

STOCKHOLM SCHOOL OF ECONOMICS

Department of Finance

Master's Thesis 2014

Course 4350

Evaluating the Swedish Business Reorganization Act

A study on firms' post emergence development

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Abstract

We evaluate the ex-post efficiency of the Swedish Business Reorganization Act by investigating the performance of Swedish firms emerging from the reorganization procedure compared to a control group. To account for heterogeneity in firm pre-filing characteristics, we employ propensity score matching in choosing comparable benchmark firms. We find that even though emerging firms on average improve their operating performance after emerging from the reorganization procedure, the bankruptcy re-filing rate for the sample is high. Our findings suggest that the Swedish Business Reorganization Act is not sufficiently efficient in alleviating economically viable firms from financial distress.

Keywords: The Swedish Business Reorganization Act, financial distress, reorganization, propensity score matching

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Acknowledgements

The authors would like to thank Ramin Baghai for valuable guidance. Remaining shortcomings are ours alone.

”[I]t gives to the honest but unfortunate debtor [...] a new opportunity in life and a clear field for future effort, unhampered by the pressure and discouragement of preexisting debt.”

Local Loan Co. v. Hunt, 292 U.S. 234, 244 (1934)

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1 Introduction

An efficient insolvency system is an important cornerstone of a well-functioning financial system. It gives credibility to financial contracts and allows creditors to force non-performing firms into default. This provides investors with predictability and increases their confidence to invest in risky assets. An efficient insolvency system also helps to ensure an efficient allocation of capital. This includes an efficient restructuring of both assets and liabilities of financially distressed firms, redeploying the capital invested in economically non-viable firms and allowing economically viable firms to continue operations. Thus an efficient insolvency system needs to be balanced between being transparent and predictable for investors, and at the same time be able to protect financially distressed but economically viable firms from over-predatory claimants, or using the terminology of Smith and Strömberg (2005) an efficient insolvency system needs to be both ex-ante efficient and ex-post efficient.

When a firm is subject to financial distress its claimants and other stakeholders may try to resolve the distress by privately renegotiating the claims on the firm or file for formal bankruptcy procedures. In order for the insolvency system to be efficient, formal procedures need to offer a transparent and fairly predictable substitute to private renegotiations for resolving financial distress, mitigating bargaining frictions that may interfere in private negotiations. With the purpose of allowing distressed but economically viable firms to continue operations and reallocating capital invested in non-viable firms, many jurisdictions around the world have both a formal procedure for liquidation and a formal procedure for reorganization.

In the US, these two different procedures are referred to as Chapter 7 bankruptcy and Chapter 11 bankruptcy respectively. The efficiency of the US Chapter 11 procedure has been subject to evaluation by many studies as well as debate among scholars. Some critics, for example Ayotte and Morrison (2009), have criticized the code for favouring secured creditors. Others, for example Weiss and Wruck (1998) have claimed that it is too debtor friendly, allowing non-viable firms to survive and continue as going concerns

when they should instead be liquidated. This notion, that many companies emerging from Chapter 11 are non-performing, is questioned by Aivazian and Zhou (2012). They examine the efficiency of Chapter 11 by comparing firms emerging from Chapter 11 with comparable non bankrupt firms, using matching methods to control for firm level heterogeneity. The authors find that firms emerging from Chapter 11 do not perform worse and in some instances even perform better than comparable non-filing firms.

In Sweden, the liquidation procedure is referred to as *Konkurslagen* or *the Bankruptcy Act* (herein "*the liquidation procedure*"), while the reorganization procedure is referred to as *Lagen om företagsrekonstruktion* or *the Business Reorganization Act* (herein "*the reorganization procedure*"). The Business Reorganization Act was introduced in 1996 but has not achieved comparable importance to its US counterpart. For example, during the period between 1996 to 2000, only 1.5% of bankruptcy procedures in Sweden were conducted under the Reorganization Act, while the rest were made under the liquidation oriented Bankruptcy Act. The corresponding number for the period between 2001 to 2006 was 1.7%.¹ The proportion of reorganizations has slightly increased since, but still remains only a small fraction of the total number of bankruptcies (Persson and Karlsson-Tuula (2012); Karlsson-Tuula (2006)). Also, studies has shown that many firms in practise reorganize through the liquidation procedure, with firms being sold as going concerns, often back to previous owners (Strömberg and Thorburn (1996); Strömberg (2000)).

Although the Swedish Business Reorganization Act has been subject to empirical studies and evaluation, compared to the US Chapter 11, it has not been nearly as scrutinized. For example, no empirical studies have been made on the performance of firms emerging from the reorganization procedure. By investigating how firms' operating performance evolve after emerging from the reorganization procedure, one could infer clues about how efficient the procedure is on sorting out economically non-viable firms and not allowing them to emerge as going concerns.

¹The proportion of Chapter 11 filings to total bankruptcy filings in the US for the period between 2001 to 2006 was 23.8% (Administrative Office of US Courts (December 8, 2014). Retrieved from <http://www.uscourts.gov/Statistics/BankruptcyStatistics/12-month-period-ending-december.aspx>).

However, evaluation of the efficiency of a formal reorganization procedure is difficult due to the fact that it is essentially a relative efficiency. It is relative to the outcome of the liquidation code as well as to the outcome of out-of-court renegotiations. The efficiency of the in-court reorganization and liquidation procedures will affect the outcomes of private workouts since claimants expecting a large payoff in court can opt to file for formal bankruptcy and may therefore not accept a lower payoff in private negotiations. Likewise, the efficiency of the reorganization procedure will be dependent on the relative efficiency of the liquidation procedure. Similarly, in-court reorganizations could be affected by privately negotiated pre-package filings. Thus, in order to fully evaluate how efficient an insolvency system is in resolving financial distress, one would need to evaluate each feature and their interdependence. The lack of systematic data, especially on private workouts, makes this even more difficult.

Acknowledging this argument, we nevertheless limit the scope of this paper to investigate and discuss the Swedish Business Reorganization Act, evaluating the procedure using a similar framework and methodology to that of Aivazian and Zhou (2012) in the Swedish setting. Investigating the operational development of firms that emerge from reorganization and the proportion of firms that file for bankruptcy again in the years following emergence from reorganization, could tell us more about the sorting function of the procedure and hence the ex-post efficiency of the procedure. For example, assuming both economically viable and non-viable firms file for the reorganization procedure, on average weak performance of emerging firms and a high rate of refilings could signal that economically non-viable firms are allowed to emerge as going concerns. Aivazian and Zhou (2012) find that for the US Chapter 11 this does not seem to be the case and given that the Swedish Business Reorganization Act is in many ways modelled after Chapter 11, could we expect similar findings?² However, due to the substantially lower proportion of reorganization procedures in Sweden, could it be that the procedure is considered among Swedish businesses to be unpredictable in sorting out viable firms from

²The preparation of the Swedish Bankruptcy Act was to a great extent influenced by the US Chapter 11. The legislators made extensive study trips to the US, but also to other jurisdictions including the United Kingdom, France and Finland (Gustafsson (2014)).

non viable firms? Could it be that the Swedish reorganization procedure is inefficient in resolving the financial distress of firms? In order to investigate the Swedish Business Reorganization Act on these aspects we work with two contradictory main hypotheses:

H1: *Firms that emerge from the Swedish Business Reorganization Act do perform worse than comparable non filing firms.*

H2: *Firms that emerge from the Swedish Business Reorganization Act do not perform worse than comparable non filing firms.*

In notion the "perform" in this context we include both operational performance and ability to service liabilities. The purpose of the study is to find out which hypothesis finds more support in the data. By investigating and discussing this, we hope to contribute to existing literature by adding a piece of the puzzle on the efficiency of the Swedish insolvency system.

