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Does acquisition of a cooperative generate profits for the buyer?

The Dairyworld Case

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Abstract: This article examines the takeover of a cooperative (Dairyworld) by an investor-owned firm (Saputo) that was not previously present in the industry, determines if this takeover generates greater returns for the investor-owned firms (IOF), and on the basis of this evidence makes some inferences about the behavior and performance of cooperatives and IOFs. The empirical evidence strongly supports the conclusion that Saputo's stock price rose with its takeover announcement. This outcome is consistent with a number of explanations, including that Saputo was unaffected by hubris, a factor often suggested as the reason that many firms overbid when they undertake acquisitions. Dairyworld's poor liquidity and capital shortage problems, as well as a limited number of suitors, may have weakened its bargaining position in its dealings with Saputo. The observed increase in Saputo's stock price is also consistent with the possibility that, by taking over a cooperative, Saputo was able to decrease competition and thus increase its profits. A fruitful area for future research would be a rigorous theoretical and empirical determination of the impact that these various factors have on acquisition profitability. Such analysis is required before inferences about the behavior and performance of cooperatives and IOFs can be fully answered.

JEL classifications: G34, L13, L21, L22, Q13

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Introduction

Beginning in 2000, a number of agricultural cooperatives in the United States and Canada underwent fundamental economic restructuring. These restructurings took many forms, including bankruptcy, conversion to investor-owned firms (IOFs), mergers, and the development of new organizational structures such as alliances. While some of these restructurings were the result of poor management, there was also evidence that lack of capital, property right problems and portfolio problems played important roles (Fulton and Hueth 2009).

The conversion of agricultural cooperatives to IOFs provides an opportunity to test the well-established proposition that cooperatives and IOFs behave differently and thus have different impacts on the market. Thus, the purpose of this article is to examine a takeover of a cooperative by an IOF that was not previously present in the industry, to determine if this takeover generates greater profits for the IOF and to use the observed change in IOF profits to make inferences about the behavior of the cooperative and the IOF.

The cooperative in question is Agrifoods International Cooperative Ltd. (or Dairyworld as it was commonly known), an open-membership, dairy-processing cooperative that was acquired by Saputo (a publicly-traded IOF) in 2001. At the time of its acquisition, Dairyworld was Canada's largest dairy cooperative and the second largest dairy processor in the country, conducting business mainly in the fluid milk and cheddar cheese market. Prior to the takeover, Saputo (SAP:TSX) handled mozzarella and imported cheese and crackers, mainly in central Canada and the United States. Saputo was not a player in the fluid milk market.

The methodology used in this paper is a modified prediction-error technique. This method measures the performance of Saputo's stock price before and after the acquisition as the deviation from its predicted value. The observed stock price increase is in contrast to the results from the large literature on corporate control, which concludes that the bidder's shareholders generally do not benefit from a takeover, largely due to overpayment by the buyer. Such a conclusion may not hold, however, if the takeover target is a cooperative.

For instance, if a cooperative promotes competition in a market, then its removal from the market can be expected to result in reduced competition and greater profits for the purchasing firm. In addition, poor financial management and the need to acquire additional capital appear to be linked to cooperative conversions and restructurings (Fulton and Hueth 2009). These factors could also affect the profits earned by IOF.

The rest of the article is organized as follows. The next section presents a brief overview of the takeover of Dairyworld by Saputo. The following two sections survey, respectively, the industrial organization literature on how cooperatives promote competition and the literature on the effect of acquisition on the bidder's stock price. The article then examines the implications of this literature for the Dairyworld case, followed by an empirical examination of the impact that Saputo's acquisition of Dairyworld had on Saputo's share prices. The article concludes with a summary and conclusions.

The Dairyworld Takeover

Dairyworld had its origins in 1992 with the merger of a number of dairy cooperatives in Western Canada. By 1996, Dairyworld was the largest dairy cooperative in Canada and the largest food company west of Ontario. In December 2000, Saputo announced the purchase of the fluid milk and cheese operations of Dairyworld for C\$407 million. Dairyworld still exists as a federal co-op that handles transportation and logistics of raw milk (Fulton and Larson 2009).

At the time of the takeover, Dairyworld was heavily in debt and had been for some time – in 2000, its debt:equity ratio was 6.36, up from 3.61 in 1992. The high level of debt and the rapid increase in the debt:equity ratio were the result of a very aggressive acquisition program in the mid-1990s. Dairyworld made 15 acquisitions during the 1992-1999 period – everything from cheese plants to refrigerated food processors to oils and margarine producers – valued at C\$152 million. As Fulton and Larson (2009) argue, this aggressive acquisition activity was in part a function of hubris and overconfidence on the part of Dairyworld's senior management.

The acquisition program was generally not successful. Starting from 1997, Dairyworld's return on equity (ROE) steadily declined, becoming negative after 2000, while its current ratio was below one for several years before its acquisition. In the beginning of 1997 Dairyworld sold its ice cream products group to Nestlé Canada (but continued to supply dairy ingredients) and in 2000, after the failure of a deal with Parmalat, sold additional assets (Fulton and Larson 2009).

In addition to poor financial results, Dairyworld appeared to have capital constraints. Mr. Wong, the coop's representative, was reported saying that: "We have reached a point where the coop's ability to expand was limited by the structure of the coop" (Globe and Mail, December 19, 2000), and that "In order for the business to remain competitive it needed to expand, maintain a national presence and invest, and members didn't have that kind of money" (Gazette,

December 19, 2000). According to him “The cooperative structure doesn’t give you the capital base to expand infinitely [...] In order to keep pace with the needs of the marketplace, you have to find a way to capitalize yourself to keep growing and by joining Saputo, you have access to that capital.” (Vancouver Sun, December 19, 2000).

At the time of the acquisition, Saputo’s assessment of Dairyworld was favorable regarding Dairyworld’s efficiency, but rather negative for its profitability. Mr. Lisio, Saputo’s president and chief operating officer at the time, acknowledged that Dairyworld was an efficiently run company, but it had a profit margin of only 4.3 per cent, while Saputo had a margin of 13.6 per cent (Globe and Mail, December 19, 2000). One reason for this difference may be the different objectives and priorities that the two organizations had because of their corporate structure (cooperative versus IOF). There is also evidence that the new management placed more emphasis on profits after the acquisition. The day after the official announcement of the takeover, Mr. Lisio was reported saying: “We want to drive down costs and bring out the profitability. This company has great potential.” (Globe and Mail, December 19, 2000).

