In Search of Lost Dividends

- An Empirical Study on Swedish Listed Firms' Propensity to Pay 1966-2001 -

Jens Andersson[a]
Major in Finance
Stockholm School of Economics

Fredrik Wansheim[b]
Major in Finance
Stockholm School of Economics

ABSTRACT

As for NYSE-listed firms, the fraction of Swedish-listed firms that pay dividends has declined over the last decades. Applying a unique and extensive database, this thesis uses the Fama and French (2001) framework to describe and explain the decline in payer percentage among Swedish-listed firms. Firm characteristics are evaluated as dividend payment predictors and the importance of individual firm characteristics in dividend payment decisions is scrutinized.

The thesis confirms the expected strong dividend driver quality of firm characteristics such as profitability, firm size and leverage, while revealing owner characteristics as unimportant to dividend decisions. This is an important result, since owner characteristics in Sweden are considered highly unusual and are therefore often attributed a wide explanatory power over various corporate finance issues.

The thesis presents no evidence of any effect of the declining propensity to pay that Fama and French discovered among American listed firms. It seems instead that changing firm characteristics provide the key explanation to the decline in payer percentage.

Swedish firms are found to omit dividends liberally when incurring temporary losses, only to revert to paying dividends when profits return. The thesis suggests that Swedish firms do not pay much attention to concepts such as signaling, but base their dividend decisions primarily on whether or not there is excess cash to be distributed.

[a]18729@student.hhs.se, [b]18817@student.hhs.se

Master's thesis in Finance
Tutor: Peter Högfeldt
Dissertation: 23 May 2007, 13.15 in room 550.

We would like to thank our tutor Peter Högfeldt for his valuable insights as well as his time and patience. Furthermore, we would like to thank Hans Hällefors at the SSE Department of Accounting and Business Law as well as former SSE students Simon Angeldorff, Kirill Novikov and Fredrik Hansson for providing us with helpful data.

Table of Contents

1. BACKGROUND **4**

1.1 PREVIOUS RESEARCH 6

1.1.1 Why do Firms Pay Dividends? *6*

1.1.2 Recent Time Trends in Dividend Policy and Factors Affecting It *6*

1.1.3 The Swedish Setting and Its Implications *7*

2. DATA AND DESCRIPTIVE STATISTICS **8**

2.1 DATA SELECTION 8

2.2 TIME TRENDS IN DIVIDENDS – EVIDENCE FROM SWEDEN 9

2.3 CHARACTERISTICS OF PAYERS AND NON-PAYERS 10

2.3.1 Profitability *10*

2.3.2 Size *12*

2.3.3 Investment Opportunities *14*

2.3.4 Leverage *15*

2.3.5 Age *16*

2.3.6 Firm Owner Characteristics *18*

3. EMPIRICAL ANALYSIS **21**

3.1 EVIDENCE FROM LOGIT REGRESSIONS 21

3.1.1 Methodology *21*

3.1.2 Logit Regression Estimates *22*

3.1.3 Results from Post-Base Period Tests *23*

3.2 EVIDENCE FROM PORTFOLIO FORMATION 26

3.2.1 Methodology *27*

3.2.2 Descriptive Analysis of Base Period Portfolio Formations *28*

3.2.3 Results from Post-Base Period Tests *30*

3.3 DECLINING PROPENSITY TO PAY OR CHANGING FIRM CHARACTERISTICS? 31

3.4 THE EARLY NINETIES – A CLOSER LOOK 33

4. CONCLUSIONS **35**

REFERENCES **37**

APPENDIX A – SUMMARY STATISTICS **39**

APPENDIX B – LOGIT REGRESSIONS **41**

APPENDIX B – LOGIT REGRESSIONS **41**

APPENDIX C – PORTFOLIO FORMATION **43**

1. Background

In Sweden, the fraction of listed firms that pay dividends has declined extraordinarily over the last four decades. In the mid-sixties, all firms listed on the Stockholm Stock Exchange paid dividends, but by the early 21st century, more than half of the listed firms did *not* pay dividends. Figure 1 displays the fraction of firms that pay dividends, henceforth referred to as payer percentage, year by year 1966-2001. The reasons behind this large time-series shift have never before been examined properly. The purpose of this thesis is therefore to shed light on why Swedish-listed firms have become less inclined to pay dividends. Obviously, the composition of listed firms has changed over time, and part of the observed decline in payer percentage is likely to be attributed to changing firm characteristics. For instance, if overall firm profitability has declined, one would expect a decline in payer percentage too. However, previous research, by Fama and French (2001), suggests that firms have a declining propensity to pay regardless of firm characteristics, which has sped up the decline in payer percentage. The Fama and French study was on firms listed on the NYSE, but their conclusions may be relevant to the Swedish market as well, and therefore we will apply Fama and French's methodology to try to explain the Swedish case.

Why is there a long-term downward trend in payer percentage and how can we explain the radical sub-periods in the Nineties, with two massive declines separated by a temporary recovery? What determines the likelihood that a Swedish-listed firm will pay dividends? These are the questions that we will try to shed light on in this thesis.

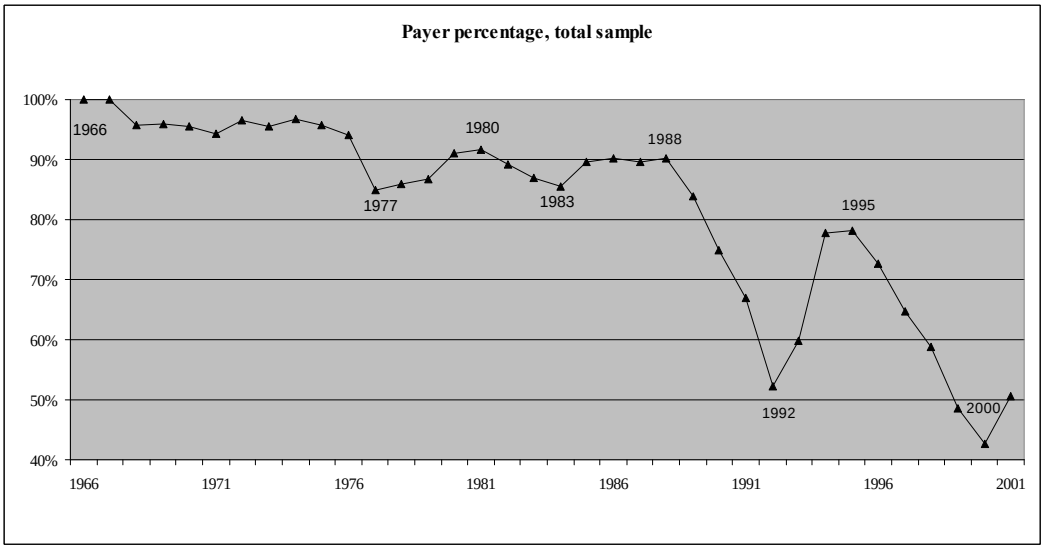


Fig. 1. Payer percentage, all firms
The figure illustrates the fraction of firms that pay dividends in any given year throughout our sample, 1966-2001.

In order to determine how and to what extent changing firm characteristics have influenced the decline in payer percentage, we must first of all identify firm characteristics which are important as dividend drivers. Consequently, a major part of this thesis will be descriptive, as we evaluate expected dividend-driving firm characteristics. After a solid examination of the expected dividend drivers, we will try to draw conclusions on the extent to which the changing firm characteristics explain the decline in payer percentage. The conclusions will be based on formal tests as well as reasoning built on descriptive statistics. Thereafter we may identify any effects of a declining propensity to pay and possibly other explanations.

In the light of the findings of Fama and French (2001) one could expect that Sweden too would exhibit the same decline in propensity to pay dividends. However, as the Swedish institutional setting (discussed below) appears to be very different from the US institutional setting, we do not have any strong expectations as to what has caused the decline in payer percentage in Sweden. Accordingly, this thesis is largely descriptive. Our main objective is to present a comprehensive picture of the decline in payer percentage in Swedish-listed firms and the reasons thereof as we try to identify the underlying drivers of Swedish firms' dividend behaviour.

This is the first study of its kind on Swedish data and our data set is extensive, by Swedish standards, and therefore we hope that this thesis will be a valuable contribution to the understanding of what drives dividends in the non-Anglo-American markets. The respectable size of our dataset should help us to discover long-term trends and identify possible disruptions of long-term trends. We also implement firm owner data into the Fama and French framework, an important addition since owner characteristics are usually attributed as a major influence in Swedish corporate finance research.

The thesis is outlined as follows: First we take a quick look at the previous research that inspired this thesis. Then, after describing our data and defining our variables, we set off to describe the decline in payer frequency and the firm characteristics of payers vis-à-vis non-payers. Later we try to quantify the observed "dividend drivers" and separate the effects of changing firm characteristics from the effect of a possibly diminishing propensity to pay dividends, in the spirit of Fama and French (2001). We use logit regressions to quantify and to make out-of-sample tests, and as a robustness check of the logit regression findings we also perform more informal tests

based on portfolio formation. Finally we will discuss our findings and stress key findings.

1.1 Previous Research

1.1.1 Why do Firms Pay Dividends?

Dividends do not really matter – famous words by Miller and Modigliani (1961). In an efficient market, dividends do not influence the market value of firms. So why do we bother examining dividend policy and the factors affecting it? Because, evidently, markets are not efficient and dividends do play an important role in capital markets. In the US, dividends have long been a conundrum. Since dividends are taxed at a higher rate than capital gains, the common conjecture is that dividends are less valuable. Firms paying dividends should, thus, be at a disadvantage. Nevertheless, firms in the US pay out huge amounts in the form of dividends[1]. In Sweden, however, this conundrum is less accentuated since dividends and taxes have been taxed at the same rate for quite some time, with a few exceptions in the early Nineties.[2] Still, there are some advantages to capital gains that reinstate the dividend puzzle in the Swedish setting as well. By choosing capital gains, investors can themselves choose whether or not to realize the gain depending on their own personal preferences, be it tax reasons or cash constraints. Three main reasons have been suggested to why firms insist on paying dividends:
(1) to signal the firm's future prospects to the market, (2) to meet the owners' need for cash; and (3) to prevent management empire building (Jensen (1986)).

1.1.2 Recent Time Trends in Dividend Policy and Factors Affecting It

Essentially, what inspired this paper were the findings of Fama & French (2001). In their influential paper they document a large decline in dividend-paying US firms from 66.5 percent in 1978 to 20.8 percent in 1999. By employing summary statistics and logit regression they set out to explain this dramatic fall in dividend payers. They conclude that the characteristics of firms that influence dividend policy the most are profitability, size and investment opportunities. Interestingly, even when controlling for these effects, a significant part of the decline in dividend payers between 1978 and 1999 remains unexplained. The propensity to pay dividends must, thus,

[1] See Black (1976) on more about the "dividend puzzle".
[2] In 1994, dividends were taxed at 0 percent whereas capital gains were taxed at 25 percent. In 1993, dividends were taxed at 25 percent and capital gains at 15 percent.

have changed and firms have become less disposed to pay, whatever their characteristics.

Goergen et al. (2003) examine German firms' dividend change decisions between 1984 and 1994. Their main finding is that loss occurrence is a key determinant of dividend cuts or omissions, ie a previously profitable firm that encounters a first loss is likely to cut or omit dividends on account of that loss. They also discover that dividend cuts or omissions for German firms are temporary, which differentiates German firms from Anglo-American firms. Goergen et al.'s time period is not as extensive as Fama & French's, or our own for that matter, and hence it does not help us explain long-term patterns. However, it examines the dividend behaviour of non-Anglo-American (German) firms and therefore its findings are relevant to our thesis.

Vieira et al. (2007) analyze the propensity to pay dividends in three European markets: Portugal, France and the UK. They too find evidence of a decline in firms paying dividends in the Portuguese and UK markets, however not the French. Furthermore, their study suggests that European markets have a higher payer percentage than other markets (such as the US). They also find that Portuguese firms do not have a smoothing dividend policy like UK or US firms, in line with what Goergen et al. found for German firms. Here too, it is important to note that Vieira et al.'s sample period is not as extensive as Fama & French's or our own. Moreover, they do not attempt to explain the decline in payer percentage.

1.1.3 The Swedish Setting and Its Implications

We are basing this thesis on the questions raised and methods used by Fama & French (2001), but we need to remember that the Swedish setting differs from the US setting in many ways, which could have an effect on this thesis in any number of ways. First of all, the legislative setting regarding investor protection differs between Sweden and the US (La Porta et al. (2000)). La Porta et al. (2000) show that the variation in dividend policies across countries relies heavily on the countries' respective investor protection framework, and that the largest difference is between common law countries (eg the US) and civil law countries (eg Sweden). Furthermore, the Swedish institutional setting is recognized as being somewhat special, and definitely different from the US institutional setting:

- Non-Anglo-American firms seem more flexible in terms of changing their dividend levels and they are not as dependent on dividends as a means of signalling (Goergen et al. (2001))

- Swedish firms rely more heavily on retained earnings relative to external financing than do US firms (Oborenko (2004))
- Taxes on dividends are lower relative to taxes on capital gains in Sweden than in the U.S (Angeldorff and Novikov (1999))
- The composition of the average firm's owners is largely different in Sweden than in the U.S (Agnblad et al. (2002))
- Dual class share systems are much more widespread among Swedish-listed firms than among NYSE listed firms
- The Swedish stock market is very young compared to the NYSE

2. Data and Descriptive Statistics

2.1 Data Selection

All data has been collected from either SIX Trust or Finlis. Our sample for calendar year *t* includes only the firms with fiscal year-ends in *t* that have the following data: (1) total assets in t and t-1, (2) stock price and shares outstanding or market capitalization at the end of the fiscal year, (3) income before taxes and excluding extraordinary items, (4) interest expense, and (5) proposed dividends. We also require that firms have: (1) book equity, and (2) liabilities. For the regressions that we run including ownership data, firms must also have: (1) votes for the largest owner, and (2) type of largest owner. We define three different types of owners: (1) Family, (2) Institutional, and (3) Corporate.