We investigate the operational performance and refiling rates for Swedish firms emerging from the Swedish Business Reorganization Act during 1996 to 2012 and benchmark these firms against comparable non-filing firms. We limit our scope to Limited liability Companies with more than SEK 1.0 million in total assets. To account for heterogeneity in firm characteristics and self-selection bias, we employ propensity score matching in choosing benchmark firms. This enables us to account for some of the problems that are associated with endogenous filing decisions, for example that firms have some certain characteristics that make them more/less likely to file for the reorganization procedure, i.e. that the filing decision is not random. Propensity score matching enables us to create a group of comparable firms based on certain characteristics and mimic the counterfactual performance of reorganized firms, had they not gone bankrupt. This enables us to isolate the effect of the reorganization filing decision, disregarding differences among specific firms.

We identify a number of firm characteristics that affect a firm's propensity to file for the reorganization process. Such characteristics include profitability, bargaining power of creditors, the amount of intangible assets to total assets, and liquidity measured by a firm's quick ratio and interest coverage ratio. When comparing the change in operating

performance for firms going through the reorganization procedure with that of the group of matched firms, we find that, on average, firms going through the reorganization procedure improve their operating performance significantly compared to non-filing firms. This is true both over the period measured between the pre-filing year to the first post emergence year, and between the pre-filing year to three years post emergence from the reorganization procedure. In order to shed light to the structural changes undertaken during reorganization that may give rise to the improvement in operating performance, we investigate firm's changes in total assets, total liabilities, operating income and trade credits. We find that firms going through reorganization shed assets and decrease liabilities after emerging. In addition, firms going through reorganization also manages to decrease their trade credits and improve their operating income. This suggests that, during reorganization, firms undertake substantial structural changes helping them to improve their operating performance. By dividing emerging firms into two groups, firms that file for liquidation within three years after emerging from reorganization and firms that do not file for liquidation within three years after emerging, we are able to observe some differences in reorganization behavior between the groups. It seems like the firms that do not file for liquidation within three years shed assets and decrease liabilities to a larger extent.

Our findings suggest that firms emerging from the reorganization procedure, on average, reduce costs associated with being in financial distress and/or make better use of their assets. This finding seems to support our second hypothesis, namely that firms that emerge from the Swedish Business Reorganization Act do not perform worse than comparable non filing firms. However, the fact that such a large portion of filing firms later file for liquidation could suggest the contrary, that firms that emerge from the Swedish Business Reorganization Act do perform worse than comparable non filing firms. We conclude that even though viable firms emerge from the reorganization procedure, it does not help viable firms to restructure their debt to the extent needed to recover from financial distress.

The rest of the paper proceeds as follows. Section 2 discusses theoretical and empir-

ical literature on financial distress and insolvency procedures, including the US Chapter 11 and the Swedish Business Reorganization Act. Section 3 describes the data we use for our analysis. Section 4 discusses our methodology framework. Section 5 presents the results from the data analysis. Section 6 provides a discussion and interpretation of the results. Section 7 contains some concluding remarks.

2 Previous research

Smith and Strömberg (2005) write that the goal of an optimal financial distress mechanism is to resolve financial distress in a way, such that it has an outcome as socially efficient as possible. Social efficiency balances, according to the authors, ex-ante efficiency and ex-post efficiency. Ex-ante efficiency ensures that socially valuable projects get funded, providing confidence to investors entering into financial contracts by honoring ex-ante contractual rights. Ex-post efficiency allocates financially distressed firms' assets to their highest-value use by restructuring assets as well as liabilities efficiently. Capital invested in inefficient firms can thus be redeployed, efficient firms are thus allowed to emerge with a sustainable capital structure and ownership of assets is thus shifted to where it is most efficient. Ex-ante and ex-post efficiency are sometimes conflicting. For example, giving creditors rights to seize collateral in a bankruptcy increases ex-ante efficiency but may obstruct an efficient use of assets ex-post. Hence a socially efficient insolvency system finds an optimal balance between ex-ante and ex-post efficiency.

Indeed, empirical studies have supported the importance of an efficient insolvency system and how it is correlated to the size and width of the capital market within the jurisdiction in question. For example, LaPorta et al. (1998) show that in countries with poor investor protection the capital markets tends to be smaller and narrower.

On average, firms emerging from an ex-post efficient bankruptcy code would be expected to regain strength and perform at least as good as non-bankrupt peers, given some time to rehabilitate from the direct and indirect costs related to the distressed situation.

Given an inefficient bankruptcy code, you would either expect to see firms emerging from bankruptcy not regaining their strength, still be subject to financial distress and perform worse on average than non bankrupt peers, and/or expect economically viable firms to be liquidated. White (1994) constructs a game theoretic model of in-court-reorganization with which he evaluates the efficiency of the US bankruptcy code. An inefficient bankruptcy proceeding are characterized by two different types of errors. A Type I error occurs if an inefficient firm emerges from in-court-reorganization, while a Type II error occurs if an efficient firm is liquidated. In an insolvency system where all firms are liquidated no Type I error occurs, while a significant number of Type II errors occur. Thus, there is substantial deadweight loss for society as a result of economically viable firms being liquidated. When introducing a reorganization procedure to the insolvency system, with perfect information there are no Type I errors or no Type II errors and hence the deadweight loss for society is decreased to costs deriving from the distressed situation for the efficient firms. However, in a world of imperfect information there is, according to White (1994), a significant risk of a pooling equilibrium where the Type II errors decreases as compared to the liquidation only system, but at the cost of increasing Type I errors as both inefficient and efficient firms reorganize. In this case the deadweight loss also consists of the cost of spending resources on saving inefficient firms. Thus, the benefits of the insolvency system is a tradeoff between gains from reducing Type II errors and the increase of Type I errors. The author argues that due to the difficulty of sorting between efficient and inefficient firms, the current form of the Chapter 11 feature of the US insolvency system results in more deadweight losses than benefits.

Weiss and Wruck (1998) supports the argument by White (1994) after examining the case of the Eastern Airlines bankruptcy. They argue that the court was overprotective in fending of market forces that would have otherwise put a stop to the incumbent management's value-destroying behaviour.

Empirical research has been done that both support and oppose the hypothesis that indeed many companies that go through a Chapter 11 reorganization procedure emerge

as non-performing firms, with continuing operating losses following the procedure. In an article examining the performance of 197 companies emerging from Chapter 11 Hotchkiss (1995) reports that 40% of the companies in the sample continue to experience operating losses three years after emerging from Chapter 11 and 32% of the companies file for bankruptcy again or restructure out-of-court. She concludes that the results are consistent with the view that the Chapter 11 process is economically biased towards continuation of unprofitable firms. Alderson and Betker (1999) examine the post-bankruptcy performance of firms reorganized in Chapter 11 between 1983 and 1993. They look at total cash flows available to equity and debt holders five years after firms emerge from Chapter 11 bankruptcy. Assuming that in the counterfactual case of liquidating the firms, the proceeds would have been invested in benchmark portfolios, the authors find that the returns of the emerging firms on average neither underperform nor outperform the returns of the benchmarks portfolios. Emerging firms with high growth options even generate superior returns to investors compared to the benchmark portfolios. These results imply that the Chapter 11 bankruptcy does lead to inefficiencies in the allocation of capital. Denis and Rodgers (2007) point to characteristics and actions associated with a successful Chapter 11 restructuring, such as significantly reducing assets and liabilities while in Chapter 11. Their findings suggest that a Chapter 11 procedure may indeed provide a way for firms to rise from the financial distress and successfully reorganize.