Dairyworld’s integration started immediately after the acquisition was complete (February 5, 2001) and became a top priority for the new management. As part of its restructuring plan, Saputo proceeded with the closure of three of its 20 cheese plants in Canada. Two of these plants (Yorkton, Sask., and Oakville, Ont.) came with Dairyworld’s acquisition, while Saputo had owned the third plant (Souris, Man.) for several years. Saputo’s vice-president at the time, Mr. Claude Pinard, said that the plant closures were designed to improve efficiencies and did not reflect a drop in demand for Saputo’s products (Dairy Foods 2002). According to Saputo officials, these closures were estimated to result in after-tax costs of about C\$3.8 million and annual after-tax savings of about C\$4 million (Globe and Mail, September 13, 2002).

Saputo’s Interim Report for the fiscal year 2002 (3rd quarter) shows that the restructuring process and the integration of Dairyworld was swift and very successful. The EBITDA margin for Dairyworld activities, which was only 4.3 percent at the time of acquisition, rose to 5.2 percent for the first quarter, 5.9 percent for the second quarter, and climbed to 6.6 percent for the third quarter, thus indicating a steady increase in Dairyworld’s profitability.¹

¹ The EBITDA margin is a reliable indicator of a company’s operative profitability. It is equal to the EBITDA (earnings before interest, tax, depreciation and amortization) divided by total revenue.

The discussion in this section indicates there were a number of factors that could have affected Saputo's profitability after its acquisition of Dairyworld. The reduction in competition that comes with the removal of a cooperative from the market suggests that the market reaction to Saputo's takeover of Dairyworld would be positive. Dairyworld may also have been in a relative weak bargaining position vis-à-vis Saputo. Poor financial performance and a shortage of capital, along with limited competition among bidders and limited asset liquidity, may have reduced Dairyworld's bargaining power as a seller. On the other hand, managerial motives and hubris – which have often been associated with a buyer paying too much for an acquisition – could result in a fall in Saputo's stock price.

The next section examines the competitive role played by cooperatives and the expected impact of removing a cooperative from a market. This section is then followed by an examination of the factors that affect the price that IOF's pay for other firms during takeovers.

Cooperatives and Competition

A long held view in the industrial organization literature is that cooperatives have a pro-competitive role in imperfectly competitive markets. In Dairyworld's case, the pro-competitive effect would be in the raw milk market. In the absence of the cooperative, farmers would receive less for their milk; larger margins would, in turn, lead to greater profits for the dairy processor.

Numerous examples exist of agricultural cooperatives having been formed as a response to market failures or to counterbalance the market power of IOFs. Examples include the dairy cooperative movement in New York in the mid-1800s (Porter and Scully 1987) and the establishment of grain elevator cooperatives in Western Canada in the first decades of the 20th century (Fowke 1957). The idea that cooperatives could provide a pro-competitive impact was introduced by Nourse ([1922] 1992) and became widely known as the competitive yardstick school of thought (Knapp 1979). The underlying hypothesis is that cooperatives provide extra competition that forces IOFs to operate in a more competitive way; cooperatives also provide a measure against which the competitiveness of other firms can be measured (Cotterill 1984, Torgerson, Reynolds and Gray 1998).

Various scholars after Nourse have re-examined theoretically the impact of cooperative involvement and have typically confirmed cooperatives' pro-competitive role in the economy. Helmberger (1964) examined cooperative marketing under different market structures based on

the assumption that the cooperative's objective is to maximize its members' surplus for any given level of raw input. He shows that in general the cooperative has a larger output and pays a higher price than an IOF, and therefore has a beneficial impact on farmers' income and on the competitiveness of the market.

Sexton and Sexton (1987) examine the threat of entry of a cooperative into an industry and illustrate how a potential cooperative entrant can have a pro-competitive effect on market conduct. Sexton (1990) analyzes competition between a cooperative and an IOF in a spatial setting. He demonstrates that farmers will be better off in the presence of an open-membership cooperative compared to a situation where all wholesalers are IOFs. Cotterill (1996) argues that cooperatives can perform as competitive yardsticks for consumers in oligopolistic food industries with differentiated products. He shows that in monopoly and oligopoly settings, open membership cooperatives can play an important role in helping to move output and price closer to those of perfect competition and hence increase overall efficiency in the market.

Albæk and Schultz (1998) present a model of mixed duopoly á la Cournot and illustrate how the organization of a cooperative acts as a commitment device for increased production. In the resulting equilibrium, cooperative members earn more than the farmers supplying the vertically integrated IOF. Karantininis and Zago (2001) show that the presence of a cooperative results in higher aggregate production and lower profits for the processing firms.

Fulton and Giannakas (2001) examine member commitment in a mixed oligopoly and show that when the cooperative maximizes members' welfare the prices charged by the cooperative and the IOF decrease, while consumer welfare is increased. Giannakas and Fulton (2005) show that the presence of a member welfare-maximizing cooperative that replaces a pre-existing IOF can result in an increase in process innovation while reducing the prices of agricultural inputs. Finally, Hoffman and Royer (1997) used simulation analysis to show that the yardstick effect is not universal, but instead is sensitive to market structure and member behavior.

There is little empirical research on the existence and magnitude of cooperatives' pro-competitive effect. Fulton (1989), in an analysis of the fertilizer industry in Western Canada, shows that cooperatives failed to fulfill their pro-competitive role for various reasons, including barriers to entry by an incumbent IOF and information and principal-agent problems. Rogers and Petraglia (1994) examine the yardstick of competition hypothesis using an extended structure-

performance model where cooperative market share was included as a separate variable. The estimation over a number of food manufacturing markets supports the yardstick hypothesis since consumer prices are generally lower in markets with a substantial cooperative presence.

Peterson and Anderson (1996) survey the theoretical strategies typically attributed to cooperatives and compare them with actual strategies identified in interviews with 21 northeastern U.S. agricultural cooperatives. All the cooperative CEOs in their sample claimed to follow a competitive yardstick strategy, arguing that one of their main roles is to introduce competition in a level of the supply chain that might otherwise expose farmers to market power abuse by an IOF; however, the authors agree that these claims alone do not necessarily constitute the adoption of such a strategy.

Factors Affecting Takeover Bids

There is an extensive literature on the price that IOFs pay for target firms in corporate takeovers and acquisitions. In general, the literature indicates that acquisitions are not profitable for the firms making the acquisition if the firm being acquired is publicly traded; in contrast, the acquisition of privately-held firms is profitable. Among the factors that decrease profitability are management hubris and the desire for control, while limited competition, monitoring, and lack of liquidity can increase profitability. Applied to the Dairyworld case, the results of this literature – which are summarized below – suggest a range of factors that could result in Saputo either underpaying or overpaying for Dairyworld.

