Entry, survival or exit of firms over industry life cycles

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**Entry, Survival or Exit of Firms
over
Industry Life Cycles**

The Market for Daily Newspapers in The Netherlands

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Industry Life Cycles**

The Market for Daily Newspapers in The Netherlands

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan
de Universiteit Maastricht,
op gezag van de Rector Magnificus, Prof. dr. A.C. Nieuwenhuijzen Kruseman
volgens het besluit van het College van Decanen, in het openbaar te verdedigen
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Preface

This thesis starts with a brief introduction to the story of one of Egypt's most ancient myths: Osiris. According to the legend, Osiris was the wise and benevolent king who had civilized Egypt. After this civilization of Egypt, he travelled to other countries to teach people what he taught the Egyptians. Shortly after his return to Egypt he was killed by his jealous brother Seth. Osiris had a faithful wife, Isis, who used her magical abilities to resurrected him long enough to be impregnated by him so that she could give birth to the new king, Horus. The young Horus killed his uncle Seth and put new life into his father Osiris. Osiris climbed up to the star sky and became the constellation Orion¹. The elements of this story were seen as symbolic of real events that happened in Egypt. Osiris' death and resurrection symbolized the annual death and re-growth of the crops and the yearly drought and flooding of the Nile. The re-birth and death of the stars, sun, and moon also symbolized the cycle of life and death. In Ancient Egypt connections were made between the religion and the stars. A special link existed between the Pharaohs who were always connected to Osiris and the constellation of Orion. The hieroglyphics in the pyramids show that Orion is equal to Osiris.

Because the thesis deals with the birth, life, survival, death, and sometimes re-birth of firms and industries, the front of this thesis shows the constellation of Orion. The elements of the legend of Osiris symbolized in Orion can be associated with the industry life cycles and the behaviour and lifetime of firms.

¹Source: R. Bauval and A. Gilbert (1994), *The Orion Mystery: Unlocking the Secrets of the Pyramids*, Heinemann, London.

Acknowledgements

The road to this thesis was full of surprises. In my teenage years I never dreamt of becoming a member of the academic society. Serving in the army as a general was my main mission. Many times my parents told me: “think twice before you make a choice like that”. Gradually, dark clouds increasingly distorted the beauty of being a soldier. In particular, the picture of digging holes and sleeping outdoors on rainy days started to terrify me. The barriers to enter the university disappeared slowly. One year before leaving highschool I still had to decide about my future profession. After deleting some options, I ended up with econometrics. Without realizing it, my academic life cycle was born.

With the decision to write a Ph.D. thesis I introduced the second stage in this life cycle. Apart from it being a challenge, I had two more reasons to start a Ph.D. project. During the times when I watched the news on television and read the newspapers, my scientific curiosity in economics increased. However, many of the economic topics were beyond the scope of my knowledge at that time. The drive to understand more of economics stimulated me to stay in the academic society. Now, after four years of research, I am happy to conclude that I have become more acquainted with many of these topics. Another incentive to start a research project were the many discussions I had with my friends, especially the ones we had in pubs. Our discussions ended seven out of ten times with the following question from their side: “What can you do with econometrics?” It is up to them to conclude if I was able to answer their question successfully by conducting this research project.

The process of expanding my knowledge has not been possible without the contribution, support and friendship of many persons. First of all, I own a great debt of gratitude to Franz Palm. His honesty and enthusiasm for economic research stimulated me to finish the project. Even at moments when his desk was overloaded with administrative tasks, he still had time for me. He also was the one who kept me out of the army when I had to go, but did not want to go anymore. Gerard Pfann has been equally important. He succeeded in creating a very friendly and stimulating research environment. I have greatly benefited from his adequate, wise, and always stimulating responses to my questions and work. Moreover, I had the pleasure to appreciate him also outside the university, in particular during our games of squash and our trips to conferences abroad.

I am greatly indebted to many other persons. Joan Hemels for his willingness to share with me his profound and encyclopaedic knowledge about the Dutch daily newspapers. Glenn Carroll who gave me confidence in my work and pointed out the richness of the data set. Boyan Jovanovic, Paul Geroski, and Marc van Wegberg also provided me with

constructive comments and suggestions. Hans Peters and Martin Carree provided comments and advice which were especially valuable during the last phase of research and writing.

Norman Bradburn invited me to participate in an internship at National Opinion Research Center (NORC) affiliated with the University of Chicago (Chicago, U.S.A.) in the summer of 1997. In this period I learnt how to deal with deadlines and budgets. I still remember the good old days I spent in the Windy City, especially thanks to Julie Antelman, Woody Carter, Lisa Thalji, Vani Radhakrishna, Antonieta Diaz, and the other employees at NORC.

In this research the collection and processing of data played a crucial role. I could not have created the data set without the help and cooperation of several persons. I acknowledge Christophe Boone and Arjen van Witteloostuijn for sharing part of their data on the Dutch daily newspaper industry after 1950. Hetty van Sijl from CEBUCO gave me the missing data for the period after 1950. I would also thank the employees from the Jesuits' Library at Maastricht University, the Social Historical Centre in Maastricht, and the National Press Museum in Amsterdam for their hospitality and cooperation.

The illustration on the cover of this Ph.D. thesis is taken from the book 'The Orion Mystery: Unlocking the Secrets of the Pyramids' by Robert Bauval and Adrian Gilbert. I thank the authors for their permission to use the Orion illustration for my thesis.

I am grateful to several organizations for the opportunities they gave me to visit NORC and international conferences. My gratitude goes to the Netherlands Organization of Scientific Research (NWO), Shell Nederland N.V., European Economic Association 1998 in Berlin, and Stichting Wetenschappelijk Onderzoek Limburg (SWOL) for (travel) grants I received throughout my Ph.D. period.

My stay in Maastricht would not have been so pleasant without many others. For four years, Christian Kerckhoffs served as my roommate and guided me through both the culture and politics of Maastricht. He provided an open atmosphere for the many discussions we had on a large variety of subjects, even when we had opposite opinions about the leader of our political party. Thanks also to Aric, Boris, Cornelia, Ellen, Karin, Stan, Wilko, Yolanda and many members of the department of Quantitative Economics. A special thanks goes to Robert van de Leensel, who has always rescued me when I had accepted the challenge to play a match of soccer against the members of other departments. His attitude together with his wisdom were inspiring factors in all the years we have known each other.

Meeting people all around the world is a pleasure and a privilege. Fortunately, I have built up friendship with many persons from different countries. I would like to thank them all, in particular Rian, Sjaak, and Gabi, because they believe in what they are doing.

Constant love and support were given by Annelies Hogenbirk throughout the main trajectory of my thesis. Many hours in the evening, weekends and holidays I worked and when I was home my thoughts were off newspapers. The words of thanks are quite insufficient to reflect the gratitude I would like to express. I can tell you that these four

years have shown me again the importance of enjoying life.

Mijn grootste dank gaat uit naar mijn ouders zonder wie dit alles niet zou zijn gelukt. Hun eindeloze liefde, ondersteuning en geduld vallen niet in woorden uit te drukken.

Hans van Kranenburg
June 1999

*This is not the end,
it is not even the beginning of the end.
But it is, perhaps, the end of the beginning.*

Winston S. Churchill (1942)

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Chapter 1

Introduction

1.1 Introduction

How do firms and the market structure of industries change over time? This is a central question in the industrial organization literature, and the subject of this thesis. When industries are new, a lot of entry takes place, firms offer many different versions of the industry's product, the rate of product innovation is high, and market shares change rapidly. Through the increase in competition and an acceptance of a dominant product design the industry's firms have to become more price and cost conscious. Firms that produce the standard product can enjoy the advantages of economies of scale. As a consequence, the innovative activities of firms gradually shift from product to process innovations. Over their evolution industries may experience a shake-out period during which the number of firms declines strongly. In other words, "the character of industries evolves over time hand in hand with their market structures, and the process by which this co-evolution occurs involves a selection between different firms which have different ideas that are embodied in the different products and services that they offer"¹.

As the industry evolves from birth to maturity, the rate of growth in demand and the minimum efficient size of firms producing the standard product are likely to change. These evolutionary changes alter entry, exit, and survival chances of firms in the industry from the first introduction of the product to maturity of the industry. Any industry experiences major and profitable innovations which attract new competitors. These new firms play an important role in shaping the industry in precisely those phases of the industry life cycle when the current activities of incumbents are most out of line with exogenous changes in costs and demand. The speed with which new competitors enter into the industry therefore depends crucially on the innovative activities within and outside the industry and on demand growth. In its early stage, the new industry is populated by a few firms, which receive a high price for their product. As the number of firms increases and the technologies gradually improve, industry output expands and the price decreases. At a later stage in the evolution of the industry the product becomes standardized. The emergence of economies of scale in producing and selling the standard

¹See Geroski (1991, p. 264).

product and Research and Development (R&D) leads to a sharp increase in market concentration (Cohen and Klepper (1996a, b)). Fewer and fewer new firms enter the industry successfully, while incumbent firms that are less successful in producing the standard product exit the industry.

A number of theories has recently been proposed to explain the evolutionary processes in industries. Many theories of industry evolution reserve key roles for the entry and exit of firms and innovation activities. In general, incorporating the evolution of the entry, exit, and innovation processes into industrial organization studies clarifies how the underlying processes shape the industry in which market outcomes are determined. Although research on the selection of firms and the evolution of market structures and industries has a long tradition, primary data on industries over a long time period are scarce. Due to the lack of industry specific and firm specific data over industry's life cycles, little is known about what factors systematically trigger the expansion or contraction of the number of incumbent firms, and what temporal relations exist between entry, exit, and survival of firms and scales of operation as the industry evolves. To date, most empirical studies have adopted a static approach of entry, exit, and survival analysis across industries. By building up a detailed historical profile of an industry, we can go much further in explaining the evolution of industries than would be possible solely on the basis of static analyses.

Since previous research showed that entry, exit, and survival rates of newspaper firms depend systematically on the stage of development of the industry in the cycle from birth to maturity, therefore we also selected the daily newspaper industry in The Netherlands from 1848 to 1997. Another important reason for studying the Dutch daily newspaper market is that its history is well-documented. Daily newspapers not only provide information about their own history, but also about the economic, technological, political, and cultural developments in The Netherlands. Or as Park (1923) pointed out,

"The newspaper has a history: but it has likewise, a natural history.... The natural history of the press is the history of a surviving species. It is an account of the conditions under which the existing newspaper has grown up and taken form".²

Unlike the vast majority of industries, the newspaper industry is intimately linked with the protection of freedom of expression. To ensure the economic independence of newspapers the Dutch government has intervened in the Dutch newspaper industry on several occasions. The evolution of the industry and the survival chances of newspapers have been influenced by government regulations and financial support. Hence, the daily newspaper market in The Netherlands can be described as an imperfect (regulated) market. Nowadays, the collective price policy of the Dutch Newspaper Publishers' Association (NDP) and the Dutch government restricts the possibility of newspapers to compete with prices and advertising tariffs. Furthermore, the Press Fund 'Bedrijfsfonds

²See also Carroll (1987, p. xxiii).

voor de Pers', installed in 1971, may provide financial assistance to newspapers that struggle for survival. Because the daily newspaper market is and always has been linguistically demarcated and geographically segmented, we can investigate the effects of government interventions on the market structure and survival opportunities of newspapers. Newspapers did not have to compete for their market share with foreign newspapers in The Netherlands. Therefore, we do not have to take foreign competitors into account in this study.

The results of this study offer interesting insights for economists, historians, and politicians. By going back in time, we can explain the state of the life cycle the present daily newspaper industry is in. The remainder of this chapter is organized as follows. Section 1.2 presents a brief literature review of the theories of industry evolution. Section 1.3 provides an outline of the thesis.

1.2 Review of the Existing Theories of Industrial Evolution

1.2.1 Introduction

Recent game theoretic literature brought an indisputable contribution to the insight in market structures associated with entry and exit patterns within and between industries (see, e.g., Bresnahan and Reiss (1987, 1990, 1993), Tirole (1990), Sutton (1992, 1997)). This game theoretic approach which aims to explain the long-run issues surrounding the determination of industry and market structure addresses issues that are closely related to the empirical literature on industry and market structure. Despite the fact that the game theoretic industrial organisation models analyse the process to the possible market equilibria, they are not able to solve the issue of the lack of a unique market structure equilibrium. The analyses are concerned with stationary multi-equilibria, and do, for instance, not provide an evolution of market structures at different times. To identify the most appropriate model or market equilibrium for any particular industry requires knowledge of various market and industry specific characteristics, the evolution of the industry's market structure, the evolution of firms and so on. Unfortunately, only some of these features are observable. Making assumptions based on additional empirical information these game theoretic models then select the unique equilibrium (e.g., MacLeod (1987), Cairns (1989)). The richness and depth of understanding of these additional assumptions required to select the equilibrium can only come from a detailed historical analysis. For instance, Sutton (1992) shows the importance of the form of the underlying game with theoretical and empirical evidence. However, every industry is different. Gathering the required additional information specific to a particular industry or market via a case study approach may provide more precise information about the economic mechanisms in operation in a specific case. As Sutton (1994, p. 42) noted, "Single industry studies in this framework appeal to market specific features to motivate additional assumptions, allowing us to tailor-make a model for one particular market".

The question that arises is, what do we know about industries, in particular their evolutions, and what do they have in common? This section therefore provides a brief survey of recent empirical and theoretical studies on the dynamic evolution of the industry market structure. It summarizes the entry, exit, and survival of firms in terms of the evolutionary changes in an industry from birth to maturity.

1.2.2 Organizational Ecology

Scholars in different disciplines have studied firm behaviour and developments in markets. The most relevant research fields are organizational ecology and industrial organization. A brief overview of the history of economic and sociological thoughts gives a good understanding of the two main streams. Organizational ecology is a sociology-based approach that studies the evolution of industries (see, e.g., Carroll (1987, 1997), Hannan and Freeman (1989)). This stream offers an interesting perspective to analyse the dynamics of specific organizations which are tied to their membership in a particular industry (organizational populations). One of the important research areas in organizational ecology concerns the study of vital rates such as the entry and exit rates of organizations in a particular industry. These rates are strongly influenced by environmental forces, embodied in the number of firms (density) operating in any industry. This relationship is formulated in the density dependence model of competition and legitimation (Hannan and Carroll (1992))³. According to the density dependence model, entry of firms is an inversed U-shaped function of the number of incumbent firms. The rate of entry is proportional to the degree to which an organizational form is legitimate and inversely proportional to the level of competition. In the beginning of an industry, when the number of firms is low, the entry rate is low because the organizational form is not fully legitimate. Increases in the number of firms accelerate the entry rate by increasing the form's legitimacy. When the number of incumbent firms is high, the inhibiting effects of competition prevail and the entry rate slows down. An entry into the industry is based on the scarcity of material resources that firms compete for. The availability of particular environmental resources influences both the expansion of the number of firms and the level of competition between firms (Hannan and Freeman (1989)). Changes in competition and environmental resources determine a ceiling on the expansion of the number of firms. This ceiling is defined as the carrying capacity of the industry (Hannan and Freeman (1977)). When the number of firms nears the carrying capacity, the entry of a new firm greatly intensifies competition. Entry in a market is therefore influenced by the number of incumbent firms and the carrying capacity of the industry.

³Density dependence is defined as the effect of the number of organizations (density) on entry, exit or survival processes of firms in industries. The effect of the number of firms on legitimation, competition, and entry and exit rates changes systematically as the industry ages (see, e.g., Hannan and Freeman (1977), Carroll (1997), Hannan (1997)).

In organizational ecology strong emphasis is also given to the existence of inertia in markets. Firms are assumed to be inert and unable to undertake reorganizations of goals, authority, technology, and market segments. Therefore, early in the industry life the relationship between the number of firms and competition is strongest, and weakens as the industry matures (Hannan (1997)). This inertia is assumed to be caused by past performance and market growth, by competitive experience and the diversity of market environment, and by the firm's age and size (Miller and Chen (1994)).

1.2.3 Industrial Organization

An important shortcoming of organization ecology is that it aims at explaining industry behaviour without paying attention to the conduct and the particular performance of individual firms. As Caves (1998, p. 1947) pointed out, "To an economist's eyes, its treatment of turnover in business populations suffers from eschewing simple priors about business behaviour: intended profit-maximization and the need to cover costs to keep a firm's coalition together". Industrial organization studies contribute significantly to the understanding of how a market works from birth to maturity, associated with firms' behaviour. Before the eighties, in almost all studies the entry, exit, and survival processes were closely related to the structure-conduct-performance (S-C-P) paradigm of an industry or product market⁴. Though the studies of S-C-P contributed significantly to the understanding of the various market structure and performance of firms, they were not sufficient to explain the evolution of industries. In the last two decades the focus in industrial organization studies has shifted away from the S-C-P approach to new approaches. Recent industrial organization studies have increased the insights in the dynamics of industries. In general, the results point out that there is considerable short-run entry and exit turnover in most industry markets, while the long-run market structure is relatively stable (see, e.g., Bresnahan and Reiss (1987, 1990, 1993), Dunne, Roberts and Samuelson (1988)). The entry and exit rates of firms are positively correlated across industries. However, comparisons between entry and exit rates in expanding and declining industries reveal that they differ substantially (e.g., Geroski (1991), Baldwin (1995)). Relevant in this respect are the effects of sunk costs on market structure and firms' behaviour. In the contestability doctrine the market structure, the conduct, and performance of firms have been associated with the existence of sunk costs (see e.g., Baumol and Willig (1981), Stiglitz (1987), Tirole (1990)). This doctrine implies that firms may behave competitively because of the threat provided by potential entrants even when the market is characterized by a limited number of incumbents. In other words, the force of competition is determined not only by the number of existing firms but also by the

⁴The S-C-P paradigm, introduced by Bain (1956), explains the relationship between alternate forms of market structure, firms' conduct and the performance of firms. In general, the various aspects of the paradigm often overlap or are interdependent. Within Bain's pioneering S-C-P approach, it was supposed that an one-way causation runs from structure to conduct to performance.

potential entrants. Baumol and Willig (1981) showed that sunk costs constitute an entry barrier, while fixed costs do not create barriers to entry⁵. The existence of sunk costs determines the entry and exit thresholds of a market, and the competitive interaction that arise when sunk costs exist, particular when sunk costs are relatively small. The role of sunk costs also became of significant importance in other industrial organization studies. For instance, Eaton and Lipsey (1980, 1981) have convincingly argued the interaction of entry and exit rates, and that sunk costs are an essentially dynamic phenomenon. An increase in the irrecoverable costs should act as a barrier to entry, resulting in fewer firms in the market. Moreover, sunk costs are closely linked to the prospects of strategic interaction, influencing entry and exit rates of firms, and the market structures. These costs explain substantially the short-run processes in industries (see, e.g., MacLeod (1987), Sutton (1992), Rosenbaum and Lamort (1992), Dixit and Pindyck (1994)).

Although many industrial organization studies contribute significantly to the understanding of the various market structures and firms' behaviour, they are not sufficient to explain the evolution of industries. The industrial organization literature still pays too little attention to the relationship between industry dynamics and the age of the industry. It is therefore worthwhile to focus on studies which investigate the evolution of industry dynamics in the long-run, to attribute to a better understanding of how market structures of industries evolve. Recently, a wave of studies has focussed on analysing and modelling the evolution of entry, exit, and survival rates of firms and the industry market structures. These studies led to a richer set of conclusions, and a richer set of empirical regularities for theorists to puzzle over, than studies which did not connect the age of the product / industry to the evolution of the structure of its market (Jovanovic (1998))⁶. Since the seminal work of Gort and Klepper (1982) the diffusion of innovations and of firms' survival rates has been associated with the industry life cycle theory. They showed that the time path of the diffusion of product innovations determined not only the pattern of entry and exit rates but the ultimate market structure. The number of firms are connected to the age of the product / industry and to the evolution of the structure of its market. The markets are characterized by a life cycle from their beginning until the period of diminishing number of incumbents. More explicitly, the number of firms in a market should be modelled as a dynamic process. The industries considered by Gort and Klepper (1982), Klepper and Graddy (1990), and Jovanovic and MacDonald (1994b) demonstrated that output rises and prices fall at decreasing (percentage) rates both during the growth phase and the decline phase for the number of firms. These empirical findings stimulated

⁵In their definition fixed costs are those costs that cannot be reduced even in the long-run by decreases in output as long as the production process continues. These costs are fixed in the long run as well as in the short run. However, fixed costs can be diminished by complete cessation of production.

⁶See, e.g., Phillips (1956), Collins and Preston (1961), Gort (1963), and Shepherd (1964). In his study of 57 product histories, Kuznets (1930) had already shown the existence of a product life cycle in terms of industry sales and output and the price of the products. His study had been based on individual products and not on the numbers of firms.

the development of theoretic models of industry evolution. The selection and learning model of Jovanovic (1982) has been influential in shaping the recent literature. In the Jovanovic model, a sequence of firms enters the market. Each firm has a level of efficiency that is characterized by its unit cost of production. Firms learn about their efficiency as they operate in the industry. Over time, the efficient firms grow and survive, while the inefficient ones decline and exit. Hence, the longer firms remain in the industry the more they learn about their true costs and their relative efficiency and the less likely they are to exit. Other models of innovation adoption or entry decisions also derive an S-shaped diffusion path as the outcome of an assumed heterogeneity across firms (see, e.g., Jovanovic and Lach (1989), Jovanovic and MacDonald (1994a)). Due to learning by doing firms reduce their costs. If the learning effect cannot be fully appropriated by the incumbent firms, then unit production costs decrease further as the number of firms grows. Through the new lower industry costs less efficient firms decline and exit the industry⁷.

Furthermore, the empirical and theoretical evidence of life cycles indicates that shake-outs are a common phenomenon in the evolution of many industries. These industries experience that the number of firms first rises, then later falls, as the industry evolves, despite continued growth in output (Gort and Klepper (1982), Klepper and Graddy (1990), Klepper and Miller (1995)). The theoretic diffusion models developed by Jovanovic (1982), Jovanovic and Lach (1989), and Jovanovic and MacDonald (1994a) do not explain this explosive growth of output and the decline of the product price alongside rapid entry and subsequent net exit. Therefore, a number of theories has recently been proposed to explain the extent and timing of shake-outs across industries. The first group emphasizes the role of precipitating events, such as major exogenous technological changes (e.g., Jovanovic and MacDonald (1994b), Klepper (1997)). The new technology offers low unit costs, but at a higher level of output per firm. Firms that are able to implement the new large-scale technology early increase their output and thus are able to produce efficiently. Consequently, the exit rate rises sharply until the less efficient firms are forced out of the market. Another group interprets shake-outs as part of a gradual evolutionary process (Nelson and Winter (1982), Winter (1984), Klepper and Graddy (1990), Klepper (1996)). This evolutionary theoretic view of economic processes and economic change emphasizes that firms differ in their behaviour due to strategy, structure, and core competencies. This view is focussed on the differences in firms innovative capabilities and the importance of firm size in appropriating the return from

⁷The entry and exit process and the dynamics of firm size can also be explained by stochastic models of firm evolution with purely idiosyncratic shocks (see, e.g., Hopenhayn (1992a, b), Pakes and Ericson (1998)). Hopenhayn (1992a), for instance, developed and analysed a dynamic stochastic model for a competitive industry which endogenously determines processes for entry and exit and for individual firm's output and employment. He showed that entry and exit are part of the limiting behaviour of the industry and not only part of the adjustment to a long-run steady state. Furthermore, the results indicate that the rate of survival will be higher for older firms together with average size, profits and value of firms.

innovation to explain how entry, exit, growth, and market structure evolve over the life cycle of an industry. The majority of product innovations are introduced in the expanding phase of the industry life cycle, while process innovations in latter phases are more likely to originate from large size firms (Utterback and Abernathy (1975)). Through the increase in competition, firms are becoming more price and cost conscious, and as a consequence, the innovative activities of firms gradually shift from product to process innovations. Process innovations increase the firm's optimal scale and reduce the production costs. The technological improvement compresses the profit of the less efficient firms, in general the smaller firms, who are not able to imitate the new innovation and exit, generating the 'shake-out'⁸.

As an industry or market evolves from birth to maturity, the rate of demand growth and the minimum efficient size of firms are both likely to change. These structural changes influence the entry, exit, and survival rates of firms. It has been shown that both entry and exit rates depend systematically on the phase of the industry's life cycle from birth to maturity (see, e.g., Gort and Klepper (1982), Hannan and Carroll (1992), Carroll (1997), Klepper (1997)). Closely related to the relation between entry and exit and the evolution of the industry is that between evolution of firms and survival. For the entering, surviving, and exiting firms in the twenty-five new product markets that Agarwal and Gort (1996) studied, they found that firm's survival rates increase with the age of the firm but fall with the age of the industry. This result is supported by Dunne, Roberts and Samuelson (1988, 1989b), who also found a positive relation between firm age and survival throughout the observed age range for U.S. manufacturing data. According to Jovanovic (1998), these empirical stylized facts about survival rates suggest that older incumbent firms are more efficient, and that the threshold of efficiency for viable operation in the industry rises as the industry matures. The empirical literature also shows that entry in most industries is easy, but to survive is difficult (see Geroski (1991, 1995), Audretsch (1995), Baldwin (1995), Caves (1998)). Recent empirical studies investigating the survival rates of entrants find a negative relation between starting size of firms and the probability to exit. Mata (1994), for instance, found for the Portuguese manufacturing sectors that the hazard rates of incumbents and entrants are considerably higher for smaller than for larger firms. Furthermore, the results showed that four years after entry 47 percent of the entrants had failed, while only 27 percent of incumbents had exited in the same period. Audretsch and Mahmood (1995) also found that the survival rates of firms are positively related to size and age of firms in the U.S. manufacturing. A comparison between hazard rates of entrants into a product or a process innovative industry by Audretsch (1991), revealed that the survival rates are determined by the

⁸Evolutionary economics studies, for instance Winter (1984), point at the existence of routinized regimes, where information based on the product of experience within the industry is an important input in generating innovative activity. The incumbent firms have relative innovative advantages over entrants. Successful routines are replicated, leading to growth, while unsuccessful routines disappear. Because success yields replication, large size firm is positively related with profitability and thus with survival chances.

conditions of technology, scale economies, and demand underlying the industry. In process innovative industries the survival chances of new firms are generally lower than for the entrants into product innovative industries.

It is a stylized fact that the survival rates for entrants are low (Geroski (1995)). This is consistent with the view of learning by doing processes and the size of firms. Entrants accumulate knowledge through learning by doing. The larger this base of knowledge, the larger the minimum efficient size of firms. Geroski (1995) recognized that even for successful entrants it may take more than a decade to achieve a size comparable to the average incumbent. Hence, both firm size and age are correlated with the survival and growth of entrants. Sutton (1997) and Caves (1998) summarize the recently accumulated stylized empirical facts about entry, exit, and survival of entrants and incumbent firms. Their studies mentioned the following stylized facts:

- (1) the probability of survival increases with firm size and the rate of growth of a firm, given that it survives, is decreasing in size;
- (2) the growth rate of a firm is smaller as the firm becomes older but the probability of survival is greater;
- (3) the number of firms tends to rise to a peak and later fall to some lower level (according to Jovanovic (1998) the number of firms stabilizes at a level of about 40 percent below the peak);
- (4) across industries there is a positive correlation between gross entry rates and gross exit rates;
- (5) entry is more likely to occur into smaller size classes, and the initially smaller entrants have generally a lower survival rate;
- (6) a firm's survival rate increases with the age of the firm but falls with the age of the industry;
- (7) during the expansion phase of the number of firms, the most recent entrants account for a disproportionate share of product innovations, and the number of major product innovations reaches a peak in this phase.

The stylized facts indicate that the age and stage of the industry life cycle can explain a significant part of the firms' entry and survival rate differences over time. Because entry seems to have an important influence on the evolution of industry structure, many studies therefore investigated which factors influence the number of entrants. The main important factors that influence the number of entrants over a period are: the pre-entry profit rate of incumbents, the minimum efficient scale of entry, the rate of demand growth, the elasticity of demand, and the magnitude of sunk costs (e.g., Geroski (1995), Sutton (1997), Caves (1998)). Kessides (1990) attempted to specify a testable model of entry behaviour which describes the factors that may influence the entry decisions of firms⁹.

⁹The model using cross-section sample of all four-digit U.S. manufacturing industries that experienced net entry between the Census years 1972 and 1977.

The results suggest that the profit level of incumbent firms and expected growth of industry demand are very strong incentives to entry. Under rapid growth conditions, entry by potential firms will not necessarily reduce incumbent sales and decrease their profits. In these markets the incumbent firms will have less of an incentive to engage in aggressive post entry behaviour. The results indicate that incumbent firms are significantly more likely to take strategic and tactical actions to deter entry when they are profitable, especially in concentrated industries. It should be noted that Kessides' result is dependent upon the assumption regarding the manner in which growth in demand for the industry's products influences the number of participants in the market and the profits accruing to each operating firm. If incumbents expand at a faster rate than the industry demand grows, then the number of participants decreases or is at most constant in the industry. According to Mata (1991), the expected lifetime of firms in a market, if entry fails, is probably influenced by two main factors: the active rivalry by the incumbent firms, and the entrant's ability to fight and to take action to ease collusions after entry has taken place. Tirole (1990) provides an impressive survey of the theoretic literature on entry and strategic and tactical actions of incumbent firms. Firms may dispose of a variety of theoretical business strategies, depending on whether they want to deter entry, induce exit of immediate rivals, or battle for market shares, and the role of sunk costs. Given the size of the market, the larger the scale at which entry must be attempted, the smaller the number of firms in the market and the higher the reduction in incumbents' output as a result of successful entry of new firms. The behaviour of incumbents is therefore determined by the incentives they face and the market form of the industry. In an unconcentrated or expanding market with a large number of firms, the initiation of retaliatory measures against an entrant is low. However, in a concentrated market the incumbents have an incentive to engage in collusive punitive actions against new firms. Geroski (1991), Sutton (1992), and Baldwin (1995), for instance, provide comprehensive empirical analyses of the dynamics of the competitive process in a broad range of industries, in particular, in Canada, United Kingdom, and the United States of America. The empirical analyses provide a better understanding of the dynamic processes of the entry and the exit of firms, the growth and the decline of incumbent firms, and the merger and acquisition processes over time. These studies showed that decreases in concentration are associated with higher entry and exit rates and that increases in concentration are not so much associated with lower rates of entry but with shake-outs of incumbent firms. The shake-out theory presumes that economies of scale increase the survival opportunities of the more efficient large scale plants and firms (e.g., Jovanovic and MacDonald (1994b)). However, the shake-out theory in the previous evolutionary industry models assumes that aggregate output increases, while an industry's product demand may decline and eventually extinct.

A small number of theoretic studies has recently been conducted to explain the competitive process in industries which were characterized by declining demand. In these declining industries the most important firms' competitive actions pertain to divestment rather than investment. An industry experiencing a decline in market demand must reduce

its capacity in order to remain profitable of its firms. Firms can divest by cutting capacity incrementally or by exiting. Incremental reductions can be carried out by closing part of an ongoing firm. The pattern of capacity reduction and exit of firms depends on the industry structure and the market's decline (Whinston (1988)). Some studies emphasize that large firms are more efficient (see, e.g., Jovanovic and MacDonald (1994b), Klepper (1996)). The differences in efficiency would cause smaller firms to be 'shaken out' relatively early if prices fall during the declining phase. However, in declining industries the competitive process can also generate a stakeout of firms. In the absence of cost differences in efficiency between firms, smaller firms can remain profitable over a longer period as market demand is declining. Controlling for plant size as the industry devolves, larger firms would rationally choose to exit early or reduce capacity by a greater percentage than smaller firms. Ghemawat and Nalebuff (1985) theoretically showed that shrinking demand creates pressure for capacity to be reduced or eliminated to maintain profitability. If firms have different market shares and firms are perfectly informed about their competitors' costs then the survival chances of firms depend on the size ordering of the incumbent firms; the largest firm is the first to exit the industry. Londregan (1990) generalized the Ghemawat and Nalebuff (1985) result for exit from a declining industry to cases in which reentry is a costly but feasible option. The outcome was in line with Ghemawat and Nalebuff's (1985) finding. Other extensions of the Ghemawat and Nalebuff's model (1985) showed that large (multi-plant) firms that anticipate an eventual decline in demand of a specific product begin to close plants or merge with its rival to provide a revenue increase of the remaining plants (see, e.g., Reynolds (1988), Whinston (1988)). In a subsequent paper, Ghemawat and Nalebuff (1990) postulated a model in which firms divest continuously as demand declines. Large firms experience a greater pressure to reduce incrementally their capacity to the size of the formerly smaller firms¹⁰. The larger firms can increase their survival chances by closing plants. If this process happens then the concentration in the declining industry diminishes over time, as firms' sizes become more equal. The convergence in size of firms occurs under both the 'shakeout' and 'stakeout' processes (Lieberman (1990)). Whinston (1988) showed that it is difficult to reach any general conclusions about the pattern of firms' capacity reduction and exit. The results strongly indicate that knowledge of the industry and pattern of shrinking demand over time are necessary to predict which firms reduce their capacity or exit. Or as Ghemawat and Nalebuff (1990, p. 181) pointed out, "we still face obvious gaps in our understanding of how industries actually decline".

Empirical evidence on the pattern of firms exit and capacity reductions in declining industries has primarily been obtained from case studies. Many studies have found higher rates of exit for small firms and plants, but only limited evidence has been found to support stakeouts. For example, Lieberman (1990) showed that for 30 declining chemical products, in general, small size firms exited disproportionately the market, whereas the

¹⁰According to Ghemawat and Nalebuff (1990), the intuition that the largest firms reduce capacity first is that large firms have lower marginal revenue and hence greater incentives to reduce capacity.

large-share firms made more frequent incremental reductions of capacity. In the U.K. steel casting industry, Baden-Fuller (1989) observed that the two largest firms closed during the early years of decline, and that diversified firms were more likely to reduce capacity first.

The aim of this section was a discussion of the most important theories that may contribute to a deeper understanding of the phenomena studied in this thesis. The main sources in this respect have been the organizational ecology theory and the industrial organization theories of industry evolution. It appears that a combination of the various concepts would enrich the insights in entry, exit, and survival processes of firms and the market structure over industry life cycles. From the discussion of the theories it has become clear that the confidence in theoretical results depends on the empirical validity of the assumptions upon which theoretical models are based. Although the organizational ecology research and industrial organization research dealing with the evolution of industries differ significantly in approach, they confirm the importance of the industry life cycle on the entry, exit, and survival rates of firms. In this thesis we combine these two approaches to analyse the entry, exit or survival opportunities of firms and the market structure over an industry's life cycle. Additionally, we investigate the impact of shocks and political events on the number of firms in the industry.

1.3 Outline of this Study

The goal of this thesis is to attribute to the insight in the determinants of the evolution of an industry and its market structure, and in the determinants of entry, exit, and survival rates by taking the case of the daily newspapers. The historical analysis of this industry in The Netherlands reveals that the market structure is determined by the technology, the existence of scale economies, and the demand underlying the industry. With the obtained information we also increase the insights in the effects of government interventions on the market structure for the daily newspapers. The 150 years of data available for this study are a long enough period to observe an almost complete Gort-Klepper's life cycle for the daily newspaper industry.

