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TEACHING NOTE

Strategic Capital Management, LLC Series

Substantive Issues

In December 1998, Creative Computers sold approximately 20% of its Internet auction subsidiary, Ubid, to the public. The stock was offered at $15 and closed the first day of trading at $48 for a 220% gain. This gave Ubid a $439 million market capitalization. Paradoxically, the parent's stock price did not keep pace with that of its subsidiary. At the end of Ubid's first day as a public company, Creative Computer's equity value was less than the value of its stake in Ubid. Stated differently, market prices implied that Creative Computers' non-Ubid assets had a value of *negative* $79 million.

The relative prices and ownership link between Creative Computers and Ubid suggests an arbitrage opportunity. By purchasing the parent and shorting the subsidiary, an arbitrageur could *be paid* to own Creative Computers' non-Ubid assets. If the arbitrageur placed such a trade shortly after Ubid's IPO, and was able to maintain his investment for six months, he would have earned a substantial profit. The long position increased over 40% and the short position fell about 6%. However, the prices did not converge smoothly, such that if the arbitrageur did not have access to additional capital, he could have been forced out of his investment prematurely, losing nearly 100% of his equity capital.

Pedagogical Objectives

The key pedagogical objective is to develop an understanding of how arbitrage acts to enforce the law of one price and to keep markets efficient. It also provides a venue to discuss the various real world market imperfections that can prevent arbitrageurs from immediately eliminating mispricings in equity markets. The case is probably best taught at the end of a capital markets module. The analysis involves:

1. Assessing the relative valuations of two publicly-traded firms that are linked through a majority ownership of one by the other;
2. Recognizing that an apparent relative mispricing may not be a true arbitrage opportunity involving no capital and no risk;
3. Determining what investment positions will best exploit an "arbitrage opportunity;"

This note was prepared by Professors Mark Mitchell, Todd Pulvino and Erik Stafford for the sole purpose of aiding classroom instructors in the use of Strategic Capital Management, LLC (A)-(C), HBS No. 202-024 to 202-026. It provides analysis and questions that are intended to present alternative approaches to deepening students' comprehension of business issues and energizing classroom discussion. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

4. Calculating returns to an investment portfolio containing both long and short positions; and
5. Understanding the effects of leverage and capital requirements on investment returns.

Class Plan

1. What are the benefits/costs of investing in hedge funds? (5 minutes)
2. Evaluate the market values of Creative Computers and Ubid on an individual basis as of December 9, 1998. (10 minutes)
3. Generate the market value balance sheet for Creative Computers and calculate the negative stub value. (15 minutes)
4. Identify possible investments. (20 minutes)
5. Discuss leverage and margin requirements. (15 minutes)
6. Track investment over time and calculate returns. (10 minutes)
7. Summary of hedge funds, market neutral investing, and risks associated with apparent arbitrage opportunities. (5 minutes).

Opportunities for Student Analysis

Why Invest in a Hedge Fund?

Hedge funds attempt to identify investment opportunities with positive risk-adjusted returns. In most cases, but not always, they attempt to generate returns that are uncorrelated with the market. To do this in equity markets generally requires taking both long and short positions. This is because most equities have positive betas, so the negative beta of a short position is necessary to offset the positive beta of a long position. Hedge funds have much greater flexibility with the positions that they can hold than mutual funds, and therefore hedge fund investors must meet the SEC's sophisticated investor standards.

Along with the benefits of hedge funds, there are costs. Hedge funds charge high fees. Whereas a typical mutual fund might charge 1.25% of assets under management, hedge funds typically charge 1% of assets under management *plus* 20% of all profits.[1] In addition to being expensive, hedge funds often do not provide transparency to investors. That is, hedge fund investors are often unaware of the securities in which the fund is invested and how much financial leverage is being employed. Finally, hedge funds investments are often illiquid. Initial investments are often "locked-up" for a period of time and withdrawals are commonly allowed on a quarterly or annual basis.

[1] In many cases, returns must exceed a predefined hurdle (e.g. LIBOR) before the hedge fund manager is paid the 20% performance fee.

Evaluation of Ubid's Market Value

On December 9, 1998, Ubid's stock closed at $35.6875 per share. With 9,146,883 shares outstanding, Ubid's market capitalization was $326 million. This compares to book equity of -$3.3 million. Using book values (Exhibit 2) as estimates of market values for net working capital, PP&E, other long-term assets, and debt yields the following market value balance sheet:

Exhibit TN-1 Ubid's Market Value Balance Sheet

Assets		**Liabilities**	
Cash	25,400	Debt	3,709
NWC	-624	Stockholders Equity	326,540
PP&E	302		
Other Long-term Assets	739		
Growth Opportunities (plug)	**304,432**		
Total Assets	330,249	Total Liabilities and Equity	330,249

Source: Annual reports and case writers' calculations.

The market value balance sheet shows that, like most Internet firms at the time, Ubid's market value was based almost exclusively on anticipated growth opportunities. Ubid's rapid growth rate (637% and 127% growth over the first and second quarter sales, respectively) fueled the market's anticipation of future growth.

Evaluation of Creative Computer's Market Value

On December 9, 1998, Creative Computers' stock closed at $22.75 per share. With 10,238,703 shares outstanding, Creative Computers' market capitalization was $233 million. This compares to book equity of $48.5 million (Exhibit 1). Using book values from Exhibit 1 gives the following market value balance sheet:

Exhibit TN-2 Creative Computer's Market Value Balance Sheet

Assets		**Liabilities**	
Cash	15,528	Debt	3,152
NWC	6,737	Stockholders Equity	232,930
PP&E	15,040		
Other Long-term Assets	14,313		
Ubid Stake	261,585		
[9,146,883 - 1,817,000] x $35.6875			
Stub (plug)	**-77,121**		
Total Assets	236,082	Total Liabilities and Equity	236,082

Source: Annual reports and case writers' calculations.