The initial evidence on the wealth effects of takeovers (i.e., changes in stock price) was presented by Jensen and Ruback (1983), who surveyed 13 studies on mergers and tender offers published from 1977 to 1983. They use pre-1980 stock market data and in general show positive returns for the shareholders of the target firm, negative or zero returns for the shareholders of the bidding firm, and an overall net gain for the combined firms. Jensen and Ruback's review was updated by Jarrell, Brickley and Netter (1988) who summarize the evidence on wealth effects of takeovers made in the 1980s and confirm that while the shareholders of target companies clearly benefit from takeovers, the bidding firms do not.²

² Additional evidence on the impact on target companies is found in Bradley, Desai and Kim (1983), who report that target firm stockholders, on average, receive significant positive abnormal returns with the announcement of a takeover offer. Jarrell and Poulsen (1989) show that the shareholders of target firms over

Subsequent analysis of the returns to the bidding firms after an acquisition proposal have found them to average close to zero and to be even negative for some categories of offers (Jarrell and Poulsen 1989; Andrade, Mitchell, and Stafford 2001). Most of the studies that examine the 1960s and the 1970s show that the gains for the shareholders of the acquiring firm are very small (and frequently statistically insignificant) or even zero; however, other researchers report significant negative abnormal returns over the same period. Jensen (1988) offers a comprehensive review of the available evidence, arguing that on average the shareholders of the acquiring firm earn about four per cent in hostile takeovers and approximately zero in mergers. Jarrell and Poulsen (1989) document the decline in the returns of successful bidders in tender offers over the period from 1963 to 1986. In the 1960s, bidders experienced significant positive abnormal returns of about five per cent; these were reduced to 2.2 per cent in the 1970s and became negative but statistically insignificant in the 1980s. Andrade, Mitchell and Stafford (2001) examine 4,000 mergers during the period 1973-1998 and obtain similar results for their sample.

The returns to the acquiring firms are sensitive to a number of factors. Jarrell and Poulsen (1989) review 663 successful takeovers and show that the size of the target firm (relative to the acquiring firm) and the level of competition for the target have an influence on the acquiring firm's stock price reaction. As the target firm increases in size, the acquiring firm gets a significantly larger appreciation in its stock price, while competition between bidders leads to overpayment and hence diminishes the acquiring firm's stock price. Asquith, Bruner and Mullins (1983) show that the bidding firm's shareholders typically gain from mergers and the observed abnormal returns are positively related to the relative size of the two merging firms. Draper and Paudyal (1999) show that the returns to the shareholders of the bidding firm can also depend on the mode of payment – there is a strong stock market preference for cash-based acquisitions (Hou, Olsson and Robinson 2000; Andrade, Mitchell and Stafford 2001). Travlos (1987) reports the period 1963-1986 received relatively high premiums, while Andrade, Mitchell, and Stafford (2001) report steady target firm returns of 23 to 25 per cent for completed mergers over the 1973-1998 period. The positive effect on the target firm appears to be independent of country. A number of studies report evidence of positive gains to target firms' shareholders for specific countries – Conrad and Niden (1992) for the USA, Cheung and Shum (1993) for Hong Kong, Draper and Paudyal (1999) for the UK, Firth (1997) for New Zealand, Kyriazis and Diacogiannis (2008) for Greece, and Goergen and Ronneboog (2004) for several European countries.

negative abnormal returns for firms financing a takeover with common stock and no abnormal returns for those financing with cash.³ Doukas and Travlos (1988) show that when the bidder is an internationally expanding domestic firm then its shareholders will experience positive returns, while more recently Goergen and Ronneboog (2004) present evidence that the shareholders of the acquiring firm may gain in friendly takeovers but lose in hostile ones. For an overview of the theory and evidence on takeovers, see Romano (1992).

Management considerations

Evidence of negligible or negative returns to acquiring firms in tender offers and mergers leads some researchers to argue that acquisitions are in fact poor investments that are driven by objectives other than the wealth-maximization of the shareholders. According to Roll (1986), managers may pursue an acquisition because of hubris, and hence may overpay for target shares. Brown and Sarma (2007) present evidence that overconfident CEOs are more likely to undertake acquisitions; they also show that CEO dominance is important in explaining the acquisition decision. Malmendier and Tate (2008) show that overconfident CEOs are more likely to overpay for acquisitions and thus to participate in value-destroying activities.

Related to the hubris hypothesis is the empire building hypothesis, which argues that executives undertake merger and acquisition activities in an attempt to increase their own authority and control within corporations or industries (Baumol 1967; Mueller 1969; Lubatkin 1983). Weidenbaum and Vogt (1987) discuss various studies on corporate control and conclude that managers often undertake acquisitions to increase the size of the corporation they control – something that generally implies higher compensation schemes for themselves; at the same time such a strategy limits the ability of their shareholders to monitor their actions. Morck, Shleifer and Vishny (1990) provide evidence that bidding firms systematically overpay when they diversify, when they acquire a rapidly growing target and when their managers had previously performed poorly. Avery, Chevalier and Schaefer (1998) present evidence from the mid-1980s that CEOs may acquire other firms for personal reasons – namely to increase their prestige and reputation in the business community. Blair (1993) presents several studies that examine the acquisition activity in the latter half of the 1980s that was mostly characterized by leveraged

³ More empirical evidence is provided in Wansley, Lane and Yang (1983), Asquith, Bruner and Mullins (1987), and Servaes (1991).

buyouts. Her evidence supports the hypothesis that many managers used excess earnings to inefficiently pursue further takeovers. Several other studies (Odagiri and Hase 1989; Cosh, et al. 1989) refer to empire building as one of the factors driving takeover activity.

Takeovers of privately-held firms

Studies of takeovers of privately-held firms and their impact on the wealth of shareholders are relevant for an examination of cooperatives, since cooperatives share some of the attributes of privately-held firms. On average, bidders that offer common stock for privately held firms experience significantly positive abnormal returns, while bidders that offer cash experience zero or slightly positive abnormal returns (Hansen and Lott 1996; Chang 1998; Ang and Kohers 2001; Fuller, Netter and Stegemoller 2002; Draper and Paudyal 2006; and Faccio, McConnell and Stolin 2006). The negligible or positive abnormal returns earned by bidders for private firms sharply contrasts with the negative or zero abnormal return earned by bidders acquiring a publicly traded target. Several hypotheses have been proposed to explain these differences.

The limited competition hypothesis argues that the takeover market for privately held firms is usually less competitive compared to publicly traded targets (Chang 1998). As a result of this lower competition, it is possible for the bidding firm's stock to experience a positive shock at the time of the announcement of the acquisition since the probability of underpayment is higher.

