BRG REVIEW

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Letter from the Editor — C. Paul Wazzan, Ph.D.

Letter from the Chairman — David J. Teece, Ph.D.

ARTICLES

The Value of Control: Control Premiums, Minority Interest Discounts, and the Fair Market Value Standard
by Kevin Kreitzman

Case Study: Impact of Health Reform on a Pharmaceutical Company
by Aaron Vandervelde, MBA

BRG BERKELEY RESEARCH GROUP

BRG REVIEW

Volume 1 Issue 1

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BRG REVIEW

Table of Contents

1. **C. Paul Wazzan, Ph.D., Editor BRG Review**

   Welcome to the Inaugural Issue of the BRG Review

2. **David Teece, Ph.D., Chairman BRG, LLC**

   Introduction to BRG

3. **Kreitzman, Kevin, Director**

   The Value of Control: Control Premiums,
   Minority Interest Discounts, and the
   Fair Market Value Standard

4. **Vandervelde, Aaron, Senior Managing Consultant**

   Case Study: Impact of Health Reform
   on a Pharmaceutical Company

From the Desk of the Editor

Welcome to the first issue of Berkeley Research Group Review ("the Review"), the official publication of the Berkeley Research Group, LLC ("BRG"). BRG was founded in 2010 by a group of distinguished academics and private sector professionals in the fields of economics, finance, health care, and data analytics. BRG engages primarily, but not exclusively, in litigation consulting – providing innovative solutions and analyses to the complex problems being addressed in the Courts today.

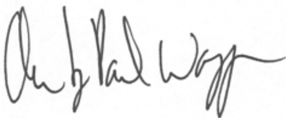
As I write this introduction the business headlines in the *Wall Street Journal* are dominated by bank failures, surging commodities prices, the effects of the BP deepwater horizon spill and ongoing remediation efforts, executive compensation controversies, intellectual property disputes, and a number of proposed mergers and acquisitions. What these headlines all have in common is that BRG professionals are already engaged on behalf of our clients in each of the matters listed above or similar ones.

The Review is a natural extension of the thought leadership and intellectual capital our staff brings to our engagements specifically and our profession generally and was established to showcase high quality, independent research on topics of interest to economists, legal scholars, and the general public. The Review will be published twice a year and circulated to public and private sector organizations as well as academia and government. While the journal will primarily be distributed in electronic form, a limited number of printed copies will be available through subscription. The Review will be in the public domain and it is our hope that it will contribute to the development of both the established literature in our chosen fields and to the understanding of how litigation experts are an important and integral part of the justice system.

Each issue of the Review will typically contain a letter from the Editor on a current topic of interest at the intersection of law and economics/finance/accounting, a practical case study on a recently completed project conducted by BRG senior staff, and one refereed paper containing original research. Future issues may focus on a particular topic, such as the litigation flowing from the banking crisis, while others may feature collections of papers written by legal scholars.

We hope to use the Review to provide our audience with a "good read" and to improve our connections with clients, recruits, peers, and colleagues. We expect that the Review will stimulate discussion and debate around key issues we face today. With this in mind, we welcome any comments or feedback you have about the subjects we raise in the Review.

Kindest regards,



C. Paul Wazzan, Ph.D.
Editor

From the Desk of the Chairman

Inventing New Incentive and Organizational Models for Highly Talented Individuals

It is a pleasure to chair a growing enterprise, with a deep bench of highly talented individuals eager to work together on complex unstructured problems identified by our clients. Analyzing such issues requires special talent. This work is non routine by its nature.

The quality of the work produced at the Berkeley Research Group, LLC ("BRG") ultimately depends on our ability to attract and retain top talent at the expert, staff, and administrative levels. I am happy to take on this challenge and view it as an organizational and incentive design "problem."

At BRG, we believe we have made some organizational design innovations. Indeed, modern management will be defined around the capacity of the business enterprise to allow highly talented individuals to enjoy the professional autonomy they seek and our work demands, while simultaneously obtaining the collegiality and staff support that our projects require. In many ways, we are like other companies such as Google, Apple, and United Artists who are challenged to properly "manage" high-end talent. Top talent generally does not need to be told what to do, at least not by a manager that is not at least somewhat familiar with the business and the people they "manage." In a different context, Professor Richard Nelson noted this half a century ago in his analysis of the invention of the transistor at Bell Labs:

> "…the type of interaction we have noted…requires that individuals be free to help each other as they see fit. If all allocation decisions were made by a centrally situated executive, the changing allocation

> of research effort called for as perceived alternatives and knowledge change would place an impossible information processing and decision making burden on top management. Clearly the research scientists must be given a great deal of freedom…"[1]

This is not merely esoteric academic theory; more recently, *The Economist* noted:

> "…three of the most popular management fads of the moment: empowerment, engagement and creativity. Many companies pride themselves on devolving power to front-line workers..."[2]

Within the field of professional services, BRG strives to create a work environment and organizational platform to empower and engage "star" talent (and their support staff) across economics, finance, financial and forensic accounting, engineering, data analytics, and related disciplines. We deploy these disciplinary strengths in a wide range of areas including antitrust, health care, energy, banking, electronics, communication, and the Internet. Moreover, our system is scalable since our decentralized structure does not require decisions on matters of professional substance to be cleared through top management. In essence, BRG has taken the Silicon Valley management model – shallow hierarchies, flexibility, agility, empowerment of talent – and applied it to professional services.[3] The

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[1] Nelson, R. (1962). "The Link between Science and Invention: The Case of the Transistor," in National Bureau of Economic Research, The Rate and Direction of Inventive Activity (Princeton: Princeton University Press).

[2] "Down with fun; The depressing vogue for having fun at work," *The Economist,* September 16th, 2010.