Aivazian and Zhou (2012) evaluate the efficiency of Chapter 11 by investigating the operating performance of public firms that emerge from it, benchmarking the firms' performance to comparable firms. In order to reduce selection bias of the operating performance post-reorganization and account for problems associated with endogenous filing decisions, the authors employ propensity score matching on pre-filing characteristics that may affect the decision to file for Chapter 11. The authors argue that the propensity score matching method is a more accurate way of measuring post-reorganization performance than using industry-adjusted or industry and performance-adjusted measures, as often has been done in previous empirical research. This is due to the substantial

heterogeneity among firms and reasons for filing for Chapter 11 that only controlling for one of two characteristics may not be enough. They find that on average, the operating performance of the emerging firms improve significantly from the pre-filing year to the first post emergence year. They also find that the improvements of filing firms are even larger when considering operating cash flow to total assets. In addition, they find that firms going through reorganization shed assets significantly and cut debt levels after emerging from Chapter 11. This shows that firms filing from Chapter 11, undertake substantial organizational changes during the period of reorganization.

Several empirical studies have discussed the direct and indirect costs of financial distress. Direct costs include legal, administrative and advisory fees that are paid with the purpose of trying to resolve the distress. Weiss (1990) estimates the direct costs of financial distress to be around 3% of pre-bankruptcy firm value, using a sample of 37 bankrupt firms in the period between 1980 to 1986. Lubben (2000) investigates legal advisory fees using a sample of 22 firms and finds that on average these amounts to 1.8% of the distressed firms total assets, but can be as high as 5%. Compared to the direct costs, empirical research suggests that the indirect costs of financial distress are both more significant and more substantial. Indirect costs are opportunity costs in the sense that they are the sum of the outcomes of suboptimal actions by corporate stakeholders when the firm is in financial distress. This includes conflicts of interest, asymmetric information, holdout problems, lost sales, weakened competitive positions, higher operating costs, liquidation constraints and inefficient use of management's time. However, given the more subtle nature of the indirect costs they are hard to observe and measure and as a result interpretation and comparison of estimations of the costs of financial distress may be difficult (Senbet and Wang (2010)).

Asquith et al. (1991) find that the capital structure of companies affects how they are restructured, where companies with a combination of secured private debt and numerous public debt issues hinders an out-of-court workout and increases the probability of a Chapter 11 filing. Hence, the most complex cases of financial distress situations are taken through a Chapter 11 procedure and the measures are taken trying to overcome

the complexity in the matter. Wruck (1990) discuss in an article benefits and costs of financial restructuring. Financial restructuring often lead to organizational restructurings that may reallocate and improve the use of resources, but a financial restructuring may also come at great cost. They find that the net benefit/cost of a financial restructuring is dependent on the financial and ownership structure of the company.

Comparing the bankruptcy systems of six different jurisdictions, Smith and Strömberg (2005) use a framework for evaluating each bankruptcy system's ability to mitigate bargaining frictions during financial distress. The authors argue that in a world without bargaining frictions, financial distress could have economically efficient outcomes by private negotiations between the stakeholders, as is stated by the Coase theorem. In a reality full of bargaining frictions, the bankruptcy code should therefore mitigate these frictions in a way that achieves both ex-ante and ex-post efficiency. The authors conclude that the US, through its Chapter 11 bankruptcy code, has the most effective reorganization procedure in addressing ex-post bargaining frictions without significant ex-ante inefficiencies. They list several key features that reorganization procedures in other jurisdiction lack compared to the US, and as a result, firms may be discouraged to use these procedures in favour of more liquidation oriented procedures. In effect, liquidation procedures are in many countries used to reorganize distressed companies, as going concern sales in these countries are common. This seems to be the case also for Sweden. Strömberg and Thorburn (1996) estimated that 76% of liquidations in Sweden end up as going concerns.³ Strömberg (2000) studies 205 Swedish bankruptcies of closely held corporations, finding that about two thirds of the going concern sales in the sample were made back to the previous owner-manager. Also, these asset purchases were often financed by an existing senior creditor.

Within the Swedish jurisdiction, the code that is corresponding to the US Chapter 11 is the Business Reorganization Act of 1996. During the early 1990s there was an unprecedented number of bankruptcies in Sweden and among the Swedish business

³They base their estimate on a study of 263 Swedish corporations with over 20 employees which filed for bankruptcy during the period 1987 through 1991. Thus before the introduction of the Business Reorganization Act.

community there was sentiment that this large number of bankruptcies led to significant value destruction. Consequently, increasing demand for an alternative legislation that could help to preserve the value of economically viable companies emerged. In contrast to the Swedish Bankruptcy Act of 1987, which has the implicit purpose of creating liquidity in order to minimize the losses of creditors, the Business Reorganization Act is more debtor oriented with the aim of reorganizing rather than liquidating economically viable companies (Welamson and Mellquist (2013)).

However, the Swedish Business Reorganization Act has failed to attain an equally important role in Sweden as Chapter 11 in the US. Welamson and Mellquist (2013) summarise several reasons for this discussed in Swedish legal research literature. One of the reasons is that the Bankruptcy Act is considered to be well functioning and quite flexible in the handling of financially distressed companies, with many skillful and experienced bankruptcy trustees. Another reason is that the Reorganization Act is too "weak" in that it does not provide enough of the necessary measures needed in order to successfully reorganize a financially distressed firm. In connection to this is the failure in many cases to resolve ownership issues that may be the cause of the problems of many firms. Also the Reorganization Act's role in relation to the Bankruptcy Act is not properly elaborated, resulting in irrational incentives to choose one of the insolvency acts over the other. Karlsson-Tuula (2006) studies the filings for the Swedish Business Reorganization Act and its application. She concludes that the act does not fulfill its purpose as a viable alternative to the Bankruptcy Act and likens the Business Reorganization Act with a "paper tiger". The Swedish Bankruptcy Code was investigated by the *2007 Insolvency Inquiry* (Government of Sweden (2010)). The Inquiry concludes that there is significant improvement to be made by harmonizing the features of the the Bankruptcy Act and Reorganization Act, and assembling the two acts through a joint act. However, the inquiry has not led to any legal implementations (Welamson and Mellquist (2013)).

3 Data

The data used in the study comes from the Serrano database and our sample period spans from 1996 to 2012, which is the last year provided in the database. The Serrano database is in turn a product of Bisnode, a European information provider to companies, institutions and private persons. The database contains financial data for most legal forms in the Swedish business community. The data is based on financial statements collected from the Swedish Companies Registrations Office (*Bolagsverket*), the Swedish Statistics Agency (*SCB*) and data from Bisnode's internal resources. There is one data entry per calendar year from the respective source's contents as of December 31 of the respective year. The database is adjusted for phenomena such as broken accounting periods, short and long accounting periods etc., ensuring comparability within the data. Besides financial data, the database also contains information on start dates/end dates for firm reorganizations, mergers and liquidations. In addition, for all firms and years, key ratios are calculated based on the financial statement data in the Serrano database.