Chang (1998) suggests the monitoring hypothesis based on the presumption that privately-held target firms are usually controlled by a small group of people.⁴ In cases of a takeover through common stock exchange, this small group automatically transforms to an outside stakeholder group that can serve as an effective monitor of managerial activities (Shleifer and Vishny 1986). Furthermore, in stock offers the small shareholder group of the target firm has a significant incentive to carefully evaluate the bidder's prospects since a significant amount of its stock will come into their possession once the merger is complete. The fact that they are willing to accept shares as compensation is a positive signal to the market for the bidding firm

⁴ Poulsen and Stegemoller (2008) show that the insider ownership prior to the transaction is (on average) over 58 per cent for takeovers of private firms by publicly traded firms (sell-outs) and 67.5 per cent for initial public offerings. Insiders are the officers, or senior executives, and directors of the company.

and therefore may have a positive impact on the bidder's stock. Chang (1998) calls this effect the information hypothesis.

Fuller, Netter and Stegemoller (2002) propose the existence of a liquidity effect. Their argument is that the private targets are in a relatively illiquid market, in the sense that they cannot be acquired and then resold as easily as public firms. It is because of this lack of liquidity that private firms can be less attractive and therefore less valuable than comparably more liquid investments, thus allowing for a liquidity discount in their price. The liquidity effect can also be seen as enhancing the bidder's bargaining power and hence causing underpayment (Draper and Paudyal 2006).

Draper and Paudyal (2006) have also advanced the managerial motive hypothesis. This hypothesis argues that managers exhibiting hubris will most probably target publicly listed firms, since they are generally larger, better known and more prestigious than private firms. Thus the acquisition of a private firm is less likely to be based on self-centric motives and private objectives (status, prestige from controlling a larger company) and more likely to be motivated by real synergies and the management's desire to maximize shareholders' wealth.

Finally, tax considerations and the method of payment can also affect the bidder's abnormal returns. When the bidding firm pays in stock, the owners of the target firm can potentially delay their tax liability and therefore they may be willing to accept a lower price (Fuller, Netter and Stegemoller 2002). In this case the bidder can experience positive returns due to underpayment.

Of course, bidding on private targets can also result in overpayment. For instance, the usually small group that controls a private firm has the discretion to potentially choose the timing of the sale and in some cases even the buyer. This ability to control the terms of sale implies that a private firm may have bargaining power that can allow its owners to receive a better price for their firm and thus result in overpayment by the bidder (Draper and Paudyal 2006).

Application to Dairyworld

The previous sections outlined a number of hypotheses that have been used to understand cooperative behavior and to explain stock price effects in takeovers. The purpose of this section is to apply these theoretical insights to the Dairyworld case. The theoretical perspectives that are

discussed can be divided into two sets – one focusing on the characteristics of the buyer and the other focusing on the characteristics of the seller.

Buyer characteristics – namely managerial motives and hubris – can obviously influence the price paid for an acquisition. According to the managerial motive hypothesis, self-interested managers generally avoid purchasing private firms; instead, they prefer to acquire public firms that are typically characterized by their larger relative size, are more recognizable and hence more prestigious. Dairyworld, while neither a public nor a private firm, was nevertheless a large and well-established company with a wide geographical spread. Therefore, it is possible that its acquisition was influenced by the desire of Saputo's management for greater profile. CEO hubris and overconfidence are also possibilities, as they are with any acquiring firm. However, there is no obvious evidence (e.g., CEO remarks, press releases) at the time of the takeover to suggest that these factors were particularly important in Saputo's takeover of Dairyworld.

Moving to the seller's characteristics, Dairyworld's cooperative nature means that its acquisition by an IOF could lead to less competition in the dairy market. A reduction in competition would, in turn, lead to higher profits for Saputo.

In addition, the monitoring, information, limited competition and limited liquidity hypotheses all potentially apply. As a cooperative, Dairyworld has some of the characteristics of a privately held company (e.g., there are typically no tradable shares). However, the board and membership of a cooperative are quite different in nature than the closed group of trustees that controls the typical private firm described in the literature and therefore Dairyworld's acquisition would not result in the creation of a stakeholder group that would serve as a monitor of managerial activities. In addition, Saputo's offer was in cash and not common shares and therefore did not allow for any information leakage to the market. Therefore, the first two hypotheses – monitoring and information – do not seem applicable for this particular case.

The other two hypotheses in this group – limited competition and limited liquidity – would appear to have more applicability. In both instances, these factors suggest a relatively weak bargaining position for Dairyworld in its negotiations with Saputo.⁵ On the competition side, the lack of a market for Dairyworld shares due to Dairyworld's cooperative status may have limited competition among buyers. Moreover, Dairyworld operated in the oligopolistic dairy-

⁵ Bargaining models have been used to shed light on mergers and acquisitions/takeovers – recent articles include Canoy et al. (2000) on takeovers and Rosenkranz and Weitzel (2006) on mergers.

processing industry where potential bidders were limited to the rest of the domestic players and a small number of multinational corporations. Parmalat was an obvious candidate to offer a bid for Dairyworld, and in fact there was a preliminary agreement between the two firms in 1999. After the failure of these negotiations in 2000, Saputo appears to have been left as the only potential bidder and was therefore possibly in a position to obtain Dairyworld with a relatively low bid.

There is also substantial evidence that liquidity was a factor. Clearly, Dairyworld could not be acquired and then resold as easily as a typical public firm, which in turn increased Saputo's bargaining power. Moreover, the poor financial situation of Dairyworld left it with few options but to sell, thus further enhancing Saputo's bargaining power.

Empirical Analysis

As outlined above, the theoretical literature suggests that Saputo's stock price could potentially rise or fall with the acquisition of Dairyworld, depending on which of the various factors affecting the price paid for Dairyworld are the most prominent. The purpose of this section is to empirically determine whether Saputo's stock price increased or decreased with the purchase of Dairyworld. Using the results of this analysis, the final section of the paper draws some conclusions about the factors at work in the Dairyworld case.

On the day of the acquisition announcement (December 18, 2000), Saputo's stock price rose from C\$33 to C\$36, an increase of 9 percent. To determine if this price increase was a response to the announcement or simply a random change, the analysis in this section uses stock market data to compare Saputo's actual stock price (SAP:TSX) at the time of its acquisition of Dairyworld with an expected stock price. If the actual price is statistically greater than the expected price, then the acquisition of Dairyworld is interpreted as an event that has generated positive returns to Saputo. This methodology is generally referred to as the residual, prediction-error, or event study approach (Campbell, Lo and MacKinlay 1996). Binder (1998) offers a comprehensive review of the development of this methodology.

The analysis is based on the efficient market hypothesis, where the basic assumption is that at any given time stock prices reflect all available information and therefore are accurate in reflecting the collective beliefs of investors about future prospects of a particular firm (Campbell, Lo and MacKinlay 1996). The market efficiency assumption implies that the new information

from the acquisition is quickly incorporated into a firm's stock price that in turn accurately predicts investors' beliefs about the impact of the acquisition.