[3] Teece, D. (Forthcoming). Chapter 21: Human Capital, Capabilities, and the Firm: Literati, Numerati, and Entrepreneurs in The Twenty-First-Century Enterprise. Oxford Handbook on Human Resources (Oxford University Press, 2011).

firm's management "leads from the front" and is in touch with both clients and the experts. As a consequence, the firm's management and its experts are tightly integrated and have a shared vision.

The management challenge with any decentralized system is to provide both autonomy and integration at the same time. BRG has designed a high accountability management and compensation structure to achieve this. Professionals are held accountable by high standards, an objective compensation model, and by standard financial controls. Management is, in turn, held accountable to these professionals and to the Board of Directors.

Demand for our services is vigorous, driven primarily by financial dislocation, health care industry issues, environmental and energy issues, and large intellectual property disputes associated with a vigorous global electronics industry. Traditional areas like antitrust appear to be primed for renewed growth, energized by recent regulatory efforts; and health care, one of our largest practice areas, is being stimulated by a plethora of policy and regulatory issues given new impetus by recent legislation. As a result, BRG has exhibited remarkable growth in headcount, clients, and projects.

It is critical to note that the benefits of the BRG system ultimately accrue to society. We believe our success is directly related to the decentralized professionally led model we use. In short, talent is free to work together to find projects for which they have a competitive advantage – rather than being cabined into firm-wide initiatives and sales strategies deemed to be important by disengaged executives. The ultimate result is that clients receive/achieve a better match of skills to the problems they face. The fact that we are working as a young company on many large cases simultaneously engaging experts from many different fields is testimony to the recognition that our firm and our experts have already received in the market.

The BRG Review, of which this is the inaugural issue, is a testimony to the

intellectual prowess of our experts and the thought leadership that BRG collectively brings to issues and problems. We hope you find the material we present in this issue and subsequent issues of interest and significant value.

Kindest regards,

David J. Teece, Ph.D.

Kevin Kreitzman

Kevin Kreitzman is a director at Berkeley Research Group. He has over 25 years of financial-economic consulting experience in both litigation and non-litigation environments. He has testified in both federal and state court and before the Department of Justice. He has conducted damages studies for litigation matters including, fraud, mergers and acquisitions, 10(b) 5 class actions, mutual funds, distributor termination, environmental, insurance coverage, solvency, fraudulent conveyance, breach of contract, patent infringement, trade secrets, professional malpractice, sales practices, breach of fiduciary responsibility, tax liabilities, Employee Stock Ownership Plans (ESOPs), antitrust, and intellectual property.

Mr. Kreitzman has management experience in investment banking, investment management and insurance. He has conducted valuations of businesses, intellectual property, securities, and options and has structured transactions using financial engineering tools. Mr. Kreitzman's financial services background combined with various operational experiences, including that of a Chief Financial Officer, provides him with a broad base of practical knowledge that provides him the opportunity to add unique and creative insight to each engagement.

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* * *

The Value of Control: Control Premiums, Minority Interest Discounts, and the Fair Market Value Standard

— Kevin Kreitzman —

Abstract:

Control premiums applied in non-negotiated transactions of private securities represent the value that can be extracted from minority interests by controlling shareholders. The common practice of using observed acquisition premiums to justify excessive control premiums (or minority interest discounts) is misguided and not supported by the empirical evidence. This practice causes significant damage to the welfare of the general public and the millions of employees who rely on the integrity of these valuations. Small control premiums do persist despite laws to protect minority shareholders, even though such premiums should be eliminated if directors comply with their fiduciary responsibilities.

The value of control, as reflected in control premiums or minority interest discounts that are applied in business valuations, is an important matter since the integrity of business valuations is a requirement for the fairness of non-negotiated transactions of private securities, enforcement of the tax codes, and the viability of retirement plans for millions of employees. The common practice of using acquisition premium studies to justify control premiums of 25 to 40 percent or more is not supportable and causes significant damage to those relying on the integrity of these valuations as well as to the welfare of the general public. The term "control premium" is commonly used to refer to two distinct and unrelated measures: (1) the difference between the value of a controlling interest and a minority interest (sometimes also called a minority interest discount) and (2) an acquisition premium paid in a change of control transaction that is unrelated to the

relative value of controlling and minority shares.[1] Although acquisition premiums are not found in situations that require valuations to be performed according to the fair market value standard, they are often incorrectly added to interests in privately held firms that hold a majority of voting shares.[2] Under the fair market value standard, premiums for control (or minority interest discounts) are based on an estimate of the amount of value that will be diverted to the controlling shareholders at the expense of the minority shareholders. The application of a control premium or a minority interest discount thus is an estimate of the amount of value that is expected to be appropriated from the minority shareholder by the controlling agent.[3]

I. BACKGROUND

Control is assumed to have value because, "all things being equal," having control is more desirable than having no control. In reality, however, all things are not equal. Having control can subject the controlling shareholder to responsibilities and liabilities not incurred by the minority shareholders.[4] In a U.S. corporation, control rests with the directors, including members who may be outsiders or

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[1] In this paper, the focus will be on the former sense, with "control premium" representing the additional amount of value allocated to a controlling (majority) block of stock based on the perceived ability of the controlling shareholders to benefit from their ability to direct the actions of the corporation.

[2] See Rev. Rul. 59-60, 1959-1 C.B. 237, § 1.02: "Section 20.2031-1(b) of the Estate Tax Regulations (Section 81.10 of the Estate Tax Regulations 105) and section 25.2512-1 of the Gift Tax Regulations (section 86.19 of Gift Tax Regulations 108) define fair market value, in effect, as the price at which property would change hands between a willing buyer and a willing seller, when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts. Court decisions frequently state in addition that the hypothetical buyer and seller are assumed to be able, as well as willing, to trade and to be well informed about the property and concerning the market for such property."

[3] A controlling shareholder's willingness to pay a premium for purely psychological reasons would be an exception to this rule.