The initial dataset we start with contains 1,738,755 firm years. This corresponds to 211,331 firms. Since the Swedish Business Reorganization Act is not applicable for all types of firms we adjust the dataset and clean for firms in industries that are not covered by the legislation. For example, the Swedish Business Reorganization Act does not apply to financial firms including banks, insurance companies and mutual funds. In addition, public entities and local federations are not eligible to go through the reorganization procedure. After the adjustments we are left with a dataset containing Limited liability companies only. The datafile containing the group of comparison companies is subject to further cleaning, as we impose a minimum asset criteria (i.e. that assets should be above SEK 1.0 million during all years between 1996 and 2012. More on this below). In addition, we also clean the dataset for firms containing missing values on assets in any one year between 1996 to 2012. This provides us with a group of 34,150 firms.

From the database we are able to identify the firms that has entered the reorgani-

zation procedure and emerged. In addition, we are able to identify the companies that have filed for the liquidation procedure. In some instances firms that has entered the reorganization procedure in a given year does not emerge but instead files for the liquidation procedure. It might also be the case that a firm emerges from reorganization but within some years post this event files for the liquidation procedure.

We choose to focus on firms with a total asset base of above SEK 1.0 million during all years between 1996 and 2012. The larger a firm is, the more stakeholders it has and thus, the consequences of financial distress affects society to a larger extent, compared to financial distress of small firms. For our sample group, firms with assets below SEK 1.0 million corresponds to the 43-44th percentile.

4 Methodology

Using a methodology framework that mimic that of Aivazian and Zhou (2012) in the Swedish setting, we employ propensity score matching to assess the difference in difference in performance of firms emerging from the Swedish Reorganization Act and benchmarked firms not having filed for bankruptcy. The propensity score matching is a statistical matching technique first introduced by Rosenbaum and Rubin (1983) that attempts to estimate the effect of a treatment by accounting for the covariates that predict receiving the treatment. The purpose is to reduce the bias due to confounding variables that could be found in an estimate of the treatment effect obtained from simply comparing outcomes among units that received the treatment versus those that did not. By matching firms that have filed and emerged from the reorganization procedure with control firms that have not gone through this treatment we can control for firm level heterogeneity in pre-filing characteristics. The propensity score matching technique helps us, for each treated firm, to find one or more non-treated firms that have similar propensity to file for reorganization like the treated firm in the pre filing year. The difference in change in operating performance is then compared in order to estimate the treatment effect.

Like Aivazian and Zhou (2012) we use the propensity score matching method as econometric evaluation estimator, as developed by Heckman et al. (1998). First step is to identify the firms that goes through the reorganization procedure at any point in time during our sample period, which spans from 1996 (the time of introduction of the Business Reorganization Act) to 2012. The firms going through the reorganization procedure are labeled the treatment group and their performance emerging from the reorganization procedure is labeled Y_{i1} . The performance for firms that do not receive the treatment (i.e. not go through the reorganization procedure) is denoted by Y_{i0} . For all firms we also assign the reorganization status D_i , which is equal to 1 for filing firms and 0 for non-filing firms. $E[Y_1 - Y_0 \mid D = 1]$ denotes the average treatment effect on the treated, where $E[Y_1 \mid D = 1]$ is obtained from the data on filing firms, while the counterfactual, $E[Y_0 \mid D = 1]$ cannot be identified from the data. Replacing $E[Y_0 \mid D = 1]$ with $E[Y_0 \mid D = 0]$, for which data is available, would risk leading a possible selection bias in observational studies. Matching reduces this bias by constructing a group of comparable non-bankrupt firms. The matching technique is justified by two assumptions:

1. The conditional independence assumption:

$$(Y_0, Y_1) \perp D \mid X. \quad (1)$$

2. The overlap assumption:

$$0 < Pr(D = 1 \mid X) < 1. \quad (2)$$

Given these two assumptions, the ATT is identified:

$$\begin{aligned} E[Y_1 - Y_0 \mid D = 1] &= E_X[E[Y_1 - Y_0 \mid X, D = 1]] \\ &= E_X[E[Y_1 \mid X, D = 1] - E[Y_0 \mid X, D = 0]]. \end{aligned} \quad (3)$$

The conditional independence assumption indicates the independence of (Y_0, Y_1)

and D conditional on the observable set of covariates X . It asserts that the conditioning variables sufficiently comprises variables affecting the performance, so that the filing decision does not systematically depend on unobservables. The overlap assumption asserts that every firm has a chance of receiving the treatment, providing for matches to be found for all values of X . Given the two assumptions, matching generates unbiased estimators. The matching method does not entirely eliminate the selection bias if certain unobservable factors systematically affect filing decisions even when conditioning on a rich set of observable firm attributes.

In contrast to Aivazian and Zhou (2012) many empirical studies estimate the effect of US Chapter 11 on operating performance industry adjusted or industry and performance adjusted measures, implicitly assuming that the industry median and the prefiling performance are the only characteristics that need to be controlled for. This carries the risk of not producing a proper control group of non-filing firms leading to a biased estimate. Matching on a broader range of prefiling characteristics to overcome this bias may turn difficult as it may be hard to find matches across all dimensions and therefore much emphasis is placed on the choice of weighting scheme to account for differences in covariates. Under the two assumptions mentioned above, using propensity score for matching reduces the dimensionality of the problem and alleviates concerns over weighting schemes. The method explicitly controls for prefiling characteristics so that filing firms are only compared to non-filing firms with similar prefiling characteristics.

4.1 Business Reorganization Act filing determinants and empirical measures

Building on the methodology used by Aivazian and Zhou (2012), we identify a number of firm characteristics that affect a firm's propensity to file for the reorganization procedure in a given year. These variables are measured at the end of the prefiling year for reorganized firms. Hence, we compare on firm characteristics one year before they go into the reorganization procedure.

Below follows an outline and discussion about the chosen variables and why they should affect a firm's propensity to file for the reorganization procedure.

4.1.1 Liquidity

Liquidity is an important measure for assessing the likelihood of filing for reorganization since the lower liquidity the less chance a firm has to service its debt. As a proxy for a firm's liquidity we use the quick ratio and the interest coverage ratio. The quick ratio is defined as cash plus receivables divided by current liabilities. What that tells us is the ability for a firm to repay its short term obligations. Interest coverage ratio is defined as EBITDA divided by current interest expenses. The interest coverage ratio tells us about a firm's operational efficiency to generate cash from operations to pay its interest. We are required to make some adjustments when it comes to calculating the interest coverage ratio. As some of the firms in our sample does not have any debt we need to create dummy variables that in ranges capture the interest coverage ratio per firm and year.

4.1.2 Profitability

We control for operating income to total assets when measuring a firm's propensity to file for reorganization as a lower profitability could lead to financial distress. Operating income is defined as earnings before interest and taxes (EBIT).

4.1.3 Liquidation value

According to research by Gilson et al. (1990) on firms going through Chapter 11, assets are more likely to be sold when a firm goes through a reorganization procedure than when the debt is restructured privately. Since fixed assets can serve as collateral for firms in distress to borrow against and overcome default, a higher degree of intangible assets should make firms less prone to enter into the reorganization procedure since they cannot collateralize their borrowings. To control for this we calculate the portion of

intangible assets to total assets for all firms. Since fixed assets can be used as collateral we calculate and control for the fixed asset to total asset ratio for each firm.

