Introduction

According to Delaware corporate law, a controlling shareholder is entitled to buy out - or “freezeout” - the minority shareholders.¹ Leaving aside the technical aspects of the freezeout, which is commonly performed through a merger,² the most significant result is that the controlling shareholder is not just able to force the minority to sell their shares, but also determines the price of these shares. The law offers protection to minority shareholders against the risk


of expropriation: a shareholder who objects to the price offered for the shares in the merger is entitled to ask the court to determine the fair value of her shares. Depending on the circumstances, this is accomplished either by using the "appraisal" right,³ or by claiming breach of fiduciary duty, thereby initiating the "entire fairness" test.⁴

The controlling shareholder's freezeout right is, in fact, a call option on the minority shares for an indefinite time whose exercise price is determined by the option holder.⁵ However, given the appraisal right and the duty to meet the entire fairness standard, the exercise price should not be lower than the expected fair price of the shares in the valuation process.⁶

It is generally accepted that the fair price valuation process does not take into account the effect of the merger itself. The fair price of the shares is thus

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³ See, Delaware General Corporations Law, Sec. 262(a) and (b).

⁴ See, Weinberger v. UOP, 457 A.2d 701 (Del. 1983).


their pre-merger value.\textsuperscript{7} On the other hand, it is also accepted that the fair price is a function of the proportionate value of the corporation as a whole and not as minority shares. That is, the minority shares get a proportionate part of the control premium.\textsuperscript{8}

Regardless of the particular valuation principles, courts rely on publicly known information about the corporation, such as the market price of publicly traded corporations,\textsuperscript{9} in the valuation process. This feature of the valuation process has generated an academic debate on the propriety of the use of such information.

Hermalin and Schwartz argue that in capital markets where shares are traded widely enough to have a market price, the pre-merger fair value is the pre-investment market price.\textsuperscript{10} In our context, this might be the pre-merger

\textsuperscript{7}See, Delaware General Corporations Law, Sec. 262 (h); but see the interpretation of Gilson and Black, \textit{supra note 2} p. 1287-1288, to the Weinberger case \textit{supra note 4}.

\textsuperscript{8}See, Rapid-American Corp. v. Harris, 603 A.2d 796 (Del. 1992).


market price, i.e., the price before the announcement of the merger. There is no need for complicated appraisal proceedings: every price above the pre-merger market price is a fair price.

Bebchuk and Kahan, on the other hand, argue that the use of publicly known information is not sufficient to assure the fair value is accurately determined, even in efficient markets.\textsuperscript{11} The reason is that the market reflects the value of the freezeout option in the price,\textsuperscript{12} such that the mere existence of the option decreases the value of the stock. In fact, the value of the option is subtracted from the stock price.

In Bebchuk and Kahan’s opinion, the freezeout option is very valuable. Since the controlling shareholder holds private information about the future value of the corporation, she can time the exercise of the option to her maximum benefit. Thus, whenever the expected future price is higher than the current market price, the option will be exercised. Given that courts are unable to reflect the value of private information held by the controlling shareholder in the valuation process, Bebchuk and Kahan argue that the freezeout option is yet another private benefit of control.


\textsuperscript{12} This is the view of Easterbrook and Fischel, \textit{supra note 6} p. 50-51, as well.
Is the freezeout option really that valuable? Bebchuk and Kahan present a single-period model showing that given the freezeout option the stock price will drop to the lower end of the probability range, as a result of the "lemons effect". Nevertheless, no one has offered a quantitative measurement of the value of the freezeout option.

We here present a method for determining the value of the freezeout option. The result of our model indicates that the freezeout option has a low value. This result implies that the use of publicly known information, including market prices, in determining a fair value for minority stocks will not cause expropriation of minority shareholders and will not distort efficiency.

**Pricing the Freezeout Option**

Let's assume that markets are efficient and accept the pre-merger market price as the fair price. The freezeout option is, then, a call option for an indefinite time to buy a share at today's market price. If the controlling shareholder has no information about the future price, and assuming the demand curve for the shares is perfectly elastic, this option is valueless as the controlling shareholder can buy the shares on the market for the same price without it.

But if the controlling shareholder has some private information about the
future price of the share, the option will be valuable. She has a call option to buy a share for today's market price, while only she knows tomorrow's market price. This information advantage provides the option-holder the benefit of foresight; she knows two values -- today's market price and tomorrow's market price -- before she decides whether or not to exercise the option.