The Finlis database has been the largest source in the data collection and SIX Trust has been the complementary data source. Finlis reports accounting data from 1966-2001. In later years however, Finlis is not as extensive as in earlier years, hence our use of SIX Trust. We exclude all financial firms – banks, insurance companies and investment companies – on the basis of (a) poor data, (b) significantly differing capital structure and balance sheet composition, and (c) investment companies' ability to exert tax benefits by paying out dividends (Holmén and Högfeldt (2004)). By combining the data from SIX Trust and Finlis, in addition to our ownership data, we have in front of us a significant and very comprehensive database. To our knowledge, it is one of the most complete databases on firm characteristics and ownership data over the selected time period.

In our definition of the variables we stay faithful to the framework used in Fama and French (2001). Upon that, we add intuitively important variables, such as owner characteristics, which allows us to reach even beyond the Fama and French approach. We define the variables as follows:

Variable	Firm characteristic	Definition
E/A	Profitability	Earnings before interest expenses divided by total assets
Y/E	Profitability	Earnings to common divided by adjusted equity
Market Cap.	Size	Market capitalization percentile, ie the fraction of firms smaller than firm(*i*)
Assets	Size	Book assets
V/A	Investment opportunities	Market equity and liabilities divided by assets
dA/A	Investment opportunities	Relative change in assets from year t-1 to t
L/A	Leverage	Liabilities divided by assets
Age	Firm maturity	Number of years since market entry
FAM	Owner type	Private or family owner is the largest owner (voting power)
CORP	Owner type	Corporate owner
INST	Owner type	Institutional owner
Cut10	Owner size	The largest owner controls >10% of the votes
Cut20	Owner size	The largest owner controls >20% of the votes
Cut50	Owner size	The largest owner controls >50% of the votes
AllAone	Dual class share system	The firm has a dual class share system

2.2 Time Trends in Dividends – Evidence from Sweden

In 1966 and 1967, all of the firms in our sample paid dividends, a remarkable figure. For the next nine years, 1968-1976, the payer percentage hovered around 95%. In 1977 the payer percentage dropped to 85%, followed by a slight annual payer percentage increase in the following years, peaking at 92% in 1981. In 1982 through 1984 there was a small annual decline, landing at 86% in 1984. After that the payer percentage was a stable 90% for every year up to and including 1988. Indeed, throughout the period 1966-1988 paying dividends seems to have been very popular among Swedish firms, indicated by an annual average payer percentage of 92%. Thereafter we observe our sample period's sharpest decline in payer percentage, a fall by 38 percentage units in four years, reaching an all-time low of 52% in 1992. In 1993 the payer percentage was still low, but had climbed up to 60%. The climb continued the next year but it proved to be a temporary increase in payer percentage. After reaching 78% in 1994 and 1995, payer percentage declined considerably year by year until 2000, when it dropped to a new low of 43%. In the last year of our sample period, 2001, the payer percentage was 51%.

This paper is not set on providing a strict comparison between Sweden and the US, but it is interesting to note that throughout our examined period, 1966-2001, the payer percentage for Swedish firms has widely exceeded the payer percentage for US-listed firms. For the period 1963-1979, Fama and French report an average payer percentage of 68% for US listed firms. With a few exceptions, the payer percentage decreases every year in their sample period, landing at 21% in 1998. Hence, the payer percentage has been between 30 and 50 percentage units higher in Sweden than in the US, from the Sixties until 1998 at least. We will address the reasons thereof later in this thesis.

2.3 Characteristics of Payers and Non-Payers

A first step in resolving the uncertainty as to what has caused the observed decline in payer percentage over time is to identify the characteristics of the typical dividend payer. Only then can we separate the possible effects of changing firm characteristics and changing propensity to pay. We examine variables measuring profitability, size, investment opportunities, leverage, age, owner type and owner size. For each of the relevant variables we compare the variable average, or median, for payers to the corresponding measure for non-payers. This comparison is performed both on individual years and on multiple year averages, in order to arrive at an adequate understanding of the differences in characteristics between payers and non-payers. The first two years in our sample, 1966-1967, are excluded. Since all firms in our sample paid dividends in 1966-1967, these years cannot be used individually, and if used in an inter-year average they would induce a bias, since we lack non-payer observations for these years. Also the years from 1968 through 1976 contain so few non-payer observations that trying to compare payers to non-payers is ambiguous. With so few observations white noise is a force to be reckoned with, and therefore we use those years restrictively.

2.3.1 Profitability

Profitability is expected to be a very strong driver of dividend payments. In order to identify the actual link between profitability and dividends we use two different profitability measures; E/A and Y/BE. In accordance with basic finance theory, total earnings divided by assets is generally lower and has a much lower volatility than earnings to common divided by

book equity. Since E/A is the more stable measure, far less affected by noise than Y/BE, we put more faith in the E/A measure when analyzing differences between payers and non-payers.

The average[3] E/A for payers over the full period, 1968-2001, is 9.3%, compared to 1.2% for non-payers. This means that firms paying dividends have been, on average, almost eight times more profitable than firms that do not pay dividends. This is overwhelming evidence, and although a strong link was expected, we cannot help but marvel at the magnitude of the difference in profitability between payers and non-payers. Not even for one single year in our sample period do non-payers earn more relative to their assets than do payers, and yet we are looking at a period of 34 years, stretching over several full business cycles. E/A has been positive in every year for payers, ranging from a minimum of 5.5% (2001) to a maximum of 12.9% (1995). For non-payers, E/A has been negative in seven out of 34 years, ranging from -7.7% (1972) to 6.5% (1984).

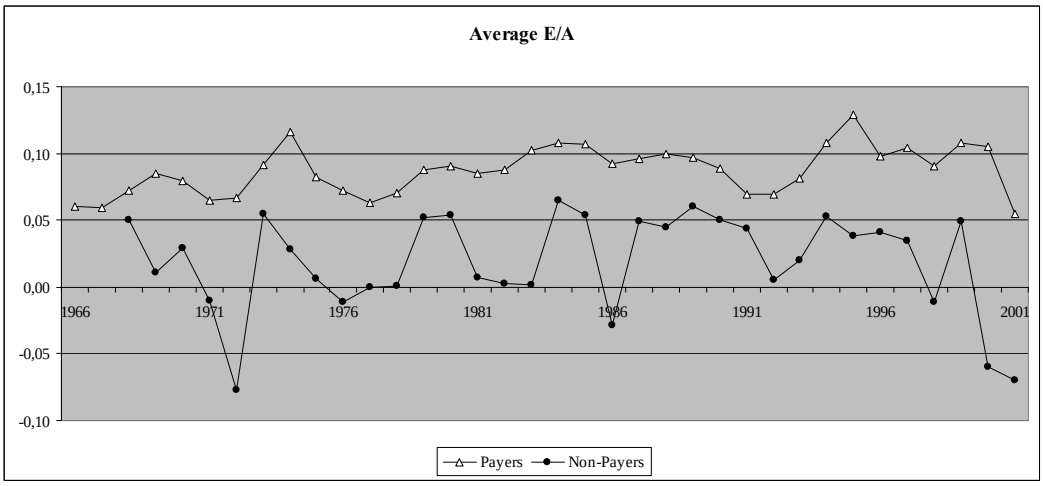


Fig. 2. Average E/A
The figure illustrates the average annual earnings divided by assets for payers and non-payers respectively. Clearly, there is a connection between profitability and paying dividends.

The average Y/BE for payers over the 1968-2001 period is 26.8%, compared to -9.5% for non-payers. Naturally, the difference between payers and non-payers is even greater with regards to Y/BE than with regards to E/A. After all, Y/BE is a levered E/A. Due to the nature of the Y/BE measure, in terms of volatility, we would expect non-payers' Y/BE to exceed the Y/BE of payers in, at least, a handful of years. However, out of our entire sample of 34 years, non-payers beat payers in terms of Y/BE in one single year only, the first year of our sample. And we may as well

[3] All inter-year averages are weighted in the following manner:

$$Inter-year\ average = \frac{\sum (Intra-year\ average \times Number\ of\ firms)_t}{\sum (Number\ of\ firms)_t}$$

look the other way with this 1968 observation, since there were but two non-payers in our sample in that year. Payers' Y/BE is positive for each year in the sample and, in fact, the minimum payers' Y/BE exceeds the minimum payers' E/A in our sample. Payers' Y/BE ranges from a minimum of 9.3% (2001) to a maximum of 45.0% (1974). Non-payers' Y/BE is negative in an overwhelming 23 out of 34 years, ranging from negative 62.9% to positive 22.0%. Hence, Y/BE provides strong evidence for the relationship between profitability and dividend payment. Both our profitability measures, E/A and Y/BE, indicate that the relationship between profitability and propensity to pay is even stronger than we expected. Judging by these descriptive statistics, we cannot imagine any other factor being more important as a dividend driver than profitability.

2.3.2 Size

Size is expected to have a fairly strong positive correlation with dividend payments. Perhaps there is no economic intuition that size per se should influence dividends, but size serves as an umbrella measure for real dividend drivers such as profitability, stability, age, industry, etc, and therefore size earns its position as a valid dividend predictor. Naturally, size may be defined in any number of ways, but we focus on market capitalization and assets as size measures.

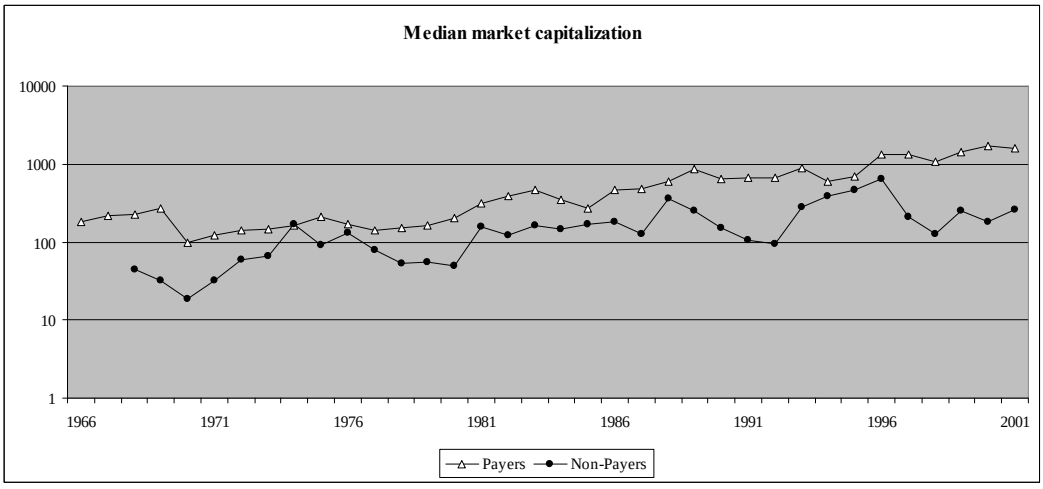


Fig. 3. Median market capitalization
The figure illustrates the median annual market capitalization (MSEK) for payers and non-payers respectively. Note that market capitalization is illustrated on a logarithmic scale. The connection between size and paying dividends is pronounced.

The average market capitalization over the full sample period, 1968-2001, is 3.3 times larger for payers compared to non-payers, 3,874 MSEK for payers and 1,167 MSEK for non-payers. This result measures up to our expectations, that payers are considerably larger than non-payers. Payers have a larger average market capitalization than non-payers for each single year in

our sample. However, the size variable is very sensitive to outliers and therefore the picture may be clearer if we look at median size instead of average size. Also, before 1977 there were so few non-payers that we cannot fully trust comparisons between payers and non-payers, so we focus on the 1977-2001 period. Looking at the medians we observe that payers have a relatively high market capitalization in comparison to non-payers in each year from 1977 and on, ranging from 1.27 times higher (1977) to 9.32 times larger (2000). Even though these extremes lie respectively at the beginning and in the end of the sample, relative payer size does not display a smooth increasing pattern over time. From 1977 to 1990 the market capitalization for payers is between around one and a half to four times higher than for non-payers. There is no clear pattern within that limited period. It is in the latter part of our sample that relative size seems to tell us something.

There are two major increases in relative payer size; one taking place between 1988 and 1992 and one between 1995 and 2000. Notice that these periods of increasing relative payer size coincides with the two major decreases in payer percentage. Starting at a low 1.63 times the market capitalization of non-payers, relative payer size increases for four consecutive years, peaking at 7.11 in 1992. The largest relative payer size increase year-to-year is from 3.73 in 1990 to 6.47 in 1991. After the peak in 1992, relative payer size is more than halved in one year. From 3.20 in 1993 the drop continues to 1.54 in 1994 and 1.50 in 1995. These are also the years when payer percentage temporarily recovered. Relative payer size increases again in 1996 (1.98) and in 1997 it takes a major leap to 6.42 times the median market capitalization of non-payers. The increase continues to 8.16 in 1998. In 1999 there is a temporary drop to 5.74 before the sample peak of 9.32 is reached in 2000. In 2001 the relative size of payers dropped down to 6.28 times the market capitalization of non-payers.

Without doubt market capitalization is a powerful determinant of firms' propensity to pay, since payers always seem to have a larger market capitalization than non-payers. But looking quantitatively at the relative size differences we also discover that the magnitude of the difference in size may be related to the payer percentage.

Assets too present a strong case for the expected positive relationship between size and propensity to pay, although not as strong a case as market capitalization. Non-payers are actually larger than payers in median assets for four of the last 25 years in our sample. While a strong

increase in relative payer market capitalization coincided with both major drops in payer percentage, relative payer assets increased strongly only at the second major drop in payer percentage. All in all, size seems to be in some way connected to most of the action that is going on with payer percentage.

2.3.3 Investment Opportunities

Ideally, a firm should retain earnings and reinvest them as long as the investments yield at least the required rate of return, but if investment opportunities are poor, then the firm should distribute excess earnings to its shareholders. Even if this is a very simplified version of reality, the idea that firms should only undertake positive NPV projects is so fundamental that investment opportunities are bound to be a powerful determinant of a firm's propensity to pay dividends. Unfortunately, there is no clear-cut variable by which we can measure a firm's investment opportunities, but rather, we face a palette of proxies. We choose to look at two measures; the change in assets, dA/A[4], and the market value of assets over the book value of assets, V/A. These proxies are not perfect, but they are reasonably valid theoretically, and also they provide consistency with Fama and French. Fama and French also use R&D levels as a proxy for investment opportunities, but we are not fortunate enough to have complete data on R&D.

