Divest = 0 if no divestitures, 1 if there are. Holding = holding time of deal. Exit type = 1 if IPO, 2 if trade sale, 3 if sold to another PE firm, 4 if recapitalization, 5 if bankrupt. AnnRevGr = Annual revenue growth. Bankrupt = 0 if none, 1 if bankrupt. RevsExit = revenues at exit. RevenuUp = 0 if no revenue growth, 1 if revenues grew during deal. Ebit Exit = EBITDA at exit. AnnEBTGr = Annual EBITDA growth. EBITDAUp = 0 if no EBITDA growth, 1 if EBITDA grew. EBmargEx = EBITDA/Revenues at exit. EBmarGr= Growth in EBITDA/Revenues. EBTmarUp = 0 if no growth in EBITDA/Revenues, =1 if there was. EmploExt = # Employees at exit. CapExExt = CapEx at exit. CapExGr = Growth in CapEx. Exit Value = firm value at exit. RetEqIRR = return on equity. RoAIRR = IRR of assets. ExitMult = EBITDA multiple at exit. ExitEntr = Exit multiple/entry multiple. MultipUp = 0 if no growth in EBITDA multiple, 1 if there was. CapExUp = 0 if CapEx flat or down, 1 if it grew.**

APPENDIX 17. Fisher's ANOVA analysis of PE firm strategy & performance

(a) ANOVA of Return on Equity in Solo Deals

```
Number of obs =     107     R-squared     =  0.0753
Root MSE      =  .456392    Adj R-squared =  0.0811
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  17.6953871  11 1.60867155  1.74  0.0706
       |
pefirm | 17.6953871  11 1.60867155  1.74  0.0706

Residual |  134.215053  145  .925621054
-----------+----------------------------------------------------
   Total |  151.91044   156  .973784871
```

(b) ANOVA of Return on Equity in Controlling Stakes Deals

```
Number of obs = 181     R-squared     =  0.1031
Root MSE      =  .932477    Adj R-squared =  0.0448
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  16.9009493  11  1.53644993  1.77  0.0633
       |
pefirm | 16.9009493  11  1.53644993  1.77  0.0633
       |
Residual |  146.947876  169  .869514057
-----------+----------------------------------------------------
   Total |  163.848825  180   .910271249
```

(c) ANOVA of EBITDA Multiple Uplift for PE firms

```
Number of obs =     257     R-squared     =  0.1205
Root MSE      =  .45451     Adj R-squared =  0.0811
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  6.93674054    11  .630612776  3.05    0.0008
       |
pefirm |  6.93674054    11  .630612776 3.05    0.0008
       |
Residual |  50.6118976   245  .206579174
-----------+----------------------------------------------------
   Total |  57.5486381   256  .224799368
```

(d) ANOVA of EBITDA Margin Growth for PE firms

```
Number of obs =     254     R-squared     =  0.0877
Root MSE      =  75.3999    Adj R-squared =  0.0423
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  13.3598504  12  11.1332087 1.93  0.0316
       |
pefirm | 13.3598504  12  11.1332087 1.93  0.0316

Residual  1389.81514  241  .576686779
-----------+----------------------------------------------------
   Total |  1523413.64   253  .60213978
```

(e) ANOVA of Profit Growth for Minority Stakes Deals

```
Number of obs =  98      R-squared     =  0.1615
Root MSE      =  .385784    Adj R-squared =  0.0651
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  616.333932   10  61.6333932 1.68  0.0993
       |
pefirm | 616.333932   10  61.6333932 1.68  0.0993
|
Residual |  3199.41222  87  36.7748531
-----------+----------------------------------------------------
   Total |  3815.74615  97   39.33758922
```

(f) ANOVA of Profit Growth for Controlling Stakes Deals

```
Number of obs = 157     R-squared     =  0.1239
Root MSE      =  71.3362    Adj R-squared =  0.0638
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  105031.966    10    10503.1966  2.06  0.0310
       |
pefirm | 105031.966    10    10503.1966  2.06  0.0310

Residual | 742973.266  146   5088.85798
-----------+----------------------------------------------------
   Total |  848005.232  156  5435.93097
```

(g) ANOVA of Profit Growth for Solo Deals

```
Number of obs =     138     R-squared     =  0.1416
Root MSE      =75.6701      Adj R-squared =  0.0740
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  119987.334   10  11998.7334  2.10  0.0293
       |
pefirm | 119987.334   10  11998.7334  2.10  0.0293
       |
Residual |  727197.949   127  5725.9681
-----------+----------------------------------------------------
   Total |  847185.283   137  6183.83418
```

(h) ANOVA of Profit Growth for Club Deals

```
Number of obs =     116     R-squared     =  0.1605
Root MSE      =  5.54122    Adj R-squared =  0.0805
Source |  Partial SS    df       MS          F     Prob > F
-----------+----------------------------------------------------
Model |  616.249164   10  61.6249164  2.01 0.0396
       |
pefirm |  616.249164   10  61.6249164  2.01 0.0396

       |
Residual |  3224.03262  105   30.7050726
-----------+----------------------------------------------------
   Total |  3840.28178  115  33.3937546
```