The option-holder, however, will not exercise the option the first time it gets into the money, i.e., as soon as tomorrow's market price is greater than today's market price. Rather, since the option is indefinite but can be used only once, the option-holder will wait for the time when the difference in expected value between the price today and the price tomorrow is large enough to maximize her profit. In other words, the option-holder will attempt to capture the highest range of the expected probabilities of values. This, of course, will influence the share's price, which will endure a drop equal to the value of the option. The share and the option, together, reflect the whole range of expected probabilities of values for the corporation. Thus, the value of the option is subtracted from the potential value of the share without the freezeout option.

To enable us to price the option, we must equalize the freezeout option to a perpetual call option to buy a share today for an exercise price equal to yesterday's market price. Here, too, the option-holder has the benefit of hindsight. The option-holder knows two values -- yesterday's market price and today's market price -- before she decides whether or not to exercise the option.
Here, too, the option-holder will attempt to capture the largest expected
difference between today's price and yesterday's price.

Accepting this change in the description of the option will allow us to
price the option using a simple model. We assume that the stock price follows
a random process with changes in the price distributed normally over a short
time horizon. In fact, this assumption is similar to an arithmetic Brownian
motion, i.e. “random walk” (and not geometric as in Black-Scholes-Merton),
which is a reasonable assumption for a short time-horizon.

The perpetual option allows the owner to buy one share of stock at
yesterday’s price. First, it should be noted that since there is no explicit time
dependence, the option’s price does not depend on calendar time. Second, the
option is homogeneous in price (there is no fixed strike), so its price is linear in
the stock price. We can always normalize the stock price at $1. The price of
the option is a function of the distribution of price changes, interest rates, time
interval (one day in the current settings) and is proportional to the stock price.

Denote the value of the option by $v$, which is then equal to the expected
payoff relative to the risk-neutral probability measure.\textsuperscript{13} The payoff is defined
by the realized price change. The optimal exercise strategy is to exercise the

\textsuperscript{13} Risk neutrality means that price is equal to the expected payoff relative to
this measure without an additional risk premium.
option as soon as the price change is bigger than the cash value of the option but to leave it alive otherwise.

Denote the risk neutral probability density distribution of the price change \( X \) by \( \rho(x) \). Two events are possible: either the price jump is above \( v \) (then the option will be exercised) or the price jump is below \( v \) and the option is then worth more alive than dead:

\[
ve^{\tau} = v \int_{-\infty}^{\infty} \rho(x) \, dx + \int_{v}^{\infty} x \rho(x) \, dx
\]

Denote the yearly drift and volatility of the stock price by \( \mu \) and \( \sigma \). The corresponding drift and volatility of the price changes in time \( \tau \) (\( \tau = 1 \text{ day} = 1 \text{ year} / 365 \)) is then \( \mu \tau \) and \( \sigma \sqrt{\tau} \). Since we assume the price changes to be distributed normally we can use the standard cumulative normal

\[
\int_{-\infty}^{v} \rho(x) \, dx = N \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right)
\]

and correspondingly

\[
\int_{v}^{\infty} x \rho(x) \, dx = \mu \tau \left( 1 - N \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right) \right) + \frac{\sigma \sqrt{\tau}}{\sqrt{2\pi}} e^{-\frac{1}{2} \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right)^2}
\]

The option pricing equation becomes:

\[
ve^{\tau} = \mu \tau + (v - \mu \tau) N \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right) + \frac{\sigma \sqrt{\tau}}{\sqrt{2\pi}} e^{-\frac{1}{2} \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right)^2}
\]

Its solution is not analytic, but can be easily found numerically.

The probability of the exercise is
The numerical results\textsuperscript{14} are presented below. As a starting point we choose $r = 10\%$, $\sigma = 40\%$, $\mu = 15\%$. The price of this option is then $0.059$. The probability of an exercise tomorrow is 0.00268.