The study starts in 1848, the year that freedom of opinion, speech, and press was incorporated in article 7 of the Constitution of the Kingdom of The Netherlands. In order to understand the context in which the firms under study compete, the industry is analysed descriptively over the period between 1848 and 1997 in chapter 2. There, we present the literature on industry life cycles and study the life cycle characteristics of the market for daily newspapers in The Netherlands from 1848 onwards. We estimate hazard and survivor functions to investigate how the survival chances of firms depend on the state the market is in. Our results show that survival opportunities depend on the cyclical evolution of the number of daily newspapers. The life cycle of the competitive newspaper industry is characterized by a turning period of turmoil during World War II. Nowadays, the Dutch daily newspaper market has reached the state where opportunities to successfully establish

a new newspaper are very low.

Changes in tax policy can substantially alter market structures. They can change entry conditions and survival opportunities of entrants and incumbent firms significantly. Cuts in revenue or production unit specific taxes stimulate entry of new firms and increase the number of available products. Usually, a cost-reducing shock cannot be observed directly, or at least not its exact timing. The abolition of the stamped paper duty in 1869, known as 'Het Dagbladzegel', is a very clear event that affected the market structure. In chapter 3 we study the effects of the 1869 repeal of the stamped paper duty on the market structure for daily newspapers in The Netherlands. The 1869 tax cut was a cost-reducing shock that changed entry and survival conditions dramatically. It increased oligopolistic competition in large cities and stimulated entry of newspapers in small cities. We present two models to investigate these phenomena and estimate a simple hazard rate model to analyse their effects on the survival chances of newspapers.

In both chapter 2 and 3 we analyse the relationships between survival chances of newspapers and cyclical characteristics of the industry and the effects of two political events in a static setting. We show that government interventions can significantly affect the market structure in the expanding phase of the industry. One main problem is that we do not know whether the effects of government actions depend on the cyclical evolution of the industry. Therefore, in chapter 4 we investigate whether governments can have a large influence on the market structure through interventions during the industry life cycle. In this chapter we explore the dynamic setting by using annual data of all newspapers in the data set. We study the effect of four political events on the market structure for daily newspapers in The Netherlands. Political events may change the market structure, although the effect of these events depends on the cyclical evolution of the market. Policy measures to lower entry barriers in an expanding industry created new entry and survival opportunities for potential entrants and incumbent firms. Exit barriers enhancing policies to stop concentration have not been successful.

The number of daily newspapers in The Netherlands has experienced a continuous decline in the post-World War II period which coincided with a continuous increase in total output. Chapters 5 and 6 are dealing with the development of increasing scale economies in the daily newspaper industry since 1950. These chapters provide an understanding of the economics that underlie the survival possibilities of newspapers when concentration persists. Chapter 5 studies the effects of macroeconomic, industry and firm specific shocks on the exit chances of firms in the concentrating market for daily newspapers in The Netherlands between 1950 and 1996. First a brief overview of the exit literature is presented. Exponential and piecewise constant hazard rate models are used to analyse the influence of three types of shocks on the survival chances of newspapers along the concentrating industry's time path. The piecewise constant model is flexible and appropriate to investigate whether the parameter estimates of the determinants vary over time. We find that the exit hazards of daily newspapers depend on the circulation size, ownership, and the size of the market upon entry. Moreover, the effects are time dependent.

The process that takes place within the industry as newspaper firms enter and exit, and grow and decline is described in chapter 6. This chapter analyses the market structures and intensity of competition in the Dutch market segments for daily newspapers as explained by market share mobility statistics. These statistics measure the intensity of competition, the market structure, and the market share dynamics in the industry between 1950 and 1995. During this period large-scale newspapers became more prominent, and the newspapers' contents became more homogeneous. A geographical analysis of the evolution of the structure of market segments therefore appears valuable to understand the competitive process in the industry. To study this process more accurately we present a decomposition and disaggregation of market share mobility into market segments and identify the characteristics of entrants, continuing firms, and exiting firms in the industry.

Finally, chapter 7 presents a summary and conclusions of this thesis. We also provide some recommendations for future research based on the experience with the daily newspaper industry in The Netherlands. Studies that investigate the survival chances of firms and measure the effects of government interventions should acknowledge the cyclical characteristics of the industry.

Chapter 2

The Life Cycle of Daily Newspapers in The Netherlands: 1848-1997

2.1 Introduction

Freedom of the press was incorporated in Article 7 of the Constitution of the Kingdom of The Netherlands in 1848¹. This political event gave an impulse to the evolution of the number of newspapers in The Netherlands. Until World War II the number of daily newspapers grew steadily. In 1869 an explosive increase occurred as a result of the abolishment of a special tax system for newspapers, known as the 'Dagbladzegel' (cf. Hemels (1969a, b, 1992)). According to Schneider and Hemels (1979) this change caused a drop in production costs by as much as 50 percent, raising survival chances for existing newspapers and lowering entry costs for new publications. During the late 1960s and early 1970s the market for daily newspapers in The Netherlands was confronted with an upsurge in press concentration. In 1971, as a temporary provision against concentration of the press, the Dutch government installed the 'Bedrijfsfonds voor de Pers' to financially support daily newspapers in trouble, which became a foundation in 1974 and still exists today.

This chapter analyses the economic dynamics of the market for daily newspapers in The Netherlands using data on all daily newspapers in The Netherlands from 1848 until 1997. Modelling the dynamics of the Dutch daily newspaper market is inspired by its nature, characterized by an oligopolistic structure with price-inelastic demand and differentiated supply, being linguistically demarcated and regionally segmented. Its history is well-documented because long time-series carrying newspaper-specific statistical information are available.

Research on the newspaper market in The Netherlands primarily focussed on the decreased number of newspaper titles during the last decades. De Ridder (1984) studies concentration tendencies over the period 1950 to 1982, using a sample of 33 daily newspapers. He finds that the number of newspapers reduces, that widely circulating

¹This chapter is based on: H.L. van Kranenburg, F.C. Palm, and G.A. Pfann (1998), "The Life Cycle of Daily Newspapers in The Netherlands", *De Economist*, 146, 475-494.

papers expand faster, and an increasing number of publishers unite or start to work in close cooperation. Van Cuilenburg, Kleinnijenhuis and De Ridder (1988) argue that the inverse relationship between the number of daily newspapers in the market (press concentration) and the number of copies sold (circulation) is due to the increasing costs of productive capital. Indeed, the number of copies sold did increase at least until 1990 (see, e.g., Abbring and Van Ours (1994), and Chapter 5). However, both Jovanovic and MacDonald's (1994) life cycle theory of competitive industries and empirical evidence suggest that technological shocks and increasing production efficiency reduce production costs, resulting in an increase of the firm's (newspaper's) optimal scale (circulation). Klepper (1996) argues that during the declining phase of the industry's life cycle, firms with high product-to-process investment ratios are disproportionally driven out of the market due to production cost disadvantages.

The aim of this chapter is to study the life cycle of the market for daily newspapers in The Netherlands. In particular, we study the determinants of the life expectancy of daily newspapers over the period 1848-1997 using hazard rate models as in, for example, Audretsch and Mahmood (1995). Besides duration, market density measures, indicators for regional market segmentation, and dummy variables for World War II are the main determinants of the survival rates of daily newspapers. We compare our findings with those of other studies such as Carroll (1987) and Carroll and Hannan (1995) who investigated the market for newspaper publishers in Argentina, Ireland and the U.S. for a longer period of time, and the industry life cycle theory by Gort and Klepper (1982).

As far as the availability of data allows us to compare the Dutch newspaper regularities with the statistical regularities that have emerged from the empirical industrial organization literature we will do so. For instance, in his bound approach Sutton (1997) advocates to check these regularities in empirical studies. He mentions the following empirical regularities: (1) regularities concerning size and growth: the probability of survival increases with firm size and the rate of growth of a firm given that it survives is decreasing in size, (2) regularities regarding the life cycle: the growth rate of a firm is smaller as the firm becomes older but the probability of survival is greater, (3) regularities with respect to shake-out: the number of firms tends to rise to a peak and later fall to some lower level, (4) regularities on turbulence: across industries there is a positive correlation between gross entry rates and gross exit rates. As pointed out by Jovanovic (1998), the second and fourth regularities are documented in Agarwal and Gort (1996) and the third regularity is convincingly established both in Gort and Klepper (1982) and Agarwal and Gort (1996). For the entering, surviving, and exiting firms in the twenty-five new product markets that Agarwal and Gort (1996) studied, they find that firms' survival rates increase with the age of the firm but fall with the age of the industry. With respect to the third regularity, in their study of 46 product histories, Gort and Klepper (1982) conclude that markets for products generally pass through at least five stages in the course of their evolution: after an initial stage (I), there is rapid entry of firms in the market (II), then a peak is reached (III) which is followed by a stage in which the number of producers substantially decreases (IV) and finally stabilizes (V).

The 150 years of data available for this study are a long enough period to observe an almost complete life cycle of the newspaper industry. We consider the effects of the life cycle phases on the expected life span of daily newspapers. Despite the long tradition of research investigating factors which determine whether a new firm is likely to survive, Brüderl, Preisendörfer and Ziegler (1992) come to the conclusion that the results are inconclusive. The reason they highlight is the inconsistent and sometimes incorrect use of various research methodologies in different studies. We estimate a Cox' proportional hazard model and several survivor functions to find out which model fits the data best.

The chapter is organized as follows. Section 2.2 outlines the econometric models, and section 2.3 presents the data used in this chapter. Section 2.4 discusses the outcomes of our empirical analysis. Section 2.5 concludes.

2.2 Event History and Duration Models

Previous studies on the Dutch daily newspaper market neither used all available historical data nor accounted for the dependence of survival rates on the stage of this life cycle. Event history and duration models are most appropriate to investigate the relationship between daily newspaper survival rates and the evolution of the newspaper industry. The analysis of the number of titles should include the state variables of the market for newspapers. Even in the case where complete spells of data are not available, at least the fact that the evolution of publication rates is state-dependent must be acknowledged.

A natural starting point for such a study is a survivor function that is easy to understand, is practical to work with, and produces results which can be interpreted in a straightforward manner. An example of such a model is the survivor function that assumes an exponential distribution of duration (see Kiefer (1985, 1988), Lancaster (1990)).

Let $F(t)$ be the distribution function $F(t) = \Pr(T < t)$ of random variable T (being the lifetime on a newspaper-specific clock, that is set equal to zero at the moment a newspaper enters the market), where T is less than t , and let $f(t) = dF(t) / dt$ be the unconditional probability density function. The survivor function is defined as $S(t) = 1 - F(t) = \Pr(T \geq t)$. The exponential distribution function is defined as

$$F(t) = 1 - \exp(-\lambda t), \quad \lambda > 0, \quad (2.1)$$

The ratio of the density and the survivor function, $f(t) / S(t)$, is referred to as the hazard rate, $h(t)$, which is "the rate at which spells will be completed at duration t , given that they last until t " (Kiefer (1988), p. 651). For the exponential distribution of durations, the hazard rate yields: $h(t) = \lambda$, which is constant through time and therefore characterized as memoryless. This property is often found to be in conflict with data on duration dependence, and alternative functions have been suggested. In this chapter we also consider survival models that correspond with the Weibull distribution and with the

Gamma², Normal and Log-logistic distributions which do not necessarily imply monotonic exit rates. Duration dependence is positive if the hazard rate rises with t ($dh(t)/dt > 0$), meaning that the exit probability increases with the duration of being in the market. Vice versa, if $dh(t)/dt < 0$, duration dependence is negative, reducing the exit probability with age.

Although duration functions and corresponding hazard rates relate to economic theory and appeal to the economist's intuition, neither theory nor intuition provides sufficient guidance to decide a priori what the appropriate model is. Apart from the available information, a commonly applied solution in duration studies is the use of the proportional hazard function that depends on the baseline hazard rate $h_0(t)$ multiplied by a vector of explanatory variables X with unknown coefficients β . This yields

$$H(t, X, \beta, h) = \exp(\beta X) * h_0(t), \quad (2.2)$$

with $h_0(t)$, the baseline hazard function being independent of X and equal to $H(\cdot)$ if $\beta = 0$. The exogenous variables shift the level of the hazard rate, but do not affect its shape as a function of duration.

The partial-likelihood approach, initially suggested by Cox (1975), can be used to estimate β independently of $h_0(t)$. The partial likelihood is the ratio of the hazard function $H(\cdot)$ for the single spell that is completed at duration t , divided by the sum of spells which are still in progress at duration t . A major advantage of this approach is the easy handling of censored data, and the estimation of β without knowledge on $h_0(t)$. A shortcoming, however, is its inflexibility and the fact that the baseline and the intercept in $\exp(\beta X)$ cannot be jointly estimated with the coefficients of the exogenous variables. The proportional hazard function is homogeneous of degree zero in the vector of explanatory variables, so that any variable that does not vary over spells will simply multiply both numerator and de-numerator of the partial-likelihood function, and consequently drops out. Therefore, we do not only estimate Cox' proportional hazard function, but we also present estimates of the various survivor functions we have discussed extended with explanatory variables X .

2.3 The Data

The unit of analysis in our research is the newspaper publication (title). Our data set contains information on every daily newspaper which appeared on the market and has left

²Stacy & Mihram's (1965) generalized Gamma distribution with p.d.f. for duration t yields $f(t) = \rho \lambda^{\rho} t^{\rho-1} \exp[-(\lambda t)^{\rho}] / \Gamma(\rho)$, with $\Gamma(\cdot)$ being the Gamma function. The two-parameter Weibull distribution is a special case if $\theta = 1$; the exponential distribution is a special case if $\theta = 1$ and $\rho = 1$. The effects of explanatory variables X on the survival rate or the hazard function can be incorporated by substituting $\lambda = \exp(-\beta X)$.

a historical record of its existence, and constitutes the complete historical product population of a single product market from 1848 onwards. We concentrate on newspapers rather than publishing companies, because each newspaper has its own market segment and reading public. In the beginning, a publishing company could be identified by its newspaper, but in the early twentieth century companies started to publish more than one newspaper. The characteristics of a newspaper determine the circulation and its readership and not the publishing company. Nowadays, a newspaper is generally one of many products of the publishing company. These companies are not specializing in publishing newspapers only, but they have a vast range of media products.

Our unit of research is defined as a daily newspaper if it satisfies five criteria. The selection requirements are composed from the criteria defined by Carroll (1987) and Emery and Emery (1978, p. 4). Newspapers must be available to anyone willing to pay the price, and must print anything of interest to a general public; their contents should consist of timely information. In most countries and especially in the early days newspapers either were nationally or locally-oriented. Hence, those interested in a particular newspaper - advertisers, readers, suppliers - face a geographically and linguistically demarcated market. We add an additional criterion: daily newspapers ought to be published six days per week. The criteria for a newspaper to be defined as a daily newspaper can thus be summarized as follows.

Daily newspapers

1. follow a daily publishing scheme (six days a week);
2. are available to anyone willing to pay the price, regardless of class or special interest;
3. publish selected material of interest to a general public, as contrasted with religious and / or business publications;
4. publish timely information;
5. are directed to a geographically and linguistically demarcated market of consumers and advertisers.

For an adequate analysis of the market evolution it is important to precisely define, when a unit ceases to exist, i.e. one of the first tasks in studying the death of a unit is to define when a newspaper disappears from the market. A unit's death occurs when a newspaper title does not persist in a name anymore, and when it has lost its identity at the same time. Losing identity can be caused by several factors. A newspaper death occurs when a newspaper has legally ceased to exist. Other causes of losing the identity, like mergers or takeovers, are more complicated. Discussion of this question often depends on the opinion of the researcher. Literature dealing with mergers has shown that there is a continuum of outcomes to merger partners. Small newspapers may be absorbed and have virtually no further idiosyncratic existence. Or, at the other extreme, one newspaper absorbs another without bearing a significant impact on its own structure. The other structural forms of mergers lie within the range of these two extremes. We have characterized mergers as one of the following three types (see also Carroll (1987)):

- a. the focal newspaper absorbs another newspaper which can keep its own title;
- b. the focal newspaper is absorbed and loses its title;
- c. the focal newspaper merges with one or more newspaper publications and a new title results.

The first type of merger is not death; the record of the focal newspaper remains unaltered. The second type, a takeover, is characterized as the focal newspaper's death. The third type of merger is commonly treated as the creation of one new newspaper publication. However, our definition of this type of merger involves one surviving newspaper, while the others exit. The merit of our treatment is that the existing knowledge remains embodied in the market in the form of the one remaining newspaper, which seems more realistic than the creation of a brand new title without any historical relationship. This type of merger is known as a horizontal merger within the same industry (see also Dunne, Roberts and Samuelson (1988)).

Economists focus on the costs that an entrant has to make to conquer a market share, fighting the goodwill the incumbents have created among their consumers. Potential entrants stimulate competition in the market. Tammeling (1988) illustrated this process with the foundation of *De Nieuwe Drentsche Courant* in 1852. This newspaper only existed for two years, but its appearance stimulated the competitive attitude of the *Provinciale Drentsche en Asser Courant*, its immediate rival. The incumbent newspaper publishing company responded by improving the quality of its newspaper. Its response became more aggressive, in the end resulting in the acquisition of the new newspaper by the incumbent.

Despite the apparently high quality of the data, the nature of the effort unavoidably resulted in some historical inaccuracies. These involved the omission of some small and short-lived newspapers. In total we have monitored 261 daily newspaper appearances in The Netherlands since 1848. In constructing the data set we used information from Goedhart (1943), Hemels (1969a, b), Overhof (1995), Schneider and Hemels (1979), Tammeling (1988), De Ridder (1984), Ros (1993), Vermeulen (1994), and Witteloostuijn et al. (1996) and information obtained from NDP, CEBUCO, the Jesuits' library at Maastricht University, the Social Historical Centre in Maastricht, and the National Press Museum. Appendix A presents the list of all Dutch daily newspapers since 1848. For every newspaper in the data set the following information is available:

<i>Censor:</i>	A dummy variable indicating right censored versus uncensored cases ³ ;
<i>Spell:</i>	Length of the lifetime spell, measured as the difference between the year in which the newspaper ceased to appear and the year of initial publication;
<i>Left:</i>	For left censored cases, the age at the start of our counting year, otherwise zero;

³Our data set has been corrected for those newspapers which entered the market before our starting year; they are treated as uncensored cases. In order to avoid misinterpretation we corrected these cases by adding the variable age of a newspaper at the year 1848 (*Left*).

<i>YearIn:</i>	Initial year of appearance of the daily newspaper;
<i>YearOut:</i>	Year of disappearance from the market;
<i>InWW2:</i>	A dummy variable indicating if a newspaper was forced to exit the market during World War II;
<i>PastWW2:</i>	A dummy variable indicating if a newspaper enters the market in the aftermath of World War II in 1945-1946;
<i>Dens(j):</i>	Number of newspaper titles one year before the newspaper enters the market before 1946 ($j = 1$) or after 1945 ($j = 2$);
<i>Region:</i>	Indicator for main regional appearance ⁴ . The definition of the regions in our study is based on the classification that is published by the Dutch Central Bureau of Statistics. The four regions are composed from the twelve provinces: <i>North</i> (Friesland, Groningen, and Drenthe), <i>East</i> (Gelderland, Overijssel, and since 1986 Flevoland), <i>South</i> (Noord-Brabant, and Limburg), and <i>West</i> (Utrecht, Zuid-Holland, Noord-Holland, and Zeeland);
<i>Found:</i>	Dummy variable indicating that a newspaper is founded after 1945;
<i>Diff(j):</i>	Variable representing the development of the number of newspapers in the market. <i>Diff(j = 3)</i> expresses the difference in the number of newspapers between the year of exiting the market before 1946 and 1848. <i>Diff(j = 4)</i> expresses the difference in the number of newspapers between 1945 and the year of exiting the market after 1945 ⁵ .

Basically, we created variables so as to distinguish in a crude way between two sub-periods in the life cycle of the Dutch daily newspaper industry. The first sub-period is the phase in which the number of newspaper titles emerging in the market increased. This corresponds to stage II and part of stage III in Gort and Klepper (1982). The second sub-period is characterized by a diminishing number of newspapers in a market that became increasingly concentrated. This corresponds to the latter part of stage III, stage IV, and possibly the beginning of stage V in Gort and Klepper (1982).

⁴In spite of the fact that few newspapers have been nationally distributed after their first appearance, we have selected them in one of the four regions. The selection criterion was the region with the highest market share for that particular newspaper.

⁵When an observed duration of length T is incomplete, the observation for the lifetime of that newspaper only contains the information if that duration is at least T , given the state of exogenous variables at that time. Consequently, the contribution to the likelihood function is the probability that the newspaper publication has a duration greater than T . Since some newspapers appear in both sub-periods of the life cycle, we assume that other determinants than *Diff(j = 3, 4)* influence their survival chances. In other words, for these particular newspapers *Diff(j = 3, 4)* are set to 0. The creation and application of a dynamic data set will solve this problem.

2.4 Empirical Results

This section is divided into two parts. First a descriptive analysis of the data is given. The second part is devoted to a discussion of the outcomes of the parameter estimates of the hazard and survivor functions.

2.4.1 Descriptive Analysis

Newspapers which appeared before the year 1848 generally had time and government support to establish a reading public. According to Schneider and Hemels (1979) these newspaper organizations were obliged to print the city or provincial weapon on the front page of their newspapers to receive this support. Many newspapers, however, frequently faced capital and cash flow problems very early on. They could be forced by creditors to liquidate before they had time to establish a readership. The actual lifetime of the first-movers was ignored until the time of their government independence. It is reasonable to assume that the newspaper market was dominated by the first-movers' advantage in The Netherlands. As of today 55 daily newspapers⁶ are published by 11 publishing companies, of which only four publish one daily newspaper. From today's existing newspapers 9 appeared for the first time before 1848, 21 appeared between 1848-1900, 9 between 1900-1939, 6 were established during World War II, and 10 after 1945. Table 2.1 shows the number of established daily newspapers in The Netherlands that still existed in 1997 during specified time periods.

Table 2.1 The Foundation of Daily Newspapers in The Netherlands through Time

Period	< 1848	1848-1900	1901-1939	1940-1945	> 1945	Aggregate
Still existing in 1997	9 (30%)	21 (18%)	9 (21%)	6 (14%)	10 (34%)	55 (21%)
Total foundations	30	118	42	42	29	261
Correlations entry/exit	-	0.146	0.164	0.595	0.292	0.388

Notes: The number of surviving newspapers which were established in the defined period, as a percentage of the total number of new newspapers established in the same defined period are in parentheses.

Sources: Goedhart (1943), Hemels (1969a, b), Overhof (1995), Schneider and Hemels (1979), Tammeling (1988), De Ridder (1984), Ros (1993), Vermeulen (1994), Witteloostuijn et al. (1996), NDP annual reports (1950-1997), CEBUCO in Amsterdam, Jesuits' Library at Maastricht University, Social Historical Centre in Maastricht, and the National Press Museum in Amsterdam.

⁶Between the end of the investigation period and March 1, 1998 two of the 55 daily newspapers have exited the Dutch daily newspaper market.

Table 2.1 also exhibits the total number of newly founded of newspaper titles in the periods considered, and presents the correlations between the number of annually entering and exiting daily newspapers. The correlations are remarkably low, except during World War II, compared to, for example, the turnover of companies in the U.K. manufacturing industry in cross-sectional studies. For 95 different industries Geroski (1991) finds a correlation of 0.796. Sutton's (1997) fourth regularity of turbulence - meant to apply to firms - only applies in a very limited sense to the Dutch daily newspaper market, because the correlations of newspapers are over time instead of across industries. However, our results are in line with Agarwal and Gort's (1996) findings of positive correlations between entry and exit in stages II, III, and IV.

Figure 2.1 provides an overview of the development of the number of daily newspapers in The Netherlands since 1848, when thirty newspapers existed. The number increased steadily until World War II after which the market became more and more concentrated.

Figure 2.1 The Market for Daily Newspapers in The Netherlands: 1848-1997

The shape of Figure 2.1 resembles that of the stages II, III, and IV of the number of producers in new product industries given in Gort and Klepper (1982). Stage I begins with the introduction of the first daily newspaper in 1618 (see, e.g., Schneider and Hemels (1979)) and ends in 1848 when stage II begins. Stage II is characterized by a period of a sharp increase with an exceptional expansion in the number of newspapers

in the period after 1869. In 1869 the Dutch government repealed the special tax system for newspapers, known as 'Dagbladzegel' (see, e.g., Hemels (1969a, b, 1992)). The abolition of this tax system stimulated economic activity for the newspaper publishing companies. The costs for a publishing company to produce a newspaper decreased enormously with the abolition decision of the government. According to Schneider and Hemels (1979), in some cases the production costs for existing newspapers decreased with 50 percent in that year. This cost shock not only provided an economic incentive to increase the circulation of the incumbent newspapers, it also boosted the potential profits and consequently survival probabilities for the incumbents as well as for potential entrants. Stage III which is characterized by a net entry of approximately zero corresponds to the period 1900-1948. It is followed by a period of rapid decrease in the number of daily newspapers since 1948 (stage IV). It is difficult to determine whether stage V has been reached yet.

A similar evolutionary pattern is shown for the four regional markets in Figure 2.1. The patterns in the western and, although less so for, the northern market segment are most pronounced. The large differences in the number of newspaper titles among the national regions may be explained by the fact that the western region has had the highest population density and economic growth relative to the other regions in The Netherlands. The correlation between the regional density evolutions of the western and northern markets is 0.92, whereas the correlation between the number of newspaper titles in the eastern and southern regions is only 0.35, suggesting a less similar pattern in the development of the latter two regional markets.

A more precise overview of the dynamics of the Dutch newspaper market can be shown by looking at the annual aggregate number of newspaper births and deaths. Figure 2.2 illustrates a plot of the annual aggregate number of newspaper births from 1848 until 1997. The comparatively large number of newspaper births between 1869-1872 reflects the effect of the change in the tax system. After the year 1900, the annual number of newspaper births gradually decreased. Immediately after the end of World War II, an inflow of new entrants occurred. The entry level shows a stabilized pattern after the war. The entry shock after World War II is due to the fact that the market dramatically changed in the period 1940-1945 (see also Goedhart (1943)). After the war the underground newspapers prohibited by the pro-German government were legalized, while the newspapers which had collaborated with the pro-German government were prohibited (cf. Schneider and Hemels (1979)).

Immediately after World War II new opportunities for newspapers emerged to conquer larger market segments and new readers. These opportunities led to an increase of competitiveness in the market. More newspapers fought in the same market segments with only limited space. The development of competition reduced the survival chances of potential entrants and increased exit rates. The consequences of the increased competition on the Dutch market are shown in Figure 2.3, which presents the mortality pattern of the newspapers. The early period shows that the annual number of newspaper deaths had been influenced by the constitutional and economic changes. Between 1900

Figure 2.2 Entry Patterns in the Market for Daily Newspapers

Figure 2.3 Exit Patterns in the Market for Daily Newspapers

and 1940 the newspaper market was more or less stable, but after World War II the mortality of newspapers increased dramatically. On the aggregate, more newspapers exited the market.

Recent research on the evolution of the Dutch newspaper market concentrates on the explanation of the decrease of the number of newspaper titles, without taking into account the life cycle of the market. Our figures show in a prominent way the existence of the life cycle for daily newspapers, a finding that is confirmed by Carroll (1987) for other countries. It seems likely to assume that the phase of the life cycle the newspaper market is in significantly influences an individual newspaper's expected lifetime. This being the case, the interpretation of expected survival rates must be executed with care. For example, estimation of the liabilities of newness and aging crucially depends on the phase of the market, which should therefore be taken into account.

2.4.2 Parameter Estimates of the Hazard Functions

Table 2.2 presents the estimation results of the Cox' proportional hazard model and of the survivor functions being characterized by their respective distributions of duration. In general, one should recognize that the estimates of the proportional hazard model have opposite signs compared to those of corresponding variables in the survivor functions. In the Cox' proportional hazard model a positive sign of a parametric estimate can be interpreted as follows. If the corresponding variable increases, *ceteris paribus*, the hazard rate will increase as well. This means that the conditional exit probability of a daily newspaper from the market, given that the newspaper has appeared for a specific period, increases if the value of an explanatory variable increases. In the case of survivor functions a positive sign indicates that an increase in the variable corresponds with an increased survival rate.

As illustrated in the previous part of this section, the evolution of the daily newspaper market shows a turning point around World War II. It is, therefore, interesting to test whether the developments in the number of newspaper titles before and after the break have a contrary effect on the hazard rate and survival rate of newspapers in The Netherlands. *Dens1* represents the pre-World War II number of incumbent newspapers one year before the newspaper enters the market. The number of newspapers (density) one year before entrance proxies the effects the intensity of competition at the beginning might have on the chance of survival. The estimates of *Dens1* are negative for the survivor functions. This indicates that in the period before the war a higher density the year before entry corresponds with a shorter expected lifetime. The estimates of *Dens2* are positive for the survivor function. This implies that the larger number of incumbent newspapers the year preceding entry, the higher the market density at the start of the firm life and therefore the longer the expected endurance in the market. During the second sub-period of the newspaper market life cycle entering has become more difficult, even though the number of newspaper titles decreased.

The variables *Diff3* and *Diff4* have been created to investigate the effects the number

of firms (market density) has on the survival chances of newspapers before and after World War II. *Diff3* is defined as the difference between the number of incumbent newspapers in the year that newspapers left the market before World War II and the initial number of 30 newspapers in 1848. *Diff4* is defined similarly as the difference between the number of newspapers (density) in the year in which the newspaper exited the market after 1945 and the 1945 number (density) of 124 different newspaper titles⁷. The estimates of the variable *Diff3* are significantly different from zero with a negative sign in all the survivor functions. An increase in the number of newspapers over time illustrates an increase in competitiveness between incumbents and entrants. Our results show that an increase in competition among newspapers reduces the survival chances of newspapers before World War II. After the war the effect of competition on the survival chances continues. If fewer newspapers are in the market the chances to survive for the incumbents increase.

It may be expected from Figures 2.1 and 2.3 that, in general, newspapers which appeared after 1945 had different survival opportunities than newspapers which appeared before the war. We do not know yet what may have caused this development after 1945. But we can estimate the extent of the downward trend even without understanding the reasons why. To do so, we created a dummy variable, *Found*, that indicates if a newspaper was founded after 1945. The estimates are significantly different from zero in all models and indicate that the newspapers founded after 1945 have a lower chance to survive, *ceteris paribus*, than the other newspapers in our data set.

Figure 2.1 shows a breaking period rather than a breaking point during World War II. The political developments during, and after the war created all kinds of market opportunities for incumbent and entering newspapers. As a result a relatively large number of new newspapers emerged right after the war ended. The variable *InWW2* represents the first part of this political process, and its coefficient estimate indicates that newspapers which were characterized by high survival rates were forced out of the market. Because the newspapers with high survival rates had exited the market, new opportunities for the remaining incumbents and potential entrants had emerged in the aftermath of World War II. Hence, at the end of the turmoil period new opportunities existed for potential entrants. The variable *PastWW2* acts to mimic the effect on life expectancy rates during the boom, and its coefficient estimate illustrates that the survival rate (hazard rate) of the incumbents decreased (increased) as a response to the increased competition after World War II.

⁷The variable *Diff3* contains zero and positive values, whereas the variable *Diff4* contains zero and negative values.

Table 2.2 Parameter Estimates of the Hazard Model and Survival Functions

	Cox' prop. haz. rate model	Survival Functions Characterized by the following Distributions				
		Exponential	Weibull	Gamma	Logistic	Normal
<i>Constant</i>		5.298* (0.284)	5.295* (0.320)	6.191* (0.310)	4.420* (0.357)	4.038* (0.361)
<i>Dens 1</i>	0.016* (0.004)	-0.011* (0.004)	-0.011* (0.004)	-0.014* (0.003)	-0.005 (0.005)	-0.002 (0.006)
<i>Dens 2</i>	-0.070* (0.019)	0.090* (0.026)	0.091* (0.028)	0.0887* (0.023)	0.092* (0.032)	0.094* (0.031)
<i>Diff 3</i>	0.028* (0.003)	-0.027* (0.003)	-0.027* (0.003)	-0.021* (0.002)	-0.035* (0.004)	-0.034* (0.004)
<i>Diff 4</i>	0.070* (0.016)	-0.079* (0.022)	-0.099* (0.023)	-0.097* (0.019)	-0.098* (0.027)	-0.101* (0.032)
<i>Found</i>	12.813* (2.481)	-15.977* (3.344)	-16.159* (3.615)	-16.135* (2.947)	-15.576* (4.014)	-15.478* (5.029)
<i>PastWW2</i>	0.904* (0.245)	-0.757* (0.266)	-0.777* (0.287)	-0.576* (0.207)	-1.082* (0.368)	-1.135* (0.400)
<i>InWW2</i>	-1.285* (0.260)	1.325* (0.298)	1.355* (0.326)	0.875* (0.266)	2.034* (0.357)	2.046* (0.390)
<i>Left</i>	-0.006+ (0.004)	0.007 (0.004)	0.007 (0.005)	0.003 (0.004)	0.012* (0.004)	0.014* (0.005)
<i>North</i>	-0.071 (0.246)	0.077 (0.255)	0.077 (0.275)	0.045 (0.224)	0.043 (0.329)	0.159 (0.356)
<i>East</i>	-0.236 (0.198)	0.216 (0.239)	0.227 (0.256)	0.112 (0.199)	0.437 (0.293)	0.532 (0.307)
<i>South</i>	-0.171 (0.219)	0.215 (0.252)	0.223 (0.272)	0.083 (0.203)	0.415 (0.327)	0.483 (0.329)
$\sigma = 1/\rho$	-	1	1.054* (0.064)	0.394* (0.201)	0.852* (0.056)	1.501* (0.089)

θ	-	1	1	0.300 ⁺	-	-
				(0.178)		
Log-lik.hood	-936.282	-403.517	-403.129	-393.864	-418.268	-417.798

Notes: * significant at 5 per cent; + significant at 10 per cent; standard errors in parentheses.

Table 2.1 shows that the Dutch newspaper market is dominated by first-movers. One-fifth of the 55 newspapers that remained in 1997 came into publication before the liberalisation of the press in 1848⁸. The estimate of the variable *Left* indicates that the first-movers' advantage is insignificantly different from zero in the family of Gamma distributions. With the survivor function derived from the Gamma distribution for durations, being the model that describes the data best, we conclude that even though it is remarkable that a relatively high proportion of newspapers remains in the market during the whole life cycle that we investigated, their age at the start of the counting year, 1848, did not play a significant role in the explanation of survival rates.

To estimate the parameters of the Cox' proportional hazard model and the survival models we used the western market as benchmark, in other words the West Region is our reference region. The regional dummy variables North, East, and South in the model indicate whether the survival chances in the three other market segments in The Netherlands differ from the market segment West. Our results show that the Dutch market segments did not demonstrate significant variabilities in survival chances. It is worthwhile to point out that the coefficient estimates for the regional dummy variables North, East, and South, though insignificant, are all positive. This may suggest that newspapers published in these regions have a higher survival rate than newspapers published in the western part of the country. Given that the national newspapers are mostly based in the western part of The Netherlands, this finding suggests that regional newspapers have found a specialist's niche that offers shelter against heavy competition. The finding is possibly the result of a dual structure of segmented markets for generalists and specialists, respectively (see, e.g., Carroll (1987) and Witteloostuijn et al. (1996) for a dual market structure resulting from resource partitioning).