A standard event study examines the impact of an announcement on a set of securities that comprise the analysis sample. Typically this sample consists of securities representing firms that it is expected will be affected by the announcement or are active in the examined market. For instance, a sample could include the firms of a whole sector or the close competitors of the firm under examination (Campbell, Lo and MacKinlay 1996; Binder 1998). In the examined case there were only three firms in the Canadian dairy sector that could potentially comprise an event study sample: Dairyworld, Québec's Agropur and Parmalat Canada (Belhadji, Gagné and Roy 2000; McNeill and Daoust 2003). The first two were producer-owned cooperatives with no tradable shares, while Parmalat Canada was the subsidiary of Parmalat Finanziaria SpA (PLT:MI) listed on the Milan stock exchange. Therefore there is no clear way to produce a comprehensive sample; thus the rest of the analysis follows a modified prediction-error approach that focuses exclusively on Saputo's stock.

To conduct the modified prediction-error analysis, two pieces of information are needed: historical stock prices for Saputo and the exact date when the market learned about the acquisition. The historical stock prices are provided by the Canadian Financial Markets Research Centre Database (CFMRC/TSX) via the Computing in the Humanities and Social Sciences Data Centre (CHASS) at the University of Toronto. These data include daily opening and closing prices for Saputo's stock, its daily returns and the daily volume.

Finding the correct date of the first public announcement of the acquisition is critical since, under the semi-strong form of the efficient market hypothesis, the impact of the acquisition on the value of Saputo would occur on the announcement day. Historically, the *Wall Street Journal Index* and *Lexis-Nexis* have been popular sources for announcement dates. The present study relies on the *Canadian Business & Current Affairs Databases* (CBCA Complete) that focus on Canadian content and provide a wide collection of full-text databases covering news, business, and legal research. Following other studies of this sort, the present analysis relies on the official announcement of the agreement and not on rumors or hearsay that may precede this announcement. The examined announcements are generally in the form of press releases from Saputo's management.

This section examines the null hypothesis, H_0 , that the event under examination has no impact on the behavior of Saputo's returns. Fama et al. (1969) were the first to introduce a technique to identify the impact of a specific event on a security's rate of return. Their technique attempts to remove any market influences from the rate of return of a security over the event time period. This approach results in an adjusted rate of return of the security that represents the impact of the event under examination (Campbell, Lo and MacKinlay 1996; Kothari and Warner 2007).

The literature offers a number of models to provide this kind of adjustment and thus quantify the impact of the event on the security. The simplest is the constant mean returns model:

$$(1) \quad R_t = \mu_t + \zeta_t$$

The variable R_t is the return on the security in period t , μ_t is the mean return on the examined asset and ζ_t is the disturbance term, with $E(\zeta_t) = 0$ and $\text{var}(\zeta_t) = \sigma_{\zeta_t}^2$ (MacKinlay 1997). Brown and Warner (1980, 1985) show that although simple, this model provides robust results that are similar to those generated by more elaborate and sophisticated models.⁶

The model used in this paper is a variant of the model in equation (1); it assumes that the rate of return of a security over a period of time is generated as follows:

$$(2) \quad R_t = \alpha + \beta RM_t + \varepsilon_t$$

⁶ Other statistical models include factor models that incorporate portfolios of traded securities in the regression and multifactor models that include industry indexes (MacKinlay 1995, 1997). The capital asset pricing model (CAPM) (Sharpe 1964; Lintner 1965) and the arbitrage pricing theory (APT) (Ross 1976) were popular in studies in the 1970s. In CAPM the expected stock return is determined by its covariance with the market portfolio; in the APT, the stock return is assumed to be a linear combination of various market risk factors. More recent studies, however, have questioned the validity of these models arguing that the results they generate may be sensitive to model restrictions (Fama and French 1996; MacKinlay 1997; Kothari and Warner 2007). This sensitivity can be potentially removed by applying the market model that is used for the rest of this analysis (MacKinlay 1997).

where R_t and RM_t are the period t returns on the security under examination and the market portfolio, respectively, and ε_t is the stochastic error term with $E(\varepsilon_t) = 0$ and $\text{var}(\varepsilon_t) = \sigma_\varepsilon^2$. The parameters of interest are α , β and σ_ε^2 .

A broad based stock index is used for the market portfolio, RM_t , with the CRSP Equal Weighted Index and the S&P 500 Index being the most popular choices. This study uses the CFMRC Equal Weighted Index (CFMRCeq) as a proxy for the market portfolio; this index is defined as the average daily return (fully adjusted for distributions) for all domestic common equities in the CFMRC database. This index is calculated as the sum of all defined common equity returns divided by the number of valid equity returns (only for Canadian based firms). The fully adjusted daily return R_t for Saputo is calculated by the CFMRC database as follows:

$R_t = [(P_t + D_t)S_t - P_{t-1}] / P_{t-1}$, where P_t is today's closing price, D_t is the cash or cash equivalent dividend (in \$) paid today (ex-dividend date) and S_t is the stock split factor for a stock dividend or split today. Figure 1 shows Saputo's returns and the CFMRCeq index over the four month period surrounding the event. The dashed vertical line marks the day of the acquisition announcement.

To carry out the analysis it is necessary to specify a length of the observation interval, an estimation window and an event window. The observation interval is set to one day; thus daily stock returns are used. The estimation period (period T_0 to T_1 in Figure 2) is set to 120 trading days prior to the event window and covers the period June 23, 2000 to December 14, 2000. A three-day event window (period T_1 to T_2 in Figure 2) is employed, comprised of one day before the event, the event day, and one day after the event.

The analysis is based on an ARMA (1,1) best-fit model that is estimated using data in the period T_0 to T_1 (see Table 1 for the regression results). Two dummy variables were included to account for the dividend announcement and the dividend calculation that took place on August 2, 2000 and August 18, 2000, respectively.