We plot below several graphs that show how the price of this option changes with changes in the parameters (interest rate, drift and volatility).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Value of a 1 day option when interest rates change from 1\% to 30\%, $\mu=15\%$, $\sigma=40\%$.}
\end{figure}

\textsuperscript{14} Calculated with Mathematica.
According to this model the price of the freezeout option ranges between 4% and 6% of the stock price. This result is robust relative to all major parameters of the model as demonstrated in the figures above.
Extensions of the Assumptions

The results suggest that the value of the option is not as high as might be expected. However, we priced an option for a single day. One may argue that the future event of which the controlling shareholder has private information will be reflected in tomorrow's market price if is known to the market. In other words, it does not matter if the significant development in the corporation -- about which the controlling shareholder knows -- will take place next week, next month or next year, as once known, it will be reflected in tomorrow's market price.

Nevertheless, this is not a correct valuation of the option. Whether the option holder has a wider range of values to choose from (information advantage) does make a difference. The option will have greater value if the option-holder can look to the future and see the share's prices for several days in advance before deciding whether or not to exercise. This foresight will increase the option-holder's ability to capture the largest difference between today's and tomorrow’s prices. Thus, the longer the horizon, the greater the value of the option.

Using the same method, we price an option that allows the option holder to exercise the option, while looking backward for up to 100 days. Each day the option holder can exercise the option for a price equal to the stock price 100 days ago. This is equivalent to a freezeout option with a controlling
shareholder having a horizon looking into the future for the same time.

Furthermore, we price the option assuming that the option holder knows, every day with certainty, the whole range of future prices within her horizon. In reality it seems more plausible that the controlling shareholder will have private information about the future price for only part of the time. Therefore, we added probability factor q to our pricing, which reflects the probability with which the option holder knows the future prices within her horizon. It is clear that the higher the probability, the more valuable the option.

The freezeout option allows its owner to buy the stock at the price registered some time (τ) ago, but it is active with some probability (q) and inactive with probability (1-q). The idea is that the principal shareholder has important information about future price changes with some probability (but not 100%) and can then buy shares back from other stockholders at the current price (or slightly higher). We assume that there is zero correlation between the information and the jump size. This is a useful assumption, even though in many cases the controlling shareholder will be informed of significant events first. However, as soon as q is a parameter, this can be incorporated in a risk-neutral version of q (in other words q is an adjusted probability).
In addition, we here assume a European type option. If the controlling shareholder has the information for a forthcoming period of length \( \tau \), but is prohibited from freezing out and then immediately reselling the stock, then the only information that matters is the information for the longest time horizon. In other words, if the private information predicts a price increase following by a decline, the freezeout option should not be exercised.

Given the above assumptions, there are two possible events: either the price jump is above \( v \), then with probability \( q \) the option will be exercised, otherwise it is either inactive and can not be exercised or the price move is not big enough to exercise the option. Since \( \rho \) is the risk-neutral probability measure, we can equate the future value of the current price with the expected payoff:

\[
ve^{rt} = \int_{-\infty}^{v} \rho(x) dx + q \int_{v}^{\infty} x \rho(x) dx + (1 - q) \int_{v}^{\infty} \rho(x) dx.
\]

The option pricing equation becomes:

\[
ve^{rt} = vN\left(\frac{v - \mu \tau}{\sigma \sqrt{\tau}}\right) + (1 - q)v + q\mu \tau \left(1 - N\left(\frac{v - \mu \tau}{\sigma \sqrt{\tau}}\right)\right) + \frac{\sigma \sqrt{\tau}}{\sqrt{2\pi}} e^{-\frac{1}{2} \left(\frac{v - \mu \tau}{\sigma \sqrt{\tau}}\right)^2}
\]

or

\[
ve^{rt} = vN\left(\frac{-v + \mu \tau}{\sigma \sqrt{\tau}}\right) + (1 - q)v + q\mu \tau \left(1 - N\left(\frac{-v + \mu \tau}{\sigma \sqrt{\tau}}\right)\right) + \frac{\sigma \sqrt{\tau}}{\sqrt{2\pi}} e^{-\frac{1}{2} \left(\frac{-v + \mu \tau}{\sigma \sqrt{\tau}}\right)^2}.
\]
Its solution is not analytic, but can be easily found numerically. The probability of the exercise is
\[
q \int_{v}^{+\infty} \rho(x) dx = q \left( 1 - N \left( \frac{v - \mu \tau}{\sigma \sqrt{\tau}} \right) \right) = q N \left( \frac{-v + \mu \tau}{\sigma \sqrt{\tau}} \right).
\]

We plot below several graphs that show how the price of this option changes when the parameters (interest rate, drift and volatility) change.