Assuming that the market values of assets such as Cash, NWC, etc. are equal to the book values of those assets, the market value balance sheet reveals that the market places a negative value on the stub assets. Even if the market values of Cash, NWC, PP&E, and other long-term assets are zero, the stub value is still negative $25.5 million. If the market value of the other assets exceeds the book value (as would be expected given the conservatism principle of accounting), the stub value will be even more negative than the -$77.1 million shown in the market value balance sheet.

The negative stub value leads to a couple of interesting questions for discussion. First, what does it mean in an efficient capital market for assets to have a negative value? Usually negative assets are viewed as liabilities. In this case, it is difficult to characterize Creative Computers' "stub" assets as liabilities. Creative Computers' had achieved record sales in the most recent quarter, and net income was the highest since the third quarter of 1997. Second, is the market value balance sheet missing something? Large off-balance sheet liabilities might explain the negative stub value. For example, investors' fears that Creative Computers' managers will squander the value of the Ubid stake might explain the apparent anomaly. Finally, it is interesting to note how valuing one firm relative to another can often be considerably easier than an absolute valuation done in isolation.

The Investment Decision

Given the values of Creative Computers and Ubid, the case protagonist, Elena King, must decide how to invest. There are four main options: (1) buy Creative Computers, (2) buy Ubid, (3) short sell Creative Computers, and (4) short sell Ubid. In addition, combinations of the above options are possible. Three possible strategies are discussed below.

A. Buy Ubid

For	Against
• Growth company • Stock is down 40% from its high	• High implied growth rate may not be attainable • Few tangible assets • Highly volatile stock

B. Buy Creative Computers

For	Against
• Rapid growth • Profitable • Ubid stake is valuable—buying Creative Computers dominates the Buy Ubid strategy ➢ Buying one share of Creative Computers gives the owner 0.7159 shares of Ubid (9,146,883-1,817,000)/10,238,703 = 0.7159) ➢ Cost of Creative Computers share is $22.75 ➢ Value of 0.7159 Ubid shares is $25.55	• Off-balance-sheet liabilities could explain the negative stub value, for example, Creative Computer's management may squander the value of the Ubid stake • Value of Creative Computers depends on value of Ubid—a young company valued solely on perceived growth opportunities

C. Short Sell Ubid and Buy Creative Computers

This strategy attempts to profit from Creative Computers' negative stub value. From above, by purchasing one share of Creative Computers for $22.75, Elena will effectively own 0.7159 shares of Ubid. The strategy requires that she simultaneously short sell 0.7159 shares of Ubid, producing short proceeds of $25.55. In six months, if the proposed spin-off occurs, Elena's short proceeds will be released generating a minimum unlevered six month return of 12.3%. If Creative Computers' other assets actually have positive value, and if Elena receives interest on her short proceeds, her return will be greater than 12.3%.

For	Against
• Market-neutral strategy is consistent with the hedge-fund's mandate; profit does not depend on overall market moves--profit will be made whether CC and Ubid go up or down • Profit depends on Elena's ability to calculate relative values of Creative Computers and Ubid, not absolute values	• Proposed spin-off may take longer than six months • IRS approval of tax status of spinoff may not be granted • Creative Computers' management may squander the Ubid stake • Unknown off-balance sheet might explain the apparent arbitrage opportunity • Shorting stock subjects investor to unlimited downside. What happens if Ubid stock skyrockets?

Implementing the Arbitrage Strategy: Leverage and Margin Requirements

Whereas long positions in equity can be established on an unlevered basis, short positions must use financial leverage. This stems from the fact that the underlying short position requires the investor to sell borrowed stock, which gives rise to a liability. Margin requirements, set by the Federal Reserve and the stock exchanges, are used to regulate the amount of financial leverage employed by investors. Initial margin requirements are set by the Federal Reserve's Regulation T. "Reg T" requires that investors post minimum initial capital of 50% for any long position. A margin loan from the investor's broker can be used to finance the remaining 50% of the stock's purchase price. Similarly, 50% initial margin is required for all short positions. For example, if an investor shorted a stock for $100, he would be required to post $50 of cash or marginable securities in a margin account. In this case, the investor's broker would hold $150 worth of cash and.marketable securities ($100 from the short sale and $50 of posted collateral).

Maintenance margin requirements are set by stock exchanges (e.g. NYSE) and self-regulatory organizations (e.g. NASD). Both the NYSE and NASD require maintenance margin of 25% for long positions and 30% for short positions. If security prices move such that the investor's position has less than the required maintenance margin, he will receive a margin call and will be required to post additional collateral or reduce his position so as to satisfy the maintenance margin requirements.[2]

To minimally satisfy Reg T, an investment in the Creative Computers/Ubid arbitrage would require the following initial balance sheet:

[2] There are special margin requirements for shorting stocks that have a price less than five dollars. For stocks priced between and including $2.50 and $5.00, the maintenance margin requirement is 100 percent. For stocks priced below $2.50, the maintenance requirement is $2.50 per share shorted. Note that brokerage firms typically impose higher maintenance requirements for retail investors than the maintenance requirements stipulated by the NYSE and NASD. For example, Charles Schwab & Co. has a minimum maintenance requirement of 35 percent for long positions. In addition, brokerage firms often set higher initial and maintenance margin requirements for certain securities depending on volatility. In all cases, the higher requirement, whether imposed by the Federal Reserve Board, the exchange/self-regulatory organization, or the broker, prevails.