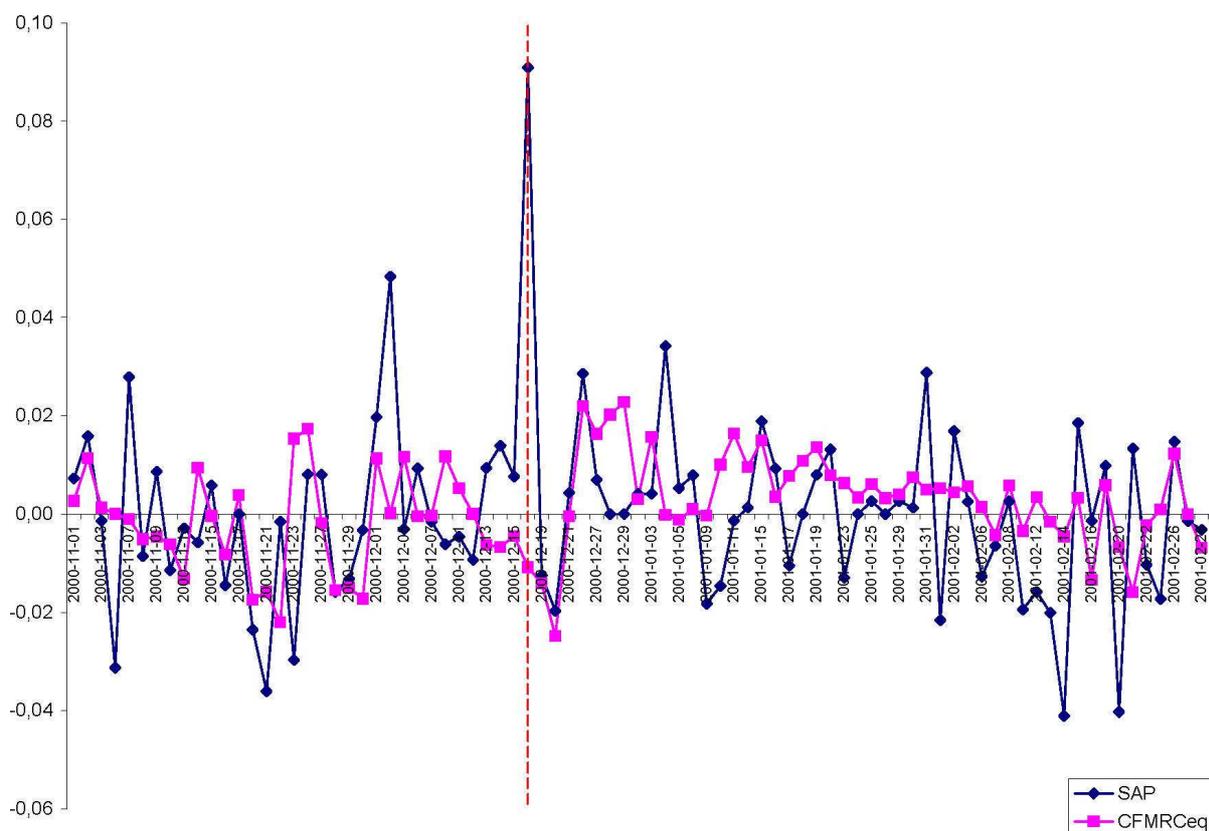


Figure 1. Saputo's return and CFMRCEq, November 2000 – February 2001.

Source: Canadian Financial Markets Research Centre Database (CFMRC/TSX).

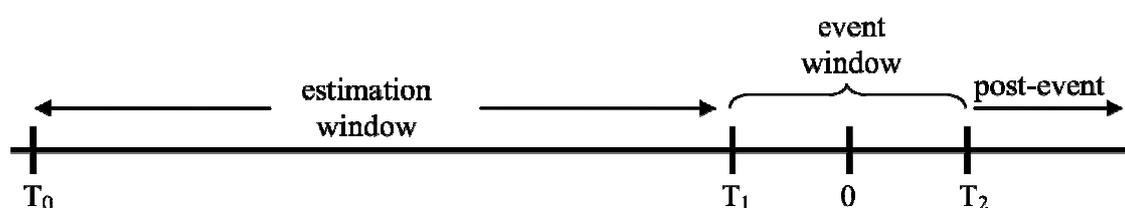


Figure 2 Time line for the market model.

Let AR_τ with $T_1 < \tau < T_2$ be the firm's abnormal returns during the event window. Using the market model to estimate the normal return, the sample abnormal return is the disturbance term calculated on an out-of-sample basis:

$$(3) \quad AR_\tau = R_\tau - \hat{\alpha} - \hat{\beta}RM_\tau$$

where $\hat{\alpha}$ and $\hat{\beta}$ are the estimated market model coefficients from equation (2). Under the null hypothesis, H_0 , the distribution of the abnormal returns (conditional on the event window) is assumed to be normal, with zero conditional mean and conditional variance $\sigma^2(AR_\tau)$; asymptotically $\sigma^2(AR_\tau) = \sigma_\varepsilon^2$ while the abnormal return observations become independent through time (MacKinlay 1997). Thus, under the null hypothesis that the examined event has no impact on the mean and variance of stock returns, the distribution of the sample abnormal return in the event window is $AR_\tau \sim N(0, \sigma^2(AR_\tau))$.

The abnormal returns are usually aggregated in order to draw overall inferences for the event under examination (MacKinlay 1997). For $T_1 < \tau_1 \leq \tau_2 \leq T_2$, let CAR be the cumulative abnormal returns:

$$(4) \quad CAR_{\tau_1, \tau_2} = \sum_{\tau=\tau_1}^{\tau_2} AR_\tau$$

Table 1 Estimation results for the market model

Variable	Coefficient	Std. Error
RM	0.519	0.216
DUMMY _A	0.056	0.019
DUMMY _B	0.133	0.019
AR(1)	-0.832	0.131
MA(1)	0.665	0.178
Intercept	-0.001	0.002
Included observations: 119		
Adj. $R^2 = 0.39$		
Convergence achieved after 13 iterations		
MA Backcast: 375		
Inverted AR Roots -0.83		
Inverted MA Roots -0.67		

For a relatively large estimation window CAR 's variance is $\sigma^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\sigma_\varepsilon^2$. Under the null hypothesis, H_0 , the distribution of the sample cumulative abnormal returns in the event window is then $CAR_{\tau_1, \tau_2} \sim N(0, \sigma^2(\tau_1, \tau_2))$ (MacKinlay 1997).

Using the market model estimated in Table 1, the abnormal returns (AR) and the cumulative abnormal returns (CAR) for Saputo are first estimated over the forty-day period centered on the event date (Figure 3). Abnormal returns are generally small in magnitude and randomly distributed during the 20 days leading up to the event date. The proportion of negative ARs is 50 percent and almost all pre-event CARs are negative; the mean AR and CAR over the event window are 0.0348501 and 0.0749043, respectively.

