Cranfield University

Luis Coelho

Are Markets Efficient?
The Extreme Case of Corporate Bankruptcy
- A Systematic Review

School of Management

MRes Dissertation

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Luis Coelho

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Supervisor: Professor Richard Taffler

31 August 2005

This thesis is submitted in partial fulfilment of the requirements for the Degree of Master of Research in Management Research

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To my niece, Margarida

Abstract

Fama (1970) presents the classical definition of an efficient market: in such a market, prices always reflect all available information. Recently, behavioural finance has emerged as an alternative theoretical framework to the traditional paradigm. This new approach is based on the idea that not all investors are rational and that rational investors face *limits to arbitrage*.

The market's reaction to corporate bankruptcy announcements is a privileged context within which to explore the conflicting predictions of these two competing theoretical frameworks. In fact, existing research does not provide clear guidance on this issue. Some studies suggest that the market is efficient in the event of corporate failure (e.g. Clark and Weinstein, 1983; Morse and Shaw, 1988; Elayan and Maris, 1991) while others conclude that the market is highly inefficient when dealing with extreme bad news (e.g. Katz et al, 1985; Eberhart et al, 1999; Indro et al, 1999).

This study resorts to the systematic literature review methodology to organize a survey on the existing literature that analyses the market's reaction to corporate bankruptcy announcements. The purpose of the review is to identify suitable research gaps that can be explored at a PhD level. A brief overview of the thematic under analysis is presented in the first part of the study. Subsequently, a detailed analysis of the systematic literature review methodology is provided, including both the search strategy employed and the different selection criteria used. The last part presents the results. These suggest that the area under analysis has received considerable attention from the finance academic community but some interesting research questions still remain unsettled, providing the context for future research in the field.

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1. Introduction

One of the dominant themes in the finance academic literature since the 1960s has been the concept of an efficient capital market. Although the term *efficient market* has been used to denote different phenomena at different times, finance scholars have given it a very specific meaning (Elton and Gruber, 1995). In fact, when someone refers to efficient capital markets they mean that *security prices fully reflect all available information* (Elton and Gruber, 1995; Blake, 2001; Lofthouse, 2001). This classical definition of an efficient market was presented for the first time in Fama (1970) and it sets the stage for the Efficient Market Hypothesis (EMH).[1] After the publication of this seminal work, several other theoretical and empirical contributions were made in this domain and the EMH became the central proposition of finance (Shleifer, 2000).

Recently, a new generation of financial economists has developed a different theoretical approach to explain how financial markets work (Shleifer, 2000; Montier, 2002; Shefrin, 2002; Barberis and Thaler, 2003). This new approach is known as behavioural finance and it sharply contrasts with the traditional EMH paradigm. In fact, this new framework suggests that any asset can systematically be traded in the market at a price that differs from its fundamental value[2] and that such deviation can persist for long periods of time (Shleifer, 2000; Lo and MacKinlay, 2002; Shefrin, 2002 and Barberis and Thaler, 2003). Not surprisingly, EMH proponents heavily criticized behavioural finance in the early years of its development[3] and many academics foresaw its quick end (Thaler, 1999). However, the increasing number of empirical studies published in finance journals documenting persistent cross-sectional and time series patterns in returns that are not predicted by the EMH fuelled the interest of the academic community on behavioural finance (e.g., Shiller, 1981; De Bondt and Thaler, 1985; Harris and Gurel, 1986; Shleifer, 1986 and Jegadeesh and Titman, 1993). These empirical results were initially classified as *anomalies* (Hawawini and Keim, 1995). Nowadays they constitute the most relevant empirical challenge to the EMH.[4]

---

[1] According to Blake (2001) there are several levels of economic efficiency. A market is said to be allocatively efficient if the highest bidder for any given (scarce) resource gets to use it. A market is said to be operationally efficient when the transaction costs of operating in that market are determined competitively. Finally, a market is said to be informationally efficient if the current price of any given asset traded in the market instantaneously and fully reflects all relevant available information. If a market is simultaneously allocatively, operationally and informationally efficient it is said to be perfectly efficient (Blake, 2001).

[2] Technically speaking, this means that the price of any given asset (security) traded in the market will be equal to the net present value of its future cash flows, discounted at the appropriate risk rate (Elton and Gruber, 1995; Haugen, 2001).

[3] Actually, behavioural finance is still a controversial subject in the finance literature (e.g., Fama, 1998; Thaler, 2005). Nevertheless, the development of a theoretical body of literature explaining the market pricing from this new perspective and the abundance of empirical results challenging the EMH predictions facilitated its definitive implementation in the field. Today, behavioural finance is taught in major universities around the world and is the basic framework within which several respectable finance academics develop their work (Shleifer, 2000).

[4] Schwert (2004) offers an associated definition of an anomaly: anomalies are empirical results that seem to be inconsistent with maintained theories of asset pricing. This is important since testing the EMH directly is not possible

The market's reaction to corporate bankruptcy announcements provides a particularly interesting area to test the accuracy of both the EMH and behavioural finance predictions. Existing research does not provide clear guidance on this issue. Some studies support the traditional position (e.g. Clark and Weinstein, 1983; Morse and Shaw, 1988; Elayan and Maris, 1991) while others conclude that the market is highly inefficient when dealing with extreme bad news (e.g. Katz et al, 1985; Eberhart et al, 1999; Indro et al, 1999). In this context, I would argue that a deeper understanding of this particular research domain might enhance our understanding about the way markets react to acute bad news, particularly the role that behavioural biases play on the pricing of distressed companies' market equity. In a more general perspective, it is expected that this research effort will shed further light on the debate between efficient market hypothesis proponents and behavioural finance economists.

There are several ways to conduct a literature review. In this study, I argue that the systematic literature review methodology produces results superior to those delivered by the traditional approach. Drawing on this argument, this methodology is used in the present study to review existing literature on the market's reaction to corporate bankruptcy announcements. The objective is to identify a suitable research field within which to conduct future doctoral research.

The study proceeds as follows. Chapter 2 presents the results of an initial scoping study undertaken in the area under analysis. A particular emphasis is given to the theoretical framework of both the EMH and behavioural finance. This chapter also presents some preliminary evidence supporting both competing theories in the context under review. Chapter 3 describes the methodology of the systematic literature review in detail. The first part of the chapter justifies the appropriateness of this methodology to undertake the current literature review. The subsequent parts of the chapter describe, in detail, the actual search strategy employed. Chapter 4 presents the findings. It is divided in two parts. The first summarizes the overall results achieved through the search strategy designed for this study. The second synthesises all the contributions provided by the papers that were identified as being relevant for the development of future research. Chapter 5 details the author's learning experience. Chapter 6 concludes.

because of the joint hypothesis problem (Fama, 1970). However, Schwert (2004) does acknowledge that the existence of anomalies indicates that markets are not efficient in the traditional sense.

2. Theoretical Background

This chapter is divided in four parts. The first presents the concept of bankruptcy and offers a brief overview of how the U.S. legal system related to bankruptcy evolved through time. The second part describes the theoretical frameworks of both the EMH and behavioural finance. The main characteristics of these competing theories are summarised. The third part discusses the implications of the EMH and behavioural finance to the empirical research on corporate bankruptcy announcements. A brief overview of the empirical evidence available on this issue is also provided at the end of this part. Finally, the main ideas developed in the chapter are summarized and the rationale for the systematic literature review's development is provided.

2.1 Bankruptcy and bankruptcy law [5]

There is an astonishing difference between the ancient Roman concept of bankruptcy and the current textbook definition of the same event. In medieval Italy, when a businessman did not pay his debts, it was the practice to destroy his trading bench. From the Italian for broken bench, *"banca rotta"*, comes the term bankruptcy. Nowadays, Damodaran (2001), one of the leading corporate finance textbooks in the U.S., defines corporate bankruptcy in the following way: *"a firm is bankrupt when it is unable to meet its contractual commitments"*. What factors motivate such an acute difference?

Bankruptcy law can be traced as far back as 118 B.C. to a crude form of liquidation in Roman law. Under this law, the entire estate of a debtor was sold in one lump sale to a single buyer, who would then pay creditors a percentage of what was owed. Interestingly, the debtor continued to be responsible for any remaining debt and failure to repay it in a fairly quick order would dictate one of four possible fates: imprisonment, enslavement, exile or even death (Delaney, 1998). Following the spirit of the ancient Roman law, rules and practices concerning bankruptcy before the 20th century generally favoured the creditor and were very harsh toward the bankrupt. At that time, the focus was on recovering the investments of the creditors and not to concede a second chance to debtors. The first official laws concerning bankruptcy in England, passed on 1542 under Henry VIII, provide an example of this state of affairs. In fact, these laws posited that a bankrupt individual should be considered a criminal and thus he or she must be subjected to criminal punishment, which ranged from incarceration to death penalty.

In the U.S., early federal bankruptcy laws were temporary responses to bad economic conditions. The first official bankruptcy law was enacted in 1800 in response to land

[5] The contents of this section were greatly enriched with the information available at the New Generation Research, Inc. website.

speculation, being repealed in 1803. Similarly, in 1841, in response to the panic of 1837, the second bankruptcy law was passed, being revoked in late 1843. The economic turmoil of the Civil War caused Congress to pass another bankruptcy law in 1867. That law was repealed in 1878. All these laws shared a common characteristic: to some extent, they all allowed the discharge of unpaid debts. In particular, the laws of 1800 and 1841 authorized only minimal discharge of debt while the 1867 law included, for the first time in the U.S. legal system, some degree of protection for corporations.

In line with the aims and objectives of the 1867 law, modern bankruptcy rules and practices in the U.S. emphasize the notion that debtors in distress should be granted the possibility to reorganize. The Bankruptcy Act of 1898 pioneered the idea of providing companies in distress with the option of being protected from creditors by introducing the concept of *"equity receivership"*. This reorganization provision was made much more formal and extensive in that country during the 1930s. In fact, the extremely negative economic and social effects of the Great Depression fuelled the production of a high volume of bankruptcy legislation. In only two years, two major contributions were made in this domain: the Bankruptcy Act of 1933 and the Bankruptcy Act of 1934. This legislation culminated with the Chandler Act of 1938, which included substantial provisions for business' reorganization. The advent of World War II cooled the interest of U.S. legal experts in corporate bankruptcy, a situation that continued until the 1970s. During this timeframe, bankruptcy was not a hot topic in the news.

The Bankruptcy Reform Act of 1978 was passed in 1978 and took effect on October 1, 1979. This act substantially renovated bankruptcy practices, making it easier for both businesses and individuals to file bankruptcy and reorganize. Under the new law, Chapters X, XI and XII were consolidated into a single Chapter 11 and a new chapter, Chapter 7, was introduced.[6,7] The major difference between these legal structures is that firms filing for Chapter 7 are immediately liquidated while firms filing for Chapter 11 are granted the possibility to continue operating at the same time as devising their own reorganisation plan (Grinblatt and Titman, 2002).[8] This new act also changed the way managers could act during the bankruptcy period (Delaney, 1998). Under the old Chapter X, management had to prove the court that it should remain in control of the company. Chapter 11 introduced the concept of *trustee*, who is appointed to oversee the company during the reorganization process. Interestingly, in sharp contrast with Chapter X, Chapter 11 automatically authorizes current management to continue in control of the company, unless there is *"a showing that a trustee is necessary to preserve the*

[6] According to the legal convention, Roman numerals should be used for chapters under the 1898 Bankruptcy Act and Arabic numerals for chapters under the 1978 Bankruptcy Reform Act (Delaney, 1998).
[7] This Act also introduced a personal bankruptcy code, Chapter 13, which replaced the old Chapter XIII introduced by the 1898 Act.
[8] Almost all bankruptcies of large companies start out as Chapter 11 bankruptcies (Grinblatt and Titman, 2002). Some of them eventually turn into a Chapter 7 bankruptcy if the various claimants fail to agree on the reorganization plan (Grinblatt and Titman, 2002).

property of the estate or prevent loss to the estate" (Delaney, 1998). This new law also reduced the role of the bankruptcy judge whist elevating the role of the creditors' committee (Delaney, 1998).

Contrary to prior expectations, following the implementation of the 1978 Act, there was an increase in the number of bankruptcy filings. It is particular noteworthy the fact that, between the 1980s and early 1990s, many well-known companies filed for bankruptcy, primarily Chapter 11 reorganization. Included were LTV, Eastern Airlines, Texaco, Continental Airlines, Federated Department Stores, Greyhound and Pan Am. These massive bankruptcies created a challenge for the U.S. legal system, namely the possibility of Chapter 11 being used for strategic reason instead of financial motivations, which is yet to be resolved (Delaney, 1998).

The last major modification in the U.S. legal system concerning corporate bankruptcy was the introduction of the Bankruptcy Reform Act of 1994.[9] This is the most comprehensive piece of bankruptcy legislation since the 1978 Act and was signed into law by President Clinton on October 22, 1994. The 1994 Act contains many provisions, for both business and consumer bankruptcy, including: 1) provisions to expedite bankruptcy proceedings; 2) provisions to encourage individual debtors to use Chapter 13 to reschedule their debts rather than use Chapter 7 to liquidate; 3) provisions to aid creditors in recovering claims against bankrupt estates; 4) creation of a National Bankruptcy Commission to investigate further changes in bankruptcy law, among others.

The previous paragraphs suggest that corporate bankruptcy plays a fundamental role in a country's economic performance. The continuous evolution of the U.S. legal system concerning bankruptcy, which results from an increasingly challenging economic and social context, provides evidence in favour of this argument. This fact partially explains the interest of the finance academic community in this domain. The next section presents two competing theoretical frameworks that are currently used to explore several bankruptcy-related issues in finance literature.

2.2 The efficient market hypothesis and behavioural finance

Corporate bankruptcy is a theme frequently addressed in finance journals. A particularly interesting setting for understanding some of the debates in this context is that of the competing theoretical frameworks of the EMH and behavioural finance. These approaches differ in their assumptions about human behaviour. The classical framework assumes that investors are rational. EMH proponents also argue that even if not all investors are rational, the existence of some rational investors (*sophisticated* or *smart investors*) and the use of the arbitrage

[9] Public Law 103-394, on October 22, 1994.

mechanism will ensure that securities' prices, on average, reflect their fundamental value. In contrast, drawing on previous knowledge from psychology, behavioural finance proponents argue that investors are not *fully* rational. Moreover, behavioural theorists suggest that sophisticated investors cannot force markets back to fundamental values if prices go out of line since there are *limits to arbitrage*. The next sub-section presents an overview of these competing frameworks.

2.2.1 Efficient market hypothesis: theoretical foundations

Prior to the 1950s, financial economists claimed that traditional investment analysis could be used to outperform the stockmarket (Lofthouse, 2001). However, in the early 1950s and 1960s, a set of finance papers challenged previous ideas in this domain, suggesting that changes in security prices follow a random pattern (e.g. Kendall, 1953; Cowles, 1960; Alexander, 1961; Mandelbrot, 1963 and Fama and Blume, 1966). These studies provided the initial intellectual capital for the EMH development. Under this hypothesis, market prices are *"right"*, in that agents who understand Bayes Law[10] and have sensible preferences set them. This means that, in an efficient market, there is *no free lunch*: no investment strategy can earn excess risk adjusted average returns, or average returns greater than those that are warranted for its degree of risk (Shleifer, 2000; Lofthouse, 2001; Barberis and Thaler, 2003).[11]

The basic theoretical case for the EMH rests on three arguments, which rely on progressively weaker assumptions about the degree of market participants' rationality. These assumptions and their implications are discussed in the following paragraphs.

2.2.1.1. All agents in the market are fully rational

EMH proponents initially argued that all market participants are rational. Rationality means two things. First, when new information is released, market participants update their beliefs correctly, particularly in the manner described by Bayes Law (Barberis and Thaler, 2003). Second, given their beliefs, agents make choices that are normatively accepted, in the sense that they are consistent with Savage's notion of Subjective Expected Utility (Barberis and Thaler, 2003).[12] According to EMH proponents, rational investors value each security at its

---

[10] Reverend Thomas Bayes (1702-1761) developed Bayes' Theorem, originally published after his death in 1763 and published again in 1958. Bayes' Theorem provides a way of revising conditional probabilities by using available information. It also provides a procedure for determining how probability statements should be adjusted given additional information. For an introduction, see Wonnacott and Wonnacott (1990) and Newbold et al (2003).

[11] An interesting paradox in the concept of an efficient market was quickly noted (Lofthouse, 2001). Analysts are considered to be informed agents that collect and analyse data in order to release relevant information to the market (Schipper, 1991). This mechanism facilitates market efficiency. However, under the EMH framework, analysts cannot benefit from their research since all new relevant information is instantly reflected in market price. Fama (1991) acknowledges this issue and states that the extreme version of the EMH *"is truly false"*. A weaker and economically more sensible version of the EMH states that security prices reflect available information to the point where the marginal benefits of acting on this information do not exceed the marginal cost (Jensen, 1978).

[12] The theory of Subjective Expected Utility is the central element of the neoclassical theory of rational economic behaviour. Its basic assumptions are that choices are made among a fixed and given set of alternatives, with a subjectively known probability distribution of outcomes for each possible alternative and in such a way as to maximize

fundamental value and respond quickly to new information about it (Samuelson, 1965; Mandelbrot, 1966; Pliska, 1997; Le Roy and Werner, 2001 and Lo and MacKinlay, 2002). If all investors behave as the *"rational man"* described here, markets will be, by definition, informationally efficient.

2.2.1.2. The role of irrational agents in financial markets

Black (1986) suggests that some market participants trade on noise, not on news. The existence of these *noise traders* (or irrational agents) disputes the key assumption of the theoretical framework presented in the previous paragraph. As a result, EMH proponents moved to the position that financial markets can be efficient even when not all investors are fully rational (Elton and Gruber, 1995; Shleifer, 2000; Haugen, 2001). In this alternative model, the assumption of full rationality is relaxed and the existence of noise traders is acknowledged. The crucial assumption here is that irrational agents trade randomly among themselves and thus have investment strategies that are not correlated (Shleifer, 2000). In this case, no price bias is expected to exist since opposite positions will cancel out. Consequently, the market value of any given security will be, on average, its fundamental value. Under this framework, even in the presence of irrational agents, the market should be efficient and the EMH should hold in practice (Shleifer, 2000; Le Roy and Werner, 2001).

2.2.1.3. The role of arbitrageurs in financial markets

Psychological evidence shows that people do not deviate randomly from rationality but rather that most deviate in the same way (e.g. Kahneman and Tversky, 1973). As a result, noise traders' investment strategies are expected to be highly correlated since these investors form their demand for securities based on their common beliefs (Shiller, 1984). A systematic bias in security prices is then likely to exist. Interestingly, EMH proponents argue that markets can still be efficient in this situation. The existence of arbitrageurs[13] and their use of the arbitrage mechanism[14] are the two key factors in this framework (Fama, 1965). Arbitrageurs collect and analyse relevant information in order to check for any possible misalignment between the market price of existing securities and their fundamental value. Given the existence of transactions costs, the market price of any security will wander around the asset's fundamental value and within an arbitrage band (Blake, 2001).[15] As soon as the price of the security wanders outside this band, an arbitrage opportunity exists and it becomes profitable for

the expected value of a given utility function. For further references, see Mas-Colell et al (1995), Varian (1999) and Geoffrey and Reny (2003).

[13] Arbitrageurs are considered to be rational agents, usually specialist financial intermediaries, who act to ensure both that securities' prices do not move out of line with their fundamental value and that prices of identical securities traded in different market-places do not move out of line with each other (Blake, 2001).

[14] There is an arbitrage opportunity when an investor operating in a financial market has a positive probability of achieving a positive return with no risk of loss (Pliska, 1997; Cochrane, 2001; Le Roy and Werner, 2001; Cvitanic and Zapatero, 2004). Blake (2001) defines the process of arbitrage as the simultaneous purchase and sale of the same, or essentially similar, securities in two different markets at advantageously different prices.

[15] Transaction costs define the width of the arbitrage band. The higher the transaction costs, the wider the band.

the arbitrageur to act.[16] By exploiting the arbitrage opportunity, the arbitrageur aligns the security price once again with its fundamental value.

It is worth noticing three important characteristics of this process. The first is that the arbitrageur does not have to invest any money to earn a sure profit. In fact, in the classical arbitrage strategy, the arbitrageur always short sells a asset similar (in terms of risk) to the one that is apparently being mispriced by the market. This is crucial, since it makes the arbitrage *riskless* for the arbitrageur. The second aspect is that by buying and selling large quantities of these similar assets, the arbitrageur is modifying their market demand. This buying and selling behaviour will influence the market price of the two securities involved in the arbitrage strategy and the price movement will only end when the market value of both assets has converged to their fundamental values. Finally, according to EMH proponents, competition among arbitrageurs for superior returns ensures that this price adjustment mechanism produces results almost instantaneously (Shleifer, 2000). As a result, it takes just one rational investor acting as an arbitrageur to justify why the EMH should hold even when irrational investors use correlated investment strategies to operate in financial markets.

2.2.2 Behavioural finance: an alternative approach

The traditional framework is appealingly simple and it would be very satisfying if its predictions were confirmed in practice (Barberis and Thaler, 2003). However, in the last two decades, several empirical papers have suggested that basic facts about aggregate stock market behaviour, the cross-section of average returns and individual trading activities cannot be fully understood within classical market pricing theory. Behavioural finance is a new approach to financial markets that has emerged, in part, as a response to the difficulties faced by the EMH. According to Thaler (1993), behavioural finance is simple *"open minded finance"* and is based on two pillars: the existence of limits to arbitrage and investor psychology (Shleifer and Summers, 1990). The following paragraphs discuss these two points.

2.2.2.1. Limits to arbitrage

In the EMH world, if mispricing occurs, smart investors will immediately take a position to exploit it for a profit using a *riskless* arbitrage strategy as the one described in section 2.2.1.3. Behavioural finance argues that this is *not* true since such strategies are, in fact, very risky (Shleifer, 2000; Montier, 2002; Barberis and Thaler, 2003). Behavioural theorists present three basic reasons to explain why arbitrage should not be considered a riskless process:

[16] For instance, if the market price of a given security falls below the lower band, it becomes profitable for the arbitrageur to buy this security in large volumes since it is now underpriced compared to its theoretical value. However, the arbitrageur will only make his or her profit when the market corrects itself. This will happen when the security price increases to the point when it starts to wander inside the arbitrage band once again. At that time, the arbitrageur closes the position and makes his or her profit. The opposite strategy will be implemented by the arbitrageur if the security price rises above the upper limit of the arbitrage band.

i. *Fundamental risk:* the basic idea of a riskless arbitrage strategy is that the arbitrageur is always able to hedge his or her position. To do this, he or she shorts a security that is similar to the one being apparently mispriced by the market. However, substitute securities are usually highly imperfect, making it impossible to remove all the fundamental risk of such an investment strategy (Shleifer, 2000; Montier, 2002; Barberis and Thaler, 2003);

ii. Noise trader risk: De Long et al (1990) and Shleifer and Vishny (1997) introduce and explore the notion of noise trader risk. The basic idea of this concept is that the risk of the mispricing being exploited by the arbitrageur can increase in the short run. For instance, a profitable investment opportunity can arise if a set of pessimistic irrational investors pushes the market price of a given security down to a level that is below its fundamental value. In this case, arbitrageurs can exploit this opportunity by buying this security and shorting a substitute one. However, this position is not hedged: the irrational investors can remain pessimistic about that security and trade in a way that lowers even further its market price. In this case, arbitrageurs have a potential gain (if the price of the security returns to its fundamental value) but have to deal with an effective financial loss in the short run. Noise trader risk matters because it can force arbitrageurs to liquidate their positions early, bringing them potentially steep losses (Shleifer, 2000; Montier, 2002; Barberis and Thaler, 2003);

iii. Implementation costs: bid-ask spreads and commissions are examples of transaction costs that make it less attractive to exploit a potential arbitrage opportunity (Barberis and Thaler, 2003). Merton (1987) also suggests that the substantial cost of finding a mispricing as well as the cost of the resources needed to exploit it have to be considered as implementation costs. However, the main constraints to the implementation of an arbitrage strategy are the ones associated with short selling a security. The fees charged for borrowing a stock are the simplest example of such constraints. Additionally, in several situations, arbitrageurs simply cannot find securities to borrow at any price (Barberis and Thaler, 2003). Finally, it is also noteworthy that many professional money managers are forbidden by law to short sell securities.

The overall argument presented here is that, in contrast with the arbitrage mechanism suggested by EMH proponents, real world arbitrage entails both costs and risks, which can significantly limit the ability of arbitrageurs to exploit an eventual market mispricing (Shleifer, 2000; Montier, 2002; Barberis and Thaler, 2003). As such, persistent price deviations from fundamental value can continue to exist.