Exhibit TN-3 Arbitrageur's Initial Balance Sheet per One Share Long Creative Computers

Assets		Liabilities	
Cash collateral posted for short position	12.78	Margin loan	11.38
Short proceeds	25.55	Short 0.7159 Ubid shares	25.55
Long 1 share of Creative Computers	22.75	Equity	24.15
Total Assets	61.08	Total Liabilities and Equity	61.08

Source: Case writers' calculations.

As Creative Computers' and Ubid's stock prices change, both the margin requirements and the equity capital available to meet the margin requirements change. For example, suppose that Ubid's stock price increased from $35.6875 to $53.125 and Creative Computers' stock price increased from $22.75 to $28.875 (as they did on 12/18/98). The cash posted as collateral for the short sale, the margin loan, and the short proceeds are all determined at the initial trade date and do not change. However, the value of the long position, the value of the short position, and the equity value adjust to the new market prices. Ignoring interest paid on short proceeds, cash collateral, and margin loans, the arbitrageur's new balance sheet would be:

Exhibit TN-4 Arbitrageur's Balance Sheet on 12/18/98 per One Share Long Creative Computers

Assets		Liabilities	
Cash collateral posted for short position	12.78	Margin loan	11.38
Short proceeds	25.55	Short 0.7159 Ubid shares	38.03
Long 1 share of Creative Computers	28.88	Equity	17.80
Total Assets	67.21	Total Liabilities and Equity	67.21

Source: Case writers' calculations.

In this example, the arbitrageur's equity capital has decreased from $24.15 to $17.80. Equally as important, the equity value is less than that required to meet maintenance margin requirements. Assuming that 25% of the long position and 30% of the short position is required, the required equity capital would be $18.63 [=**(0.25)***(28.88) + **(0.30)***(38.03)]. Since the required equity capital exceeds the actual equity capital, the arbitrageur would face a house call and would be required to deposit additional collateral into the account or partially liquidate his position.

What Happened?

There are (at least) two approaches the instructor can follow. In the first approach, the instructor can omit the presentation of the arbitrageur's balance sheet, and focus on two key dates, the eventual distribution date and a date immediately subsequent to the initial investment when the arbitrage gap widened. In the second approach, the instructor builds the arbitrageur's balance sheet day by day and monitors the deal position, deciding each day whether to increase or decrease the amount of capital in the deal.

The first approach is to jump ahead six months in time and reveal to the class that Creative Computers successfully spun off its remaining 80% of its Ubid stock causing the arbitrage spread to converge. At the time of convergence, the price of Creative Computers was $32.625 and the price of Ubid was $34. Thus, SCM made $9.875 ($32.625 - $22.75) on the long position and $1.21 (.7159*($35.6875 - $34) on the short position for a total gain of $11.085. Based on initial equity capital of $24.15, the total return on equity capital over six months is $11.085/$24.15 = 45.9% (annualized

return of 113%). As indicated above, it is not necessary to build the arbitrageur's balance sheet; however it is necessary to recognize the 50% initial margin requirement on long and short positions in order to calculate the beginning equity capital of $24.15. After displaying the 45.9% on the six-month investment, assuming no interventions along the way, the instructor can highlight a particular date when the arbitrage spread widened. For example, on December 24, 1998, Ubid's stock price had increased to $188 whereas the price of Creative Computers' had only increased to $59.6875. Assuming there were no maintenance margin calls between December 9 and December 24 (note that this approach only requires the initial margin requirement so as to set the equity investment), SCM would have gained $36.9375 on the long position in Creative, but would have lost $109.04 ((188-135.6875)*.7159) on the short position in Ubid, yielding a net loss of $72.10. The $72.10 loss completely wipes out SCM's original capital of $24.15.

With the second approach, the instructor builds the market value balance sheet of the arbitrageur's investment, and reveals, day by day, the price path of Creative Computers' and Ubid stock. In this approach, the discussion of maintenance margin calls is required. Exhibits TN-5 through TN-9 allow the instructor to ask students after each margin call whether they want to post additional collateral or partially liquidate. The arbitrageur will hate to liquidate when the arbitrage spread widens; the opportunity has improved and the arbitrageur will want to invest more. However, it is difficult to raise money on short notice when your investments are performing poorly. Furthermore, as the spread widens, the arbitrageur has to wonder whether his analysis was incorrect (e.g. omission of off-balance-sheet liability). Exhibit TN-12 can be used to show that, *ex-post*, the optimal strategy would have been to post additional collateral. However, at the time, uncertainty over the path to convergence and limited capital may have forced the arbitrageur to liquidate and incur massive losses. This exhibit shows that while the arbitrage spread ultimately converged, the path to convergence was extremely bumpy. In fact, the arbitrageur faced 4 margin calls. If, rather than depositing additional capital to meet margin calls, the arbitrageur partially liquidated his position, he would have generated a return of -99%.

Summary

The case can be summarized with the following points:

(1) Hedge funds search for violations of the law of one price, giving rise to positive alpha / low risk investment strategies (note what risk means).

(2) There are significant impediments to arbitrage.

- Finding two securities with such a clean link is difficult. Even with such a link, there is no guarantee that prices will converge.
- Even if prices do converge, the arbitrageur may not be able to maintain his positions until convergence. The path to convergence may be too long or too bumpy.
- Investments, even in apparent arbitrages, require up-front capital to secure loans (e.g. stock loans and margin loans). This capital is not free and must be accounted for when calculating returns.
- Hedge funds may have to be specialized to identify arbitrage opportunities. However, a single investment in Creative Computers/Ubid would have put SCM out of business. Thus, a diversified approach is recommended. Unfortunately, it is not easy to diversify if profitable deals are not rampant and independent of one another.

(3) Arbitrageurs work hard to elimanate mispricings, but real-world frictions limit their effectiveness.

Suggested Assignment Questions

(1) What are the costs/benefits of investing in a hedge fund?