According to Kiefer (1988) the exponential distribution is unlikely to be an adequate description of the data if the sample contains both very long and short durations, as in the data set we use in this chapter. In our study we find that the Weibull distribution is almost similar to the exponential distribution. The Gamma distribution, with $\theta = 0.3$, seems to be the most appropriate for explaining the lifetimes of daily newspapers in The Netherlands. This model illustrates that the hazard rates of a newspaper in the first few years of existence are high and then decrease gradually over time. Survival models corresponding with a normal or logistic distribution are found to be weaker than a

⁸Nowadays, these first-movers are provincial newspapers.

Gamma model. Formally we did not test the two additional models against the Gamma model. But the differences between the values of the log-likelihood functions are sufficiently large so that the two alternative models are likely to be rejected in a formal non-nested LR test.

The models discussed here are based on the assumption of identical survival distributions across units. However, it is likely that newspapers are not homogeneous, but may differ in characteristics as well as orientation. Therefore, we tested the validity of homogeneity across the newspapers in our study. We estimated survival functions that correspond with the Weibull or the exponential distribution conditional on an unobserved random variable with a Gamma distribution that represents heterogeneity. We find that the assumption of homogeneity across units cannot be rejected. The estimated parameter that corresponds with the unobserved heterogeneity is found to be insignificantly different from zero⁹.

Using an LR test, the exponential distribution is not rejected when compared to the Weibull distribution. Notice that for the Weibull distribution we find a value of ρ slightly smaller than one, implying negative duration dependence. The value of ρ is, however, not significantly different from one as the large sample t -value based on the estimates given in Table 2.2 for the hypothesis $\rho = 1$ is -0.90. The Weibull survivor function is strongly rejected in favour of the generalized Gamma model. Also, the estimated values for ρ and θ for the Gamma model differ substantially from the values $\rho = 1$ and $\theta = 1$, indicating that the proportional hazard rate model is likely to be inappropriate. Hence, the estimates using Cox' proportional hazard model should be used with care, although the estimates for β using Cox' approach are in line with those for the Gamma model. This indicates robustness of these effects with respect to the choice of the functional form of the (baseline) hazard rate.

The hazard rate based on the generalized Gamma density function evaluated at the means of the explanatory variables is shown in Figure 2.4. The graph in Figure 2.4 exhibits strong negative duration dependence for duration up to ten years, a phenomenon known in the literature as liability of newness (see, e.g., Brüderl, Preisendörfer and Ziegler (1992), Hannan and Freeman (1989)).

For longer duration, the hazard rate increases very gradually indicating some liability of aging. The hazard function is not monotonic, but U-shaped. We find a value of $\theta\rho < 1$ ($\theta\rho = 0.76$) with $\rho > 1$ ($\rho = 2.54$). These findings imply negative duration dependence during the early years and an increasing exit probability when newspapers grow older (cf. Lancaster (1990))¹⁰.

⁹The hazard function for the Weibull distribution that includes the Gamma distribution for heterogeneity can be expressed as $h(t) = (\lambda\rho)(\lambda t)^{\rho-1} / (1 + \delta(\lambda t)^\rho)$. If $\delta = 0$, then the hazard function corresponds with the distribution model without heterogeneity. If, in addition, $\rho = 1$, $h(t)$ becomes a proportional hazard function.

¹⁰The minimum of the U-shaped curve is the turning point between liability of newness and liability of aging. In Figure 2.4, the minimum of the hazard function is approximately 70 years, which is larger

Figure 2.4 Hazard Function based on Gamma Density ($\theta = 0.3$)

Figure 2.5 Hazard Rates for Individual Newspapers

than the average age of newspapers in the data set (48 years). This is plausible since the hazard function shows the propensity of a T -years old newspaper to exit, whereas the mean of age is dominated by the number (density) of relatively young newspapers that exit.

For shorter durations our results are in accordance with Sutton's (1997) second regularity of the probability of survival which increases with the unit's lifetime. Our findings are similar to those of Agarwal and Gort (1996) who also found negative duration dependence for durations up to 40 years for early entrants and 18 years for late entrants, followed by a slightly positive duration dependence for higher durations. They interpret the decreasing hazard rates as the impact of learning by doing and initial endowments on survival rates. Increasing hazard rates for higher ages refer to liability of aging. They find a negative impact of increased competition on survival rates. The negative sign of the coefficient of the variable *Dens1* in our analysis is in line with this result.

Finally, a similar but less explicit shape of the hazard rate at the means of the explanatory variables is shown in Figure 2.5. The graph in Figure 2.5 exhibits the hazard rates for the individual newspapers. It illustrates the heterogeneity between individual newspapers explained by the explanatory variables included in the model.

2.5 Conclusions

In this chapter we present a descriptive analysis of the evolution of the market for daily newspapers in The Netherlands for the period 1848 to 1997. We estimate hazard and survivor functions to investigate how the survival chances depend on the state the market is in. Three important stages of the product life cycle are considered: the pre-World War II phase of growth from 1848 onwards, the period of turmoil during the war, and the post-war period of increased concentration from 1948 until 1997.

Our results show that the estimation of a hazard rate crucially depends on the state of the market. Among economic variables, the intensity of competition at the time entrance takes place is found to be a key variable explaining chances of survival. In The Netherlands the daily newspaper market has reached the state where the opportunities to successfully establish a new newspaper are very low. Moreover, from our analysis we know that models that aim at estimating the expected lifetime of newspapers should acknowledge the cyclical characteristics of the industry.

The development of dynamic industry analyses, allowing for technology and political events to explain the dynamics of the daily newspaper industry in The Netherlands, is needed to obtain a thorough understanding of the economics that underlie the phenomena studied in this chapter. On the one hand, the creation and application of a dynamic data set are necessary requirements to understand the economics and dynamic evolution of the daily newspaper industry in The Netherlands. On the other hand, for further research it is recommended to investigate the influences of governments on the market structure through interventions during the industry life cycle. In the next chapter we study the effect that an important political event, the abolition of the stamped paper duty in 1869, had on the market structure for daily newspapers in The Netherlands.

Chapter 3

Market Structure, Tax Policy, and Survival Chances: 1848-1936

3.1 Introduction

Changes in tax policy can substantially alter market structures. Cuts in revenue or production unit specific taxes are comparable to downward shocks in production costs or to cost reducing technological innovations¹. They can change entry conditions substantially. New firms enter (see, e.g., Seade (1980), Besley (1989)) and the number of available products increase (see, e.g., Romer (1994)). Usually, we do not observe cost reducing shocks directly, or at least not their exact timing. In this chapter, however, we study the effects of the 1869 repeal of the stamped paper tax on the market structure for newspapers in the Netherlands, a clear-cut example.

The effects that a cost reducing shock may have on entry conditions depend on the moment when it occurs. In a competitive industry the shock might increase a firm's optimal scale causing a shake-out of incumbent firms that results in an increase in market concentration (Jovanovic and MacDonald (1994)). The 1869 tax repeal, however, occurred when the newspaper industry was in its infancy giving birth to the second stage of a Gort-Klepper (1982) industry with many new firms entering just after the shock.

The 1869 tax repeal led to a reduction in production costs of about 50 percent that was shifted totally into the price of newspapers. It changed entry conditions in two ways: (1) the number of firms in oligopolistic market segments in large cities increased; and (2) new monopolistic markets emerged in small cities where no newspapers were available before the shock. In medium sized cities with one or two available newspapers nothing changed.

Bresnahan and Reiss (1991) showed that the difference in competitive conduct between markets with isolated geographical monopolies on the one hand and duopolies or oligopolies on the other hand is large and occurs with the entry of the second or third firm. These findings are helpful in explaining the observed changes in the Dutch

¹This chapter is based on G.A. Pfann and H.L. van Kranenburg (1998), "Market Structure, Tax Policy, and Survival Chances in the Dutch Newspaper Industry".

newspaper industry and in comparing them with the results predicted for single product firms from the two models used to analyse the effects of taxation on market structure. One is a model for oligopolistic competition and taxation first presented by Seade (1980) and extended by Besley (1989). The second model is Romer's (1994) model of monopolistic providers of new products.

This chapter is organized as follows. The next section presents details about the effects of the 1869 repeal of the stamped paper tax. Delving in historical archives surfaced evidence of incumbent newspaper providers being favourably disposed towards the tax repeal, not blocking the road to entry of new dailies. The then used arguments in favour of the tax cut are briefly passed in review. Those form the basis of the theoretical models that we use to analyse the tax policy significance for market structures. Section 3.3 presents the two theoretical models of taxation and entry. Section 3.4 presents the data used in this chapter. In section 3.5 we estimate Weibull survivor models to investigate the effect of altered entry conditions on market participants' survival chances using a data set of all Dutch daily newspapers between 1848, the year press freedom was written into the Constitution of the Kingdom of The Netherlands, and 1936. Section 3.6 concludes.

3.2 The 1869 Repeal of the Stamped Paper Duty for Newspapers

The stamped paper duty originated from the "*timbre extraordinaire*" left over from the French Empire's tax laws installed in 1811, one year after the annexation of the Netherlands². The argument for levying newspaper taxes has been that the returns of advertisements or announcements designed for publication in newspapers must occur on a paper format stamped for this purpose. After 1848, the stamped paper duty constituted the last remaining obstacle to be removed from the path to economic press freedom.

On the 17th of April 1867, an influential group of Dutch intellectuals founded the "Anti-Stamp-Duty-Alliance". The Alliance's arguments to persuade the government to abolish the newspaper taxes were:

1. the fundamentally political argument: a free press is a *sine qua non* for a parliamentary-constitutionally ruled country. Repeal of the stamped paper duty creates opportunities for new newspapers to be set up and break down the existing monopolistic structure;
2. the social-economic argument: the imposition of approximately 50 percent levy on newspapers' gross income is not only disadvantageous for the newspapers themselves, trade and industry suffer losses as well;
3. the cultural argument: taxation of the spread of knowledge keeps news(papers) beyond the reach of many.

The first argument forms the basis of the Seade-Besley model for oligopoly and taxation we will present in the next section. The second and third argument motivate the use of

²The information provided in this section is based on Hemels (1969a, b, 1992).

Romer's model to investigate the effects of a change in tax policy on the provision of new products.

The large and prominent incumbent newspapers were in favour of the abolition of the newspaper tax. Publishers regarded the repeal of the stamped paper duty as a necessary intervention to improve the literacy of the Dutch citizens and to widen the distribution of information they struggle to provide. The tax withheld newspaper publishers to use their capital in favour of the improvement and enforcement of their informational powers and contents. On the 10th of November, 1868 the *Nieuwe Rotterdamsche Courant*, a leading daily newspaper with a large circulation, wrote:

"Is it not an anomaly that the State spends a fortune on education, while keeping people from decent and inexpensive daily readings through a stamp tax levied upon newspapers?"

Incumbent newspapers actually welcomed more competition, rather than blocking it. They argued that measures widening and liberalizing the market significantly will not only improve competition and increase the availability of their product (information), they also increase their opportunities to grow and their survival chances because of the expected augmented circulation.

Figure 3.1 Development of Price and Number of Daily Newspapers between 1848 and 1936

The stamped paper duty on newspapers was officially repealed on the 1st of July 1869. The tax cut caused a decrease in variable production costs by approximately 50 percent and was shifted totally into the commodity's price. The average price of newspapers fell accordingly and competition increased. Figure 3.1 shows the life cycle of the industry for daily newspapers in The Netherlands between 1848 and 1936. It contains two series: (1) the total number of newspaper titles available in a certain year (see also Figure 2.1); and (2) the five-years aggregate price for daily newspapers in real constant 1845-1849 terms. In the pre-World War II period the number of firms rises, while the opposite is true for the average commodity's price (see also Appendix B).

Daily newspapers in The Netherlands have never fought price wars, but have always competed for the largest quantity with regard to circulation (Cournot competition). Moreover, the product in its initial stage was much more homogeneous than later on in the industry life cycle. For example, at the time of the stamped paper tax, the years 1848 to 1869, confessionally or politically oriented daily newspapers did rarely exist. Segregation or compartmentalization of the newspaper market started to become important in later years, made possible by the 1869 repeal of the stamped paper tax.

Regrettably, we do not have data on circulation of individual newspapers before the year 1950. But we can learn about the sizes of segmented markets in local cities using the 1869 Census. For example, Bresnahan and Reiss (1991) and Berry (1992) analysed the relation between population, local monopolies, and oligopolistic entry in other industries. In Table 3.1 we compare the 1869 census data with the change in the newspaper market in the two years after 1869.

In 1869, before the shock, 42 daily newspapers were published. In the period 1869-1871, 21 new dailies appeared as a result of the 1869 repeal of the stamped paper duty; 14 entered into local markets where other newspapers already existed. These local markets were situated in some of the largest Dutch cities: Amsterdam (5), Arnhem (2), Den Bosch (1), Den Haag (1), Groningen (1), Maastricht (1), and Rotterdam (3). The other 7 new entrants emerged in new local markets of small provincial cities where up to then no daily newspapers were available (Den Helder, Deventer, Enkhuizen, Harlingen, Roosendaal, Tilburg, and Winschoten). In 24 medium sized cities dailies were published at the time of the 1869 tax cut and no new newspapers appeared there. New newspapers entered only in large and in small cities. The average population density per available newspaper dropped from 26,536 people before the tax repeal to 17,690 afterwards. Furthermore, the average (standard deviation) population in expanded markets is 88.4 (78.4); in unchanged markets is 17.1 (12.5); and in newly emerged markets is 12.3 (6.3).

Table 3.1 Market Structure Changes resulting from 1869 Tax Cut

City	Number of Newspapers The 1869 Tax Repeal		Population 1869 Census (x1000)
	before	after	
<u>Market Segments with Increased Competition</u>			
Amsterdam	5	10	264.1
Rotterdam	1	4	117.1
Den Haag	1	2	91.3
Nijmegen	3	5	55.4
Groningen	2	3	38.0
Maastricht	2	3	28.5
Den Bosch	2	3	24.4
	16	30	618.8
<u>Newly Emerged Market Segments</u>			
Tilburg	0	1	21.4
Den Helder	0	1	18.5
Deventer	0	1	17.8
Harlingen	0	1	9.9
Roosendaal	0	1	7.6
Winschoten	0	1	5.5
Enkhuizen	0	1	5.4
	0	7	86.1
<u>Market Segments that did not change</u>			
Utrecht	2	2	60.4
Leiden	2	2	39.3
Haarlem	1	1	31.0
Leeuwarden	1	1	26.0
Dordrecht	1	1	24.8
Delft	1	1	22.0
Zwolle	1	1	20.6
Schiedam	1	1	19.3
Middelburg	1	1	16.6
Gouda	1	1	16.0
Breda	1	1	15.2
Kampen	1	1	14.7
Zutphen	1	1	14.6
Amersfoort	1	1	13.3
Alkmaar	1	1	11.4
Almelo	1	1	10.3
Vlissingen	1	1	9.6
Roermond	1	1	9.2
Tiel	1	1	8.1
Zierikzee	1	1	7.7
Assen	1	1	6.9
Enschede	1	1	5.1
Heerlen	1	1	4.9
Schagen	1	1	2.6
	26	26	409.6

Sources: CBS, and Hemels (1969a, b).

3.3 Modelling Taxation and Entry in an Expanding Industry

The 1869 Dutch economy consisted of a collection of geographically isolated market segments. In large cities entry into existing oligopolies occurred. In small cities, where no newspapers were available before the tax cut, news providing monopolists entered. Bresnahan and Reiss (1993) showed that the effect of entry on competitive conduct denotes a remarkable difference between a market with a monopolist on the one hand and a market with two or more competitors on the other hand. We use their results to divide this section into three parts. The first part aims to explain the increased competition in large cities and presents a model that investigates the effect of per unit taxation on entry in oligopolistic markets. The second part aims to explain the entry of newspaper monopolists in small cities and presents a model to analyse the relation between the provision of new products and revenue taxation. We end this section with a synopsis of the two models and caveats about what the two models leave open to explain.

3.3.1 Oligopolistic Competition and per Unit Taxation

This part presents a model of oligopolistic competition and per unit taxation that has initially been put forward by Scade (1980) and Besley (1989). It is a one-period model. Each single product firm faces a fixed cost of production that varies with the number of active firms (daily newspapers). This allows us to look at the evolution of the structure of market segments in large cities before and after a tax shock, without adding a multi-period condition governing entry.

The supply side of the market consists of a finite number n (≥ 2) of firms that is large enough to ascertain that the commodity price of newspapers is given to each individual firm. A cost reducing shock is observed at the beginning of a period. The number of firms changes as a result of the shock. At the end of the period the effect of the shock has balanced out and fixed costs of production have changed accordingly. Then the market has moved into a new equilibrium output and equilibrium number of firms. The inverse demand function in oligopolistic competition yields:

$$p_1\left(\sum_{i=1}^n q_{1i}\right) \quad (3.1)$$

where p_1 is the commodity price given to all firms, q_{1i} is the circulation of newspaper i , and $Q_1 \equiv \sum_{i=1}^n q_{1i}$ denotes the total provision of information in the form of newspapers' circulation in an oligopolistic market. The price function $p_1(\cdot)$ is twice continuously differentiable over Q_1 , with $p_1(Q_1) > 0$ if $Q_1 > 0$, and $dp_1/dQ_1 \equiv p_1' < 0$.

The profit π_i of producer i yields

$$\pi_i = p_1(Q_1)q_{1i} - c(q_{1i}, n) \quad (3.2)$$

where $c(\cdot)$ is the cost function which is twice continuously differentiable over q_{ii} . We specify $c(\cdot)$ as follows

$$c(q_{ii}, n) = (\alpha + \tau)q_{ii} + \beta, \quad \text{with } \alpha, \tau > 0, \text{ and} \quad (3.3a)$$

with α being the marginal costs of producing an additional unit that is assumed to be identical for all firms, τ is a specific per unit tax rate, and

$$\beta = \beta_0 + \beta_1(dn), \quad (3.3b)$$

where $\beta_0 > 0$ are exogenous fixed costs of production given the number of competitors before the shock and β_1 is the autonomous change in fixed production costs as a result of the change in the number of firms³, dn , after the shock. The effect (sign) of β_1 has yet to be determined. Each firm chooses circulation q_{ii} as to maximize its expected profit stream⁴. The first-order necessary condition for profit maximization choosing q (dropping subscripts i and j) yields:

$$\pi_q = p + p'q - c' = 0, \quad (3.4)$$

and the second order necessary condition is:

$$\pi_{qq} = 2p' + p''q < 0, \quad (3.5)$$

since $c'' = 0$.

In the absence of adjustment costs and with fixed costs of production being incurred upon entry, a unique symmetric Cournot equilibrium of output q^* exists, where n^* firms make zero profits (see Vickers (1989)):

$$p(n^*q^*)q^* - c(q^*) = 0. \quad (3.6)$$

Following Besley (1989), we investigate the effect of a change in the specific unit tax rate on the number of producers, the circulation of incumbent newspapers, aggregate output, and the commodity price. Since we focus entirely only on the symmetric unique equilibrium, we drop the subscripts and superscripts, i , j , and $*$.

$$dn / d\tau = [n / p'q][(E+2) / (E+2n)], \quad (3.7)$$

³We treat the number of firms as a continuous variable.

⁴We abstract from optimizing the option value to postpone entry, that arises from the fact that producers have expectations about the development of the irreversible costs β_1 .

$$dq / d\tau = [-1 / p'] [E / (E+2n)], \quad (3.8)$$

$$dQ / d\tau = [n / p'] [2 / (E+2n)], \quad (3.9)$$

and

$$dp / d\tau = p' dQ / d\tau \quad (3.10)$$

with $E \equiv nqp'' / p'$ being the elasticity of the slope of demand (Seade (1980)), and $E + 2n > 0$ ⁵.

If the tax cut is shifted by 100 percent into the price, from (3.9) and (3.10) it follows that $E = 0$. Then, equations (3.7) - (3.10) become

$$dn / d\tau = 1 / p' q < 0, \quad (3.11)$$

$$dq / d\tau = 0, \quad (3.12)$$

$$dQ / d\tau = 1 / p' < 0, \quad (3.13)$$

and

$$dp / d\tau > 0. \quad (3.14)$$

Equalities (3.11) and (3.13) together with (3.12) show inverse relationships between the net change in the number of newspapers and aggregate output on the one hand, and a change in the specific unit tax rate on the other hand. A cost reducing tax cut that is shifted into the commodity price for 100 percent, leads to increase participation of single product firms in oligopolistic markets.

To measure the effect of a change in fixed costs on q and n , we derive the following equations:

$$dq / d\beta = [-1 / p' q] [(E + n) / (E + 2n)] \quad (3.15)$$

and

$$dn / d\beta = [n / p' q^2] [(E + n + 1) / (E + 2n)]. \quad (3.16)$$

With $E = 0$, the relationships yield:

⁵Define $E \equiv nqp'' / p'$, and write equation (3.5) as $(E + 2n)p' / n < 0$. Since, $p' < 0$ and $n > 0$, we find $E + 2n > 0$. Stability requires $k \equiv 1 - c'' / p' > 0$. Compared with Seade (1980) and Besley (1989), we have $k = 1$, since $c'' = 0$.

$$dq / d\beta = -1 / 2p'q > 0 \quad (3.17)$$

and

$$dn / d\beta \equiv \beta_i^{-1} = (n + 1) / 2p'q^2 < 0. \quad (3.18)$$

We find that a decrease in fixed costs of production, when changes in specific unit tax are shifted into the commodity's price by 100 percent, leads to higher circulation for each newspaper in the market. Moreover, we find that $\beta_1 < 0$, suggesting an inverse relationship between fixed production costs and the number of firms.

What is true for specific unit taxes will also be true for any specific unit cost shock that is shifted into the commodity's price: according to (3.11) and (3.13) n^* and Q^* will be affected in the same direction (result R3, Seade (1980)). Since $p' < 0$, n^* and p^* will move in opposite directions.

3.3.2 New Goods and Ad Valorem Taxation

We now study the second phenomenon observed after the 1869 repeal of the stamped paper tax: the emergence of newspaper monopolists in small cities. To understand what might have happened in these local market segments, we shall consider each newspaper publisher in a monopolistic market to be the sole provider of information technology. Information serves as a new production factor made available in this market segment by the monopolist. We assume that every possible provider faces a fixed cost of production. The willingness to incur this cost depends on the possibility to charge a monopoly price for the new good up to the local market segment. The monopolist's mark-up times sales is the monopolist's first-mover advantage. The existence of a fixed cost prevents information (newspapers) to appear in small places or far away corners of the Dutch economy. But, if entry barriers change, due to, for example, cost reducing shocks, publishers that are already active in large cities elsewhere in the economy will see profit in bringing new information to small geographically isolated markets and will therefore enter as monopolists in small cities. This is a restrictive but necessary assumption to model the entry process in small geographically isolated markets.

The effect that the 1869 repeal of the stamped paper tax had on the Dutch market for information was one of augmenting conception. Fixed cost forms a *membrana lucida* around each local market that acts as a barrier for new providers to enter. In seven small Dutch cities newspaper monopolists overcame that barrier paying the fixed cost incurred on them and started the new business to provide information as a new production factor. Each successful conception starts a cascade of new activities restraining other providers of the same good from entering this market segment. This process does not only explain why a new good appeared in a small city but also why in 24 other medium sized cities provided with daily information before the tax cut no new newspaper entered.

Romer (1994) showed that, at least in an indirect way, taxes can play an important

role in the provision of new products in small or remote markets. The imposition of taxes may increase the minimum sales necessary for a provider to overcome the fixed cost. The higher the fixed cost of production, the fewer goods will be available. As Romer (1994, p. 26) pointed out “tax that prevents a good or activity from coming into being is particularly insidious because it leaves no trace of what might have been”.

The 1869 repeal of the stamped paper tax is an excellent example of a natural experiment to actually observe and test the point made by Romer. In our analysis, we will stick to Romer’s (simulated) economy as closely as possible. First, we will regard the stamped paper tax as an *ad valorem* taxation. The fact that the repeal of the per unit tax is shifted totally in the price for newspapers implies that it can be treated as a newspaper provider’s revenue tax. Second, we will divide the Dutch economy into two parts: one part is characterized by large (developed) market segments (large cities) in which newspaper publishers are already actively involved in the economic process, and another part consists of small (developing) market segments (small and medium sized cities) in which one provider operates or newspapers do not yet appear. We focus on the emergence of a new information technology in the form of a newspaper provided by a monopolist in a small market segment after a cost reducing shock.

We define q_{2i} as the information available in the form of a newspaper provided by a monopolist in a small market segment i . Q_2 denotes the sum over all $i = 1, \dots, N$ small market segments of q_{2i} , $Q_2 \equiv \sum_{i=1}^N q_{2i}$. Y_s is defined as the aggregate production of goods in small markets for which information technology is a necessary input factor being provided by the monopolists. Y_s is produced according to a constant return to scale production technology similar in all small market segments $i = 1, \dots, N$ using the input of information technology q_{2i} , to be determined by single product monopolist i , and a given input L_i of labour:

$$Y_s = \sum_{i=1}^N L_i^{1-\theta} q_{2i}^\theta, \quad 0 < \theta < 1. \quad (3.19)$$

For each market segment i we assume that L_i is a constant proportion of a given population size P_i and providers in smaller cities can sell less. Market segments are arranged in decreasing order of population size P_i .

The entering monopolist faces an inverse demand dY_s / dq_{2i} that yields

$$p_{2i}(q_{2i}) = \theta L_i^{1-\theta} q_{2i}^{\theta-1}. \quad (3.20)$$

After having paid a fixed cost of production⁶, $\beta_0 > 0$, a monopolist’s profit of providing information technology i yields $p_{2i}(q_{2i})q_{2i} - (\alpha q_{2i} + \beta_0)$. The units for measuring the quantity q_{2i} are chosen so as to bear similar marginal costs $\alpha > 0$ for each monopolist in every segment i . Given an *ad valorem* tax rate τ the monopolist’s first order condition

⁶Romer (1994) remarks that in a multi-period model fixed cost β_0 would be the interest over set-up costs and maintenance costs in each period.

yields

$$(1-\tau)(p_{2i} + p_{2i}'q_{2i}) - \alpha = 0, \quad (3.21)$$

assuming $(1-\tau)p_{2i}(q_{2i})q_{2i} \geq \beta_0$ and $p_{2i}' < 0$.

The equilibrium solution $(q_{2i}^*(\tau), p_{2i}^*(\tau))$ of equation (3.21) depends on τ and is determined once the monopolists have started their businesses. Given (3.19) and (3.20) it is easy to show that the equilibrium price is a constant proportional mark-up, and because of the way α has been chosen to be the same for all markets i , it yields:

$$p_{2i}^*(\tau) = \alpha / \theta(1-\tau), \quad (3.22)$$

so that

$$dp_{2i}^* / d\tau > 0. \quad (3.23)$$

Equation (3.22) shows an inverse relation between the revenue tax and the price for information in each segment i .

The equilibrium input level $q_{2i}^*(\tau)$ is solved from equation (3.22) and (3.20) and yields

$$q_{2i}^*(\tau) = \alpha^{1/(1-\theta)} \theta^{2/(1-\theta)} (1-\tau)^{1/(1-\theta)} L_i, \quad (3.24)$$

which yields

$$dq_{2i}^* / d\tau < 0. \quad (3.25)$$

Lower revenue taxes boost the sales of information technology in each small market segment. The monopolist's revenue net of taxes and costs is equal to $\alpha q_{2i}^*(\tau)(1-\theta)/\theta$.

Not only do q_{2i}^* and p_{2i}^* depend on τ , but the conception of entry and thus N is also influenced critically by τ . According to (3.20), there exists a real value $\epsilon_i > 0$ for each market segment i for which technology q_{2i} would not be provided was the tax rate $\tau + \epsilon_i$. To determine $N(\tau)$, we assume an inverse relation between fixed costs β_0 and population size P_i (see, e.g., Bresnahan and Reiss (1991)). We ordered all small markets according to population size. Therefore, we have

$$\beta_0(N) > \beta_0(N-1) > \dots > \beta_0(2) > \beta_0(1). \quad (3.26)$$

Assuming β_0 to be linearly related to i , it follows that

$$\beta_0(i) = \gamma i, \gamma > 0. \quad (3.27)$$

The equilibrium number of monopolists $N^*(\tau)$ is found by equating the last entrant's net revenue to the fixed costs, γN , of entering the marginal market segment with the smallest population size P_N . This yields

$$N^*(\tau) = (1-\theta) \gamma^{-1} \alpha^{-\theta/(1-\theta)} \theta^{(1+\theta)/(1-\theta)} (1-\tau)^{1/(1-\theta)} L_N, \quad (3.28)$$

and therefore

$$dN^*(\tau) / d\tau < 0. \quad (3.29)$$

More information is provided in smaller market segments if the revenue tax rate decreases.

Because $Q_2 \equiv \sum_{i=1}^N q_{2i}$, equations (3.25) and (3.29) yield

$$dQ_2^*(\tau) / d\tau < 0. \quad (3.30)$$

We find that the aggregate input of information technology in small markets is inversely related to the tax levied upon monopolist's revenues. Furthermore, it is easy to show that the aggregate output of goods Y_s for which information is a crucial production factor increases if the tax rate on revenues declines.

3.3.3 Synopsis and Caveats

The two models for market structure and taxation are both static models that describe the evolution of an expanding industry through the entry of single product firms. In the Seade-Besley model growth occurs through entry in oligopolistic market segments. In Romer's model the emergence of new markets in small cities results from a downward shock in revenue taxation. Even though the two models differ in various respects, they are unanimous in their predictions of (1) an inverse relation between the tax rate on the one hand and the number of firms and (aggregate) output on the other hand; (2) the positive relation between the tax rate and the (aggregate) price of a product; and (3) the inverse relationship between numbers of firms and the commodity price (see also Figure 3.1).

In reality, the effect of τ on N , the number of monopolists in small market segments, is somewhat subtler than described by the extension of Romer's model we discussed. Table 3.1 does not only show that new monopolies emerge, but a few (two in our sample) disappear as well to become oligopolies. This transition is not explained, nor is the number of oligopolistic market segments in the economy. The modelling of transition is particularly difficult. First, we do not know whether the newspapers traded in the large markets actually differ in such a way that product differentiation in oligopolistic markets should be taken into account. Second, the transition from existing monopolist market segments to duopolistic or oligopolistic competition is a complex strategic game that

requires different new theoretic modelling. The two models in this chapter are polar models and do not provide insights into the process of going from one extreme to the other.

When taking a closer look at the evolution of the industry's life cycle in chapter 4, in particular Figure 4.1, we will observe a negative correlation between the change in real prices and the number of firms before and after the turning period. In 1869 the repeal of the stamped paper tax caused the real price for newspapers to fall which was followed by an increase of the number of available daily newspapers that appeared in the Dutch economy. The models discussed in this chapter are both static and apply only for the birth and growth phases of a Gort-Klepper industry. They do not account for the inverse relationship between real prices and aggregate demand after the shake-out has started, and can also not deal with reversed (causal) relationships. To incorporate these changes in the market structure over time a dynamic model is needed that, for example, describes the development of product diversity, includes uncertainty and expectations of newspaper providers over time, and takes into account the heterogeneity of consumer tastes (e.g., Anderson, De Palma and Nesterov (1995)). This is beyond the scope of this research study.

3.4 The Data

The unit of analysis in this study is the daily newspaper. We define the unit of research as a daily newspaper if it satisfies the five criteria, which are defined in section 2.3. The data set has been used in chapter 2 to examine the relationships between the expected lifetime of newspapers and the cyclical characteristics of the industry in a static setting. In this chapter we study the effects of the abolition of the stamped paper duty on the market structure and survival chances by using a sub-sample of the data set. The abolition of the stamped paper duty removed the last obstacle to economic press freedom in 1869. It is reasonable to assume that the effects of the tax cut reduced over time, and eventually disappeared after World War II. Besides, in chapter 2 we show that the survival opportunities of newspapers depend on the state of the market. Therefore, we only analyse the effects of the stamped paper duty repeal on the market structure and survival chances in the expanding phase of the industry life cycle. For every newspaper in our sub-data set the following information is available:

Duration: Lifetime, measured as the difference between the year at which the newspaper ceased to appear and the year of initial publication⁷;

⁷The data are censored for newspapers that entered the market before 1848; these newspapers are treated as uncensored cases. This is known as *left censoring* in the duration analysis literature. In order to avoid misinterpretation we added the variable age for each newspaper that appeared before 1848 (*Left*). When an observed duration of length T is incomplete, the observation for the lifetime of that

<i>Left:</i>	For left censored cases: the age of incumbent newspapers in 1848;
<i>Dens:</i>	Number of daily newspapers one year before the newspaper entered the market;
<i>TInd:</i>	Age of the industry at the year the newspaper entered the market;
<i>Dregion(i):</i>	Number of daily newspapers in the main appearance region <i>i</i> of the newspaper in The Netherlands one year before the newspaper entered the market. The four regions are <i>North</i> , <i>East</i> , <i>South</i> , and <i>West</i> . For the definition of the regions see section 2.3;
<i>Price:</i>	Five years average price for daily newspapers in real constant 1845-1849 terms the year at entrance;
<i>Incum69:</i>	Variable indicating if a newspaper existed at the time of the 1869 tax repeal;
<i>Enter69:</i>	Variable indicating if a newspaper entered the industry in the period 1869-1871 following the 1869 stamped paper duty repeal;
<i>Mono69:</i>	Variable indicating if a newspaper entered into a local monopoly in the period 1869-1871 after the 1869 tax repeal;
<i>Oligo69:</i>	Variable indicating if a newspaper entered into a local oligopoly with incumbent newspapers before 1869 in the period 1869-1871 following the 1869 stamped paper duty repeal.

Despite the interesting information beared in the data set, it will almost surely have historical inaccuracies. Most likely, these involve omissions of some small and short-lived newspapers. In total we have duration data of 187 Dutch daily newspapers for the period between 1848 and 1936. Median duration and average age of newspapers on the market are 30.0 and 36.5 years respectively.

3.5 Duration Analysis

Within different phases of the industry's life cycle the correlation between entry and exit rates is positive (Table 2.1). Together with the rapid increase of new firms after 1869, and the pre-World War II decreasing number of new entrants through time (Figure 3.1), we assume that fixed cost of production decreased when the number of newspaper providers increased. Agarwal and Gort (1996) argued that a fixed cost incurred upon entry constitutes an exit barrier as well. Hence, firms that enter and incur larger fixed costs of production are expected to live longer. The survivor model that we estimate in this section to investigate the effects of taxation on the survival probabilities of newspapers, is static and is limited in its scope. However, this kind of model is closest to the one-period models discussed in section 3 of this chapter.

The sub-data set we described above enables us to investigate how a change in entry

newspaper contains only the information that duration is at least T . This is known as right censoring.

conditions caused by the 1869 downward cost shock influences the survival rates of newspapers. If fixed costs of production diminish when the number of firms increases, entry barriers may decline accordingly. If fixed costs incurred upon entry constitute exit barriers as well, and if firms in larger markets incur larger fixed costs (see Bresnahan and Reiss (1993)), then these firms may have lower exit propensities. Alternatively, one can argue that a newspaper provider, that emerges as a monopolist in a new market segment, pockets a monopolist's profit. When this situation does not change for some time, the monopolist should have a higher expected survival rate than one that entered at the same time in an oligopolistic market segment. We will use an industry life cycle duration analysis (see, e.g., Audretsch and Mahmood (1995)) to test the following two hypotheses:

Hypothesis 1: A newspaper that enters directly after a downward cost shock (tax cut), has a lower survival opportunity than one that already existed before the shock.