2.2.2.2. Investor psychology

Behavioural models assume that not all investors are fully rational. However, stating that investors do not behave in line with the *rational man* suggested by classical finance theory is not enough. In order to explain why investors are not fully rational, behavioural finance

proponents use extensive experimental evidence compiled by cognitive psychologists (Shleifer, 2000; Montier, 2002; Barberis and Thaler, 2003). In fact, drawing on such literature, behavioural models use concepts such as overconfidence, optimism, representativeness, anchoring, conservatism and availability biases to explain how investors are likely to form their beliefs and thus why there is no evident reason for expecting them to act rationally (Montier, 2002 and Barberis and Thaler, 2003). In practical terms, this approach simply recognizes that the average investor is unable to collect all the relevant information and process it rigorously as required by classical finance theory. Instead, behavioural finance posits that investors use rules of thumb to deal with the deluge of information available to market participants (Shleifer, 2000 and Montier, 2002).

Kahneman and Tversky (1979) and Tversky and Kahneman (1992) provide a further psychological contribution to the finance literature. These two articles present what is known as *prospect theory*, which questions whether or not investors state and evaluate preferences according to the expected utility theory (Shleifer, 2000; Montier, 2002 and Barberis and Thaler, 2003). In general, these studies suggest that individuals tend to use cognitive heuristics when they have to deal with the complex task of assigning probabilities to uncertain outcomes. Moreover, by manipulating the decision frame, Kahneman and Tversky (1986) demonstrate that individuals make "consistently inconsistent" decisions, something that is also not predicted by the expected utility theory.

Overall, the literature on cognitive psychology provides a promising framework for analysing investor behaviour in the stock market. The breakthrough achieved with this approach is that the stringent assumption of rationality used in conventional market models can finally be relaxed. This leads to a new context in which several persistent anomalous findings can be better understood (Shleifer, 2000; Montier, 2002 and Barberis and Thaler, 2003).

2.2.2.3. The contra-argument of EMH proponents

EMH proponents have also provided some arguments against the behavioural approach (e.g. Fama 1998; Rubinstein, 2001; Ross, 2005). Perhaps the most interesting one is that behavioural finance models have a *theory mining flavour*. Particularly, behavioural detractors suggest that, to date, such models have been developed randomly, with the sole purpose of building custom answers that fit *publishable* empirical facts (Shefrin, 2005). An example of this situation relates to the behavioural decision literature, which contains several studies documenting that people often violate Bayes rule. Moreover, some studies published in this context also demonstrate that people overweight recent events relative to more distant ones. Interestingly, some behavioural models addressing the same question assume that investors act as Bayesians in some of their decisions, but they overweight recent events in others.

This piecemeal approach to developing behavioural models resulted more in a patchwork quilt of contrived examples than in a general theory of asset pricing (Shefrin, 2005). Consequently, to date, this body of literature has been unable to develop a general theory that coherently explains how financial markets work. The lack of existence of such an overreaching theory provides one of the strongest arguments that EMH proponents use to challenge the appropriateness of behavioural finance. In the words of Fama (1998), *"it takes a theory to challenge another theory".*

2.2.2.4. EMH and behavioural finance - a clarification

On 28th December, 2000, the *Wall Street Journal* published two opinion pieces that are relevant for the theme under discussion: *"Are Markets Efficient? Yes, Even if They Make Errors"* and *"No, Arbitrage Is Inherently Risky".* The first was written by Burton Malkiel and the second had Andrei Shleifer's signature. The fact that both authors do not share the same theoretical orientation about how financial markets work fuelled the interest in their written debate about market efficiency. Despite the useful insights provided by both authors, understanding each other's arguments was not an easy task. In the centre of such complexity lies the fact that both authors used a different definition of what is an efficient market. Professor Shleifer focused on the mispricing of particular securities, whereas Professor Malkiel used the concept of absence of abnormal profits being earned by smart investors. According to Shefrin (2005), this is a common issue in the debates between EMH proponents and behavioural theorists since the former tend to focus on definitions based on the absence of arbitrage whist the latter typically define market efficiency in terms of objectively correct prices.

The different definitions about market efficiency adopted by proponents of the EHM and its detractors make it difficult to compare and understand the voluminous empirical literature addressing this issue. Barberis and Thaler (2003) provide a useful clarification of this question. The authors base their argumentation on two key concepts: the *fundamental price of a security as compared to its market price* and the absence *of arbitrage opportunities.* According to Barberis and Thaler (2003), the market correctly assesses the future prospects of a particular asset whenever its market price equals the asset's fundamental value. They use *"prices are right"* to denote this situation. On the other hand, Barberis and Thaler (2003) use the expression *"no free lunch"* to state the idea that, in the market, there are no arbitrage opportunities like the one described in sub-section 2.2.1.3. Based on these two concepts, the authors state that "prices are right" and "there is no free lunch" are not, by definition, equivalent statements. Barberis and Thaler (2003) explain that, while both are true in an efficient market, "no free lunch" can also be true in an inefficient market. In fact, just because prices move away from fundamental value does not necessarily mean that there are any excess risk-adjusted average returns that can be explored by smart investors. In simple words, under

the Barberis and Thaler's (2003) framework, it is correct to say that "prices are right" implies "no free lunch" but is also true that "no free lunch" does not imply that "prices are right".

According to the authors, this is a fundamental distinction for evaluating the ongoing debate about market efficiency. For instance, many researchers still point to the inability of professional money managers to beat the market as strong evidence of market efficiency (e.g. Rubinstein, 2001; Ross, 2005).[17] Underlying this position, though, is the assumption that "no free lunch" implies "prices are right". However, under the Barberis and Thaler (2003) approach, the performance of money managers tells us little about whether prices reflect fundamental values.

It is interesting to verify that some authors acknowledge the difference between the concepts of "no free lunch" and "prices are right" but emphasize that the debate should focus on the former rather than on the latter. Barberis and Thaler (2003) dispute such a position. According to them, the economist's main concern should be to ensure that capital is allocated to the most promising investment opportunity. Consistent with their previous discussion, Barberis and Thaler (2003) argue that achieving this goal depends much more on prices providing a correct signal to investors than on the lack of existence of free lunches for the taking.

2.3. Bankruptcy, the efficient market hypothesis and behavioural finance

This sub-section is divided in two parts. The first presents a theoretical framework within which to explore the implications of the EMH and behavioural finance in the context of corporate bankruptcy. The second sums up some of the empirical evidence that the finance literature has already uncovered in this domain.

2.3.1. Theoretical considerations

According to Altman (1993), the interest of finance academics in corporate bankruptcy is as old as bankruptcy itself. This explains the sizable bankruptcy-related literature nowadays available in finance journals. One of the most researched domains in this area is how markets react to corporate bankruptcy announcements. The announcement of a bankruptcy filing is an important economic event that should be associated with market activity (Shrader and Hickman, 1993). The argument underlying such a rationale is that this extreme event provides material information about the potential reduction of the firm's fundamental value. In fact, even in the most optimistic scenario, a bankrupt firm has to pay the legal and other costs associated with bankruptcy administration, which will reduce its fundamental value (e.g. Altman, 1984;

[17] Rubinstein (2001) classifies markets according to their degree of rationality. He suggests the existence of three types of markets: maximally rational markets, rational markets and minimally rational markets. All agents are fully rational in a maximally rational market. In rational markets, the assumption that all agents are fully rational is relaxed and the existence of irrational agents is acknowledged. The basis characteristic of this market is that asset prices are set as if all investors are rational. Lastly, markets are minimally rational if there are no arbitrage opportunities. In other words, although prices are not set as if all agents are rational, no abnormal profit opportunities exist for smart investors.

Opler and Titman, 1995; Gilson et al, 2000; Branch, 2002). Furthermore, firms filing for bankruptcy will usually have to bear indirect costs such as the diversion of scarce management time while bankruptcy is underway, additional lost sales during and after bankruptcy, constraints on capital investment and R&D spending, and the loss of key employees after the bankruptcy becomes effective. These costs also affect the firm's fundamental value (Meggison, 1997 and Grinblatt and Titman, 2002).

Fama (1970) provides an operational basis for testing the market's reaction to information disclosures. Based on the type of information reflected in security prices, Fama (1970) suggests three types of market efficiency (Elton and Gruber, 1995; Blake, 2001):

1. A market is said to be *weak form efficient* if current security prices instantly and fully reflect all information conveyed by prior security price history. The inconsistent performance of technical analysts suggests that this form of market efficiency holds in practice (Elton and Gruber 1995; Lofthouse, 2001). In 1991, Fama expanded this concept to include predicting future returns with the use of accounting and/or macroeconomic variables. Several empirical papers provide an argument against this new definition of the weak form of market efficiency (e.g. Basu, 1977; Banz, 1981; Reinganum, 1981; Campbell and Shiller, 1988);

2. A market is said to be *semi-strong form efficient* if the current prices of securities instantly and fully reflect all publicly available information. Financial economists use event studies and cross-sectional tests of return predictability to explore to what extent the semi-strong definition of an efficient market holds in practice (Kothari, 2001). Published results are mixed and thus no consensus exists on this issue (Kothari, 2001);

3. A market is said to be *strong form efficient* if current securities prices instantly and fully reflect all information, both public *and private*. Eyssel (1991), Seyhun (1986) and Seyhun (1988), among others, show that insiders are able to profit from trading on information that is not already incorporated in stock prices. Hence, these results suggest that the strong form of an efficient market does not hold in practice.

Most finance literature that explores the market's reaction to the disclosure of new information is based on Fama's (1970) definition of a semi-strong efficient market since they investigate whether this new information is fully incorporated into stock prices on a timely basis. Dyckman and Morse (1986) summarize what can be expected in this context. Firstly, some price reaction is expected to exist previous to the event. This happens because market participants use alternative sources of information that can provide data that helps to anticipate the event. Moreover, it is also expected the existence of some price reaction immediately after the event has become publicly known. This happens because, at the date of the event, additional information that was not anticipated by or previously disclosed to market participants may be released. Finally, there should be no discernable price reaction following the

announcement. This happens since the semi-strong form of an efficient market requires market participants to unbiasedly adjust their expectations about market prices immediately after the release of the new value-relevant information, which also removes the possibility for future abnormal returns.

Studies addressing the issue of the market's reaction to corporate bankruptcy announcements use this framework to assess their results. Two possibilities exist. If the market is semi-strong efficient, it should react to the information conveyed by a corporate bankruptcy announcement in a timely and unbiased manner. In this case, no abnormal returns can be earned by trading on the bankruptcy announcement event or on the securities of bankrupt companies. There is, in fact, some empirical evidence suggesting that markets react rationally to this extreme case of bad news (e.g. Clark and Weinstein, 1983; Morse and Shaw, 1988; Elayan and Maris, 1991). On the other hand, behavioural finance theorists argue that markets have difficulties in properly assimilating extreme negative events as corporate bankruptcy and typically underreact. Consistent with this argument, a number of studies show that markets only react partially to certain corporate announcements (e.g. Ball and Brown, 1968; Bernard and Thomas, 1989; Michaely, Thaler and Womack, 1995; Ikenberry and Ramnath, 2002; Kausar et al, 2004). In this case, information associated with the bankruptcy announcement should only be partially incorporated in the stock price, creating an investment opportunity for rational investors. Interestingly, there is also some empirical evidence suggesting that markets can misprice the securities of bankrupt companies (e.g. Katz et al, 1985; Eberhart et al, 1999; Indro et al, 1999). Such contradictory results clearly demonstrate the degree of disagreement between finance scholars about whether financial markets are efficient or not in this particular context. The next paragraphs review some of the empirical evidence already available in this domain.

2.3.2. Empirical research on corporate bankruptcy

This sub-section is divided in two parts. The first presents an overview of several research areas that the finance literature has already addressed within the corporate bankruptcy domain. The second discusses some of the extant literature in this area that specifically provides evidence relevant to the EMH versus behavioural finance debate in the bankruptcy setting.

2.3.2.1. General areas of research

Bankruptcy is not a trivial event. Even major countries like the U.S. suffer enormous social and economic consequences whenever a major corporation like WorldCom or Enron seeks protection under federal bankruptcy law. Nowadays, there is a wide body of literature covering

many different issues related to corporate bankruptcy.[18] This section provides a brief overview of some of the areas in this domain that are relevant for the development of my doctoral research.

The likelihood of financial distress is an important concern about the life or death of any enterprise. The going-concern assumption is critical for the behaviour of many stakeholders, both internal and external to the firm (Altman, 1993).[19] Internal stakeholders, such as managers and employees, are concerned about their specific skills invested in the firm that may be difficult to transfer to other corporations. External stakeholders, such as customers, suppliers, creditors and investors, may view the firm quite differently in times of financial distress relative to times of prosperity. Moreover, auditors are required to assess the appropriateness of the going-concern assumption, for which they must have a methodology to predict financial distress and bankruptcy. Security analysts also require a similar methodology to be able to measure the financial status of an enterprise for valuation purposes.

The importance of the going-concern assumption explains why the *ex-ante* prediction of corporate bankruptcy is one of the most thoroughly researched issues in the bankruptcy domain. In 1968, Altman published one of the seminal contributions in this area. In this paper, a sample of 66 firms (33 failed and 33 non-failed) is used to assess the quality of ratio analysis as an analytical methodology. The author relies on the multiple discriminant analysis technique and a set of financial ratios to generate the first multivariate statistical model of bankruptcy prediction. Using this model, Altman (1968) correctly predicts bankruptcy in 94 percent of the cases included in his initial sample.[20]

Beaver (1968) is another important reference in this domain. This study uses a sample of 79 failed and 79 non-failed U.S. firms to examine the extent to which changes in market prices of stocks can be used to predict corporate failure. The same study also explores if financial ratios can be used to assess the solvency positions of firms. Results suggest that investors recognize and adjust to the solvency conditions of failing firms. Moreover, consistent with the EMH predictions, Beaver (1968) demonstrates that equity returns generally anticipate bankruptcy sooner than financial ratios.

The debate initiated with these seminal contributions continued to be expanded over the following years and several authors suggested alternative methodologies to assess the financial status of a company. Nowadays, there is an intense debate around the question of

[18] For a survey on different areas of financial research on bankruptcy, see John (1993) and Bhandari and Weiss, (1996).
[19] An entity is a going-concern if it has neither the intention nor the need to liquidate or to cease its operations at least 12 months from the balance sheet date (IAS1.24). At each balance sheet date, management should assess the entity's ability to continue as a going-concern. Material uncertainties concerning the entity's ability to continue as a going-concern should be disclosed (IAS1.23).
[20] Ohlson (1980) is another seminal paper in this area. This study uses an alternative approach, the conditional logit analysis, to develop a model that predicts corporate failure. This model is also extensively used in the finance literature to estimate firms' probability of default.

which model (accounting-based or market-based) performs better in assessing the probability of bankruptcy. One of the first attempts to contrast these two competing typologies of models is provides by McQuiwn (1993), which also describes KMV's conceptual approach to measuring default probabilities.[21] According to the author, market-models should provide superior estimates of the probability of default since they are based on market prices, thus containing *ex-ante* information about the likelihood of corporate bankruptcy. McQuiwn (1993) also casts doubt on the usefulness of accounting-based models in this context since they lack a theoretical structure reflecting the causative linkage among the included variables. According to the author, market-based models provide a more credible alternative in the sense that they are based on a well-established theoretical framework initially developed by Black and Scholes (1973) and Merton (1974).

In a related paper, Hillegeist et al (2004) provide further evidence on this issue. Using a 21 year sample (from 1980 to 2000) containing 78,100 firms of which 756 are bankrupt companies, Hillegeist et al (2004) assess whether the Altman (1968) and Ohlson (1980) models effectively summarize publicly available information about the probability of bankruptcy. This study also compares the relative information content of these two models with a market-based measure derived from the option-pricing framework originally developed by Black and Scholes (1973) and Merton (1974). Hillegeist et al (2004) show that the market-based measure provides significantly more information about the probability of bankruptcy than the two accounting-based measures analysed in this study. These findings are robust to various modifications of the original Z-Score and O-Score model.

Financial economists have also put considerable effort into studying the cost of financial distress and bankruptcy. Traditionally, finance literature posits that financial distress and bankruptcy are costly because they create a tendency for firms to undertake actions that are not in the best interest of their debtholders and non-financial stakeholders (Altman, 1984; Meggison, 1997; Ogden et al, 2002). Moreover, financial distress can also be costly due to competitive reasons. In fact, Meggison (1997) and Odgen et al (2002) argue that a firm's weakened condition may induce an aggressive response by competitors seizing the opportunity to gain market share. Interestingly, in the last years, a group of scholars has challenged traditional knowledge in this domain (e.g. Wruck, 1990). According to this alternative perspective, financial distress may improve firms' market value by forcing managers to make difficult value-maximizing choices, which they would otherwise avoid.

One of the central problems in Chapter 11 bankruptcy negotiations is the valuation of the bankrupt company. In a recent study, Gilson et al (2000) analyse how accurate the process

[21] Moodys's KMV Corporation developed its own version of an option-pricing model to assess the default risk, which is nowadays a benchmark in the field. For an introduction to the basic concepts underlying this model, see Crosbie (2003).

of bankrupt firms' valuation is. They find that commonly used valuation models produce unbiased estimates of value but yield high valuation errors. Gilson et al (2000) argue that the estimated errors are consistent with the strategic biases of participants in the bankruptcy proceedings, who have incentives to distort their assessments of the company's market value.

Existing finance literature has also provided evidence of how markets react to corporate bankruptcy announcements, in particular for the U.S. equity market. As mentioned previously, this topic is the basis for the development of my doctoral research. The next paragraphs summarize some of the evidence that has already been uncovered on this issue.

2.3.2.2. Evidence consistent with markets reacting efficiently to corporate bankruptcy announcements

Several empirical papers provide evidence suggesting that equity markets are efficient in the context of corporate bankruptcy announcements. One of the first studies addressing this issue is that of Altman (1969). The paper presents a model to measure stockholders' performance and examines the post-bankruptcy experience of approximately 70 corporations that filed for bankruptcy before the implementation of the Bankruptcy Reform Act of 1978. After controlling for risk factors, Altman (1969) finds an insignificant difference between the bankrupt firm sample returns and the average return on common stocks listed on the New York Stock Exchange (NYSE). He concludes that the stock of bankrupt companies *"is not an attractive investment"*.

Warner (1977) uses a sample of 20 railroads that went bankrupt between 1930 and 1975 to provide some evidence on the debt market's reaction to bankruptcy announcements. He concludes that, on average, bondholders have a negative abnormal return of 9.2 percent in the bankruptcy filing month, providing evidence that the bond market reacts on a timely basis to corporate bankruptcy announcements.

Aharony et al (1980) analyse the risk and return characteristics of 45 industrial bankrupt companies. Their findings demonstrate that the differential portfolio return turns negative approximately 4.5 years before the bankruptcy announcement and declines increasingly thereafter. Aharony et al (1980) also report a further sharp decline seven weeks before the actual filing date. This paper highlights an increase in bankrupt firm return variance, leading to the conclusion that non-systematic risk increases as the date of bankruptcy filing approaches. Three years later, El Hennawy and Morris examine the price behaviour of 20 British companies that failed between 1960 and 1971. Consistent with previous research, El Hennawy and Morris (1983) suggests that, on average, the UK equity market begins to perceive firms' distress as early as five years prior to bankruptcy.

Michel and McHugh (1998) use a three year sample (1989 to 1991) of 40 companies (24 one-time filers and 20 two-time filers) to analyse the extent to which the U.S. stock market differentiates between those companies emerging successfully from bankruptcy and those

emerging but then filing bankruptcy for second time. In order to investigate this issue, the authors explore the relationship between stock market performance and the divergence between companies' actual results (after the firms' emergence from Chapter 11) and the projected results in the companies' reorganization plans. Evidence presented by Michel and McHugh (1998) suggests that the market differentiates early and significantly between one and two-time filers. In fact, one year following emergence from bankruptcy, the median cumulative return for one-time filers is 29.71 percent while the two-time filers present a value of -34.17 percent for the same variable. Moreover, according to Michel and McHugh (1998) this difference increases dramatically as time goes by after the emergence date.

A final reference is that of Bi and Levy (1993). This study explores how bond downgrades affect stock returns. Bi and Levy (1993) compare the market's reaction to bond downgradings followed by Chapter 11 filings and similar bond downgrades which are not followed by such event. Their results show that shareholders of firms receiving a bond downgrade and that subsequently file for Chapter 11 bear negative abnormal returns on the announcement date. On the other hand, shareholders of similar firms that also receive a bond downgrade but do not file for Chapter 11 do not experience such abnormal returns. Bi and Levy (1993) conclude that the stock market differentiates between two apparently identical downgrading events, presenting evidence in favour of the EMH.

2.3.2.3. Evidence inconsistent with markets reacting efficiently to corporate bankruptcy announcements

There is also empirical evidence, however, suggesting that the market does not react efficiently to corporate bankruptcy announcements. One interesting contribution in this context can be traced back to Tiras (2002), who explores the characteristics of firms that are likely to survive Chapter 11. This article investigates 162 firms that filed for bankruptcy protection between 1981 and 1994. The analysis demonstrates systematic differences between the group of firms that actually fail (and liquidate) and the group of firms that are able to emerge successfully from Chapter 11. After controlling for macroeconomic variables, Tiras (2002) shows that firms that are liquidated after filing for Chapter 11 are usually smaller, reported more aggressively, switched auditors more frequently before the filling and had previously defaulted on their loans. The findings of this paper are relevant for investors interested in high-risk markets like the one of bankrupt firms. In fact, those evaluating the possibility of investing in a bankrupt company may analyse the firm-specific characteristics identified by Tiras (2002) in order to assess the likelihood of a future emergence from Chapter 11, which may lead to the development of a wealth-maximizing investment strategy.

Campbell (1996), Partington et al (2001) and Barniv et al (2002) provide further evidence on this subject. The first paper develops a model to predict the likelihood of rehabilitation for closely held firms. Using a probit regression, Campbell (1996) shows that, in

this specific context, five variables have significant power in distinguishing firms that reorganize versus those that are finally liquidated: firm size, asset profitability, the number of secured creditors, the presence of intangible assets and the number of under-secured creditors. On the other hand, Partington et al (2001) use both firm-specific and market-wide predictor covariates and a proportional hazard model to estimate the hazard that firms will exit Chapter 11 without returning any value to shareholders. The authors find that the outcome of the bankruptcy proceeding can be estimated using the two models developed in the paper and that both perform equally well. Accordingly, Partington et al (2001) recommend the use of the firm-specific model for reasons related with its improved parsimony.[22] Consistent with previous research, this study finds that the most useful variables for predicting value outcomes for shareholders are the market capitalization of the firm immediately prior to its Chapter 11 filing and the ratio of funds from operations to assets (EBITDA/Assets). Using a logistic regression, Barniv et al (2002) develop a classification model to predict the final outcome of the bankruptcy process. Three possibilities are considered: firms are acquired, firms emerge, or firms are finally liquidated. The model developed by Barniv et al (2002) performs well, correctly classifying 61.6 percent of all firms.[23] Interestingly, results suggest that only few of the accounting variables used in previous research for predicting financial distress are useful for forecasting the bankruptcy outcome. In fact, Barniv et al (2002) show that non-accounting variables such as fraud, resignation of executives and investor's past losses are more relevant in this context. The results of Campbell (1996), Partington et al (2001) and Barniv et al (2002) suggest that particular models can be used by investors to predict the final resolution of the bankruptcy process. These predictions may be helpful for developing utility-maximization investment strategies, although the analysed studies do not provide evidence on their adequacy.

A final relevant contribution is that of Gilson (1995). This paper surveys the theory and practice of investing in distressed situations. The author concludes that investors that are skilful in valuing firms' assets, that have superior negotiating and bargaining skills and understand the risk of investing in distressed situations can consistently earn money in this market by using standard investment techniques. This situation is inconsistent with the notion of *no free lunch* predicted by the EMH.

[22] For details of the implications of this question see Green (2003).
[23] The classification accuracies reported in Barniv et al (2002) are based on the Lanchenbruch (1967) U-technique.

2.4. Conclusion and rationale for the systematic review

The previous sections present the outline of my doctoral research at the initial stage of its development. Corporate bankruptcy, one of the most dramatic events that firms may be confronted with, provides the research's background. The brief literature review presented in sub-section 2.3.2 suggests that this area is a well-research topic in finance. In fact, several scholars have already studied many features of corporate bankruptcy, providing relevant knowledge for those that have to deal with this awkward situation. In particular, extant research addresses questions like the ex-ante prevision of bankruptcy, the costs associated with the event, the valuation of bankrupt firms, among others.

Literature has also explored how markets react to corporate bankruptcy announcements. My doctoral research project aims at providing further understanding on this question. Figure 1 helps to visualise the finance literature that is relevant for its development.