[4] Control can have a negative value when the costs, such as legal liabilities or the lack of diversification associated with maintaining a controlling block, outweigh obtainable private benefits.

shareholders with a controlling interest. All board members have a fiduciary responsibility to work for the benefit of all shareholders and it is a violation of this fiduciary responsibility to favor one group of shareholders over another. Such violations are often illegal and can result in litigation by the minority shareholders. It is never acceptable for controlling shareholders to enrich themselves at the expense of the minority shareholders. Still, differences in the allocation of the enterprise value between controlling and minority interests are nevertheless justified by the assumption that the controlling shareholders can benefit at the expense of the minority shareholders. In this context, control premiums are based on the ability and willingness of the controlling shareholders to extract more value than they are otherwise entitled to from their *pro rata* claim on the company's cash flows. The amount of the control premium represents the value that can be diverted from the minority interest to the controlling interest through such things as fraud that can be hidden by those who control the records, excess compensation to controlling shareholders, nepotism, or other agency costs.[5] The value of control is limited by laws protecting minority shareholders, the degree of enforcement, remedies available through civil litigation, and cultural factors that determine the willingness of a controlling shareholder to engage in value transferring behavior. Control premiums (or minority interest discounts) based on the assumed ability of the controlling shareholders to benefit at the expense of the minority shareholders are zero if the directors are assumed to comply with their fiduciary responsibilities.

When estimating the value of a controlling interest in valuation of common stock

[5] There are some practical limits to the size of the control premium when considered in relation to the size of the controlling block. A 100 percent interest cannot have a control premium, since there are no minority shareholders and no value to extract from them. A 90 percent interest with an 11 percent control premium or a 25 percent control premium on an 80 percent control block would leave no value whatsoever for the minority shares; an interest in the company cannot have a value that exceeds the underlying company value. Conversely, interests can be saddled with unfavorable characteristics, such as restrictions on transfers, which cause the sum of the value of the interests to be less than the value of the enterprise.

using the fair market value standard, control premiums based on observed acquisition premiums are often added to values derived from comparisons to marketable minority interests. Similarly, minority interest discounts are applied when the value of a minority interest is derived from comparisons to observed prices of controlling interests.[6] These premiums and discounts are applied to reflect the difference between a *pro rata* share of a company when it is a part of a controlling interest and when it is a part of a minority interest. Excessive control premiums or minority interest discounts are often used as justification for valuations of securities that result in mispriced transactions when valuations are used as the sole means of setting prices. These premiums and discounts are misapplied to certain transactions involving closely held securities in which prices are not negotiated but are instead based on valuations using the fair market value standard.[7] Control premiums and minority interest discounts are applied when shares that represent part of a controlling block are considered to be more valuable than shares of a minority interest in the same security. In effect, control premiums assume that, despite rules and laws to the contrary, controlling shareholders are able to divert value to themselves at the expense of the minority interest shareholders. Given the regulations and laws protecting the rights of minority shareholders, the private benefits that the controlling shareholders can appropriate are limited to those things that do not meet the standards of proof in court or that can be easily hidden. The amount of private benefits that controlling agents are expected to extract is also a function of the

[6] Minority interest discounts are estimated by taking the inverse of the controlling interest premium. For example, a 40 percent premium over a minority interest of $100 would be $40, for a total of $140; the "minority interest discount" from the controlling interest value would be $40/$140, or 28.6 percent.

[7] Transactions of this type include equity interests sold to Employee Stock Ownership Plans and gifts of ownership interests in closely held companies, partnerships, or limited liability companies. Estimates of damages in litigation or other disputes are also often based on estimates of value that apply control premiums or minority interest discounts using the fair market value standard.

integrity of the controlling agents.[8] If no value is placed on the psychological benefit of being in control, an analysis to support a non-zero control premium could consist of making an estimate of the degree to which the controlling agents would likely violate their fiduciary responsibility and favor one group of shareholders over another.

If value transferring behavior is considered allowable and the controlling group has malicious intentions vis-à-vis the minority interests, then the difference in value between controlling and minority interests depends on the ability of the minority shareholders to block or influence the actions of the controlling interest group. In such circumstances, value transferring behavior by the controlling shareholders would be limited by the threshold that would trigger litigation. Also, there can be circumstances in which no value transferring behavior is expected and there is no difference between controlling and minority interests of the company. One example is the case of a parent who holds a controlling interest in a company but runs the company solely for the benefit of his/her children, who are minority shareholders. Consequently, when the possibility of value transferring behavior by the controlling shareholder is assumed, the difference in value between minority and controlling interests for a particular company is based entirely on factors that are unique to the particular company and shareholders; control premiums found in one firm would not be comparable to another.

The assessed value of control is a key factor in determining the integrity of the retirement plans for the millions of employees who own shares in private

[8] The implication is that those who are more willing to abuse their status as controlling agent by taking what they can from the minority shareholders would place more value on control than would those who would not abuse their controlling agent status. All things equal, dishonest agents would be willing to bid a higher price to gain control.

companies through an Employee Stock Ownership Plan ("ESOP").[9] It also determines the fairness of buyouts and settlements in disputes involving shares of private companies, and it allows certain groups of people to avoid paying taxes that would otherwise be due.[10] Estimates of equity value are typically based on comparisons to prices observed in the secondary markets for securities.[11] Such prices reflect the value of marketable minority interests in the traded equity. Interests in equity interests of closely held companies may differ from traded securities if they represent a controlling interest rather than a minority interest.[12] It is assumed that investors value control, accordingly marketable minority interest values are adjusted with a control premium if the interest constitutes a majority of the voting shares. Similarly, "minority interest discounts" are applied when valuing minority interests using comparisons to values that have been defined as controlling interests.