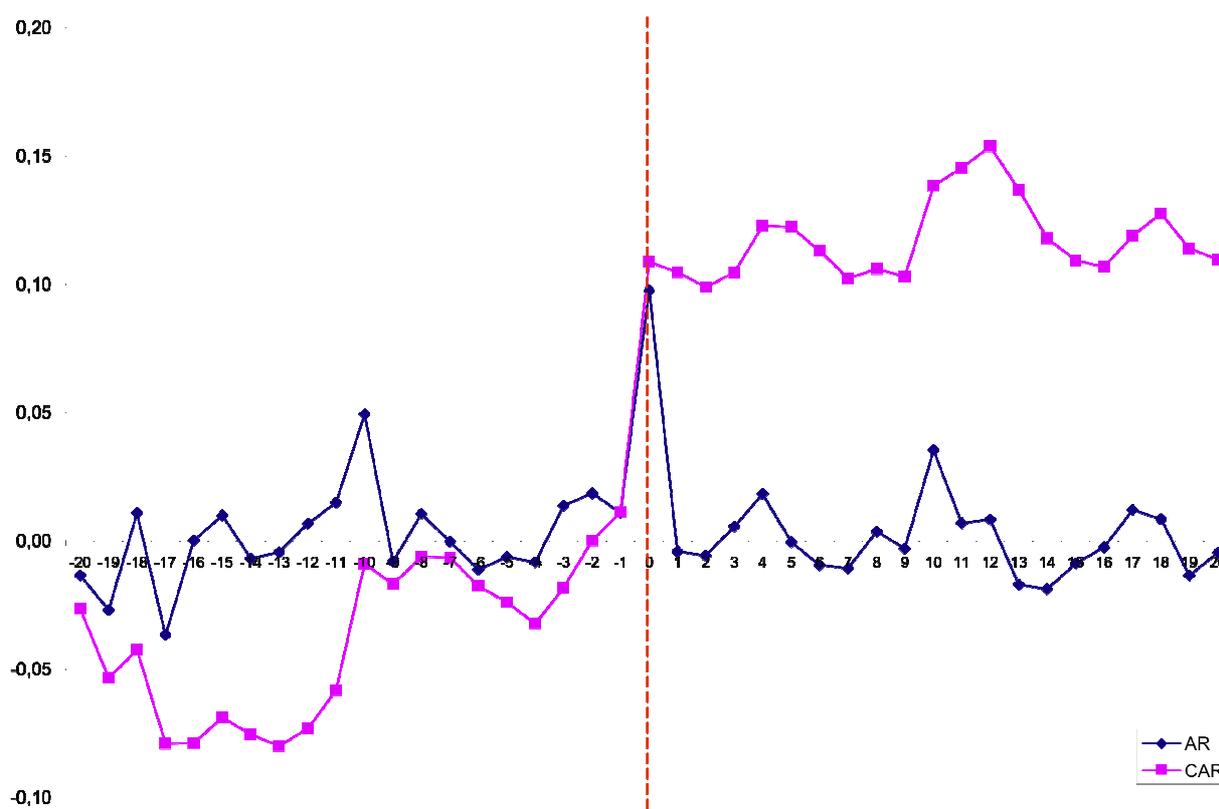


Figure 3 AR and CAR twenty days around the acquisition day

The standard test statistics used to examine if the abnormal returns are statistically significant over the examined event window are based on the normality assumption that is associated with large samples (McWilliams and Siegel 1997). In addition, the expected non-normality of ε (due to the non normality and asymmetry of daily stock returns) can affect the efficiency and strength of the usual hypotheses tests (Fama 1976; Brooks 2002). More recent studies indicate that the non-normality problems associated with the daily stock returns may persist even in large samples (Corrado and Zivney 1992; Peiro 2002; Brooks 2002; Bai et al.

2004). Given the small sample in this analysis, the normal test statistics were not used. Instead, a bootstrap technique was used since it does not require any assumption about the underlying distribution (Barclay and Litzenberger 1988).⁷

The bootstrap procedure involves choosing random samples with replacement from the data set and analyzing each sample separately. Sampling with replacement means that a particular data point from the original data set may appear multiple times in a given bootstrap sample. The number of elements in each bootstrap sample equals the number of elements in the original data set. The range of sample estimates allows the calculation of the bootstrap distribution. The latter gives information about the shape, center, and spread of the sampling distribution of the statistic and hence enables one to establish the distribution of the parameter under estimation. The bootstrap technique is described in Efron and Tibshirani (1993), Zoubir (1993), and Zoubir and Boashash (1998).

The AR and CAR series are examined using the bootstrap procedure (subscript b denotes bootstrap results). The bootstrap analysis is applied over the last 120 trading days before the announcement – i.e., from June 23, 2000 to December 14, 2000. The 95 percent and 99 percent confidence intervals for the AR_b mean are calculated as (-0.00338, 0.00360) and (-0.00446, 0.00476), respectively, and thus H_0 is rejected (Figure 4 shows the empirical distribution for the AR_b mean). Similar analysis results in the bootstrap distribution for the CAR_b mean (see Figure 5); the 95 percent and 99 percent confidence intervals for the CAR_b mean are calculated as (-0.00478, 0.00778) and (-0.00709, 0.00958) respectively, and thus H_0 is again rejected.

Thus, the prediction-error analysis rejects the hypothesis that the event under examination had no impact on bidder's returns. Instead, the statistical evidence indicates that there was a positive effect on Saputo's stock at the time of the announcement of Dairyworld's takeover.

⁷ Bootstrapping is a nonparametric approach that can be employed to obtain standard errors of estimates when the population distribution is not known. This approach relies on the assumption that the original sample represents the population and the distribution function can be estimated by undertaking a large number of draws with replacement. The empirically estimated sample distribution will then represent the true distribution of the population (Mooney and Duval 1993).