Figure 1: Areas of the Literature Relevant for my PhD Project

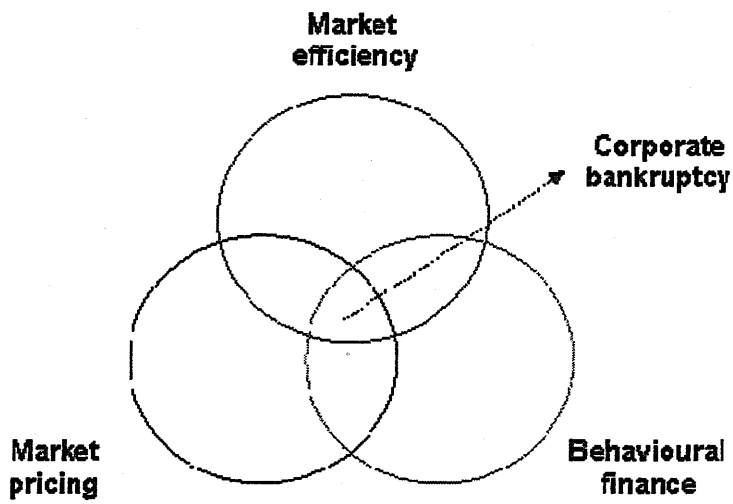


Figure 1 shows that my doctoral research draws on two well-established theoretical approaches to how financial markets operate and relates them with the market pricing literature, using the corporate bankruptcy event as context. As discussed in section 2.3.2.2 and 2.3.2.3, existing empirical studies provide mixed results and therefore no consensus exists about the degree of market (in)efficiency in this domain. Moreover, my preliminary reading suggests that, to date, little evidence exists on the *long-term* market reaction to bankruptcy announcements. The main reason that explains this fact is that until mid 1980s, U.S.

corporations would be typically delisted upon their filling for bankruptcy or shortly after. With the introduction of the Act of 1978, this situation changed considerably and, currently, it is usual to see firms traded in organized exchanges after having filed for Chapter 11. This presents an interesting research opportunity that may be suitable to explore in a doctoral study. Moreover, research undertaken in this area may also provide further evidence of how different market participants behave in the context of acute and economically significant bad news events.

The rationale presented in the previous paragraphs suggests that a suitable research question to investigate during my PhD is the following: *"Does the market react efficiently to the announcement of corporate bankruptcy in the long-term?".* A systematic literature review was undertaken in order to explore the appropriateness of this research field and to identify relevant contributions that could improve and refine the initial research question. The remainder of this study reports both the methodology and results of such systematic literature review.

3. Methodology

This study employs a systematic approach in order to identify and analyse the relevant literature concerning the market's reaction to bankruptcy announcements. Part 1 introduces the basic concepts of the systematic literature review methodology and justifies its appropriateness. Part 2 provides the details of its use in this particular case, describing the keywords, search strings, databases and selection criteria that were used. Part 3 concludes.

3.1. Traditional literature review vs. systematic literature review

Hart (1998) defines literature review as *"the selection of available documents on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed".* Two major approaches can be employed to undertake a literature review: the *traditional literature review* and the *systematic literature review.* One of the main characteristics of the traditional approach is that it does not provide a particular methodology to undertake a literature review. In fact, under this approach, researchers do not have precise guidelines on how to collect and analyse the potentially relevant contributions for their research. Consequently, many scholars criticize this methodology arguing that it lacks rigour and is very prone to bias induced by the tastes and preferences of the researcher developing the literature review. In a sharp contrast, the systematic literature review adopts a replicable, scientific and transparent process to identify and assess both published and unpublished research, while it mitigates potential biases that may arise due to the preferences of the researcher (Tranfield et al, 2003). The overall objective of this approach is to offer completeness of the evidence on the subject under review, emphasizing the thoroughness and quality of the results.

This study employs a systematic approach to analyse the existing literature on the market's reaction to bankruptcy announcements. Two reasons explain my motivations for making this choice. The first relates to the scope of the literature that needs to be covered. Bankruptcy is a very common subject in finance and, consequently, a considerable amount of academic research has already been published in this domain. Moreover, it is also worth noting that only a small fraction of this literature is relevant for the development of my PhD and thus it would be unwise trying to cover all the literature on the subject. In this context, the use of a systematic approach enables the review task to become feasible in the sense that it allows searching the literature according to pre-specified objectives and with the implementation of a clear method. The second reason relates to the potential of the systematic literature review methodology to minimize biases induced in the review process by the researcher and its

capacity to enhance the robustness and quality of the findings. As mentioned before, the traditional approach is usually seen as a *"black box"* since, in most cases, researchers employing this methodology present their findings without clarifying which selection criteria were adopted and how they controlled for potential biases introduced by their preferences in the review. As a result, the final output produced is subject to various degrees of random and systematic errors. In contrast, the systematic literature review uses a well-defined methodology based on the scientific method that helps to overcome the shortcomings of the traditional approach. Accordingly, this alternative framework allows the researcher to generate a review that is consistent, replicable and assessable for both users and readers.

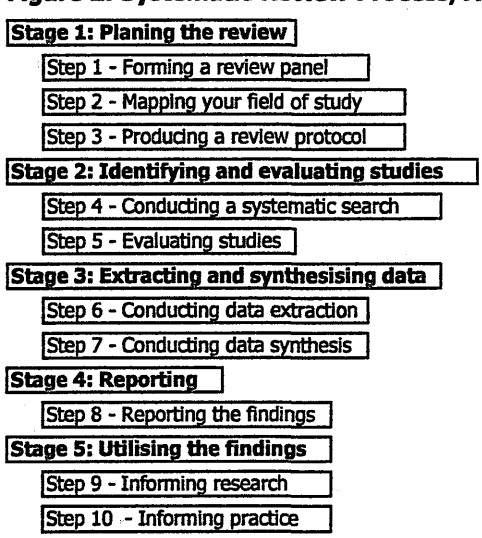
3.2 Protocol description

This sub-section starts by discussing the major steps of the systematic literature review process. It continues by describing the specific research protocol developed to undertake this study's systematic literature review.

3.2.1 Process overview

Researchers at Cranfield Advanced Management Research Centre (AMRC) suggest that any particular systematic literature review may be developed according to a pre-determined algorithm. Figure 2 presents the details of AMRC review process.

Figure 2: Systematic Review Process, AMRC – Cranfield University



Researchers that follow this protocol in order to conduct their literature reviews are able to minimize the errors that would naturally arise in the context of a traditional literature review. Moreover, the implementation of this protocol also provides a scientific character to the review, enhancing the quality of the findings. The next section provides an example of how this protocol may be used in practice.

3.2.2 Research protocol for systematic revising the literature on the market's reaction to corporate bankruptcy announcements

This sub-section presents a description of the different steps that were used to develop the systematic review that informs this study. The process was initiated with a scoping study, which consists of a loose literature review on the subject in which the researcher is interested in. This first step is critical whenever the researcher is not entirely familiar with the research field that he or she intends to explore. In the particular case of this dissertation, the scoping study was the foundation of chapters 1, 2 and 3.

3.2.2.1. Consultation group and brief description of the consultation process

The consultation panel plays two different and complementary roles within the development of a systematic literature review. The first is to provide guidance and expert advice on several aspects of the review. This ensures that all relevant literature is covered during the process. This is a particularly important aspect in the context of a PhD review since the young researcher usually lacks a deep knowledge about all the areas that are relevant for the development of his or her work. On the other hand, the review panel also acts as an auditor of the entire process. This means that the panel members not only give advice but they also provide valuable input by constructively criticizing both the contents and process of the review. Table 1 shows the composition of my systematic review panel:

Table 1 – Consultation Panel for the Systematic Review

Person	Title/Organisation	Role in the review
Professor Richard Taffler	Professor of Accounting and Finance, Cranfield School of Management	Supervisor
Dr. Vineet Agarwal	Research Fellow, Cranfield School of Management	Advisor and member of panel
Dr. David Denyer	Senior Research Fellow, Cranfield School of Management	Advisor of the systematic review process and member of panel
Professor Duarte Trigueiros	Professor of Accounting and Finance, Faculdade de Economia da Universidade do Algarve	External Advisor
Professor José Azevedo Pereira	Professor of Finance, ISEG Universidade Técnica de Lisboa	External Advisor
Ms. Heather Woodfield	Cranfield University Librarian	Advisor for the literature search

The members of the panel were carefully selected since I was aware that I had several limitations in working with academic literature when I first started to explore the domain of the market's reaction to corporate bankruptcy. The following paragraphs describe how each member of the panel helped me complete my final work.

Professor Richard Taffler and I maintained regular meetings to discuss issues related to my PhD topic during the time that I was writing my MRes dissertation. Professor Taffler helped me identify key literature in the bankruptcy area and provided guidance in the choice of the

keywords and research strings that I used in this systematic literature review. He was also very helpful on the preliminary analysis of the results obtained with the database search, where he ensured that I did not overlook any important contribution. His comments were also very important in the quality assessment phase.

Dr. Agarwal and I also had regular meetings during the time I was writing the MRes dissertation. His assistance was important to help me improve my understanding of the conceptual framework in which I am anchoring my PhD. Dr. Agarwal also played a major role in the development of my systematic review. His experience in finance research was especially useful in the synthesising phase of my work. Moreover, his extensive knowledge of empirical methods in finance was also very helpful since the majority of the studies I looked at are of empirical nature.

Professor Duarte Trigueiros and Professor Azevedo Pereira were my external advisers. Both of them are very experienced researchers in finance and they assisted me in different ways during this first year as a PhD student. Professor Trigueiros pointed to some relevant literature in the domain of investing in financially distressed firms, particularly books, which I would have otherwise disregarded. He also helped me focus on particular aspects of the literature that are relevant for my research. Professor Azevedo Pereira's background in real options valuation was very handy in helping me understand the conceptual underpinnings of my research. It is important to note that my two external advisors only had an indirect participation in the actual development of my systematic review. However, this fact enhanced the overall quality of the project in the sense that they were able to act as peer reviewers of the entire process. This added a critical perspective that would have otherwise been absent.

I have been introduced to the systematic literature review process by Dr. David Denyer. The sessions with Dr. Denyer provided the initial background on this methodology and his expertise was important in dealing with different procedural aspects of my systematic review.

Any researcher planning to do a systematic literature review needs to have specific training in working with academic databases and specific software. Ms. Heather Woodfield (as well as Dr. Denyer) provided me with this initial training. She also helped to identify the most relevant databases for my research domain from those that are available at Cranfield University.

3.2.2.2. Description of the search strategy

One of the major concerns when using a systematic literature review is to define its limits. In this particular case, the design of the research project creates a natural boundary for the review since I am interested in a specific event that is clearly identified in the finance literature. Therefore, my systematic literature review was designed to cover the existing contributions of both the efficient market and the behavioural finance literatures in this domain.

The first step of the process consisted of identifying relevant academic studies in pre-determined electronic databases. In order to achieve this goal, a set of keywords was assembled and different search strings were devised. Given my initial lack of thorough knowledge in my research domain, I relied on the help of the panel members and PhD students in Finance and Accounting to identify the different keywords and search strings that were actually used during the review. The advice provided by Professor Edward Altman and Professor Mark Dawkins, two leading scholars in the field, was also very important in this stage of the process. The following table presents the keywords that were used in this study:

Table 2 – Keywords used in the Systematic Literature Review

Domain	Keywords	Rationale
Bankruptcy event	1. Bankrupt*	This first set of keywords captures the essence of the phenomena that I am interested in.
	2. Chapter 11	
	3. Chapter 7	
	4. Financial distress	
	5. Liquidation	
	6. Price reaction	
	7. Market reaction	
	8. Financial Disclosure	
	9. Announcemen*	
Market Efficiency	1. Efficient Marke*	This set of keywords relates to different terms that are used in the bankruptcy area to express the idea of market rationality or efficiency.
	2. Rational Investo*	
	3. Smart Investo*	
	4. Sophisticated Investo*	
Behavioural Finance	1. Behaivo* Finance	This set of keywords relates to different terms that are used in the bankruptcy area to express the idea that markets are not rational or efficient.
	2. Anomal*	
	3. Underreaction	
	4. Overreaction	
	5. Bad News	
	6. Naïve Investo*	
	7. Noise Trade*	
	8. Irrational Investor*	
Market Pricing	1. Stock Pric*	This set of keywords relates to different terms used in the bankruptcy area that are related with market pricing issues.
	2. Share Pric*	
	3. Abnormal Retur*	
	4. Post filin* retur*	

The identification of this set of keywords was just the first step of the process. In fact, in order to use it in my systematic search for relevant literature, I had to combine the keywords in a meaningful way. After discussing this issue with the panel members and doing some pilots with several possible search strings, I decided to use the following:

Table 3 – Search Strings used in the Systematic Review

Search String	Rationale
(Bankrupt or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Market reaction or Price reaction)*	This search string was designed to capture all relevant studies that address the issue of market reaction to corporate bankruptcy.
(Bankrupt or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Financial Disclosure or Announcemen*)*	This search string complements the first one. In fact, some important studies (identified in the scoping study) were not captured by the first search string. This second string was a response to this and is an attempt to capture all studies that address the issue of market reaction to disclosure of information related with corporate bankruptcy.
(Bankrupt or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Efficient Marke* or Rational Investo* or Smart Investo* or Sophisticated Investo*)*	This search string was designed to capture both theoretical and empirical papers that are published in the EMH domain which directly relate to corporate bankruptcy.
(Bankrupt or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND ((Behavi* Finance or Anomal* or Underreaction or Overreaction or Bad news) or ((Naive Investor* or Noise trade* or Irrational investor*))*	This search string was designed to capture both theoretical and empirical papers that are published in the behavioural domain which directly relate to corporate bankruptcy.
(Bankrupt or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Stock Pric* or Share Pric* or Abnormal retur* or Post filin* retur*)*	This search string is not subject dependent. It was designed to capture empirical papers that directly relate to corporate bankruptcy and were not identified by any other search string.

All the search strings presented in table 3 were designed to evaluate the titles and abstracts of the papers included in five different databases: ABI Proquest, EBSCO Business Source Premier, Social Science Citation Index, EconLibrary and Social Science Research Network (SSRN). The first four databases were identified with the help of Ms. Heather Woodfield and Ms. Mary Betts-Gray, two experienced information officers in the management and finance areas. These two experts suggested that I should cover the contents of these four databases in my systematic review since they allegedly contained the most relevant *published* papers in my research domain. The SSRN database was included following expert advice from my systematic review panel. According to the panel members, this database provides one of the most important sources of information for working papers in the finance and accounting areas.

My general search strategy does not directly consider some information sources that could be used to develop my research topic. Specialized books provide an example of this situation. Nevertheless, some books were covered during the preliminary scoping study, providing the basis for the first part of my systematic literature review. The main justification for this choice is that, in the behavioural finance domain, much of the theoretical work is mainly

available in books. Specialized press and newspapers can also have relevant qualitative information. Nonetheless, this type of information was not included in my systematic review since it generally lacks scientific rigor.

Working papers and conference papers are also important sources of information because they incorporate the latest thinking on the research subject. However, I decided not to include these sources of information in my systematic review. There are two main reasons that justify my decision. The first relates to quality and the second to availability. Despite their potential interest, working papers and conference papers have not been reviewed rigorously by academics in the field. This means that some of them may have problems at a fundamental scientific level, something that is minimized in peer-reviewed publications. In addition, it is not easy to locate relevant literature before it has been published in a journal. Consequently, the working papers that were finally considered in my systematic review were identified in SSRN or directly suggested by a member of the panel or by some key scholar in the field.

Finally, it is also important to mention that cross-referencing was used to uncover several papers that are part of my systematic review. In fact, the use of this technique, widely accepted in the traditional literature review framework, allowed me to find seminal papers within my research domain that were not identified with the use of the systematic approach.

3.2.2.3. Selection criteria

The use of the search strings presented in table 3 enabled me to identify a set of papers that were potentially interesting. However, it was always expected that only a fraction of such studies could make a significant contribution to the development of my PhD and comply, at the same time, with a high quality standard of research. Consequently, a set of pre-determined selection criteria were designed to make sure that only high quality papers that make a relevant contribution to my research were reviewed in depth in the present dissertation. The next paragraphs detail such selection criteria.

Broad selection criteria

The first stage of the selection process consisted of analysing the titles and abstracts of the papers that were identified with the five search strings in the different databases. This analysis showed that, as initially predicted, only a sub-set of these studies were relevant to my doctoral research. The following table summarizes the exclusion criteria that were used in this initial stage.

Table 4 – Exclusion Criteria and Rationale (Title and Abstract)

Criteria	Rationale
1. Only studies published in scholarly journals are to be included in the review. The exceptions are SSRN working papers and papers suggested by the panel or an eminent scholar in the bankruptcy domain.	Working papers, conference papers, magazines, newspaper articles, and similar sources of information lack scientific rigour.
2. Empirical studies have to be based on U.S. data to be included in the review.	My research project can only be undertaken with U.S. data. The difference between U.S. and non-U.S. bankruptcy systems makes non-U.S. contributions irrelevant for my research.
3. Studies considering financial companies are to be excluded from the review.	Financial and insurance corporations have financial responsibilities that are not strictly comparable with other firms' financial responsibilities. Moreover, these companies are also constrained by special legal requirements and by investor protection schemes that influence their financial strategy and thus their default probability.
4. Studies considering utilities companies are to be excluded from the review.	Utilities are regulated business thereby being subject to different pressures and influences compared to conventional firms.
5. Studies focusing on the legal aspects of bankruptcy are not to be considered in the review.	The focus of my PhD is not the legal aspects of bankruptcy.
6. Studies focusing on consumer bankruptcy are not to be considered in the review.	The focus of my PhD is corporate bankruptcy.
7. Studies that mention corporate bankruptcy but do not have it as a main focus are to be excluded from the review.	Corporate bankruptcy is very much a current issue in the finance literature. Many papers and articles use this concept without adding to the knowledge in the field.

All studies identified by the five search strings that did not fall into one or more of these exclusion criteria were assessed by the selection criteria for full papers. Details of such criteria are presented in the next paragraphs.

Selection criteria for full papers

1. Empirical paper - in order to be included, such a paper provided/described:
    - A clear definition of the sample used (first and last year of the sample, sectors included, nationality of the sample firms, descriptive characteristics such as size distribution, etc.)
    - A clear definition of the variables and methodologies employed
    - The relationship with existing theory and previous work
    - Contribution to the existing knowledge
    - Clearly stated the empirical results and their significance. Moreover, the paper also provided a clear interpretation of the results in the context of the existing literature and relevant theory
    - The methodological shortcomings that may reduce the possibility to generalize from the presented results

2. Non-empirical paper - in order to be included, such a paper presented/defined:
    - The aim of the model and relationship with existing theory and previous work
    - Its contribution to the existing knowledge
    - The assumptions of the model being developed
    - The variables, parameters and equations used must be clearly stated and defined
    - Explicit proofs of the most important results and theorems

All the papers that complied with both the selection criteria for abstracts and titles and the selection criteria for full papers were also assessed with a quality appraisal tool. This procedure ensured the overall quality of the papers included in the final review. The next paragraphs summarize the main characteristics of the quality appraisal tool devised for this study.

Quality Appraisal

Quality is always an issue when dealing with academic literature. In fact, scholars have long realised that there are severe qualitative differences between extant academic publications. Having this in mind, I spent a considerable amount of time debating with the panel members how I could assess the quality of the papers I would have to include in my final systematic review. In the end, I decided to use a similar methodology to the one originally developed by Marcos (2000) to address this issue. This methodology analyses five different dimensions of each paper: contribution to knowledge, discussion of the underlying theory, use of appropriate methodology, data analysis and discussion of the limitations of the study. The details of the quality assessment tool are provided in table 5.

Table 5 – A Critical Appraisal Tool for the Systematic Review

Elements to Consider	Level			
	0 - Low or absence	1 - Medium	2 - High	Not Applicable
Contribution to Knowledge	This article does not provide enough information to assess this criteria	Contribution to knowledge exists but is limited in importance and/or significance	Significant addition to current Knowledge.	This element is not applicable to this paper
Discussion of the Underlying Theory	This article does not provide enough information to assess this criteria	There is a connection between the paper's theoretical basis and extant theoretical knowledge in the field; Empirical papers built on existing theory	Excellent discussion of the model; good review of prior literature	This element is not applicable to this paper
Use of Appropriate Methodology	This article does not provide enough information to assess this criteria	Justified research design; Acceptable methodology to develop the paper's idea	Adequate research design; Adequate choice of relevant proxies	This element is not applicable to this paper
Data Analysis	This article does not provide enough information to assess this criteria	Appropriate sample, results are relevant for understanding the aim of the paper	Adequate data samples; results are significant and enable the reader to draw concludions about the paper's aim	This element is not applicable to this paper
Limitation of the Study	This article does not provide enough information to assess this criteria	Paper mentions its limitations but does not explain their relevance to understand the results	Paper states clearly its limitations; implications are acknowledged	This element is not applicable to this paper

Source: Marcos (2000)

Papers were considered for the systematic review if:

1. they do not score two zeros in the five different categories under evaluation;
2. they score a two at least once in any of the categories under evaluation.

I must emphasize the idea that the use of this tool is by no means completely objective. In fact, the expertise of my panel was fundamental in the analysis of several particular cases. I am now sure that the consultation process is the most effective one when dealing with the question of assessing the quality of academic literature.

3.2.2.4. Data extraction

Data was extracted from the studies that were judged suitable for the aims of the systematic review and that met all the selection criteria described in the previous points 3.2.2.2 and 3.2.2.3. Procite was used to log extracted categories of information, which include:

- Citation information: author, article title, journal title, year, and volume;
- Methodological information: empirical, non-empirical, quantitative or qualitative, method of data collection and particular methodology employed;
- Thematic information: key findings and contribution to knowledge, underlying theory, limitations.

Table 6 provides an example of the data extraction form used in this study.

Table 6 – Sample of the Data Extraction Form

Author Name	Seyhun, N.//Bradley, M.
Article Title	Corporate Bankruptcy and Insider Trading
Journal Title	Journal of Business
Author Affiliation	University of Michigan//Duke University
Publication Date	1997
Volume	70
Page Number	189-217
Research Category	Empirical
Data Description	407 firms listed on NYSE and AMEX that filed for voluntary bankruptcy petition between 1990 and 1991. Insider trading data obtain from SEC's official Summary of Security Transactions and holdings.
Quality Assessment	
Contribution to knowledge	2
Discussion of underlying theory	2
Use of appropriate methodology	2
Data analysis	2
Limitations	1
Include (Yes/No)	Yes
Exclusion Reason	N\A
Related Papers	Loderer and Sheehan (1989); Gosnell et al (1992); Jaffe (1974); Seyhun (1986)
Location of item	D:\PhD\thesis\artigos\Journal of Business\seyhun_bradley_1997.pdf
Key findings	Insiders engage in significant sales of their firms' stock in the months and even years preceding a bankruptcy filling and thereby avoid significant capital losses. In particular, the study documents that insider selling begins five years before the filling date and builds to a crescendo up to the announcement month. Results also demonstrate that insiders change their investment pattern after the prices have fallen. After the market prices become stable, corporate insiders begin to buy back their firms' stock. Results also show that top executives and officers exhibit a stronger selling pattern than the remaining corporate insiders do. This study's results have two major implications. First, results show that insider trading does, in fact, convey important information regarding the future market prices of a firm's equity. Second, this study also questions managers' incentives to maximize shareholder value throughout the bankruptcy process. In fact, the behavioural pattern of insiders documented in this study suggests that they maximize their utility (wealth) by selling their firms' shares, which reduces their incentive to bargain for their shareholders interests during the bankruptcy proceedings.
Abstract	This study documents significant sales by the insiders of firms filing bankruptcy petitions prior to the filing date. It is found that selling is more intense for top executives and officers and that insiders in general systematically sell stock before prices fall and buy stock after prices have fallen. Although this trading pattern may simply reflect an implicit compensation arrangement between insiders and stockholders, the significant sell-off does raise potential questions regarding managements' incentives to maximize shareholder wealth through the Chapter 11 process.
Critique	Well-structured. Good methodology. Solid theoretical basis and well-related with previous research
Keywords	Insider trading, Bankruptcy, Chapter 11, Abnormal Returns

3.2.2.5. Synthesis

One of the main reasons for doing a systematic literature review is to go beyond simple narrative descriptions of existing contributions to a particular field. Several studies were identified by using this protocol and their relevant content to my doctoral research was captured by the data extraction procedure. However, this process did not provide clear guidance on how each study contributes to the development of the field and how different studies relate to each other. Consequently, I needed to organize and summarize the relevant literature in a meaningful way. The experience gathered with the scoping study suggested that a possible way to achieve this objective was to organize the discussions around the main theoretical frameworks that embed my PhD research. Accordingly, this dissertation contrasts the theoretical and empirical contributions of the EMH and behavioural finance in the context of

corporate bankruptcy. This approach provides a clearer understanding of extant knowledge in the field.