(2) What is the current stock market valuation of Creative Computers and of Ubid based on the stock prices as of December 9? Evaluate these valuations with respect to the assets associated with these firms.

(3) What should Elena do? Buy Creative Computers? Buy Ubid? Buy both Creative Computers and Ubid? Is there some other investment strategy involving Creative Computers and Ubid that you would suggest?

Exhibit TN-5 Initial Investment in Creative Computers and Ubid, 12/9/98

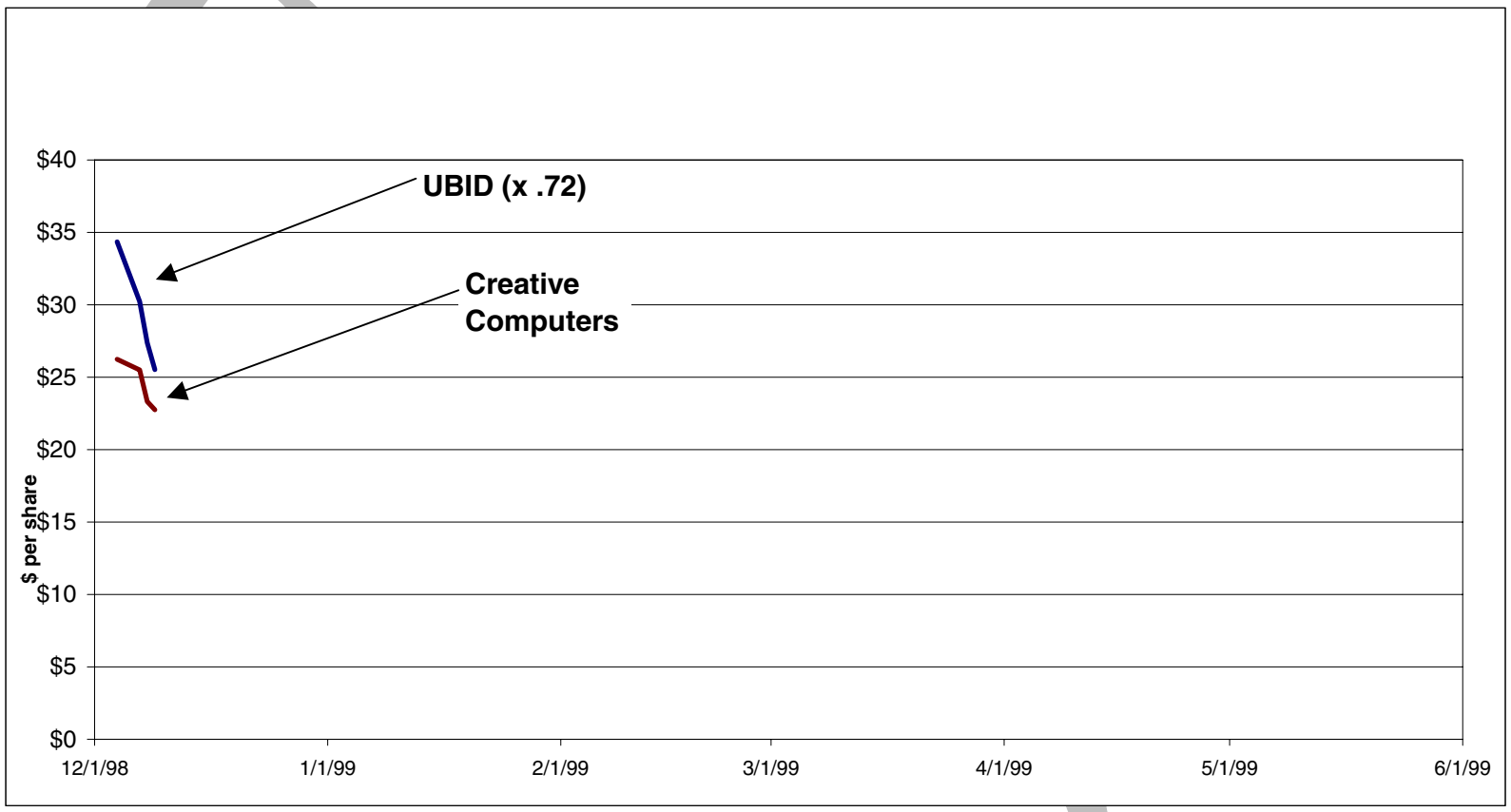

Exhibit TN-6 Investment in Creative Computers and Ubid Receives a Margin Call, 12/18/98