Much to our surprise, neither V/A nor dA/A seem to help explain the payer percentage. V/A is virtually the same for payers and non-payers from 1968 to 1990, although non-payers display a marginally higher V/A then do payers during most of the years from 1977 to 1990. Of course, we would expect V/A to be higher for non-payers. In 1991 through 1996, however, payers have a distinctly higher V/A than non-payers, which contradicts our expectations. From 1997 to 2001 non-payers again display the highest V/A, and this time the difference is more substantial than it was up until 1990. It is alluring then to draw the conclusion that the theory is actually supported by our data, and that the above-mentioned special economic environment in the early Nineties is responsible for the contradictory part of our findings. Now this may be true, but ultimately, the evidence supporting the theory is so weak that we dare not put any faith in the V/A variable as a predictor of payer percentage.

---

[4] dA/A is a simplified notation. The variable is calculated as $\frac{(A_t - A_{t-1})}{A_{t-1}}$.

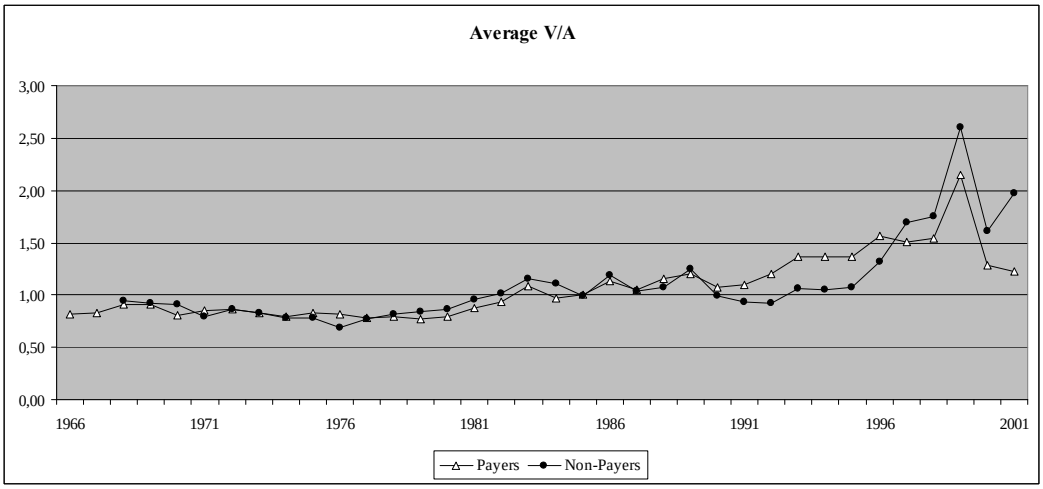


Fig. 4. Average V/A
The figure illustrates the average market equity plus liabilities divided by book assets for payers and non-payers respectively. As a proxy for investment opportunities, V/A should be higher for non-payers, but apparently, this is not always true.

The change in assets variable, dA/A, is even less useful, not to say that it looks completely arbitrary. Since 1977, payers display the highest dA/A in 16 out of 25 years. This contradicts our hypothesis. Also, the years in which non-payers actually outgrow payers seem scattered randomly across the sample, so basically we cannot learn anything about payer percentage from looking at dA/A. On the whole, after this overview, the explanatory power of the level investment opportunities is a real disappointment to us.

2.3.4 Leverage

Assuming that the average capital structure of all firms is a reasonable proxy for a perceived optimal capital structure, firms with high leverage should, ceteris paribus, strive to lower their leverage, while moderately leveraged firms should strive to increase their leverage. Paying dividends means that, ceteris paribus, leverage increases, and hence we expect leverage and payer percentage to be negatively correlated.

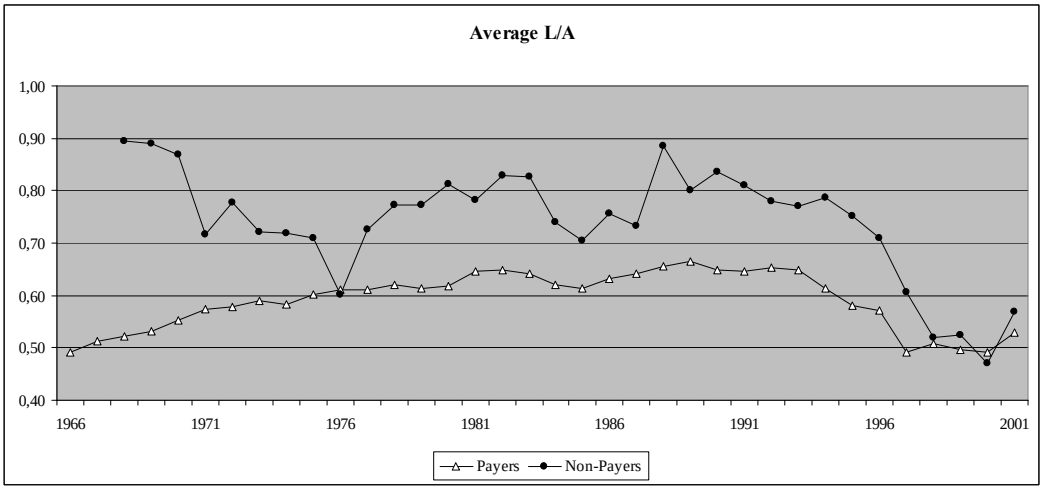


Fig. 5. Average L/A
The figure illustrates the average leverage, computed as liabilities divided by book assets, for payers and non-payers respectively. L/A is expected to be higher for non-payers and our expectation seems to hold up well.

We use total liabilities through assets, L/A, as our leverage measure, and indeed the data is supportive of our theory. Throughout our entire sample, 1968-2001, non-payers are more highly levered than payers in every year but two. In 1976 payers and non-payers have the very same mean L/A, and in 2000 payers are slightly more levered. After displaying a considerably higher leverage than payers from 1977 to 1997, non-payers alter their capital structure so that for the period 1998-2001 both groups display virtually the same leverage. At this stage we cannot tell whether this is a permanent shift in non-payers' capital structure, or if we merely observe a temporary effect.

2.3.5 Age

Firms enter the stock market because they need equity funding. Hence, it is unlikely that a firm that has just entered the stock market has excess equity to distribute. Therefore, ceteris paribus, younger firms should be less inclined to pay dividends than more mature firms.[5] To investigate this we divide the firms into three age categories; young firms are 0-2 years old, middle-aged firms are 3-8 years old and mature firms are older than 8 years. From 1982 to 2001 our reasoning proves to hold up very well empirically. In 16 out of 20 years we observe the expected pattern; young firms display the lowest payer percentage, mature firms the highest and middle-aged firms are in between. This is strong evidence that age is an important determinant of

[5] By age we refer to the number of years since stock market entry.

firms' likelihood of paying. The difference in payer percentage between the different age categories is larger at the end of our sample. From 1982 to 1988 payer percentage is stable for the different categories. Young firms' payer percentage is hovering around 80%, while the corresponding figure is 90% for middle-aged firms and 96% for mature firms. The weighted average payer percentages over the period 1997-2001 paints the same picture, but in more distinct colours. Young firms display a payer percentage of merely 34%, while 52% of the middle-aged firms and 83% of the mature firms pay dividends. Clearly, age has increased in importance over time as a determinant of likelihood of paying.

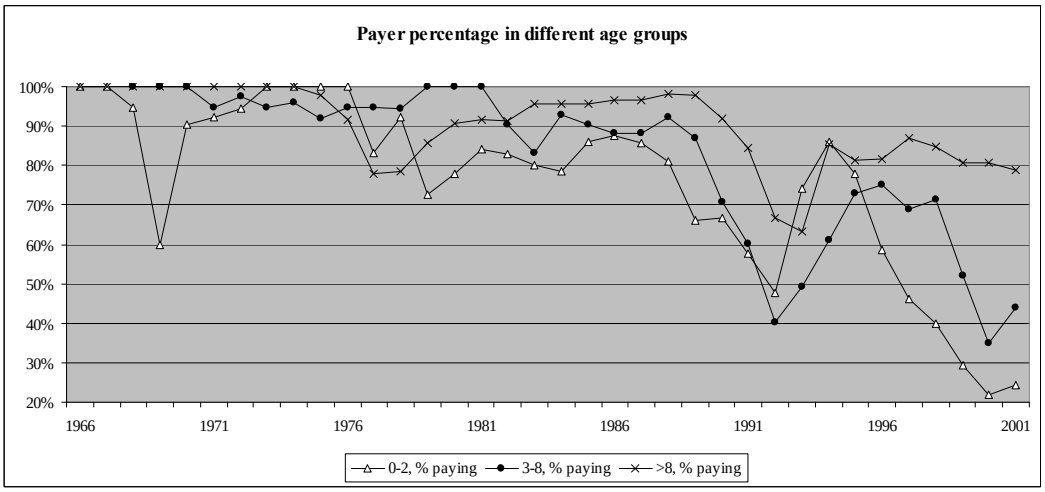


Fig. 5. Payer percentage in different age groups
The figure illustrates the payer percentage for firms which have been listed on the stock market for 0-2, 3-8 or more than 8 years respectively. Age in the market is believed to be positively correlated with payer percentage. This seems to be true in general, but the evidence is not overwhelming.

However, in four consecutive years, 1992-1995, middle-aged firms display the lowest payer percentage. In 1992 and 1995 the mature firms group still holds up as the most dividend-friendly category, but in 1993 and 1994 young firms actually display the highest payer percentage. In terms of the validity of the age variable as a determinant of whether a firm pays or not, these four years of non-conformist results do not discourage us. The early Nineties represents a very special period in our sample, with an extreme macroeconomic situation in Sweden coinciding with changing tax regimes for dividends. So, with little hesitation, we blame the disruption of the otherwise robust age variable on the special economic environment of the time. This period may even be considered an outlier. The bottom line is that age seems to be strongly positively related to payer percentage.

2.3.6 Firm Owner Characteristics

As mentioned earlier, ownership structure in Sweden is very different compared to that in the US. Ownership structure is central in corporate agency problem theory, and agency problems are strongly interlinked with dividends. Hence, since the Swedish ownership structure is odd: it should have a great influence over dividends. We investigate different owner types, owner sizes and share classes in order to identify possible drivers of a firm's likelihood of paying. Owner data in Sweden is only available back to 1985, so we must settle for a 17 year sample.

We look at the nature of each firm's largest owner and we divide the firms into three mutually exclusive owner-type categories; private owners, corporate owners and institutional owners. Private owners are individuals, families and trusts or companies controlled directly by individuals or families. Corporate owners are companies that are not firmly controlled by individuals, so that they do not fall within the private owner category on account of pyramid owning. Institutional owners are investment companies, insurance companies and mutual funds. In short, we expect institutionally owned firms to display the highest payer percentage, followed by privately owned firms, with corporately owned firms as the bottom payer.

For the first half of our sample period, our expectations are well backed by our data, but after 1992 the pattern is disrupted, and for the latter part of the sample we cannot detect any link between owner type and payer percentage. It is difficult to pinpoint why this should be. Either there is a structural shift around 1992-1993 that makes institutionally owned firms permanently move down in terms of payer percentage, or there could be a cyclical pattern, which we cannot detect on account of too short a sample. It could also be that we observe the true pattern in 1985-1992, and that white noise is responsible for the "non-results" in the post-1992 period. There may even be no true relationship between owner type and the likelihood of paying dividends, making the 1985-1992 pattern merely a coincidence. The two possible explanations that seem most likely are a structural shift or white noise disrupting the true pattern. Anyway, we did expect a more solid connection between owner type and the likelihood of paying than we are able to find.

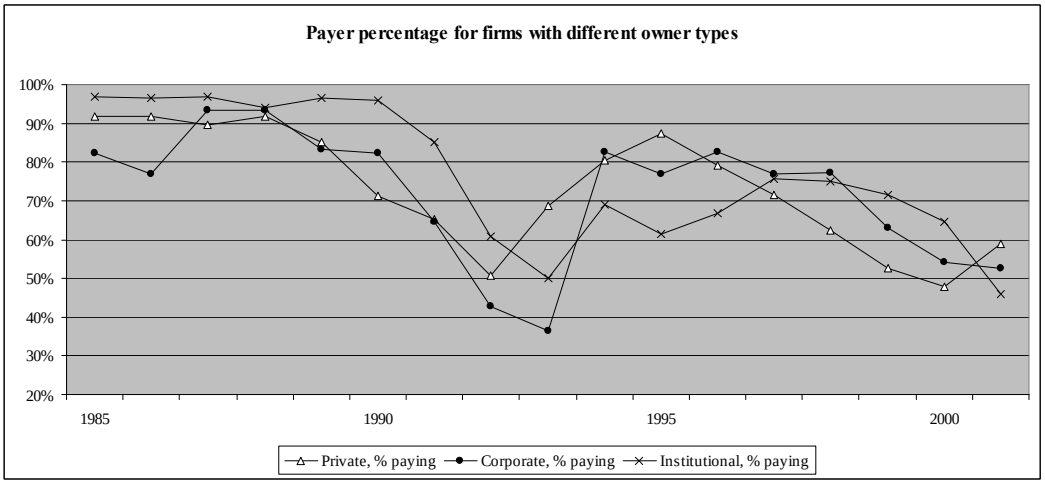


Fig. 6. Payer percentage for firms with different owner types
The figure illustrates the payer percentage for firms of which the largest owner (voting power) is private, corporate or institutional. Note that the sample only dates back to 1985. We expect institutionally owned firms to display the highest payer percentage, followed by privately owned firms, with corporately owned firms as the bottom payer; however, apparently, this is not always true.

Apart from owner type, we also look at owner size; the largest shareholder's voting power. Since different theories clash as to whether a really strong owner means a larger or a smaller probability of the firm paying dividends, we have no real expectations about the results. However, since the Swedish owner concentration is extraordinary high, we feel that it is worthwhile examining the possible relationship between owner size and payer percentage, at least at this initial stage.