3.3 Implementation of the review protocol

The protocol presented in the previous sub-sections was actually implemented in six different stages:

1. The first stage consisted of using all the search strings presented in sub-section 3.2.2.2 on ABI Proquest and EBSCO since pilot studies undertaken before the actual systematic review demonstrated that the bulk of literature would come from these two databases. I then checked for the existence of overlapping studies. I began by identifying the overlapping studies within each database. Afterwards, I compared the studies identified in ABI Proquest with the ones identified in EBSCO and eliminated those that were present in both databases. Subsequently, a shortlist that combined all non-overlapping studies identified in this first stage was compiled;
2. In the second stage, I used the search strings identified in sub-section 3.2.2.2 on Social Science Direct and EconLibrary. The studies identified in this stage were compared to those included in the shortlist mentioned in the previous point. The non-overlapping studies were included in this shortlist;
3. In the third stage, I used SSRN to collect working papers that were potentially interesting for my MRes review. I then controlled for the existence of overlapping papers within the results obtained through SSRN. In a second stage, I controlled for overlapping between the studies identified with this database and those included in the shortlist mentioned in the previous point. The non-overlapping studies were included in this shortlist;
4. The next step was to analyse the title and abstract of all the studies in the shortlist. The broad selection criteria allowed me to reduce the bulk of literature that had to be analysed in depth;
5. Papers that were not excluded in the previous step were analysed with the selection criteria for full papers and the quality assessment tool. Those that were considered to meet a high quality standard and to make a relevant contribution for the development of my doctoral research were revised in depth and included in this study;
6. Finally, I added to the previous studies some others that were directly suggested by the panel or that were identified by cross-referencing.

The next chapter summarizes the major findings of the papers identified with the search protocol now presented.

4. Findings

This chapter is divided in four main parts. The first details the literature that was identified using the review protocol presented in the previous chapter. The second provides a basic characterization of the literature included in the final review. The third presents the results of the data extraction procedure. The last part summarizes the main findings of this study.

4.1 Summary of the literature

This sub-section presents the results obtained with the methodology described in chapter 3. It summarizes the number of studies identified with the search strings and the number of papers excluded from the analysis due to the several selection criteria. This sub-section finalizes by presenting the papers that were included in the final review but were not directly identified with my database search.

4.1.1 Descriptive results of the search strategy

As mentioned in sub-section 3.3, the search strings were initially used with ABI Proquest and EBSCO. Table 7 summarizes the information about the amount of literature identified in this stage of the process.

Table 7 – Literature Identified in ABI Proquest and EBSCO: All Search Strings

	Number of Papers Identified		
Search String	**ABI Proquest**	**EBSCO**	**Total**
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Market reaction or Price reaction)	41	33	74
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Financial Disclosure or Announcemen*)	71	80	151
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Efficient Marke* or Rational Investo* or Smart Investo* or Sophisticated Investo*)	16	11	27
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND ((Behavi* Finance or Anomal* or Underreaction or Overreaction or Bad news) or ((Naive Investor* or Noise trade* or Irrational investor*))	22	18	40
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Stock Pric* or Share Pric* or Abnormal retur* or Post filin* retur*)	124	103	227
Total	**274**	**245**	**519**

As shown in Table 7, a total of 519 papers were identified by using the five search strings presented in table 3 in ABI Proquest and EBSCO. However, given the existence of overlapping problems, the actual number of relevant studies was much lower. As discussed in

sub-section 3.3, two different sources of overlapping were identified: within the same database and between databases. Table 8 provides detailed information about this issue.

Table 8 – Overlapping and Non-overlapping Studies in ABI Proquest and EBSCO

	Total Number of Studies	Overlapping Studies	Non-overlapping Studies
ABI Proquest	274	97	177
EBSCO	245	56	189
Total	**519**	**153**	**366**

Table 8 shows that 153 papers identified in table 7 are simply repeated observations within ABI Proquest and EBSCO (30 percent of the total). Moreover, by comparing the independent results obtained with each database, I was able to identify 34 additional papers that should be excluded from the subsequent phases of the analysis. As a result, this initial search stage provided a total of 332 papers that were potentially interesting for the development of my systematic review.

After completing the first step of my search strategy, I used the search strings defined in sub-section 3.2.2.2 to identify other potentially interesting contributions in three additional databases: Social Science Citation Index, EconLibrary and SSRN. Table 9 presents the results of this procedure.

Table 9 - Literature Identified in Social Science Citation Index, EconLibrary and SSRN: All Search Strings

	Number of papers			
Search String	**Social Science Citation Index**	**EconLibrary**	**SSRN**	**Total**
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Market reaction or Price reaction)	10	10	16	36
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Financial Disclosure or Announcemen*)	51	5	27	83
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Efficient Marke* or Rational Investo* or Smart Investo* or Sophisticated Investo*)	0	0	29	29
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND ((Behavi* Finance or Anomal* or Underreaction or Overreaction or Bad news) or ((Naive Investor* or Noise trade* or Irrational investor*))	13	6	9	28
(Bankrupt* or Chapter 11 or Chapter 7 or Financial distress or Liquidation) AND (Stock Pric* or Share Pric* or Abnormal retur* or Post filin* retur*)	43	0	31	74
Total	**117**	**21**	**112**	**250**

Table 9 shows that a total of 250 papers were identified by using Social Science Citation Index, EconLibrary and SSRN as information sources. After comparing the studies identified with Social Science Citation and EconLibrary with the ones identified in the previous search

phase, I realised that 48 papers of the Social Science Citation Index and three of the EconLibrary were relevant for the present study since they did not overlap with the ones previously identified with ABI Proquest and EBSCO. SSRN provided 49 additional papers. In fact, from the total of 112 studies identified using SSRN, 42 studies were repeated observations and 21 papers overlapped with those identified with other databases. Consequently, the total scope of literature identified by the use of the database strategy presented in chapter 3 is 432 papers.

4.1.2 Using the selection criteria for titles and abstracts

The 432 papers mentioned in the previous sub-section were assessed using the selection criteria for titles and abstracts. Table 10 describes the results obtained in this phase.

Table 10 – Results from the Exclusion Criteria: Titles and Abstracts

Criteria	Number of papers excluded
1. Only studies published in scholarly journals were included in the review. The exception are SSRN working papers and papers suggested by the panel or an eminent scholar in the bankruptcy domain.	1057 [24]
2. Empirical studies must be based on U.S. data to be included in the review.	14
3. Studies considering financial companies were excluded from the review.	9
4. Studies considering utilities companies were excluded from the review.	2
5. Studies focusing on the legal aspects of bankruptcy were not considered in the review.	71
6. Studies focusing on consumer bankruptcy were not considered in the review.	51
7. Studies that mention corporate bankruptcy but do not have it as a main focus were excluded from the review.	229
Total (excluding criterion number 1)	**376**

The volume of literature that had to be analysed with the selection criteria for full papers was considerably reduced in this phase. In fact, as shown in table 10, a total of 376 papers were considered as non-essential for the development of my doctoral research and were consequently excluded from the analysis. The main reason explaining this result is that an important number of studies initially identified with the search strings did not have corporate bankruptcy as their main focus. Moreover, a considerable amount of papers was not included in the review because they examined the legal aspects of bankruptcy, which is not the main aim of the present study. On the other hand, it is also noteworthy that only 14 studies were excluded because they use non-U.S. data to produce their results.[25] This is a surprising result

[24] These papers refer to those studies that were excluded automatically in the database search since they were not peer-reviewed. They are not accounted for in the rest of section 4.1.

[25] Interestingly, 10 of these studies are working papers identified with SSRN.

since almost all studies identified with the search strings are of an empirical nature. In the end, only 56 articles (13 percent of the total) were considered relevant for in-depth analysis. The next paragraphs describe the results of this subsequent phase of the process.

4.1.3 Using the selection criteria for full papers

As mentioned in sub-section 3.2.2.3, two different criteria for full papers were used, conditional on the empirical/non-empirical nature of the study under analysis. Table 11 lays out the number of papers under each category uncovered with my database search.

Table 11: Empirical and Non-empirical Studies to Assess with Full Paper Criteria

Nature of paper	Number of papers
Empirical (Quantitative)	55
Non-Empirical	1
Total	**56**

Table 11 shows that almost all papers under analysis at this stage were of an empirical nature. Two factors contribute to explain this result:

1. The present study aims at identifying literature that explores the extent to which the predictions of two well-established theoretical frameworks, the EMH and behavioural finance, explain the stock price behaviour of companies that file for bankruptcy. Accordingly, there is not an *a priori* reason for expecting the existence of theoretical papers addressing this particular issue. Instead, the bulk of existent literature on this domain simply puts the theoretical predictions of the competing frameworks to the test;
2. The research tradition in finance explains the complete lack of existence of qualitative literature published on the research area under analysis. In fact, as argued by Ryan et al (2002), mainstream financial methodology is eminently quantitative and thus U.S. finance journals are not prone to publish work of a qualitative nature.

The selection criteria for full papers enabled me to further reduce the volume of literature to be included in the final review. Table 12 shows the results obtained with the selection criteria for full empirical papers.

Table 12: Number of Empirical Studies Excluded with the Full Paper Criteria

Criterion	Number of papers excluded
Definition of the sample	0
Definition of the variables and methodologies	0
Relationship with existing theory and previous work	6
Contribution to existing knowledge	3
Empirical results and their significance.	1
Methodological shortcomings	1
Total	**11**

Table 12 shows that the most relevant reason for excluding an empirical paper from this systematic review relates to its lack of relationship with the existing theory and previous work. This is consistent with the findings of Mitenko and Diamond (1994), which analyse the reasons for rejecting an academic paper in top finance journals. According to the authors, finance academic papers are mainly rejected for lacking a relevant contribution and for not providing a clear link between their particular contribution and the existing knowledge in the field.

At this stage, four other studies were excluded from the analysis. In fact, after reading these papers in full, I realised that they were out of scope, something not clear by just reading their abstracts and titles. Finally, it is worth mentioning that the non-empirical paper identified in table 12 met the selection criteria and was included in the set of 41 papers that were assessed with the critical appraisal tool presented in sub-section 3.2.2.3.

4.1.4 Using the quality assessment tool

As previously suggested, debating the quality of academic publications is always difficult. In fact, I found that this was the most demanding and frustrating phase of the entire project. The question is that, as emphasized by Dr. Denyer in one of his lectures, assessing the quality of research is not a perfectly objective process since it is highly sensitive to the researcher's personal bias.

Consistent with chapter 3, a critical appraisal tool was used to assess the quality of the 41 papers identified in the previous point. After scoring all of them, I realised that five studies should be excluded from the analysis due to quality problems: Katz et al (1985); Dawkins and Rose-Green (1998); Rose-Green and Dawkins (2000), Rose-Green and Dawkins (2002) and Mishra and Drtina (2004). After discussing this issue with the panel members, I decided not to include in the review the contribution by Mishra and Drtina (2004) given that this paper presents severe methodological shortcomings. Despite their quality limitations, all the remaining studies were included because they make an important contribution to knowledge. Consequently, only 40 of the 41 papers analyzed with the critical appraisal tool were included in the final literature review.[26]

4.1.5 Literature included in the systematic review but not identified with the search strategy

The methodology chapter suggests that cross-referencing is also a suitable method for identifying relevant sources of information for this systematic review. In fact, five extra papers

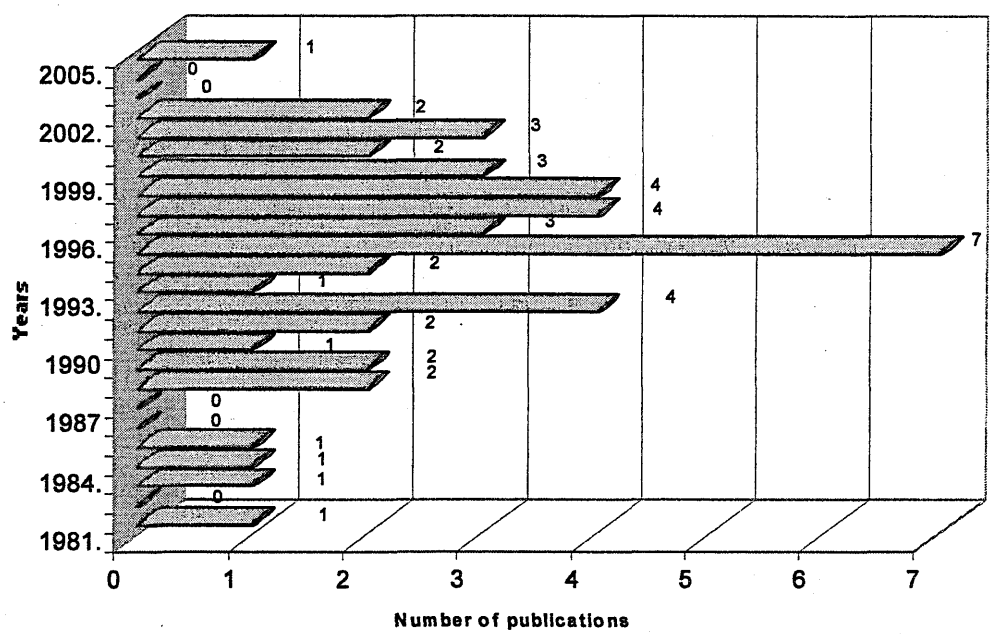
[26] See Appendix 1 for details.

were identified with this technique.[27] Moreover, the panel members also suggested two additional papers to be included in the final study.[28] All these studies were assessed with the selection criteria for full papers and with the critical appraisal tool. None of the articles was excluded since they all met the relevant selection criteria.[29] As a result, the final review is based on 47 papers, with 40 having been directly identified through my database search and the remaining seven by cross-referencing or suggestions made by the panel. A book written by Delaney in 1998 is also included in the review. In fact, after debating this issue with the panel members, I concluded that this particular book made a fundamental contribution to the development of my doctoral research and therefore should be included in the final document.[30]

4.2. Descriptive statistics of the papers

This sub-section provides some basic statistics about the final sample of 47 papers included in the review. Figure 3 shows the number of publications per year.

Figure 3: Number of Publications Per Year



As shown by figure 3, the design of my search strategy does not allow me to find a considerable number of relevant studies until 1988. In fact, from 1981 (which is the year of publication of the first study included in the review) to 1987, only four studies are identified. Figure 3 also shows that the ten-year period from 1988 until 1998 was the most productive

[27] See Appendix 2 for details.
[28] See Appendix 3 for details (includes the book by Delaney, 1998).
[29] Two articles are theoretical and the remaining ones empirical.
[30] Appendix 4 presents a summary of all of the studies included in the systematic review.

one, with an average of 2.9 studies published per year. From 1999 until 2005 the average number of publications decreases sharply and in 2003 and 2004 no study was published in this domain.[31]

Table 13 shows the distribution of the selected papers by journal, providing some insight on the different areas of research that contribute to the development of the issue under analysis.[32]

Table 13: Distribution of the Papers Included in the Review by Journal and Area

Finance and accounting		Marketing	
Financial Analysts Journal	1	Journal of Business Research	1
Contemporary Accounting Research	2	**Total**	**1**
Journal of Business Finance & Accounting	3	**Economics**	
Review of Financial Economics	1	Journal of Economic Issues	1
Journal of Accounting & Economics	2	Journal of Economics & Business	1
Journal of Accounting Research	1	Quarterly Journal of Business and Economics	3
Journal of Accounting, Auditing & Finance	1	The Rand Journal of Economics	1
Journal of Banking & Finance	2	**Total**	**6**
Journal of Corporate Finance	1	**Strategic Management & International Business**	
Journal of Financial and Quantitative Analysis	1	AREUEA Journal	1
Journal of Financial Economics	2	Journal of Management	1
Quarterly Review of Economics & Finance	2	Management International Review	1
The Accounting Review	1	Management Research News	1
The Financial Review	5	S.A.M. Advanced Management Journal	1
The Journal of Business	1	**Total**	**5**
The Journal of Finance	9		
Total	**35**		

The information provided in table 13 shows that finance and accounting are the main areas of research contributing to the development of the present study. In fact, 76 percent of the papers included in the review were published in these areas of research. Moreover, it is also possible to verify from table 13 that the *Journal of Finance* is the most prolific journal in this research domain, being responsible for 25.7 percent of the publications of the finance and accounting areas. Economics and strategic management and international business also contribute with a total of 11 papers to the review. Interestingly, marketing also provides one contribution for the discussion that is undertaken in the next sections.

Overall, results show that the market's reaction to corporate bankruptcy announcements has captured the attention of several academics with different research orientations and, in particular, of those working in the areas of finance and accounting. This multidisciplinary setting provides an interesting background for the remaining parts of this literature review.

4.3 Data extraction

This sub-section presents the contributions of the papers that passed the scrutiny of all the selection criteria presented in chapter 3. For an easy understanding, this sub-section is

[31] It is important to note that this analysis is only valid for the studies identified with my search strategy.
[32] This table is based on the second edition of "*Journal Recommendations for Academic Publication*", published by the School of Management - Cranfield University.

divided in four main parts. The first closely relates to sub-section 2.3.2.1, and reviews the studies presenting evidence consistent with markets reacting efficiently to corporate bankruptcy announcements. Conversely, the second part relates to sub-section 2.3.2.2 and reviews the studies that present evidence that is inconsistent with markets reacting efficiently to corporate bankruptcy announcements. The third part introduces a set of papers that are relevant for the development of my doctoral research but do not provide any particular insight about the degree of market (in)efficiency in the context under analysis. The last part syntheses all the contributions presented in this sub-section, and also provides the background for the development of my doctoral research.

4.3.1. Evidence consistent with markets reacting efficiently to corporate bankruptcy announcements

There are several papers addressing the market's reaction to corporate bankruptcy announcements which support the predictions of the EMH. Studies investigating the impact of the Act of 1978 on the market's reaction to this event provide one of the clearest examples in this domain. Clark and Weinstein (1983) is one of the first references in this area, examining the market's ability to anticipate bankruptcy filings before the implementation of this new legal framework. The paper demonstrates that shareholders start losing money long before the formal announcement of bankruptcy. These losses are especially acute for the month in which the bankruptcy occurs and are particularly concentrated in the three-day interval surrounding the bankruptcy filing. Consistent with these findings, Clark and Weinstein (1983) conclude that bankruptcy filings convey important unanticipated information and that the market is able to react in a timely manner to the disclosure of such valuable news.

In a related study, Morse and Shaw (1988) empirically test the impact of the Bankruptcy Reform Act of 1978 on the risk and return characteristics of bankrupt companies' stock. This paper contributes to the finance literature in several ways. Firstly, Morse and Shaw (1988) find that firms going into bankruptcy prior to 1978 experience the same degree of financial distress as firms entering this situation after that date. This study also shows that a firm's systematic risk is not significantly affected by the bankruptcy announcement. Morse and Shaw (1988) also conclude that, although the three-year average returns for firms that have entered bankruptcy appear large, they are not significant. Additionally, there is evidence suggesting that stock prices of firms in Chapter 11 react favourably to both the announcement of the filing of a reorganisation plan and to the creditors' approval of such a plan.

Elayan and Maris (1991) focus on U.S. real estate firms to provide evidence on the impact of the Act of 1978 on the market's reaction to the announcement of voluntary liquidation and reorganization. Moreover, Elayan and Maris (1991) also investigate if the introduction of this legal framework altered the percentage of real estate firms opting for liquidation rather

than reorganization. A sample of 36 firms that voluntary entered bankruptcy in the form of Chapter 7 or Chapter 11 between 1973 and 1987 is used by Elayan and Maris (1991) to explore these research questions. Results show that the market responds positively to the announcement of corporate liquidation whereas a negative reaction to the announcement of reorganization is documented. Elayan and Maris (1991) also concluded that the Reform Act of 1978 had no impact on the market's reaction to both announcements. In fact, consistent with the findings of Morse and Shaw (1988), their results demonstrate that the market's reaction to the announcement of liquidation and reorganization is the same in the pre and post-1978 periods.

Rimbey et al (1995) contribute to this body of literature by examining the 1978 Bankruptcy Reform Act's impact on the wealth of bankrupt firms' shareholders, using a sample of 140 firms that filed bankruptcy between 1974 and 1978. Consistent with previous results, Rimbey et al (1995) show that the bankruptcy filing date is associated with a significant decline in shareholders' wealth. The authors suggest that this event signals the failure of private attempts to restructure the firms' obligations, which is perceived as bad news by the market. Interestingly, in contrast with the findings of Morse and Shaw (1988) and Elayan and Maris (1991), Rimbey et al (1995) find that the post-Reform Act filings are associated with more negative pre-filing and announcement period returns to shareholders than those occurring before the implementation of this new legal framework. In the last part of the paper, Rimbey et al (1995) present complementary evidence to that offered by Elayan and Maris (1991) and report larger losses at the announcement date for firms that are liquidated without providing any value to their shareholders than for the remaining firms. The authors conclude that this indicates that the market is highly efficient, since apparently it is able to evaluate limited information under very difficult circumstances.

In a related study, Rose-Green and Dawkins (2000) investigate if, at the time of bankruptcy filing, the market differentiates between firms that are subsequently liquidated and those that are reorganized. In sharp contrast with the evidence presented in Elayan and Maris (1991), their results demonstrate that the former group of firms presents a significantly larger negative price reaction at the bankruptcy filing date than the latter group of firms. The difference in these results may be due to sampling issues. In fact, the study by Elayan and Maris (1991) relies only on U.S. real estate firms, whilst Rose-Green and Dawkins (2000) use a sample of 77 non-industry specific firms listed on the NYSE, AMEX and NASDAQ, which filed for bankruptcy between 1980 and 1996. In line with Rimbey et al (1995), Rose-Green and Dawkins (2000) conclude that the U.S. equity market is efficient, in the sense that it has a high degree of insight into subsequent bankruptcy resolution.

The market's reaction to the violation of the absolute priority rule (APR) is also a field of research within the bankruptcy domain that has produced empirical evidence in favour of the EMH's predictions. The APR states that the value of a bankrupt firm is to be distributed to suppliers of capital in such way that senior creditors are fully satisfied before any distributions are made to junior creditors and junior creditors are paid in full before common shareholders (John, 1993). Although APR is strictly followed in Chapter 7 liquidations, a number of recent studies document that APR is frequently violated in Chapter 11 reorganizations (Frank and Torous, 1989 and John, 1993). In particular, nowadays, it is common to verify that reorganization plans designed under Chapter 11 provide for shareholders to be given a stake in the reorganized firm (Frank and Touros, 1989 and Weiss, 1990). Creditors have an incentive to agree with these terms, which provides some wealth to shareholders at their expense, because this action speeds up the resolution of bankruptcy and consequently reduces the overall cost of the process (Frank and Touros, 1989 and Weiss, 1990).

Drawing on this rationale, Eberhart et al (1990) use a sample of 30 fillings under the Act of 1978 to explore how deviations from APR influence the wealth of bankrupt companies' shareholders. In particular, this study measures the amount paid to shareholders in excess of what was due under strict fulfilment of this rule. Evidence shows that the violation of the APR is a frequent event: this rule is not strictly applied in 23 of the 30 cases explored in Eberhart et al (1990). Moreover, this paper shows that the amount paid to shareholders in excess of what was due under complete adherence to APR varies from zero to 35.71 percent of the total value paid to the firms' stakeholders, averaging 7.6 percent. In line with Frank and Torous (1989), Eberhart et al (1990) posit that the reported payments to shareholders may be viewed as compensation for losing their option to delay reorganization proceedings. They provide evidence supporting this argument. In fact, Eberhart et al (1990) show that the length of the delay in bankruptcy proceedings is negatively related to the proportion of the total distribution that shareholders are given in violation of the ARP. This study also provides some evidence on how the market reacts, conditional on whether or not the APR is violated. Consistent with Clark and Weinstein (1983) and Elayan and Maris (1991), the results show that the market value subsequent to the bankruptcy announcement impounds the present value of both the amount paid in adherence to the APR and the amount paid in violation of that rule.

The finance literature has long investigated the impacts of debt service default and bankruptcy on security prices whilst several studies in accounting provide insight into the effects of technical default or the violation of accounting-based covenants in debt agreements on the same variable. However, until 1995, little was known about the relationship among these different events. Beneish and Press (1995) use a sample of 134 firms traded on the NYSE to

explore the valuation effects of technical default, debt service default and bankruptcy.[33] This study also provides some evidence of the interrelation between the events under research. Beneish and Press (1995) find that all the analysed events are value-relevant and increasingly severe. Moreover, Beneish and Press (1995) show that the events are interrelated. In particular, their results demonstrate that: 1) firms in technical default are more likely to suffer serious future distress (like debt service default or bankruptcy) when compared to non-defaulters; 2) bankruptcy is more likely after debt service default. The authors also conclude that the valuation effects of technical default provide a valuable timely warning to investors, because they partially anticipate losses from subsequent distress announcements. In fact, the effects of debt service default announcements are attenuated if preceded by disclosure of technical default in the previous year and that firms filing for Chapter 11 suffer less price variation in the cases where bankruptcy is preceded by a debt service default. These results suggest that the market reacts to signs of financial distress long before the firm files for bankruptcy, something predicted by the EMH.