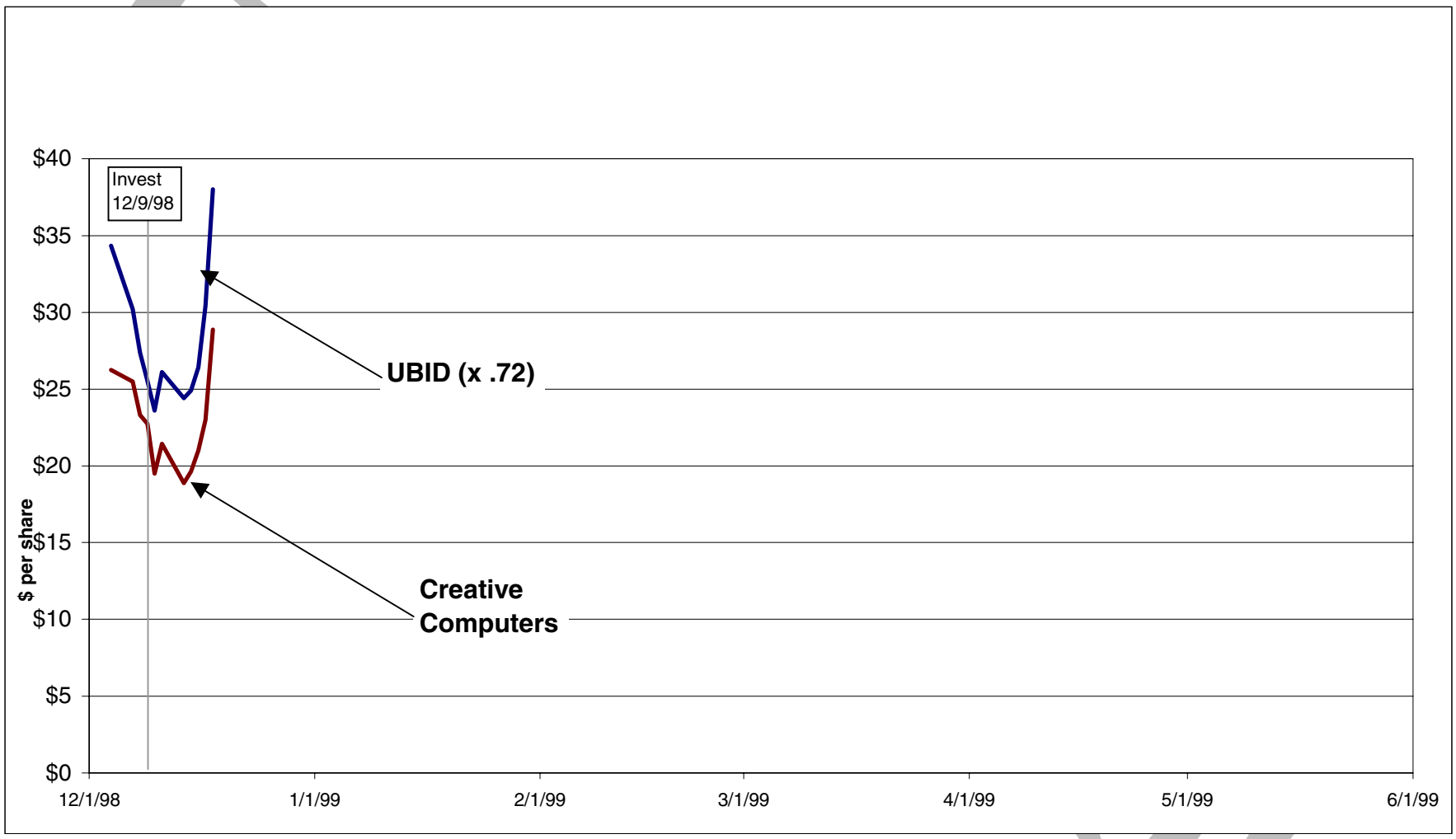

Exhibit TN-7 Investment in Creative Computers and Ubid Receives 2nd Margin Call, 12/21/98