![Graph showing the value of a 1 day option when drift \( \mu \) changes from -20% to 30%, \( r=10\% \), \( \sigma=40\% \), \( q=0.1 \).](image)

Figure 4.

Value of a 1 day option when drift \( \mu \) changes from -20% to 30%, \( r=10\% \), \( \sigma=40\% \), \( q=0.1 \).
Figure 5.
Value of a 1 day option when volatility $\sigma$ changes from 0% to 70%, $\mu=15\%$, $r=10\%$, $q=0.1$.

Figure 6.
Value of a multi-day option when the time horizon $t$ changes from 1 to 100 days, $\mu=15\%$, $\sigma=40\%$, $r=10\%$, $q=1$. 
Value of a 1 day option when the probability $q$ changes between 0 and 100%, $\mu = 15\%$, $\sigma = 40\%$, $r = 10\%$.

The Model’s Implications

Given the result of our option pricing, the debate over the value of the freezeout option becomes a debate over which assumptions best reflect reality. If one assumes that the controlling shareholder has a short horizon of future prices and low probability of knowing them, then the freezeout option has very little value (4%). Given that in freezeout mergers the normal premium paid is substantially greater than the value of the option, the source of this premium is not the exploitation of the minority through the freezeout mechanism.\(^{15}\) Rather, \(^{15}\)See, e.g., Harry DeAngelo, Linda DeAngelo and Edward M. Rice, *Going Private: Minority Freezeouts and Shareholder Wealth*, 27 J. Law & Econ. 367 (1984) (average premium paid to minority shareholders is 56%).
it could be from a new project which the minority has no right to claim\(^{16}\) or some other source of efficiency.\(^{17}\) Therefore, the use of the market price and other publicly known information would not distort finding the fair value.\(^{18}\) Moreover, such a low value of the freezeout option will not justify, from the controlling shareholder point of view, entering inefficient investments or investing in information as to future prices.

However, if one assumes that the controlling shareholder has a long horizon of future prices which she can foresee with a high probability, the freezeout option is very valuable (30\%). Given that in some freezeout mergers

\(^{16}\) See, Hermalin and Schwartz, *supra note 10*.


\(^{18}\) The use of publicly known information other than the market price to find fair value, is clearly justified in inefficient markets. Moreover, it is also justified in efficient markets for purposes of attempting to allocate proportionate part of the control premium.
the premium is lower than the value of the freezeout option, this might reflect an exploitation of the minority through the use of the freezeout mechanism.

It can be argued that the assumptions should differ relative to the specific corporation. In some industries it is more plausible that the controlling shareholder will have longer horizons of future prices or greater probability than in other industries. For instance, in a corporation operating a mature supermarket chain, it is reasonable that the controlling shareholder will not have an advantage over market analysts in foreseeing future prices. On the other hand, in the high-tech industry it seem more likely that the controlling shareholder will have greater probability of foreseeing future prices than market analysts.

Nonetheless, it seems unlikely that the controlling shareholder will have an advantage over market analysts regarding both probability and horizon. In a mature corporation, for example, there is a greater probability of both foreseeing future prices and foreseeing them for a long horizon, but this effect works for outsiders as well as for insiders. Thus, it is easier for market analysts to erode the insider's advantage by pricing information into today's price. On the other hand, in high-tech industry, the controlling shareholder has an advantage regarding the probability of knowing future prices, but, given the nature of the industry, her horizon is limited. This suggests that freezeout options will not be very valuable.
Empirical Support

According to our model, the value of the freezeout option is low, when its price is based on publicly known information. Thus, it should not be expected that the use of the market price as a measure of fair value would lead to minority shareholders’ exploitation or to inefficiency in corporate and

However, in our model the stock price, which is used to price the option, is exogenous. To understand this point, assume that there are two countries: country A in which freezeout is allowed and country B in which freezeout is restricted. In country B, the stock will be traded for its full value, reflecting the whole range of expected probabilities of values. In country A, the stock will be discounted, subtracting the value of the freezeout option. In our model, investors in country A expect the court determining the fair value to draw the market price from (hypothetical) country B.