In a related study, Vu (1998) presents evidence on the stock market's reaction to bond defaults. In particular, this paper analysis the effect of junk bond defaults on common stock returns.[34] As mentioned by Vu (1998), defaults are negative events that should be associated with market activity since they signal that the defaulting company is in financial distress. Results demonstrate that stock prices fall sharply before the default announcement date. This fact shows that the market is able to uncover the signs of financial distress before the actual date of the event (Vu, 1998).

The papers reviewed in this sub-section suggest that a significant share price decline occurs around the time of a bankruptcy filling. Consequently, market participants have an incentive to anticipate this corporate event in order to minimize their financial losses. As mentioned in sub-section 2.3.2.1, some authors argue that financial distress can be anticipated by analysing the data disclosed in a firm's annual report (e.g. Altman, 1968; Beaver, 1968; Ohlson, 1980; Altman and Brenner, 1981; Aziz et al, 1988). Accordingly, a body of finance literature posits that, if these models are able to capture information about the firm's financial prospects, then they may dissipate the surprise of impending bankruptcy. Drawing on this argument, Zavgren and Friedman (1988) suggest that the financial prospects of the firm, as filtered through a multivariate prediction model, may induce portfolio realignments that adjust the share price in advance of the bankruptcy announcement. Zavgren and Friedman (1988)

[33] In Beneish and Press's (1995) sample, 159 events of default are explored: 87 related with technical default, 42 with debt service default and 30 with bankruptcy.

[34] Junk bonds (or high-yield) are bonds rated below Baa3 by Moody's or BBB- by Standard and Poor and consist of *"fallen angels"*, which are former investment-grade bonds that have declined in rating and original-issue junk bonds, which are usually issued by young, growing companies (Vu, 1998).

explore this question by examining the relationship between unanticipated financial failure or survival in both market returns and trading volume. In this paper, the authors use a logistic regression model to derive the expectations of a firm's financial prospects. This logistic regression is based on variables obtained through the analysis of the firm's financial statements one year prior to the potential bankruptcy announcement. When the model falsely identifies a failing firm as healthy, a type I error occurs. According to Zavgren and Friedman (1988), this is bad news event and should be associated with a stronger negative reaction to the announcement of bankruptcy when compared to the case of firms filing for Chapter 11 but which were correctly classified by the model. On the other hand, when the model falsely identifies a healthy firm as failing, a type II error occurs. In this case, non-failed firms are expected to exhibit a positive market reaction one year following model prediction of failure. Results show that the expectations about the type II error are confirmed in that, in an initial period after the classification of such firms, their stock price declined sharply and then rebounds, as the financial failure anticipated by the model did not materialize. However, expectations about the type I error were not confirmed since such firms did not suffer strong negative abnormal returns. In the light of these results, Zavgren and Friedman (1988) posit that although their financial statement-based model does not pick up the type I firms' declining prospects, investors do adjust their expectations about these firms prior to the event window analysed in the paper. The overall conclusion of Zavgren and Friedman (1988) is that traders attempting to generate excess profits by using accounting-based bankrupt prediction models would be hard-pressed to achieve the desired results.

Burgstahler et al (1989) provide additional evidence on the association between bankruptcy prediction models and the market's reaction to bankruptcy announcements. The authors posit that due to the direct and indirect costs of bankruptcy, there are *a priori* grounds for expecting changes in the probability of bankruptcy to have cash flow implications and hence incremental informational content. Using Ohlson's (1980) bankruptcy prediction model, Burgstahler et al (1989) identify a set of firms with a nontrivial probability of bankruptcy in order to analyse the relation between unexpected changes in this variable and unexpected changes in share price. Results indicate that unexpected changes in the probability of bankruptcy are somewhat useful in explaining security returns. This result holds after controlling for the effect of unexpected earnings. According to Burgstahler et al (1989), the evidence collected provides additional evidence on the role of accounting information in determining the value of the firm. However, the authors conclude that the market fully incorporates the information present in the public accounting documents, something consistent with the EMH framework.

Dugan and Forsyth (1995) use the cumulative sum technique presented by Hillmer and Yu (1979) and Ramaswawi (1987) to determine the point at which the stock market first perceives that a firm may file for bankruptcy. These authors then attempt to identify information, whether from financial statements or from other sources, that may have influenced the market in its assessment of the firm's prospects. Results suggest that the switching point of the mean and variance of stock returns is related both to financial statement information, as measured by changes in the bankruptcy model probability assessments, and the release of unfavourable news in the *Wall Street Journal.*

In a related study, Dawkins and Rose-Green (1998) provide additional evidence on the association between the market reaction to bankruptcy announcements and the disclosure of relevant non-financial information to the market. In particular, this study examines the relation between prior *Wall Street Journal* announcements of possible bankruptcy filings and price reaction to subsequent Chapter 11 filings. According to the authors, the EMH predicts that the magnitude of observed price reaction to announcements of economic events should be inversely related to the amount of unexpected information or surprise contained in these announcements. Drawing on this argument, Dawkins and Rose-Green (1998) posit that firms mentioned in the *Wall Street Journal* as possibly bankrupt should experience a smaller price decline around the bankruptcy filing date when compared with similar firms that have not been previously mentioned as likely bankrupt by the same newspaper. Consistent with the findings of Dugan and Forsyth (1995), Dawkins and Rose-Green (1998) show that firms with a prior announcement in the *Wall Street Journal* as having the possibility of bankruptcy experience a smaller price reaction to the event when compared to the other firms that did not receive a similar disclosure in that journal.

A final contribution is this domain is that of Russell et al (1999), which offers a different approach to the study of the market's reaction to bankruptcy announcements. Russell et al (1999) start by arguing that, at that time, existing research had not systematically examined the post-bankruptcy filing behaviour of bankrupt firm shares. According to the authors, this represented a gap in the literature since, in a considerable number of cases, the shares of bankrupt firms continued to be traded on organized exchanges for nontrivial prices. Interestingly, Russell et al (1999) argue that the U.S. press had already become aware of this situation. According to the authors, press reports produced at that time tended to classify the market for bankrupt firms as inefficient, based on the argument that some apparently worthless stocks were being valued and traded at relatively high values in the market. Drawing on the early work of Black and Scholes (1973) and Merton (1974) and using a sample of 154 firms that filed for bankruptcy between 1984 and 1993, Russell et al (1999) provide some insight into the valuation of bankrupt firms' stock in the post-filing period. Their results show that the pre-

petition stockholders' investment in 93 of the 154 firms in the sample was completely lost. Moreover, Russell et al (1999) also provide evidence showing that shareholders of these companies, on average, suffer a loss of around 70 percent during the bankruptcy period. In the last part of the paper, the authors posit that the stock of bankrupt firms attracts numerous investors, possibly due to the option-like characteristics of such stocks. Using an option-pricing model, Russell et al (1999) produce theoretical estimates for the equity value of the bankrupt firms in their sample. The authors show that such value estimates are aligned with the observable market capitalization. However, Russell et al (1999) acknowledge that their estimation procedure may produce biased estimates for the variable under analysis since they had problems related with lack of information about some of the sample companies. Despite these methodological limitations, Russell et al (1999) conclude that their study provides evidence reinforcing the idea that, on average, markets efficiently access the future prospects of bankrupt companies.

4.3.2. Evidence inconsistent with markets reacting efficiently to corporate bankruptcy announcements

The results obtained with my search strategy also uncovered some empirical papers providing indirect evidence in favour of the behavioural theorists' arguments. This section summarizes the main contributions in this domain.

Analysts typically stop following firms after they have filed for bankruptcy (e.g. Phalon, 1990; Harpel, 1992; Welling, 1993; Ellis, 1995 and Jaffe, 1995). This is known as the *fallen angel, neglected firm effect* and provides the argument often used to justify why investing in bankrupt firms is possibly a profitable high-risk investment strategy for the risk-seeking investor (Indro et al, 1999). In fact, there are several cases documented in the literature where an investment strategy consisting of buying the stock of bankrupt companies provides investors with a substantial return (Indro et al, 1999).[35] Indro et al (1999) use a sample of 171 publicly traded firms that filed for Chapter 11 between 1980 and 1991 and a logistic regression model, to identify the characteristics of the firms whose shareholders experience post-bankruptcy filing gains (the winners). Their results show that, on average, winners have a well-defined pattern. Usually, these firms are relatively small, have higher proportions of convertible debt, tend to file bankruptcy for non-financial reasons, present a low level of ownership concentration and suffer relatively higher pre-filing stock price declines. Indro et al (1999) also find that shareholders of firms that have higher levels of private debt, better growth opportunities (as measured by research and development expenditures) and operate in more concentrated industries are better off than the remaining shareholder of winner firms. More interestingly, Indro et al (1999)

[35] Indro (1999) mentions the cases of Itel Corporation, Charter Company and Texaco as examples of this situation.

show that, on average, an ex-ante trading strategy consisting of purchasing bankrupt stocks that present a 50 percent or higher probability of being a winner on the day after the bankruptcy filing and holding the stock for a year can generate average compounded and excess compounded holding-period returns of +71 percent and +42 percent, respectively. The investment strategy described in this paper, which is based on public information and that systematically delivers abnormal returns, challenges the EMH prediction of the lack of free lunches for the taking.

Katz et al (1985) provides further evidence on the profitability of investing strategies based on the stock of distressed firms. In particular, this study explores the impact on common stock prices of distress and recovery signals generated by the popular bankruptcy models presented in Altman (1968) and Wilcox (1978). The authors classified NYSE firms according to whether they were moving from health to distress (bad news) or from distress to health (good news). Results show that for the 15 month period prior to the issuance of the annual report that triggers a shift in state, firms classified by the Altman (1968) model as recovering from distress displayed significant abnormal positive returns. Moreover, those firms classified by the model as deteriorating show significant abnormal negative returns. Interestingly, both groups continued to exhibit abnormal returns in the expected direction over the 9 months period following the announcement date. However, using the Wilcox (1978) model as the discriminator of recovery, Katz et al (1985) find no abnormal return behaviour before or after the predictions of distress. According to the authors, the apparent disparity in results is motivated by methodological problems with the use of the Wilcox (1978) model, namely the procedure that was used to identify the distress and recovery groups. Despite the weaker results obtained with the use of the Wilcox (1978) model, the study by Katz et al (1985) provides evidence consistent with that of Indro et al (1999), suggesting that it is possible to earn abnormal returns by simply using public information.

Hubbard and Stephenson (1997) provide further insight into the stock price behaviour of firms that continue to be actively traded after filing for bankruptcy. In particular, Hubbard and Stephenson (1997) aim at analysing the appropriateness of the prices defined in the reorganization plan when compared with the actual market price of the companies. In order to achieve their goal, the authors use a comprehensive sample of the firms that filed for Chapter 11 between 1988 and 1993 and remained listed on a major U.S. exchange when they filed their first reorganization plan. Results suggest that investors grossly overpaid for what would be received from bankrupt companies. This conclusion is supported by two complementary findings. Firstly, Hubbard and Stephenson (1997) show that a quarter of their sample-firms were traded on the market for nontrivial positive prices despite the fact of having filed a reorganization plan that granted nothing to their shareholders. Secondly, Hubbard and

Stephenson (1997) analyse the particular case of the companies that remained listed after filing their first reorganization plan until the date in which a plan was officially confirmed by the bankruptcy court. They find that these firms' investors lost an average of 22 percent of their investment during this period, despite a substantial appreciation in the overall stock market. Hubbard and Stephenson (1997) conclude that investors do not understand the bankruptcy process and/or are not aware of the terms of publicly available reorganization plans.

The association of newly reported financial data with stock prices has been studied by many researchers (e.g. Beaver, 1967; Benston, 1967; Ball and Brown, 1968). These studies are based on the assumption that the market is efficient with respect to accounting information and typically focus on the information content of accounting numbers. In general, the evidence reported in these papers indicates that all information from annual reports is incorporated in stock prices before and/or upon the publication of the accounting numbers. In 1981, Altman and Brenner published another contribution to this field of research. In particular, Altman and Brenner (1981) examine the market response to the disclosure of accounting information about firms whose future is assessed to be extremely problematic. The information is obtained from the firms' new annual report and transformed by means of a financial-ratio model, which provides signs of negative performance. The analysis is undertaken with a group of companies that, according to the results of the model, may suffer a change in their current status from that of a going-concern to one of potential bankruptcy. Altman and Brenner (1981) argue that this methodology provides a joint test of market efficiency and the multivariate model as providing new signals of firm deterioration (that are not directly observable).[36] Results reported by Altman and Brenner (1981) are ambiguous. Depending on the model employed to determine the abnormal returns, there is evidence in favour or against the notion of market efficiency in the context under research. Specifically, when Altman and Brenner (1981) use a two–factor market model, it appears that the market's realization of the firm's deterioration, as reflected by subsequent excess negative returns, persists for at least twelve months. Conversely, results suggest that the model does not provide any new information when Altman and Brenner (1981) use the single factor model to measure the abnormal returns. The authors conclude that, despite the mixed results, their study provides some weak evidence that the market does not incorporate all the relevant information in the stock price of firms that are experiencing a period of extreme financial distress.

[36] According to the authors, results showing that ex-post residual behaviour is not significantly different from zero are consistent with market efficiency. In fact, in this case, all the information provided by the model is irrelevant (i.e., it is not new information) in the sense that it has already been incorporated into the market prices. However, evidence of market inefficiency is provided if results show excess negative returns, which indicates that the information provided by the model is new. In fact, such results suggest that the market has not efficiently incorporated all the information when it was first available.

In a related study, Schatzberg and Reiber (1992) argue that financial markets may not adjust rapidly to all types of information, especially when the disclosure of new information is accompanied by dramatic price declines. This study uses an independent dataset to replicate the early study of Clark and Weinstein (1983) and provides evidence that post-announcement price movements are consistent with the hypothesis of overreaction and subsequent price rebound. Schatzberg and Reiber (1992) explore several possible explanations for their results: estimation error, missing data during the test period and the transaction cost hypothesis. However, using the available data, the authors conclude that such explanations do not provide a satisfactory answer.[37] Accordingly, they conclude that, despite the limitations of the study, evidence suggests that the market for bankrupt companies is inefficient and that the apparent mispricing may be due to the existence of an underlying economic factor.

Datta and Iskandar-Datta (1995) investigate the effect of the information released by bankruptcy announcements on stockholders and three different classes of bondholders: secured debtholders, unsecured debtholders and convertible debtholders. Consistent with previous research, Datta and Iskandar-Datta (1995) report an adverse stock price reaction to the bankruptcy announcement. These authors also find that the different classes of debtholders react differently to the information revealed by the bankruptcy announcement. In particular, secured debtholders seem to be unaffected by the announcement whereas the unsecured and convertible debt classes exhibit significant adverse price reaction to the announcement. According to Datta and Iskandar-Datta (1995), these results can be explained by the fact that secured creditors are given privileged treatment which is not provided to unsecured debtholders. This evidence is not inconsistent with the predictions of the EMH. However, Datta and Iskandar-Datta (1995) also report that, in the post-filing period, a substantial price recovery is observable for all the groups under analysis. According to the authors, this result suggests that all types of analysed investors overreacted to the bankruptcy announcement, something that is not consistent with the predictions of the EMH.

Eberhart et al (1999) directly investigate how efficient the market is for firms emerging from bankruptcy. The authors conclude that the market is highly inefficient in that, after controlling for transaction costs and risk characteristics, there is strong evidence that investors of firms emerging from bankruptcy are able to earn positive abnormal returns in the longer-term (200-day window). Eberhart et al (1999) also show that the market is surprised by the performance of this type of firm, something that is not in line with the conclusions of Hotchkiss (1995). In fact, investors in such firms also earn positive abnormal returns around subsequent earnings announcements.

[37] The authors acknowledge the existence of the microstructure problem associated with the bid/ask spread. However, due to data restrictions problems, Schatzberg and Reiber (1992) did not verify whether this problem provides a suitable answer for their puzzling results.

A final relevant contribution in this context is that of Dawkins and Bamber (1998). This paper examines the timing of the market reaction to corporate failure. In the EMH framework, the market is expected to react as soon as relevant new information about the fundamental value of any security is released. However, Dawkins and Bamber (1998) argue that the market can overlook or disregard some of the publicly available information in their assessment of securities' fundamental value even in the case of relevant economic events like corporate bankruptcy filings. The authors test this proposition by comparing the market's reaction at the date of formal bankruptcy filing with the market's reaction on the date that corporate bankruptcy is disclosed via the Broadtape. Contrary to what is predicted by the EMH, Dawkins and Bamber (1998) find that most of the market reaction occurs on the Broadtape disclosure date rather than at the bankruptcy petition filing date, when this information becomes publicly available in the first place. This result holds after controlling for firm size, exchange listing and pre-disclosed information.

4.3.3. Research topics in the bankruptcy domain

The implementation of the research strategy described in Chapter 3 enabled me to identify a complementary set of papers that are useful for refining my initial research question. This sub-section presents a brief overview of such literature. Five areas of research are covered in this part: 1) insider trading and bankruptcy announcements; 2) corporate governance issues of bankrupt firms; 3) intra-industry effects of bankrupt announcements; 4) strategic bankruptcies and 5) accounting, auditing and bankruptcy. It is worth noticing that some of the studies reviewed in this sub-section also provide some insight into the degree of market (in)efficiency in the context of corporate bankruptcy announcements. I decided not to include these studies in the previous sub-sections for consistency reasons since each of the topics under review are a coherent area of research. Moreover, this setting also facilitates the discussion of the results presented in sub-section 4.3.

4.3.3.1 Insider trading and bankruptcy announcements

The SEC defines insiders as the firm's chairmen, directors and officers.[38] The SEC also considers as insiders the principal shareholders that have 10 percent or more of any equity class of securities. Insiders are expected to possess superior information about their firms' future prospects since they run both the investment and operational policies of their companies. As a result of their privileged position within the company, insiders have the possibility to engage in trading activities either to earn abnormal returns or to convey their private information to the market. Several studies support this argument (e.g. Lorie and Niederhoffer,

[38] It is also traditional in finance literature to designate individuals that hold management positions in the firm as corporate insiders.

1968; Jaffe 1974; Finnerty, 1976; Pratt and De Vere, 1979; Seyhun, 1986 and Rozeff and Zaman, 1988). However, trading by insiders based on material private information is against U.S. government regulations and corporate policies. This makes illegal insider trading costly, with severe implications at both civil and criminal levels. Some authors, based on the idea that insider trading is costly, argue that insiders do not have an incentive to trade before major corporate announcements, particularly those that are prone to motivate large price effects (Ma, 2001).

As previously argued in this study, the announcement of corporate bankruptcy provides material information to the market about the potential reduction of the fundamental value of the firm filing for bankruptcy. Consequently, this event offers a particularly interesting domain within which to explore insiders' behaviour. Elliot et al (1984) provide one of the first contributions on this area. This paper explores the relationship between insider trading and five different types of corporate announcements: earnings, dividends, bond ratings, mergers and bankruptcies. Elliot et al (1984) argue that if insiders are using early access to information that has to be publicly disclosed, then the issuance of good news should be preceded by insider buying activity whilst public announcements of bad news should be preceded by insider selling activity. In order to verify if unusual insider trading is occurring, Elliot et al (1984) analyse the distribution of all insider trading for listed firms from 1975 through 1979. The authors argue that this procedure makes it possible to examine the existence of significant abnormal levels of insider trading around public announcements. Moreover, the general characterization of insider trading also provides a useful insight on why insiders trade. In their study, firms are partitioned by size. According to Elliot et al (1984), analysts are less prone to follow smaller firms. As a result, the stock prices of these firms may not completely reflect all the available information and insiders could be more successful in using their private information. This paper makes two important contributions to finance literature. On the one hand, the empirical evidence collected suggests that the direction of insider trading is generally consistent with insiders' using private information in a profitable manner. On the other hand, Elliot et al (1984) show that insider trading surrounding specific public information events is insignificantly different from insider trading at other times. In short, the evidence presented in Elliot et al (1984) suggests that although insiders may use information to generate profits, the bulk of insider trading seems to be unrelated to imminent information releases. In this context, Elliot et al (1984) conclude that insider trading may be motivated by wealth changes, portfolio diversification effects, consumption opportunities and taxes and not only on the ability/desire to generate superior returns.

Loderer and Sheehan (1989) focus on the behaviour of corporate insiders in the context of bankruptcy. More specifically, this study investigates the actions of these insiders in

corporations that experience large declines in equity value over an extended period of time. In order to achieve this goal, Loderer and Sheehan (1989) compare the level and the changes in stockholdings of the corporate insiders of bankrupt companies with the same variables for a matched sample of non-bankrupt firms.[39] Loderer and Sheehan (1989) conclude that corporate insiders of bankrupt companies do not systematically reduce their stockholdings in the five-year period before the formal announcement of bankruptcy. Moreover, results also suggest that insiders' stockholdings of bankrupt firms are insignificantly different from those of the insiders of non-bankrupt firms. In the light of these results, Loderer and Sheehan (1989) argue that insiders' stockholdings in both bankrupt and non-bankrupt firms of similar size and industry do not provide the market with useful information about the firm's intrinsic value.

Gosnell et al (1992) extend the previous study of Loderer and Sheehan (1989). Particularly, Gosnell et al (1992) explore the pattern of corporate insider trading surrounding the first public announcement of a bankruptcy filing, examining whether insiders trade in a systematic way so as to avoid losses. This study differs from the one by Loderer and Sheehan (1989) in two ways. Firstly, Gosnell et al (1992) use the actual transactions of insiders as reported to the SEC to measure insider behaviour. Secondly, this study extends the previous one by incorporating in the analysis both OTC and exchange-listed firms. Results show that the number of insider selling transactions for OTC firms, as opposed to exchange-listed firms, increases significantly before the first public announcement of bankruptcy. This is particularly true for the five-month period before the actual filing. Gosnell et al (1992) point out that OTC firms' insiders increase both the number and volume of their selling transactions just before the bankruptcy event. Furthermore, results also demonstrate that, in the six months following the announcement of bankruptcy, selling by insiders of OTC firms decreases from the previous six months period but it is still statistically greater than the selling by insiders of firms that do not go bankrupt. Gosnell et al (1992) also mention the existence of a direct relationship between the share price decline that occurs before the bankruptcy announcement and the volume of selling activity by insiders. The authors conclude that in the context of OTC firms, better-informed corporate insiders use their privileged information concerning the financial state of the firm in trading with the less informed market in order to earn abnormal returns.

Seyhun and Bradley (1997) provide evidence that challenges the findings of Loderer and Sheehan (1989) and Gosnell et al (1992). The authors argue that previous research on insider trading clearly demonstrates that corporate managers possess valuable information regarding the future price of their firms' securities. Moreover, consistent with Jaffe (1974) and Seyhun (1986), Seyhun and Bradley (1997) argue that corporate insiders typically sell (postpone purchases) before significant price declines and buy (postpone purchases) before

[39] The group of control firms is matched by industry (two digits SIC code) and book value.

significant price increases. Consequently, the authors conclude that the findings of Loderer and Sheehan (1989) and Gosnell et al (1992) are puzzling and surprising. Using a large sample of firms that filed for bankruptcy between 1990 and 1991 and insider trading activity as reported to the SEC on a daily basis, Seyhun and Bradley (1997) analyse the actual behaviour of corporate insiders around the announcement of bankruptcy. Their results show that these market participants engage in significant sales of their firms' stock in the months and even years preceding a bankruptcy filling and thereby avoid significant capital losses. In particular, Seyhun and Bradley (1997) document that insider selling begins five years before the filing date and builds to a crescendo up to the announcement month. Interestingly, the results also demonstrate that insiders change their investment pattern after the prices have fallen. In fact, after the market prices become stable, corporate insiders begin to buy back their firms' stock. Results also show that top executives and officers exhibit a stronger selling pattern than the remaining corporate insiders do. The findings of Seyhun and Bradley (1997) have two major implications. First, results show that insider trading does, in fact, convey important information regarding the future market prices of a firm's equity. Second, this study also questions managers' incentives to maximize shareholder value throughout the bankruptcy process. In fact, the behavioural pattern of insiders documented in this study suggests that they maximize their utility (wealth) by selling their companies' shares, which in turn reduces insiders' incentives to bargain for stockholders' interests in Chapter 11 proceedings.