In many cases, the term "control premium" is incorrectly used to refer to what is

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[9] An ESOP is a defined contribution pension plan in which a portion of an employee's compensation is used to purchase the employer's stock. With private companies that have no market determined price, the price of the purchase is set by appraisal. When a large and inappropriate control premium is added to the price, employees get shorted on the funds set aside for their retirement and in some cases end up with worthless pieces of paper, not because the company fails, but from overpayment by the employees for the employer's securities.
[10] Consider an example in which a company worth $900 million is split into three parts and is gifted equally among three children of the original owner. Each 1/3 share is considered to be a minority interest. If a typical minority interest discount of 40 percent is applied, each share is now considered to be worth only $180 million, not $300 million (ignoring issues of marketability). If no discount for lack of control were appropriate, taxes would be paid on $300 million, not $180 million. To the extent the minority interest discount is overstated, taxes otherwise due are avoided.
[11] Appraisals done for tax purposes need to comply with Revenue Ruling 59-60. Under this ruling, the fair market value standard is applied when a hypothetical sale needs to be considered because an actual sale price is not available. Since valuations using the fair market value standard are attempts to estimate the market price of a security, observed market prices are usually considered synonymous with the fair market value of a marketable minority interest.
[12] All things being equal, control is assumed to be more desirable than having no control, and marketable interests are assumed to be more desirable than non-marketable interests. Marketability is not addressed in this paper.

more accurately called an "acquisition premium," the premium paid in change of control transactions when the new controlling shareholders expect to increase the value of the entire firm by making changes to the operations or financing of the acquired company.[13] Even though change of control transactions are unrelated to the ability of the controlling shareholders to benefit at the expense of the minority shareholders, the large observed acquisition premiums in change of control transactions are mistakenly applied in valuations to represent the value of control.

II. OBSERVED CONTROL PREMIUMS

There is a substantial and long-standing body of theoretical and empirical work in the area of private benefits to control. Berle and Means discussed this issue in 1932, for example, and Jensen and Meckling described agency costs in their well known 1976 paper.[14] Since private benefits extracted by controlling shareholders are by their nature difficult to measure directly, empirical studies of the market value of control generally apply one of two indirect methodologies. The first, developed by Barclay and Holderness,[15] evaluates the negotiated transfers of controlling blocks of public company stock.[16] The second compares dual and

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[13] The acquisition premium would also include the expectation of extracting private benefits from the minority shareholders and any egocentric value derived by the acquirer.

[14] *See* Berle, A., Means G, *The Modern Corporation and Private Property,* Macmillan New York.; Jensen, M., Meckling W.,1976 Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3, 305 – 350.

[15] See Barclay, Michael, and Holderness, Clifford, 1989, Private Benefits of Control of Public Corporations, *Journal of Financial Economics* 25, 371 – 395.

[16] In this methodology, the acquisition premium is segmented into two parts. The difference between the negotiated price per share of the control block and the post-announcement prices of minority shares represents the control premium. The difference between the pre-announcement price of the publicly traded minority shares and the negotiated sale price of the privately held control block represents the acquisition premium that reflects the expected value of changes to be made by the new management. The difference between the negotiated price of the control block and the post-announcement price of the publicly traded securities represents the difference in price between the controlling interest and the minority interest. If the pre-announcement price per share was $10 and the negotiated price of the control block was $15, the acquisition premium would be $5. If the post-announcement price of the minority shares goes up to $14, then the difference between the controlling interest and the minority interest would be $1, not $5.

multiple class shares with differing voting rights to value the control block votes (or evaluate the premiums paid in dual stock unification transactions).[17]

A recent study by Dyck and Zingales observed 393 controlling block sales across 39 countries using the privately negotiated transfer of controlling blocks methodology and found an average control premium of only one percent in the U.S.[18] The studies also found, as perhaps would be expected, that countries with low control premiums had developed capital markets, common law legal systems, and a high rate of tax compliance.[19] These findings are consistent with the presence of well developed laws protecting minority shareholders and robust enforcement.[20]

Similarly, in a 2003 study by Tatiana Nevona of 661 dual class firms in 18 countries, control premiums averaged 2 percent in the U.S.[21] Common law countries were found to have control block premiums averaging 4.5 percent while French legal origin countries had control block premiums averaging 24.5 percent. Control premiums thus vary greatly across countries. From the Nevona and Dyck

[17] Shareholders competing for control are assumed to be willing to pay minority shareholders with voting shares a positive price up to their expected value of control. The value of control is estimated by making assumptions about the probability of a control contest. Alternatively, in stock unification transactions, premiums are paid to holders of voting shares for relinquishing the private benefits of control.
[18] See Dyck, Alexander and Zingales, Luigi, April 2004, Private Benefits of Control: An International Comparison, *The Journal of Finance* Vol. LIX No.2, 537 – 600.
[19] Countries with well developed capital markets tend to have better defined minority shareholder rights, common law legal systems tend to have a lower standard of proof threshold for civil litigation. Also, a higher level of tax compliance is associated with increased monitoring of transactions by taxing authorities.
[20] See Dyck, Alexander and Zingales, Luigi, April 2004, Private Benefits of Control: An International Comparison, *The Journal of Finance* Vol. LIX No.2, Table III. For example, control premiums were 9.5 percent in Germany and 65 percent in Brazil.
[21] See Nevova, Tatiana, 2003. The Value of Corporate Voting Rights and Control: A Cross Country Analysis, *Journal of Financial Economics* 68, 325 – 351. The value of the control block in this study was considered to be a lower bound.

and Zingales studies it seems clear that the control premiums of 25 to 40 percent or higher that are typically applied by U.S. valuation firms are only suitable for countries lacking regulatory protection of minority shareholders and thus are inappropriate for the U.S. market. The ability of controlling shareholders to extract value from minority interests in the U.S. is limited by a regulatory environment that sharply curtails their ability to take opportunistic actions that may be possible under different legal regimes. Even cross-listing on U.S. exchanges by non-U.S. firms can provide some level of protection to minority shareholders. Foreign firms that cross-list on U.S. exchanges have premiums that are approximately 43 percent lower than foreign firms that do not cross-list in this manner.[22] Foreign firms that choose not to cross-list their shares on the U.S. exchanges have a higher level of private benefits than those that do not.[23] Further, minority shareholders in the U.S. have greater access to remedies through civil litigation.