We form three owner size groups; where a firm's owner has 10 or more, 20 or more, or 50 or more percent of the firm's votes. The variables are called Cut10, Cut20 and Cut50, respectively[6]. Cut50 is the group with the highest payer percentage in 11 out of 17 years. In 1985 and 1989-1993 both Cut10 and Cut20 display a higher payer percentage. Until 1995, Cut10 and Cut20 are virtually indistinguishable, but for the rest of the sample Cut20 becomes increasingly larger relative to Cut10. Cut50 becomes larger relative to the other two groups towards the end of the sample. From 1997 to 1999 Cut50 payer percentage drops from 80% to 70%, while the other two groups take steeper dives. Cut20 decreases from 78% to 58% and Cut10 drops from 75% to 57%. The link between owner size and payer percentage is thus weak. It is interesting to note that Cut50 reacted differently relative to the other groups in the two periods of major overall payer percentage drops. In the first major drop, Cut50 decreased the most in payer percentage, going

[6] Building on Hansson (2003).

from having the highest payer percentage in 1988 and earlier to having the lowest payer percentage in 1989-1993, before getting back on top again in 1994. In the other major payer percentage drop, Cut50 was the most stable group, with only half as large a drop as the other groups.

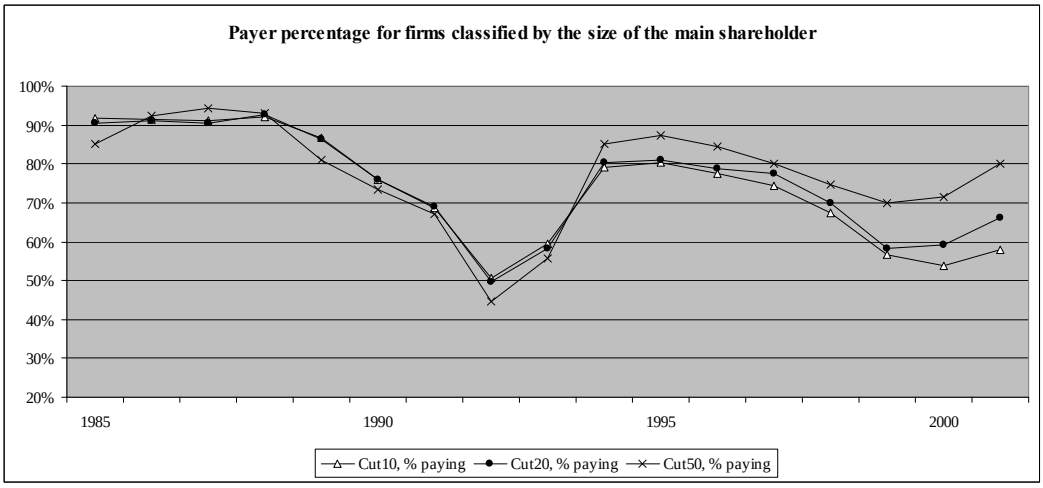


Fig. 7. Payer percentage for firms classified by the size of the main shareholder
The figure illustrates the payer percentage for firms of which the largest owner (voting power) holds 10% or more, 20% or more, or 50% or more. Note that the sample only dates back to 1985. We have no strong expectations of the relationship between owner size and payer percentage and, indeed, the different categories do not differ much. From 1994 and onwards, owner size is strictly positively correlated with payer percentage, but the differences are too subtle to base any conclusions on.

Looking at firms with dual class shares, we did expect those firms to display a higher payer percentage than average, but we find that the empirical evidence is weak. Average dual class share firms do not stand out in any way concerning payer percentages. Firms for which the largest owner possesses all type A shares do in fact prove themselves as the extreme group throughout the sample. For most years this group displays the largest payer percentage, except for 1991-1992, where the group has the lowest payer percentage. However, this group is highly tilted towards the family owner type group, so what we observe here may actually be caused by the owner type rather than the share class structure. For 1985-2001 the average fraction of firms that utilize a dual class share structure is 82% for privately owned companies, 41% for corporate owned firms and only 7% for institutionally owned firms. Also, the "AllAone" group does not distinguish itself enough for us to draw any conclusions based on this observation as of yet.

3. Empirical Analysis

3.1 Evidence from Logit Regressions

In line with Fama and French, we use logit regressions in order to examine whether the propensity to pay dividends has changed over time. The logit regression approach is first of all used as a more formal way to examine the previously analyzed firm characteristics as dividend drivers. After building models, in order to confirm our descriptive analysis, we turn to out-of-sample tests to look for any effect in firms' propensity to pay.

As was shown in the descriptive part of the study, all firms paid dividends in 1966 and 1967. For the following years up till 1976 the payer percentage hovered around 95 percent. By including these years, the very few companies that did not pay dividends would affect the result of the logit regressions to a very large extent and give very poor estimates. Therefore we will use the period from 1977 to 1982 as our main sample period. We do however, for reference, include a table with logit regressions for all years (see Appendix B). Since our owner data only dates back to 1985, for our regressions using owner data we use the sample period 1985-1991. Hence, we will use three different sample periods, but for good reasons; the 1968-1981 period gives us the longest prediction period, the 1977-1986 period is as far back as we can go in order to avoid the years with super-high payer percentages and henceforth obtain reasonable estimates, and finally, the 1985-1991 period is put to work to allow us to use owner data.

3.1.1 Methodology

For each year in the base period we estimate logit regressions using time-series standard deviations[7] of the annual coefficients in order to conjecture the reliability of these coefficients. The averages of these coefficients within the estimation period are later applied to the values of the explanatory variables for a given year in the post base period sample. The dependent variable is 1.0 in a year if the firm pays dividends and 0.0 otherwise. The expected percentage of payers for a given year is then obtained by summing over firms, dividing by the number of firms and multiplying by 100. Expected percentage of payers minus Actual percentage of payers should thus reflect the change in propensity to pay dividends. A positive number means that the

[7] Allowing for correlation of the regression residuals across firms (also known as Fama/MacBeth estimates).

propensity to pay has declined and vice versa in case it is negative.

We focus on the variables that, beforehand, are considered as most likely to influence the decision whether to pay dividends. These are: Earnings (E/A), Size (market cap. percentile), Investment opportunities (dA/A and V/A), Leverage (L/A), Owner characteristics (CORP, INST or FAM) and Age (log(number of years since market entry)). In order to stay faithful to the Fama and French study, we start off with the same regressions that they used, namely earnings, investment opportunities (both with and without V/A and always with dA/A) and size. After that we elaborate and add our unique variables – Owner characteristics, Leverage and Age.

3.1.2 Logit Regression Estimates

As aforementioned, we will firstly look at the logit regression results from a descriptive analysis point of view. Now, the logit regressions confirm the results found in the descriptive section of this paper (see all estimates in Appendix B). Profitability and size are the most important predictors of dividend payers, both displaying positive and highly significant coefficients. Investment opportunities, on the other hand, brings us mixed results. The V/A variable is of the right sign (negative) and highly significant except for the 1968-1981 base period. This indicates that V/A is a more powerful driver of payer percentage than we could see in the descriptive section. The dA/A coefficient, on the other hand, is not only insignificant, it is positive, which contradicts theory. From here on we will use the V/A measure exclusively to represent investment opportunities. Although this is a step away from the Fama and French methodology, it is supported by our previous findings in the descriptive section of the thesis and therefore we feel that it is acceptable to remove the dA/A variable from our model.

When we add L/A and Age to our model, we find that L/A is negative, as expected, and highly significant for any of our sample periods. In fact, L/A is as significant as the profitability and size estimates. From the descriptive section we expected a strong linkage, but the predictive power of L/A over payer percentage seems even more powerful. Unfortunately, we cannot compare this finding to the American market, since Fama and French did not use leverage as a payer percentage predictor.

The Age coefficient estimates are positive, as we predicted, and significant in the two latter base periods. In the 1968-1981 period the Age estimate is not significant. This is probably due to

a sample bias, namely that for firms which we could not verify the actual market entry year we set market entry equal to the first year the firm appears in our sample. This means that some older firms were given market entry 1966, which of course damages the quality of the model when using a base period as early as 1968-1981. But as aforementioned, when performing out-of-sample tests we will focus mostly on the 1977-1986 base period models.

Turning our attention to the model including owner data. the weak patterns we discovered in the descriptive section are not made much clearer using logit regressions. We expected institutionally owned firms (INST) to be top payers, followed by family-owned firms (FAM), with corporately owned firms (CORP) as bottom payers. Using dummy variables for FAM and CORP we obtain the expected negative estimates. CORP is significant at the 1% level, but FAM is not significant. The voting power of the largest owner (VOT1) was expected to negatively correlate with payer percentage, and indeed the VOT1 estimate is negative. However, it is far from significant. Thus, we do not expect much from the model including owner data when we move on to make out-of-sample predictions.

To summarize, the logit regression modelling contributes to our descriptive analysis by confirming what we have already seen in the previous sections. The respective firm characteristics' importance in terms of dividend drivers have been more formally established. Two interesting nuances, that could not be established as facts in our previous descriptive analysis, were proven accurate by the logit modelling, namely that the intended investment opportunity variable (V/A) is a poor predictor of payer percentage, and that leverage (L/A), on the other hand, is a very powerful determinant of payer percentage.

3.1.3 Results from Post-Base Period Tests

In order to isolate the effect of changing firm characteristics from a possible change in firms' propensity to pay we perform out-of-sample tests (see Appendix B for detailed results).

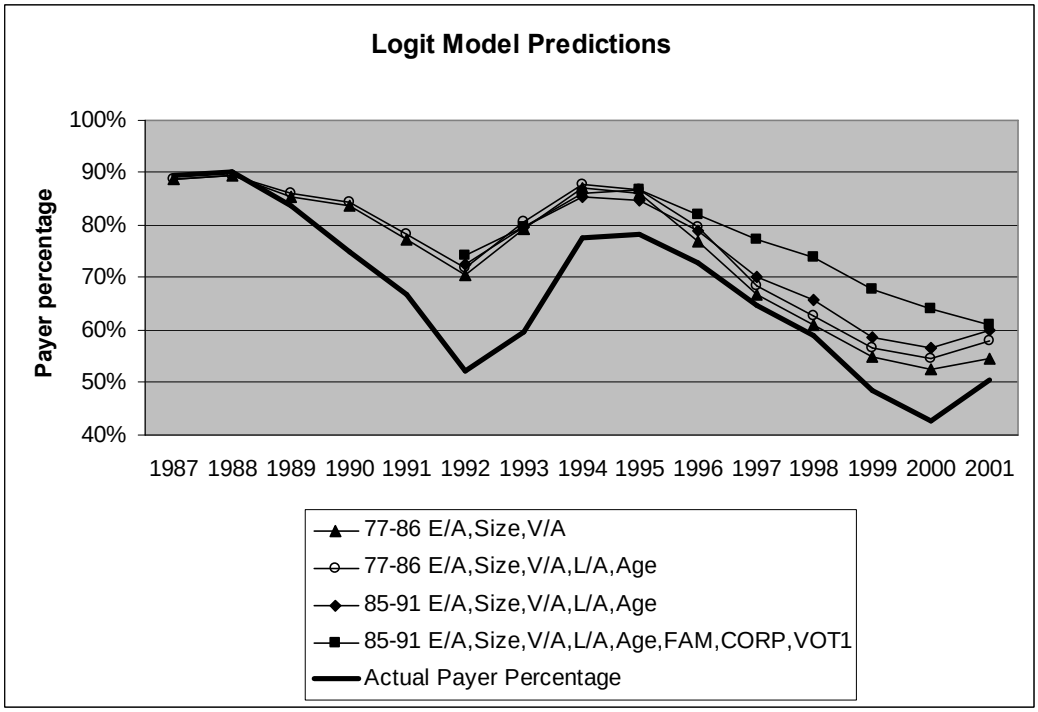


Fig. 8. Logit Regression Predictions
The figure illustrates the average annual payer percentages predicted by our respective models alongside the actual payer percentage.

When comparing the predictions produced by our models with actual payer percentage, the first observation is that the predictions are overall too high. Between 1987-1989 the predictions are very accurate. In 1990-1991 the predictions are about 10 percentage units too high while they are around 20 percentage units too high in 1992-1993. From 1994 and onwards the models produce estimates that are consistently too high, but not as high as in 1992-1993.

Much to our surprise the simplest model proved to produce the best predictions. For the 1977-1986 base period the model without L/A and Age predicts payer percentages closer to the truth than the model including L/A and Age in every year. This is the case despite the fact that both L/A and Age were highly significant in our base period. Now, we will not hang on this fact for too long since the models produce very similar predictions, only with consistent and slightly lower predictions for the simplest model. What is more striking is that for the 1985-1991 base period the elaborate model including owner variables proves useless beyond doubt in predicting payer percentage. It produces worse predictions than the simpler model in every year, and in 1997-2000 its predictions are around 10 percentage points further from the actual payer percentage than is the simpler model's predictions. Note that this simpler model was only constructed as a reference to allow us to evaluate the quality of the model including owner data,

and from now on we will focus our attention on the 1977-1986 base period models.

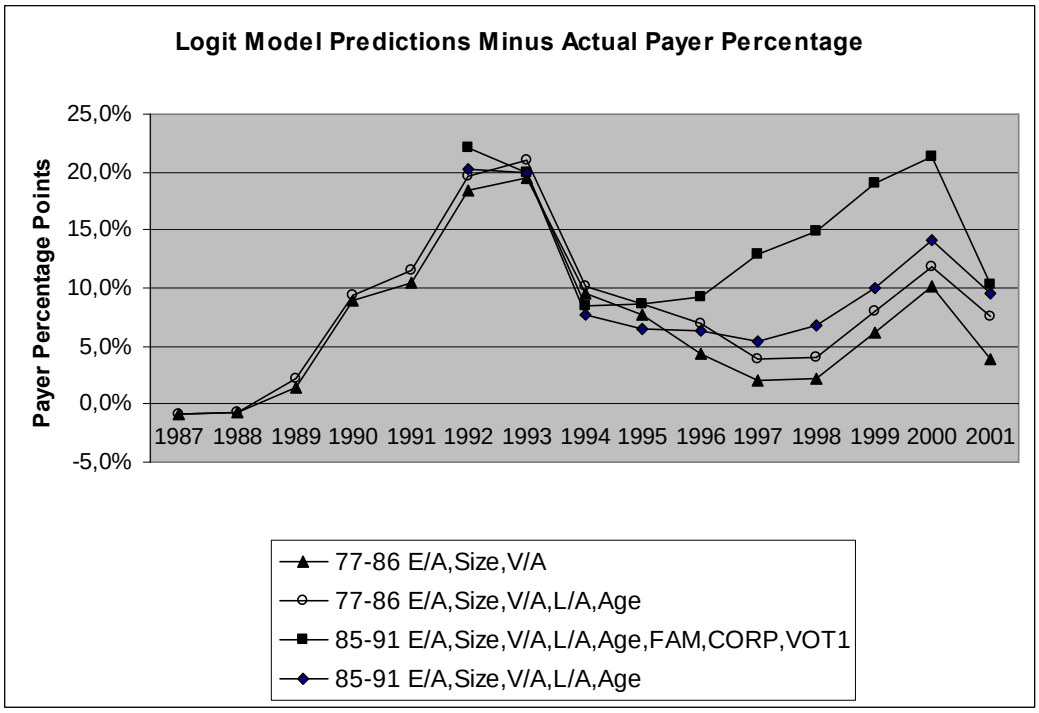


Fig. 9. Logit Regression Predictions
The figure illustrates the percentage point gap between the out-of-sample year payer percentages predicted by our models and the actual payer percentage. This difference should, in accordance with the Fama and French approach, represent the effect of firms' declining propensity to pay. Note that apart from the model including owner data, which stands out as the poorest, the models produce similar predictions.