4.1.4 Bargaining power of creditors

The creditors' claims on a company can have a large impact on whether a firm ends up in formal bankruptcy or private workout. The bargaining power of creditors could often affect the outcome of a debt workout and influence what kind of method is used to restructure the company. When the bargaining power of creditors is high the chances of a successful private workout of the debt is less. It also depends on the type of debt holders a firm has and whether or not this group is heterogeneous or homogenous. One variable attempted to capture this issue of bargaining power of creditors is accounts payable to total assets. Previous research Gilson et al. (1990) shows that holdout problems can be particularly severe for companies with a large portion of trade credit, as the creditors are often many and very different in nature. In such situations it is less likely that a firm is reorganized through a private workout, but rather through a formal liquidation or reorganization process.

4.2 Restrictions

Aivazian and Zhou (2012) look at public companies going through reorganization in their study regarding the efficiency of Chapter 11. As we use a dataset containing both public and private firms, with the latter largely outnumbering the former, we are unable to control for two of the variables that are used in the study by Aivazian and Zhou (2012), as the data required is usually not available for private firms. These two variables are market value of equity to total liabilities and secured debt to total liabilities. The rationale for using market value of equity to total liabilities is that the larger equity value in continuation, the less likely the firm is to file for a reorganization procedure. Regarding secured debt to total liabilities, it is again the argument that bargaining power of creditors affects how a firm chooses to restructure its debt. Previous research, includ-

ing Asquith et al. (1991), has found that firm's with a larger portion of secured debt is more likely to rely on a private workout, as creditor's are often more homogenous. The profitability measure used by Aivazian and Zhou (2012) is defined as earnings before interest, taxes, depreciation and amortization (EBITDA). The profitability measure that we use is slightly different as we look at EBIT. In addition, Aivazian and Zhou (2012) use operating cash flow to total asset as an additional profitability measure to operating income to total assets. Unfortunately, our database does not include numbers on firms' operating cash flows. As our data limits us to include these variables in the regression, this risks violating the conditional independence assumption. As a consequence our results may be slightly biased. In addition, since we build on the methodology of Aivazian and Zhou (2012), in a Swedish context there might be other variables that may be important to explain the propensity to file for the reorganization procedure. Acknowledging these potential biases, we still consider that we would be able to infer conclusions from the results using this method.

We winsorize all independent variables (0.5% in each tail) in order to clean for outliers. We run a logit regression to estimate firm's propensity to file for the reorganization procedure. The dependent variable is 1 if the company has gone through the reorganization procedure and 0 if it has not. The independent variables used are the ones mentioned above. We control for macroeconomic conditions, which may affect a firm to file for the reorganization procedure by using year dummies.

5 Results

5.1 Sample summary

In order to test our hypothesis about the post reorganization performance of reorganized firms we start by retrieving the firms that have gone through the Swedish reorganization procedure. From our total sample we are able to observe 2,062 firms that entered the reorganization procedure during the period between 1996 to 2012. Of these, 900 firms

emerged from the reorganization procedure. 943 of the firms that went into the reorganization procedure filed for the liquidation procedure during the same year as they emerged from the reorganization procedure, while 97 firms went straight into the liquidation procedure after entering the reorganization procedure. We define these as not having emerged from the reorganization procedure. 244 of the firms emerging from the reorganization procedure filed for the liquidation procedure within three years after emerging. 656 firms emerged from the reorganization procedure, without filing for liquidation within three years after emerging. 122 firms had not yet emerged as per the date of the dataset. The number of firms filing for the liquidation procedure during the time period was 81,070.

However, since we impose the criteria of a minimum asset base of SEK 1.0 million and do not look at firms that file for the liquidation procedure the same year as they emerge from the reorganization procedure, the numbers are slightly altered. We find that during our sample period 669 firms went into the reorganization procedure of which 522 exited. Of these, 361 firms did not file for the liquidation procedure within three years after emerging from the reorganization procedure. 161 of the firms that exited the reorganization procedure filed for the liquidation procedure within three years after emerging. 67 firms in our sample went straight into the liquidation procedure without emerging from the reorganization procedure and 80 firms has not emerged as of the data's publishing. The number of liquidation filings for firms with a minimum asset base of SEK 1.0 million were 32,843 during the period. An overview of the number of reorganized firms can be found in Table I. The distribution of reorganization filings is shown in Figure 1.

5.2 Logit regression

Once we have the group of filing firms we create a group of comparable firms. In order to create a group of comparable firms we estimate a specific firm's propensity to file for reorganization. We do this by using a logit model and present the results of the regression in Table II. We run the regression using robust standard errors. In terms of

firm characteristics that affect a firm's propensity to file for reorganization procedure we find that firms with lower profitability and less liquidity (measured by a firm's quick ratio and interest coverage ratio) are more likely to file for reorganization. The dummy variables used to capture firms' interest coverage ratio clearly show, as anticipated, that the higher the interest coverage ratio the less likely a firm is to file for reorganization. We also find that firms with a high proportion of intangible assets to total assets have a higher propensity to file for reorganization. This goes against the findings of Gilson et al. (1990), that a higher degree of intangible assets should make firms less prone to enter into reorganization. In addition, we find, similar to previous research Gilson et al. (1990), that firms with a higher proportion of trade credits to total liabilities have a higher propensity to file for reorganization. This suggests that a more heterogeneous creditor group increases the likelihood of filing for in-court reorganization, instead of looking for a resolution outside court. We apply year dummy variables in order to control for the macroeconomic environment in a given year. Finally, it seems like the higher the amount of fixed assets to total assets, the more likely a firm is to file for reorganization.

The logit regression captures a firm's propensity to file for reorganization rather well. However, we notice that the regression constant is large and statistically significant. This suggests that there are additional factors that affect a firm's propensity to file for reorganization that we have not controlled for. As discussed above, data constraints unfortunately limit us to test for all possible explanatory variables that might exist, for example market value of equity to total liabilities and secured debt to total liabilities, which are used by Aivazian and Zhou (2012).

5.3 Measuring the effect of formal reorganization on firms' operating performance

When the treatment and control groups are established we can investigate which one of our hypotheses have the most support from the data. We match filing firms with non-

filing firms based on their propensity score, representing as good substitutes for the filing firms counterfactual outcomes as possible. The goal is to estimate the average treatment effect on the treated (ATT), isolating the effect of filing for the reorganization procedure. The ATT is estimated to the mean difference between the observed change in operating performance of firms emerging from the reorganization procedure and matched non-filing firms. We look at the short term and long term difference in difference in operating performance, using operating income to total assets as a proxy for performance.

Estimation of the effect of reorganization measured by the change in operating performance for the nearest k-neighbor matching for $k=1,4,6,10$ are presented in Table III. The counterfactual outcome is estimated as the average change in performance for the k nearest neighbors for the same period as the reorganized firm. An increasing number of neighbors normally reduces variance but increases bias. The k-nearest neighbour matching estimate is then computed as the mean difference between the reorganized firms' observed and counterfactual change in operating performance. The t-statistics for the different outcomes are calculated in order to assess the statistical significance of the results.

As depicted in Table III, the average change in operating performance for firms emerging from reorganization on the short term, from the pre-filing year to one year after emerging, is 11.4%. The corresponding average short term change in operating performance for the matched firms ranges from -1.2% to -0.4%, depending on the number of nearest neighbours used. The group of firms that receive the treatment equals to 297, after removing observations lacking the necessary data. The estimates indicate a significant difference between firms emerging from the reorganization procedure and matched non-filing firms on the short term. The results show that on the short term operating performance measured in terms of operating income over total assets increase significantly during reorganization.