In a recent contribution, Iqbal and Shetty (2002) extend the previous work of Seyhun and Bradley (1997). In particular, this paper analyses whether insiders engage in abnormal selling of their firm's stock around the point at which a bankruptcy filing is first perceived by the firm's shareholders.[40] Moreover, based on the earlier work of Ramaswami (1987), the authors posit that insider transactions that occur because of anticipation of bankruptcy would go undetected when the intervals between the perception time and the eventual date of bankruptcy differ widely. As a result, Iqbal and Shetty (2002) also address the question of whether insiders sell their holdings around the filing date, in a time frame where the firm is already perceived to be in acute financial distress. The results of the study suggest the existence of an insider asymmetrical behavioural pattern, conditional on the period under research. In fact, Iqbal and Shetty (2002) demonstrate that insiders sell their shareholdings prior to the anticipation of the bankruptcy by investors. This result is consistent with previous research that suggests that insiders exploit private information about the firm for their own personal benefit (e.g. Seyhun and Brandely, 1997 and Ma, 2001). However, Iqbal and Shetty (2002) fail to detect significant insider transactions around the actual filing month if the

[40] Iqbal and Shetty (2002) use the cumulative sum technique proposed by Hillmer and Yu (1979) to determine the point at which the stock market perceives that the firm may file for bankruptcy.

impending bankruptcy was perceived long ago. The authors conclude that bankruptcy-related insider sales occur around the point of bankruptcy perception rather than around the date of formal filing. These findings support the argument that insiders have self-serving motives and that they are likely to bail out on the stockholders during periods of financial distress.

Eyssel (1991) is another contribution in the domain of insider trading in the context of corporate bankruptcy. The main characteristic of this paper is that it focuses on the relationship between insider transactions and subsequent managerial decisions regarding corporate dissolutions. According to the author, previous empirical research had established that the overall wealth of shareholders increases when the firm's managers decide to voluntarily liquidate the company. Kim and Schatzberg (1987) reports abnormal returns exceeding 30 percent over a period extending from the date on which the liquidation is first announced to its subsequent occurrence. In a related study, Skantz and Marchesini (1987) report excess returns of over 21 percent in the month of the liquidation announcement, and cumulative excess returns of over 41 percent in the eleven-month period preceding the announcement month. Based on this evidence, Eyssel (1991) suggests that managers of firms that announce their intention to liquidate voluntarily will have an incentive to engage in an abnormal volume of purchases of their own firm's shares in the period preceding the liquidation announcement. Such an investment strategy would allow them to capture the anticipated price increases and consequently to earn excess abnormal returns. In line with the previous studies of Loderer and Sheehan (1989), Gosnell et al (1992) and Seyhun and Bradley (1997), Eyssel (1991) also explores the investment decisions of managers of firms that file for bankruptcy. Results suggest that, in general, corporate insiders present a trading pattern that maximizes their own wealth. In particular, Eyssel (1991) concludes that managers of firms that finally liquidate are heavy purchasers of their own firm's shares and that the managers of bankrupt firms were heavy sellers of their own firm's shares.[41] Moreover, in line with Seyhun and Bradley (1997), Eyssel (1991) also shows that those insiders with the greatest access to information were the heaviest purchasers before liquidation and the heaviest sellers before the bankruptcy announcement.

A recent contribution to the research area under analysis is the one by Ma (2001). This paper uses non-parametric methods to examine whether insiders of Chapter 11 bankruptcy firms change their trading patterns prior to the bankruptcy announcement. This study differs from the one by Loderer and Sheehan (1989) because it uses actual insider trading transaction data from SEC instead of changes in the shareholdings in the proxy statements. It also differs from the study presented by Gosnell et al (1992) since it focuses exclusively on firms filing for Chapter 11 bankruptcy. Ma (2001) also presents a methodological difference when compared to

[41] This behavioural pattern is particularly evident for the managers of bankrupt firms that sustained the biggest price declines after the bankruptcy announcement.

the study by Seyhun and Bradley (1997) since it uses non-parametric methods to test the significance of abnormal insider trading rather than parametric methods. The results of this study provide further evidence of abnormal behaviour by insiders of Chapter 11 bankruptcy firms. In sharp contrast with the earlier studies, Ma (2001) finds significant abnormal insider purchases between Chapter 11 bankruptcy firms and the control firms. Moreover, Ma (2001) shows that insider trading volume is observed to decline at least one year before the bankruptcy announcement, but the decline is only statistically significant within the three-month period before the announcement. According to Ma (2001), these results provide interesting insights into the rationale of insiders' behaviour before corporate announcements. The fact that insiders of bankrupt firms appear to trade long before, and only significantly different just before the bankruptcy announcement, suggests that insiders do use their private information in trading but may not possess such information for a long period before the announcement. Further, even when insiders do anticipate the market reaction to the announcement, they tend to follow a less aggressive trading strategy in the light of potential penalties on illegal insider trading. Finally, the author's results suggest that insider trading is more influenced by the short-term market reaction than by the long-term re-emergence from bankruptcy issue.

4.3.3.2 Corporate governance issues of bankrupt firms

The finance literature has explored several issues related to corporate governance in the extreme context of corporate bankruptcy. Khanna and Poulsen (1995) provide some evidence on the extent to which managers are to blame when their firms become bankrupt. They use a sample of firms that file for Chapter 11 and determine the actions taken by the firm's managers during the three-year period before the filing. Khanna and Poulsen (1995) then compare that sample with a control sample of firms that performed better. Within this framework, Khanna and Poulsen (1995) investigate whether financial distress is the result of incompetence and excessively self-serving managerial decisions or due to factors outside management control. Results show that managers of both sets of firms make very similar decisions and that, on average, neither group of managers is perceived to be taking value-reducing actions. These results hold even when Khanna and Poulsen (1995) control for managerial ownership. On the other hand, it is interesting to note that the evidence presented in this study suggests that, in firms that file for Chapter 11, the market reacts negatively to managerial turnover, regardless of whether the new managers are from inside or outside the firm. According to Khanna and Poulsen (1995), these findings support the idea that financial distress is due to conditions outside the control of managers. Consequently, the authors conclude that managers of bankrupt firms are most likely scapegoats when they are blamed for the critical situation of their firms.

In the same year, Hotchkiss examines the relation between post-bankruptcy performance and management changes using a sample of 197 public companies that emerged from Chapter 11 in the period of 1979 to 1988. Hotchkiss (1995) reports that only 24 percent of the firms initially analysed successfully reorganized and, from those, only 50 percent survived over the five-year period after the reorganization. This study also finds that the five-year post-reorganization performance of the surviving firms was significantly inferior to their respective industry average. Additionally, Hotchkiss (1995) presents evidence that challenges the conclusions presented in Khanna and Poulsen (1995). In fact, this study shows that retaining pre-bankruptcy management is strongly related to worse post-bankruptcy performance. In particular, Hotchkiss (1995) demonstrates that firms often fail to meet cash flow projections prepared at the time of reorganization, particularly when pre-bankruptcy management remains in office through the time these projections are made.

In a related study, Hotchkiss and Mooradian (1997) explore the relationship between vulture investors and the market for control of distressed firms. Drawing on Gilson (1990), the authors suggest that this market was unusually underdeveloped in the U.S.. In fact, according to the authors, only the increasing number of cases of large public companies going into financial distress during the 1980s and early 1990s allowed for the development of an active market for trading claims on distressed companies. Vulture investors are major players in this market. However, little was known about the wealth effects on firms' shareholders that result from their actions. Using a sample of 288 firms that defaulted on their public debt, Hotchkiss and Mooradian (1997) provide some insight on this issue by exploring the role of vulture investors in the management of distressed firms. Their results show that vulture investors frequently gained control by purchasing senior securities and often become board members or managers of the target firm. Hotchkiss and Mooradian (1997) also find that the improvement in post-restructuring performance relative to pre-default level is higher when vulture investors are active in management and/or gain control of the firm. The authors also find that the returns to bondholders and shareholders associated with vulture claim purchases are negatively related to the priority of the claim purchased and are greater when the vulture investor is active in the restructured company. In particular, Hotchkiss and Mooradian (1997) analyse 57 cases of vulture purchases and find an average abnormal stock return of 4.17 percent for the two-day period surrounding the announcement of the purchase. The authors highlight the fact that this valuation effect is conditional on the level of priority of the claim being purchased by the vulture investor. For purchases of public debt, the average and median abnormal stock return are significant and positive (8.64 percent and 2.85 percent, respectively). In sharp contrast, purchases of bank debt have a negative effect on the common stock. In contrast with Khanna and Poulsen (1995) and consistent with the findings of Hotchkiss (1995), Hotchkiss and

Mooradian (1997) conclude that vulture investors can bring managerial skills to the target firm and add more capability to discipline managers of companies in financial distress.

In another study, Davidson et al (1993) analyse two major issues related to the market response to CEO succession. The first is whether the market reacts positively to a succession announcement that occurs in either the year before or the year after the bankruptcy announcement. The second relates to the origin of the manager that is being appointed as new CEO of the bankrupt firm. In particular, Davidson et al (1993) analyses if outside successions announcements in bankrupt firms are associated with more positive abnormal returns than those related to an inside succession. In order to achieve their goals, Davidson et al (1993) use a sample of firms that declared bankruptcy between 1979 and 1989 and had a CEO succession within one year on either side of the bankruptcy date. Results show that succession announcements that occurred prior to and subsequent to bankruptcy announcements are associated with positive abnormal returns. Moreover, Davidson et al (1993) find a greater incidence of outside succession near bankruptcy than for successions in general. Interestingly, the authors report that the market's reaction was more positive when the new managers were appointed from outside the firm than when they were appointed from inside the firm. This pattern was clearer when the succession took place after the firm had filed for bankruptcy. These results provide evidence consistent with that of Hotchkiss (1995), Hotchkiss and Mooradian (1997) and Seyhun and Bradley (1997) and contrast with the findings of Khanna and Poulsen (1995).

4.3.3.3 Intra-industry effects of bankruptcy announcements

One of the most intensively researched areas within the bankruptcy domain has been the intra-industry effects resulting from such an event. Lang and Stulz (1992) provide one of the most cited studies in this area. Based on the sample collected by Altman (1990), these authors examine directly the impact of a bankruptcy announcement on other firms in the same industry. In particular, Lang and Stulz (1992) focus their attention on two intra-industry effects: the contagion effect and the competitive effect. According to the authors, corporate bankruptcies may reveal adverse information about industry conditions, which generates a specific industry-wide negative effect. This is known as the contagion effect. However, positive information about a particular sector can also be signalled to the market when one of the firms operating in that industry files for bankruptcy. The argument here is that the bankruptcy of one company may potentially increase the market share of its rivals. This is known as the competitive effect. Lang and Stulz (1992) argue that, in general, it is expected the contagion effect will have a negative impact on the industry whereas the competitive effect should have a positive impact on the sector. However, a priori, there is no theoretical argument suggesting that one of the effects should dominate the other, irrespective of the characteristics of the

industry. Lang and Stulz (1992) find that a bankruptcy announcement has both a contagion and a competitive effect on other firms in the same industry. Using the totality of the firms included in the study, the authors demonstrate that the contagion effect dominates the competition effect. In fact, results show that, in this case, the value of a value-weighted portfolio of the common stock of competitor firms falls, on average, by 1 percent in reaction to the bankruptcy announcement. However, results differ when Lang and Stulz (1992) analyse a sub-sample of industries where leverage and the degree of competition are low. In this case, the value of the value-weighted portfolio of the common stock of competitors increases, on average, by 2.2 percent in reaction to the bankruptcy announcement.[42] Accordingly, Lang and Stulz (1992) conclude that the competitive effect dominates the contagion effect for this particular type of industry.

Ferris et al (1997) extended the analysis of Lang and Stulz (1992) in two ways. Firstly, they explore both small and large bankruptcy events whilst Lang and Stulz (1992) focused exclusively on large companies. Secondly, Ferris et al (1997) attempt to determine which firms are more likely to exhibit a contagion or a competitive effect affecting their equity values. In order to achieve this objective, the authors compare the stock price reactions of competitors who themselves subsequently file for bankruptcy in the next three years (labelled as candidates for a contagion effect) to those who do not (labelled as candidates for a competitive effect). Results show that the contagion effect dominates the competitive effect. In particular, for their large firm sample, Ferris et al (1997) document a loss of 0.56 percent in the three days centred on the bankruptcy announcement day in a value-weighted portfolio of competitors. In addition, evidence shows that although this result also holds for the small firm sample, the decrease in the value of competitors is only 0.12 percent. Ferris et al (1992) also demonstrate that candidates for the contagion effect experience a significant negative three-day stock price reaction of -4.68 percent to the bankruptcy announcement of the other firm, something consistent with previous expectations. However, this paper also shows that candidates for a competitive effect also have a significant negative loss of 0.49 percent in the same period. The authors posit that this result suggests that the impact of the competitive effect may already be incorporated in the prices prior to the Chapter 11 filing.

In a related study, Haensly et al (2001) also examine the contagion and competitive effects of bankruptcy announcements. This study differs from the one by Lang and Stulz (1992) in four ways: 1) the sample of bankruptcies is larger; 2) in the period under analysis, 1985-1993, bankruptcy law is consistent, something that does not happen with Lang and Stulz (1992), which is affected by the introduction of the Bankruptcy Act of 1978; 3) more industries

[42] Lang and Stulz (1992) also analyse the results for a sub-sample of industries where leverage and the degree of competition are high. In this case, the value of the value-weighted portfolio of the common stock of competitors falls, on average, by 3.2 percent in reaction to the bankruptcy announcement.

are included in the study and 4) firms are included in the sample independent of their level of outstanding debt. Despite the differences between the papers, the study by Haensly et al (2001) replicates the industry stratification originally presented in Lang and Stulz (1992) by concentration and leverage. Interestingly, the results of Haensly et al (2001) do not support the conclusions of Lang and Stulz (1992). In fact, using their sample, Haensly et al (2001) failed to verify any significant shareholder wealth effect, both positive and negative, for competitors of bankrupt companies. Haensly et al (2001) offer several possibilities to explain their results. The first relies on the fact that their sample is bankruptcy-law consistent, which is not valid for the sample used by Lang and Stulz (1992). Moreover, Haensly et al (2001) argue that Lang and Stulz (1992) overlooked a multiple comparison problem that could lead them to overstate the statistical significance of their results. Finally, the authors posit that the bankruptcy debt screen that was imposed in the early study may introduce a positive bias in the statistical evidence of a contagion effect reported in Lang and Stulz (1992). Haensly et al (2001) conclude that their evidence suggests that investors see the impact of bankruptcy news on competitors as minor or, alternatively, it is absorbed in subtle and complex changes in the financial and real asset markets.

Akhigbe and Madura (1996) provide further evidence on the intra-industry effects of voluntary corporate liquidations. In particular, drawing on the previous work of Lang and Stulz (1992), Akhigbe and Madura (1996) study the contagion effect versus competitive effect in the context of voluntary corporate liquidations. This study employs a sample of 2,779 rival firms related to 91 bankruptcy announcements that occurred between 1979 and 1992 to examine this research question. Results show that rival portfolios experience significantly negative valuation effects at the time of the liquidation announcement. The authors conclude that signals of adverse industry conditions dominate perceived changes in competitive positions. Akhigbe and Madura (1996) also find that intra-industry effects are more unfavourable for rival firms when industries have more growth opportunities and for rival firms in high-leverage industries. Accordingly, the authors conclude that the degree of contagion effects of voluntary liquidations varies among industries. Moreover, using a cross section analysis, Akhigbe and Madura (1996) show that the share price response of rivals is more favourable when the liquidating firm has more monopolistic power, which suggests that the degree of competitive effects is stronger in some industries than in others.

Cheng and McDonald (1996) provide further evidence on the relationship between industry structure and stock market effect on surviving firms around bankruptcy announcements. In line with the results presented in Akhigbe and Madura (1996), Cheng and McDonald (1996) posit that the market structure of an industry plays an important role in determining the stock market performance of surviving firms during intra-industry bankruptcy

announcements. This study explores this issue using a survivor sample of two dissimilar industries: airliners and railroad companies. Cheng and McDonald (1996) demonstrate that the companies included in the airline sample showed significant positive abnormal returns after the announcement of the bankruptcy. However, this result does not hold for the railroad sample. In this case, Cheng and McDonald (1996) show that the companies suffered significant negative abnormal returns following the bankruptcy announcement. Accordingly, in line with Lang and Stulz (1992), Cheng and McDonald (1996) conclude that market structure does affect intra-industry announcement effects, influencing the magnitude of both the competitive and contagion effects.

A recent contribution in this domain is the paper by Akhigbe et al (2005). This study uses the particular case of WorldCom to assess the impact of a major bankruptcy on firms' stakeholders. In particular, Akhigbe et al (2005) analyse the valuation effects of the WorldCom failure on exposed financial institutions for their important monitoring roles as institutional investors and creditors. The study also explores the impacts of the event on the firm's competitors.[43] Their results suggest that, even in the extremely volatile period surrounding WorldCom's bankruptcy, markets were remarkably efficient in distinguishing among the various types of stakeholders. In fact, Akhigbe et al (2005) report that institutional investors and creditors were largely unaffected by the event. According to the authors, this result is consistent with the basic benefit of diversification: a single bankruptcy (even the largest in the world) should not have any impact on well-diversified shareholders. In sharp contrast, large and key competitors are adversely affected by the events leading to the failure of WorldCom. Akhigbe et al (2005) posit that this result may be attributed to scrutiny of rivals that are perceived to be facing similar problems. The authors conclude that, in the particular case of WorldCom, contagion effects tend to dominate competitive effects.

4.3.3.4 Strategic bankruptcies

In traditional microeconomics, firms go bankrupt when they are no longer economically efficient (Mas-Colell et al, 1995; Varian, 1999; Geoffrey and Reny, 2003). Microeconomic models also suggest that, in a competitive economy, the bankruptcy mechanism promotes an efficient allocation of economic resources since firms that are more efficient will always replace the bankrupt ones as long as demand continues to exist (Mas-Colell et al, 1995; Varian, 1999; Geoffrey and Reny, 2003). Despite the elegance of this economic rationale, several scholars suggest that, in the U.S. context, the traditional microeconomic perspective of bankruptcy is now outdated (e.g. Shrader and Hickman, 1993; Tavakolian, 1994 and 1995; Delaney, 1998). The complex U.S. legal system provides the main argument of these academics. Prior to 1978,

[43] In order to measure the consequences of information released about the future viability of WorldCom, Akhigbe et al (2005) examine the market's response by measuring portfolios returns for institutional investors, creditors and industrial rivals using the seemingly unrelated regression method developed by Johnston (1984).

bankruptcy was only available to financially insolvent firms (Tavakolian, 1994 and 1995; Delaney, 1998). However, with the adoption of the Bankruptcy Reform Act of 1978, the U.S. legal system abandoned this basic assumption (Delaney, 1998),[44] making it possible for solvent firms to take advantage of the bankruptcy mechanism in a variety of different situations.

This important modification of the U.S. law had severe repercussions for the country's economy. Probably, the most important one was the complete change of U.S. managers' perception about corporate bankruptcy (Tavakolian, 1995; Delaney, 1998). Traditionally, corporate failure was seen as a stigma, which should be avoided at all costs. The introduction of the Bankruptcy Reform Act of 1978 fuelled a major shift in this situation and, during the 1980s, bankruptcy become one of the top ten business trends (Business Week, January 20th, 1986). This change in corporate managers' attitude explains the increasing number of financially solvent U.S. firms seeking protection under Chapter 11 for strategic reasons (Tavakolian, 1994 and 1995; Delaney, 1998).

Dean Foust comments on this situation on an article published in *Business Week*, on March 20, 2000. According to Dean Foust, between 1997 and 2000, the overall number of bankruptcies in the U.S. decreased by 30 percent. However, from 1998 to 2000, the number of public companies seeking protection under Chapter 11 increased an astonishing 75 percent. The author provides his explanation for this dramatic increase in the number of cases of public bankruptcies: more companies, under intense pressure to meet Wall Street's expectations, are using bankruptcy not as a safe haven to restructure their debts, but as a strategic tool in everything from litigation to merger negotiations. It is important to notice that, once a company files for Chapter 11, the law prohibits all creditors from taking action against it, pending an approval of a reorganization plan by a bankruptcy court. This gives the company temporary relief from collection attempts, lawsuits and foreclosure procedures (Tavakolian, 1995). Consequently, it may be argued that strategic bankruptcy provides the means by which a financially healthy firm can seek protection for itself and its shareholders from the financial risks associated with abnormal events.[45]

The finance literature provides some evidence on the market's reaction to strategic bankruptcy announcements. Drawing on Tavakolian's (1994, 1995) argument that the U.S. bankruptcy law enables economically viable firms to file bankruptcy petitions for strategic reasons, Rose-Green and Dawkins (2002) suggest that under the EMH, strategic bankruptcy

[44] One of the most important changes in the new Bankruptcy Code was the broadening of the definition of a claim (Delaney, 1998). The new Code defines a claim as *"any right to payment, whether or not reduced to judgment, liquidated, unliquidated, fixed, contingent, matured, unmatured, disputed, undisputed, legal, equitable, secured or unsecured"*. The very broad definition of this legal concept allowed corporations to argue their cases in the bankruptcy court in such a manner that was simply not possible until 1978.

[45] Some examples of solvent firms seeking protection under Chapter 11 to save off potential disaster are Wilson Foods and Continental, who argued that they need protection since high labour costs were making them uncompetitive. Manville and Amatex also sought protection because they were flooded with asbestos lawsuits. For more details and other examples, see Tavakolian (1994 and 1995) and Delaney (1998).

filings should be accompanied by smaller stock price declines than financial bankruptcy filings. According to these authors, firms filing strategic bankruptcies are expected to have a greater likelihood of emerging from bankruptcy as viable economic entities than similar firms that file financial bankruptcy petitions. Consequently, the market is expected to be able to differentiate between firms that file strategic bankruptcy petitions and firms that file financial bankruptcy petitions. Rose-Green and Dawkins (2002) test this hypothesis by using a sample of 245 firms that filed Chapter 11 between 1981 and 1996. The overall results confirm prior expectations. In fact, the evidence presented in Rose-Green and Dawkins (2002) suggests that, in the period around the bankruptcy filing date, firms that file financial bankruptcies have significantly larger price declines than firms filing strategic bankruptcies.

Orr (1998) explores the role of strategic bankruptcies in private pension defaults. According to Orr (1998), literature analysing private sector pensions assumes that the firm promising to pay the pension plan has the desire to fulfil this promise. In sharp contrast with the mainstream literature in this domain, Orr (1998) posits that this basic assumption may be incorrect since sponsoring firms have an incentive to default on their promises. Moreover, the author argues that strategic bankruptcy is the legal mechanism that these firms require to materialize their intentions. The basis of Orr's (1998) analysis is the liability of pension promises to the baby-boom generation in the U.S.. According to this author, this problem has been ignored by the literature because it will only manifest itself several years in the future. Orr (1998) estimates that, by the time the entire baby-boom generation cohort has retired, on average, firms will have only 2.7 employees generating income for each retiree receiving benefits. In this context, Orr (1998) argues that paying out enormous amounts of money, if it is not necessary, it is not profit-maximizing behaviour. However, he also acknowledges that terminating the pension plans just before the baby-boom cohort reaches retirement age will not reduce the overall liability significantly, and terminating plans too early will lead to employee resentment and reduced profitability. According to Orr (1998), strategic bankruptcy is the perfect vehicle to avoid such liabilities. The author presents the case of LTV Corp. as an example of this mechanism. When ERISA was enacted, LTV's pension fund was seriously under-funded. Given that the company was in a declining industry and profits were low, LTV did not make an effort to move assets into the fund and continued to pay dividends to its shareholders and fines to PBGC. As the size of its unfunded pension liabilities grew, PBGC stepped up its monitoring of LTV. Finally, early in 1987, PBGC forced LTV into Chapter 11 bankruptcy and took over the firm's pensions liabilities. This action had two immediate consequences. First, released of its pension liabilities, LTV was financially solvent. With bankruptcy protection, the firm was able to renegotiate contracts with labour and suppliers and became the firm with the lowest cost and the highest profitability in the U.S. steel industry. Second, PBGC became insolvent and

remained so until the end of 1996. Orr (1998) argues that, despite the effectiveness of this strategy, it is too transparent to be applied generally and that a more subtle approach is needed to hide such ultimate intentions of the process. Accordingly, the author concludes that as soon as an improved financial technique is devised, more firms will have an incentive to use a strategic bankruptcy to reduce their responsibilities with the management of their pension funds.

4.3.3.5 Accounting, auditing and bankruptcy

The increasing number of bankruptcies in the 1980s and early 1990s enhanced the interest of academics and practitioners in the auditors' assessment of going-concern. Although auditors are not responsible for predicting bankruptcy and the issuance of a going-concern opinion is by no means a prediction of bankruptcy, investors seem to expect the auditor to provide them with a warning of approaching financial failure. Some studies provide evidence that the issuance of a going-concern opinion may increase investors' assessment of the firm's probability of financial failure. Therefore, if financial failure subsequently occurs the surprise associated with such event would differ between firms receiving a going-concern opinion and those receiving an unqualified opinion.