III. CHANGE OF CONTROL TRANSACTIONS

The acquisition premiums paid in change of control transactions reflect expectations regarding an increase in the enterprise value of the firm through synergies or changes. The value of a change of control is a measure of the value of specific expected operational changes; however, such a measure is not comparable from firm to firm and is certainly not relevant to circumstances in which no change of control is contemplated. The value of control, as it is used in the context of change of control transactions, derives from the ability of the new management to make changes in the company.[24] The consequences of changes affected by new management can be positive, neutral, or negative (from the viewpoint of

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[22] See Doige, Craig, 2004. U.S. Cross-listings and the Private Benefits of Control: Evidence from Dual-class Firms, *Journal of Financial Economics* 72, 519-553.

[23] See Doige, Karolyi, Lins, Miller & Stultz, 2009. Private Benefits of Control, Ownership and the Cross-listing Decision: Evidence from Dual-class Firms, *Journal of Finance LXIV* No.1 425-466.

[24] New management can also be installed without changing the ownership of the voting shares.

valuation), but there can only be an increase over the status quo value of the firm when changes with positive effects are made. Still, benefits from increasing the enterprise value accrue to both the controlling and minority interest shares. No differential between controlling and minority interests is observed or implied.

A common example of a change in control is the passing of control from one generation to the next in a family owned business. In such circumstances, the enterprise value of the company can:

- Increase if the new generation brings about positive changes;
- Remain unchanged (i.e., there is no net effect on valuation) if control is passed seamlessly and there is no discernable difference in the direction and policies of the company; or
- Decrease if the next generation lacks the business acumen of the previous one, as is too often the case.

The change of control value that is associated with acquisitions typically reflects the expectation that the particular changes contemplated by the acquiring shareholders will increase the enterprise value of the firm. Since potential acquirers will only be willing to pay an acquisition premium in cases in which they expect to be able to increase the enterprise value of the firm, acquisition premiums observed in change of control transactions are the result of unique circumstances and do not measure an intrinsic value of control that can be generalized and applied to other firms. Further, it is a potential change in the value of the enterprise, not the difference in the relative value of controlling versus minority interests, that is modeled or observed in change of control transactions.

IV. ACQUISITION PREMIUMS ARE NOT CONTROL PREMIUMS

Typically, when someone wishes to buy something that is not offered for sale by

the targeted seller at the current prevailing price, a premium over the prevailing price is required for the transaction to happen. Efforts to buy securities that are not offered at the current market price require a premium over the current market value to induce the seller's acceptance. Likewise, in cases in which a third party, such as a board of directors, makes the decision to accept an offer, premiums can and often do serve as a justification for the acceptance of an offer. Acquisition premiums are observed when all traded shares of a public company are acquired. These acquisition premiums are often called "control premiums" even though acquisition premiums are observed regardless of whether it is a minority or a controlling interest that is acquired.[25] Further, publicly traded stock of acquiring firms that pay acquisition premiums will often lose value after such an acquisition, an indication that the market does not equate these acquisition premiums with an increase in value.

Other observations in the capital markets also contradict the idea that acquisition premiums represent an intrinsic value of control. The mere existence of widely held companies in which no single group holds a controlling interest is not consistent with the concept of an intrinsic value of control. If having "control" always added value, it would not be rational for companies to exist in a form characterized by "no control." Also, spin-off transactions, in which control by the parent company is relinquished at the marketable minority interest value, would be an irrational destruction of value if "control" were always more valuable

[25] Curiously, valuation professionals will sometimes claim that a widely held company, with no single majority shareholder, has "no control" and that the acquisition premium paid by an acquiring company is a premium for "control." Under this logic, the acquisition premium represents an intrinsic value of control that can be applied to other circumstances. In fact, the board of directors has control and a fiduciary responsibility to all shareholders in both cases. In addition, companies repurchasing tracking stock (i.e., minority interests in controlled subsidiaries) also pay acquisition premiums even when they already have a controlling interest prior to the acquisition of the traded stock and the tracking stock represents a minority interest.

than “no control.”[26] In other words, observed acquisition premiums cannot be generalized as an indication of the value of control, and observations of market transactions that include acquisition premiums do not indicate some “intrinsic value” of control that can be applied to other situations as “control premiums.”

V. ACQUISITION PREMIUM STUDIES

Empirical studies have measured the acquisition premiums associated with the acquisition of controlling interests by comparing the pre-announcement price of the target company to the consideration ultimately received by the target in the transaction at some later time. However, it is important to note that the observed value of the consideration may not be an indication of the value expected by the buyers at the time of the offer, especially when the consideration is paid with buyer securities, the prices of which are likely to change between the time the exchange ratio is set and the completion of the transaction. Also, observed consideration provides the negotiated price, which presumably falls somewhere between the perceived value of the changes to the potential buyer and the status quo value of the target company. The observed transaction price is also a function of the relative bargaining positions of the buyer and the target company and may not fully reflect the buyer’s expectations of the value from the acquisition. When studies observe cases in which the premium becomes negative during the time it takes to close the transaction, these cases are often removed from consideration. Studies making such omissions are not only unreliable but also biased to inflate the measure of observed acquisition premiums. Although control premiums are often applied based on comparisons to acquisition premiums paid for controlling

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[26] In a typical spin-off transaction, the controlling interest of a subsidiary held by a parent company is sold to many minority interest holders, such that no one shareholder owns a controlling interest in the company. If there were always a premium for control, such transactions would decrease value and be illogical. Further, it could also be argued that spin-off transactions are an indication of a “control discount.”

interests, such studies, at best, only reflect the expectations of particular buyers regarding the enterprise value likely to result from specific changes they intend to make, not the difference in value between the controlling and minority interests of the enterprise.