Hypothesis 2: A newspaper that enters as a monopolist into a local market segment after a downward shock (tax cut), has a higher chance to survive than one that enters into an oligopolistic market structure.

Apart from the available information, a commonly applied model in duration studies to describe exit rates is the Weibull survival model that depends on a vector of explanatory variables with unknown coefficients β . The Weibull survival model is flexible and appropriate for a wide variety of situations (see, e.g., Lancaster (1990), Blossfeld and Rohwer (1995)). Therefore, we use the Weibull model that allows the hazard rates to fall monotonically or to increase monotonically with duration. Formally, the Weibull density function is written as

$$f(t) = \rho \lambda^\rho t^{\rho-1} \exp(-(\lambda t)^\rho), \quad \lambda, \rho > 0, \quad (3.31)$$

the survival function as

$$S(t) = \Pr(T \geq t) = \exp(-(\lambda t)^\rho), \quad (3.32)$$

and the hazard function as

$$h(t) = f(t) / S(t) = \lambda \rho (\lambda t)^{\rho-1}, \quad (3.33)$$

where T is a random variable. The variable T measures time on a newspaper-specific clock, that is set to zero at the moment the newspaper enters the industry (Lancaster (1990)). When an observed duration of length T is incomplete, the observation for the lifetime of that newspaper contains only the information that duration is at least T . Hence, the contribution to the likelihood function is the probability that the newspaper has a duration greater than T . The effects of explanatory variables X on the survival rate or the

hazard function can be incorporated by substituting $\lambda = \exp(-\beta X)$. Duration dependence is positive if $\rho > 1$, meaning that the exit probability increases with the duration of being in the market. If $\rho < 1$, duration dependence is negative, indicating that the exit probability is reducing with age.

Table 3.2 Weibull Survival Analysis of Dutch Daily Newspapers: 1848-1936

	Baseline		1869 Repeal of Stamped Paper Duty (Hypothesis 1)		Local Market Segmentation (Hypothesis 2)	
<i>Constant</i>	3.3951	(2.5655)	6.0987*	(2.4424)	6.4726*	(2.4474)
<i>Dens / 10</i>	-0.7967	(0.6145)	-1.0675+	(0.5979)	-1.1650+	(0.6429)
<i>TInd</i>	0.1708*	(0.0671)	0.2039*	(0.0660)	0.2147*	(0.0723)
<i>Left / 100</i>	0.6432	(0.9791)	-0.0923	(0.9793)	-0.0920	(0.9574)
<i>Price</i>	0.1815*	(0.0726)	-0.0037	(0.0663)	-0.0048	(0.0626)
<i>DNorth</i>	-0.1698	(0.2851)	-0.1642	(0.2706)	-0.1871	(0.2628)
<i>DEast</i>	-0.0649	(0.1318)	-0.0573	(0.1223)	-0.0626	(0.1192)
<i>DSouth</i>	-0.1160	(0.1698)	-0.0856	(0.1685)	-0.1022	(0.1624)
<i>DWest</i>	-0.0518	(0.0489)	-0.0408	(0.0460)	-0.0422	(0.0445)
<i>Incum69</i>			4.1257*	(0.9922)	4.0624*	(0.9721)
<i>Enter69</i>			-0.1854	(0.5969)		
<i>Mono69</i>					1.6307	(1.2413)
<i>Oligo69</i>					-1.1156	(0.8368)
$\theta = 1 / \rho$	1.8969*	(0.3467)	1.7262*	(0.2906)	1.6821*	(0.2759)
Log Likelihood	-247.4535		-232.8492		-229.9211	

Notes: * significant at 5%; + significant at 10%; standard errors in parentheses.

The first column in Table 3.2 shows the baseline results of the parameter estimates for the Weibull function for durations⁸. *Dens* represents the pre-World War II number of incumbent newspapers one year before entry of a specific newspaper. The density one

⁸We have estimated Cox' proportional hazard, and exponential, generalized Gamma, Logistic, and Normal survival distribution functions. We found that all alternatives could be rejected in favour of the Weibull distribution.

year before entrance proxies the effects the intensity of competition at the entry date might have on the chance of survival. This indicates that in the period before World War II a higher density in the year before entry corresponds with a shorter, albeit insignificant, expected lifetime. This is a first hint pointing towards our suggestion of a positive relationship between diminishing fixed costs of production and survivorship through time in a market with net entry and a positive entry/exit correlation. It is worthwhile to point out that the parameter estimates of the regional number of newspapers *DNorth*, *DEast*, *DSouth*, and *DWest*, though insignificant, are all negative. This may also suggest that the larger the number of regional incumbent newspapers in the year preceding entry in that particular market segment, the more intense the competition and therefore the lower the survival chances.

We have already mentioned in chapter 2 that it may be plausible to assume that the Dutch newspaper market is dominated by first-movers. However, the parameter estimate of the variable *Left* indicates that the first-movers advantage is insignificantly different from zero in the Weibull survivor function.

As illustrated in Figure 3.1, the aggregate average price for daily newspapers in real constant 1845-1849 terms decreases between 1848 and 1936. It is plausible to assume that especially the dramatic decrease in price immediately after the tax cut should have a significant influence on the survival opportunities of newspapers. The parameter estimate of the price development effects, *Price*, on the survival rate is positive and significantly different from zero. This indicates that a higher price corresponds with a longer expected lifetime. This points towards an intensifying competition process.

The variable *TInd* has been created to investigate the effects of the industry age in the year a particular newspaper entered the industry on the survival chances of newspapers. The parameter estimate of this variable shows a significant positive effect on the survival chance of a newspaper. This suggests that other industry specific characteristic evolutions should have had a larger influence on the survival opportunities of newspapers. Unfortunately, we do not have data on firm specific and industry specific determinants, such as circulation data, literacy and population developments in The Netherlands, and sizes of the segmented markets before 1936. But, we can learn about the effects of the abolition of the stamped paper duty in 1869 on the survival opportunities of newspapers in the daily newspaper industry.

The second column of Table 3.2 provides a test of our first hypothesis. *Incum69* indicates if a newspaper existed at the time of the 1869 tax repeal. Its significantly positive parameter estimate points indeed at the fact that incumbent newspapers at the time of the 1869 tax repeal had higher survival chances. *Enter69* indicates if a newspaper entered the market in the period 1869-1871 as a result of the 1869 stamped paper duty repeal. Its parameter estimate is negative and insignificantly different from zero. This result confirms that newspapers, which entered in response to the 1869 tax cut generally had lower survival chances than the incumbents.

If the relationship between fixed costs and the number of firms, as put forward by Bresnahan and Reiss (1993), is realistic for the newspaper industry, then newspapers,

when producing in larger markets, incur a higher fixed cost and should therefore have higher survival opportunities. The third column of Table 3.2 presents the estimation results to test our second hypothesis. *Monop69* indicates if a newspaper entered into a local monopoly in response to the 1869 tax repeal; *Oligo69* indicates if a newspaper entered into a local oligopoly after the 1869 tax cut. We find that the expected lifetime of newspapers created in small local markets exceeds that of other newspapers in our sample. The interpretation of the result of *Monop69* > 0 is similar to the result *Incum69* > 0. It is the first mover advantage in small local markets that was created after the 1869 repeal of the stamped paper duty (*Monop69*) or after the freedom of the press was written into the Dutch Constitution in 1848 (*Incum69*). Dailies that, in response to the 1869 tax cut, appeared in large existing markets had lower survival chances (*Oligo69* < 0). This result refutes the notion that entrants in larger markets are faced with a large fixed cost of production and therefore have higher survival chances. Newspapers that enter into a segment of the market with oligopolistic competition are faced with the same costs of purchase and degree of irreversibility of production capacity as newspaper that emerge as monopolists in small markets at the same time. But the entrants in large markets may have higher marketing expenses to obtain a desirable market share (Spence (1976), Sutton (1992)). The fact that these newspapers perform not as well as entrants that are monopolists suggests that the industry's selection mechanism works rather well. The difference between the variables *Mono69* and *Oligo69* is statistically significant at conventional levels, as indicated by a computed χ^2 statistic of 5.9.

It is worthwhile to point out that the parameter estimates of variable *Price* are insignificantly different from zero in column two and three. This implies that the significant effect of *Price* in column one can be explained by the abolition of the stamped paper duty in 1869. The differences between column one and columns two and three are statistically significant at conventional levels, as indicated by the computed χ^2 statistic of 29.2 and 35.1, respectively.

The models discussed here illustrate that the hazard rates of newspapers in the first years are high and decrease gradually over time. For all Weibull survival models we find a value of ρ significantly smaller than 1, implying negative duration dependence.

3.6 Conclusions

In this chapter we investigated whether governments can have a large influence on market structures through tax policy; i.e. whether the market structure consequences should be part of tax policy design. We studied the effect of the 1869 repeal of the stamped paper duty on the market structure for daily newspapers in The Netherlands. The permanent tax cut implied a downward cost shock like a cost reducing technological improvement. Our results should therefore generalize to any situation in which a dramatic cost reduction changes entry conditions. Usually, we do not observe such shocks directly, or at least not their exact timing. The 1869 tax cut, on the other hand, is a clear-cut example.

We found that after the 1869 tax shock, the cost reduction was shifted almost completely into the commodity's price that dropped by about 50 percent as well. The number of available newspapers in the market increased from 42 before to 63 right after the tax repeal. This result confirms that well-designed tax policy can affect entry and exit conditions of industries. The 1869 repeal of the stamped paper duty increased market competition in oligopolistic markets and increased the provision of new products at lower costs.

Newspapers that emerged after the tax cut as monopolists in small local markets are more likely to survive than the ones that entered into existing oligopolistic markets in large cities. This result confirms that fixed costs that form an entry barrier decline with increased competition, but it refutes the notion that a firm that enters in a larger market incurs a larger fixed cost of production and therefore is more likely to survive.

The previous chapters analysed the relationships between expected lifetime of newspapers and cyclical characteristics of the industry and the effects of two political events in a static setting. The results show that government interventions can significantly influence the market structure during the life cycle, although we did not analyse whether the effects of political events depend on the cyclical evolution of the industry. In the next chapter we will, therefore, investigate the effect of four political events on the market structure taking into account the cyclical evolution of the daily newspaper industry. We will analyse the dynamic setting by using annual data of all newspapers in our data set.

Chapter 4

Political Events in the Dutch Polder

4.1 Introduction

This chapter investigates the impact of four political events on the development of the market for daily newspapers in the Netherlands since one and a half century ago¹. The previous chapters already described and analysed the effects of some of the following four political events. In 1848, freedom of press was incorporated into the new Constitution of the Kingdom of the Netherlands (see chapter 2). This initiated the development of the Dutch newspaper industry. The second political event, the 1869 special tax cut, has been discussed extensively in chapter 3. The abolition of this stamped paper duty removed the last obstacle to economic press freedom. The tax repeal substantially reduced the newspaper production costs which caused the number of newspapers to grow by 50 percent in the two years thereafter. The third political event is World War II. This period of turmoil caused a reversion in the industry's life cycle. During the pre-war period from 1848 onwards the market expanded in the number of available dailies, whereas after the war the expansion ended and the number of newspapers steadily declines. In reaction to this concentration tendency, in 1971 the Dutch government decided to install a press relief fund. The fund's goal was and is to save pluralism of daily newspapers. The creation of the press relief fund, that still exists today, is the fourth political event that changed the development of the industry. We note that until 1997 the market's players have been Cournot competitors. The price for dailies was annually agreed upon in collective bargaining agreements, as typical for the Dutch polder model².

Event history analysis of the unique data set of Dutch daily newspapers for the period 1848 to 1997 enables us to investigate the impact of these four political events on the duration dependence of the incumbent newspapers' survival chances. We find that policy

¹This chapter is based on: H.L. van Kranenburg and G.A. Pfann (1999), "Events in the Dutch Polder: Expansion and Concentration of the Daily Newspaper Market".

²Consensus is the heart of the Dutch Polder model. In policy development the main institutions in the industrial relation systems play a major role. The participants bargain for a consensus to solve their common problems and to achieve their common goals.

measures, targeting a reduction in the entry barriers to enhance the development of the market for dailies, had, when taken early in the life cycle, a long-lasting impact. Especially those newspapers that found an isolated spot in the market were guaranteed a longer lasting successful readership. We also found evidence of the fact that the technological changes, such as the increase of transportation possibilities and the improvement of electronic communication, changed the market structure from a regional to a national market. These changes increased the optimal size of newspaper firms causing concentration in the newspaper market. Finally, the exit barrier enhancing policy to delay the concentration process when the market was in decline did not seem to be very successful.

The chapter is organized as follows. The next section briefly gives the theoretical background of the dynamics of markets. Section 4.3 presents summary information on the Dutch daily newspaper industry in general and details the effects of the four shocks on entry and survival rates. Section 4.4 presents the data used in this study. Section 4.5 outlines the econometric method and section 4.6 discusses the outcomes of our empirical analysis. Section 4.7 concludes.

4.2 Theoretical Background

Schumpeter (1934) noted that the fittest firms in an industry are those that gain competitive advantages through innovations or early adoption of a new product or process. Survival chances depend on the actual firm behaviour and the characteristics of the competitive environment, or as Nelson and Winter (1974, p.893) pointed out, “the selection environment is at once the medium through which exogenous influences are transmitted to the firms in the sector and the medium through which the firms of the sector influence each other”. Entry rates vary over time, come in waves, and often peak early in the life of an industry. These waves of entry tend to contain different types of firms. High rates of entry are often associated with high rates of innovative activities and increases in efficiency (Geroski (1995)). However, empirical literature shows that entrants generally are not the major source of innovation in an industry, but that entry stimulates incumbents’ innovative activities (see, e.g., Baldwin and Gorecki (1989) for the Canadian manufacturing industry)³. Entry plays an important role in shaping the industry structure in certain phases of the industry life cycle at precisely those times when the current activities of incumbents are most out of line with exogenous changes in costs and demand. Entry is easy, but to survive is difficult. It is a stylized fact that the survival chances of most new firms are low. Geroski (1995) recognized that even for successful entrants it may take more than a decade to achieve a size comparable to the average incumbent.

³This finding depends on the stage of the life cycle the industry is in. In general, the empirical studies are based on mature industries only.

In the literature, models of industry evolution are developed to reflect the impact of the selection mechanism on the nature of industry evolution (see, e.g., Jovanovic (1982), Winter (1984), Klepper (1996)). These models predict that the longer a firm remains in the market, the more it learns from its true costs and its relative efficiency and the less likely it is to fail. A group of industry evolution models is developed by Klepper and Graddy (1990). They model how chance events and exogenous factors influence the number of potential entrants to the industry.

Despite the long tradition of empirical research investigating which factors determine whether incumbents and new firms are likely to survive, only a small number of studies to our knowledge investigates the effects of political events on the survival chances of firms during the industry life cycle. Political events may change the market structure, although the effect of these shocks depends on the stage the market is in. Government action in an expanding industry can create new opportunities for potential entrants and incumbent firms, while intervention in a concentrating industry generally does not lower the entry barriers and does not increase the exit barriers in the newspaper industry.

We study the effects of political events on the entry rates and survival chances of daily newspapers in The Netherlands. The statistical model that we use is comparable to the ones used by Agarwal and Gort (1996) and Audretsch and Mahmood (1995). We estimate hazard rate models to find out which determinants influence the survival chances of dailies significantly. Apart from duration other factors like incumbency, monopoly, the aggregate price level, and market density measures determine the survival rates of the daily newspapers. We compare our findings with those of other studies that investigate the market for newspapers in Argentina, Finland, Ireland, and the U.S.A. (Amburgey, Kelly, and Barnett (1993), Carroll (1987)).

4.3 Market Dynamics in the Dutch Polder

In this section we review the entry rates and survival chances of entrants in the Dutch daily newspaper market in response to political events and over the industry's life cycle. We concentrate on four political events in particular which influence the entry rates and survival chances of newspapers. These are (1) freedom of speech, press and opinion; (2) the repeal of the stamped paper duty; (3) World War II; and (4) the introduction of the press relief fund.

4.3.1 Freedom of Press

One and a half century ago, in 1848, freedom of the press was incorporated in Article 7 of the Constitution of the Kingdom of The Netherlands. The lack of essential political freedom, such as freedom of speech and opinion, had profound consequences on the market structure before 1848. In fact, most of the early attempts to establish a new newspaper firm were forced to be unsuccessful in the regulated industry. The existing

Table 4.1 New Newspapers Entry and Survival Rates over the Daily Newspaper Life Cycle in The Netherlands: 1848-1994

Period	Entry Rate	Survival Rates		
		≤ 5 years	≤ 10 years	≤ 15 years
1848-1850	0.20	0.83	0.67	0.67
1851-1858	0.13	0.80	0.80	0.64
1859-1868	0.07	0.71	0.60	0.49
1869-1871	0.50	0.67	0.57	0.52
1872-1878	0.17	0.48	0.40	0.40
1879-1888	0.16	0.76	0.76	0.69
1889-1898	0.07	0.83	0.58	0.47
1899-1908	0.04	1.00	0.90	0.87
1909-1918	0.04	1.00	0.83	0.83
1919-1928	0.04	0.90	0.86	0.86
1929-1938	0.02	0.83	0.33	0.00
1939-1944	0.06	0.94	0.94	0.86
1945-1946	0.31	0.70	0.58	0.48
1947-1958	0.02	0.79	0.54	0.42
1959-1968	0.02	0.58	0.58	0.58
1969-1978	0.01	1.00	1.00	1.00
1979-1988	0.03	0.50	0.50	0.33
1989-1994	0.02	0.67	-	-

Notes: The entry rate is the average of the entry rates in the sub-periods in a defined period. An entry rate is defined as the number of entrants in the defined sub-period compared to the number of newspapers one year before entrance in the sub-period. The survival rate is defined as the number of firms surviving in a given year, as a percentage of the total number of new newspapers established in the defined period.

newspapers supported the (local) government. These newspapers were obliged to print the city or provincial weapon on the front page of their newspapers to receive financial and political help (Schneider and Hemels (1979)). The incumbent newspapers before 1848 had a huge competitive advantage over newcomers after 1848. They had both the time and the government support to establish a substantial reading public before 1848. The average age of the incumbent daily newspapers was 52.63 years at that time. The introduction of press freedom lowered the entry barrier and therefore created new survival opportunities for entrants. The 1848 event gave an impulse to the evolution of the industry. Indeed, a relatively high entry rate characterized the increased survival opportunities for new established newspapers. Table 4.1 presents the entry rates of new newspapers over the industry life cycle. It also contains the survival rates of the newly established newspapers over 5, 10, and 15 years. We find that in the two years after 1848 the market expanded with 20 percent. This result is derived from the information described in Schneider and Hemels (1979), and Hemels (1969a).

4.3.2 The Repeal of the Stamped Paper Duty

In chapter 3 we have shown that after 1848, a stamped paper duty still constituted an economic obstacle for incumbent and potentially new newspapers. The stamped paper duty, known as ‘Dagbladzegel’, originated from the ‘*timbre extraordinaire*’ left over from the French Empire’s tax laws installed in 1811, one year after the annexation of The Netherlands (Hemels (1969a, b, 1992)). The special tax system doubled the production costs and therefore constituted a high entry barrier. As a result many new newspapers frequently faced capital and cash flow problems after 1848. This led to a decrease of entry rates and survival chances of new newspapers in the following period. In 1869, the Dutch government repealed the special tax system for newspapers. The abolition of the tax system removed this barrier to economic press freedom. Production costs decreased enormously, in some cases with 50 percent, after the abolition decision of the government (Schneider and Hemels (1979)). The abolition of this tax system stimulated potential entrants to enter the industry. Table 4.1 shows a high entry rate of 0.50 for the period 1869-1871. Of this cohort 67% of the entrants survived the first five years, and just 50% of them were still active in the industry after 15 years. With the construction of two structural theoretical models in chapter 3, we could explain the survival opportunities for the incumbents and entrants in this period. We show that a newspaper that entered as a monopolist into a local market segment generally had a lower probability to exit than one that entered into an oligopolistic market structure. A newspaper that entered as a monopolist in a new local market segment, earned a monopolist’s profit. The oligopolists or duopolists had to compete with incumbents for the same reader public. Liberalization of the industry increased incumbents’ opportunities to grow and their chances to survive because of the lower cost prices and the augmented circulation. The tax cut decreased the production in variable production costs by approximately 50 percent and was shifted almost completely into the product’s subscription price. Figure 4.1 shows the five-years

aggregate price for daily newspapers in real constant 1845-1849 terms (see also Appendix B).

Figure 4.1 The Life Cycle of the Daily Newspaper Industry: 1848-1994

4.3.3 World War II

The third political event that affected the entry and the survival rates of daily newspapers was the turmoil period of World War II. The political developments before, during, and after the war caused all kinds of market adjustments for incumbents and entering newspapers. During the war, pro-German newspapers entered the industry, while anti-German newspapers were forced to exit (see also Goedhart (1943)). The post World War II entry shock is mainly due to the legitimization of the underground newspapers prohibited by the pro-German government (see Table 4.1)⁴. Also the newspapers which collaborated with the pro-German government were abandoned (cf. Schneider and Hemels (1979))⁵. New opportunities for newspapers existed to conquer larger market segments and new readers. These opportunities led to an increase of competitiveness in the industry. More

⁴For instance, the underground newspapers 'Het Parool', 'Trouw', and 'De Waarheid'.

⁵For instance, the newspaper 'De Telegraaf'.

newspapers fought in the same market segments with only limited space. The increased intensity in competition reduced the survival chances of entrants and the entry rates.

Other studies also show that environmental shocks changed the entry and exit barriers in the newspaper industry and thus affected the survival chances and opportunities for newspapers. In Finland, for instance, Amburgey, Kelly, and Barnett (1993) show that environmental shocks, especially wars and civil disorder, increased the hazard rate for newspapers. Carroll (1987) shows that wars resulted in new opportunities for potential entrants in Ireland, Argentina, and U.S.A.

4.3.4 Press Relief Fund

After World War II the number of daily newspapers in The Netherlands has experienced a continuous decline. During the 1960s and 1970s, the market for daily newspapers was confronted with an upsurge in press concentration, especially due to the introduction of television and radio advertising in 1967. Starting in the late 1960s, the request for corrective governmental actions increased. In 1971, the Dutch government installed a press relief fund, 'Bedrijfsfonds voor de Pers' as a temporary provision to protect the multiformity in the daily newspaper industry. The press relief fund could financially support daily newspapers that struggled for survival. This fund became a foundation in 1974 and still exists today. The government financial assistance existed of (1) general support like tax and postal concessions, (2) special measures available to newspapers in trouble, like compensation schemes, loans, and credits, and (3) specific general measures available to all newspapers such as subsidies (Hemels (1997)). For instance, between 1973 and 1997, the Press Fund paid out more than 19 million Dutch guilders for loans, credits with special facilities, subsidies to 12 daily newspapers that struggled to survive (Bedrijfsfonds voor de Pers annual report 1995). The purpose of the Press Fund was not only to provide newspapers with financial assistance, but also to encourage potential newspapers to enter the industry. The aim, tasks, and authorities of the 'Bedrijfsfonds voor de Pers' are written in the Dutch '*Mediawet*' and in the '*Mediabesluit*' (KB of 19th November 1987, STB. 573). The press relief fund turned out to be unsuccessful in fulfilling its mission. The exit barrier enhancing policy to stop the concentration process did not seem to be very successful. Other studies of concentrating newspaper markets have shown as well that government interventions to maintain pluralism in the daily newspaper industry have not been successful after World War II. In Sweden, for instance, Gustafsson (1993) finds that government policies could not increase the exit barriers in the upsurge concentrating newspaper industry.

4.3.5 Evolution of Price and Number of Newspapers

Daily newspapers in The Netherlands have never fought price wars, but have used increases in quality and cost reductions as a device to compete for the largest circulation quantity. Quality is referred to as the quality of the editorial and commercial contents of

the newspapers. After World War II, the prices of newspapers were at least partly set by the government. Newspapers were allowed to increase their prices within margins, subjected to government's approval as long as the industry could demonstrate that the total costs had increased more than the total revenues in the previous years. Figure 4.1 shows that the average real price falls, but in the last decades it rises. The opposite is true for the number of newspapers. Since 1848, when 30 newspapers existed, the number of newspapers increased steadily until World War II after which the market became more and more concentrated. In the post-World War II period the number of daily newspapers in The Netherlands has experienced a continuous decline that coincides with an increase in total circulation (see Dutch Newspapers Publishers' Association annual reports). After World War II, the scale of production has enlarged significantly, possibly due to technological innovations. Evidence of increasing scale economies is also found in other countries' newspaper industries like in Argentina, Ireland, and U.S.A. (see, e.g., Rosse (1967, 1970), Carroll (1987)). Table 4.1 exhibits that, from 1947 on, the entry rates were very low. The survival rates of entrants in the post-World War II period confirm that intensified competition attracted only stronger than average entrants (see also Agarwal and Gort (1996)). Entrants that survived the first five years have a high chance to remain in the industry after 15 years. Studies of Gort and Klepper (1982), and Klepper and Graddy (1990) have established a particular pattern: in the 46 industries they analysed, the number of firms first grows, then declines sharply, and finally stabilizes. However, they did not find an inverse relationship between the number of firms and the product price. They find that output rises and product prices fall at decreasing percentage rates during the evolution of the industries⁶.

If we correct the average aggregate real price data for the average aggregate number of newspapers' pages for the post-World War II period, then we observe a sharp decline in the average real price until 1970 after which the average price increases. This pattern suggests that although the average price increased, the production costs increased as well, which lead to the concentration of newspapers in The Netherlands. The turning point in the price per page development corresponds with the installation of the press relief fund in 1971, together with the government decision to allow newspapers to substantially increase their subscription prices to cover the increase in distribution costs (Schneider and Hemels (1979)). Figure 4.2 illustrates the development of the average real annual newspaper subscription price corrected for the average number of pages from 1950 onwards.

⁶Klepper and Graddy (1990) argue that many products departed from the direction of change in price and output over time and the time path of the number of firms at some point in their evolution. Both the study of Klepper and Graddy (1990) and the work of Gort and Klepper (1982) computed the price data from indexes of sales and output, and thus errors can be introduced from either components. This may indicate that our finding of an inverse relationship between the number of firms and the product price is not unique and explain why our price data do not confirm their declining price path.

Figure 4.2 Annual Subscription Price per Number of Pages in Dutch Guilders: 1950-1994

In the early stages of an industry's life cycle the intensity of competition within a region depends on the number of newspapers in this segment, while the legitimization in regional market segments depends on the total number of newspapers in the early industry (see Hannan, Carroll, Dundon, and Torres (1995)). In other words, the regional number of newspapers will have a negative effect on the survival chances of newspapers in these regions, while the total number of newspapers will have a positive effect on survival chances of these newspapers in the early increasing phase of the number of newspapers. When the number of newspapers nears the limited readership space of the industry, an additional entrant greatly intensifies competition (Hannan (1997)). Changes in competition and the size of the reading public determine a ceiling, called the carrying capacity, on the expansion of the number of newspapers. The survival opportunities for potential entrants decrease as the industry matures. Therefore, this phase of the industry evolution is attractive only for stronger than average entrants. Table 4.1 confirms the low entry rates and high survival rates for entrants in the periods between 1900 and 1938, and from 1950 to 1994.

4.4 The Data

In this chapter we investigate whether political events changed entry and exit conditions.

The unit of analysis in our research is the newspaper publication (title). Our unit of research must satisfy the five criteria, which are defined in chapter 2. We consider the entry date for a newspaper to be the year in which the first publication appeared, and the exit date to be the year in which a newspaper title does not exist in a name anymore, and when it has lost its identity at the same time. In our definition if a focal newspaper horizontally merges with one or more newspapers, then one newspaper survives, while the other(s) exit(s). In constructing the life-histories in this way, we maintain any historical relationships and the existing demands remain embodied in the market with a horizontal merger.

In total we have observed 261 daily newspaper publications in The Netherlands for the period between 1848 and 1995. Median duration and average age of newspapers on the market are 35 and 48 years respectively. This data set has been used in chapter 2 to examine the relationships between expected lifetime of newspapers and cyclical characteristics of the industry in a static setting. In this chapter we study a dynamic setting by using annual data of all newspapers in our data set. For every newspaper in the data set the following annual information is available:

<i>Duration</i> :	Lifetime of a newspaper;
<i>Price_{t-1}</i> :	Five years average (aggregate) price for daily newspapers in real constant 1845-1849 terms;
<i>Price_{t-1}²</i> :	Five years average (aggregate) price for daily newspapers in real constant 1845-1849 terms squared;
<i>Ntot_{t-1}</i> :	Number of newspaper titles in The Netherlands in the previous period;
<i>Ntot_{t-1}²</i> :	Squared number of newspaper titles in The Netherlands in the previous period;
<i>NRegion(i)_{t-1}</i> :	Number of newspaper titles in the main appearance region i of the newspaper in The Netherlands in the previous period. The definition of the regions in our study is based on the classification that is published by the Dutch Central Bureau of Statistics; The four regions are composed from the twelve provinces: <i>North</i> (Friesland, Groningen, and Drenthe), <i>East</i> (Gelderland, Overijssel, and since 1986 Flevoland), <i>South</i> (Noord-Brabant, and Limburg), and <i>West</i> (Utrecht, Zuid-Holland, Noord-Holland, and Zeeland);
<i>NRegion(i)_{t-1}²</i> :	Number of newspaper titles in the main appearance region i of the newspaper in The Netherlands in the previous period squared;
<i>TInd_t</i> :	Age of the industry at time t;
<i>TInd_t²</i> :	Age of the industry squared at time t;
<i>Incum48</i> :	Variable indicating if a newspaper existed at the time freedom of speech, opinion, and press was written in the Constitution in 1848;
<i>Enter48</i> :	Variable indicating if a newspaper entered the market in the period 1848-1850 in response to the liberalization of the press in 1848.

<i>Mono69:</i>	Variable indicating if a newspaper entered into a local monopoly in the period 1869-1871 as a result of the 1869 stamped paper duty repeal;
<i>Oligo69:</i>	Variable indicating if a newspaper entered into a local oligopoly with newspapers existing before 1869 in the period 1869-1871 as a result of the 1869 stamped paper duty repeal;
<i>InWW2:</i>	Dummy variable indicating if a newspaper was forced to exit the market during World War II;
<i>PastWW2:</i>	Dummy variable indicating if a newspaper entered the market in the aftermath of World War II in 1945-1946;
<i>Fund71:</i>	Dummy variable indicating if a newspaper appeared between 1972 and 1995, the period of the press relief fund in this sample.

4.5 Method of Analysis

Event history and duration models are most appropriate to investigate the relationships between daily newspaper survival rates, and explanatory variables such as political events, and the evolution of the newspaper industry. The analysis of duration of a newspaper should include the number of newspapers in the industry, the average price, and the political events. Ideally, we would like to use more firm specific data, but at present only the data specified in the previous section are available. Even in the case where complete spells of data are not available, at least the fact that the evolution of publication rates is state-dependent must be acknowledged (see chapter 2).

A common applied solution to describe exit rates is an exponential relationship between duration and the hazard rate (cf. Kalbfleisch and Prentice (1980)). Models with monotonically increasing or decreasing duration dependence, which are normally applied in duration analyses, are the Gompertz (-Makeham) and the Weibull distribution. These models use measures of duration time as proxy variables for unobserved or latent factors (Blossfeld and Rohwer (1995)). In the Gompertz model the unobserved or latent variable, for example learning by doing, increases linearly over the duration t a firm spends in the industry (origin state). The linearly increasing learning by doing experience leads to a monotonic declining or increasing Gompertz hazard rate. A Weibull model, on the other hand, assumes a logarithmical increase of the duration t a firm spends in the industry as a proxy variable for the unobserved variable learning by doing. The model which provides the best fit to the data, a linear or a log-linear specification of the accumulation of firm-specific learning experience over duration, is an empirical question. We find that a Gompertz hazard rate model provides a better fit to the annual data used in this study than the Weibull model⁷. Duration dependence is negative if the hazard rate, $h(t)$,

⁷The estimation of the models in chapter 3 is done with time constant explanatory variables. In other words, we have assumed that the explanatory variables are constant from the beginning of the

decreases with the age of a newspaper, t , ($dh(t) / dt < 0$), implying that the exit probability reduces with the duration of a newspaper being in the market. Vice versa, if ($dh(t) / dt > 0$), duration dependence is positive, increasing the exit probability of a newspaper with age. The explanatory variables included in the Gompertz hazard model are varying over time. We use the method of episode splitting to include time-varying explanatory variables into the specification of the Gompertz hazard model (see Blossfeld and Rohwer (1995)). The original episode (s, t) is split into L sub-episodes $((s, t) \equiv \{(s_l, t_l) \mid l = 1, \dots, L\})$, called splits of an episode, and each split is given appropriate values of the explanatory variables. All splits have the same origin state as the original episode and, except for the last split, are regarded as right censored. Only the last split is given the same destination state as the original episode. Formally, we parameterize the Gompertz hazard model for i^{th} newspaper which is observed to exit at t_i^l as

$$h(t_i^l) = \exp(\beta X_i^l) * \exp(\theta t_i^l), \quad (4.1)$$

and the conditional survivor function for i^{th} newspaper which is the probability of staying in the origin state at least until t_i^l given that this state was not exited until s_i^l , as

$$S(t_i^l \mid s_i^l) = \exp \{ \exp(\beta X_i^l) * 1/\theta * [\exp(\theta s_i^l) - \exp(\theta t_i^l)] \}, \quad (4.2)$$

where β denotes the vector of regression coefficients measuring the impact of a set of explanatory variables included in vector X_i^l , and θ is a constant term. The general log likelihood for a sample of N firms can be written as a function of the hazard term and the survival term:

$$\text{Log } L = \sum_{i \in E} \log [\exp(\beta X_i) * \exp(\theta t_i)] + \sum_{i \in P} \exp(\beta X_i) * 1/\theta * [\exp(\theta s_i) - \exp(\theta t_i)], \quad (4.3)$$

where E is the set of newspapers that exit and P is the set of all newspapers episodes with no exit. Written in this way, the likelihood can also be used with a sample of original episodes, and with the sample splits (see Blossfeld and Rohwer (1995)).

4.6 Results

The first column of Table 4.2 shows the estimation results of the Gompertz hazard model for the entire industry's life cycle. An important result is that the industry age affects the

measurement period, $T = 0$, to the time of the measurement, $T = t$. In this chapter we allow the explanatory variables to vary over time. The hazard function is modelled as a step function, with different values of explanatory variables through annual intervals between $T = 0$ and $T = t$, at which censoring or exit takes place.

survival chances of newspapers significantly. The industry age effects, $TInd_i$ and $TInd_i^2$, show that the survival chances of individual newspapers increase during the pre-World War II period, while the industry age has a contrary effect on the survival possibilities after the war. The quadratic function of industry age has its minimum at age 83 (corresponding to the year 1931). This finding indicates that entrants before 1931 had better survival opportunities than the new firms after this year. Hence, the survival possibilities of newspapers changed with the evolution of the industry structure. The parameter estimates of the political events show that the four political events affected the survival chances of incumbents and new firms, most particularly in the case of World War II. The political developments during the war affected the industry significantly. The variable $InWW2$ represents the first part of the effect of World War II, and its coefficient estimate indicates that incumbent newspapers which were characterized by high survival opportunities were forced out of the market.