Estimating the impact of reorganization on firms on the long term, we look at the change in operating performance from the pre-filing year to three years after emerging. The number of observations is in this case somewhat lower since some firms have

emerged such that observational data up to three years after emerging is not included in our sample. The total amount of firms that have received the treatment is 143 firms in this case. The emerging firms show an average change in operating performance of 14.9%, while the same number for matched firms range from 6.1% to -0.2%. Thus, the estimated long term ATT range from 8.8% to 15.1%. The ATT is statistically significant when looking at 4, 6 and 10 neighbors while for 1 neighbor the ATT is not significant.

5.4 Measures undertaken during reorganization

In order to investigate the sources of change in operating performance and measures undertaken by firms during a reorganization and try to understand what drives changes in operating performance, we study mean and median changes for reorganized firms between the prefilig year and one year post emerging from reorganization. Table IV summarizes the changes for reorganized firms, and we see that reorganized firms increase their operating income by on average SEK 6.227 million with a median of SEK 0.965 million. Reorganized firms decrease their assets with -15.2% on average and with a median of -21.6%. The change in liabilities for reorganized firms is -26.3% on average and with a median of -34.3%. In addition, we also investigate the average and median change in trade credits and find that firms reorganizing decrease their trade credits by -26.1% on average and with a median of -52.4%. We test if the mean and median changes are significantly different from zero and find that they are statistically significant.

5.5 Comparison of emerging firms

The results describing the change in operating performance shed some light as to how well firms emerging from the reorganization procedure perform. In order to shed some light as to why some of the firms emerging from the reorganization procedure later file for the liquidation procedure, we investigate the changes of some key metrics between the prefilig year and one year post emerging from the reorganization procedure. We look at two different groups, firms that have filed for the liquidation procedure within

three years after emerging from the reorganization procedure and firms that have not filed for the liquidation procedure within three years after emerging from the reorganization procedure during our sample period. In Table V and Table VI we can see that firms that do not file for the liquidation procedure within three years of emerging, decrease their asset base on average to a larger extent (-17.5%) compared to firms filing for the liquidation procedure within three years after emerging from the reorganization procedure (-14.3%). Furthermore, we observe a larger reduction in liabilities on average for the non liquidation filing firms (-31.4%), compared to those that file for the liquidation procedure within three years after emerging (-15.6%). Firms that do not file for liquidation within three years also show a larger average decrease in trade payables compared to the other group. We also see a substantial difference in changes in operating income during the period of reorganization. The average (median) change in operating income for firms not filing for the liquidation procedure within three years of emerging is SEK 6.005 million (1.307), while the change in operating income for firms filing for the liquidation procedure within three years is SEK 1.206 million (0.506). We also observe that the total asset base is on average larger for emerging firms not filing for the liquidation procedure within three years of emerging from reorganization compared to the other group.

Looking at the ATT for the group of firms filing for liquidation one to three years post emerging from reorganization we see a similar improvement in operating performance as the full sample. As can be seen in Table VII the average change in operating performance for these firms is 12.1% while the performance for matched firms range from 2.2% to -0.8%. The ATT is not however significant at the 5% level, when looking at this subsample.

5.6 Robustness checks

In order to check the validity of our results we run the propensity score matching procedure using different matching methods. The two alternative matching methods we use are radius matching and kernel matching, which offers an alternative way to choose

matched firms. Radius matching is similar to nearest neighbor matching, but instead of using the nearest neighbor, radius matching uses all comparison variables within a pre-defined caliper around the propensity score. Kernel matching implies that the matched observation for treated observation Y_i is given by a kernel weighted average for all untreated outcomes. For the kernel matching we use a gaussian kernel type. The results are consistent with the results obtained using nearest neighbor matching, in that the ATT is positive meaning firms going through the reorganization procedure improve their operating performance significantly. This is true, both over the long term and the short term.

6 Interpretation

We investigate the performance of firms emerging from the Swedish Business Reorganization Act compared to matched firms that have not filed for reorganization but, based on selected characteristics, would be similarly prone to file as emerging firms. Assuming an emerging firm whose operations ex-ante are perfectly efficient, but is in financial distress due to excessive leverage, neglecting the costs of being in financial distress, we would expect to observe no difference in difference in operating performance compared to matched firms after emergence from reorganization, since the only rational outcome from the reorganization would be to decrease the firm's leverage. Adding direct costs of financial distress, such as legal, administrative and advisory fees, and indirect costs of being in financial distress, such as inefficient use of management time and weakened competitive position, we should expect to observe an improvement of the firm's operating performance relative to the time in financial distress as the firm recovers. Additionally, assume that the firm's operations are inefficient under the current management, and that a reorganization of its assets and operations could improve its operating performance. In this case, we should expect to observe additional improvements after emergence if the reorganization procedure is assumed to facilitate such an operational transition, through for example change of ownership or management. On the

other hand, assuming an emerging firm whose operations ex-ante are inefficient without potential for improvement under the reorganization procedure we would rather see a deterioration of operating performance as a results of for example increasing liquidity constraints.

We use the firms' operating income over total assets as a proxy when trying to evaluate the changes in their operating performance. Hence, the observed changes are derived from changes in firms' operating income and total assets. We find that emerging firms on average improve their operating income as well as reduce their total assets, in effect making better use of their assets. Looking at this change in operating performance, our results suggest that both on the long term and short term, firms that have emerged from reorganization on average does not perform worse but rather improve their performance compared to non-filing firms, supporting our second hypothesis. The results suggest that emerging from the reorganization procedure firms, on average, reduce costs associated with being in financial distress and/or make better use of their assets. This may imply that on average, the reorganization procedure has effectively helped the emerging firms. Using the terminology of White (1994), the result tells us that the magnitude of Type I errors, where economically non-viable firms are allowed to emerge from the reorganization procedure rather than being liquidated, is not substantial. These findings on the Swedish Reorganization Act are analogous with the findings on Chapter 11 by Aivazian and Zhou (2012).

Our results show that the improvement in operational performance of reorganized firms is substantially larger than the change in operating performance of matched firms. Using the same methodology and measurement on public firms emerging from Chapter 11, the results of Aivazian and Zhou (2012) differ to ours in that the difference in difference in operating performance is smaller, especially on the short term. Thus, looking at our higher sample ATT, there is room for firms with smaller improvement in operating performance that would lower the ATT to the same level as Aivazian and Zhou (2012). This may suggest that the Swedish reorganization procedure prevents some economically viable firms to emerge as going concerns, and hence that Type II errors may exist.

Investigating the data we also find evidence that may support our first hypothesis that emerging firms on average perform worse than comparable firms. In our sample, of the firms that emerge from the reorganization procedure, almost 30% filed for the Bankruptcy Act, i.e. the liquidation procedure, within three years. This could mean that economically non-viable firms are in effect allowed to emerge from the reorganization procedure. But it could also mean that the procedure does not sufficiently help viable firms to restructure their debt and recover from financial distress. As our results show us that firms emerging from the reorganization procedure on average improve their operating performance we infer that the latter is the case. Comparing emerging firms that file for the Bankruptcy Act within three years to those that did not, we find that firms that did not file post emergence on average reduced their debt to a higher degree during reorganization than the firms that ended up filing. This may suggest that in the cases of firms refiling for bankruptcy the reorganization procedure failed to successfully restructure the debt and alleviate the financial distress, even though the firms may have improved their operational performance.