Chen and Church (1996) provide some evidence on this issue. In particular, this study examines the association between going-concern opinions and the market's reaction to bankruptcy announcements. Results indicate that going-concern opinions are useful in explaining the market's reaction to bankruptcy filings. After controlling for the probability of bankruptcy, the market's reaction to medias' disclosures of financial difficulties and the changes in stock prices prior to the issuance of the auditor's report, Chen and Church (1996) find that the unexpected drop in share prices is less negative for firms that have received a going-concern opinion as compared to those that have received an unqualified opinion. This finding is consistent with going-concern opinions having information value.

Holder-Webb and Wilkins (2000) extend the work of Chen and Church (1996). The aim of this study is to evaluate whether the expanded requirements of SAS Nº 59, which requires auditors to actively evaluate and report on a client's going-concern status for the coming year, have allowed investors to make more accurate ex-ante assessments of firms that eventually file for bankruptcy. Holder-Webb and Wilkins (2000) posit that if SAS Nº 59 has achieved what was intended, going-concern opinions issued under SAS Nº 59 should further reduce investors surprise at bankruptcy announcements. Holder-Webb and Wilkins (2000) also explore the implications of SAS Nº 59 when compared to those of SAS Nº 34 in the context of the market's reaction to bankruptcy announcements.[46] The authors posit that the increase in auditors'

[46] The authors clarify that, under the previous SAS Nº 34, the auditor's responsibility to evaluate a firm's ability to continue as a going concern is passive. In fact, although auditors were not expected to ignore information relevant to

responsibility and the improved communication of those responsibilities, under SAS Nº 59 as compared with SAS Nº 34, will provide better information regarding future firm viability. In this context, Holder-Webb and Wilkins (2000) predict that investors should be less surprised with bankruptcies that are filed following going-concern opinions issued under SAS Nº 59. After controlling for the impact of the macroeconomic environment during the announcement year, firm-specific levels of financial distress and the predictability of a bankruptcy filing, results confirm the expectations of Holder-Webb and Wilkins (2000). In fact, this paper shows that price responses to bankruptcy announcements are less negative for firms receiving a SAS Nº 59 going-concern opinion than for firms receiving a SAS Nº 59 clean opinion. Moreover, Holder-Webb and Wilkins (2000) report that price reactions to bankruptcy announcements are less negative for firms receiving a SAS Nº59 going-concern opinion than for firms receiving a SAS Nº 34 subject to going-concern opinion. The evidence collected in this paper also suggests that the difference between going-concern bankruptcy surprise and clean opinion bankruptcy surprise under SAS Nº 59 is greater than the corresponding difference under SAS Nº 34. As a conclusion, Holder-Webb and Wilkins (2000) state that investors have benefited from the implementation of SAS Nº 59 since it provides value-relevant information.

Han et al (1992) examine the communication value of accounting disclosures of information other than earnings. The paper explores the association of unexpected changes in the probability of bankruptcy, as measured by the Ohlson (1980) model, with security returns over three return intervals. The first interval is the period from the beginning of the fiscal year until the disclosure of the full financial statements. The second period relates to the time span between the earnings announcement and the SEC disclosure date of such information. The last period concerns the period after the firm's annual earnings announcement but prior to disclosure of the financial statements. Using the information concerning the first period, Han et al (1992) show that changes in the probability of bankruptcy due to non-earnings information and security returns are associated. This result holds after controlling for the relation between unexpected earnings and returns and the effect of earnings changes on the probability of bankruptcy. As a result, Han et al (1992) conclude that non-earnings information about the probability of bankruptcy is useful to investors and that the disclosure of such information at the SEC filing date has potential communication value. Interestingly, the analysis of the information related to the second period provides dissimilar results. In fact, in this period, Han et al (1992) show that there is only limited evidence supporting the argument that investors receive information which is useful in adjusting their estimates of the probability of bankruptcy.

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the firm's going-concern, SAS Nº 34 stated that auditors did not need to search for this information. In sharp contrast, the new SAS Nº 59 states that the auditors must evaluate whether there is substantial doubt about the entity's ability to continue as a going concern for a reasonable period of time, not to exceed one year beyond the date of the audited financial statements.

The results for the third period are mixed: there is somewhat stronger evidence of leakage of value-relevant non-earnings information to the market during this period but such evidence is not as strong as the one collected for the first period analysed in the paper. In the light of these results, Han et al (1992) conclude that, although investors react to non-earnings disclosures, almost all the information contained in annual financial statement disclosures that are required by the SEC is impounded in security prices before the actual filing date with the SEC.

In a related study, Kwon and Wild (1994) investigate the informativeness of annual reports in the face of temporal variations in the level of market uncertainty regarding the future prospects of the firm. According to the authors, the informativeness of annual reports should be positively associated with the level of market uncertainty, *ceteris paribus*. In this article, temporal variation in the level of market volatility is measured by firms' proximity to financial distress. Financial distress is evidenced by the auditor's decision to issue a going-concern audit report on the firm. Kwon and Wild (1994) test their hypothesis using a sample of U.S. companies that receive first-time going-concern in their 1989, 1990 or 1991 annual reports. In this paper, the informativeness of annual reports is assessed by the increase in returns variability scaled by returns variability in the immediately preceding estimation period, relative to the scaled returns variability in earlier (nondistress) periods.[47] Results demonstrate that the informativeness of annual reports is significantly associated with the level of market uncertainty regarding future firm prospects. Specifically, Kown and Wild (1994) show that price reactions to annual reports for the three years preceding distress are 35 percent larger than the price reaction to reports from earlier periods. The authors conclude that their findings are consistent with the informativeness of financial disclosures being dependent on the level of market uncertainty.

The finance academic literature suggests that security analysts play a central role in financial markets (Schipper, 1991). One of the most important debates in this body of literature relates to the notion of analyst rationality.[48] However, to date, no consensus exists on this subject (Kothari, 2001). Drawing on the literature that suggests that analysts are not rational, Espahbodi et al (2001) argue that the observed optimism in analysts' forecasts of earnings is related to the costs and benefits to analysts of issuing optimistic forecasts. In this context, the authors posit that when the costs of issuing an optimistic forecast are high relative to the benefits of doing so, optimism will be less apparent or absent. Moreover, Espahbodi et al (2001) posit that underreaction to past forecast errors and past changes in earnings is most evident when earnings' components are viewed as permanent. The authors test these

[47] Kwon and Wild (1994) use the standard capital market model to measure abnormal returns.
[48] Easterwood and Nutt (1999) offer a possible definition of rationality in this context. According to these authors, analysts' rationality means "*analysts immediately and without bias incorporating information into their forecast*".

hypotheses by examining the properties of analysts' forecasts for two samples of distressed firms: 1) firms that file for bankruptcy and 2) firms that experience financial distress but turnaround. Consistent with the general argument, Espahbodi et al (2001) argue that, for the sample of bankrupt firms, optimism should become less apparent or absent as bankruptcy approaches. Further, for this group, undereaction to past forecast errors and past changes in earnings should persist during the period of financial distress. In contrast, for the turnaround group, Espahbodi et al (2001) predict the opposite results. The authors show that the bias in forecasts for the bankrupt sample declines to insignificant levels by the year prior to bankruptcy filing. Espahbodi et al (2001) also find that forecast bias for the turnaround sample disappears in the year of recovery and is absent during the first half of the following year. For the bankruptcy sample, the authors find evidence of underreaction to past errors in the 4 years prior to the bankruptcy filing and that this underreaction is driven by firms with negative earning-to-price ratios. Moreover, Espahbodi et al (2001) also conclude that underreaction to past errors for the turnaround sample disappears in the year of recovery and is absent in the two subsequent years. The findings of Espahbodi et al (2001) suggest that financial analysts gain a higher level of insight about companies' futures as more information about them becomes available (this explains why the estimation bias disappears in both groups). However, their results also show that analysts systematically underreact to bad news, as demonstrated by the sample of bankrupt companies. This fact may influence the market's assessment of the future prospects of these companies, leading to mispricing in this particular market.

4.4 Summary and discussion of the results

As suggested by sub-sections 2.3.2.1 and 2.3.2.2, the results of the present study suggest that no consensus exists about the degree of market (in)efficiency in the context of the announcement of corporate bankruptcy. The EMH predicts that it should be impossible to use publicly available information to develop trading strategies that systematically deliver abnormal returns. There are several papers supporting this idea in the context under analysis. For instance, Clark and Weinstein (1983), Rimbey et al (1995) and Morse and Shawn (1998) show that the market starts to incorporate the impact of such events in the stock price of such firms long before it is publicly known. These studies also document a strong negative market reaction on the day of the announcement, suggesting that the market reacts in a timely basis to any new information released by the bankruptcy event. In another study, Russell et al (1999) use an option-pricing framework to estimate the theoretical market values of bankrupt companies in the post-filing period. Consistent with the findings of Clark and Weinstein (1983), Rimbey et al (1995) and Morse and Shawn (1998), Russell et al (1999) demonstrate that the actual market price of these companies is aligned with its theoretical value. The findings of this study suggest that the market not only reacts on a timely basis to the bankruptcy announcement but also that

it reacts in a non-biased way. Zavgren and Friedman (1988) and Burgstahler et al (1989) provide further evidence in favour of the EMH predictions. Using multivariate models of bankruptcy prediction to discriminate *ex-ante* the set of firms that will go bankrupt in one-year time from the remaining ones, these papers show that is not possible to use publicly available accounting information to develop an investment strategy that systematically delivers positive abnormal returns.

Interestingly, a set of papers identified in this study present evidence that disputes the previous results. Katz et al (1985) and Indro et al (1999) are two of the most interesting contributions in this domain. In sharp contrast with Zavgren and Friedman (1988) and Burgstahler et al (1989), these papers show that it is possible to develop an investment strategy based on publicly available information to earn systematically positive abnormal returns around the bankruptcy announcement date. Eberhart et al (1999) reinforce the results of Katz et al (1985) and Indro et al (1999) by analysing firms' performance after their emergence from Chapter 11. The authors also demonstrate that it is possible to systematically earn abnormal positive returns with these companies by using a strategy based exclusively on publicly available information. Schatzberg and Reiber (1992) is another interesting contribution in the domain under analysis. In fact, after replicating the study by Clark and Weinstein (1983), Schatzberg and Reiber (1992) obtain results inconsistent with the previously available ones. In particular, these authors conclude that the post-filing behaviour of bankrupt firms' stock is not well described by the EMH since it seems to be consistent with the hypothesis of initial overreaction and subsequent price rebound. Datta and Iskander-Datta (1995) provide further evidence on this issue. In particular, this paper shows that shareholders and debtholders seem to overreact to the announcement of bankruptcy since they force the prices of the bankrupt companies' stock and debt to levels that are below their "efficient" values. Hubbard and Stephenson (1997) also provide evidence suggesting that the market for bankrupt firms is not efficient. According to these authors, investors are unable to understand the bankruptcy process and are not aware of the terms of publicly available reorganization plans. The results of Espahbodi et al (2001) are useful in explaining the findings of Hubbard and Stephenson (1997). This study analyses the behaviour of analysts for two groups of companies: 1) firms that file for bankruptcy and 2) firms that experience financial distress but turnaround. The conclusions of the study suggest that before the announcement of bankruptcy, financial analysts typically underreact, i.e., tend to provide estimate for earnings that are systematically higher than the realised value of firms' earnings. This result suggests that, to some extent, analysts might introduce noise in the bankrupt firms' market, which may result in the mispricing of this type of securities.

There is, however, additional evidence supporting the predictions of the EMH. For instance, Beneish and Press (1995) document that the market reacts to previous events that signal firms' increasing financial distress. Specifically, this paper analyses the relationship between technical default, bond default and bankruptcy to conclude that all of these events are value-relevant and that the market understands each of them as a sign for increasing financial distress. Consistent with these findings, Vu (1998) shows that the stock market anticipates the default on bond contracts by companies, an event that may signal future bankruptcy. Dugan and Forsyth (1995) and Dawkins and Rose-Green (1998) demonstrate that the market reacts not only to financial signs of distress but to other sources that can provide similar information. In particular, these papers show that, in the context under analysis, the *Wall Street Journal* is a privileged source of information for the market.

The body of literature exploring the impact of accounting disclosure on the market also provides some evidence consistent with the predictions of the EMH. Chen and Church (1996) examine the association between going-concern opinions and the market's reaction to bankruptcy announcements. In line with what the EMH predicts, this paper shows that firms receiving a going-concern opinion in the year before bankruptcy exhibit an inferior price decline around the announcement date when compared to those that had received an unqualified opinion. The result of Chen and Church (1996) are refined by Holder-Webb and Wilkins (2000), who show that the market's reaction to bankruptcy announcements is less negative for firms receiving a SAS Nº 59 going-concern opinion than for firms receiving a SAS Nº 59 clean opinion. On a related study, Kwon and Wild (1994) conclude that the informativeness of firms' annual reports increases as financial distress nears.

Interestingly, the findings of Altman and Brenner (1981) and Dawkins and Bamber (1998) dispute the previous results. The first paper demonstrates that the market does not incorporate all accounting information available when the level of financial distress is high. The second study documents that, in a nontrivial number of situations, the market's reaction to bankruptcy occurs on the Broadtape disclosure date rather than at the bankruptcy petition filing date, when this information becomes publicly available in the first place.

The present study also provides other interesting contributions in the domain under review. Seven papers identified with the search strategy explore how insiders behave in the context of corporate bankruptcy. The earlier evidence available in this domain suggests that insiders do not use their superior information about their firms to earn excess abnormal returns. In fact, Elliot et al (1984) conclude that insiders do trade around the bankruptcy announcement date but that such trading pattern is motivated by wealth changes, portfolio diversification effects, consumption opportunities and fiscal reasons rather than by the desire to generate superior returns. In the same line, Loderer and Sheehan (1989) show that for their sample-

firms, corporate insiders do not systematically reduce their stockholdings in the five-year period before the formal bankruptcy announcement. Using a sample of exchanged-listed firms, Gosnell et al (1992) also presents results consistent with Elliot et al (1984) and Loderer and Sheehan (1989). However, this study finds somewhat different results for a sample of OTC firms. Interestingly, Gosnell et al (1992) argue that this is an expected result since these firms do not capture the attention of financial analysts. According to the definitions presented in Fama (1970), the evidence collected through these studies suggests that the market of bankrupt firms is strong form efficient.

In sharp contrast with this body of literature, Eyssel (1991) shows that insiders do trade in a systematic way in order to exploit their superior information and earn excess abnormal returns. Subsequent research by Seyhun and Bradley (1997), Ma (2001) and Iqbal and Shetty (2002) refined the results presented in Eyssel (1991). Two major implications arise from these findings. The first is that the market of bankrupt companies cannot be strong form efficient. It is worth noticing that this does not mean that the definition of semi-strong form efficiency does not hold for this market. The second is that these studies question managers' incentives to maximize shareholder value throughout the bankruptcy process.

Hotchkiss (1995) provides evidence in favour of the previous argument. In particular, this study suggests that retaining pre-bankruptcy management is strongly associated with worse post-bankruptcy performance. In line with the conclusions of Hotchkiss (1995), Hotchkiss and Mooradian (1997) show that vulture activity in firms that are facing severe financial distress is associated with a considerable improvement in their post-bankruptcy performance. The authors conclude that active vulture investors add more capability to discipline managers of highly distressed companies. Consistent with these studies, an earlier contribution by Davidson et al (1993) demonstrates that, in bankrupt firms, the market reacts positively to CEO succession announcements. The evidence is particularly strong when the new CEO is appointed from outside the firm. In another piece of research, Elayan and Maris (1991) investigate the market's reaction to the announcement of liquidation and reorganization of real-estate firms in the U.S.. Consistent with Elayan and Maris (1991), Hotchkiss (1995) and Hotchkiss and Mooradian (1997), Elayan and Maris (1991) conclude that the market reacts positively to the former announcement but negatively to the latter.

Interestingly, Morse and Shaw (1988) and Rose-Green and Dawkins (2000) present evidence inconsistent with the findings of Elayan and Maris (1991). The first paper shows that the market reacts positively to the announcement of a reorganization plan and that it also reacts positively to its formal approval. The second paper investigates whether, at the bankruptcy filing date, the market is able to differentiate between the firms that will be liquidated from those that will be reorganized at the end of the bankruptcy process. Results

show that, at that particular date, the market reacts more negatively for the group of companies that are ultimately liquidated than for the remaining set of companies.

Eberhart et al (1990) provides some evidence that may explain the results presented in Morse and Shaw (1988) and Rose-Green and Dawkins (2000). According to this paper, during Chapter 11 negotiations, the APR is often violated, something that does not happen under Chapter 7. Moreover, Eberhart et al (1990) show that shareholders, on average, receive up to 7.6 percent more than they should if APR would be strictly applied. Khanna and Poulsen (1995) provide a complementary explanation. The authors compare the decisions taken by managers of a group of bankrupt companies with the decisions of other managers of similar firms that did not file for bankruptcy. The results show that managers of both groups make very similar decisions and that, on average, neither set of managers is perceived to be taking value-reducing actions. Accordingly, the authors suggest that managers of bankrupt companies are most likely scapegoats when they are blamed for the critical situation of their firms.

One of the most exciting fields of research uncovered with this literature review is that of the implications of strategic bankruptcy. Tavakolian (1994, 1995) and Delaney (1998) suggest that the introduction of the Bankruptcy Act of 1978 fuelled a major shift in U.S. managers' perception of corporate bankruptcy. In fact, after the introduction of the new Code, bankruptcy is no longer regarded as a stigma: it became an extra weapon in managers' armoury. Few studies provide insights into the effect of such legal change in the market's perception about bankruptcy. Rose-Green and Dawkins (2002), the only empirical study identified with my search strategy in this domain, show that the market's reaction to strategic bankruptcies is less negative than in the case of financial bankruptcies. This evidence suggests that the market expects strategic bankruptcies to be less costly than the financial ones. The fact that most of the strategic Chapter 11 filings documented to date concern large firms that are able to emerge from this situation as perfectly stable enterprises provides some evidence in favour of this argument. Consistent with this argument, Orr (1998) presents a particular case where a firm, wanting to reduce its pension liabilities, used the strategic bankruptcy mechanism to achieve its goal.

The present review also provides some evidence on the intra-industry effects of bankruptcy. Lang and Stulz (1992) is one of the first references in this domain, documenting the existence of a dominant contagion effect that arises due to a bankruptcy filing. However, this study also shows that a competitive effect exists for the firms that are mainly financed with equity and that belong to less competitive industries. The overall results of Lang and Stulz (1992) are confirmed by further research developed by Ferris et al (1997), Akhigbe and Madura (1996) and Cheng and McDonald (1996). However, Haensly et al (2001) replicate the initial study of Lang and Stulz (1992), introducing some minor alterations in methodological aspects,

and fail to reach the same conclusions. Several explanations are offered for this dissimilarity in the results but the authors do not provide evidence of their actual value. Despite this fact, Haensly et al (2001) conclude that investors see the impact of bankruptcy news on competitors as minor, or alternatively, it is absorbed in subtle and complex changes in the financial and real asset markets.

At this point, a word of caution is needed. As with empirical research in other finance domains, efficient market research is the subject of much controversy and is subject to diverse interpretations (e.g. Fama, 1998, Barberis and Thaler, 2003). Beaver (1989), Campbell et al (1997) and Lo and MacKinlay (1999) suggest the existence of four main research design issues related to this question:

1. *Relationship between the definition of market efficiency and the tests of market efficiency*: any test of efficiency must assume an equilibrium model that defines normal security returns. If efficiency is rejected, this could be because the market is truly inefficient or because an incorrect equilibrium model has been assumed. This *joint hypothesis* problem means that market efficient as such may never be rejected. Moreover, based on the classical definition of an efficient market, Beaver (1989) argues that none of the existing empirical studies directly tests market efficiency since the security prices that would prevail if there were universal access to information are not observable. Accordingly, available empirical evidence only attempts to infer the security price behaviour that would be observed if such a condition held;

2. *Inter-study comparability in general and specification of security return metric in particular:* currently, the finance literature investigates a wide number of aspects within the market efficiency domain and researchers employ several different methods to undertake their research. The main problem with this outburst of methods and topics is that they make it difficult to compare new results with previously existing ones;

3. *Self-selection bias*: evidence suggests that many of the firms studied differ from other firms in systematic fashion, which makes it difficult to interpret their security price behaviour. If a firm differs in a systematic way, then there is a confounding effect here, which can be viewed as a correlated omitted variable (Greene, 2003). This may induce ambiguity in the interpretation of the results (Greene, 2003);

4. *Securities markets that are studied within the efficient market research domain*: the results of this review show that the majority of the studies published in finance literature are based on exchange-listed companies from the U.S.. Beaver (1989) argues that, although listed securities represent the bulk of the market value of common stocks traded in the U.S. equity market, they constitute only a small percentage of the overall number of securities registered with the SEC. It is difficult to determine the extent to which the evidence of listed securities can be generalized to the OTC market. Additionally, the social, economic and legal differences

between the U.S. and all other countries casts doubt on the possibility to generalize the U.S.-driven results to other contexts.

In short, regardless of all the research effort that has been made in the efficient market research domain, several technical shortcomings persist. These methodological problems undermine the strength of the empirical evidence available. In fact, some of the conflicting results summarized in this sub-section may be due to such methodological limitations. Despite these important problems and the amount of literature produced in the last decades in the bankruptcy domain, this review demonstrates that the question of whether or not the market is efficient in the context of corporate bankruptcy announcements is still to be settled. The results of this study also provide some interesting research ideas that can used to continue with the research within this area.

5. Learning Experience

In 1946, the first issue of *The Journal of Finance*, one of the leading academic journals in finance, was published. Six decades have passed since then and finance has developed like not many other areas in the social science domain. At present, a sizable academic community around the world dedicates its time and expertise to the analysis of several finance-related issues, providing a relevant contribution for the development of human knowledge. The increasing research effort undertaken in the last decades has contributed to the development of a voluminous literature, which is currently offered by a crescendo of different publications and journals. This fact has two major implications for those now entering this field of knowledge. The first is that information is, in fact, available. At present, the number of academic publications, working paper sites, conferences and workshops is immense, making it easier to gain access to information. However, the second implication is that undertaking research in this area is more complex than ever. This is not only a result of the increasing complexity of the subjects being researched. Instead, the main factor underlying this observation is that managing the deluge of available information is becoming extremely challenging. In fact, the voluminous literature on any given research subject is now disseminated through various sources of information and making sense out of them as a whole is becoming a very hard task.

It is particularly interesting to analyse the implications of this issue in the context of a literature review. Traditionally, researchers would wonder around existing literature on a random basis, collecting whichever information they thought was important for their research topic. At the present time, such approach could not provide a comprehensive understanding of the research field in which the researcher is interested. The systematic literature review is an alternative methodology for conducting a literature review that has emerged, in part, as a response to the difficulties faced by the traditional approach. Sub-section 3.1 has already presented a brief comparison between the two alternative frameworks and justified the reason why the former was employed in this study. This section presents my reflections in my personal experience on using systematic literature review methodology, in order to provide some guidance for those that in the future decide to undertake their literature review adopting this particular framework. The following points summarize my most relevant thoughts on this.