As is illustrated in Figure 4.1, the evolution of the daily newspaper market shows a turning point around World War II. It is, therefore, interesting to test the effects of prices, newspaper's age, number of firms, and industry age before and after the break on the hazard rate of newspapers in The Netherlands. Table 4.2 presents the estimation results. The second column in Table 4.2 shows the results for the pre-World War II period: 1848 until 1944. The estimate of the squared term of the total number of newspapers in the industry, $Ntot_{i,t}^2$, shows a significant positive effect on the survival chance of a newspaper. This suggests that the survival chances of firms increase in an expanding industry. However, the regional number of newspapers has a marginally decreasing positive effect on the survival chances of newspapers which appeared in the particular region. The parameter estimates of $NNorth$, $NEast$, $NSouth$, $NWest$ are negative, while the squared terms increase the hazard rate. These results show that the intensity of competition within a region affected the hazard rate of newspapers in the same region, but not the competition in the other market segments. The estimate of the price development effects, $Price_{i,t}$ and $Price_{i,t}^2$, on the hazard rate is negative and significantly different from zero. This indicates that in the period before World War II a lower price corresponds with a shorter expected lifetime. This process may suggest that through the increase in competition and the acceptance of a dominant product design the newspapers had to become both price and cost conscious to survive.

The variables $TInd$ and $TInd^2$ have been created to investigate the effects of the industry age on the survival chances of newspapers. The parameter estimates of these variables show a substantial influence of $TInd^2$ on the hazard rate. The hazard rate decreases if the industry becomes older in the pre-World War II period. To explain the effect of this process on the survival opportunities of newspapers, we need industry and firm specific factors. Unfortunately, these specific data are not available for the pre-World War II period. The results of model 2 are still in line with the increasing survival rates of entrants in Table 4.1 and the mortality rates of newspapers in Figure 2.3 (see chapter 2).

Table 4.2 Estimation of Hazard Models

	Model 1 1848-1997		Model 2 Pre WWII		Model 3 Post WWII	
<i>Constant</i>	-2.1971	(2.1154)	-3.5455	(3.2935)	0.9203	(21.0390)
<i>Price_{t-1}</i>	-0.1955	(0.1291)	-0.3585*	(0.1656)	-2.8861*	(0.6896)
<i>Price_{t-1}²</i>	0.0013	(0.0038)	-0.0123*	(0.0045)	0.0826*	(0.0218)
<i>Ntot_{t-1}</i>	0.2060*	(0.0702)	-0.1219	(0.1067)	0.4734*	(0.1666)
<i>Ntot_{t-1}² (/1000)</i>	-0.8763*	(0.3460)	-1.3070*	(0.5939)	-2.5963*	(0.8936)
<i>NNorth_{t-1}</i>	-0.1960	(0.3027)	-0.7264*	(0.3484)	-0.0021	(0.9841)
<i>NNorth_{t-1}² (/1000)</i>	0.0068	(0.0180)	0.0497+	(0.0261)	0.0014	(0.0471)
<i>NEast_{t-1}</i>	-0.2170	(0.1393)	-0.7020*	(0.2274)	-0.0125	(0.4331)
<i>NEast_{t-1}² (/1000)</i>	0.0064+	(0.0037)	0.0295*	(0.0108)	0.0003	(0.0097)
<i>NSouth_{t-1}</i>	-0.2780	(0.2351)	-0.6698*	(0.2808)	-0.0155	(0.9976)
<i>NSouth_{t-1}² (/1000)</i>	0.0155	(0.0119)	0.0394*	(0.0192)	0.0046	(0.0456)
<i>NWest_{t-1}</i>	-0.0626	(0.0594)	-0.1639*	(0.0684)	-0.0334	(0.2271)
<i>NWest_{t-1}² (/1000)</i>	0.0006	(0.0006)	0.0023*	(0.0010)	0.0007	(0.0024)
<i>TInd_t</i>	-0.2880*	(0.0478)	-0.0948	(0.0776)	-0.2010	(0.4326)
<i>TInd_t² (/1000)</i>	1.7249*	(0.2730)	-1.1930*	(0.4860)	1.2629	(1.9532)
<i>Incum48</i>	-2.0132*	(0.8466)	-1.7833+	(0.9498)	-0.1819	(0.5986)
<i>Enter48</i>	-1.4627+	(0.7963)	-0.7106	(0.8738)		
<i>Mono69</i>	-1.1623+	(0.5934)	-1.4033+	(0.7261)	-1.1813	(1.0269)
<i>Oligo69</i>	0.4781	(0.3062)	0.2905	(0.3328)	1.3105+	(0.7536)
<i>InWW2</i>	5.1981*	(0.2443)				
<i>PastWW2</i>	0.4146+	(0.2284)			0.2763	(0.2532)
<i>Fund71</i>	-0.3659	(0.5131)			3.5780*	(1.4565)
<i>θ</i>	-0.0066*	(0.0027)	-0.0018	(0.0039)	-0.0110*	(0.0039)
Number of Spells	12558		7865		4693	
Number of Events	206		108		98	
<i>χ²</i>	437.6		123.8		160.0	
Log likelihood	-870.9137		-517.2705		-433.0985	

Notes: * significant at 5%; + significant at 10%; standard errors in parentheses.

Important influences on the survival chances of individual newspapers are the political events. The first political event that changed the market structure significantly was the liberalization of the press in 1848. From this year on, the regulated market became competitive. Given the results of chapter 3, it is likely to assume that duration in the Dutch newspaper market is dominated by first-movers. The variable *Incum48* indicates if a newspaper existed at the time of the liberalization of the press in 1848. Its significant negative coefficient estimate indeed points at the fact that newspapers that existed at the time of the 1848 liberalization of the press had lower exit probabilities. The incumbent newspapers had a first-mover advantage over later entrants. Newspapers that emerged immediately after freedom of the press was written in the Dutch Constitution, were more likely to survive longer than the ones that entered into the market at a later date. However, the incumbents were more persistent to survive than these new newspapers. The parameter estimate of *Enter48* is negative and only significantly different from zero at 10% level in model 1.

We have already mentioned that the stamped paper duty constituted the last remaining obstacle to be removed from the path to economic press freedom. The variables *Mono69* and *Oligo69* indicate if a newspaper entered into a local monopoly or oligopoly in response to the abolition of the stamped paper duty. We find that newspapers that emerged immediately after the 1869 tax shock as monopolists in small local market segments were more persistent to survive than the ones that entered into existing oligopolistic local market segments.

The last column in Table 4.2 presents the effects of the variables on the hazard function for the post-World War II period. It is clear that, in general, newspapers which appeared after 1945 had different survival opportunities than newspapers which appeared before this turning period. Just after the war new opportunities arose for potential entrants. The variable *PastWWII* acts to mimic the effect on survival chances of newspapers that entered in the years during the boom 1945 and 1946. The positive, but not significantly different from zero, coefficient illustrates that the survival rates of these new entrants were lower than the ones for the other newspapers. The end of this political process was characterized by new opportunities that might also be attractive for weaker than average entrants.

Figure 4.1 shows an inverse relationship between the price and the number of newspapers in The Netherlands. The average aggregate real price rises after the war. We already mentioned that the daily newspapers in The Netherlands have never fought price wars, and the prices were, at least in part, set by the government. The price developments were only allowed to follow the production cost's increases in the industry. An increase in the average price over time illustrates an increase in the production costs in the newspaper industry. The parameter estimates of the price terms are significant. The survival chances of newspapers decreased, although the prices increased. This implies that the production costs increased more than the prices were allowed to rise and this suggests a positive relationship between increasing large scale advantages and survivorship through time. Furthermore, our results show that the total number of

newspapers in The Netherlands contributes significantly more to the survival chances of individual newspapers than the regional number of newspapers in the upsurge concentrating industry. This finding shows that the protection advantage of appearing only in one market segment has diminished after World War II. The estimates of the total number of newspapers in The Netherlands ($Ntot_{t-1}$ and $Ntot_{t-1}^2$) show that an increase in competition among newspapers reduces the survival chances of newspapers in the first decades of the post-war period. If fewer newspapers are in the market the survival chances for newspapers increase. The parameter estimates of the regional and national number of newspapers indicate that the market structure changed from a regional to a national market after World War II. In particular the technological changes in World War II started to increase the optimal size of newspaper firms that caused concentration of the market.

The parameter estimates of *Incum48*, *Mono69*, and *Oligo69* do not significantly differ from zero. This result indicates that the effects of being a first-mover and of the abolition of the stamped paper duty on the survival chances of newspapers which already appeared between 1869 and 1871, had disappeared in the post-World War II period. The variable *Enter48* is not included in the post-World War II model, because many newspapers that entered the market in response to the liberalization of the press in 1848 had already exited the industry before the end of the war in 1945.

As a reaction to the request of government actions to protect the multiformity in the industry, the Dutch government introduced a press relief fund in 1971, which became a foundation in 1974. From 1971 on, newspapers that struggled to survive could receive financial support. It is likely to assume that survival chances of newspapers increased in this period. The variable *Fund71* acts to mimic the effect on survival chances of newspapers that appeared after the introduction of the press relief fund. The positive coefficient illustrates higher exit chances for newspapers after 1971. This implies that the government action could not increase the exit barriers in an upsurge concentrating market.

The estimation results of columns two and three indicate that the survival possibilities of newspapers changed with the evolution of the industry structure. Thus, if we compare the results of the parameter estimates of the entire industry and the sub-periods, our results show that the estimates in column one do not explain appropriately the differences in survival opportunities between newspapers in a new industry, and in a mature industry. Most importantly, the technological changes that resulted mainly from World War II, changed the market from a geographically partitioned to a nationwide market. The structural changes caused a turning point in the life cycle of the daily newspaper industry.

The models discussed here illustrate that the hazard rate of a newspaper in the first years after entry is high and then decreases gradually over time. For all Gompertz hazard rate models we find a value of θ slightly smaller than zero, implying negative duration dependence. The value of θ for the pre-war is, however, not significantly different from zero as the large sample t-value based on the estimates given in Table 4.2 for the hypothesis $\theta = 0$ is -0.47. This implies that the included time dependent explanatory variables explain the declining hazard rate for the pre-war period.

4.7 Conclusions

In this chapter we present a historical analysis of the entry and survival rates of the daily newspapers in The Netherlands for the period 1848 through 1997. We estimate Gompertz hazard functions to investigate how the survival chances depend on the phase of the industry evolution and political events. Four important political events that affected the market structure are considered: liberalization of the press in 1848, repeal of the stamped paper duty in 1869, the turmoil period of World War II, and the introduction of a press relief fund in 1971.

Our results show that the estimation results of a hazard rate crucially depend on the state of the industry. Early in the history of the expanding daily newspaper industry, the survival rates depended on the competitors in the same regional market segment and less so on the total number of newspapers in the industry. The development of the industry structure resulted in a substantially weakened importance of the number of regional newspapers. In the late stages of the industry evolution, the effect of the total number of newspapers in The Netherlands has become much more important. The intensity of competition in the industry and the increase in production costs, reflected in the increasing price, are found to be key variables in explaining chances of survival.

Our findings show that the political events have changed the market structure significantly. Liberalizing the daily newspaper industry indeed increased competitiveness in The Netherlands. The entry barrier lowering policy used in an expanding newspaper industry provided increasing new survival opportunities for potential entrants, and increased the survival rates of many first-movers. The abolition of the stamped paper duty removed the last obstacle to economic press freedom in 1869. Newspapers that emerged after the tax cut as monopolists in small local market segments were more persistent to survive than the ones that entered into existing oligopolistic local market segments. Incumbent newspapers were in favour of the abolition of the special tax system. However, their advantages reduced over time, and eventually disappeared after the war. The third event that affected the entry and the survival rates of newspapers significantly was the turmoil period of World War II. Most importantly, the technological changes that resulted from World War II changed the market from a geographically partitioned to a nationwide market. This structural change caused a turning point in the industry's life cycle. The introduction of a press relief fund in 1971 did not change the structure of the industry. Government interventions may have delayed the concentration process in the newspaper industry, but did not stop it. The exit barriers remained very low after World War II.

In the previous chapters we have only worked with industry specific data. To increase our understanding of the dynamics of firms and the evolution of the industry and the structure of markets, we need more detailed information which explains the entire period more precisely. Unfortunately, no firm specific data, such as circulation of individual newspapers, before the year 1950 exist, they were destroyed in and after World War II. However, we can investigate the evolution of firm specific and industry specific characteristics for the post-war period. Recent industrial organization studies, for instance

Gort and Klepper (1982), Jovanovic and MacDonald (1994b), and Klepper (1996), show that industries are characterized by a life cycle from their start up to a period of diminishing number of incumbents. Moreover, they demonstrated that the declining phase for the number of firms coinciding with a continuous increase in total output. The number of daily newspapers in The Netherlands has also experienced a continuous decline coincided with an increase in total circulation in the post-World War II period. The evidence indicates that after World War II the scale of production had enlarged significantly possibly due to technological innovations. Therefore, the following two chapters are dealing with the development of increasing scale economies in the daily newspaper industry in The Netherlands. These chapters provide a thorough understanding of the economies that underlie the survival possibilities of newspapers when concentration persists.

Chapter 5

Concentration Process and Macroeconomic, Industry, and Firm Specific Shocks

5.1 Introduction

Most studies of the dynamics of market structure are concerned with entry processes in expanding markets¹. Only a few (empirical) studies analyse the exit patterns in a concentrating industry that is characterized by negative net entry. These studies find that gross exit accelerates continuously until it reaches a peak and decelerates thereafter. In general, the phase of increasing concentration is characterized by the highest exit rates in an industry's life cycle (see, e.g., Gort and Klepper (1982), Klepper and Graddy (1990), Geroski (1991), Carroll and Hannan (1995)).

The dynamics of exit patterns are complex and still poorly understood. In recent years, it has been recognized that firm and industry specific characteristics, such as firm size and volatility in market shares, are crucially important features of an ongoing concentration process (see, e.g., Klepper and Grady (1990), Agarwal and Gort (1996)). To date, empiricists have had limited success in testing the theories on firm and industry specific determinants and their implications on individual survival chances of firms. The primary reason has been the limited availability of firm specific industry life cycle data. The question of industry turnover as a function of idiosyncratic, industry specific, and aggregate shocks is important and open. For example, influential theoretical studies on life cycle expansions and concentration assume that exiting firms loose their output. This is a strong assumption and neglects the fact that a concentrating industry is often characterized by mergers and takeovers. As Geroski (1991, p. 270) pointed out, "Market leaders often maintain their positions over considerable periods of time, and their exit is generally more likely to be due to takeover than to failure". Hence, changes in survival chances may be endogenous to the process of competition, while many other changes are exogenous.

This chapter investigates the exit process in the Dutch market for daily newspapers

¹This chapter is based on H.L. van Kranenburg, F.C. Palm, and G.A. Pfann (1999), "Concentration and Shocks in the Market for Dutch Daily Newspapers".

as explained by macroeconomic developments, industry specific shocks, and idiosyncratic firm characteristics, respectively. Between 1950 and 1996 the industry has experienced a continuous decline in the number of daily newspapers that coincided with a significant increase in demand. Exponential and piecewise constant hazard rate models are used to analyse the influences of the three types of determinants on the survival chances of newspapers along the concentrating industry's time path. The piecewise constant model is flexible and appropriate to investigate whether the effects on survival chances vary over time. We find that the newspaper's specific and industry specific characteristics largely explain the newspaper's survival chances. This is in line with the theoretical findings of, for instance, Ghemawat and Nalebuff (1990), Hopenhayn (1992), and Klepper (1996).

The chapter is organized as follows. Section 5.2 presents an overview of the theoretical and the empirical findings on exit behaviour. A distinction is made between macroeconomic, industry specific, and firm idiosyncratic specific results on exit. In section 5.3 the post-World War II history of the daily newspaper industry is described. Section 5.4 presents the determinants used for testing how the three types of determinants contribute to the exit of daily newspapers. Section 5.5 discusses the econometric models that we use and outlines the econometric specification of the piecewise constant hazard model. Section 5.6 presents and discusses the empirical results. Section 5.7 concludes.

5.2 Theoretical and Empirical Findings

While a sizeable number of recent theoretical studies examined the determinants of entry and exit, the majority of empirical work examined entry. To the extent that exit has been analysed, a symmetric relation between entry and exit has usually been imposed. There are, however, several theoretical reasons to believe that the factors conducive to entry differ from those affecting exit decisions. In fact, the few existing theoretical models on exit are indecisive whether the decline of incumbency is caused by macroeconomic, industry specific or idiosyncratic firm shocks². In this section we pass in review the theoretical exit models that are available in the literature³. We divide the factors that influence exit decisions of firms into three categories: (1) macroeconomic effects such as the counter-cyclicality of exit rates and variations in aggregate demand; (2) industry specific effects such as the industry's competitive structure, set up costs, technological innovations, and specific demand shocks; and (3) firm specific effects such as age, size, innovative power, fixed and variable production costs.

²These models have derived testable predictions regarding the survival chances of firms in a concentrating industry. Only a few studies subjected these theories to empirical tests, for instance Baden-Fuller (1989), Lieberman (1990), and Boeri and Bellmann (1995). But no empirical study has investigated the three types of shocks in an integral way.

³Caves (1998) provides an impressive overview of studies dealing with entry-exit turnover and mobility of firms.

5.2.1 Macroeconomic Effects

Entry and exit rates of firms vary over the business cycle (Campbell (1998)). Entry rates are found to be pro-cyclical, although, in general, the relationship between entry rates and GDP growth is weak and statistically insignificant. Exit rates, on the other hand, are counter-cyclical. Their dynamic correlation with future GDP growth is positive, large, and significant. Campbell explicitly models the idiosyncratic uncertainty experienced by plants in a vintage capital framework. Exogenous technological progress is embodied when new plants are built. The calibrated entry and exit of plants exhibit strong cyclical variation as found in real world data. The features of Campbell's model are in line with the findings of Chetty and Heckman (1986). They predict larger fluctuations in employment than in output or in the utilization of capital stocks as a result of entry and exit over the business cycle. Davis and Haltiwanger (1992) also observed that gross entry-exit turnover moves contra-cyclically, with the effects most pronounced in larger and older plants and plants belonging to multi-plant firms. In a vintage model of creative destruction Caballero and Hammour (1994) investigate the variations in demand as a source of economic fluctuations, and how a continuously renovating productive structure responds to them. They show that a fall in demand will cause the most outdated plant or firm to become unprofitable and that therefore it is expected to disappear. The extent to which the exit process depends on the variations in demand depends on the adjustment costs and technological adoption in the industry. In addition, the results show that the most outdated plants are most likely to turn unprofitable and exit when the industry is hit by a recession. Hence, an apparently important influence on entry-exit turnover is the stage of the business cycle (Caves (1998)).

5.2.2 Industry Specific Effects

In large, according to Agarwal and Gort (1996), exit is determined by stage-related changes in competition intensity: concentration tendencies intensify competition and only the fittest incumbents survive. Increased competition narrows the average expected return on investment as the industry life cycle progresses towards maturity. For example, firms that are unable to implement the most efficient production process associated with economies of scale and scope have to exit the market so that the number of firms shrinks over time.

The organizational ecological literature (e.g., Hannan and Freeman (1989), Carroll and Hannan (1995)), however, points at a reversed causal relationship between competition (number of firms) and entry rates. Competition rises with an increasing number of firms in the market which leads to higher exit rates.

Sutton (1992) notices that there are industries with rather low set up costs, where a growth of market size in terms of sales goes hand in hand with fewer incumbent firms. A competitive escalation of endogenous sunk cost outlays leads to a situation in which only a small number of firms survives and dominates the market. This escalation-process

has been studied in the recent game theoretic literature (Sutton 1997). Other theories that account for various features of the product life cycle are generally based on changes in production technology. For instance, Jovanovic and MacDonald (1994b) postulate a model in which a major exogenous technological improvement leads to exit of those firms that are unable to adjust sufficiently to the new regime. The new production technology reduces production costs, but increases the optimal level of output per firm, leading to a reduction in the number of firms over time. Firms that are able to implement the new large-scale technology survive. The innovation boosts the output and value of the remaining firms.

Finally, demand factors, in particular consumers' recognition and loyalty, play an important role in the shaping of the industry structure. Incumbent firms that produce the product which becomes standard in the market will develop competitive advantages. Economies of scale in producing and selling the standard product are incorporated as a result of the possibilities of mass production of the standard product⁴. As industry demand shrinks, a firm that is still active in the market has to choose between continuing operating and exiting the industry. Ghemawat and Nalebuff (1985) theoretically show that shrinking demand creates pressure for capacity to be reduced or eliminated to maintain profitability. If firms have different market shares but identical costs then the survival chances of firms depend on the size ordering of the active firms; the largest firm is the first to exit the industry. However, firms rarely have identical cost structures. Jovanovic and Lach (1989) specify a model in which both fixed and variable production costs are vintage-specific. Sufficiently strong scale economies can give large firms enough cost advantages to force smaller and less efficient firms out of the industry. This is in line with the results found by Fudenberg and Tirole (1986), who analyse a theoretical model in which firms have asymmetric information about each other's fixed costs. They show that the high cost firms exit earlier than the low-cost firms in a declining industry. Reynolds (1988), Whinston (1988), and Ghemawat and Nalebuff (1990) extended the dynamic game-theoretic models for multi-plant firms in a declining industry. They show that large firms that anticipate an eventual decline in demand of a specific product begin to close plants or merge with a rival to provide a revenue increase of the remaining plants. Thus larger firms increase their survival chances by closing plants.

5.2.3 Firm Specific Effects

Klepper (1996) summarizes various cross-sectional regularities within industries and how R&D, costs, and profitability differ across firms. He finds that as firms grow in size they spend more on endogenous sunk costs such as R&D, advertising and marketing. By appealing their endogenous sunk costs to a larger level of output, large firms are able to

⁴Evidence based on looking at large size incumbent firms suggests that those firms producing the dominant design product enjoy the advantages of economies of scale. See, e.g., Geroski (1991) for an overview of empirical studies.

appropriate a greater fraction of the value of their costs than smaller firms. Once entry ceases, the smallest firms are disproportionately driven out of the market. Based on the empirical regularity that the size distribution is stochastically increasing in age, Hopenhayn (1992a, b) implements an evolution for the size distribution of firms by age cohort in his theoretical models. He confirmed that in general older firms, which have lower hazard rates, will tend to remain larger before they exit. However, Hopenhayn (1992a) also showed that the effect of higher entry sunk costs on size distribution is not obvious⁵. These costs have a price effect and a selection effect, although he observed that firm size and concentration are positively correlated to rates of return. This is in line with the finding of Demsetz (1973), who showed that higher concentration is associated with higher profits for larger firms, but not for the smaller firms. Jovanovic (1982) postulates a theory of selection with incomplete information that is consistent with these findings. The longer a firm remains in the industry, the more it learns about its true costs and its relative efficiency and the more likely it is to survive. Moreover, firms that grow as a result of efficiency can be expected to be characterized by higher survival chances (Agarwal and Gort (1996)). Another circumstance under which an increase in the minimum efficient size of the firm can arise is when a product matures and when technological change slows down. The slowing rate of technical change reduces the rate of obsolescence, making investment in capital-intensive production methods more profitable⁶. This increases the survival chances of firms that attain to the minimum efficient size (see, e.g., Gort and Klepper (1982), Klepper and Graddy (1990), Rosen (1991)).

Finally, when economies of scale are important, firm growth and survival chances depend crucially on limited heterogeneous resources in the industry. Firms can target their products to heterogeneous market segments or choose a homogeneous market segment (Freeman and Hannan (1982), Carroll (1985), Sutton (1992)). This process of resource partitioning generates a dual market structure. In an ongoing tendency of firms to grow in size the intensive competition occurs in the most abundant market segments. The surviving firms become larger and more general-to-specific. Firms that are established in a specialist's niche can shelter against this heavy competition. This, in turn, increases the

⁵Hopenhayn considers the case where input prices are fixed. The price effect indicates that output price increases with a higher entry barrier, leading to higher employment and output for the firms. But a higher entry barrier reduces the competitive structure of an industry, rises profit for incumbents, misallocation, and inefficiencies. The less innovative and efficient firms remain in the industry. The absence of selection reduces output and employment.

⁶Utterback and Abernathy (1975), for instance, showed that the majority of product innovations for 77 firms operating in five industries were introduced in the expanding stages of the life cycle, while process innovations dominated the latter phases of the life cycle. They also observed that innovations in latter phases were more likely to originate from large size firms.

survival chances of the specialist firms⁷.

5.3 The Post-War Period of the Daily Newspaper Industry in The Netherlands

After World War II the number of daily newspapers in The Netherlands has experienced a continuous decline. The previous chapters show that the Dutch daily newspaper's industry life cycle is characterized by a turning period of turmoil during World War II. In the period after World War II concentration dominated the market. In 1950, for instance, 60 independent publishers were selling 68 editorially independent newspapers, and 44 editorially dependent newspapers. In 1996 14 independent publishers were selling 37 editorially independent newspapers of the 55 daily newspapers that appeared in the market. But while the number of newspaper titles shrank, the total number of copies sold increased. Table 5.1 exhibits the declining number of publishers and newspapers, and the increase in aggregate copies sold. These features point at the existence of economies of large-scale production during the concentration phase in the industry's life cycle. These findings are consistent with evidence of increasing scale economies in other countries' newspaper industries like in Argentina, Ireland, and the U.S.A. (Rosse (1967, 1970), Carroll (1987)).

Using a sample of 33 newspapers De Ridder (1984) finds that an increasing number of newspaper publishers unite or start to work in close cooperation in the period 1950 to 1982. Newspaper firms anticipated decline in the demand for specific newspaper products and merged with rivals to raise joint profits for these firms. Rather than merging, large newspaper firms often acquired their smaller rivals to exit them. The large newspaper firms utilize their capacity more efficiently by reducing excess capacity in the industry. In the period 1950 to 1996 many editorially independent newspapers became dependent or ceased to appear, while many editorially dependent newspapers disappeared as well. Ownership of more than one daily newspaper provides economies of size in news gathering, in securing advertising, in financing, and in management by lowering average and marginal costs. These cost reductions are greater for chain ownership, for high aggregate circulations, and for editorially homogeneous newspaper products⁸. Large-scale newspaper firms became more pronounced, and the reader's preferences for newspapers

⁷In general, empirical studies of resource partitioning find that concentration rises coincide with increasing survival chances of specialist firms relative to generalist firms (e.g., Carroll (1985), Carroll and Swaminathan (1992), Swaminathan (1995)).

⁸Heterogeneity of newspaper firms or publishers arises from differences in capacity costs, and high first-copy costs, like the collection and organization of editorial and advertising copy and preparation of the printing mechanism. These costs are ineluctable to produce even one copy. The marginal production costs of the subsequent copies may be very low (see also Corden (1953), Ferguson (1983), Norton and Norton (1986)).

became more homogeneous after World War II. The continuous decline in the number of available newspaper titles and the significant increase in number of copies sold underline these developments. This process is recognized as a consequence of the breakdown of the traditional socio-political and religious barriers in The Netherlands (see Hemels (1997)).

Table 5.1 (Daily Newspaper) Firms in the Industry and Circulation: 1950-1996

Year	Publishers	Editorially Independent Newspapers*	Editorially Dependent Newspapers	Total Circulation (x1000)	Real Compensation in Hfl mln**
1950	60	68	48	2781	
1960	56	62	41	3105	
1970	35	48	39	3965	4.84
1980	24	44	36	4554	3.58
1990	21	43	35	4589	
1996	14	37	18	4754	

Notes: *The editorial independence is defined as a newspaper with its own chief editor, who is not subordinated to the editor staff of another newspaper.

** Deflated with CPI (1950 = 1). These subsidies compensated the income losses of newspapers in financial problems due to the advertisements in television and radio. In 1968 and 1969 the compensation budgets were in (real) million Dutch guilders (Hfl.) 13.18 and 15.32 respectively.

Sources: CEBUCO, annual reports NDP.

The decrease of the number of daily newspapers in the industry was speeded up by the introduction of television and radio advertising. Starting in the late 1960s, the request for corrective government actions increased, especially by the Dutch Newspapers Publishers' Association (NDP)⁹. To ensure heterogeneity of newspapers, the Dutch government financially supported the newspaper industry on several occasions. During the late 1960s the newspaper industry received approximately 40% of the annual revenues of advertisements on television and radio to compensate for suffered income losses (see Table 5.1). A temporary provision against the deteriorating competitive situation of newspapers, the Dutch government established a press relief fund 'Bedrijfsfonds voor de Pers' in 1971, to financially support daily newspapers that struggled for survival. As we

⁹In 1962 a Commission of the Lower House, which examined the possible consequences of the introduction of television and radio advertisements, concluded that the newspapers would have to compete with television and radio for advertisements. They expected that a large amount of the advertisement budget from business would flow to television advertising, which might reduce the survival chances of many newspapers. In 1965 the Dutch government decided to allow advertisements in these other media.

already mentioned in the previous chapters, this became a foundation in 1974 that still exists today¹⁰. Furthermore, the collective price policy of the NDP and Dutch government restricted the newspapers to compete with prices. Newspapers could only compete with the editorial and the commercial contents and quality of their products. Abbring and Ours (1994) suggest that if the government wants to maintain multifirmity in the Dutch newspaper market it should give specific financial support to a newspaper firm. But other studies of newspaper markets show that government interventions to protect multifirmity in the daily newspaper industry have not been successful. For instance, Gustafsson (1993) finds that government actions were not successful in sustaining the media pluralism in Sweden. The data in Table 5.1 suggest that Dutch government interventions have probably delayed the concentration process in the newspaper industry, but could not stop it. If increased concentration is due to cost advantages and superior efficiency of large-scale newspaper firms (see, e.g., Jovanovic (1982), Klepper and Graddy (1990)), then a deconcentration policy can reduce innovative activities, and retain high production costs (Hopenhayn (1992a), or as Demsetz (1973, p.3) pointed out, “there are definite dangers of decreasing efficiency through the use of deconcentration or anti-merger policies”. It is likely that the Dutch daily newspaper industry will become more concentrated as long as a differential advantage in expanding output persists.

5.4 The Empirical Specification and Determinants

The data set we use in this chapter consists of all editorially independent daily newspapers which existed in The Netherlands after 1950, and which published selected material of interest to a general public. Out of a total of 78 daily newspapers, 40 became editorially dependent or ceased to appear between 1950 and 1995¹¹. Losing independency is considered as exit. When a larger newspaper acquired a smaller rival then the newspaper was often withdrawn from the market shortly thereafter. Special-interest newspapers which appeared in our sample period are excluded from our data¹². In constructing the data set we used information from the Dutch Central Bureau of Statistics (CBS), the Dutch Central Bureau for Newspaper Publicity (CEBUCO), the Dutch Newspaper

¹⁰Hemels (1997) provides an overview of trends in the newspaper industry in The Netherlands, and summarizes the types of financial support the newspaper industry can receive. A compensation scheme is available to newspapers which are in financial problems, and some financial support is available to all newspapers like tax and postal rate reductions, and subsidies.

¹¹The publishing companies of these 78 newspapers were members of the Dutch Newspaper Publishers' Association (NDP) between 1950 and 1995.

¹²Excluded are the financial newspapers ‘Het Financieele Dagblad’ and ‘Economisch Dagblad’, the official newspaper of the Netherlands ‘Nederlandse Staatscourant’, and the shipping newspaper ‘Dagblad Scheepvaart’.

Publishers' Association (NDP), and information obtained from the National Press Museum.

The data are used to test hypotheses that are derived from the, mainly theoretical, literature (see section 5.2). We formulated and selected variables that should account for the macroeconomic, industry specific and firm specific determinants of exit rates.

5.4.1 Macroeconomic Variables

The macroeconomic variables will reflect the influence of aggregate demand shocks on incentives to differentiate or to standardize the newspaper products. We concentrate on two factors in particular: real income per household ($Income_{t-1}$), and a measure for the heterogeneity of the readers' preferences ($Entropy_{t-1}$)¹³. An increase in purchasing power per household is expected to lead to an increase in demand for newspapers per household. After World War II, demand became more and more homogeneous simultaneously with a decline in differences in political and religious preferences. This process changed the market structure for daily newspapers. Some daily newspapers which identified with political parties or special interest groups ceased to appear, while others became increasingly independent from the group they originally belonged to and broadened their scope and circulation (Hemels (1997)). The variable $Entropy_{t-1}$ is a proxy to capture the shifts in ideological and / or religious ties after World War II¹⁴. Figure 5.1 exhibits the development of the entropy measure over time.

Figure 5.1 provides evidence on the shape of the political processes which have taken place in The Netherlands. Crudely, we can distinguish three phases. Phase I is characterized by a gradual decline of demand diversity that ends around 1970. It is followed by a strong period of polarization. In the beginning of 1980s political parties were moving to the middle field of the political scene. With loosening of traditionally political and religious ties many newspapers stepped away from their original background.

¹³We use only two variables which reflect macroeconomic effects. Different aggregate time series may measure similar features or are strongly correlated. Therefore, identification problems may arise whenever several correlated time series are included in the model simultaneously.

¹⁴Not all readers of newspaper have identical product preferences. For every sufficiently strong identifiable set of reader product preferences at least one newspaper must exist as long as per unit costs are not much higher than those of the largest newspapers. Diversity in taste is larger when we have more sets of religious and ideological preferences. An indicator for diversity is the dispersion of members over different trade unions within a country. To measure the diversity in preferences we calculate the diversity in number of equivalents. The formula is defined as follows:

$$Entropy = \prod_{i=1}^N [1 / m_i]^m$$

where N = number of trade unions, and m_i = market share of trade union i (= number of members / total number of available jobs in The Netherlands), including a remaining category of non union members. Unemployed people are not taken into account in this measure. If all trade unions have the same m_i then entropy value is N , and if we have only one trade union then entropy is equal to 1.

Figure 5.1 Evolution of a Political Affinity Measure in The Netherlands between 1950 and 1995

5.4.2 Industry Specific Variables

The second effect we investigate is the influence of industry specific shocks on the survival chances of the Dutch daily newspapers. The variable $Ntot_{t-1}$ represents the total number of daily newspapers in the market. We will test to what extent the number of dailies in the previous period $t-1$ affects the probability to exit in the current year t as a proxy of competitive intensity.