VI. CONCLUSION

The change in the value of an enterprise that is expected with a change of control is typically evaluated by modeling the specific changes that are contemplated by the acquiring entity. Although the fair market value standard implies a change of control transaction (since there is a hypothetical buyer and seller of the controlling interest), it is often applied incorrectly to situations in which no change of control is actually contemplated, no changes to the operations are assumed, and no change to the value of the enterprise is expected. Under the fair market value standard, attributes of the buyer and seller are not considered and thus provide no basis to assume a change in the operations of the company that can affect enterprise value.

Differences in enterprise value that result from a change of control are a function of specific synergies or actions that are expected to be implemented by the new management. Similarly, any actual differences between the controlling interests and minority interests of a particular firm are determined by factors that are unique to that firm, its management, and its shareholders. Certain appraisals are performed using the fair market value standard in which the characteristics of the buyer, seller, and controlling and minority shareholders are intentionally ignored. Differences between controlling and minority interests simply cannot be supported without making assumptions about the characteristics of the hypothetical buyers and sellers. Applications of control premiums and minority interest discounts are a source of controversy and disagreements precisely

because there is no basis for applying control premiums or minority interest discounts in the standard.[27]

If a control premium is to be applied, studies quantifying the private benefits of control in the U.S. markets can be used as an indication of the value of control. These studies could indicate practical guidelines and fall into a range of 1 to 4 percent rather than the 25 to 40 percent premiums typically applied in the valuation of privately held companies.

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[27] Since we cannot assign idiosyncratic attributes to the hypothetical buyer and seller, we cannot assume that hypothetical buyer is willing to pay a premium over his or her *pro rata* share of the cash flows because of a greater psychological benefit for control than that possessed by hypothetical seller, and we cannot assume that the hypothetical buyer will increase the enterprise value based on superior management skills compared to those of the existing management. Arguably, the possibility of extracting private benefits from the minority interests could be considered a separate issue from the actual intent of the buyer to violate his or her fiduciary responsibility and extract benefits at the expense of the minority shareholders.

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Aaron Vandervelde is a senior managing consultant with Berkeley Research Group's Health Analytics practice in Washington, DC. He has over 10 years of experience providing management and litigation consulting services to clients in the health care industry. He specializes in litigation related issues arising from contracts and transactions between health care entities as well as strategic issues related to healthcare policy. Specifically, he focuses on deriving insight through the integration and analysis of large, complex data sets including claims data, internal and external sales data and publicly available health data. Mr. Vandervelde's practice is focused primarily on clients across the healthcare continuum, including Fortune 500 pharmaceutical manufacturers and biotech companies, health insurers, hospital systems, PBMs, and others. He has assisted clients in a variety of federal investigations, contract disputes, litigation, mediation and health policy analysis.

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Case Study: Impact of Health Reform on a Pharmaceutical Company

— Aaron Vandervelde, MBA —

Abstract:

*Health reform is driving significant change in the healthcare industry and will continue to do so over the next five to ten years. Pharmaceutical companies in particular are experiencing the immediate impact of health reform and there are several key components of the legislation that the pharmaceutical industry is monitoring closely. This article describes a model of the financial impact of five components of health reform on a pharmaceutical company's product portfolio and interprets the strategic and operational implications of the model results.**

In March 2010 Congress passed the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act of 2010 (HCERA), collectively "the Acts" and commonly referred to as "health reform."[1] These Acts are substantially changing how healthcare is paid for and delivered in the United States. In particular, the legislation immediately impacted the pharmaceutical industry by expanding the Medicaid Drug Rebate Program and increasing the statutory Medicaid rebate amounts.[2] Other changes, including the imposition of a penalty on individuals without healthcare coverage, will phase in over the next few years and, as a result, the pharmaceutical industry will continue to experience significant transformation.

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* This project was conducted at the request of a company in the healthcare industry.

[1] Patient Protection and Affordable Care Act, Pub. L. No. 111-148, 124 Stat. 119 (codified as amended in scattered sections of 42 U.S.C.); Health Care and Education Reconciliation Act of 2010, Pub. L. No. 111-152, 124 Stat. 1029 (codified as amended in scattered sections of 42 U.S.C.).

[2] Pub. L. No. 111-148, § 2501.

In June 2010, we studied the impact of the Acts on the sales and profitability of a pharmaceutical product portfolio. Specifically, we estimated and quantified the impact of five key aspects of health reform:

- 50% Discount on Part D Drugs Purchased in the "Donut Hole"
- Expansion of the 340B Program
- Creation of an Annual Excise Tax on Brand Pharmaceutical Manufacturers
- Elimination of the Retiree Drug Subsidy Tax Advantage to Employers
- Expansion of Medicaid Eligibility and Creation of Health Exchanges

Using a combination of product sales forecasts and third-party data (e.g., National Health Expenditure Estimates, MedPAC surveys, and IMS Health data), our team developed a set of predictive financial models to estimate the effect of these five changes on the sales and profitability of each product in a company's portfolio through 2015. Each model was designed to be flexible enough to account for various scenarios of health reform implementation. The resulting estimates can be used to inform important strategic and operational decisions such as how to design and implement future pricing strategies, the effectiveness of potential changes in contracting and how to properly accrue for tax and rebate liabilities.

I. 50% DISCOUNT ON PART D PURCHASES IN THE "DONUT HOLE"

One objective of the Acts is to close the so-called "donut hole" – a range of out-of-pocket spend where Medicare Part D beneficiaries are responsible for 100% of the cost of their medications.[3] To achieve this objective, the Acts stipulate that pharmaceutical manufacturers provide a 50% discount on all Part D

[3] Medicare Part D is the part of the Medicare benefit that covers prescription pharmaceutical products. Medicare beneficiaries are eligible, but not required, to participate in the Part D program.

drugs purchased in the "donut hole."[4] The discount paid by a pharmaceutical manufacturer is on the point-of-sale purchase price, which is typically based on average wholesale price (AWP). Depending on the contracting and pricing strategy in place for a particular drug, the discount can represent almost the entire net sales amount, which is typically based on wholesale acquisition cost (WAC) and is net of discounts and rebates (see Figure 1). Pharmaceutical companies, and brand companies in particular, are eager to understand the total discount liability they should expect from the 50% discount mandate and the resulting effect on profitability.