1. The use of the systematic literature review methodology requires some degree of knowledge of the research subject within which the review is going to be undertaken. This demands a considerable amount of previous work of an exploratory nature. However, this preliminary work is not sufficient if the researcher is noticeably unfamiliar with the research domain that he or she wants to explore. I was faced with this particular situation. In this case, the panel plays a fundamental role, providing useful expert advice and comments that help to improve the overall quality of the work being developed;

2. It is also important to notice that this methodology requires not only academic knowledge but also some expertise in particular information systems and software. Those considering the possibility of using this approach in their work should gain particular skills in dealing with academic search databases and working with bibliographic software like ProCite. In fact, these tools do not only make the process manageable, but they also make it feasible;

3. One of the critical points in the implementation of this methodology is the development of the search strings. I spent a considerable amount of time searching for keywords and search strings to use during the present study. At the beginning, I developed a preliminary set of search strings for which I did not have a clear rationale. Not surprisingly, after testing these search strings on the databases, I realised that a considerable amount of relevant literature was not being picked up. Accordingly, I decided to request some advice from my panel on this subject. Combining the panel's advice with the results from the initial scoping study provided a solid background for the identification of suitable keywords and consequently the development of adequate search strings;

4. It is very important to devise a set of relevant exclusion criteria for analysing titles and abstracts. The implementation of these criteria allowed me to reduce the bulk of literature that had to be assessed with the selection criteria for full papers, which resulted in an important reduction in my workload. However, it must be noted that all criteria must have a rationale in order to avoid the exclusion of relevant literature from the study;

5. One of the most frustrating phases of the systematic literature methodology is that of the quality assessment of the selected papers. Despite the importance of the critical assessment tool, this phase is still permeable to subjectivity and bias. I found that the best practice in assessing the quality of the academic literature is to work closely with the panel members. In fact, their expertise and knowledge were of fundamental importance at this stage. I am now sure that some of the judgement calls that I had to make during the quality assessment phase would have been different from those that I ultimately decided to make and that this difference would have negatively influenced the results of this study;

6. One of the key aspects of undertaking a systematic literature review is to understand what it does. In fact, when I started using the methodology I thought that, when well employed, it would uncover every single paper that was relevant for the research that I was undertaking. I soon realised that is not the case. This methodology provides a well-defined framework for doing a literature review; it is not an ultimate search tool. In order to deliver optimized results, it has to be complemented with several other sources of information. In my particular case, I found it especially rewarding to talk to academics working in the same area. These experts provided relevant advice that complemented the ideas and discussions that I

regularly had with my panel members. I also recommend using cross-referencing as a complementary technique;

7. I also found it particularly interesting to have two panel members that were not directly involved in the development of the review. In fact, Professor Duarte Trigueiros and Professor Azevedo Pereira acted as external reviewers of the process, providing a critical perspective to this study that the remaining panel members could not offer. I am certain that this fact enhanced the overall quality of the final output;

8. It was ultimately interesting to analyse how my understanding of the subject under revision evolved during the development of the present study. My preliminary reading suggested that the long-term market reaction to bankruptcy announcements was an unexplored topic in finance literature. After analysing the results of the systematic review, I realised that, to some extent, existing studies have already analysed this question. This fact reduced the possibility of exploring this particular aspect as the central topic of my PhD. However, this literature review uncovered a set of related papers that provide alternative routes for the development of my doctoral research. In fact, the literature on strategic bankruptcy allowed me to consider the possibility of extending the existing knowledge on the efficiency of bankruptcy prediction models by analysing their performance on this context. It also provided the idea of analysing the existence of asymmetrical behavioural patterns of insiders conditional on firms' motivation for filing Chapter 11. These two examples make it clear that undertaking a systematic literature review can, in fact, provide the means by which the young researcher may detect a potentially interesting gap in the literature.

The systematic methodology offers a credible alternative for undertaking academic literature review, presenting many advantages when compared to the traditional approach. However, in order to work properly, some important aspects should be noticed. The assembling of a balanced consultation panel is of critical importance. Developing skills in specific areas like managing literature databases and reference software is also critical. Moreover, the researcher must be ready to make some complex decisions during the process and recognize that such choices may have a direct influence on the final results. On the other hand, it must also be acknowledged that this methodology inevitably contains some limitations. These limitations range from the inability of the technique to uncover all the relevant contributions to the issues under review and from the fact that some degree of personal bias can still affect the completeness of the review findings. The impact of these shortcomings can be minimized by using alternative methods of data collection and a set of pre-defined selection criteria. When used properly, this methodology allows the identification and verification of the existence of potential gaps in the literature and to refine the initial set of research questions.

6. Conclusion

This chapter concludes the present study. In sub-section 6.1, a number of future research directions are suggested based on the findings of my systematic literature review. Sub-section 6.2 examines the robustness of the methodology employed in this study, emphasizing its limitations. Section 6.3 concludes.

6.1. Future Research

This systematic literature review on the market's reaction to corporate bankruptcy announcements provided an overview of the empirical evidence existing in this domain. As mentioned in sub-section 2.4, the aim of this review is to investigate whether or not a proposed gap in the literature exists. However, sub-section 4.3 shows that some contributions to finance literature have already explored the long-term market reaction to corporate bankruptcy announcements and, as a result, this cannot be the main aspect of my future research.

Nevertheless, some potentially interesting research areas in the bankruptcy domain were identified with the present study. My attention is now focused on the issue of strategic bankruptcies. In fact, my results suggest that the finance literature has not yet provided much insight into the implications of this type of bankruptcy for the market. The following points summarize some of the research areas in this context that I intend to explore in my doctoral research.

1. *Relationship between insider trading behaviour and strategic bankruptcies*: existing literature suggests that insiders use the superior information about their firms in order to earn excess abnormal returns. However, to date, no study has explored how these market participants behave in the context of a strategic corporate bankruptcy. The fact that strategic bankruptcies are qualitatively different from financial bankruptcies provides an interesting context within which to explore whether or not the market for bankrupt firms is strong-form efficient;
2. *Relationship between strategic bankruptcy, insider trading and intra-industry effects of corporate bankruptcy*: existing finance literature has documented that bankruptcies tend to have a contagion and a competitive effect. However, no study has addressed whether managers of bankrupt firms use their privileged information to take positions in other firms in their industry in order to earn excess abnormal returns. This question is even more interesting in the context of a strategic bankruptcy filing. In fact, to date, no study has explored the intra-industry effects that arise due to this type of bankruptcy;
3. *Relationship between accounting information and strategic bankruptcies*: existing literature suggests that the market incorporates available accounting disclosures in its

assessment of the future prospects of the firm. However, until now, no study has focused on whether accounting disclosures provide any information to investors about a future strategic bankruptcy filing;

4. *Determining which bankruptcy prediction model performs better in the context of strategic bankruptcies*: this question directly relates to the previous point. As suggested in section 2.3.2.1, there is an ongoing debate among finance scholars about which bankruptcy prediction model performs better (accounting-based or market-based models). The event of a strategic bankruptcy provides an interesting domain within which to analyse the performance of these competing models. Theoretically speaking, market-based models should perform better in this context since strategic bankruptcies are usually not motivated by financial reasons. However, to date, no study has directly provided evidence on this issue.

6.2. Methodology examination

The present study uses the systematic literature review approach to review existing academic literature on the market's reaction to corporate bankruptcy announcements. Despite the rigour that is associated with this methodology, this study presents some limitations. The most important one relates to the keywords and exclusion criteria adopted in this study. Despite having a well justified rationale for both items, which was audited by the experts on the panel, these fundamental elements of the systematic literature review are based on my preference for financial economics. As a result, the papers identified in this study are mainly quantitative. Moreover, the exclusion of non-academic publications also influenced the results of the review. These alternative sources of information might have enriched the quality of the findings as well as provided a different perspective on the subject under analysis. Accordingly, this systematic review does not accomplish the objective of reviewing *all* the relevant literature on the market's reaction to bankruptcy announcements: it only systematically reviews empirical and testable results that are published in major academic journals.

The second major limitation is the lack of discussion on finance research methodology. This is particularly important since most studies included in this study are of an empirical nature. It is acknowledged that the aim of the review is to identify a gap in the literature and not to discuss the methodological aspects of finance research. However, in order to improve the quality assessment of the reviewed literature, it would have been important to have a better *a priori* understanding of such methodological features. Therefore, my quality assessment exercise only allows me to exclude from the analysis those papers that were methodologically very poor: it was not possible to verify which papers employed the appropriate methodology to research the question under analysis.

6.3. Concluding remarks

This study employs the systematic literature review methodology to identify and assess the academic literature addressing the issue of the market's reaction to corporate bankruptcy. Drawing on my initial reading on the subject, this study aims at analysing the extent to which a potential gap in the literature exists. Results show that such a gap no longer exists and consequently it is inappropriate for further doctoral research. However, the findings of this study also provide some insights into potentially interesting areas of research, namely the implications of strategic bankruptcies for the market. The study concludes that this area should be of interest for pursuing research at a doctoral level.

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Appendix 1 – List of Studies Identified with the Database Search and that Fulfil all Selection Criteria

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Appendix 2 – List of Studies Identified by Cross-referencing and that Fulfil all Selection Criteria

1. Clark, T., & Weinstein, M., 1983, The Behavior of the Common Stock of Bankrupt Firms, Journal of Finance, 38, 489-504.
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Appendix 3 – List of Studies Proposed by the Panel and that Fulfil all Selection Criteria

1. Akhigbe, A., Martin, A., & Whyte, A., 2005, Contagion Effects of the World's Largest Bankruptcy: the Case of WorldCom., Quarterly Review of Economics & Finance, 45, 48-64.

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Appendix 4 – Summary of Studies

No	Study	Research Category	Sample size	Year range	Finding(s)
1	Akhigbe and Madura (1996)	Empirical	91	1979-1992	1. Investigates the intra-industry effects of bankruptcy announcements; 2. Shows that rival portfolios experience significantly negative valuation effects at the time of the liquidation announcement; 3. Finds that intra-industry effects are more unfavourable for rival firms when industries have more growth opportunities and for rival firms in high-leverage industries; 3. Concludes that the degree of contagion effects of voluntary liquidations varies among industries.
2	Akhigbe et al (2005)	Empirical	-	2002	1. The market is remarkably efficient in distinguishing among the various types of stakeholders (secured debtholders, unsecured debtholders and stockholders). 2. Key competitors are adversely affected by the bankruptcy event. 3. For large and key competitors, the paper shows that contagion effects dominate competitive effects.
3	Altman and Brenner (1981)	Empirical	92	1960-1963	1. Using a two-factor market model the authors show that the market's realization of the firms' deterioration, as reflected by subsequent excess negative returns, continues for at least 12 months. 2. Using a single-factor model the results are consistent with other studies on market efficiency (i.e., the information is not new or, when it is new, the market reacts instantaneously).

No	Study	Research Category	Sample size	Year range	Finding(s)
4	Beneish and Press (1995)	Empirical	134	1983-1987	1. The study demonstrate that technical default, bond default and bankruptcy are value relevant events and that are interrelated; 2. Firms in technical default are more likely to suffer serious future distress (like debt service default or bankruptcy) when compared to non-defaulters 3. Bankruptcy is more likely after debt service default. 4. The authors also conclude that the valuation effects of technical default provide a valuable timely warning to investors, because they partially anticipate losses from subsequent distress announcements.
5	Burgstahler et al (1989)	Empirical	287	1977-1986	1. Provides evidence on the association between bankruptcy prediction models and the market's reaction to bankruptcy announcements; 2. The authors show that unexpected changes in the probability of bankruptcy are useful in explaining security returns.
6	Chen and Church (1996)	Empirical	12	1962-1991	1. Provides evidence on the association between going-concern opinions and the market's reaction to bankruptcy announcements; 2. The authors find that the unexpected drop in share prices is less negative for firms that have received a going-concern opinion as compared to those that have received an unqualified opinion.

No	Study	Research Category	Sample size	Year range	Finding(s)
7	Cheng and McDonald (1996)	Empirical	106	1981-1988	1. Provides evidence on the industry structure and stock market effect on surviving firms around bankruptcy announcements; 2. The authors conclude that the market structure affects the intra-industry announcement effects, influencing the magnitude of both the competitive and contagion effects.
8	Clark and Weinstein (1983)	Empirical	36	1938-1979	1. Examines the market's ability to anticipate bankruptcy fillings before the implementation of the Act of 1978. 2. Shows that the market start to react long before the formal announcement of bankruptcy; 3. The authors conclude that bankruptcy filings convey important unanticipated information and that the market is able to react in a timely manner to the disclosure of such valuable news.
9	Datta and Iskandar-Datta (1995)	Empirical	37	1980-1989	1. Investigates the effect of the information released by bankruptcy announcements on stockholders and three different classes of bondholders; 2. The authors find that the different classes of debtholders react differently to the information revealed by the bankruptcy announcement; 3. Findings suggest that in the post-filing period, a substantial price recovery is observable for all the analysed groups of stakeholders. This result suggests that all types of investors overreacted to the bankruptcy announcement.

No	Study	Research Category	Sample size	Year range	Finding(s)
10	Davidson et al (1993)	Empirical	55	1979-1989	1. Analyses the market's response to CEO succession; 2. Results show that succession announcements that occurred prior to and subsequent to bankruptcy announcements are associated with positive abnormal returns; 3. The authors document a greater incidence of outside succession near bankruptcy than for successions in general; 4. The study shows that the market's reaction was more positive when the new managers were appointed from outside the firm than when they were appointed from inside the firm.
11	Dawkins and Bamber (1998)	Empirical	330	1980-1993	1. Compares the market's reaction at the date of formal bankruptcy filing with the market's reaction on the date that corporate bankruptcy is disclosed via the Broadtape; 2. Finds that most of the market reaction occurs on the Broadtape disclosure date rather than at the bankruptcy petition filing date, when this information becomes publicly available in the first place.
12	Dawkins and Rose-Green (1998)	Empirical	336	1980-1992	1. Explores the relation between prior *Wall Street Journal* announcements of possible bankruptcy filings and price reaction to subsequent Chapter 11 filings; 2. Finds that firms with a prior announcement in the *Wall Street Journal* as being possibility bankrupt experience a smaller price reaction to the event when compared to the other firms that did not receive a similar disclosure in that journal.

No	Study	Research Category	Sample size	Year range	Finding(s)
13	Dugan and Forsyth (1995)	Empirical	17	-	1. Attempts to identify information that may influence the market in its assessment of the firm's future prospects; 2. Shows that the switching point of the mean and variance of stock returns is related both to financial statement information, as measured by changes in the bankruptcy model probability assessments, and the release of unfavourable news in the *Wall Street Journal.*
14	Eberhart et al (1999)	Empirical	131	1990-1993	1. Investigates the efficiency level of the market for firms emerging from bankruptcy. 2. The authors conclude that that market is highly inefficient. They find strong evidence that investors of firms emerging from bankruptcy are able to earn positive abnormal returns in the longer-term.
15	Eberhart et al (1990)	Empirical	30	1979-1986	1. Analysis how deviations from APR influence the wealth of bankrupt companies' shareholders; 2. Evidence shows that the violation of the APR is a frequent event; 3. Shows that the amount paid to shareholders in excess of what was due under complete adherence to APR varies from zero to 35.71 percent of the total value paid to the firms' stakeholders, averaging 7.6 percent; 4. The authors also find that the length of the delay in bankruptcy proceedings is negatively related to the proportion of the total distribution that shareholders are given in violation of the ARP.

No	Study	Research Category	Sample size	Year range	Finding(s)
16	Elayan and Maris (1991)	Empirical	36	1973-1987	1. Investigate the market's reaction to the announcement of liquidation and reorganization of real-state firms in the U.S.; 2. Finds that market reacts positively to liquidations announcement but negatively to the reorganizations announcements.
17	Elliot et al (1984)	Empirical	73,200 (firm years)	1975-1979	1. Explores insiders' behaviour around bankruptcy announcements; 2. Concludes that Insider trading may be motivated by wealth changes, portfolio diversification effects, consumption opportunities and taxes and not only on the ability/desire to generate superior returns
18	Espahbodi et al (2001)	Empirical	931	1985-1993	1. Studies analysts behaviour in the context of financial distress; 2. Shows that financial analysts gain a higher level of insight about the companies future as more information about them becomes available; 3. Demonstrates that analysts systematically underreact to bad news.
19	Eyssel (1991)	Empirical	54	1986	1. Explores insiders' behaviour around bankruptcy announcements; 2. Finds that corporate insiders present a trading pattern that maximizes their own wealth; 3. Shows that managers of firms that finally liquidate are heavy purchasers of their own firm's shares and that the managers of bankrupt firms were heavy sellers of their own firm's shares; 4. The author also shows that those insiders with the greatest access to information were the heaviest purchasers before liquidation and the heaviest sellers before the bankruptcy announcement.

No	Study	Research Category	Sample size	Year range	Finding(s)
20	Ferris et al (1997)	Empirical	274	1979-1989	1. Investigates the intra-industry effects of bankruptcy announcements; 2. Results show that the contagion effect dominates the competitive effect
21	Gosnell et al (1992)	Empirical	129	1985-1987	1. Explores insiders' behaviour around bankruptcy announcements; 2. Results show that the number of insiders selling transactions for OTC, as opposed to exchange-listed firms, increases significantly before the first public announcement of bankruptcy; 3. The authors conclude that, in the context of the OTC firms, better-informed corporate insiders use their privileged information concerning the financial state of the firm in trading with the less informed market in order to earn abnormal returns. This is not the case for exchange-listed companies.
22	Haensly et al (2001)	Empirical	76	1985-1993	1. Analyse the contagion and competitive effects of bankruptcy announcements; 2. Fails to verify any significant shareholder wealth effect, both positive and negative, at competitors of bankrupt companies
23	Han et al (1992)	Empirical	4,375 (firm years)	1978-1984	1. Examines the communication value of accounting disclosures of information other than earnings; 2. The authors conclude that, although investors react to the non-earnings disclosures, almost all of the information contained in annual financial statements disclosures that are required by the SEC is impounded in security prices before the actual filing date with the SEC.

No	Study	Research Category	Sample size	Year range	Finding(s)
24	Holder-Webb and Wilkins (2000)	Empirical	251	1975-1996	1. Provides evidence on the association between going-concern opinions and the market's reaction to bankruptcy announcements; 2. Shows that the market's reaction to bankruptcy announcements is less negative for firms receiving a SAS Nº 59 going-concern opinion than for firms receiving a SAS Nº 59 clean opinion
25	Hotchkiss (1995)	Empirical	197	1979-1988	1. Examines the relation between post-bankruptcy performance and management changes 2. his study finds that the five-year post-reorganization performance of the surviving firms was significantly inferior to their respective industry average; 3. Demonstrates that retaining pre-bankruptcy management is strongly associated with worse post-bankruptcy performance.
26	Hotchkiss and Mooradian (1997)	Empirical	288	1980-1993	1. Explore the relationship between vulture investors and the market for control of distressed firms; 2. Finds that the improvement in post-restructuring performance relative to pre-default level is higher when vulture investors are active in management and/or gain control of the firm; 3. Finds that the returns to bondholders and shareholders associated with vulture claim purchases are negatively related with the priority of the claim purchased; 4. Concludes that vulture investors can bring managerial skills to the target firm and add more capability to discipline managers of companies in financial distress.

No	Study	Research Category	Sample size	Year range	Finding(s)
27	Hubbard and Stephenson (1997)	Empirical	68	1988-1993	1. Analyse the stock price behaviour of firms that continue to be actively traded after filling for bankruptcy; 2. The authors conclude that investors are unable to understand the bankruptcy process and are not aware of the terms of publicly available reorganization plans.
28	Indro et al (1999)	Empirical	171	1980-1991	1. Analyses firms' performance after their emergence from Chapter 11; 2. Shows that it is possible to develop an investment strategy based on publicly available information to earn systematically positive abnormal returns around the bankruptcy announcement date.
29	Iqbal and Shetty (2002)	Empirical	197	1991-1998	1. Explores insiders' behaviour around bankruptcy announcements; 2. The authors conclude that insiders have self-serving motives and that they are likely to bail out on the stockholders during periods of financial distress.
30	Katz et al (1985)	Empirical	373	1968-1976	1. Explores the impact on common stock prices of distress and recovery signals generated by the popular bankruptcy models presented in Altman (1968) and Wilcox (1978); 2. Shows that it is possible to develop an investment strategy based on publicly available information to earn systematically positive abnormal returns around the bankruptcy announcement date.

No	Study	Research Category	Sample size	Year range	Finding(s)
31	Khanna and Poulsen (1995)	Empirical	128	1980-1990	1. Investigate the extent to which managers are to blame when their firms become bankrupt; 2. The authors conclude that managers of bankrupt firms are most likely scapegoats when they are blamed for the critical situation of their firms.
32	Kwon and Wild (1994)	Empirical	100	1989-1991	1. Investigate how the financial distress and the degree of market uncertainty affect the informativeness of firm's annual reports. 2. Shows that price reactions to annual reports for the three years preceding distress are 35 percent larger than the price reaction to reports from earlier periods; 3. The authors conclude that their findings are consistent with the informativeness of financial disclosures being dependent on the level of market uncertainty.
33	Lang and Stulz (1992)	Empirical	59	1970-1989	1. Investigates the intra-industry effects of bankruptcy announcements; 2. Documents the existence of a dominant contagion effect that arises due to a bankruptcy filling; 3. The study also shows that a competitive effect exists for the firms that are mainly financed with equity and that belong to less competitive industries.

No	Study	Research Category	Sample size	Year range	Finding(s)
34	Loderer and Sheehan (1989)	Empirical	218	1971-1985	1. Explores insiders' behaviour around bankruptcy announcements; 2. Shows that corporate insiders of bankrupt companies do not systematically reduce their stockholdings in the five-year period before the formal announcement of bankruptcy; 3. Finds that the insiders' stockholdings of bankrupt firms are insignificantly different from those of the insiders of non-bankrupt firms; 4. Concludes that insiders' stockholdings in both the bankrupt and non-bankrupt firms of similar size and industry do not provide the market with useful information about the firm's intrinsic value.
35	Ma (2001)	Empirical	157	1982-1990	1. Explores insiders' behaviour around bankruptcy announcements; 2. Provides evidence of abnormal behaviour by insiders of Chapter 11 bankruptcy firms; 3. Finds significant abnormal insider purchases between Chapter 11 bankruptcy firms and a sample of control firms; 3. Shows that insider trading volume declines at least one year before the bankruptcy announcement, but the decline is only statically significant within the three-month period before the announcement; 4. Concludes that insider trading is more influenced by the short-term market reaction than by the long-term re-emergence issue.

No	Study	Research Category	Sample size	Year range	Finding(s)
36	Morse and Shaw (1988)	Empirical	162	1973-1982	1. Tests the impact of the Bankruptcy Reform Act of 1978 in the risk and return characteristics of bankrupt companies' stock; 2. Finds that firms going into bankruptcy prior to 1978 experience the same degree of financial distress as firms going into this situation after that date do; 3. Shows that a firm's systematic risk is not significantly affected by the bankruptcy announcement; 4. Concludes that the market starts to incorporate the impact of such event in the stock price of the companies long before it is publicly known.
37	Orr (1998)	Theoretical	N/A	N/A	1. Explores the role of strategic bankruptcies in private pension defaults; 2. Presents a case where a strategic bankruptcy was used to minimize the cost associated with the payments of pensions.
38	Rimbey et al (1995)	Empirical	140	1974-1978	1. Examines the 1978 Bankruptcy Reform Act's impact on the wealth of bankrupt firms' shareholders; 2. Shows that the post-Reform Act fillings are associated with more negative pre-filling and announcement period returns to shareholders than those occurred before the implementation of the Act; 3. Reports larger losses at the announcement date for those firms that are liquidated without providing any value to their shareholders than for the remaining firms.

No	Study	Research Category	Sample size	Year range	Finding(s)
39	Rose-Green and Dawkins (2000)	Empirical	77	1980-1996	1. Investigates if, at the time of bankruptcy filing, the market differentiates between firms that are subsequently liquidated from those that are reorganized; 2. Demonstrates that liquidated firms present a significantly larger negative price reaction at the bankruptcy filing date than the reorganised ones.
40	Rose-Green and Dawkins (2002)	Empirical	245	1980-1997	1. Analysis the market reaction to strategic and financial bankruptcies. 2. The authors conclude that firms filling a financial bankruptcy have significantly larger price declines than the remaining ones.
41	Russel et al (1999)	Empirical	154	1984-1993	1. Provides evidence about the valuation of bankrupt firms' stock in the post-filling period; 2. Finds that that shareholders of bankrupt companies suffer a loss of around 70 percent during the bankruptcy period; 3. Estimate theoretical values for this group of companies. Demonstrate that such values are aligned with the observable market value. 4. The authors conclude that the market for bankrupt firms is efficient in assessing the future prospects of these firms.
42	Schatzberg and Reiber (1992)	Empirical	41	1980-1986	1. Provides evidence of the post-bankruptcy announcement price movements. 2. Show that such price movement is consistent with the hypothesis of overreaction and subsequent price rebound; 3. The authors conclude that the market for bankrupt companies is inefficient.

No	Study	Research Category	Sample size	Year range	Finding(s)
43	Seyhun and Bradley (1997)	Empirical	407	1990-1991	1. Explores insiders' behaviour around bankruptcy announcements; 2. Shows that insiders engage in significant sales of their firms' stock in the months and even years preceding a bankruptcy filling; 3. Finds that insiders change their investment pattern after the prices have fallen.
44	Tavakolian (1995)	Theoretical	N/A	N/A	1. Discusses from a theoretical perspective the issue of strategic bankruptcies; 2. Provides insights on how managers can use this mechanism to enhance their shareholder's wealth.
45	Tavakolian (1994)	Theoretical	N/A	N/A	1. Discusses from a theoretical perspective the issue of strategic bankruptcies; 2. Explains the impact of such strategy in the overall financial planning of the companies' life.
46	Vu (1998)	Empirical	77	1975-1990	1. Presents evidence on the stock market's reaction to bond defaults; 2. Demonstrates that stock prices fall sharply before the default announcement date; 3. Concludes that the market is able to uncover the signs of financial distress before the actual date of the event.
47	Zavgren and Friedman (1988)	Empirical	130	1972-1978	1. Examines the relationship between unanticipated financial failure or survival in both market returns and trading volume; 2. Shows that traders attempting to generate excess profits by using accounting-based bankrupt prediction models would be hard-pressed to achieve the desired results.