Revenues and costs play a crucial role in the determination of individual survival chances of newspapers. Unfortunately, we do not observe prices of individual newspapers nor individual production cost's components. We do have aggregate data on the average annual subscription price of daily newspapers. In real terms, however, costs and revenue components are highly correlated at the aggregate level. Given that prices were at least in part set by the government¹⁵, we will use the aggregate data on the average daily number of pages of newspapers ($Pages_{t-1}$) as an indicator of the quality of newspapers and

¹⁵The Dutch government maintained a rigid price policy for daily newspapers through a meticulous linking between setting the price for subscribers and the development of the price of newspapers (NDP annual report (1962)). Later on, newspapers were allowed to increase their prices within margins, subjected to government's approval as long as the industry could demonstrate that the total costs had increased more than the total revenues in the previous years.

how that has changed through time. An increase in the number of pages leads to an increase in attractiveness and the quality of the newspaper (NDP annual reports). Therefore more copies will be sold and higher revenues will be obtained. Moreover, more pages allow a newspaper to attract more advertising revenues. However, an improvement in quality will increase the first-copy costs of newspapers. Based on the theoretical findings of the life cycle models developed by, for instance Jovanovic (1982), and Jovanovic and MacDonald (1994b), we expect that the smallest and least efficient editorially independent newspapers should be driven out of the market. Controlling for the average number of pages, we expect that an increase in $Pages_{t-1}$ has a negative effect on survival chances as long as the increase in a newspaper production costs, in particular the first-copy costs, exceeds the increase in revenues.

5.4.3 Firm Specific Variables

Finally, we discuss the variables to measure the effects of idiosyncratic shocks on the exit probability of the individual newspaper. First, we develop a measure of the industry life cycle phase at entry based on the number of newspapers at entry ($Nentry$) and the industry age (T) at the year the newspaper entered the market ($T = 0$ at 1848)

$$Nentry * \{ \gamma_0 + \gamma_1 * T + \gamma_2 * T^2 \}. \quad (5.1)$$

Equation 5.1 takes into account in which phase of the life cycle a newspaper entered the market (cf. Gort and Klepper (1982)). We use a quadratic form to make a distinction of the $Nentry$ effect between an early expanding and a later concentrating market. We expect newspapers that entered in the early phase of the life cycle to have lower hazard rates in the concentrating industry than the ones that entered in the later phase (Klepper (1996)). However, a newspaper that entered in a concentrating market is generally strong and has a high survival chance (see Agarwal and Gort (1996) and chapter 4). Therefore, the coefficients of $Nentry * T$ and $Nentry * T^2$ are expected to have the following signs in the hazard function: $\gamma_1 > 0$, and $\gamma_2 < 0$.

The industry experiences a decline in the number of dailies, and an increase in aggregate number of copies sold between 1950 and 1995 (see Table 5.1). These features suggest that new large-scale technologies are introduced in the industry. Newspaper firms that were able to implement the new technology first may have a higher survival chance because they reduced average production costs at a higher level of output at the earliest stage (Jovanovic and MacDonald (1994b)). Thus, successful newspapers are those that could increase their circulation. The variable $Circ_{t-1}$ represents the average annual circulation of the editorially independent newspaper in the previous year.

Several large independent newspapers own editorially dependent regional newspapers. What we often observe, is that large newspaper firms owning a variety of dailies cease the production of the smaller editorially dependent newspapers they own, while offering the subscribers their editorially independent newspaper as a replacement.

We expect that this will lead to a reduction in production costs, raising the expected lifetime relative to newspapers that do not cease the production of regional subsidiaries (see, e.g., Reynolds (1988), Whinston (1988), Ghemawat and Nalebuff (1990)). The variable $Owner_{t-1}$ represents the total number of editorially dependent newspapers a firm owned in the previous year.

Regarding the newspaper firm's ability to implement the large-scale technology, the firm must operate in a market segment with potential growth. The regional dummy variable *Region* indicates whether the survival chances of dailies in the regional market segments in The Netherlands differ from the national editorially independent newspapers. An important finding in chapter 4 indicates that the exit chances for regional newspapers are increasing as the industry matures. In the post-war period the market has changed from a geographically partitioned to a more nationwide market. Therefore, we expect that regional newspapers have higher exit rates than the national dailies. The definition of the region in our study is based on the classification that is published by the Dutch Central Bureau of Statistics. The variable *Region* is composed of the twelve provinces in The Netherlands (see chapter 2).

Appendix C presents the data of the three types of determinants which are used in this chapter.

5.5 Methods

The survival chances of newspapers are modelled using the hazard or instantaneous exit rate from the industry. Due to endogenous and exogenous processes in the industry the exit pattern changes over time. In this chapter we focus on the influences of shocks on the exit chances during the upsurge concentration tendency in the newspaper industry. Our survival analysis starts in 1950. The findings in the previous chapters and in Agarwal and Gort (1996) indicate that survival chances of firms change with the evolution of the industry. Because we analyse the post-World War II period, we assume that the forces affecting the hazard rates in the concentrating phase differ from the ones in the expanding phase of the industry life cycle. The duration of incumbent firms starts in 1950, i.e., $T = 0$ for incumbents at 1950.

The exit rates of daily newspapers are analysed using event history models. We start our analysis with the exponential model that includes time varying explanatory variables. This model enables us to investigate how the hazard rate describing the process under study depends on the time varying explanatory variables. In this approach the coefficients of the given set of specific variables are constant over time. In order to determine whether the coefficients of the explanatory variables vary in different time periods, we use a flexible piecewise constant model with time varying explanatory variables. The estimates are the parameters of a continuous time hazard rate approach. In this approach the coefficients of the explanatory variables are constant in each defined sub-period but may vary across sub-periods (see, e.g., Lancaster (1990), Murphy (1996)). The original episode

is split into sub-episodes, which have the same origin state as their original episode, except the last sub-episodes are regarded as the original destination state. The last sub-episode is given the destination state of the original episode, exit or right censored (see also chapter 4).

Formally, we parameterize the hazard rate model for editorially independent newspaper i at time t_i conditional on time s_i , that no exit event happens before time s_i , using the exponential distribution. We divide the time axis ($T = 0$ at 1950) into M intervals by the points $l_1, l_2, \dots, l_{M+1}$ and write the hazard function for the i^{th} newspaper which is observed to exit at t_i in time interval m as

$$h(t_i) = \exp\{\beta_m X_i\}, \quad l_m \leq t_i < l_{m+1}, \text{ with } l_1 = 0 \text{ and } l_{M+1} = \infty, \quad m = 1, 2, \dots, M \quad (5.2)$$

and the conditional survivor function for the i^{th} newspaper which is observed to be censored at t_i survival up to s_i as

$$S(t_i | s_i) = \exp\left\{-\sum_{m=1}^M \Delta[s_i, t_i, l] \exp\{\beta_m X_i\}\right\} \quad (5.3)$$

where

$$\Delta[s_i, t_i, l] = \begin{cases} t_i - l_m & \text{if } s_i \leq l_m, l_m < t_i < l_{m+1} \\ l_{m+1} - l_m & \text{if } s_i \leq l_m, t_i \geq l_{m+1} \\ l_{m+1} - s_i & \text{if } t_i \geq l_{m+1}, l_m < s_i < l_{m+1} \\ 0 & \text{else,} \end{cases} \quad (5.4)$$

where β_m denotes the vector of regression coefficients assumed not to vary in the m^{th} time period, measuring the impact of a set of explanatory variables included in vector X_i also associated with the m^{th} time period (see also Blossfeld and Rohwer (1995)). The general log likelihood for a sample of N firms can be written as a function of the hazard term and the survival term:

$$\log L = \sum_{i \in E} \beta_m X_i - \sum_{i \in P} \sum_{m=1}^M (\Delta[s_i, t_i, l] \exp\{\beta_m X_i\}), \quad (5.5)$$

where E is the set of individuals with an event and P is the set of all episodes having origin state.

The survival analysis of newspapers is an evolving process in continuous time. For the estimation, it is discretized into convenient small time intervals. When many events happen, this does not create problems. However, in survival studies the exit event rate is generally low and therefore the defined time period is of more concern (Lindsey (1998)). To take this into account, we estimate the exponential hazard rate model with annual, five and fifteen years interval data.

5.6 Results

Our empirical analysis is split into two steps. First, we will control for heterogeneity among newspapers by including in the exponential hazard model the variables described in section 5.4, which measure the relevant macroeconomic, industry specific, and idiosyncratic firm developments that are expected to affect survival. At this stage, time varying explanatory variables will enable us to investigate how the hazard rate describing the process under study depends on the observed characteristics of firms, the industry and the macroeconomic developments. Second, we will estimate separate piecewise constant models, in order to determine whether the effects of a given set of specific factors vary on the survival chances of editorially independent daily newspapers in different periods in the concentrating phase.

5.6.1 The Constant Hazard Rate Models

The results of the exponential hazard models are reported in Table 5.2. The three models include the specific variables discussed above. Model 1 displays the estimates of the exponential hazard model based on annual data, while model 2 is estimated with five years interval data¹⁶. Model 3 is estimated with fifteen years interval data. The estimates of model 2 and in particular model 3 are presented for the purpose of reference mainly, and show a rejection against the use of large interval data. The use of too large interval data to analyse the effects on survival eliminates the processes underlying the forces in the concentrating daily newspaper industry in The Netherlands.

Models 1 and 2 indicate that firm specific characteristics are important for the survival chances of newspapers in the industry that experiences an upsurge in the concentration rate. Our firm specific estimates are in line with the expected effects of these factors on survival (see, for instance, Jovanovic (1982), Hopenhayn (1992a), Klepper (1996)). Circulation advantages are clearly important in the prospect of newspapers to survive in the concentrating industry. Newspapers which sell more copies reduce average production costs at a higher level of output (see also NDP annual reports). The regional dummy variable *REGION* in the models does not demonstrate significant differences in survival chances between regional and national newspapers. The finding suggests that regional newspapers did not find a specialist's niche that offers shelter against heavy nationwide competition or that two forces are operating simultaneously: scale economies, and differentiation, which may offset each other. Furthermore, an

¹⁶We have tried to estimate alternative hazard functions which are more flexible such as gamma model, Gompertz-Makeham model, and Sickle model. Unfortunately, the data were not suitable to estimate these duration dependence models. A simple generalization of the standard exponential model is the piecewise constant model. This generalization can not only give us a clear idea about the form of the time-dependence of the process, but also that the time period effects of factors may vary through time.

insignificant effect from ownership of more than one daily newspaper ($OWNER_{i,t}$) is found. Newspapers that do not cease the production of their smaller subsidiaries do not reduce their own survival chances significantly.

Table 5.2 Estimates of the Exponential Hazard Models

	Model 1	Model 2	Model 3
<i>Constant</i>	15.9152 (10.3142)	-3.5515 (15.3596)	-72.0465 (60.1827)
<i>Income_{i,t}</i>	0.1749 (0.1688)	-0.2622 (0.1976)	-1.8452 (1.8452)
<i>Entropy_{i,t}</i>	-4.8081 (3.6091)	-1.0202 (3.9615)	32.5253 (30.2923)
<i>Pages_{i,t}</i>	-0.0733 (0.1099)	0.2527 (0.1582)	0.7701 (0.6172)
<i>Ntot_{i,t}</i>	-0.0276 (0.0321)	0.0626 (0.0753)	0.0040 (0.1331)
<i>Nentry</i>	-0.1303* (0.0516)	-0.1116* (0.0488)	-0.0908* (0.0434)
<i>Nentry*T (/1000)</i>	2.1244* (0.8433)	1.7901* (0.7925)	1.3761+ (0.7094)
<i>Nentry*T² (/10000)</i>	-0.1245* (0.0491)	-0.1032* (0.0461)	-0.0737+ (0.0422)
<i>Owner_{i,t}</i>	0.1967 (0.1534)	0.1631 (0.1432)	0.1402 (0.1252)
<i>Circ_{i,t} (/10000)</i>	-0.4378* (0.1123)	-0.3343* (0.0968)	-0.1998* (0.0746)
<i>Region</i>	-0.3535 (0.6973)	-0.3395 (0.6892)	0.1429 (0.6718)
Number of Spells	2268	464	170
Number of Events	40	40	40
χ^2	50.0374	41.7288	28.8878
Log Likelihood	176.4923	181.5533	191.7549

* significant at 5%; + significant at 10%; standard errors in parentheses.

An important influence is found concerning the initial condition of the daily newspapers. After controlling for the phase a newspaper entered the market for the first time, we find that survival chances depend significantly on the stage of the industry's life cycle at the time of entrance into the market and thus on the newspaper's age. The significant parameter estimates indicate that a newspaper that entered in the early phase of the life cycle, where $Nentry$ and T are small, has a better opportunity to survive in the concentrating industry than a newspaper that entered in a later phase, where $Nentry$ and T are large. This result confirms the outcomes of Klepper's (1996) model. Figure 5.2 illustrates the effect of the initial condition on the hazard rate.

Figure 5.2 Effect of Initial Condition on Hazard Rates of Editorially Independent Newspapers

Estimates of the main effects of industry specific characteristics and macroeconomic factors turn out not to have a significant influence on the survival chances of editorially independent newspapers. These results reject the assumed influences of these processes on a firm exit in the concentrating newspaper industry in The Netherlands.

5.6.2 The Piecewise Constant Hazard Rate Models

Exponential hazard rate models implicitly assume that the effects of the explanatory variables on the survival chances of newspapers are constant over the sample period. This, of course, may be too restrictive as it rules out the possibility that the processes evolving over time will become more or less important. The piecewise constant model allows the effects of the explanatory variables on the survival chances of daily newspapers to change

Table 5.3 Estimates of Piecewise Constant Hazard Models

	Model 1A		Model 1B	
<i>Constant(1)</i>	-67.0173*	(27.9134)	-22.8219*	(8.8227)
<i>Constant(2)</i>	-65.8486*	(27.8044)	-21.6817*	(8.5201)
<i>Constant(3)</i>	-64.4191*	(27.7182)	-20.6255*	(8.5587)
<i>Income_{t-1} (1)</i>	0.8902+	(0.4772)		
<i>Income_{t-1} (2)</i>	0.1024	(0.2699)		
<i>Income_{t-1} (3)</i>	-1.0740	(2.1000)		
<i>Entropy_{t-1} (1)</i>	14.7384	(10.3532)		
<i>Entropy_{t-1} (2)</i>	1.9247	(6.2661)		
<i>Entropy_{t-1} (3)</i>	20.2555+	(11.6651)		
<i>Pages_{t-1} (1)</i>	0.2506	(0.2298)	0.4117*	(0.1191)
<i>Pages_{t-1} (2)</i>	0.4975	(0.3055)	0.1466	(0.1468)
<i>Pages_{t-1} (3)</i>	1.3216+	(0.6991)	0.8497*	(0.2969)
<i>Ntot_{t-1} (1)</i>	0.1983+	(0.1078)	0.1832*	(0.0689)
<i>Ntot_{t-1} (2)</i>	0.5754*	(0.1899)	0.2344*	(0.0775)
<i>Ntot_{t-1} (3)</i>	-0.0575	(0.0429)	-0.0664*	(0.0332)
<i>Nentry</i>	-0.1010*	(0.0416)	-0.1026*	(0.0424)
<i>Nentry*T (/1000)</i>	1.4227*	(0.6733)	1.4652*	(0.6886)
<i>Nentry*T² (/10000)</i>	-0.0718+	(0.0404)	-0.0755+	(0.0413)
<i>Owner_{t-1} (1)</i>	0.5718*	(0.2114)	0.5812*	(0.2136)
<i>Owner_{t-1} (2)</i>	-0.0057	(0.2806)	0.0029	(0.2812)
<i>Owner_{t-1} (3)</i>	-0.2912	(0.4373)	-0.2909	(0.6728)
<i>Circ_{t-1} (1) (/10000)</i>	-0.5938*	(0.2013)	-0.6140*	(0.2054)
<i>Circ_{t-1} (2) (/10000)</i>	-0.2467*	(0.1197)	-0.2572*	(0.1193)
<i>Circ_{t-1} (3) (/10000)</i>	-0.3578*	(0.1646)	-0.3516*	(0.1630)
<i>Region (1)</i>	-0.7458	(1.0920)	-0.9607	(1.1065)
<i>Region (2)</i>	-0.7197	(0.8883)	-0.8125	(0.8672)
<i>Region (3)</i>	2.6995	(2.9312)	3.1706	(3.6905)

Number of Spells	2268	2268
Number of Events	40	40
χ^2	83.2714	76.6278
Log likelihood	-159.8753	-163.1971

* significant at 5%; + significant at 10%; standard errors in parentheses.

over time.

The results of the piecewise constant models are presented in Table 5.3. We have split the time periods into three sub-periods of fifteen years. Although the selection of time splitting is arbitrary, we have tried to capture the effect of the changes in political and ideological affinity in three phases as denoted in Figure 5.1¹⁷. All estimations of the piecewise constant models shown in Table 5.3 are done using annual data, and are therefore an extension of model 1 in Table 5.2. Model 1A includes the specified macroeconomic, industry specific, and firm specific explanatory variables. The estimates of the macroeconomic determinants remain generally insignificant. This suggests that these macroeconomic factors do not have a substantial impact on the survival chances of daily newspapers. These results lead us to conclude that in our study the industry and firm specific characteristics are of more influence. Consequently, we estimate the same model, but without the macroeconomic factors. The null hypothesis of no difference between models 1A and 1B cannot be rejected at conventional levels, as indicated by a computed χ^2 statistic of 6.6. With respect to the effect of the firm specific variables we find that $Owner_{i,t}$ is found to be positive and significant in the first sub-period considered and insignificant thereafter. This suggests that editorially independent daily newspapers with many dependent and related newspapers were in a disadvantageous position in the struggle to survive when the market started to become more concentrated. In the beginning of 1960s, the introduction of a 5-day working week and a positive real wage shock raised the pressure on daily newspapers to reduce their production costs that had become excessive (NDP annual reports). This rationalization process appeared to be more successful for newspapers without subsidiaries.

In model 1B we find that the effect of industry specific developments vary among the

¹⁷The three sub-periods choice is based on the results of an analysis that took into account the interactions of the specified variables with the age of the concentrating phase in the newspaper industry life cycle (the age of the concentrating stage is zero at 1950). These interactive effects of the defined variables on the constant (exponential) hazard rate show that the global optima of these variables were around the fifteenth or thirtieth year of the concentrating phase in the industry life cycle. The approach of interactive analysis of the included variables is based on the work by Hannan (1997) in which the effect of density is evaluated as a function of industry age. We have also estimated the piecewise constant model with a two period split. Jointly considered, the null hypothesis of no difference between the two sets of estimates is statistically significant at 5%, as indicated by the computed χ^2 statistic of 19.6.

three defined sub-periods in the concentrating industry. During the first phase of the increased concentration process in the daily newspaper industry, an increase in the number of pages ($Pages_{i,t}$) reduces the survival chance of a newspaper. This result suggests that the revenue of the necessary improvement in attractiveness did not exceed the associated increase in (production) costs for a number of newspapers. The significant positive effect of the number of pages in the third sub-period suggests that the effect of quality improvement on hazard rates is increasing again. Another important industry effect is the number of firms in the market, $Ntot_{i,t}$. The results show that an editorially independent newspaper was more likely to exit in the beginning of the upsurge concentration tendency than later in this concentration process. In the first sub-period (1950-1965) the large number of newspapers had a significant positive effect on the exit chances. In the succeeding sub-period the concentration tendency intensify competition even more and according to Jovanovic and MacDonald (1994b) and Klepper (1996) the less efficient newspapers exit. In the third sub-period (1980-1995) the hazard rate of incumbents decreased due to the decline in the total number of newspapers in the previous two sub-periods.

Our evidence suggests that mainly industry and firm specific characteristics determine the survival chances of editorially independent daily newspapers. Moreover, the effects of the explanatory variables change over time.

5.7 Conclusions

In this chapter we have presented a detailed study about the exit chances in the daily newspaper industry in The Netherlands for the period between 1950 and 1996. This period is characterized by increasing concentration in the newspaper industry. We have estimated exponential and piecewise constant hazard rate models to investigate three categories of determinants of concern to the survival chances of daily newspapers. These are macroeconomic (exogenous demand), industry specific, and (idiosyncratic) firm specific effects.

We do not find any significant effect of aggregate macroeconomic shocks on the exit chances of daily newspapers at the 5% significant level. However, we find effects of industry specific developments. These effects change when concentration intensifies. Therefore, we do not support the hypothesis that the effect of industry developments is constant between the period 1950 and 1996.

The attractiveness of newspapers plays a significant role in determining the hazard rate, especially in the first sub-period (1950-1965) and the third sub-period (1980-1995). An improvement in attractiveness increases the production (first-copy) costs of newspapers, and therefore it is likely to assume that less profitable newspapers exit. This process supports the results of theoretic diffusion models that efficient firms grow and survive, while the inefficient firms exit. At the same time, we observe that the effect on the hazard rates of the total number of daily newspapers in The Netherlands changes

significantly in the period considered. Competition intensifies and the large-size, probably the most efficient, newspapers survive. The smallest (inefficient) newspapers are driven out of the industry.

Furthermore, our results show that the estimated hazard rate also crucially depends on the firm specific characteristics. The survival chances depend significantly on the phase of the industry's life cycle at the time of entrance into the market and thus on the newspaper's age. Our findings point at the existence of economies of large-scale production during the phase of a decline in the number of daily newspaper firms in The Netherlands. When the market started to become more concentrated, the editorially independent daily newspapers with many dependent and related newspapers were in a disadvantageous position in the struggle to survive. The rationalization process appeared to have been more successful for newspapers without subsidiaries. Nowadays, this subsidiary effect, although insignificant, has changed. This may indicate the beginning of economies of scope in the industry.

Despite the government financial support aimed at protecting the multiformity in the daily newspaper industry, our results show that the government interventions may have delayed the concentration process in the industry, but did not stop it. It is likely that the Dutch daily newspaper industry will become more concentrated as long as differential advantage in expanding output persists among firms as suggested by, for instance, Jovanovic (1982), and Jovanovic and MacDonald (1994b).

This empirical analysis does not answer why and how particular newspapers changed their specific characteristics. However, we do provide insight in the development of the effect of specific explanatory variables for the entire Dutch daily newspaper industry during a period when concentration was observed. With the use of the piecewise constant model, we show that the effects of industry and firm specific shocks on the exit chances in the concentrating market for daily newspapers have changed over time. The process that takes place within the industry as newspaper firms enter and exit, and grow and decline, is not completely reflected in this chapter. Market share mobility statistics reflect the process more accurately (Baldwin and Gorecki (1994, p. 93)). These statistics measure the intensity of competition, the market structure, and the dynamic evolution of the industry. The next chapter analyses the market structures and intensity of competition in the Dutch market segments for daily newspapers as explained by the market share mobility statistics.

Chapter 6

Mobility and Market Structure

6.1 Introduction

The evolution of industries has been the subject of theoretical and empirical research in industrial economics. In the case of the daily newspaper industry, these studies found evidence for the existence of product differentiation and scale economies¹. In the previous chapters, we found similar evidence for the daily newspaper industry in The Netherlands. Over time, and particularly over the last 50 years, large-scale newspapers became more prominent, and the newspapers' contents became more homogenous. Technological change, such as the increase of transportation possibilities and the improvement of electronic communication, transformed the market structure from a geographically partitioned to a more nationwide market. Key variables in explaining the dynamic market structure evolution of the newspaper industry are the intensity of competition in the industry and the increase in production costs. Studies which analysed the newspaper industries found that market shares, concentration, and strategic activities of newspaper firms depended upon the heterogeneity among newspapers (see, e.g., Rosse (1967), Thompson (1989)). Heterogeneity of newspapers arose from differences in capacity costs and high first-copy costs due to the collection and organization of editorial and advertising copy and preparation of the printing mechanism. These costs are ineluctable to produce even one copy. Therefore, scale is important to reduce the average cost per newspaper. However, despite the importance of scale economies for the newspaper industry, many newspapers retain a distinctive local orientation, which also is true for many Dutch daily newspapers. Geographical differentiation is an important characteristic of the daily newspaper industry in The Netherlands. In 1950, 116 daily newspapers existed in The Netherlands of which 68 were editorially independent and only 11 of them were national-oriented. In 1996, only 55 daily newspapers existed of which 8 were national-oriented daily newspapers. Only 37 newspapers appeared as editorially independent newspapers. Hence, the Dutch daily newspaper industry is characterized by a decline in number of daily newspapers between 1950 and 1996, in particular in the

¹See, e.g., Stigler (1964), Rosse (1967, 1970), Ferguson (1983), Norton and Norton (1986), Thompson (1984, 1988, 1989).

regional markets (see also chapter 2, in particular Figure 2.1). Geographical analysis of the evolution of the structure of market segments therefore appears valuable to understand the competitive process in the industry. It is interesting to note that the local newspaper industry produces a largely homogeneous product in terms of content and possesses advantages of being totally linguistically demarcated and regionally segmented (Thomson (1984, 1989)).

This chapter investigates the market structure and intensity of competition in the Dutch market segments for daily newspapers as explained by decompositions of market share mobility per Dutch province. The market share mobility measure we use to capture the intensity of competition is the sum of the squared value of the change in market shares in terms of output experienced by firms over fifteen years. The market share mobility decomposition in this chapter is an extension of Cable (1993, 1997). It explicitly measures market entry and exit, market share transfers of firms between market segments, and firms' transfers within market segments. The characteristics of entrants and exiting firms are identified using a decomposition of their market share mobility. We find that the industry-wide market share mobility does not completely capture the competition within market segments. The levels of concentration vary significantly between market segments in the daily newspaper industry. We also find evidence that the market share mobility for continuing firms, i.e. the surviving incumbent firms, contributes substantially to overall mobility in the concentrating industry.

The chapter is organized as follows. The next section presents the decomposition and disaggregation of market share mobility into market segments and identifies entrants, continuing firms, and exiting firms in the industry. Section 6.3 describes the data, and section 6.4 gives an empirical illustration of the daily newspaper market segments in The Netherlands for three succeeding time intervals. Section 6.5 concludes.

6.2 Decomposition of Market Share Mobility

In the industrial organization literature market structure is generally measured by concentration. The most commonly used concentration measures are the percentage of output accounted for by a small number, generally 4 or 5, of the largest firms in an industry and the Herfindahl index². Measures of concentration embody characteristics of the firm size distribution at a point in time. Changes in concentration measures are generally small, because the size distribution changes slowly over time (Baldwin (1995)). The concentration measures can indicate that the market structure changes very little, although the market shares of firms may have changed significantly. Concern has been expressed that some concentration measures may not reveal the extent of underlying change. Concentration is largely independent of the short-run individual shocks, but it strongly depends on cumulative effects of past mobility rates. Davies and Geroski (1997)

²See, e.g., Baldwin (1995), and Caves (1998) for an overview.

found that changes in the market shares of surviving firms have a dominant influence on concentration, which is fairly stable in spite of considerable market share turbulence. Geroski, Machin and Walters (1997) showed that instantaneous individual shocks account for most of the variance in growth rates of market shares, while industry level-growth, and innovations have less explanatory power. The process that takes place within an industry as firms enter and exit, grow and decline, whether via internal growth, mergers or acquisitions is not completely reflected in concentration statistics. According to Baldwin and Gorecki (1994, p.93) market share mobility statistics reflect this process more accurately. Mobility in market shares itself depends strongly on basic features in an industry's technology and demand conditions, but seems largely independent of the direction and magnitude of the industry-wide change (see, e.g., Dunne, Roberts, and Samuelson (1989a), Caves (1998)). These statistics measure the intensity of competition, the market structure, and the evolution of an industry. Mobility and concentration indices are complements, because the two indices reveal different aspects of the competitive process within industries (Baldwin and Gorecki (1994)). Hence, mobility statistics offer additional insights on the intensity of competition. An important property of market share mobility is that it embodies the level of concentration and its change, and the correlation of market shares over time (Cable (1993, 1997))³. Formally, Cable decomposed the market share mobility measure M_t over the time interval 0, t as follows

$$M_t = \sum_{i=1}^N (m_{i,t} - m_{i,0})^2 = \Delta H_t + 2H_0 - 2\rho \sigma_t \sigma_0 - 2 / N, \quad 0 \leq M_t \leq 2 \quad (6.1)$$

where $m_{i,0}$ and $m_{i,t}$ are the market share of firm i at time 0 and t , respectively, $H_0 = \sum_{i=1}^N m_{i,0}^2$ is the Herfindahl index for the initial period concentration level, ΔH_t is the change in concentration (Herfindahl indices) over the period, ρ is the correlation between market shares at successive times ($-1 < \rho < 1$), σ denotes the standard deviations ($\sigma > 0$), and N includes all firms that have been in the market at some point between 0 and t (see Appendix D for the derivation). The parameter ρ is a measure of market share stability, and shows the persistence of market shares through time (see Gort (1963))⁴. If all market shares are the same at time 0 and t then $M_t = 0$, while $M_t = 2$ in an industry with complete market turnover, where one perfect monopolist replaces another.

Mobility statistics also reflect the process that takes place within an industry as firms enter and exit, grow and decline via internal growth, mergers or acquisitions. Those indices measure the outcome of the competitive process in terms of market shares from losers to winners in different market segments. It is possible to separate out the elements

³Cable (1997) recently derived that the market share mobility index embodies concentration and its change. He empirically illustrated the systematical relationship between market share mobility and concentration for the UK daily newspaper industry.

⁴Gort (1963) examined the stability and change in market shares of leading firms between 1947 and 1954, in the US manufacturing industries. The results suggested that stability in market shares is strongly related to the relative size of the several largest firms in the industry.

of mobility by firms with recognisable similar structural or strategic characteristics or due to entry, exit, and turnover of shares amongst continuing firms. To analyse the subgroup structure of an industry, the market share mobility can be disaggregated into K subgroups,

$$M_t = \sum_{i=1}^K M_{t,i} \quad (6.2)$$

Caves and Porter (1977) emphasized that entrants and exiting firms are special cases of market share mobility. The initial market share of entrants starts at zero, the exiting firms' shares finish at zero, while continuing firms always have positive market shares. It is possible to identify the characteristics of entrants and exiting firms using a decomposition of their market share mobility. For all entrants observed in time interval 0 and t,

$$M_{t, \text{entry}} = \sum_{i=1}^{\text{EN}} m_{i,t}^2 = \sigma_{\text{entry}}^2 + \mu_{\text{entry}} \sum_{i=1}^{\text{EN}} m_{i,t}, \quad m_{i,0} = 0 \text{ and } m_{i,t} > 0 \quad (6.3)$$

where EN includes all new entrants in the time period, σ_{entry}^2 denotes the variance in entrants' market shares ($m_{i,t}$), μ_{entry} is the mean of entrants' market shares, and $\sum_{i=1}^{\text{EN}} m_{i,t}$ is the joint market share of entrants in the industry (see Appendix E for the derivation). A similar decomposition can be done for exiting firms. For all exiting firms observed in time interval 0 and t,

$$M_{t, \text{exit}} = \sum_{i=1}^{\text{EX}} m_{i,0}^2 = \sigma_{\text{exit}}^2 + \mu_{\text{exit}} \sum_{i=1}^{\text{EX}} m_{i,0}, \quad m_{i,0} > 0 \text{ and } m_{i,t} = 0 \quad (6.4)$$

where EX includes all exiting firms in the time period, σ_{exit}^2 denotes the variance in exiting firms' market shares ($m_{i,0}$), μ_{exit} is the mean of exiting firms' market shares, and $\sum_{i=1}^{\text{EX}} m_{i,0}$ is the joint market share of exiting firms at time 0 in the industry (see Appendix E). Equations (6.2) and (6.3) confirm that the measured market share mobility over a given period embodies information on which firms enter or leave the industry. A similar decomposition of continuing firms can be done. The Herfindahl index of incumbents can also be decomposed into the mean, the variance, and the joint market share of continuing firms.

6.3 The Data

The longitudinal microeconomic database used to analyse the market structure and the intensity of competition in the daily newspaper industry is taken from the Dutch Central Bureau of Newspapers' Publicity (CEBUCO). The CEBUCO collects the annual circulation data of all editorially independent daily newspapers which existed in The Netherlands after 1950. The data collection of CEBUCO makes it possible to trace the volatility in market shares of entrants, continuing newspapers and exiting firms and in market segments over time, and thus is well-suited for a longitudinal study. In total 83

daily editorially independent newspapers in The Netherlands are identified after 1950⁵. Losing independency due to mergers, takeovers, or cessation of production is considered as exit by CEBUCO and becoming editorially independent is considered as entry. Special-interest newspapers which appeared in the sample period are excluded from the data. Analysing the volatility in market shares of the Dutch daily newspaper market is inspired by its nature, being linguistically demarcated and regionally segmented. In such a case, which is very uncommon in other industries, Dutch newspapers are only each other's competitor. They do not have to compete for their market share with foreign newspapers in The Netherlands. Therefore, the market structure and intensity of competition measures do not have to take foreign competitors into account⁶.

The longitudinal data set is split into three succeeding fifteen years periods, 1950-1965, 1965-1980, and 1980-1995. The fifteen year periods are long enough to remove most short-run or seasonal fluctuations, so that the longer-term and structural changes in the industry are captured in the statistics on mobility that are measured (see Baldwin and Gorecki (1994)).

6.4 The Dutch Daily Newspaper Industry

The daily newspaper market is characterized by a high degree of product differentiation which means that geographically partitioning is relevant to the transfer of market shares from losers to winners. In an ongoing tendency of economies of large-scale, newspaper firm's growth in size depends crucially on limited heterogenous resources, such as reading public, in the industry. The newspapers become larger and more general-to-specific stimulating more competition in the market. The outcome of the competitive process in terms of transfer of market shares from losers to winners should be measured between and within market segments. Three sets of disaggregation of market share

⁵The editorial independence is a typical Dutch phenomenon. The editorial autonomy within the newspaper organization guarantees freedom of the press and freedom of opinion in order to protect publishers and editors during the exercise of their profession from the influence and pressure of internal and external powers. The publishers are not anymore the management directors. In Germany and England, for instance, the commercial and technical management and even the editor are unmistakably subordinated to the publisher (Hemels (1997, p. 326)).

⁶A shortcoming of this assumption is that we eliminate the competition between the media source newspapers and the sources like radio and television. Over the past decades newspapers had to compete with an increasing number of new media, especially for advertisers. Or as Ferguson (1983, p.637) pointed out, "Advertisers seek to communicate with potential purchasers of their products or services. In a fundamental sense, what advertisers demand, and what the various advertising media outlets supply, are units of audience for advertising message". Chapters 4 and 5 have shown that the newspaper industry in The Netherlands received financial compensation for suffered advertising and income losses caused by other media sources. Therefore, it is plausible to assume that the competition in the daily newspaper market is mainly dominated by newspapers.

mobility are used to characterize this process. The first set describes the intensity of competition, market structure, and the evolution in the national and regional market segments. The second set captures how overall market shares change due to entry by newspapers, exit by old ones, and turnover amongst continuing firms. The final set describes the relationships between market share mobility, concentration and its change in all market segments in the Dutch daily newspaper industry.

6.4.1 National and Regional Newspapers

Table 6.1 Decomposition of Mobility in National and Regional Newspapers

Firms	Period	M_t	$H_{0,N}$	$H_{t,N}$	$\Delta H_{t,N}$	ρ_N
All	1950-1965	0.01129	0.03236	0.03669	0.00433	0.723
	1965-1980	0.01117	0.03669	0.04526	0.00857	0.773
	1980-1995	0.00579	0.04526	0.05978	0.01452	0.929
Firms	Period	$M_{t, \text{national}}$	$H_{0, \text{National}}$	$H_{t, \text{National}}$	$\Delta H_{t, \text{National}}$	ρ_{National}
National Dailies	1950-1965	0.00899	0.02327	0.02750*	0.00423	0.512
	1965-1980	0.00537	0.01972*	0.03033	0.01061	0.826
	1980-1995	0.00337	0.03033	0.04470	0.01437	0.944
Firms	Period	$M_{t, \text{Regional}}$	$H_{0, \text{Regional}}$	$H_{t, \text{Regional}}$	$\Delta H_{t, \text{Regional}}$	ρ_{Regional}
Regional Dailies	1950-1965	0.00230	0.00909	0.00919*	0.00010	0.698
	1965-1980	0.00580	0.01696*	0.01492	-0.00204	0.633
	1980-1995	0.00242	0.01492	0.01508	0.00016	0.803

Note: * In 1965, the national newspaper 'Het Vrije Volk' changed its circulation from nationwide to provincial. In the period 1950-1965 this newspaper has been considered as a national newspaper, and for the period 1965-1980 as a provincial newspaper. This explains the differences in the Herfindahl indices.