Figure 1 — Example of Discount Liability Amount v. Net Sales Amount (Per Unit)

Average Wholesale Price	$10.00
(Less Discount Off AWP to Retailer)	($1.70)
Point os Sale Purchase Price	$8.30
50% Discount Liability	**$4.15**
Wholesale Acquisition Cost	$8.00
(Less Rebates & Discounts)	($3.75)
Net Sales Amount	**$4.25**

Our study estimated the utilization in the "donut hole" on a drug-by-drug basis. The point-of-sale purchase price was calculated for each product and multiplied by the utilization in the "donut hole" to estimate the total 50% discount liability. We found that:

[4] Pub. L. No. 111-148, § 3301; Pub. L. No. 111-151, § 1101.

- Due to existing contract and pricing strategies, one key product realizes a near-zero margin for all purchases in the "donut hole"
- Total discount liability decreases over time due to generic entry in several therapeutic categories
- On average, an increase in Part D utilization of 3.9% is needed to cover the expected discount liability. Increased utilization is expected due to greater compliance resulting from lower out-of-pocket expenses in the "donut hole"

II. EXPANSION OF THE 340B PROGRAM

The 340B program, a section of the Public Health Service (PHS) Act, provides certain hospitals, clinics, and other providers serving low-income and special needs communities access to significantly discounted pharmaceuticals for use in an outpatient setting.[5] The Acts expand this program to include critical access hospitals, rural referral centers and free standing cancer centers[6] – an increase of up to 1,500 newly eligible entities.[7] As these entities begin to enroll in the 340B program, pharmaceutical companies will realize a lower net price on sales to these entities. The discounts vary by product and, on average, the final sales price through the 340B program is 19% less than the Medicaid net price.[8]

The first step in modeling the impact of the expansion of the 340B program was to identify existing utilization at the newly eligible entities. We used statistics from PHS on the newly eligible entities and hospital-specific transactional data

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[5] Health Resources and Services Administration, *Introduction to 340B Drug Pricing Program http://www.hrsa.gov/opa/introduction.htm (last visited Nov. 18, 2010).*

[6] Pub. L. No. 111-148, § 7101;Pub. L. No. 111-152, § 1101.

[7] McDermott, Will & Emery, McDermott Newsletters, *Health Care Reform: Patient Protection and Affordable Care Act Expands Hospital Eligibility for 340B Program,* April 26, 2010, available at http://www.mwe.com/index.cfm/fuseaction/publications.nldetail/object_id/e03a0488-e90f-4653-847a-ebd044ce9440.cfm.

[8] NAT'L GOVERNOR'S ASSOC, FACT SHEET: THE 340B DRUG PRICING PROGRAM (March 25, 2003).

to identify current sales at these entities. Substituting 340B prices for existing prices on forecasted sales allowed us to estimate the total impact of the program expansion on net sales over the next five years. We found that:

- The overall impact of 340B expansion is mitigated by the relatively small size of the newly eligible 340B entities
- The impact is further mitigated by contracting and pricing strategies that have managed the magnitude of the 340B discount on the products most commonly used in an outpatient setting

III. PHARMACEUTICAL ANNUAL EXCISE TAX

Negotiations between the pharmaceutical industry and the White House resulted in, among other things, the creation of an Annual Excise Tax payable by brand pharmaceutical companies and this tax was incorporated into the Acts.[9] The federal government assesses individual pharmaceutical companies their share of this total tax based on a sliding scale of total brand sales to government programs (see Figure 2). In other words, the US Government receives a fixed dollar amount which is paid proportionally by the pharmaceutical companies. Brand pharmaceutical companies, therefore, must estimate and accrue the tax payments on an annual basis in anticipation of the tax assessed by the federal government.

[9] David K. Kirkpatrick, *White House Affirms Deal on Drug Cost,* N.Y. TIMES, August 5, 2009, at A1.

Figure 2 — Percentage of Brand Sales to Government Programs Taken Into Account [10]

Manufacturer's Total Brand Sales to Government Programs	% of Brand Sales to Government Programs Taken into Account
Up to 5,000,000	0%
> 5,000,000 - 125,000,000	10%
> 125,000,000 - 225,000,000	40%
> 225,000,000 - 400,000,000	75%
> 400,000,000	100%

Although the formula for calculating the Annual Excise Tax is clearly defined in the Acts, there are numerous variables that impact any single company's tax liability. Our model factored in the product sales forecasts, National Health Expenditure estimates of future government drug spend, new generic launches, and the distribution of all pharmaceutical sales across the sales tranches represented in Figure 2. The results of a series of sensitivity analyses run against the model established a number of important considerations in estimating the tax liability:

- Generic launches of several brand blockbuster drugs in the next four years will significantly alter the apportionment of the tax liability (see Figure 3)
- The distribution of sales from pharmaceutical companies with less than $400 million in government sales across the sales tranches in Figure 2 does not materially alter the apportionment of the excise tax

[10] Pub. L. No. 111-148, § 9008; Pub. L. No. 111-152, § 1404.