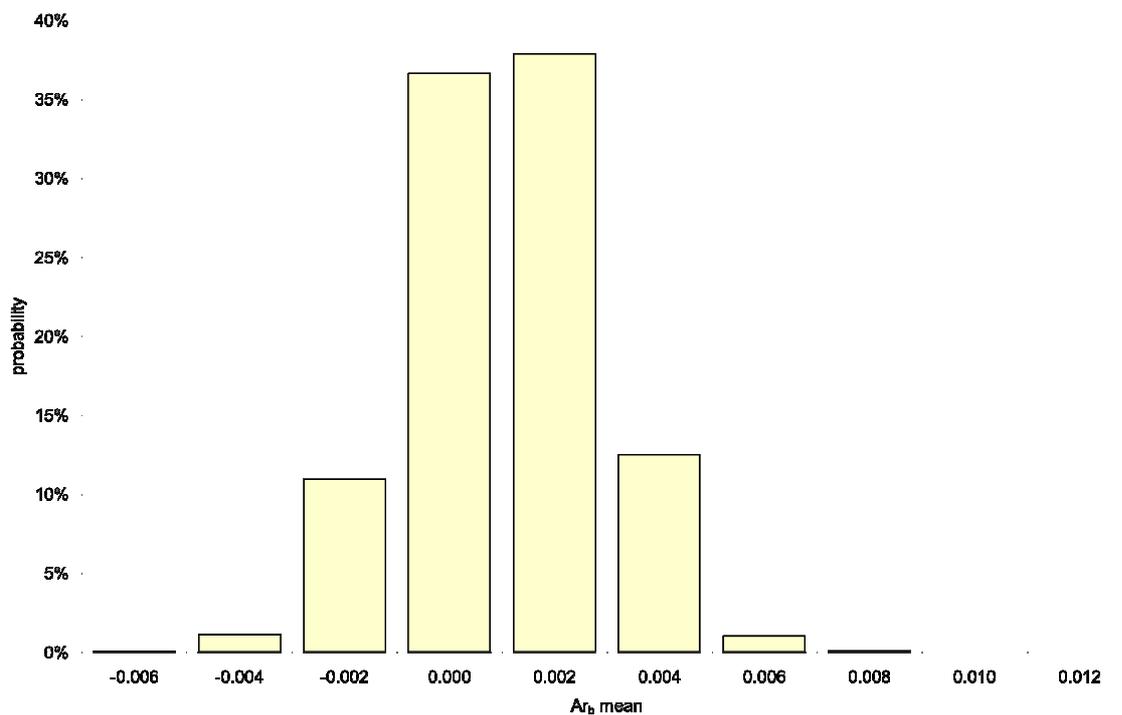


Figure 4 The bootstrap distribution for the AR_b mean.

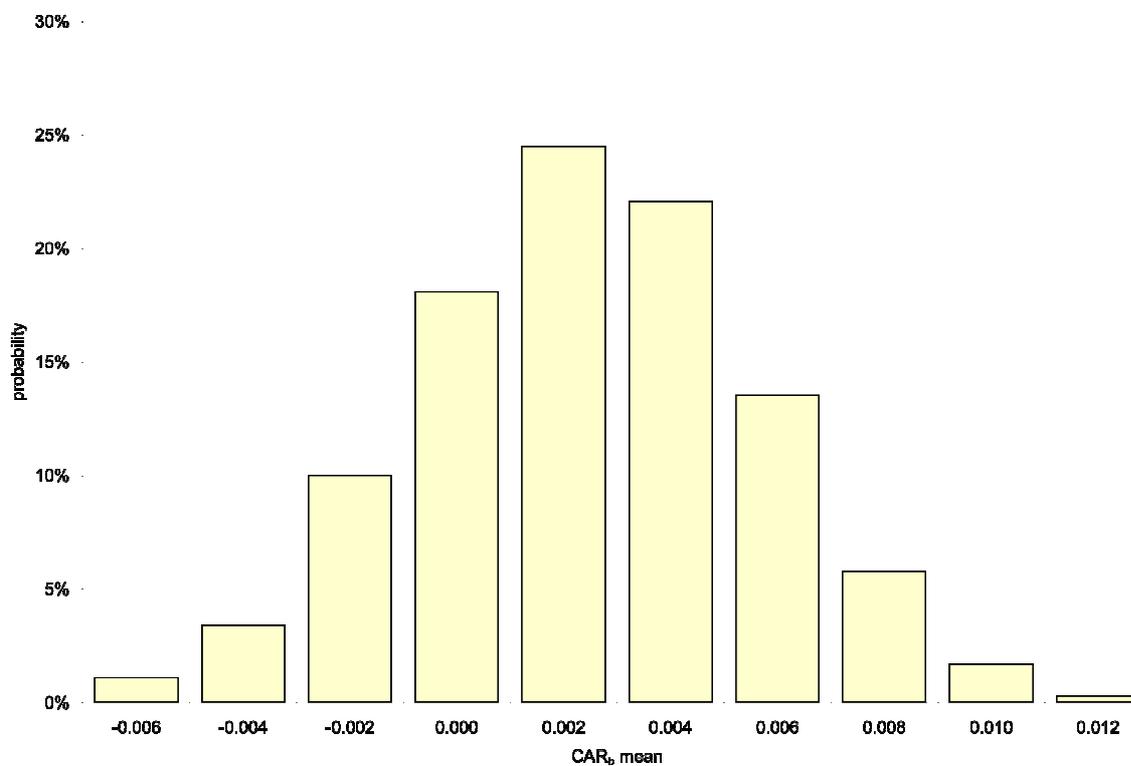


Figure 5 The bootstrap distribution for the CAR_b mean.

Discussion and Concluding Remarks

The empirical evidence presented above strongly supports the conclusion that Saputo's stock price rose with Saputo's announcement of its takeover of Dairyworld. This outcome could be the result of a number of factors. For instance, it is tempting to conclude that Saputo appears to have been unaffected by overconfidence and hubris, behavioral factors that are often suggested as the reason that many firms overbid when they undertake acquisitions and takeovers. However, although Saputo appears not to have overbid, it cannot be concluded necessarily that hubris was not a factor; hubris could have been present, albeit offset by other factors.

Two of these factors are ones that affect Dairyworld's behavior. The short case study history provided in the paper suggests that Dairyworld's poor liquidity and capital shortage problems, as well as a limited number of suitors, weakened its bargaining position in its dealings with Saputo. Interestingly, Dairyworld's over expansion, caused by its own hubris and overconfidence, may have contributed to this weaker bargaining position.

The observed increase in Saputo's stock price is also consistent with the possibility that, by taking over a cooperative, Saputo was able to decrease competition and thus increase its profits. Evidence from the case study history cannot rule out this possibility, since Saputo moved to consolidate its holdings and operations after its takeover of Dairyworld.

While it is not possible to identify a single factor that was responsible for Saputo's stock price increase when it acquired Dairyworld, the analysis indicates that the takeover of a cooperative by an IOF is more likely to have a positive impact on the IOF's stock price than the takeover of an IOF by another IOF. One reason is that a cooperative may appear less attractive to managers wishing to build empires and increase their prestige and reputation in the business community; the result is that bidding firms are less influenced by managerial objectives and hubris/overconfidence and thus more likely to make profitable investments.

The cooperative literature suggests that there may be other reasons as well. As the yardstick of competition hypothesis suggests, if cooperatives are maximizing member welfare, then their takeover by an IOF would lessen competition and result in greater IOF profitability. As well, the cooperative structure can result in limited liquidity, a smaller number of purchasers, and a shortage of capital, all of which give greater bargaining power to the IOF.

For IOF managers that are not motivated by hubris and other related managerial objectives, the acquisition of a cooperative can thus be an astute business move. The consequence is that cooperatives would appear to make highly desirable takeover targets for IOFs. This desirability may be one of the reasons for the acquisitions that have occurred among North American agricultural cooperatives during the last decade.

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