The consistent overestimation of payer percentage in the Nineties could mean two things; either we have identified the actual decline in firms' propensity to pay, or it means that our models are not refined enough to capture the effect of changing firm characteristics. The models we used to make predictions are highly significant, which should indicate that they are accurate enough to capture the effects of changing firm characteristics, hence the overestimations in the Nineties should reflect a declined propensity to pay. A declined propensity to pay is also in line with the findings of Fama and French and it is close at hand to conclude that we have isolated the effect of a declined propensity to pay. There are, however, two facts that refrain us from establishing that conclusion; firstly, the prediction error is very volatile and secondly, the base period payer percentages are still very high.

Looking at Fama and French's results, their identified decline in firms' propensity to pay starts out early in the post-base period and increases smoothly over time. The changes they discover seem permanent and rigid. None of these features hold for our findings. The predictions

are actually quite accurate[8] in the first three years of the post-base period as well as in 1996-1998 and 2001. There rather seems to be two sub-periods in which our models fail to predict actual payer percentage; the early Nineties especially but also the late Nineties. This ought to weaken the case that our findings are in line with those of Fama and French.

Furthermore, the historically super-high payer percentage in Sweden is likely to have rendered our model estimates somewhat toothless, ie our models may detect the nature of the relationship between the firm characteristics at hand and payer percentage, but they may not be sensitive to the quantitative aspects. This idea is supported by the charts above, where we see that increases and decreases in actual payer percentage are correctly predicted by our models in every year but 1995. It is the magnitude of the changes in payer percentage that our models cannot foresee. Hence, it seems as though we are victims of tricky data (consistently super-high base period payer percentages) rather than facing findings that support the Fama and French findings – that firms' propensity to pay has declined.

At this point we cannot tell to what extent the decline in payer percentage is driven by changing firm characteristics and declining firm propensity to pay respectively.

3.2 Evidence from Portfolio Formation

To identify trends in the propensity to pay dividends we must control for changing firm characteristics. However, our first approach to doing this, using logit regressions, is not completely satisfactory. First of all, the extremely high payer percentages in the Sixties and early Seventies disallow us from using those years as a sample period, and thus shrinks our total available data set significantly. Secondly, the logit regressions may suffer from a mis-specification in terms of their functional form. We cannot be certain that the link between base-period characteristics and the likelihood of paying dividends is consistent with the logit regression modelling. Therefore we use a second approach, designed to alleviate this possible problem by allowing base-period characteristics to affect probabilities in an unrestricted way. This fairly simple and intuitive approach is to rank firms according to certain key measures and form portfolios based on these rankings. Firm characteristics should then be similar for all firms within a certain portfolio, while the characteristics differ between portfolios.

[8] Within five percentage points from the actual payer percentage.

3.2.1 Methodology

For each year in the sample period we rank firms independently on relevant firm characteristics measures, such as profitability (E/A), size (market capitalization percentile), investment opportunities (V/A), leverage (L/A), age, owner type and owner size. The sample periods are 1968-1981 and 1977-1986 for the sets of portfolios formed without using owner data, while the sample period is 1985-1991 for the sets of portfolios containing owner variables. The reason, of course, is that our owner data only dates back to 1985. For each of the mentioned measures, the ranked observations are divided into three groups – high, middle and low. Using the intersections between groups of two certain measures we form nine portfolios, eg one portfolio contains firms with high profitability and high leverage, the next portfolio contains firms with high profitability and medium leverage and so forth. All nine intersections that are formed using a specific combination of measures form a set of portfolios. For each portfolio we calculate the weighted average payer percentage over all years in the base period. This percentage is our estimate for the corresponding portfolio in every year in the post-sample period. The weighted average expected payer percentage for a set of portfolios in year *t* in the post-base period is then our estimate of overall payer percentage in year *t.* This estimate is compared to the actual overall payer percentage in year *t.* The idea then is that we capture the effect of changing firm characteristics through firms' movement between portfolios in the post-base period. In the post-sample period firms are not grouped on relative measures, they are grouped on fixed cut-off points. The relevant cut-off point is the weighted average cut-off point[9] for the sample period. By doing this we aim for the respective portfolio types to have the same economic meaning in the post-sample period as in the sample period. This is somewhat ambiguous for the V/A variable, since overall V/A has increased significantly over time, but for the rest of the variables the economic meaning of the specific portfolios should be fairly constant. In this manner the effects of changing firm characteristics and actual propensity to pay can be separated and identified. The difference between actual and expected payer percentage represents any effect in propensity to pay.

Using Swedish data we face a data availability problem. We have too few observations to

[9] The point that divides ranked observations into certain groups (low, medium or high).

meaningfully form portfolios sorted on all variables, so we restrict the portfolio formation to two variables at the time. However, we form portfolios on all relevant combinations of rankings, and we feel that this is an adequate alternative. A total of 21 sets of portfolios, each set containing nine portfolios, are formed pairing up our well-known variables; E/A, market capitalization, V/A, L/A, age, owner type and owner size. Firms ranked on profitability, size, leverage and owner size are divided into equal groups while investment opportunities are divided by the 50^{th} and 80^{th} percentiles, in order to obtain enough observations in portfolios with high V/A in the post-sample period.

3.2.2 Descriptive Analysis of Base Period Portfolio Formations

The main objective of this thesis is to be descriptive and to pinpoint different firm characteristics as dividend drivers. Hence, we take the opportunity to let the portfolio formation approach shed additional light on our previous descriptive analysis. In this section we examine patterns from the base period portfolio formations to see if we can confirm or overthrow our previous findings. Thereafter, in the next section, we look at post base period predictions in order to identify any effect in changing propensity to pay.

As with the logit regression approach, profitability proves to be the foremost variable in identifying payers (see Appendix C for detailed results). Size, too, is a significant determinant, while leverage is somewhat less significant. Investment opportunities, owner type and owner size are less useful with regards to identifying payers. Hence, the portfolios formed on profitability and size display the largest contrasts. In the portfolio containing small firms with low profitability the payer percentage is 71%, while it is 100% for the large firms with high profitability. Using an alternative sample period, 1977-1986[10], the contrast is even clearer, and the corresponding portfolios display payer percentages of 57% and 99%. None of the sets of portfolios formed on other combinations of variables are nearly as robust as the set of portfolios formed on profitability and size. There is consistency in the profitability and size portfolios. For any category of size, the low profitability portfolio has a lower payer percentage than the medium profitability portfolio, which in turn has a lower payer percentage than the high profitability portfolio. Also, for any level of profitability, the small firm portfolio has a lower payer percentage than the medium-sized

[10] The same sample period as used in the logit regressions.

firm portfolio, which in turn has a lower payer percentage than the large firm portfolio. This neat feature holds for both our sample periods, but it cannot be found in any of the other sets of portfolios, regardless of sample period.

For the profitability/investment opportunities set of portfolios we observe that, with one exception, higher profitability means higher payer percentage for all levels of investment opportunities. Investment opportunities, however, are less prominent in terms of identifying payers. For the sample period 1977-1986 low V/A portfolios consequently have higher payer percentages than high V/A portfolios, but the medium V/A portfolios produce seemingly random payer percentages. And for the 1968-1981 sample period no pattern can be detected regarding the assumed relationship between V/A and payer percentage. The very same goes for the size/investment opportunities set of portfolios; size seems to have a strong relationship with payer percentage, whereas the investment opportunities variable provides no extra information about payer percentage.

No set of portfolios involving leverage fit completely to our expectations, regardless of base period. However, isolating the L/A measure when looking at the various sets of portfolios, there is a clear indication that leverage is negatively correlated with payer percentage. For instance, in the 1968-1981 base period the L/A itself measure fits to our expectations for every 12 cross sections, that is, leverage is negatively correlated with payer percentage regardless of cross section. This is by no means any formal test, so we will not draw too heavily on it, but it ought to indicate that leverage cannot be overlooked when determining the drivers of payer percentage.

For the six sets of portfolios involving owner data we observe the same pattern for profitability, size and investment opportunities as for the other sets of portfolios, even though the sets of portfolios involving owner data have a sample period of 1985-1991. Profitability and size are positively correlated with payer percentage whilst investment opportunities tell us nothing about payer percentage. For the sample period we observe somewhat robust patterns for the relationship between payer percentage and owner type or owner size. For all sets of portfolios, and regardless of the level of the other variable, the institutional owner portfolio displays a higher payer percentage than the private owner portfolio. The corporate owner portfolio typically has the lowest payer percentage, but there are a few deviations from this pattern. This is not unexpected, since the relatively small number of observations in the corporate owner portfolios makes the

portfolios more sensitive to noise.

To summarize, the base period portfolio formations further strengthens the findings in our previous descriptive analysis. Profitability, size, leverage and age seem to be strong predictors of payer percentage. Investment opportunities and owner characteristics, on the other hand, were expected beforehand to be important determinants of payer percentage, but were uncovered as very weak indicators of dividend payment. The above findings are merely informal observations, but they serve us well in pointing us in the right direction as of what drives payer percentage (see Appendix C for further details).

3.2.3 Results from Post-Base Period Tests

After examining the portfolio formations from a descriptive point of view, we turn to out-of-sample tests in order to identify any effect in changing propensity to pay and to confirm or overthrow what we found in the logit regression analysis.

The portfolio formation formal tests confirm what we discovered using logit regressions; that changing firm characteristics cannot fully explain the payer percentage movements. In fact, looking at the results from the portfolio formation formal tests (see Appendix C), it seems that very few of the payer percentage movements can be explained by changing firm characteristics.

Judging only by the fit of the payer percentage estimates produced by portfolio formation, it looks as though the lion's part of the decline in payer percentage is left unexplained by the control variables, and thus the conclusion would be that there is a huge decline in firms' propensity to pay. However, that looks like it could be a precipitate conclusion, since it contradicts what we have discovered in our descriptive analysis. In the descriptive section several control variables stand out as very useful in identifying payers. Also the base period portfolio formations indicate that there is a clear connection between combinations of control variables and the likelihood of dividend payments. The logit regression methodology attributes a lot more of the decline in payer percentage to changing firm characteristics than does the portfolio formation methodology and the discussion from the logit modelling section about sample difficulties and prediction accuracy volatility is also relevant here.

Unfortunately, in our efforts to mimic the Fama and French study we have used a methodology that proved unsuitable for Swedish data. However, even though the portfolio

formation formal test approach did not lend us much help in confirming our logit regression approach findings, we regard the portfolio formation as a valuable descriptive tool. In this respect the portfolio formation approach adds to our previous descriptive analysis and helps us to further recognize the relative importance of the separate payer characteristics as dividend payment drivers. Therefore we will not be thrown off track – we still have confidence in our control variables.

3.3 Declining Propensity to Pay Or Changing Firm Characteristics?

So far we have aimed to describe Swedish firms' dividend behaviour, to determine the underlying factors affecting dividend decisions and also determine whether or not Swedish firms have become less disposed to pay regardless of firm characteristics. In short, we have reached the first two of those aims, but there is still much uncertainty regarding the possible decline in firms' propensity to pay.

In the descriptive part we established, in an informal way, the relationship between firm characteristics and payer percentage. Our descriptive analysis reinforced the expected importance of certain firm characteristics, such as profitability and size, as drivers of dividends. Other firm characteristics, like firm owner characteristics, that were expected to be important were undressed and proven as not important. Investment opportunities leverage and firm age proved to have some influence on payer percentage, but not by far as important as profitability and size.

Armed with a general idea about the relationship between firm characteristics and payer percentage we turned to formal tests, in line with Fama and French, to try to isolate the possible effect of firms' declining propensity to pay. The first methodology, logit regressions, confirmed what we saw in the descriptive section. After performing out-of-sample tests it was evident that our control variables could not fully explain the changes in payer percentage. The way the test was set up suggested that the residual, what could not be explained by the control variables, represented the effect of changes in propensity to pay. However, we found strong indications that this was not the whole truth; the volatility of the suggested propensity to pay and the super-high base period payer percentages.

There is a perfectly sensible explanation to why the estimates produced by the logit regressions as well as the ones produced by the portfolio formation are of such poor quality; the

payer percentage in the base period years is consistently super-high. Not until 1989 does payer percentage drop noticeably below 90%. Hence, even though there are patterns to be discovered in the respective base periods, the differences in payer percentage between portfolios are so subtle that the estimates all fall within a limited (and high) range. This is unfortunate but it is the reality that we live by and therefore we must bear this general overestimation of payer percentages in mind when analyzing and trying to identify possible effects of firms' propensity to pay.

A perceived propensity to pay should not be as volatile as predicted by our tests since 1) dividend decisions are not likely to be based on mood, 2) we look at the average of all firms and it is even more unlikely that all firms simultaneously change their minds about dividends, and 3) the Fama and French study illustrated propensity to pay as gradually decreasing over a long period without any sudden changes. Therefore we are fairly certain that there are underlying factors which our control variables fail to absorb, other than propensity to pay, that drive dividend behaviour.