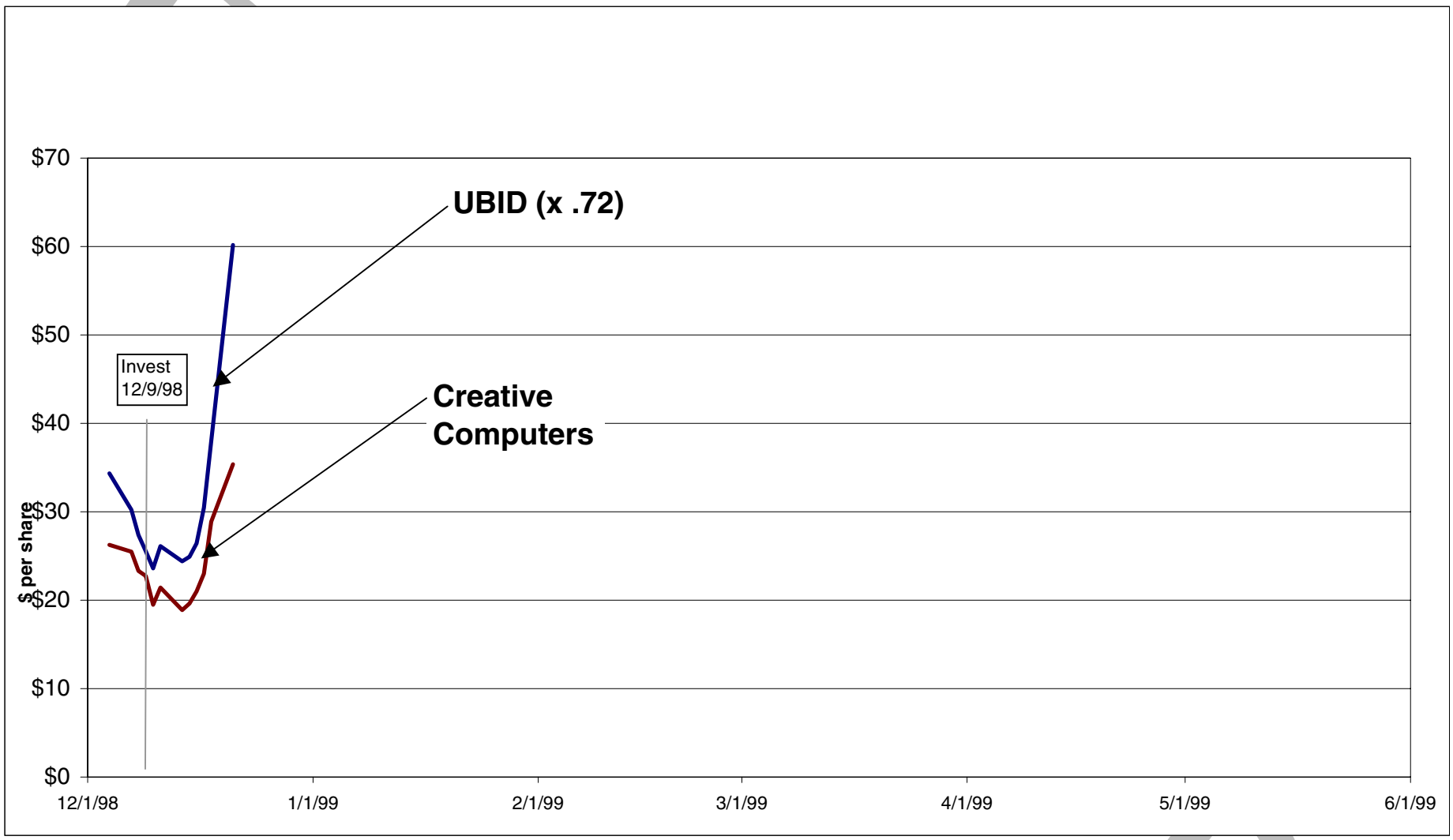

Exhibit TN-8 Investment in Creative Computers and Ubid Receives 3rd Margin Call, 12/22/98

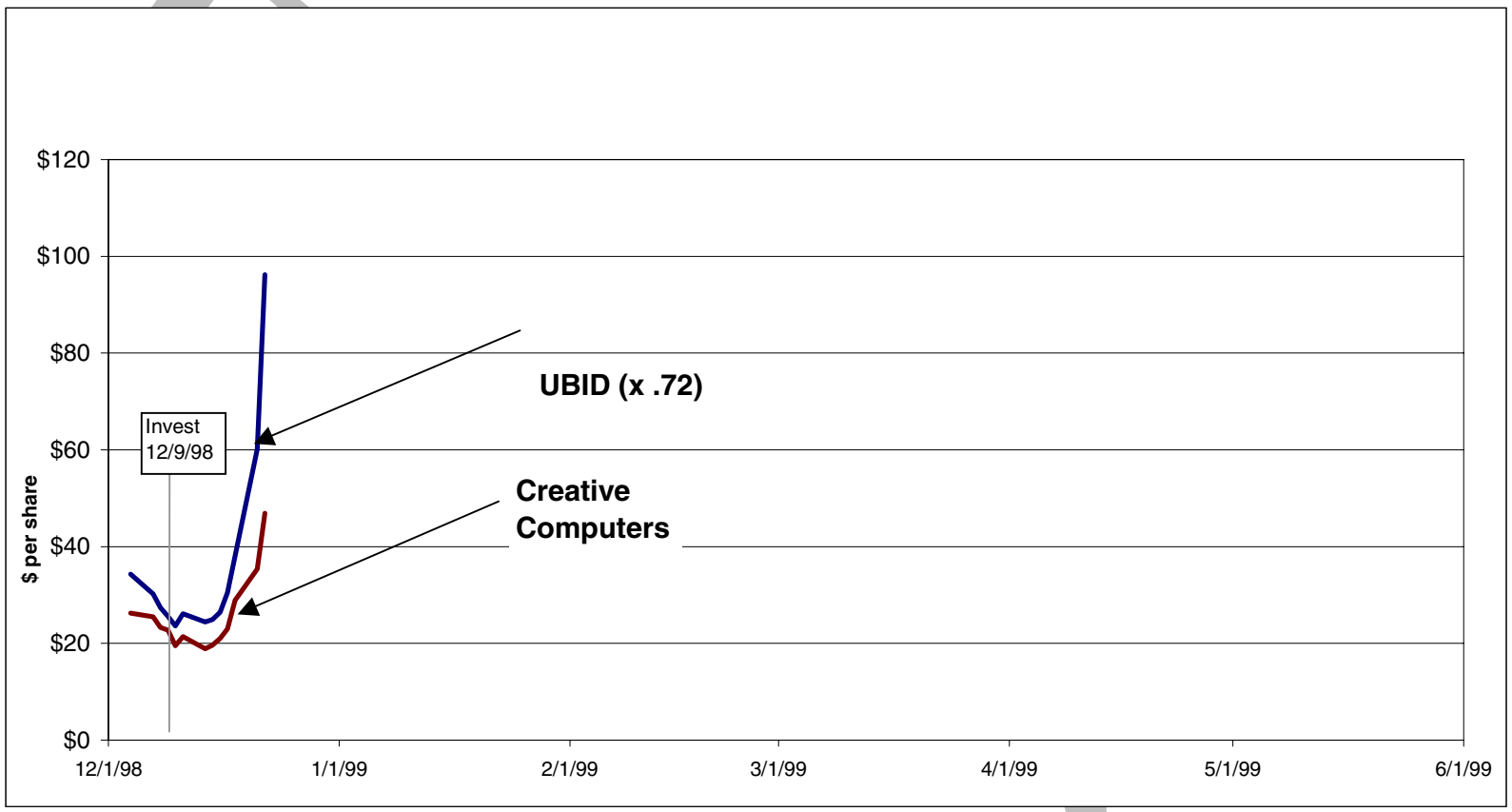

Exhibit TN-9 Investment in Creative Computers and Ubid Receives 4th Margin Call, 12/23/98