On the other hand, in Bebchuk and Kahan’s model the stock price is endogenous. The court determining the fair value of investors in country A draws the market price from country A, in which the stock is traded and a freezeout is allowed. It is this feature which gives rise to the “lemons effect”. Investors expecting to receive fair value based on a discounted price -- due to the existence of the freezeout option -- discount the stock price further to
reflect the discounted “fair value”. According to Bebchuk and Kahan this process will repeat itself until the stock price drops to the lower end of the expected range of values. Indeed, this is the basis for their claim that the option is very valuable.

However, investors’ expectations can be tested empirically.\textsuperscript{19} When investors in country A expect the court to draw the stock price from country B in which freezeout is restricted -- exogenous market price -- the market price in country A will reflect this expectation. Consequently, there is no “lemons effect”, and the stock is discounted only once to reflect the existence of the freezeout option. Since the value of the option is low, the market price in country A in which freezeout is allowed will be very similar to the market price in country B in which freezeout is restricted. On the other hand, if investors in country A expect the court to draw the stock price from country A in which freezeout is allowed -- endogenous market price -- the market price will drop

\textsuperscript{19} We leave for further research the development of a model with endogenous stock price. We expect that in a model with endogenous stock price the market price will drop to zero. If indeed the market price drops to zero, there is even greater support for our model: there is no need for empirical research to show that in countries in which freezeout is allowed stocks are traded with positive prices.
due to the “lemons effect”. Thus, the market price of stocks in the two countries will be very different.

One way to empirically test investors’ expectations, is by testing the influence that reincorporation from one state to another would have on a corporate stock’s prices. If the option has great value, we would expect to find a drop in the securities prices of corporations reincorporated in a state that has a law allowing freezeouts.

Other ways to empirically test the value of the freezeout option may be drawn from a comparison between two kinds of corporations: a majority-owned firm and a diffusely held firm. The freezeout option is viable only in a majority-owned firm, and the market will reflect its value by discounting the stock price. On the other hand, in a diffusely held firm, the freezeout option does not exist. However, there is a probability that a diffusely held firm will transform into a majority-owned firm -- e.g., through stock accumulation or through a tender to the majority of the stocks -- and the freezeout option will be born. The market will discount the stock price to reflect this probability.

It is reasonable to assume that the discount applied to a majority-owned firm -- in which the existence of the option is certain -- will be greater than the discount applied to a diffusely held firm -- in which there is only a probability that the option will materialized. Thus, if the option has a great value we should find that stocks in majority-owned firms are traded at a discount relative
to stocks in diffusely held firms.

Stocks of majority-owned firms, however, do not trade at a discount relative to stocks of diffusely held firms, as found in several studies measuring the impact of large block ownership on firms' market-to-book ratio -- the ratio of the market value of the firm to the replacement costs of its assets. Morck, Shleifer and Vishny found that for 371 Fortune 500 firms, the market-to-book ratio increases when managerial stock holdings went from 0% to 5%, decreases between 5% and 25%, and increases above that. This result suggests that the freezeout option has very little value. If the freezeout option had a great value, we would expect that as managerial holdings increases market-to-book ratio decreases due to the increased probability that a diffusely held firm would transform into a majority-owned firm. Similarly, Holderness and Sheehan found no significant difference in the book-to-market ratios for paired sample

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21 But see, John McConnell and Henri Servaes, *Additional Evidence on Equity Ownership and Corporate Value*, 27 J. Fin. Econ. 595 (1990) (for the one year studied the market-to-book ratio increased until top management owned 40% or 50% of the stock, and declined thereafter).
of majority-owned and diffusely held firms.\textsuperscript{22}

Interestingly enough, the stocks of majority-owned firms are even issued at a premium relative to diffusely held firms. Schipper and Smith, who studied the performance of equity carve-outs announced between 1965 and 1983,\textsuperscript{23} found that the initial percentage returns on the stock of the new subsidiaries was much lower than those observed in studies of public offerings generally.\textsuperscript{24} This suggests that in newly issued stocks of a majority-owned firm the issuer has to offer a lower discount on its stocks relative to public offerings generally.

\textsuperscript{22} Clifford Holderness and Dennis Sheehan, \textit{The Role of Majority Shareholders in Publicly Held Corporations: An Exploratory Analysis}, 20 J. Fin. Econ. 317 (1988).

\textsuperscript{23} A carved-out occurs when parent firm sells partial ownership interest in a subsidiary to the public. Usually, the parent firm retains at least half of the common stock and thus controls the carved-out subsidiary. A carved-out subsidiary is thus a firm that went public as a majority-owned firm.