Except for the early Nineties, which we will discuss further in the next section, the predictions in the late Nineties and forward stand out as especially poor. Apart from the mentioned base period problems there is a special circumstance which our models fail to capture; the explosion of market-entering firms. Looking at the summary statistics (see Appendix A) for the Age variable we note that firms in the age category 0-2 years since market entry represent 15%-30% of the total sample from the late Eighties to the mid Nineties but then skyrockets from 1997-1999 where the youngest category make up 44%-52% of our total sample. We have previously established that there is a positive correlation between age and payer percentage, so naturally payer percentage drops heavily. This is, however, reflected in our predictions which are fairly accurate for 1997-1998. But what our models cannot incorporate is the fact that payer percentage within the youngest category fell from 46% and 40% respectively in 1997-1998 to 29% and 22% respectively in 1999 and 2000. Changing firm characteristics, in this case represented by market composition, seem to explain very well the heavy drop in payer percentage in the late Nineties, even though not fully explained by our formal tests. As opposed to the Fama and French study, we cannot find any strong indication that firms' propensity to pay has declined.

Overlooking the general overestimation of payer percentage (which is probably a result of the super-high base period payer percentages) and the unique market composition in the late

Nineties there is really one shorter period that is left unexplained by our models; the early Nineties, especially 1992-1993. Hence, there may be short-term dividend drivers that our models cannot cover and therefore we will now take a closer look at the sub-period at hand.

3.4 The Early Nineties – A Closer Look

This thesis builds on the Fama and French study and we have borrowed their methodology in order to explain Swedish firms' dividend behaviour. There is one sub-period in our total 1966-2001 sample that the applied methods fail miserably to explain; the early Nineties. Our models and formal tests cannot fully predict the remarkable drop in payer percentage that started in 1989 and hit a record low in 1992 before recovering in 1994. Yes, our models predict a drop in payer percentage during these years, mostly on account of declining profitability, but they fail to predict the magnitude of the drop. As we concluded in our above analysis, consistently super-high payer percentages in our base periods make powerful out-of-sample predictions difficult. This is probably a key explanation as to why our predictions fall short of reality in the early Nineties too. However, the period at hand is a very special period in Swedish modern economic history and therefore it is probable that additional factors affecting payer percentage are at play.

In the early Nineties Sweden experienced a serious economic bust following a failed defence of the fixed exchange rate. There was a real interest rate shock and asset price deflation with balance sheet consolidation, combined with an "ordinary" cyclical downturn, financial fragility and slow structural adjustment (Jonung et al. (1996)). Without going into macroeconomic details[11], the bust meant heavy interest burdens and serious profitability problems to Swedish firms.

There are two more possible reasons as to why our models at hand fail to explain what happens in the early Nineties, namely (1) that our control variables are not sensitive enough to capture possible underlying true drivers of dividend omissions, and (2) that the Fama and French set-up was designed for the American market. There has been numerous evidence, for instance La Porta et al. (1998), that non-Anglo-American firms behave differently to Anglo-American firms in various corporate governance issues. Goergen et al. (2003) take a closer look at German-listed firms' dividend behaviour during 1984-1993. Goergen et al. may offer valuable insights in order

[11] See Lindbeck (1997) for macroeconomic background.

to understand Swedish firms' dividend behaviour during the early Nineties since (1) they address a non-Anglo-American market, (2) they use some refined variables that allow them to take a closer look at the profitability-payer percentage relationship, and (3) they look at the very same period that we are interested in. Goergen et al.'s most striking finding is the large extent to which previously profitable dividend paying firms omit dividends instantly when they encounter their first loss.

The Goergen et al. study is outlined as follows: They divide their sample period in half and obtain two sub-samples; 1984-88 and 1989-93. They form a sample of firms which had consistently positive earnings and dividends during the first sub-period, a total of 189 firms. Then they bring their sample to the second sub-period to look at the dividend behaviour of firms that encounter their *first* loss during the second sub-period (a total of 71 firm-years) and compare that to the dividend behaviour of firms that display positive earnings throughout the second sub-period (568 firm-years). Their striking finding is that 57 (80.7%) of the loss-incurring firms omit dividends the very same year, while merely four (0.7%) of the firms without losses omit dividends. From this and other tests they conclude that dividend cuts or omissions are temporary and driven by losses. They note that German firms' dividend behaviour is much more flexible than that of Anglo-American firms and that dividend cuts or omissions are poor indicators of long-term dividend behaviour, thus having less of a signalling role than dividend cuts or omissions in Anglo-American countries.

As abovementioned, the Goergen et al. study's relevance to the Swedish setting should be strong and we will therefore replicate their test using our Swedish data. Using the very same period and methodology we obtain a sample of 63 firms for which we have data throughout 1984-1993 and which display positive earnings (Y/E) and dividends throughout 1984-88. In the second sub-period we obtain 38 firm-years of first-year losses, all of which also paid dividends the previous year, and 150 firm-years of firms without losses in the second sub-period. Our results are in line with those of Goergen et al., although slightly less pronounced. 18 out of 38 (47.4%) loss-incurring firms omit their dividends instantly, while none (0%) of the 150 firm-years without losses omit their dividends. The fact that our results are less pronounced than those of Goergen et al. could stem from white noise, or more likely, that Swedish firms are generally more inclined to pay dividends than German firms. The bottom line is that the dividend behaviour of Swedish- and

German-listed firms, at least during the relevant period, are similar and therefore our conclusions should be similar; that dividend omissions are temporary and driven by losses.

Goergen et al. perform several more tests to arrive at the above conclusions. Performing all these tests is not reasonable within the scope of this thesis and also, to some extent, not possible on account of data unavailability. However, there is strong circumstantial evidence at hand to prove that the Goergen et al. conclusions are valid in a Swedish setting and hence can help us understand the heavy drop in payer percentage in the early Nineties. Firstly, by looking at our descriptive statistics it is obvious that there is a payer percentage rebound in the mid-Nineties, meaning that dividend omissions by Swedish firms, like those of German firms, have no long-term meaning. Secondly, Goergen et al. attribute part of German firms' dividend flexibility to the fact that they, like Swedish firms, are much more closely held than the typical Anglo-American firm, thus lowering the agency costs and the signalling role of dividends, creating dividend flexibility. Third, the business cycles in Sweden and Germany coincide, with a boom during 1984-88 followed by a recession in 1989-93.

Considering the above evidence it should be safe to conclude that the heavy payer percentage drop in the early Nineties is driven mostly by a (short-term) profitability crisis. Firms react to losses by omitting dividends without fear of signalling effects. We cannot establish any possible effect of firms' declining propensity to pay. The effect may still be present, but it is certainly not as pronounced as in the US.

4. Conclusions

We set out to investigate how and why payer percentage has declined among Swedish listed firms and what determines the likelihood that a Swedish-listed firm will pay dividends.

Through extensive descriptive statistics we have managed to expose patterns and provide a deeper understanding of why and when Swedish-listed firms pay dividends. This is the first study of its kind on the Swedish market and we have used a vast data set. Henceforth, the primary contribution of this thesis is the presentation of descriptive statistics that provide an understanding of what induces firms to pay dividends.

The descriptive statistics reinforced some expected dividend drivers, such as profitability, size, leverage and age, while it led us to discard other instinctively important drivers as myths. An

important result is the expected but not found relationship between payer percentage and owner characteristics. The unique owner characteristics in Sweden are a ready-at-hand explanation to a variety of issues within Swedish corporate finance, but in this thesis we expose owner characteristics as irrelevant vis-à-vis such a central corporate finance concept as dividends (through payer percentage).

We argue that the long-term downward trend in payer percentage is largely driven by changing firm characteristics and not by any effect in propensity to pay, as was the case for US firms. Actually, there is no indication that the propensity to pay has declined among Swedish firms.

We have provided reasonable explanations as to why we observe radical sub-periods in the Nineties, two massive declines separated by a temporary recovery. The heavy drop in payer percentage in the late Nineties is explained by a very rapid change in market composition, since a record number of market entrants emerged. The rapid drop and recovery in the early Nineties had to be examined closely. Through additional tests and descriptive analysis of the sub-period at hand we found very distinct similarities with Goergen et al.'s findings on German firms; that losses induce short-term dividend omissions. We concluded that Swedish firms' dividend policy is not as rigid as that of Anglo-American firms. It seems that signalling effects are not that important to Swedish firms. Firms seem to base dividend payment decisions primarily on whether or not there are earnings to be distributed.

References

Agnblad, J., E. Berglöf, P. Högfeldt and H. Svancar, (2002), "Ownership and Control in Sweden: Strong Owners, Weak Minorities, and Social Control", *The Control of Corporate Europe,* October 2002, pp. 228-259.

Angeldorff, S., K. Novikov, (1999), "Agency Costs: Ownership Concentrations's Influence over Dividend Levels – An Empirical Study of the Stockholm Stock Market 1990-1997", Master's thesis in Finance, Stockholm School of Economics, Stockholm.

Black, F., (1976), "The Dividend Puzzle", *Journal of Portfolio Management,* Vol. 2, pp. 5-8.

Fama, E. F., and K. R French, (2001), "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?", *Journal of Financial Economics,* Vol. 60, pp. 3-43.

Goergen, M., L. Renneboog and Correia da Silva, (2004), "When do German Firms Change Their Dividends?", *Journal of Corporate Finance,* Vol. 11, pp 375-399.

Hansson, F., (2003), "Ownership and Capital Structure in Swedish Listed Companies 1986-1997", Master's thesis in Finance, Stockholm School of Economics, Stockholm.

Holmén, M., and P. Högfeldt, (2004), "Pyramidal Discounts: Tunneling or Overinvestment?", ECGI Working paper no. 73/2005.

Jensen, M. C., (1986), "Agency Cost of Free Cash Flow, Corporate Finance, and Takeovers", *The American Economic Review,* Vol.76, No. 2, pp. 323-329.

Jonung, L., H. T:son Söderström and J. Stymne, (1996), "Depression in the North: Boom and Bust in Sweden and Finland, 1985-1993", *Finnish Economic Papers,* Vol. 9.

La Porta, R., F. Lopez-de-Silanez, A. Shleifer and R. W. Vishny, (1998), "Law and Finance", *Journal of Political Economy,* Vol. 106, No. 6.

La Porta, R., F. Lopez-de-Silanez, A. Shleifer and R. W. Vishny, (2000), "Agency Problems and Dividend Policies Around the World", *Journal of Finance,* Vol. 55, pp. 1-33.

Lindbeck, A., (1997), "The Swedish Experiment", *Journal of Economic Literature,* Vol. 35, no. 3, pp 1273-1319.

Miller, M. H., Modigliani, F. (1961), "Dividend policy, growth and the valuation of shares", *Journal of Business 34*

Oborenko, A., (2004), "Market Timing and Capital Structure: Evidence from Sweden", Master's thesis in Finance, Stockholm School of Economics, Stockholm.

Vieira, E., Raposo, C., (2007), "Lower Propensity To Pay Dividends? New Evidence From Europe", SSRN Working Paper Series

Appendix A – Summary Statistics

Table 1. Selected Summary Statistics
The table displays selected descriptive statistics for payers and non-payers respectively as well as for the total sample. For example, in 1972, dividend paying firms' average E/A was 0.07, while the average E/A for non-payers in that year was -0.06.
E/A = earnings before interest expenses divided by total assets. Y/E = earnings to common divided by adjusted equity. V/A = market equity and liabilities divided by assets. dA/A = relative change in assets from year t-1 to t. L/A = liabilities divided by assets. Age = number of years since market entry.

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Number of Firms	44	44	47	49	88	88	88	89	92	93	100	99	100	105	100	108	120	169	221
Payers	100%	100%	96%	96%	95%	94%	97%	96%	97%	96%	94%	85%	86%	87%	91%	92%	89%	87%	86%
E/A, mean																			
All Firms	0,06	0,06	0,07	0,08	0,08	0,06	0,06	0,09	0,11	0,08	0,07	0,05	0,06	0,08	0,09	0,08	0,08	0,10	0,11
Payers	0,06	0,06	0,07	0,08	0,08	0,06	0,07	0,09	0,12	0,08	0,07	0,06	0,07	0,09	0,09	0,08	0,09	0,10	0,11
Non-Payers			0,05	0,01	0,03	-0,01	-0,08	0,06	0,03	0,01	-0,01	0,00	0,00	0,05	0,05	0,01	0,00	0,00	0,06
Y/E, mean																			
All Firms	0,15	0,14	0,18	0,23	0,22	0,16	0,18	0,31	0,44	0,28	0,21	0,12	0,15	0,29	0,31	0,23	0,24	0,33	0,38
Payers	0,15	0,14	0,18	0,23	0,22	0,17	0,19	0,31	0,45	0,29	0,24	0,18	0,21	0,31	0,32	0,25	0,27	0,35	0,39
Non-Payers			0,22	-0,28	-0,10	-0,28	-0,63	0,08	-0,11	-0,26	-0,25	-0,33	-0,38	0,03	-0,09	-0,40	-0,48	-0,46	0,04
Market Capitalization, median																			
All Firms	180	215	227	267	95	107	128	146	164	196	166	130	138	149	171	306	331	456	288
Payers	180	215	227	271	99	122	139	149	162	207	166	142	154	166	202	308	381	468	345
Non-Payers			45	32	19	32	58	66	171	92	131	79	53	55	50	156	121	164	149
Assets, median																			
All Firms	719	887	918	769	408	451	490	588	607	747	663	877	825	786	957	955	1033	865	707
Payers	719	887	918	769	419	466	489	588	557	747	663	677	727	786	1017	1051	1074	937	798
Non-Payers			902	824	332	349	653	719	1392	1010	1921	1202	2201	749	486	534	762	202	393
V/A, mean																			
All Firms	0,81	0,82	0,91	0,91	0,81	0,85	0,86	0,83	0,79	0,83	0,81	0,78	0,80	0,78	0,79	0,88	0,94	1,09	0,97
Payers	0,81	0,82	0,91	0,91	0,81	0,85	0,86	0,83	0,79	0,83	0,82	0,78	0,79	0,77	0,79	0,87	0,94	1,09	0,97
Non-Payers			0,95	0,93	0,91	0,80	0,86	0,83	0,79	0,78	0,69	0,77	0,81	0,84	0,86	0,96	1,02	1,15	1,11
dA/A, mean																			
All Firms		0,09	0,07	0,15	0,11	0,10	0,10	0,14	0,16	0,16	0,14	0,12	0,06	0,09	0,13	0,17	0,15	0,12	0,18
Payers		0,09	0,07	0,15	0,11	0,10	0,10	0,15	0,16	0,17	0,15	0,13	0,07	0,10	0,13	0,18	0,15	0,13	0,18
Non-Payers			0,08	-0,09	0,21	0,04	-0,05	-0,02	0,13	-0,35	0,06	0,05	0,01	0,04	0,12	-0,01	0,14	-0,07	0,17
L/A, mean																			
All Firms	0,49	0,51	0,53	0,54	0,56	0,58	0,58	0,59	0,59	0,60	0,61	0,63	0,64	0,63	0,63	0,65	0,66	0,65	0,63
Payers	0,49	0,51	0,52	0,53	0,55	0,57	0,58	0,59	0,58	0,60	0,61	0,61	0,62	0,61	0,62	0,65	0,65	0,64	0,62
Non-Payers			0,90	0,89	0,87	0,72	0,78	0,72	0,72	0,71	0,60	0,73	0,77	0,77	0,81	0,78	0,83	0,83	0,74
Age																			
0-2, n	35	35	37	5	42	39	36	3	7	9	16	12	13	11	9	19	29	80	126
3-8, n	0	0	1	35	35	38	40	74	72	37	37	37	36	17	17	17	21	18	28
>8, n	9	9	9	9	11	11	12	12	13	47	47	50	51	77	74	72	70	71	67
0-2, % paying	100%	100%	95%	60%	90%	92%	94%	100%	100%	100%	100%	83%	92%	73%	78%	84%	83%	80%	79%
3-8, % paying			100%	100%	100%	95%	98%	95%	96%	92%	95%	95%	94%	100%	100%	100%	90%	83%	93%
>8, % paying	100%	100%	100%	100%	100%	100%	100%	100%	100%	98%	91%	78%	78%	86%	91%	92%	91%	96%	96%