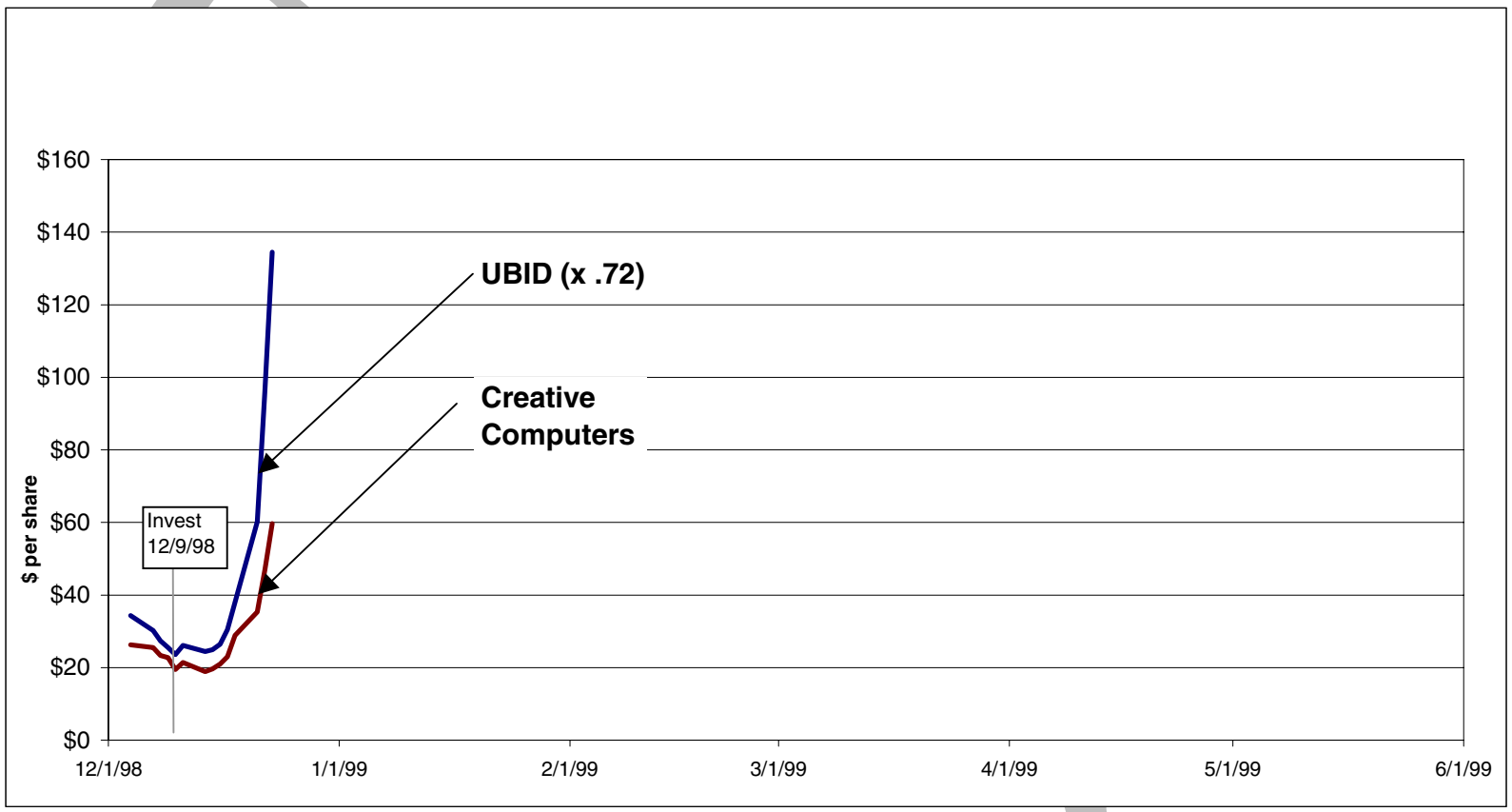

Exhibit TN-10 Investment in Creative Computers and Ubid, 12/29/98

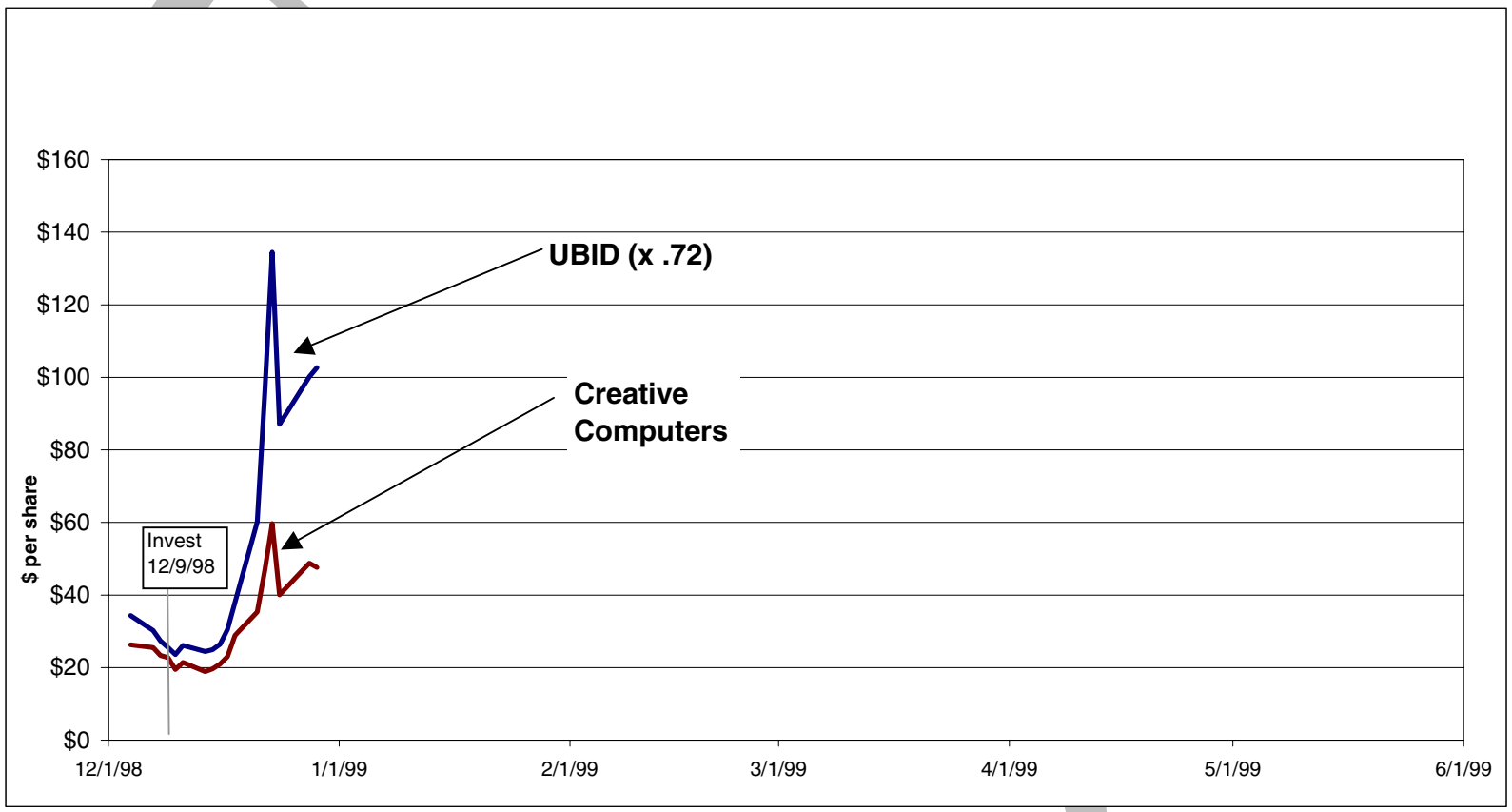

Exhibit TN-11 Investment in Creative