\textsuperscript{24} Katherine Schipper and Abbie Smith, \textit{A Comparison of Equity Carved-Outs and Equity Offerings: Share Price Effects and Corporate Restructuring}, 15 J. Fin. Econ. 153 (1986).
Furthermore, we can expect that once a freezeout merger is effected in a majority-owned firm, the premium paid for the minority stocks would be lower relative to the premium paid to shareholders in a merger of a diffusely held firm. The lower premium would be expected for both a firm that went public as a majority-owned firm and a firm that transformed from a diffusely held firm into a majority-owned firm. In fact, in both cases, the discount -- due to the existence of the freezeout option -- reflects this expected low premium. Once the majority owner has paid for the option -- either in the form of discount to newly issued minority stocks or in the form of expenses to create a majority block in a diffusely held firm -- she will wish to make use of this option and pay a lower premium in the freezeout merger.

The empirical findings, however, reveal that premiums paid for the two kinds of firms are substantially the same, supporting the result of our model that the freezeout option has a low value. The equal premium relative to diffusely held firms was found for both firms that went public as a majority-owned firm and firms that transformed from a diffusely held firm into a majority-owned firm. Klein, Rosenfeld and Beranek found that parent firms’ announcements of reacquisition of their carved-out subsidiaries are associated with positive abnormal returns for public shareholders which approximate those earned by target firms in arms-length mergers and acquisitions. Additionally, after a parent firm sell-off its interest in the carved-out
subsidiary, in most cases minority shareholders are being bought out for the same price.\textsuperscript{25} Holderness and Sheehan paired diffusely held firms and majority-owned firms, and found that minority shareholders in majority-owned firms receive approximately the same premium for their shares as shareholders in diffusely held firms.\textsuperscript{26} DeAngelo, DeAngelo and Rice examined Management Buy-Outs and found that the returns to public shareholders were substantially the same whether the buyer had control or not.\textsuperscript{27}

Similarly, we would expect the frequency of freezeout mergers and other reorganizations to be greater than the frequency of mergers and other control transactions in diffusely held firms. The motives for mergers and other control transactions in diffusely held firms are the same as in majority-owned firms,


\textsuperscript{26} Clifford Holderness and Dennis Sheehan, \textit{Constraints on Large-Block Shareholders}, National Bureau of Economic Research, p. 28 (Conference on Concentrated Ownership, June 1998).

\textsuperscript{27} DeAngelo, DeAngelo and Rice, \textit{supra note 15} at 393.
while the latter have another motive -- to exercise the freezeout option when the controller receives favorable private information. Indeed, Holderness and Sheehan found that, for paired majority-owned and diffusely held firms over the seven years followed, 36% of the majority shareholders redeemed the minority's shares, while only 29% of the paired firms reorganized over the same period. Similarly, Morck, Shleifer and Vishny found that the probability of a Fortune 500 firm being acquired between 1981 and 1985 increased with the percentage of common stock owned by its top two managers.²⁸

The increase in the frequency of reorganizations in majority-owned firms can be due to either a high value of the freezeout option or decreased transaction costs. If the freezeout option has a great value, its exercise should increase the frequency of reorganization. However, even if the freezeout option has a low value, the ownership of a large block of shares makes it easier for the majority shareholder to complete a reorganization relative to a shareholder holding a small fraction of a diffusely held firm. Thus, it is hard to conclude how much of the difference in the frequency of reorganizations is associated with the value of the option.

Summary

The freezeout option allows a majority shareholder to buy out the minority for a fair price. The freezeout option enables the majority shareholder to exercise the option whenever she holds favorable private information. However, courts determine the fair value to be paid to minority shareholders based on publicly known information. Thus, it is claimed that using publicly known information undervalues minority stocks. This claim suggests that the freezeout option is very valuable.

We presented a model that enabled us to price the freezeout option. The result of our model indicates that the freezeout option has a low value. This result implies that the use of publicly known information, including market prices, in determining a fair value for minority stocks will not cause expropriation of minority shareholders and will not distort efficiency.

The result of our model is supported by empirical findings. Stocks of majority-owned firms are not traded at a discount relative to stocks of diffusely held firms. Moreover, in reorganizations and other control transactions, the premium received by minority shareholders in majority-owned firms is similar to the premium paid to shareholders in diffusely held firms.