Table 1. Selected Summary Statistics, continued
Private = private or family owner is the largest owner (voting power). Cut10 = the largest owner controls >10% of the votes.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of Firms	230	226	231	216	223	207	172	159	169	184	188	198	260	311	255	263	152
Payers	90%	90%	90%	90%	84%	75%	67%	52%	60%	78%	78%	73%	65%	59%	49%	43%	51%
E/A, mean																	
All Firms	0,11	0,09	0,09	0,10	0,10	0,09	0,07	0,05	0,07	0,10	0,12	0,09	0,10	0,08	0,10	0,09	0,03
Payers	0,11	0,09	0,10	0,10	0,10	0,09	0,07	0,07	0,08	0,11	0,13	0,10	0,10	0,09	0,11	0,10	0,05
Non-Payers	0,05	-0,03	0,05	0,04	0,06	0,05	0,04	0,01	0,02	0,05	0,04	0,04	0,03	-0,01	0,05	-0,06	-0,07
Y/E, mean																	
All Firms	0,38	0,31	0,35	0,37	0,32	0,23	0,11	0,04	0,10	0,21	0,24	0,17	0,20	0,17	0,21	0,18	0,03
Payers	0,39	0,33	0,35	0,37	0,33	0,24	0,12	0,09	0,14	0,22	0,26	0,19	0,21	0,19	0,23	0,22	0,09
Non-Payers	0,09	-0,62	0,09	0,06	0,04	-0,04	-0,09	-0,19	-0,10	0,01	-0,03	-0,01	0,01	-0,07	0,04	-0,15	-0,28
Market Capitalization, median																	
All Firms	249	404	371	552	693	378	294	205	428	464	597	1029	660	400	619	519	514
Payers	272	469	486	605	843	644	677	668	904	604	696	1301	1328	1050	1419	1678	1612
Non-Payers	166	182	128	356	249	154	105	94	282	392	463	652	207	129	247	180	257
Assets, median																	
All Firms	633	706	688	833	1019	1372	1346	1387	1113	1145	1316	1291	682	522	443	518	695
Payers	685	748	770	906	1234	2137	2336	2056	1350	1020	1311	1537	1472	1478	1753	2351	2539
Non-Payers	302	426	329	555	451	573	790	1037	970	1488	1364	775	151	82	119	175	215
V/A, mean																	
All Firms	1,01	1,13	1,05	1,15	1,21	1,07	1,08	1,13	1,30	1,34	1,35	1,54	1,52	1,56	2,17	1,31	1,39
Payers	1,01	1,13	1,05	1,15	1,21	1,07	1,10	1,20	1,37	1,36	1,37	1,56	1,51	1,55	2,14	1,28	1,23
Non-Payers	0,99	1,19	1,04	1,07	1,25	1,00	0,94	0,92	1,06	1,05	1,08	1,32	1,69	1,76	2,60	1,61	1,97
dA/A, mean																	
All Firms	0,12	0,17	0,14	0,23	0,13	0,05	-0,02	0,07	0,04	0,04	0,07	0,08	0,12	0,08	0,07	0,14	0,11
Payers	0,12	0,17	0,14	0,22	0,12	0,04	0,00	0,08	0,06	0,04	0,08	0,07	0,12	0,08	0,06	0,12	0,11
Non-Payers	0,17	0,20	0,05	0,42	0,19	0,22	-0,15	0,04	-0,05	0,05	0,01	0,21	0,11	0,07	0,21	0,32	0,13
L/A, mean																	
All Firms	0,62	0,64	0,64	0,67	0,67	0,66	0,66	0,69	0,68	0,62	0,59	0,58	0,50	0,51	0,50	0,49	0,54
Payers	0,61	0,63	0,64	0,66	0,66	0,65	0,65	0,65	0,65	0,61	0,58	0,57	0,49	0,51	0,50	0,49	0,53
Non-Payers	0,71	0,76	0,73	0,88	0,80	0,84	0,81	0,78	0,77	0,79	0,75	0,71	0,61	0,52	0,52	0,47	0,57
Age																	
0-2, n	128	97	70	63	59	51	33	21	27	50	54	63	115	163	130	101	41
3-8, n	31	68	102	101	116	106	88	72	63	59	48	48	61	56	52	89	59
>8, n	71	61	59	52	48	50	51	66	79	75	86	87	84	92	73	89	52
0-2, % paying	86%	88%	86%	81%	66%	67%	58%	48%	74%	86%	78%	59%	46%	40%	29%	22%	24%
3-8, % paying	90%	88%	88%	92%	87%	71%	60%	40%	49%	61%	73%	75%	69%	71%	52%	35%	44%
>8, % paying	96%	97%	97%	98%	98%	92%	84%	67%	63%	85%	81%	82%	87%	85%	81%	81%	79%
Owner Type																	
Private, % paying	92%	92%	90%	92%	85%	71%	65%	51%	69%	80%	87%	79%	72%	62%	53%	48%	59%
Corporate, % paying	82%	77%	93%	93%	83%	82%	65%	43%	36%	83%	77%	83%	77%	77%	63%	54%	53%
Institutional, % paying	97%	97%	97%	94%	96%	96%	85%	61%	50%	69%	62%	67%	76%	75%	71%	65%	46%
Owner Size																	
Cut10, % paying	92%	91%	91%	92%	87%	76%	69%	51%	59%	79%	80%	77%	75%	67%	57%	54%	58%
Cut20, % paying	91%	91%	91%	93%	86%	76%	69%	50%	58%	80%	81%	79%	78%	70%	58%	59%	66%
Cut50, % paying	85%	92%	94%	93%	81%	74%	67%	45%	56%	85%	87%	84%	80%	75%	70%	71%	80%
Dual Class Share System % of dual class firms paying	94%	93%	91%	92%	86%	75%	70%	52%	61%	79%	83%	80%	76%	70%	61%	59%	64%

Appendix B – Logit Regressions

Table 2. Logit Regression Estimates – Coefficients and Significance
The table displays the value and the significance of any coefficient in our respective logit regression models.

Model	Base Period		Estimates							
			E/A	Size	V/A	L/A	Age	Fam.	Cor.	Vot1
E/A, Size, V/A	1968-1981	z	8,90	4,24	-1,49					
		P(z)	0,00	0,00	0,14					
E/A, Size, V/A, L/A, Age	1968-1981	z	6,99	3,05	-0,89	-6,90	-0,86			
		P(z)	0,00	0,00	0,37	0,00	0,39			
E/A, Size, V/A	1977-1986	z	10,63	9,14	-4,86					
		P(z)	0,00	0,00	0,00					
E/A, Size, V/A, L/A, Age	1977-1986	z	10,34	7,03	-4,18	-3,60	3,84			
		P(z)	0,00	0,00	0,00	0,00	0,00			
E/A, Size, V/A	1985-1991	z	5,86	10,64	-3,50					
		P(z)	0,00	0,00	0,00					
E/A, Size, V/A, L/A, Age	1985-1991	z	6,31	8,28	-3,99	-4,15	3,65			
		P(z)	0,00	0,00	0,00	0,00	0,00			
E/A, Size, V/A, L/A, Age, Fam, Cor, Vot1	1985-1991	z	5,25	6,85	-3,09	-4,39	1,82	-1,06	-2,54	-0,72
		P(z)	0,00	0,00	0,00	0,00	0,07	0,29	0,01	0,47

Table 3. Out of Sample Predictions Using Logit Regression Estimates
The table shows the out-of-sample year payer percentages predicted by our models as well as the difference between these predictions and the actual payer percentage. This difference should, in accordance with the Fama and French approach, represent the effect of firms' declining propensity to pay. Note that we have chosen to focus on the models with the 1977-1986 base period.

Model	Sample period	Predicted payer percentage									
		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
E/A, Size, V/A	1968-1981	93,1%	92,7%	93,8%	94,8%	92,4%	92,7%	93,6%	89,4%	88,1%	81,9%
E/A, Size, V/A, L/A, Age	1968-1981	91,6%	93,3%	94,1%	94,9%	93,4%	93,1%	93,3%	91,5%	88,5%	81,5%
E/A, Size, V/A	1977-1986						88,8%	89,5%	85,3%	83,7%	77,4%
E/A, Size, V/A, L/A, Age	1977-1986						88,7%	89,6%	86,0%	84,3%	78,4%
Actual payer percentage		**89,2%**	**87,0%**	**85,5%**	**89,6%**	**90,3%**	**89,6%**	**90,3%**	**83,9%**	**74,9%**	**66,9%**

Model	Sample period	Predicted payer percentage									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
E/A, Size, V/A	1968-1981	74,2%	83,5%	92,3%	90,8%	81,3%	67,9%	61,7%	55,3%	52,7%	55,1%
E/A, Size, V/A, L/A, Age	1968-1981	72,6%	82,5%	91,9%	90,6%	84,8%	77,2%	73,0%	62,6%	59,8%	61,1%
E/A, Size, V/A	1977-1986	70,6%	79,2%	87,2%	86,0%	77,0%	66,7%	61,1%	54,8%	52,7%	54,6%
E/A, Size, V/A, L/A, Age	1977-1986	71,9%	80,8%	87,9%	86,9%	79,7%	68,5%	62,9%	56,7%	54,5%	58,1%
E/A, Size, V/A	1985-1991	71,3%	78,1%	84,6%	83,6%	76,5%	68,8%	64,4%	57,6%	54,8%	56,0%
E/A, Size, V/A, L/A, Age	1985-1991	72,4%	79,7%	85,4%	84,7%	79,0%	70,1%	65,7%	58,6%	56,7%	60,1%
E/A, Size, V/A, L/A, Age, Owner Type, Owner Size	1985-1991	74,3%	79,8%	86,1%	86,9%	81,9%	77,5%	73,7%	67,7%	63,9%	60,9%
Actual payer percentage		**52,2%**	**59,8%**	**77,7%**	**78,2%**	**72,7%**	**64,6%**	**58,8%**	**48,6%**	**42,6%**	**50,7%**

Model	Sample period	Predicted minus actual payer percentage									
		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
E/A, Size, V/A	1968-1981	3,9%	5,7%	8,3%	5,2%	2,1%	3,1%	3,3%	5,5%	13,2%	15,1%
E/A, Size, V/A, L/A, Age	1968-1981	2,4%	6,3%	8,6%	5,3%	3,1%	3,5%	3,1%	7,6%	13,6%	14,7%
E/A, Size, V/A	1977-1986						-0,8%	-0,7%	1,5%	8,9%	10,5%
E/A, Size, V/A, L/A, Age	1977-1986						-0,9%	-0,7%	2,2%	9,4%	11,5%

Model	Sample period	Predicted minus actual payer percentage									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
E/A, Size, V/A	1968-1981	22,0%	23,8%	14,6%	12,6%	8,5%	3,3%	2,9%	6,6%	10,2%	4,5%
E/A, Size, V/A, L/A, Age	1968-1981	20,4%	22,7%	14,2%	12,4%	12,1%	12,6%	14,1%	13,9%	17,2%	10,4%
E/A, Size, V/A	1977-1986	18,4%	19,4%	9,5%	7,8%	4,3%	2,0%	2,2%	6,1%	10,1%	3,9%
E/A, Size, V/A, L/A, Age	1977-1986	19,7%	21,0%	10,2%	8,7%	7,0%	3,9%	4,0%	8,0%	11,9%	7,5%
E/A, Size, V/A	1985-1991	19,1%	18,4%	6,8%	5,5%	3,8%	4,2%	5,5%	9,0%	12,2%	5,3%
E/A, Size, V/A, L/A, Age	1985-1991	20,2%	19,9%	7,7%	6,5%	6,3%	5,5%	6,8%	10,0%	14,1%	9,5%
E/A, Size, V/A, L/A, Age, Fam, Cor, Vot1	1985-1991	22,1%	20,0%	8,4%	8,7%	9,2%	12,8%	14,9%	19,1%	21,3%	10,3%

Appendix C – Portfolio Formation

Table 4. Base Period Payer Percentages.
Every number in the tables represent the weighted average payer percentage for a specific portfolio over the relevant base period. The table to the right displays the averages for the 1977-1986 base period and the table below displays the averages for the 1985-1991 base period containing owner data. For example, the portfolios made up of firms with low E/A and high V/A display a weighted average payer percentage of 63% for the base period 1977-1986.