Table 6.1 shows the decomposition of overall values of market share mobility over the three succeeding fifteen-year periods for the market as a whole and its national and regional market segments. Mobility in market shares is strongly related to the turnover that occurs within the national newspapers' market segment. In the period 1950-1965 almost 80 percent of the volatility in the overall market share can be explained by the

market share mobility of national newspapers. In the succeeding sub-periods the volatility in regional market shares is becoming equally important in terms of volatility in market shares as the national newspapers. Although the relationship between overall market share mobility and the mobility in national and regional market segments becomes relatively stable, the difference in concentration increases over time. The results show that there is an ongoing concentration tendency in the daily newspaper market, in particular in the national market segment. In 1995 the concentration in the national newspaper market contributes for 74.8 percent to the overall Herfindahl index. Table 6.1 indicates without exception that the increase in concentration is associated with more stability according to the correlation coefficients (ρ). The pattern of the market share correlations shows the extent to which shares at one point in time are dependent on those of fifteen years later. Moreover, the increase in the values of ρ indicates a higher persistence of shares through time, in particular for national newspapers.

6.4.2 Entering, Exiting, and Continuing Newspapers

Table 6.2 Decomposition of Mobility in Entry, Exit, and Continuing Newspapers

Firms	Period	$M_{t, NC}$	$H_{0, NC}$	$H_{t, NC}$	$\Delta H_{t, NC}$	ρ_{NC}	NC
Continuing Dailies	1950-1965	0.00785	0.02899	0.03360	0.00461	0.777	53
	1965-1980	0.00787	0.03360	0.04456	0.01096	0.809	41
	1980-1995	0.00493	0.04456	0.05962	0.01506	0.927	35
Firms	Period	$M_{t, NE}$	σ_{Entry}	μ_{Entry}	$\sum m_{Entry}$	NE	
Entrants	1950-1965	0.00007	0.00238	0.00589	0.0118	2	
	1965-1980	0.00021	0.00443	0.00762	0.0229	3	
	1980-1995	0.00016	0.00700	0.00730	0.0146	2	
Firms	Period	$M_{t, EX}$	σ_{Exit}	μ_{Exit}	$\sum m_{Exit}$	EX	
Exiting Dailies	1950-1965	0.00336	0.01172	0.00979	0.1469	15	
	1965-1980	0.00346	0.01152	0.00974	0.1612	14	
	1980-1995	0.00070	0.00829	0.00322	0.0746	9	

Table 6.2 demonstrates the disaggregation of measured market share mobility between entrants, exiting firms, and the turnover of continuing newspapers. This decomposition also identifies the market share characteristics of entrants and exiting newspaper firms in the industry. The importance of entry and exit can be measured either in terms of the number of newspaper firms, or their circulations. Both sets of measures are presented in Table 6.2. Based on the number of entrants and exiting firms, the industry has experienced an increase in competition after 1950. On the aggregate, more newspaper firms exited the market. The different aspects of the market share distribution of firms measure the intensity of competition more accurately. Table 6.2 presents the results of the magnitude of entrants and exiting firms through their market shares. The aggregate market share of exiting firms is significantly greater than the aggregate market share of entrants in all three sub-periods. Interestingly, the average size of entrants (μ_{entry}) and exiting newspapers (μ_{exit}) and their corresponding variations (σ_{entry}^2 and σ_{exit}^2 , respectively) confirm the existence of economies of large-scale. The average size of entrants and variation in size increased over time, while the average size of exiting firms and variation decreased. This indicates that smaller editorially independent newspapers were forced to leave the market. Although the contribution of market share mobility of entrants and exiting firms to the overall mobility is low, they still analyse the impact of entry and of intensified competition by incumbents. Exit accounts for a substantial 12.1 to 31.0 percent of all mobility, and the continuing firms between 69.5 and 85.1 percent.

6.4.3 Provincial Markets

Despite the obvious importance of scale economies for the newspaper industry, many daily newspapers retain a distinctive local orientation. Geographical product differentiation therefore is an important competitive strategic element in the daily newspaper industry in The Netherlands. Given the high degree of product differentiation, the industry-wide market share mobility analysis must inevitably miss some of the subtleties of competition within market segments. Therefore, we relate the market share mobility to the structures of all market segments in the daily newspaper industry. The market segments are the industry as a whole, and the 12 provinces in The Netherlands. One province, Flevoland, is excluded because no editorially independent daily newspaper appeared in the sample period. The province of origin of each regionally oriented daily newspaper is treated as its geographical market. The mobility statistics are based on the provincial (national) market shares of regional (national) newspapers in a particular market segment. Table 6.3 presents the market share mobility decomposition for the market segments.

The level of concentration, as measured by the Herfindahl indices across the 12 market segments into which the daily newspaper industry is divided, increased (or stayed one) in the sample period. An exception is the market Gelderland that experienced an increase in concentration level in the first sub-period, and a declining level between 1965 and 1995. Although the concentration level increased in the sample period, the levels vary

Table 6.3 Mobility in Market Segments

Market	Period	M_t	H_0	H_t	ΔH_t	ρ	N
National	1950-1965	0.04521	0.13415	0.12464*	-0.00950	0.512	12
	1965-1980	0.03085	0.13550*	0.18318	0.04768	0.826	11
	1980-1995	0.01799	0.18318	0.24955	0.06636	0.923	9
Groningen	1950-1965	0.12902	0.36376	0.71004	0.34628	0.972	4
	1965-1980	0.00012	0.71004	0.72027	0.01023	1.000	2
	1980-1995	0.05654	0.72027	1.00000	0.27973	1.000	2
Friesland	1950-1965	0.01053	0.37397	0.42585	0.05188	1.000	3
	1965-1980	0.11276	0.42585	0.72400	0.29815	0.974	3
	1980-1995	0.00005	0.72400	0.73059	0.00660	1.000	2
Drenthe	1950-1965	2.00000	1.00000	1.00000	0.00000	-1.000	2
	1965-1980	2.00000	1.00000	1.00000	0.00000	-1.000	2
	1980-1995	0.00000	1.00000	1.00000	0.00000	1.000	1
Overijssel	1950-1965	0.00316	0.21001	0.21465	0.00464	0.888	5
	1965-1980	0.03687	0.21465	0.27017	0.55519	0.748	5
	1980-1995	0.92667	0.27017	0.44341	0.17324	0.968	4
Gelderland	1950-1965	0.03164	0.39769	0.47642	0.07873	0.936	4
	1965-1980	0.47642	0.47642	0.40452	-0.07190	0.984	3
	1980-1995	0.06302	0.40452	0.37316	-0.03136	0.836	5
Utrecht	1950-1965	0.02195	0.35671	0.41250	0.05579	0.939	4
	1965-1980	0.07329	0.41250	0.61234	0.19984	0.958	3
	1980-1995	0.13834	0.61234	1.00000	0.38766	1.000	2
Noord-Holland	1950-1965	0.21328	0.20028	0.23604	0.03576	0.902	8
	1965-1980	0.00349	0.23604	0.22037	-0.01567	0.980	6
	1980-1995	0.05568	0.22037	0.28935	0.06897	0.920	6
Zuid-Holland	1950-1965	0.06416	0.12933	0.16898*	0.03965	0.538	12
	1965-1980	0.13352	0.22110*	0.30681	0.08570	0.634	11
	1980-1995	0.01186	0.30681	0.28269	-0.24115	0.958	6

Zeeland	1950-1965	0.16492	0.42613	0.86862	0.44248	0.954	4
	1965-1980	0.00999	0.86862	1.00000	0.13138	1.000	2
	1980-1995	0.00000	1.00000	1.00000	0.00000	1.000	1
Noord- Brabant	1950-1965	0.04254	0.15249	0.19335	0.04086	0.615	8
	1965-1980	0.01004	0.19335	0.22672	0.03337	0.958	6
	1980-1995	0.03011	0.22672	0.27980	0.05308	0.827	5
Limburg	1950-1965	0.00117	0.28368	0.28832	0.00464	0.986	4
	1965-1980	0.06291	0.28832	0.38587	0.09755	0.771	4
	1980-1995	0.07822	0.38587	0.59132	0.20545	0.998	3

Note: * In 1965, the national newspaper 'Het Vrije Volk' changed its circulation from nationwide to provincial. In the period 1950-1965 this newspaper has been considered as a national newspaper, and for the period 1965-1980 as a provincial newspaper. This explains the differences in the Herfindahl indices.

significantly between market segments. The values of the concentration statistics vary between 0.12933 and 1 in 1950, and between 0.24955 and 1 in 1995. Hence, the relative firm position may differ substantially in sub-markets. The correlation coefficients in Table 6.3 indicate without exception that high concentration is associated with more stability. Interestingly, the relationship between correlation coefficients and mobility is weak. Moreover, the difference in Herfindahl indices is stronger related to market share mobility.

The market segment Drenthe experienced a complete market turnover where one perfect monopolist replaced another. The identity of newspaper firms changed in the first two sub-periods, while the last monopolist determined the complete provincial circulation between 1980 and 1995.

6.5 Conclusions

Concentration depends strongly on cumulative effects of past market share mobility in a concentrating industry. This chapter has examined the relationship between the market structure and intensity of competition in the Dutch market for daily newspapers by decomposing the market share mobility statistic for market segments. Market share mobility reflects the turnover process that takes place within the industry as firms enter and exit, grow and decline. Decomposition of market share mobility explicitly shows the market share characteristics of entrants, exiting firms, and continuing firms in the industry.

The results show that the daily newspaper market is in an ongoing concentration process. Mobility in market shares is strongly related to the turnover that occurs within the national newspapers' market. Although the contribution of market share mobility of entrants and exiting firms to the overall mobility is low, it still illustrates the impact of entry and of intensified competition by incumbents. The average size in market share and variation decreased for exiting firms and increased for entrants over time.

The difference between different segments and strategic groups within the industry shows that in a high degree of product differentiation market, the industry-wide market share mobility does not completely capture the competition within market segments. The level of concentration varies significantly between market segments in the daily newspaper industry.

The market share mobility statistic encompasses different aspects of the competitive process in an industry such as the turnover of firms' market shares, concentration and its change, and the correlation of market shares over time. Understanding the relationships between the intensity of competition, the market structure, and the evolution of the industry, it is recommendable to separate out the elements of mobility due to entry, exit, and turnover of shares amongst continuing firms. The decompositions of market share mobility reveal the differences in impact of processes in industries.

Chapter 7

Summary and Concluding Remarks

The purpose of this thesis is to increase the insight in the evolution of an industry's dynamics, its market structure, and the entry, exit, and survival rates of firms. The question that arises is, what do we know about industries, in particular their evolution, and what do they have in common? In general, industry dynamics are complex and still poorly understood. Recent industrial organization studies brought an indisputable contribution to the insight in the evolution of market structures associated with firms' behaviour. These studies reveal that the market structure and the entry, exit, and survival rates of firms are determined by the technology, the scale economies, and the demand underlying the industry. As the industry evolves from birth to maturity, the rate of growth in demand, technology, and the minimum efficient size of firms are likely to change. These (evolutionary) changes alter entry, exit, and survival rates of firms and firms' behaviour from the first introduction of the product to maturity in the industry. Due to the lack of industry specific and firm specific data over the industry's life cycle, little is known about which specific factors systematically influence the growth and decline of an industry, and which temporal relations exist between entry, exit, and survival of firms and scale economies as the industry evolves. In order to understand the selection, evolution, and industry dynamics, more precise information about the economic mechanisms operating in an industry is required. In this thesis we have taken a closer look at the evolution of the daily newspaper industry in The Netherlands by building up a unique detailed historical profile of the industry from 1848 onwards. The huge advantage of studying the newspaper industry is that its history is well-documented, because long time-series carrying newspaper-specific statistical information are available. Besides that, the content of newspapers describes the economic, technological, political, and cultural developments in The Netherlands for the same period. This study has analysed the market dynamics for Dutch daily newspapers using data on all daily newspapers in The Netherlands from 1848 until 1997. In total we have monitored 261 daily newspaper appearances in The Netherlands from 1848 onwards. It has been shown that the 150 years of data available for this study expose an almost complete Gort-Klepper's (1982) life cycle for the newspaper industry. The results of this thesis offer interesting results for economists, historians, and politicians.

Chapter 2 is subdivided into two parts. The first part defines the unit of research and presents a descriptive analysis of the data. The second part estimates hazard and survivor

functions to investigate the determinants of the life expectancy of daily newspapers over the period 1848-1997. The newspaper market has been dominated by the first-movers. Almost one-fifth of the 55 daily newspapers that appeared in 1997 came into publication before freedom of speech, opinion, and press was incorporated in article 7 of the Constitution of the Kingdom of The Netherlands in 1848. From today's existing 55 newspapers 9 appeared for the first time before 1848, 21 appeared between 1848-1900, 9 between 1900-1939, 6 were established during World War II, and 10 after 1945. These newspapers were published by 11 publishing companies, of which only four published just one daily newspaper. The results show in a prominent way the existence of the life cycle for daily newspapers. From 1848, when 30 newspapers existed, the number of newspapers increased steadily until World War II after which the market became more and more concentrated. Similar evolution patterns have been shown for the four regional markets as distinguish by the CBS, north, east, south, and west. The patterns in the western, and to a lesser extent northern market segments are most pronounced. The correlation between the regional number of newspapers' evolutions of the western and northern market is 0.92, whereas the correlation between the number of newspapers in the eastern and southern regions is only 0.35, indicating a weaker correlation between the development of the latter two regional markets. The estimation results of the hazard and survival rates crucially depend on the state of the market. Among the economic variables, the intensity of competition at the time of entrance takes place is found to be a key variable explaining the survival chances. The daily newspaper industry in The Netherlands has reached the state where the opportunities to successfully establish a new newspaper are very low. In this chapter we find that the gamma distribution is the most appropriate model for explaining the expected lifetime of newspapers in The Netherlands. The estimates of the gamma survival model imply negative duration dependence during the early years and a slightly increasing exit probability when newspapers grow older. Increasing hazard rates for higher ages refer to the liability of aging. Hence, the hazard function is not monotonically declining, but U-shaped.

The life cycle of the newspaper industry is characterized by a period of an exceptional expansion in the number of daily newspapers in the period after 1869. The abolition of the stamped paper duty, known as 'Het Dagbladzegel', on the 1st of July 1869 altered the market structure substantially. This cost shock not only provided an economic incentive to increase the circulation of the incumbent newspapers, it also boosted the survival chances for the incumbents as well as for some potential entrants. In chapter 3 we have studied the effects of the 1869 repeal of the stamped paper duty on the market structure for daily newspapers in The Netherlands. The tax cut caused a decrease in production costs of approximately 50 percent and was shifted totally into the commodity's price that dropped by 50 percent as well.

The 1869 Dutch economy consisted of a collection of geographically isolated markets for newspapers. In large cities entry into existing oligopolies occurred. In small cities, where no newspapers were available before the tax cut, news providing monopolists entered. The total number of available newspapers in the market increased from 42

before, to 63 right after the tax cut. In order to find the explanation for the effects of the tax repeal in 1869 on the market structure, we have used and extended two models. The first model that has initially been put forward by Seade (1980) and Besley (1989) analyses oligopolistic competition and per unit taxation. The second model introduced by Romer (1994) explains the emergence of newspaper monopolists in small and remote cities. Even though the two static models differ in various aspects they are similar in their predictions. Both models predict an inverse relationship between the tax cut on the one hand and the number of firms and aggregate output on the other hand. Furthermore, they show a positive relationship between a tax rate and the commodity price. We have also estimated Weibull survival models to investigate whether the 1869 repeal of the stamped paper duty changed survival chances of newspapers as well using a data set of all Dutch daily newspaper between 1848 and 1936. The results confirm that first-mover advantages played a crucial role in the Dutch newspaper market. Incumbent newspapers at the time of the 1869 tax repeal had higher probabilities to survive than the entrants after 1869. However, newspapers that emerged after the tax repeal as monopolists in small local markets had higher survival opportunities than the ones that entered into existing oligopolistic markets in large cities. This result confirms that fixed costs that form an entry barrier decline with increased competition, but refutes the notion that a firm that enters in a larger market incurs a larger fixed cost of production and therefore is more likely to survive. We find that the hazard rates of newspapers gradually decreased over time, implying negative duration dependence.

In chapter 4 we have investigated the impact of government actions on the market structure taking into account the cyclical evolution of the daily newspaper industry. We have calculated entry and survival rates and estimated Gompertz hazard functions to investigate how the entry and survival probabilities depend on the phase of the industry evolution and on political events by using annual data of all daily newspapers for the period 1848 to 1996. Four important political events that affected the market structure have been considered: liberalization of the press in 1848, repeal of the stamped paper duty in 1869, the turmoil period of World War II, and the introduction of a press relief fund in 1971. We find that the entry barrier lowering policy measures taken early in the life cycle to enhance the development of the market for newspapers had a long-lasting impact. Especially those newspapers that found an isolated spot in the market were guaranteed a longer lasting successful readership. The entry barrier lowering policies like the freedom of expression in 1848 and the 1869 tax cut in the expanding newspaper industry provided survival opportunities for potential entrants, and increased the survival chances of many first-movers. However, the first-mover advantage of incumbents reduced over time, and eventually disappeared after the war. The technological changes that mainly resulted from World War II transformed the market from a geographically partitioned to a (more) nationwide market. The structural changes started to increase the minimum efficient size of newspapers which caused a turning point in the life cycle of the daily newspaper industry. After the war the market has experienced a continuous decline in the number of newspapers coinciding with an increase in total output. To save pluralism of

daily newspapers, the Dutch government has intervened in the Dutch newspaper industry on several occasions. In reaction to the concentration tendencies the Dutch government decided to install a press relief fund in 1971 to financially support newspapers that struggled for survival. This fund, known as 'Het Bedrijfsfonds voor de Pers', became a foundation in 1974, and still exists today. The exit barrier enhancing policies to maintain multi-formity may have delayed the concentration process in the newspaper industry, but did not stop it. The exit barriers remained very low after World War II.

The evidence indicates that after World War II the scale of production has been enlarged significantly. In 1950, for instance, 60 independent publishers were selling 68 editorially independent newspapers, and 44 editorially dependent newspapers. In 1996 just 14 independent publishers were selling 37 editorially independent newspapers of the 55 daily newspapers in The Netherlands. But while the number of newspapers shrank, the total circulation increased. Chapter 5 has provided a thorough understanding of the economies that underlie the survival possibilities of newspapers when concentration persists. Before investigating which factors determine the survival chances of newspapers along the concentrating industry's time path, the first part of chapter 5 has reviewed the industrial organization exit literature on this topic and touches several relevant issues. The literature on exit is indecisive on whether the decline of incumbency is caused by macroeconomic, industry specific, or idiosyncratic firm shocks. Only a few empirical studies have analysed the exit patterns in a concentrating industry, but empirical studies have rarely investigated the effect of these three types of determinants on the hazard rates in an integral way.

In conformity with the literature, the second part of chapter 5 has studied the effects of the three types of determinants of our concern to survival chances of newspapers by using exponential and piecewise constant hazard rate models. The macroeconomic determinants are not very powerful in explaining which newspapers survive and which must exit. However, the newspaper's specific and industry specific characteristics largely explain the newspaper's survival chances. Newspapers learn about their efficiency as they operate in the industry. Over time, the efficient newspapers grow and survive, while the inefficient ones decline and exit. This is in line with the recent theoretical and empirical findings that firm and industry specific characteristics are crucially important features in an ongoing concentration process. The comparison between the two kinds of hazard rate models reveals the shortcoming of the exponential model. Exponential hazard rate models implicitly assume that the effects of the determinants on the survival chances of newspapers are constant between 1950 and 1995. The results indicate that certain industry and firm specific processes involved in the exit decisions of newspapers have become less or more important as the industry evolves.

The process that takes place within the industry as newspaper firms enter and exit, and grow and decline is not completely reflected by the hazard and the survivor models. In Chapter 6 we have introduced decompositions of a market share mobility statistic to measure explicitly market share transfers of firms between market segments, and firms' transfers within market segments. Geographically partitioning is relevant to the transfer

of market shares from losers to winners, because geographical product differentiation is an important competitive strategic element in the daily newspaper market. To investigate the market structure and the intensity of competition in the Dutch market segments we have used all editorially independent newspapers which existed in The Netherlands after 1950. In total we have monitored 83 editorially independent newspapers. Due to the high degree of product differentiation the industry-wide market share mobility does not completely capture the competition within market segments. The levels of concentration vary significantly between market segments in the daily newspaper industry. The results confirm that nationally oriented and large-scale newspapers have become more pronounced in the daily newspaper industry. Mobility in market shares shows a strong relationship to the turnover that occurs within the national newspaper market, and the average size and variation in market share decrease for exiting firms and increase for entrants.

So, what do we learn from this study? One important lesson of this thesis is that the daily newspaper industry in The Netherlands has reached the declining phase of its life cycle. Previous studies on the Dutch daily newspaper market primarily focussed on the decreased number of newspaper titles during the last decades, but none of these studies accounted for the dependence of survival chances on the stage of industry's life cycle. By taking the industry life cycle into account, the thesis therefore provides a better understanding of the economics and the selection of newspapers in the present daily newspaper industry in The Netherlands. In the last decades large-scale newspapers have become more prominent, and the newspapers' contents have become more homogeneous. Due to the continuous increase in first copy costs of producing a newspaper, like the collection and organization of editorial and advertising copy, preparation of the printing mechanism, and distribution, the minimum efficient size of newspapers has increased. As a consequence, the small and generally less efficient newspapers have been forced to exit or have been taken over by larger newspapers. Besides, the chance to successfully establish a new newspaper has become very low. It is likely that the Dutch daily newspaper industry will become more concentrated as long as the differential advantage in expanding output persists among newspapers. This is the reason why government interventions over the last decades could not stop the process of negative net entry in the daily newspaper industry in The Netherlands. If the concentrating process continues then government interventions aimed at protecting multiformity may not be very effective. To answer this more accurately, we have to know why and how particular newspapers changed their specific characteristics. This thesis has provided insight in the development of the effect of macroeconomic, industry, and firm specific factors for the entire Dutch daily newspaper industry, in particular during a period when concentration was observed.

The primary focus of this study has been on the daily newspaper industry in The Netherlands. The results of our analysis are in line with the findings observed in the same industry in other countries. For instance, the newspaper industry in Ireland, Argentina, Finland, and the U.S.A. have also shown a Gort-Klepper industry life cycle, only the upsurge in concentration in these countries has already started in the 1920s. Evidence of

large-scale economies is also found in these countries. The opportunities for daily newspapers to expand are limited because of the carrying capacity of the industry. As a result of these developments the minimum efficient size of newspapers has increased, and the small, generally inefficient, newspapers have been forced to leave the market. The investigation in this thesis has contributed to a deeper understanding of the role of macroeconomic, industry, and firm specific determinants on the entry and survival chances of firms in the industry. Some of the observed relationships are industry specific such as the linkage with the protection of freedom of expression, and can apply to the same industry in other countries, but they cannot be generalised to other industries. Other findings reported in this study may, however, hold in other industries as well. For instance, government interventions such as financial assistance and other economic stimulating measures both tend to become less effective as the industry matures. There are definite dangers of decreasing efficiency of firms through the use of interventions. If concentration has come about because of the increasing minimum efficient size of firms, then a deconcentration policy may reduce efficiency either by discouraging innovative activities of firms and by shifting output to smaller firms that are less able to produce at lower costs than large firms.

On the basis of the findings, several recommendations can be formulated that may be of interest for future research. The new evidence on industry dynamics in this thesis provides a deeper understanding of why entry, exit, and survival rates of firms are what they are, why they change, when they do, and how government interventions influence the market structures. More detailed historical research of industries is needed to further unravel the complexity of industry dynamics. The richness and depth of case studies provide a better understanding of why and how industries evolve, and perhaps even more important they explain the present market structure. Since entry, exit, and survival rates of firms depend systematically on the stage of development of the industry in the life cycle, industrial organization studies should acknowledge the cyclical characteristics of industries. Furthermore, the effects of macroeconomic, industry specific and firm specific developments on the selection of firms and industry dynamics are time dependent.

Closely related to the relationship between selection of firms and industry dynamics is that between selection and government interventions. Government actions may change the market structure, although the effect of interventions depends on the stage of the life cycle of the market. Policy measures to lower entry barriers in an expanding industry, such as a tax cut, may provide new survival opportunities for potential entrants, and increase the survival chances of first-movers. Exit barrier enhancing policy measures taken later in the industry's life cycle to stop the upsurge concentration tendency in the market seem not to be very successful. To explain the effect of government interventions on the entry, exit, and survival rates of firms in a structural way, existing models, for instance the models used in chapter 3, should be extended with a multi-period condition for entry and exit. Another interesting route we find is the development of a dynamic market theory, for example by extending life cycle theories as in Jovanovic and MacDonald (1994b) and Klepper (1996), allowing for more than one technological shock

or political event to explain the dynamics of an industry. Incorporating these shocks and events into industrial organization studies may clarify how underlying structure shapes the industry in which outcomes are determined. A successful interaction between business historical and industrial organization studies is needed to obtain a thorough understanding of the evolution of industry dynamics, its market structure, and selection of firms.

Appendix A

List of Daily Newspapers in The Netherlands

All daily newspapers, together with major changes in title are listed. The first date is the year of foundation and the second date, where appropriate, is the year that publication ceased. In some cases, the date given is approximate, marked 'c'. National newspapers and regional newspapers are marked with 'N' and 'R', respectively.

- 1870 -c1940 *Advertentieblaadje der Nederlandsche Maatschappij tot algemeene dienst verrichting te Rotterdam* (R)
- 1933 - 1945 *Agrarisch Nieuwsblad* (continued as *Drentsch Dagblad* from 1942) (R)
- 1888 - 1888 *Het Algemeen Belang* (R)
- 1946 - ----- *Algemeen Dagblad* (N)
- 1870 - 1871 *Algemeen Dagblad van Nederland* (R)
- 1828 - 1970 *Algemeen Handelsblad. Nieuwe Amsterdamsche Courant* (R/N)
incorporated in *Nieuwe Rotterdamsche Courant*
- 1866 - 1871 *Algemeen Nederlandsch Advertentie-Blad* (R)
- 1870 - 1871 *Algemeen Nederlandsch Nieuws- en Advertentieblad* (R)
- 1803 - ----- *Alkmaarsche Courant* (R)
- 1972 - 1992 *Alphens Dagblad* (R)
- 1852 - ----- *Amersfoortsche Courant* (R)
- 1945 - 1955 *Amersfoorts Katholiek Dagblad* (R)
incorporated in *Het Centrum*
- 1866 - 1877 *L'Ami du Limbourg* (R)
- 1883 - 1896 *De Amsterdammer, Dagblad voor Nederland* (R)
- 1766 - 1903 *Amsterdamsche Courant* (R)
incorporated in *De Telegraaf*
- 1903 - ----- *(Nieuwe) Apeldoornse Courant* (R)
- 1814 - ----- *Arnhemsche Courant* (R)
- 1945 - 1987 *Arnhems Dagblad* (continued as *De Nieuwe Krant* from 1971) (R)
incorporated in *De Gelderlander*
- 1886 - 1940 *De Avondpost, Dagblad voor Stad en Land* (R)
- 1895 - 1950 *De Avondster* (R)

- 1929 - 1945 *De Banier* (R)
 1971 - ----- *Barneveldse Krant* (R)
 1967 - 1992 *Beverwijkse Courant* (R)
 1945 - 1992 *Binnenhof* (R)
 Incorporated in *Haagsche Courant*
 c1800 - 1966 *Bredasche Courant* (R)
 incorporated in *Dagblad De Stem*
 1885 - 1971 *Het Centrum, Dagblad voor Utrecht en Nederland* (R)
 1912 - 1940 *Christelijk Sociaal Dagblad, De Amsterdammer* (R)
 1893 - 1998 *De Courant* (continued as *De Courant Het Nieuws van de Dag* from
 1923) (R/N)
 merged with *Het Nieuws van de Dag*
 1852 - 1892 *Le Courrier de la Meuse: Journal quotidien, religieuse, politique et*
 littéraire (R)
 1980 - 1980 *De Dag* (?)
 1947 - 1948 *Het Dagblad* (R)
 1945 - 1952 *Dagblad de Oost-Gelderlander* (R)
 1992 - ----- *Dagblad Rivierenland* (R)
 1984 - ----- *Dagblad van Almere* (R)
 1944 - 1945 *Het Dagblad van het Noorden* (R)
 1870 - 1871 *Dagblad voor Friesland* (R)
 1873 - 1876 *Dagblad van Friesland (Harlinger Courant)* (R)
 1890 - 1945 *Dagblad van Gouda (De Nieuwe Gouwenaar): Nieuws- en Adver-*
 tentieblad voor Gouda en Omstreken (R)
 1708 - 1924 *Dagblad van 's-Gravenhage* (continued as *Dagblad van Zuid-Holland*
 en 's-Gravenhage from 1856) (R)
 1945 - 1975 *Dagblad voor Coevorden* (R)
 1944 - 1964 *Dagblad Oost Brabant* (R)
 1880 - 1993 *Dagblad van het Oosten* (R)
 incorporated in *Dagblad Tubantia*
 1940 - 1964 *Dagblad voor Amersfoort en Veluwe* (R)
 incorporated in *Het Parool*
 1916 - ----- *Dagblad voor West-Friesland* (R)
 1887 - 1948 *Dagelijksch Advertentieblad voor Groningen en omstreken* (continued
 as *Groninger Dagblad* from 1911) (R)
 incorporated in *Het Vrije Volk*
 1875 - 1877 *Dagelijksch Prijsccourant van Effecten* (R)
 1840 - ----- *Delfsche Courant* (R)
 1874 - 1874 *Deventer Dagblad* (R)
 1869 - ----- *Koerier, Deventer Dagblad* (continued as *Deventer Dagblad* from
 1887) (R)
 1947 - ----- *De Dordtenaar* (R)

- 1888 - 1966 *Dordrechts Nieuwsblad* (R)
- 1881 - 1885 *Dordrechtisch Nieuws- en Advertentieblad* (*Dagblad van Zuid-Nederland*) (R)
- 1789 - 1945 *Dordrechtische Courant* (R)
- 1924 - 1975 *Dordts Dagblad* (R)
- 1851 - 1863 *L'Echo Universel de la Presse Catholique* (continued as *Journal des Pays Bas* from 1862) (R)
- 1882 - 1894 *De Echo van het Nieuws* (R)
- 1927 - 1992 *Edese Courant* (R)
- 1966 - 1967 *Ede's Dagblad* (R)
- 1913 - ----- *Eindhovenens Dagblad* (R)
- 1983 - 1983 *Eindhovenens Nieuwsblad* (R)
- 1894 - 1992 *Emmer Courant* (R)
- 1871 - ----- *Enkhuizer Courant* (R)
- 1856 - 1964 *Enschedesche Courant* (R)
- 1906 - ----- *Friesch Dagblad* (R)
- 1945 - 1969 *Heerenveense Koerier* (continued as *Friese Koerier* from 1955) (R)
incorporated in *Leeuwarder Courant*
- 1848 - ----- *De Gelderlander, Nieuwe Nijmeegsche Courant: Staatkundig-, Nieuws-, en Advertentieblad* (continued as *De Gelderlander* from 1875) (R)
- 1879 - 1993 *Gelders Overijsselse Courant* (R)
incorporated in *Overijssels Dagblad*
- 1907 - 1919 *Geldersch Dagblad* (R)
incorporated in *De Standaard*
- 1945 - 1967 *Geldersch Dagblad* (R)
- 1992 - ----- *Gelders Dagblad* (R)
- 1911 - 1917 *De (Geldersche) Koerier* (R)
- 1872 - ----- *De Gooi en Eemlander* (from 1940 to 1956 *Het Gooi en Ommeland*) (R)
- 1945 - 1958 *Gooische Courant* (R)
- 1945 - 1949 *Gooische Klanken* (R)
- 1863 - ----- *Goudsche Courant* (R)
- 1885 - 1951 *De Graafschapper: Volksblad voor Deventer en omstreken, Twente en de Graafschap Zutfen* (R)
- 1880 - 1992 *Graafschaps-Bode* (R)
incorporated in *Gelders Dagblad*
- 1859 - 1862 *De 's-Gravenhaagsche Nieuwsbode* (R)
- 1854 - 1856 *De Grondwet* (R)
- 1870 - ----- *De Grondwet: Rosendaalsche en Nieuwe Zevenbergsche Courant* (R)
merged with *De Zoom* (continued as *Brabants Nieuwsblad* from 1941)
- 1742 - 1878 *Groninger Courant, Algemeen Dagblad voor de stad Groningen en*

- Ommelanden* (R)
- 1884 - ----- *Haagsche Courant* (R)
- 1873 - 1874 *De Haagsche Nieuwsbode: Kleine Residentieblad* (R)
- 1945 - 1964 *Haagsch Dagblad* (R)
- 1924 - 1926 *Het Haagsche Volk* (R)
- 1992 - 1992 *Haarlemmermeers Dagblad* (R)
- 1884 - ----- *Haarlems Dagblad* (R)
- 1879 - 1879 *Haarlemsch Dagblad* (R)
- 1656 - 1942 *(Opregte) Haarlemsche Courant* (R)
incorporated in *Haarlems Dagblad*
- 1869 - ----- *Heldersche Courant* (R)
- 1945 - 1993 *Helmondse Courant (Dagblad)* (R)
incorporated in *Eindhovens Dagblad*
- 1942 - 1992 *Hengelosch Dagblad* (R)
incorporated in *Dagblad Tubantia*
- 1966 - 1993 *Hoogeveens Dagblad* (R)
incorporated in *Provinciale Drentse en Asser Courant*
- 1896 - 1910 *De Hollander* (R)
- 1870 - 1945 *Het Huisgezin* (R)
merged with *Noord-Brabanter, Noord-Brabantsch Dagblad*
(continued as *R.K. Dagblad Het Huisgezin* from 1917) merged with
Provinciale Noordbrabantsche Courant
- 1855 - 1857 *L'Intelligence: Nouveau Journal du Limbourg* (R)
- 1830 - 1850 *Journal de la Haye* (R)
- 1839 - 1854 *Journal du Limbourg: Feuille politique, commerciale et littéraire* (R)
merged with *Le Courier de la Meuse*
- 1838 - 1940 *Kamper Courant* (R)
- 1943 - 1949 *Kamper Dagblad (Strijdend Nederland)* (R)
- 1953 - 1965 *Kennemer Dagblad* (R)
- 1874 - ----- *Kennemerland* (continued as *Dagblad Kennemerland* from 1950) (R)
- 1875 - 1875 *Het Kleine Dagblad* (R)
- 1842 - 1873 *Koophandel- en Zeevaarttijdingen* (R)
- 1871 - 1872 *Kronijk van den Dag* (R)
- 1888 - 1888 *Kunstnijverheid* (R)
- 1905 - 1911 *Land en Volk* (R)
- 1752 - ----- *Leeuwarder Courant* (R)
- 1862 - ----- *Leidsch Dagblad* (R)
- 1719 -c1901 *Leidsche Courant* (R)
- 1910 - 1992 *Leidse Courant* (R)
- 1984 - 1988 *Lelystads Dagblad* (R)
- 1845 - 1866 *De Limburger: Dagblad van Maastricht en het Hertogdom voor
Staatkunde, Wetenschappen, Handel en Nijverheid* (R)

- 1846 - ----- *Limburger Courier* (continued as *De Nieuwe Limburger* from 1955)
merged with *Dagblad voor Noord-Limburg* (continued as *Dagblad
De Limburger* from 1996) (R)
- 1918 - ----- *Limburgs Dagblad* (R)
- 1869 - 1958 *De Maasbode* (R/N)
merged with *De Tijd*
- 1856 - 1971 *Maas- en Roerbode, Nieuwsblad* (R)
incorporated in *De Nieuwe Limburger*
- 1888 - 1889 *Maileditie* (R)
- 1758 - 1945 *Middelburgsche Courant* (R)
- 1924 - 1938 *De Morgen* (R)
- 1936 - 1945 *Nationale Dagblad* (N)
- 1849 - 1856 *De Nederlander* (R)
- 1894 - 1946 *De Nederlander* (R/N)
- 1897 - 1901 *Het Nederlandsch Dagblad* (?)
- 1944 - ----- *Nederlands Dagblad (Gereformeerd Gezinsblad)* (N)
- 1858 - 1863 *Nieuw Amsterdamsch Advertentieblad* (R)
- 1871 - 1880 *Nieuw Arnhemsch Advertentieblad* (R)
- 1863 - 1963 *Nieuw Dagblad van 's-Gravenhage* (R)
- 1877 - 1877 *Nieuw Leeuwarder Dagblad* (R)
- 1896 - 1897 *De Nieuwe Amsterdammer* (R)
- 1870 - 1877 *Nieuwe Arnhemsche Courant* (R)
- 1901 - 1936 *Nieuwe Courant* (?)
- 1879 - 1975 *De Nieuwe Dag* (R)
- 1908 - 1965 *Het Nieuwe Dagblad* (R)
- 1876 - 1945 *Nieuwe Delfsche Courant* (R)
- 1917 - 1960 *Nieuwe Dordtsche Courant* (R)
- 1922 - 1964 *Nieuwe Drentsche Courant* (R)
- 1958 - 1964 *De Nieuwe Eindhovense Krant* (R)
incorporated in *Eindhovens Dagblad*
- 1879 - 1919 *Nieuwe Groninger Courant: Dagblad voor de Noordelijke Provinciën*
(incorporated in *Provinciale Groninger Courant*) (R)
- 1924 - 1975 *Nieuwe Haagsche Courant* (R)
- 1879 - 1965 *Nieuwe Haarlemsche Courant* (R)
- 1961 - 1964 *Nieuwe Helmonds Dagblad* (R)
incorporated in *Helmondse Courant*
- 1887 - 1940 *Nieuwe Hengelosche Courant* (R)
- 1888 - 1945 *De Nieuwe Koerier, Provinciale Roermondsche Courant* (R)
- 1892 - 1951 *Nieuwe Langedijker Courant* (R)
- 1954 - ----- *Het Nieuwe Land* (continued as *Dagblad Flevoland* from 1995) (R)
- 1928 - 1975 *Nieuwe Leidse Courant* (R)
- 1945 - 1947 *De Nieuwe Nederlander* (?)