This finding may find support in the discussions of Smith and Strömberg (2005) concerning the differences in reorganization procedures in different jurisdictions. According to the authors, the Swedish Business Reorganization Act lacks some of the mechanisms that the US Chapter 11 has in order to reduce coordination problems between stakeholders, and especially creditors. Within the Swedish reorganization procedure, without unanimous consent from secured creditors, no secured debt can be written down. Moreover, write down of debt by 75% need unanimous consent from all creditors including unsecured. Also unlike the US Chapter 11, within the Swedish reorganization procedure the court cannot cram down a reorganization plan on dissenting creditors; even shareholders needs to agree on being diluted if the proposed reorganization plan includes conversion of debt into equity (Gustafsson (2014)).

As empirical studies on liquidations in Sweden has shown, many firms de facto reorganize through the liquidation procedure ending up as going concerns and oftentimes even with same owners and creditors as before the liquidation. Strömberg (2000) Thus,

possible Type II errors of the Business Reorganization Act may effectively be rectified through the Bankruptcy Act. This may be supported by the low rate of firms filing for the reorganization procedure in the first place compared to the liquidation procedure. Our findings that while firms on average improve their operational performance following emergence from the reorganization procedure, the rate of refiling for liquidation is high, may be part of an explanation to this. Efficient firms can in practise instead choose to go through the liquidation procedure in order to restructure its liabilities. Karlsson-Tuula (2006) likens the reorganization procedure to a "paper tiger" in that it does not fulfill its purpose of being a viable alternative to liquidation for efficient but distressed firms. Our results seem to support her statement.

7 Concluding remarks

Given the interdependence between the formal reorganization and liquidation procedures and private renegotiations, one must be careful when thinking about efficiency only investigating data concerning one of the procedures. Any efficiency of one of the procedures needs to be related to that of the other procedure in order to be fully understood. The formal bankruptcy procedures also needs to be thought of not only from an ex-post efficiency perspective but also from an ex-ante efficiency perspective.

We evaluate the Swedish Business Act from an ex-post perspective investigating the performance of firms emerging from the procedure. In limiting our scope to investigating one procedure from an ex-post efficiency perspective, we are thus limited in the conclusions regarding the efficiency of the Swedish insolvency system that we are able to infer from the results. However, our analysis may provide clues on the efficiency of constituents of the insolvency system, which together with other research may help us understand how to best design such a system.

We find that even though emerging firms on average improve their operating performance, many of the firms file for the liquidation procedure within a few years from emerging. Thus, we are not able to reject neither of our main hypotheses. Nevertheless,

our results provide us with a basis for discussion. Our results suggest that viable firms emerge from the reorganization procedure, but that many of them are still left with financial problems that forces them into liquidation. The reorganization procedure does not seem to be sufficiently efficient in restructuring the liabilities of economically viable firms. This together with the low rate of reorganization filings versus liquidation filings suggest that further review of the Swedish bankruptcy procedures is warranted. If, as our analysis suggests, some distressed firms in Sweden choose to reorganize through the liquidation procedure rather than the reorganization procedure, a harmonization of the two procedures would be needed in order to increase transparency for firms and stakeholders seeking to resolve financial distress.

In order to further progress the discussion on the efficiency of the Swedish insolvency system, we suggest that topics for future research can include a similar evaluation to ours on the performance of liquidated companies emerging as going-concerns. This would bring further clarity to the relative efficiencies of the reorganization procedure and the liquidation procedure. In addition to this, an investigation of the dynamics of private reorganizations of financially distressed firms in Sweden would be a necessary complement in the assessment of the Swedish insolvency system. However, we stress that in order to fully apprehend the efficiency of the insolvency system, the discussion needs to be set in a broader context, taking into account ex-ante efficiency and other impacts that the insolvency system may bring on society.

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Table I: Number of firms filing for the Swedish bankruptcy procedures, 1996-2012

Filing firms 1996-2012: All firms	Number of firms
Firms filing for liquidation	81,070
Firms filing for reorganization	2,062
Firms emerging from reorganization	1,843
Firms filing for liquidation in the same year as emerging from reorganization	943
Firms filing for liquidation within three years of emerging from reorganization	244
Firms emerging from reorganization and not filing for liquidation within three years	656
Firms entering reorganization going straight into liquidation	97
Firms that has entered reorganization but not yet emerged	122

The above table reports the total number of firms filing for the liquidation procedure and the reorganization procedure between 1996 to 2012 respectively. The data is retrieved from the Serrano database.

Filing firms 1996-2012: Firms with total assets above SEK 1.0 million	Number of firms
Firms filing for liquidation	32,843
Firms filing for reorganization	669
Firms emerging from reorganization	552
Firms filing for liquidation in the same year as emerging from reorganization	-
Firms filing for liquidation within three years of emerging from reorganization	161
Firms emerging from reorganization and not filing for liquidation within three years	361
Firms entering reorganization going straight into liquidation	67
Firms that has entered reorganization but not yet emerged	80

The above table reports the total number of firms with total assets above SEK 1.0 million that filed for the liquidation procedure and the reorganization procedure between 1996 to 2012 respectively. The data is retrieved from the Serrano database.

Table II: Logit regression

	Robust				
	Coef.	S.E.	z	95% Conf. Interval	
Estimate of Logit Regression					
Operating income/assets	-0.539	0.059	-9.100	-0.655	-0.423
Fixed assets to total assets	0.126	0.051	2.480	0.026	0.226
Intangible assets to total assets	2.902	0.114	25.480	2.679	3.126
Trade credits to total liabilities	3.975	0.070	56.930	3.839	4.112
Quick ratio	-0.011	0.005	-2.230	-0.021	-0.001
Intcovdummy1	1.564	0.215	7.270	1.142	1.986
Intcovdummy2	1.393	0.223	6.250	0.956	1.829
Intcovdummy3	1.298	0.220	5.890	0.866	1.730
Intcovdummy4	1.275	0.219	5.830	0.846	1.704
Intcovdummy5	1.228	0.221	5.550	0.795	1.662
Intcovdummy6	1.048	0.225	4.660	0.608	1.489
Intcovdummy7	0.908	0.229	3.960	0.458	1.357
Intcovdummy8	1.065	0.230	4.640	0.615	1.515
Intcovdummy9	1.078	0.232	4.640	0.623	1.533
Intcovdummy10	0.965	0.237	4.080	0.502	1.429
Intcovdummy11	0.724	0.246	2.950	0.243	1.206
Intcovdummy12	0.859	0.222	3.870	0.424	1.294
Intcovdummy13	0.821	0.226	3.630	0.377	1.264
Intcovdummy14	0.503	0.222	2.260	0.067	0.938
Intcovdummy15	0.075	0.219	0.340	-0.355	0.504
Intcovdummy16	-0.113	0.227	-0.500	-0.557	0.332
Constant	-6.036	0.224	-26.910	-6.475	-5.596
Number of observations					345,027
Log pseudolikelihood					-27924.601
R-squared					0.106

The above table reports the logit estimates of firms' propensity to file for the reorganization procedure. The dependant variable is one for all reorganized firm years and zero otherwise. The explanatory variables are presented in the methodology section and measured for each firm year. The regression is controlled for year dummy variables. Z-statistics are presented and calculated using robust standard errors (r).