Computers and Ubid, 1/29/99

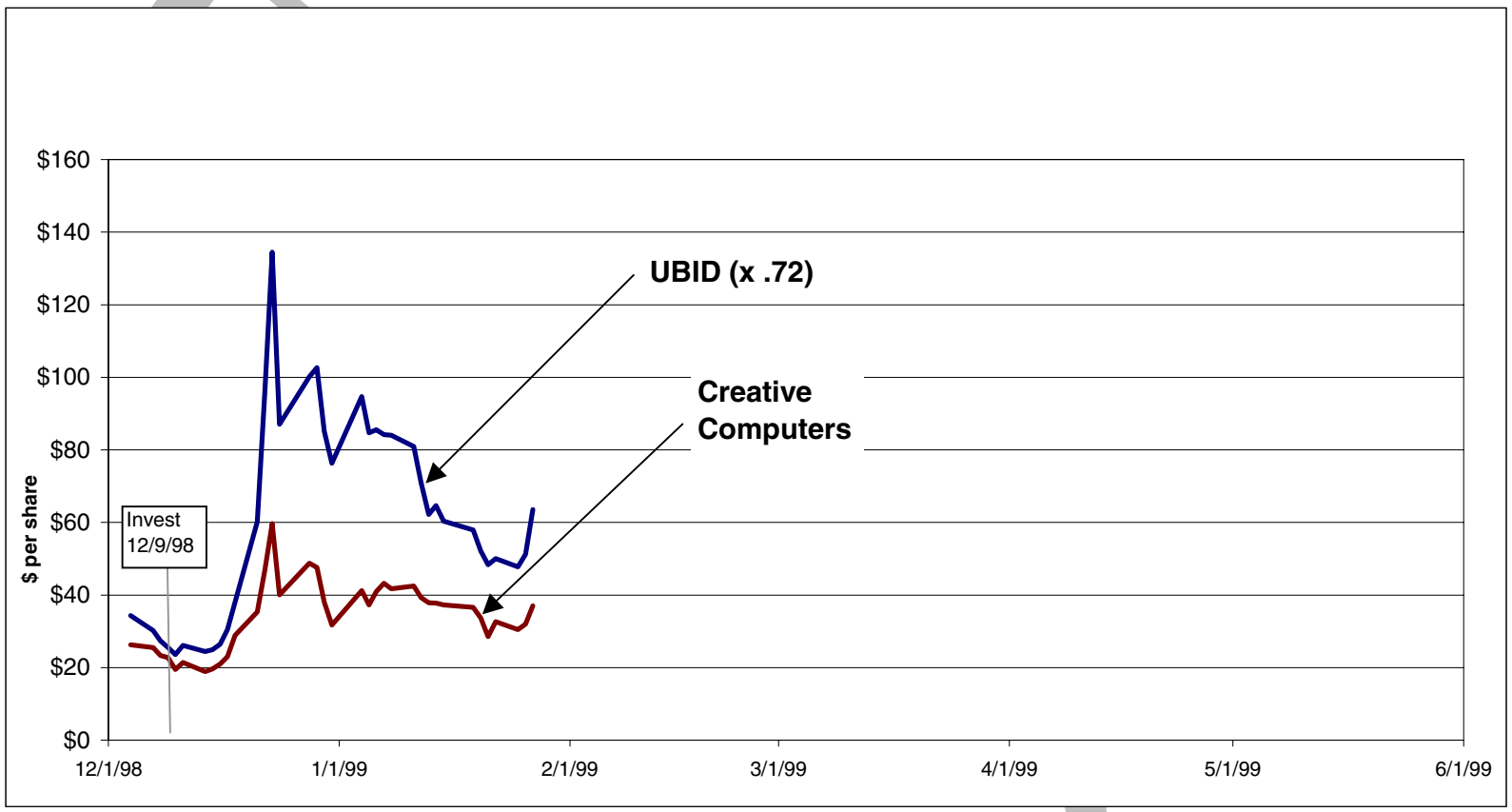

Exhibit TN-12 Investment in Creative Computers and Ubid Terminates with Distribution of Ubid Shares, June 1999