1968-1981	Low	Mkt. Cap	High	Low	V/A	High	Low	L/A	High	0-2 y. o.	3-8 y.o.	>8 y. o.
Low	71%	84%	92%	90%	76%	69%	96%	89%	68%	78%	89%	72%
E/A	97%	99%	100%	99%	99%	98%	100%	99%	98%	96%	100%	99%
High	97%	99%	100%	98%	98%	100%	100%	99%	95%	97%	99%	100%
Low	-	-	-	95%	81%	81%	99%	95%	71%	88%	93%	70%
Mkt. Cap	-	-	-	92%	92%	97%	99%	94%	89%	94%	98%	88%
High	-	-	-	97%	98%	100%	99%	99%	95%	100%	99%	98%
Low	-	-	-	-	-	-	100%	93%	76%	95%	98%	93%
V/A	-	-	-	-	-	-	100%	98%	80%	89%	93%	87%
High	-	-	-	-	-	-	98%	98%	85%	89%	98%	89%
Low	-	-	-	-	-	-	-	-	-	98%	100%	99%
L/A	-	-	-	-	-	-	-	-	-	93%	99%	94%
High	-	-	-	-	-	-	-	-	-	82%	89%	74%

1977-1986	Low	Mkt. Cap	High	Low	V/A	High	Low	L/A	High	0-2 y. o.	3-8 y.o.	>8 y. o.
Low	57%	72%	92%	85%	69%	63%	79%	85%	66%	66%	83%	75%
E/A	87%	94%	99%	95%	94%	93%	96%	95%	91%	88%	98%	98%
High	94%	99%	99%	95%	97%	98%	97%	97%	98%	93%	100%	99%
Low	-	-	-	88%	75%	79%	90%	90%	62%	82%	87%	67%
Mkt. Cap	-	-	-	86%	87%	88%	91%	88%	84%	82%	95%	87%
High	-	-	-	99%	94%	99%	99%	99%	92%	88%	100%	99%
Low	-	-	-	-	-	-	95%	92%	83%	80%	91%	96%
V/A	-	-	-	-	-	-	92%	96%	72%	82%	89%	84%
High	-	-	-	-	-	-	92%	90%	83%	85%	98%	89%
Low	-	-	-	-	-	-	-	-	-	83%	100%	100%
L/A	-	-	-	-	-	-	-	-	-	86%	99%	96%
High	-	-	-	-	-	-	-	-	-	80%	84%	73%

1985-1991	Low	Mkt. Cap	High	Low	V/A	High	Low	L/A	High	0-2 y. o.	3-8 y.o.	>8 y. o.	Private	Corp.	Inst.	Low	Vot1	High
Low	51%	72%	93%	76%	71%	63%	72%	75%	69%	63%	69%	85%	69%	57%	85%	82%	64%	67%
E/A	92%	87%	98%	95%	90%	93%	98%	94%	87%	88%	90%	97%	92%	89%	99%	93%	96%	88%
High	90%	95%	100%	91%	96%	95%	98%	97%	69%	94%	92%	99%	94%	91%	99%	95%	94%	94%
Low	-	-	-	80%	77%	69%	87%	88%	48%	80%	74%	70%	77%	55%	90%	82%	68%	78%
Mkt. Cap	-	-	-	87%	83%	85%	94%	83%	79%	81%	84%	92%	85%	80%	88%	88%	85%	83%
High	-	-	-	96%	98%	97%	99%	99%	93%	97%	95%	98%	95%	100%	98%	98%	96%	96%
Low	-	-	-	-	-	-	90%	91%	78%	78%	84%	96%	86%	72%	97%	89%	85%	85%
V/A	-	-	-	-	-	-	96%	91%	73%	80%	83%	93%	84%	91%	89%	90%	83%	84%
High	-	-	-	-	-	-	91%	89%	75%	87%	79%	96%	83%	83%	97%	91%	85%	83%
Low	-	-	-	-	-	-	-	-	-	88%	92%	97%	91%	91%	99%	91%	93%	93%
L/A	-	-	-	-	-	-	-	-	-	84%	86%	98%	91%	82%	94%	98%	86%	85%
High	-	-	-	-	-	-	-	-	-	75%	71%	86%	73%	69%	91%	78%	76%	72%
0-2 y. o.	-	-	-	-	-	-	-	-	-	-	-	-	81%	86%	88%	85%	78%	83%
3-8 y.o.	-	-	-	-	-	-	-	-	-	-	-	-	82%	67%	91%	86%	81%	80%
>8 y. o.	-	-	-	-	-	-	-	-	-	-	-	-	92%	100%	99%	96%	93%	97%
Private	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87%	82%	84%
Corporate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91%	83%	77%
Institutional	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97%	93%	93%

Table 5. Fit to Expectations.
The table summarizes the respective control variables' fit to our expectations about them. This is an informal way of uncovering the drivers of payer percentage. A fit is when a variable, at any given intersection, conforms to the expected correlation with payer percentage. For example for the 1968-81 base period E/A fits our expectation in the intersection with high V/A portfolios since 69%<98%<100%, ie E/A is positively correlated with payer percentage.

Base Period Portfolios As Descriptives - A Summary

Variable	Expectations	Fit to expectations		
		1968-81	1977-86	1985-91
E/A	Positively correlated with payer percentage.	8/12	12/12	14/18
Mkt. Cap.	Positively correlated with payer percentage.	9/12	10/12	16/18
V/A	Negatively correlated with payer percentage.	5/12	3/12	6/18
L/A	Negatively correlated with payer percentage.	12/12	8/12	13/18
Age	Positively correlated with payer percentage.	1/12	0/12*	11/18
Owner Type	Instiutionally owned are top payers, followed by privately owned and lastly corporately owned firms.	-	-	12/18
Owner Size	Ambiguous, but a negative correlation with payer percentage is closest at hand.	-	-	9/18

* Middle-aged firms actually display the highest payer percentage in 12/12 cases.

Table 6. Post-Base Period Predictions.
The "Expected Percent" is the expected payer percentage for a specific year, estimated using a specific set of portfolios. Every set of portfolios contains nine portfolios. The estimate is calculated as the sum of the number of firms in each portfolio at time *t* multiplied by its respective base period payer percentage and divided by the total number of firms at time *t*. Estimates are evaluated against the actual payer percentage at time *t*. Then "Expected-Actual", the residual that the respective control variables fail to explain, should reflect the decline in propensity to pay. The top two tables displays estimates based on the 1977-1986 base period, while the bottom four tables display estimates based on the 1985-1991 base period. The estimates for the 1968-1981 base period are of such dubious quality that they are left out.

1977-1986	Portfolio Set		Profitability and Size		Profitability and Investment		Profitability and Leverage		Profitability and Age		Size and Investment	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1987	231	**90%**	90%	1%	89%	-1%	90%	0%	92%	2%	88%	-2%
1988	216	**90%**	91%	1%	89%	-1%	90%	0%	92%	2%	88%	-2%
1989	223	**84%**	88%	5%	86%	2%	89%	5%	90%	7%	88%	4%
1990	207	**75%**	87%	12%	86%	11%	87%	12%	90%	15%	88%	13%
1991	172	**67%**	81%	15%	84%	17%	83%	16%	86%	19%	89%	22%
1992	159	**52%**	79%	27%	82%	30%	79%	27%	84%	32%	88%	36%
1993	169	**60%**	84%	24%	81%	21%	83%	23%	86%	26%	88%	28%
1994	184	**78%**	88%	10%	87%	10%	88%	11%	90%	12%	88%	10%
1995	188	**78%**	89%	11%	88%	10%	89%	11%	91%	12%	88%	9%
1996	198	**73%**	84%	12%	82%	9%	86%	14%	86%	13%	88%	15%
1997	260	**65%**	82%	17%	79%	14%	86%	21%	82%	18%	88%	24%
1998	311	**59%**	80%	21%	78%	19%	84%	25%	79%	20%	88%	30%
1999	255	**49%**	80%	32%	78%	30%	85%	37%	81%	32%	89%	40%
2000	263	**43%**	80%	38%	79%	36%	85%	43%	83%	40%	89%	46%
2001	152	**51%**	79%	28%	78%	27%	84%	34%	82%	32%	89%	38%

1977-1986	Portfolio Set		Size and Leverage		Size and Age		Investment and Leverage		Investment and Age		Leverage and Age	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1987	231	**90%**	89%	0%	90%	1%	88%	-1%	90%	0%	90%	1%
1988	216	**90%**	89%	-1%	91%	0%	88%	-2%	91%	0%	90%	0%
1989	223	**84%**	89%	5%	91%	7%	88%	4%	91%	7%	90%	7%
1990	207	**75%**	87%	12%	91%	16%	87%	12%	90%	15%	89%	14%
1991	172	**67%**	86%	19%	91%	24%	86%	19%	89%	22%	89%	22%
1992	159	**52%**	85%	33%	90%	38%	84%	32%	89%	37%	87%	35%
1993	169	**60%**	87%	27%	89%	29%	86%	26%	89%	29%	88%	28%
1994	184	**78%**	88%	11%	88%	10%	88%	10%	88%	11%	89%	11%
1995	188	**78%**	89%	11%	87%	9%	88%	10%	88%	9%	90%	11%
1996	198	**73%**	90%	17%	87%	14%	89%	16%	88%	16%	90%	17%
1997	260	**65%**	91%	27%	88%	23%	90%	26%	88%	23%	90%	26%
1998	311	**59%**	91%	32%	88%	29%	90%	31%	87%	28%	89%	30%
1999	255	**49%**	91%	42%	88%	39%	90%	42%	88%	39%	90%	41%
2000	263	**43%**	91%	49%	89%	46%	91%	48%	89%	47%	91%	49%
2001	152	**51%**	91%	40%	89%	39%	91%	40%	91%	40%	93%	42%

1985-1991	Portfolio Set		Profitability And Size		Profitability And Investment		Profitability And Leverage		Profitability And Age		Size and Investment	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1992	140	**52%**	76%	24%	80%	28%	77%	25%	80%	28%	87%	35%
1993	138	**60%**	81%	21%	81%	21%	80%	20%	85%	25%	87%	27%
1994	144	**78%**	85%	7%	86%	8%	85%	8%	88%	10%	86%	9%
1995	160	**78%**	86%	8%	87%	9%	86%	8%	88%	10%	87%	9%
1996	162	**73%**	82%	10%	82%	9%	83%	11%	85%	13%	86%	13%
1997	176	**65%**	82%	18%	80%	15%	83%	18%	83%	18%	87%	22%
1998	220	**59%**	80%	21%	78%	19%	81%	22%	80%	21%	87%	28%
1999	193	**49%**	79%	31%	79%	30%	83%	34%	81%	32%	86%	37%
2000	176	**43%**	80%	38%	80%	37%	82%	40%	81%	39%	87%	44%
2001	121	**51%**	78%	27%	77%	26%	80%	29%	79%	29%	87%	36%

1985-1991	Portfolio Set		Size and Leverage		Size and Age		Investment and Leverage		Investment and Age		Leverage and Age	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1992	140	**52%**	80%	28%	86%	34%	83%	31%	88%	36%	84%	32%
1993	138	**60%**	83%	23%	86%	26%	83%	24%	89%	29%	86%	27%
1994	144	**78%**	85%	8%	86%	8%	86%	8%	89%	11%	88%	10%
1995	160	**78%**	86%	8%	86%	8%	87%	9%	89%	11%	88%	10%
1996	162	**73%**	87%	14%	86%	13%	87%	14%	89%	16%	89%	16%
1997	176	**65%**	90%	25%	86%	22%	89%	24%	88%	24%	90%	25%
1998	220	**59%**	90%	31%	87%	28%	89%	30%	88%	30%	89%	30%
1999	193	**49%**	89%	41%	87%	38%	89%	41%	88%	39%	90%	41%
2000	176	**43%**	90%	47%	86%	43%	89%	47%	87%	44%	90%	47%
2001	121	**51%**	90%	39%	85%	35%	89%	39%	86%	36%	90%	39%

1985-1991	Portfolio Set		Profitability and Owner Type		Size and Owner Type		Investment and Owner Type		Leverage and Owner Type		Age and Owner Type	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1992	140	**52%**	77%	25%	86%	34%	86%	34%	82%	30%	87%	35%
1993	138	**60%**	80%	20%	86%	26%	86%	27%	84%	24%	88%	29%
1994	144	**78%**	85%	7%	85%	8%	85%	7%	86%	8%	88%	11%
1995	160	**78%**	86%	8%	87%	9%	86%	8%	87%	9%	89%	10%
1996	162	**73%**	82%	9%	86%	14%	86%	13%	87%	14%	88%	16%
1997	176	**65%**	81%	16%	87%	22%	86%	22%	89%	24%	87%	22%
1998	220	**59%**	79%	20%	86%	27%	85%	26%	89%	30%	86%	28%
1999	193	**49%**	80%	32%	86%	37%	85%	37%	89%	41%	87%	38%
2000	176	**43%**	80%	38%	86%	43%	86%	43%	89%	47%	86%	44%
2001	121	**51%**	78%	27%	86%	35%	86%	35%	89%	39%	86%	36%

1985-1991	Portfolio Set		Profitability and Owner Size		Size and Owner Size		Investment and Owner Size		Leverage and Owner Size		Age and Owner Size		Owner Type and Owner Size	
	Number of Firms	Actual Percent	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual	Expected Percent	Expected-Actual
1992	140	**52%**	77%	25%	79%	27%	86%	34%	81%	29%	88%	35%	86%	34%
1993	138	**60%**	80%	20%	85%	25%	86%	26%	83%	23%	89%	29%	86%	26%
1994	144	**78%**	85%	8%	94%	16%	86%	9%	85%	8%	89%	11%	86%	8%
1995	160	**78%**	86%	8%	91%	13%	86%	8%	87%	9%	89%	11%	87%	8%
1996	162	**73%**	83%	10%	88%	15%	87%	14%	88%	15%	89%	16%	87%	14%
1997	176	**65%**	82%	18%	88%	23%	87%	22%	89%	24%	88%	24%	87%	22%
1998	220	**59%**	81%	22%	87%	28%	87%	28%	89%	30%	88%	29%	87%	28%
1999	193	**49%**	83%	34%	88%	39%	88%	39%	90%	41%	88%	39%	87%	39%
2000	176	**43%**	84%	41%	88%	45%	88%	45%	90%	47%	88%	45%	87%	45%
2001	121	**51%**	82%	31%	89%	38%	88%	37%	90%	39%	88%	37%	88%	37%