Table III: Estimation by propensity score matching

<i>Short term Effects on Operating Performance</i>								
<i>Propensity Score Matched Results</i>								
Short term change in Operating Income							Results by Aivazian & Zhou (2012)	
k	No.	Observed	Control.	ATT	S.E.	T-stat	ATT	T-stat
1	297	0.114	-0.012	0.126	0.048	2.61	-0.003	-0.33
4	297	0.114	0.002	0.112	0.026	4.25	0.003	0.35
6	297	0.114	-0.001	0.115	0.025	4.64	0.004	0.46
10	297	0.114	-0.004	0.118	0.022	5.41	0.008	0.96

The above table presents the results when comparing firms filing for the reorganization procedure to the group of matched firms over the short term. The short term period is defined as the change between the pre-filing year and the first year post emergence from reorganization. The group of matched firms has been retrieved using the propensity score method. The metric used to measure operating performance is defined as EBIT to total assets. Reorganized firms are compared with k matched neighbors with the closest propensity score. No. refers to the number of firms receiving the treatment. In addition, the comparable results over the same time period obtained by Aivazian & Zhou (2012), in their study regarding the efficiency of Chapter 11, is reported.

<i>Long term Effects on Operating Performance</i>								
<i>Propensity Score Matched Results</i>								
Long term change in Operating Income							Results by Aivazian & Zhou (2012)	
k	No.	Observed	Control.	ATT	S.E.	T-stat	ATT	T-stat
1	143	0.149	0.061	0.088	0.074	1.18	0.009	0.97
4	143	0.149	0.019	0.130	0.033	3.91	0.011	1.22
6	143	0.149	0.011	0.138	0.030	4.54	0.14	1.64
10	143	0.149	-0.002	0.151	0.028	5.41	0.021	2.52

The above table presents the results when comparing firms filing for the reorganization procedure to the group of matched firms over the long term. The long term period is defined as the change between the pre-filing year and three years post emergence from reorganization. The group of matched firms has been retrieved using the propensity score method. The metric used to measure operating performance is defined as EBIT to total assets. Reorganized firms are compared with k matched neighbors with the closest propensity score. No. refers to the number of firms receiving the treatment. In addition, the comparable results over the same time period obtained by Aivazian & Zhou (2012), in their study regarding the efficiency of Chapter 11, is reported.

Table IV: Change in assets, liabilities, operating income and interest expenses

	Mean	Median	SD
<i>Reorganization filing firms</i>			
Change in assets	-0.152	-0.216	0.555
Change in total liabilities	-0.263	-0.343	0.516
Change in trade credits	-0.261	-0.524	1.081
Change in operating income	6.227	0.956	19.674
Change in interest expenses/tot asset	-0.018	-0.009	0.118
Change in interest expenses	-2.429	-0.197	12.183

The above table summarizes the changes in assets, liabilities, trade credits, operating income and interest expenses for reorganized firms between the pre-filing year and one year post emergence from reorganization. Changes in operating income and interest expenses are displayed in SEK million. The t-test (sign test) is used to test if mean (median) changes are different from zero and we find that they all are significant on the 5% level.

Table V: Changes and prefilin characteristics for emerging firms not filing for liquidation within three years

	Mean	Median	SD
<i>Firms exiting reorganization and do not file for liquidation within three years</i>			
Change in assets	-0.175	-0.249	0.504
Change in total liabilities	-0.314	-0.381	0.429
Change in trade credits	-0.326	-0.560	0.847
Change in operating income	6.005	1.307	13.384
Change in interest expenses/tot asset	0.016	0.012	0.062
Change in interest expenses	1.927	0.224	6.176

The above table show changes in assets, liabilities, trade credits, operating income and interest expenses between the prefilin year and the first post emergence year for firms emerging from reorganization and not filing for liquidation within three years of emerging. Changes in operating income and interest expenses are displayed in SEK million.

	Mean	Median	SD
<i>Firms exiting reorganization and do not file for liquidation within three years</i>			
Total assets	38.579	11.879	102.598
Trade credit	5.640	1.791	14.883
Total equity	3.797	0.581	27.360
Quick ratio	0.911	0.652	1.604
Intangible assets	1.197	0.000	5.654

The above table show prefilin characteristics for firms emerging from reorganization and not filing for liquidation within three years of emerging. Assets, trade credits and equity are displayed in SEK million.

Table VI: Changes and prefilings characteristics for emerging firms filing for liquidation within three years

	Mean	Median	SD
<i>Firms exiting reorganization and filing for liquidation within three years</i>			
Change in assets	-0.143	-0.120	0.371
Change in total liabilities	-0.156	-0.174	0.474
Change in trade credits	-0.192	-0.435	0.989
Change in operating income	1.206	0.506	6.343
Change in interest expenses/tot asset	-0.001	0.002	0.046
Change in interest expenses	0.093	0.103	1.240

The above table show changes in assets, liabilities, trade credits, operating income and interest expenses between the prefilings year and the first post emergence year for firms emerging from reorganization but filing for liquidation within three years of emerging. Changes in operating income and interest expenses are displayed in SEK million.

	Mean	Median	SD
<i>Firms exiting reorganization and filing for liquidation within three years</i>			
Total assets	25.790	7.218	73.280
Trade credit	5.571	1.811	15.064
Total equity	2.496	0.255	12.371
Quick ratio	1.7	0.6	13.3
Intangible assets	0.802	0.000	3.635

The above table show prefilings characteristics for firms emerging from reorganization but filing for liquidation within three years of emerging. Assets, trade credits and equity are displayed in SEK million.

Table VII: ATT estimation of firms filing for liquidation within three years

<i>Short term Effects on Operating Performance (firms filing for liquidation within three years)</i>						
<i>Propensity Score Matched Results</i>						
Short term change in Operating Income						
k	No.	Observed	Control.	ATT	S.E.	T-stat
1	62	0.121	0.022	0.099	0.071	1.400
4	62	0.121	0.015	0.106	0.069	1.550
6	62	0.121	0.022	0.099	0.071	1.400
10	62	0.121	-0.008	0.129	0.068	1.890

The above table presents the results when comparing firms emerging for the reorganization procedure but that later file for the liquidation procedure to the group of matched firms over the short term. The short term period is defined as the change between the pre-filing year and the first year post emerging from reorganization.

Table VIII: Robustness test of results

<i>Short term Effects on Operating Performance using Kernel and Radius matching</i>						
<i>Propensity Score Matched Results</i>						
Short term change in Operating Income						
Type	No.	Observed	Control.	ATT	S.E.	T-stat
Kernel	297	0.114	-0.004	0.118	0.019	6.190
Radius	297	0.118	0.000	0.118	0.057	2.060

The above table presents the results when using two alternative matching methods to find the group of comparable firms. This is done in order to test the robustness of our results. The short term period is defined as the change between the prefilig year and the first year post emerging from reorganization.

<i>Long term Effects on Operating Performance using Kernel and Radius matching</i>						
<i>Propensity Score Matched Results</i>						
Long term change in Operating Income						
Type	No.	Observed	Control.	ATT	S.E.	T-stat
Kernel	143	0.149	-0.009	0.158	0.025	6.370
Radius	143	0.198	0.090	0.108	0.055	1.960

The above table presents the results when using two alternative matching methods to find the group of comparable firms. This is done in order to test the robustness of our results. The long term period is defined as the change between the prefilig year and three years post emergence from reorganization.

Figure 1: Number of Swedish Business Reorganization Act filings, 1996-2012