Figure 3 – Branded Pharmaceutical Patent Expirations By Year ($US Sales)[11]

2011	2012	2013	2014
Actos ($3.4B)	Bonviva	Pariet	Actonel
Alimta	Detrusitol		Celebrex
Femara	Diovan		Copaxone
Keppra	Evista		Cymbalta
Levaquin	Lexapro		Micardis
Lipitor ($7.5B)	Singulair ($3.7B)		Nexium ($6.3B)
Oxycontin ($2.5B)	Viagra		Risperdal
Plavix ($5.6B)	Zeldox		Symbicort
Seroquel ($4.2B)	Zometa		
Sifrol			
Xalatan			
Zyprexa			

IV. ELIMINATION OF THE RETIREE DRUG SUBSIDY TAX ADVANTAGE TO EMPLOYERS

As part of the implementation of the Medicare Modernization Act (MMA) of 2003, a subsidy, paid by the federal government to employers, was established to offset expenses incurred by employers that maintained a drug benefit plan for retirees.[12] In addition to providing the subsidy, the federal government did not require that the subsidy amount be reported as income. The Acts eliminate the tax advantaged status of the retiree drug subsidies beginning in 2013 and companies will be required to treat the subsidy as income.[13] One expected consequence of this aspect of health reform is that some companies will eliminate the drug benefit

[11] Generic Pharmaceutical Association, IMS Health.

[12] MMA established the Medicare Part D drug benefit for Medicare beneficiaries and was implemented in 2006. The drug benefit is administered by commercial health insurers and financed by CMS.

[13] Pub. L. No. 111-148, § 9012; Pub.L.No. 111-152, § 1407.

provided to retirees and encourage their retirees to enroll in a Part D plan.

We also developed a model that estimated the shift of individuals out of employer-based drug benefit plans and into Part D plans. By integrating existing sales forecasts and substituting the net sales price realized on sales through the Part D program for the net sales price on purchases through employer-based plans, we were able to model the financial impact of this shift. In order to account for the uncertainty in how employers will respond to the elimination of the tax advantaged nature of the drug subsidy, a set of scenarios was incorporated into the model in order to provide a range of potential outcomes. The model revealed two important findings:

- Although most products will experience a decline in net revenue due to the shift in retirees to Part D plans, the contracting strategy for two products will result in an increase in net revenue
- Over 90% of the total change in net revenue is attributable to one product

V. EXPANSION OF MEDICAID ELIGIBILITY AND CREATION OF HEALTH EXCHANGES

A primary goal of health reform is to increase access to affordable health coverage through a combination of federal and private programs. The two most significant initiatives aimed at achieving this goal are the expansion of Medicaid eligibility to 138% of the federal poverty level and the creation of health exchanges that offer more affordable health plans to individuals.[14] Accompanying these two initiatives is the imposition of a penalty on all uninsured individuals with incomes exceeding certain income thresholds. These initiatives are scheduled to be implemented by

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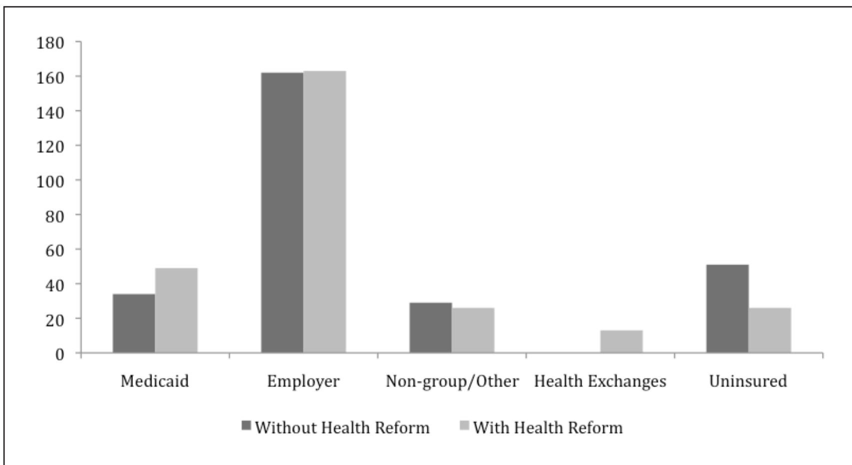
[14] Pub. L. No. 11-148, §§ 2001-2007, 2101-2102, 1301-1304, 1311-1313, 1321-1324, 1331-1333, 1341-1343, 1401-1402, 1411-1415, 1501-1502, 1511-1515; Pub. L. No. 111-152; §§ 1001-1005, 1201.

2014. The Congressional Budget Office (CBO) published estimates on the impact of health reform on payer mix that show a substantial reduction in uninsured and an accompanying increase in Medicaid and health exchange enrollment (see Figure 4). This change in payer mix represents a potential increase in drug utilization attributable to the reduction in out-of-pocket drug expense and increased access to physicians that may write new prescriptions for previously uninsured patients.

Figure 4 — Year 2015 Payer Mix, in Millions of Nonelderly People [15]



To model the impact of the shift in patients from uninsured to Medicaid and health exchanges, we used CBO estimates, National Health Expenditure data, and historical sales data to develop a utilization rate by payer type. By applying the new payer mix in Figure 4 to the existing utilization rates, we estimated the change in sales attributable to the expansion of Medicaid and creation of the health exchanges. Several important findings were revealed:

[15] Congressional Budget Office Letter to Nancy Pelosi, March 20, 2010

- Variations across the client’s product portfolio in current utilization rates by the uninsured drove significant differences in the impact on net sales by product
- The impact of the expansion in Medicaid will be compounded by the current increase in Medicaid enrollment due to economic conditions
- In addition to the direct impact on net sales, the change in payer mix will also drive changes in the prices pharmaceutical companies report to various federal agencies

VI. CONCLUSION

Health reform is currently impacting pharmaceutical manufacturers through the expansion of the Medicaid Drug Rebate Program and increase in statutory rebate amounts. Over the next four years, there will continue to be both positive and negative implications for the pharmaceutical industry. The models we designed and developed can be instructive in estimating the magnitude of the financial impact of health reform, in addition to identifying opportunities for pharmaceutical companies to strategically align their business and their products in this new, evolving marketplace.

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