- 1979 - ----- *Nieuwe Noordhollandse Courant* (R)
 1898 - 1905 *Het (Nieuwe) Ochtendblad* (?)
 1876 - 1891 *Nieuwe Provinciale Drentsche en Asser Courant* (R)
 1887 - 1964 *Nieuwe Provinciale Groninger Courant* (R)
 1844 - 1970 *Nieuwe Rotterdamsche Courant* (R/N)
 merged with *Algemeen Handelsblad* (continued as *NRC-Handelsblad*
 from 1970)
 1881 - 1960 *Nieuwe Schiedamsche Courant* (R)
 1879 - 1963 *Nieuwe Tilburger Courant* (R)
 incorporated in *Het Nieuwsblad van het Zuiden*
 1865 - 1884 *Nieuwe Utrechtsche Courant* (R)
 1933 - 1940 *Nieuwe Utrechtsche Courant* (R)
 1945 - 1977 *Nieuwe Utrechts Dagblad* (R)
 1908 - 1995 *Nieuwe Venlosche Courant* (continued as *Dagblad voor Noord-*
 Limburg) (R)
 merged with *De Limburger*
 1870 - 1993 *(Nieuwe) Winschoter Courant* (R)
 1979 - 1992 *Nieuwe Zeister Courant* (R)
 1949 - ----- *Nieuw Kamper Dagblad* (R)
 1945 - 1980 *(Nieuw) Noordhollands Dagblad* (R)
 incorporated in *Alkmaarsche Courant*
 1909 - 1960 *Nieuw Zuid-Hollander* (R)
 1945 - c1949 *Het Nieuws* (R)
 1870 - 1923 *Het Nieuws van de Dag* (R)
 incorporated in *De Courant*
 1917 - 1993 *Het Nieuwsblad, Dagblad voor Midden-Brabant* (continued as
 Het Nieuwsblad, Dagblad voor Midden-Brabant from 1983) (R)
 1884 - 1914 *Het Nieuwsblad voor Nederland* (R)
 incorporated in *De Courant*
 1889 - ----- *Nieuwsblad van het Noorden* (R)
 c1925 - 1949 *De Nieuwsbron* (?)
 1829 - 1895 *Noordbrabander (-ter)* (R)
 incorporated in *Noordbrabantsch Dagblad*
 1892 - 1910 *NoordBrabantsch Dagblad* (R)
 merged with *Het Huisgezin*
 1869 - 1873 *Het Noorden* (R)
 1870 - 1872 *Noord- en Zuid-Hollandsche Courant* (R)
 1904 - ----- *De Noord-Ooster* (continued as *Groninger Dagblad* from 1993) (R)
 1945 - 1954 *De Noord-Ooster, Dagblad voor NoordBrabant en Limburg* (R)
 1870 - 1875 *De Noordstar* (R)
 1963 - 1992 *Noord Veluws Dagblad* (R)
 incorporated in *Gelders Dagblad*

- 1881 - 1885 *Nijmeegsch Dagblad* (R)
 1889 - 1897 *Ochtendbode* (R)
 1878 - 1879 *Omnibus* (R)
 1946 - 1949 *Ons Dagblad* (?)
 incorporated in *De Nederlander*
 1913 - 1964 *Ons Noorden* (R)
 1905 - 1940 *Onze Courant* (continued as *Westfriesch Dagblad* from 1923) (R)
 1923 - 1924 *Onze Prinsensstad* (R)
 1918 - ----- *Overijsselsch Dagblad* (R)
 1941 - ----- *Het Parool* (N)
 1945 - 1948 *De Patriot* (?)
 1823 - ----- *Provinciale Drenthse en Asser Courant* (continued as *Drentse Courant* from 1974, then continued as *Groninger Dagblad* from 1993) (R)
 1800 - 1992 *Provinciale Geldersche en Nijmeegsche Courant* (continued as *Nijmeegse Dagblad* from 1950) (R)
 1787 - 1935 *Provinciale Groninger Courant* (R)
 incorporated in *Nieuwsblad van het Noorden*
 1854 - 1945 *Provinciale Noord-Brabantsche en 's-Hertogenbossche Courant* (R)
 merged with *Het Huisgezin* in 1945 (continued as *Brabants Dagblad* from 1959)
 1790 - ----- *Provinciale Overijsselsche en Zwolsche Courant* (continued as *Zwolsche Courant*) (R)
 1850 - 1859 *Le Publiciste Journal des Pays Bas* (R)
 1889 - 1900 *Recht voor Allen: Orgaan der Sociaal-Demokratische Partij* (?)
 1971 - ----- *Reformatorisch Dagblad* (N)
 1876 - ----- (*Dagblad van*) *Rijn en Gouwe* (R)
 1878 - 1883 *Reporter* (continued as *Arnhemsch Dagblad* from 1881) (R)
 1894 - 1940 *De Residentiebode* (R)
 1904 - 1975 *De Rotterdammer* (R)
 1878 - ----- *Rotterdams(ch) Nieuwsblad* (R)
 merged with *Het Vrije Volk* (continued as *Rotterdams Dagblad* from 1991)
 1941 - 1971 *Rotterdams Parool* (R)
 1889 -c1917 *Rotterdamsch Dagblad* (R)
 1717 - 1868 *Rotterdamsche Courant* (R)
 1870 - 1883 *Rotterdamsche Courant* (R)
 1967 - 1993 *Sallands Dagblad* (R)
 incorporated in *Overijssels Dagblad*
 1858 - ----- *Schager Courant* (R)
 1848 - 1945 *Schiedamsch Courant* (R)
 1949 - 1951 *Schouwsch Dagblad* (R)

- 1945 - 1960 *De Sirene* (R)
incorporated in *Brabants Dagblad*
- 1945 - 1948 *Stad en Lande* (R)
- 1873 - 1944 *De Standaard* (?)
- 1948 - 1992 *Steenwijker Dagblad* (continued as *Het Dagblad* from 1974) (R)
- 1944 - ----- *De Stem* (R)
- 1899 - 1919 *Stichtsche Courant* (R)
incorporated in *De Standaard*
- 1872 - 1882 *De Telegraaf* (R)
- 1893 - ----- *De Telegraaf* (N)
- 1945 - 1946 *De Telex* (R)
- 1854 - 1993 *Tielsche Courant* (R)
incorporated in *Dagblad Rivierenland*
- 1870 - 1931 *Tilburgsche Courant* (R)
- 1945 - 1960 *De Toekomst* (continued as *Delfs Katholiek Dagblad* from 1956) (R)
- 1908 - 1940 *De Tribune* (?)
- 1943 - ----- *Trouw* (N)
- 1872 - ----- *Tubantia Volkscourant voor Twente* (continued as *Dagblad Tubantia*) (R)
- 1849 - ----- *Twentsche Courant* (R)
- 1945 - ----- *De Typhoon, Dagblad voor de Zaanstreek* (R)
merged with *De Zaanlander* (continued as *Dagblad Zaanstreek* from 1991)
- 1845 - 1974 *De Tijd* (R/N)
- 1884 - 1945 *Utrechtsch Advertentieblaadje* (continued as *Utrechtsche Courant* from 1889) (R)
- 1893 - ----- *Utrechts Nieuwsblad* (R)
- 1863 - 1943 *Utrechtsch Provinciaal en Stedelijk Dagblad* (continued as *Utrechts Dagblad*) (R)
- 1874 - 1875 *Utrechtsche Volksblad* (R)
- 1796 - 1862 *Utrechtsche Provinciale en Stads-Courant* (R)
- 1869 - 1982 *Het Vaderland* (R)
- 1927 - 1991 *De Vallei* (R)
- 1945 - 1953 *Veluwe- en IJsselbode* (R)
- 1945 - ----- *Veluws Dagblad* (R)
- 1863 - 1872 *Vlissingsche Courant* (R)
- 1900 - 1940 *Het Volk* (?)
- 1876 - 1879 *Volksblad* (R)
- 1929 - 1940 *Volksblad voor Groningen en Drente* (R)
- 1895 - 1908 *Het Volksdagblad* (R)
- 1937 - 1940 *Het Volksdagblad* (?)
- 1919 - ----- *De Volkskrant, Katholiek Dagblad voor Nederland* (continued as *De*

- Volkskrant* from 1965) (N)
- 1920 - 1945 *Voorwaarts* (?)
- 1884 - 1884 *Vreemdelingenblad* (R)
- 1881 - 1884 *Het Vreemdenblad* (R)
- 1945 - 1991 *Het Vrije Volk* (N/R)
incorporated in *Rotterdamsch Nieuwsblad*
- 1945 - 1948 *De Vrije Alkmaarder* (R)
- 1945 - 1946 *De Vrije Pers* (R)
- 1945 - 1964 *Vrije Twentsche Courant* (continued as *Vrije Twentsche en Achter-
hoeksche Courant* from 1951) (R)
- 1945 - 1975 *De Vrije Zeeuw* (R)
- 1941 - 1990 *De Waarheid* (N)
- 1878 - 1953 *Winterswijksche Courant* (continued as *Winterswijks Dagblad* from
1945) (R)
- 1911 - ----- *IJmuider Courant* (R)
- 1887 - 1991 *De Zaanlander* (R)
incorporated in *De Typhoon, Dagblad voor de Zaanstreek*
- 1887 - 1945 *De Zeeuw* (R)
- 1877 -c1900 *Zeeuws Dagblad* (R)
- 1945 - 1962 *Zeeuws Dagblad* (R)
- 1945 - 1946 *Zeeuwse Stemmen* (R)
- 1844 - 1953 *Zierikzeesche Nieuwsbode* (R)
- 1921 - 1945 *De Zuid-Willemsvaart* (R)
- 1849 - 1943 *Zutphense Courant* (R)
- 1941 - 1993 *Zutphens Dagblad* (R)
incorporated in *Overijssels Dagblad*

Appendix B

The Average Annual Subscription Price-Level of Daily Newspapers: 1848-1994

Table B.1 Development of Average Annual Subscription Price-level of Daily Newspapers between 1848 and 1994

Period	Subscription Price in Nominal Terms in Dutch Guilders	CPI Basis-period: 1721-1745 (=100)	CPI Basis-period 1845-1849 (=100)
1845-1849	25.65	167	100.00
1850-1854	24.94	149	89.22
1855-1859	24.18	160	95.81
1860-1864	24.39	149	89.22
1865-1869	23.01	143	85.63
1870-1874	14.22	160	95.81
1875-1879	11.54	155	92.81
1880-1884	12.15	150	89.82
1885-1889	10.93	140	83.83
1890-1894	14.07	142	85.03
1895-1899	11.42	148	88.62
1900-1904	11.53	150	89.82
1905-1909	11.16	155	92.81
1910-1914	8.69	165	98.80
1915-1919	10.78	240	143.71
1920-1924	13.43	265	158.68
1925-1929	13.34	235	140.72
1930-1934	13.43	200	119.76
1935-1939	13.64	185	110.78
1940-1944	13.09	255	152.69
1945-1949	16.21	365	218.56

1950-1954	23.50	490	293.41
1955-1959	29.85	560	335.33
1960-1964	33.38	640	383.23
1965-1969	48.46	800	479.04
1970-1974	89.44	1018	609.58
1975-1979	153.82	1530	916.17
1980-1984	217.88	2033	1217.37
1985-1989	271.44	2312	1384.43
1990-1994	316.37	2496	1494.61

Sources: CEBUCO, CBS (1976, 1996a, b), Hemels (1969a), Jesuits' Library at Maastricht University, Social Historical Centre in Maastricht, and National Press Museum in Amsterdam.

Appendix C

Development of Industry Specific and of Macroeconomic Factors: 1950-1995

Table C.1 Development of Industry Specific Factors: 1950-1995

Year	Total Circulation (x1000)	Total Number of Newspapers	Edit. Indep. Dailies *	Total National Dailies	Average Number of Pages	Annual Price in Dutch Guilders	CPI Basis-year 1950
1950	2781	116	68	11	7.17	19.76	100.00
1951	2678	113	68	11	7.37	21.32	108.70
1952	2598	113	66	11	7.47	24.96	120.22
1953	2651	110	66	11	8.56	24.96	120.34
1954	2687	110	64	11	9.70	26.52	119.62
1955	2765	109	64	11	10.38	26.52	124.52
1956	2851	109	64	11	10.31	29.12	127.14
1957	2886	109	64	10	11.69	31.20	130.45
1958	2905	108	64	10	11.91	31.20	137.36
1959	2987	108	62	10	13.03	31.20	139.56
1960	3105	103	62	10	14.83	31.20	141.23
1961	3214	104	61	10	15.90	31.20	144.62
1962	3296	103	62	11	16.23	32.24	147.80
1963	3367	103	61	11	16.15	33.28	151.65
1964	3386	93	59	11	18.68	39.00	157.26
1965	3481	89	55	11	20.19	40.04	167.95
1966	3586	89	54	11	20.82	47.84	174.67
1967	3694	89	53	11	20.47	48.88	184.10
1968	3779	89	52	11	22.33	52.00	189.62
1969	3857	88	51	11	23.60	53.56	194.55
1970	3965	87	48	10	23.96	59.28	206.81

1971	4103	86	46	9	23.03	74.88	215.91
1972	4144	87	46	10	22.19	90.48	232.75
1973	4099	87	45	10	23.71	104.52	251.37
1974	4230	86	46	10	23.93	118.04	275.00
1975	4156	80	44	9	23.96	132.60	301.12
1976	4183	80	43	9	24.50	146.64	331.24
1977	4323	79	43	9	25.95	158.08	361.05
1978	4409	79	43	9	27.53	163.80	383.07
1979	4473	81	43	9	28.31	167.96	399.93
1980	4554	80	44	9	27.74	180.96	419.52
1981	4695	80	43	9	25.74	193.96	448.05
1982	4547	79	43	8	24.73	227.24	476.73
1983	4606	79	43	8	25.32	241.28	500.56
1984	4438	81	43	8	26.13	245.96	515.08
1985	4446	81	43	8	26.57	258.44	524.86
1986	4488	81	44	8	27.28	265.20	537.46
1987	4528	80	43	8	27.39	270.92	539.07
1988	4559	79	43	8	28.48	278.20	540.15
1989	4510	79	43	8	29.26	284.44	542.85
1990	4589	78	43	8	30.23	291.72	549.37
1991	4594	75	43	8	29.91	303.16	561.45
1992	4606	66	42	8	29.25	317.20	579.42
1993	4652	56	41	8	28.51	330.20	597.38
1994	4696	56	39	8	29.21	339.56	609.93
1995	4698	55	37	8	29.38	348.92	627.00

Note: * The editorial independence is defined as a newspaper with its own chief editor, who is not subordinated to the editor staff of another newspaper.

Table C.2 Development of Macroeconomic Factors: 1950-1995

Year	Real National Income in mln Dutch Guilders	House- holds (x1000)	Entropy*	Year	Real National Income in mln Dutch Guilders	House- holds (x1000)	Entropy
1950	16900	2511	2.41	1973	64690	4337	2.42
1951	17736	2525	2.46	1974	66978	4454	2.44
1952	16713	2568	2.52	1975	66396	4561	2.46
1953	17948	2606	2.50	1976	69318	4660	2.46
1954	20298	2651	2.47	1977	69596	4752	2.49
1955	21904	2702	2.45	1978	70394	4839	2.50
1956	23047	2760	2.43	1979	71498	4911	2.48
1957	24299	2804	2.40	1980	72376	5006	2.46
1958	23347	2895	2.43	1981	70588	5103	2.43
1959	24620	3049	2.42	1982	69352	5239	2.45
1960	27187	3171	2.42	1983	68401	5367	2.41
1961	28085	3231	2.43	1984	69613	5494	2.35
1962	29403	3286	2.42	1985	72229	5613	2.30
1963	31201	3342	2.41	1986	72523	5711	2.28
1964	35620	3419	2.41	1987	72512	5814	2.26
1965	37241	3508	2.39	1988	74557	5888	2.25
1966	38836	3602	2.39	1989	79136	6000	2.25
1967	40565	3698	2.42	1990	83210	6113	2.24
1968	43590	3790	2.41	1991	85443	6216	2.25
1969	51334	3890	2.37	1992	85660	6285	2.27
1970	53905	3986	2.34	1993	85749	6372	2.29
1971	57922	4094	2.36	1994	89100	6429	2.31
1972	60885	4211	2.40	1995	89705	6516	2.30

Sources: CBS, CEBUCO, NDP, Van den Brink (1987), and Witteloostuijn et al. (1996).

Note: * Not all readers of newspaper have identical product preferences. For every sufficiently strong identifiable set of reader product preferences at least one newspaper must exist as long as per unit costs are not much higher than those of the largest newspapers. Diversity in taste is larger when we have more sets of religious and ideological preferences. An indicator for diversity is the dispersion of members over different trade unions within a country. To measure the diversity in preferences we

calculate the diversity in number of equivalents. The formula is defined as follows:

$$Entropy = \prod_{i=1}^N [1 / m_i]^{m_i}$$

where N = number of trade unions, and m_i = market share of trade union i (= number of members / total number of available jobs in The Netherlands), including a remaining category of non union members. Unemployed people are not taken into account in this measure. If all trade unions have the same m_i then entropy value is N , and if we have only one trade union then entropy is equal to 1.

Appendix D

Mobility of Market Share Decomposition 6.1

We know that

$$\begin{aligned}\sum_{i=1}^N m_{i,t} &= 1, \sum_{i=1}^N m_{i,0} = 1, 1/N \sum_{i=1}^N m_{i,t} = \mu_t, 1/N \sum_{i=1}^N m_{i,0} = \mu_0, \\ \sigma_t^2 &= 1/N^2 \sum_{i=1}^N (m_{i,t} - \mu_t)^2, \sigma_0^2 = 1/N^2 \sum_{i=1}^N (m_{i,0} - \mu_0)^2, \text{ and} \\ \rho &= [\sum_{i=1}^N (m_{i,t} - \mu_t)(m_{i,0} - \mu_0)] / [\sigma_t \sigma_0] = \text{Cov}(m_{i,t}, m_{i,0}) / [\sigma_t \sigma_0]\end{aligned}$$

then we can derive decomposition 6.1 as follows

$$\begin{aligned}M_t &= \sum_{i=1}^N (m_{i,t} - m_{i,0})^2 = \\ &= \sum_{i=1}^N (m_{i,t}^2 - 2 m_{i,t} m_{i,0} + m_{i,0}^2) = \\ &= H_t + H_0 - 2 \sum_{i=1}^N m_{i,t} m_{i,0} = \\ &= \Delta H_t + 2H_0 - 2 \sum_{i=1}^N m_{i,t} m_{i,0} = \\ &= \Delta H_t + 2H_0 - 2 [\sum_{i=1}^N (m_{i,t} - \mu_t)(m_{i,0} - \mu_0) + N \mu_t \mu_0] = \\ &= \Delta H_t + 2H_0 - 2 \text{Cov}(m_{i,t}, m_{i,0}) - 2/N = \\ &= \Delta H_t + 2H_0 - 2\rho \sigma_t \sigma_0 - 2/N\end{aligned}$$

where

$$\begin{aligned}\sum_{i=1}^N m_{i,t} m_{i,0} &= \sum_{i=1}^N (m_{i,t} - \mu_t + \mu_t)(m_{i,0} - \mu_0 + \mu_0) = \\ &= \sum_{i=1}^N (m_{i,t} - \mu_t)(m_{i,0} - \mu_0) + N \mu_t \mu_0 - N \mu_t \mu_0 + N \mu_t \mu_0 - N \mu_t \mu_0 + N \mu_t \mu_0 = \\ &= \sum_{i=1}^N (m_{i,t} - \mu_t)(m_{i,0} - \mu_0) + N(1/N)(1/N)\end{aligned}$$

Q.E.D.

Appendix E

Decomposition of Market Share Mobility of Entrants

We can disaggregate all Number of Firms (N) in time period 0 and t into the total number of Entrants (NE), Exiting (EX), and Continuing Firms (NC) in the time period as follows

$$N = NE + EX + NC$$

Disaggregation of market share mobility for period between 0 and t into mobility of entrants, exiting, and continuing firms can be done as follows

$$M_t = \sum_{i=1}^N (m_{i,t} - m_{i,0})^2 = \sum_{i=1}^{NE} m_{i,t}^2 + \sum_{i=1}^{NC} (m_{i,t} - m_{i,0})^2 + \sum_{i=1}^{EX} m_{i,0}^2.$$

We can decompose the entrants contribution to the mobility of market shares as follows. We know that

$$\mu_{\text{entry}} = 1/NE \sum_{i=1}^{NE} m_{i,t}, \text{ and } \sigma_{\text{entry}}^2 = (1/NE)^2 \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2$$

then

$$\begin{aligned} \sum_{i=1}^{NE} m_{i,t}^2 &= \sum_{i=1}^{NE} ((m_{i,t} - \mu_{\text{entry}}) + \mu_{\text{entry}})^2 = \\ &= \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2 + 2 \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}}) \mu_{\text{entry}} + \sum_{i=1}^{NE} \mu_{\text{entry}}^2 = \\ &= \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2 + 2 \mu_{\text{entry}} NE (1/NE) \sum_{i=1}^{NE} m_{i,t} - NE \mu_{\text{entry}}^2 = \\ &= \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2 + NE \mu_{\text{entry}}^2 = \\ &= \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2 + NE (1/NE)^2 (\sum_{i=1}^{NE} m_{i,t})^2 = \\ &= \sum_{i=1}^{NE} (m_{i,t} - \mu_{\text{entry}})^2 + 1/NE (\sum_{i=1}^{NE} m_{i,t})^2 = \\ &= \sigma_{\text{entry}}^2 + \mu_{\text{entry}} \sum_{i=1}^{NE} m_{i,t} \end{aligned}$$

Similar for exiting firms: $\sum_{i=1}^{EX} m_{i,0}^2 = \sigma_{\text{exit}}^2 + \mu_{\text{exit}} \sum_{i=1}^{EX} m_{i,0}$.

Q.E.D.

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Nederlandse Samenvatting

In de afgelopen jaren is het dagbladkartel onder druk komen te staan. De dagbladen hebben prijsregelingen voor de advertentiemarkt en ze verhogen jaarlijks de abonnementen met een zelfde percentage. De ontheffing van het verbod op prijsafspraken voor de Nederlandse dagbladen heeft tot doel de prijsconcurrentie tussen dagbladen te voorkomen en zo de aantasting van de winstgevendheid van de dagbladbedrijven te beperken. De concurrentie zou zich daardoor moeten toespitsen op de kwaliteit van de redactionele informatie tussen de dagbladen onderling. Volgens de Nederlandse Dagbladpers (NDP) zou dat een voorwaarde zijn voor de pluriformiteit van de pers oftewel een behoud van de verscheidenheid aan kranten. De voortzetting van de prijsafspraken staat ter discussie aangezien het aantal dagbladtitels in Nederland voortdurend is gedaald.

Wat is de achtergrond van het dagbladkartel in de Nederlandse dagbladsector? Hoe is het snelle concentratieproces in Nederland te verklaren? In hoeverre hebben overheidsinterventies een rol gespeeld in de structuur en de ontwikkeling van de sector? Dit proefschrift toont aan dat - ten einde de marktstructuur en -processen in de sector beter te begrijpen - het van belang is om een historische analyse uit te voeren. Met name de rol van de overheden komt uitgebreid aan de orde. Overheidsinterventies, die in belangrijke mate hebben bijgedragen tot de huidige marktstructuur, bleven tot nu toe sterk onderbelicht in de meeste analyses van de ontwikkeling van de sector over de tijd. Omdat de overheden in Nederland de toetreding van bedrijven tot de markt en de overlevingskansen van dagbladen hebben beïnvloed, worden de invloeden hiervan op met name de dynamiek van de sector geanalyseerd.

Hoofdstuk 1 geeft een inleiding op het algemene onderwerp: de industriële levenscyclus in termen van het aantal bedrijven, toe- en uittreding en de overlevingskansen van bedrijven. De resultaten laten zien dat het aantal toetreders en de overlevingskansen van bedrijven sterk gecorreleerd zijn met de positie waar de sector of industrie zich in de industriële levenscyclus bevindt en met de innovatieve activiteiten. De industriële levenscyclus beschrijft de evolutie van het aantal bedrijven in een sector. Vanaf het ontstaan van een nieuwe sector zal het aantal bedrijven in de sector eerst toenemen tot het maximale aantal bereikt wordt, waarna een afname van het aantal bedrijven zal plaats vinden als de sector volwassen wordt.

De observatie-eenheid in dit proefschrift is de dagbladtitel. In het eerste deel van hoofdstuk 2 wordt het databestand beschreven. Het bestand bevat historische informatie van ieder individueel dagblad dat verschenen is in Nederland vanaf het jaar 1848 en geeft dus een gehele productpopulatie van slechts één productmarkt weer. Het onderzoek

concentreert zich op dagbladen in plaats van op uitgeverijen omdat ieder afzonderlijk dagblad zijn eigen marktsegment en lezersgroep heeft. In de beginfase van de dagbladsector kon een dagbladuitgeverij geïdentificeerd worden met het door haar uitgegeven dagblad, maar sinds de twintigste eeuw drukt een aantal uitgeverijen meerdere dagbladen. Heden ten dage is een dagblad slechts een product van een uitgeverij. De uitgevers van kranten zijn zich steeds meer gaan bewegen op andere mediamarkten. De observatie-eenheid is gedefinieerd als een dagblad wanneer het voldoet aan de volgende vijf criteria. Dagbladen (1) verschijnen dagelijks (6 dagen per week); (2) zijn beschikbaar voor iedereen die de prijs wilt betalen; (3) publiceren nieuws en algemene informatie voor een brede lezersgroep; (4) publiceren tijdgebonden informatie; (5) publiceren informatie voor een geografisch en taalkundig afgebakende lezersgroep en adverteerders. Een dagblad treedt toe tot de markt in het jaar waarin de eerste publicatie is verschenen en treedt uit de markt in het jaar dat de naam van het dagblad verdwijnt en het dagblad tegelijkertijd zijn identiteit heeft verloren. In de gehanteerde definitie wordt een horizontale fusie tussen twee dagbladen zo gedefinieerd dat één van hen overleeft, terwijl de andere verdwijnt. Door het op deze manier construeren van het databestand worden de historische relaties met onder meer de specifieke doelgroepen gewaarborgd. In totaal zijn er 261 dagbladen waargenomen die in Nederland verschenen zijn tussen 1848 en 1997. De mediaan van de levensduur en gemiddelde leeftijd van dagbladen in de markt zijn respectievelijk 35 en 48 jaar. Het onderzoek begint in 1848 het jaar waarin vrijheid van meningsuiting als artikel 7 werd opgenomen in de Grondwet van het Koninkrijk der Nederlanden. Het gebrek aan politieke vrijheid, zoals vrijheid van spreken en opinie, drukte zwaar op de evolutie van de dagbladsector. Voor de liberalisatie werden de toetreders in feite gedwongen om niet succesvol te zijn in de gereguleerde sector.

Het tweede deel van hoofdstuk 2 betreft een analyse van de levenscyclus van de dagbladsector en de daaraan gerelateerde overlevingskansen van de dagbladen. De beginperiode van de sector werd gekenmerkt door een sterke positieve netto toetreding van dagbladen die met name beïnvloed werd door politieke en economische ontwikkelingen. Tussen 1900 en 1940 was de sector in een stabiele fase gekomen die gekenmerkt werd door een kleine constante netto toetreding. Aan deze periode kwam gedurende de Tweede Wereldoorlog een einde. Na de roerige periode van de oorlog werd de sector steeds meer geconcentreerd. Gelijksortige evolutionaire ontwikkelingen bestaan ook voor de vier regionale marktsegmenten (noorden, oosten, zuiden, en westen) in Nederland. Het westelijke en, in minder mate, het noordelijke marktsegment hebben een evolutie gekend die sterk overeen komt met die op landelijk niveau. Het verloop van het aantal dagbladen bevestigt het bestaan van de levenscyclus voor de Nederlandse dagbladsector, een resultaat dat overeenkomt met de bevindingen voor de dagbladsectoren in andere landen. De resultaten van het onderzoek naar welke factoren van invloed zijn op de overlevingskansen van dagbladen tonen tevens aan dat met name de fase van de levenscyclus waarin de sector zich tijdens de toetreding van dagbladen bevond van cruciaal belang was en is voor de positie van de dagbladen. Na toetreding neemt de overlevingskans van een dagblad toe, maar de oude overlevende dagbladen

krijgen het steeds moeilijker om in de markt te blijven. De huidige dagbladsector heeft de levenscyclusfase bereikt waarin de mogelijkheden voor potentiële dagbladen om toe te treden zeer klein zijn.

De levenscyclus van de dagbladsector werd gekenmerkt door een uitzonderlijke expansie van het aantal dagbladen in de jaren na 1869. Hoofdstuk 3 verklaart het toetredingsgedrag en overlevingskansen van de dagbladen in deze periode. Na 1848 hield een speciale belasting het laatste economische obstakel tussen bestaande en potentiële nieuwe dagbladen in stand. Deze belasting, bekend als 'Het Dagbladzegel', stamde nog uit de tijd dat Napoleon Nederland bezette. Door de belasting werden de productiekosten verdubbeld waardoor vele dagbladen in financiële problemen kwamen. Dit ontmoedigde ook het aantal (potentiele) toetreders in de periode na 1848. Op 1 juni 1869 schafte de overheid 'Het Dagbladzegel' af. Hierdoor verdween het laatste obstakel naar economische persvrijheid. De productiekosten werden gehalveerd, en dit werd volledig verwerkt in de prijs. De prijzen daalden namelijk ook met ongeveer 50% in deze periode. Deze ontwikkeling stimuleerde nieuwe dagbladen om toe te treden tot de markt. Het aantal dagbladen groeide met ongeveer 50% in de periode 1869-1871. Opmerkelijk is dat van de toegetreden dagbladen in de periode 1869-1871 slechts 57% na 10 jaar nog bestonden. Met behulp van twee statische modellen en met een duuranalyse zijn de toetredings- en overlevingskansen geanalyseerd. Aangetoond is dat er een inverse relatie bestaat tussen een belastingverlaging en het aantal bedrijven enerzijds en tussen een belastingverlaging en totale productie van het goed anderzijds. Een positief verband blijkt te bestaan tussen een belastingverlaging en de prijs van het product. Een dagblad dat toetrad als een monopolist in een lokaal marktsegment had enigszins betere mogelijkheden om te overleven dan een dagblad dat in een oligopolistisch lokaal marktsegment verscheen. De monopolist kon namelijk een monopolistische winst verdienen, terwijl een dagblad dat toetrad in een oligopolistisch marktsegment moest concurreren met de bestaande dagbladen en slechts kon concurreren met een lagere kostprijs. Bovendien gaf de prijsverlaging de bestaande dagbladen een impuls om hun oplagen te vergroten.

Bepaalde gebeurtenissen, met name interventies door overheden hebben het ontwikkelingstempo van de dagbladsector sterk beïnvloed. In hoofdstuk 4 worden de effecten van de politieke gebeurtenissen op de industriële evolutie en de gerelateerde marktstructuur beschouwd. De Nederlandse dagbladsector laat vier belangrijke overheidsinterventies zien. De historische politieke gebeurtenissen die de toetreding van potentiële dagbladen en de overlevingskansen significant hebben beïnvloed zijn (1) vrijheid van meningsuiting in 1848, (2) opheffing van 'Het Dagbladzegel' in 1869, (3) de Tweede Wereldoorlog, en (4) de oprichting van het Bedrijfsfonds voor de Pers in 1971. Deze overheidsinterventies hebben een essentiële rol gespeeld in de ontwikkeling van de dagbladsector, met name de acties in de expanderende levenscyclusfase van de sector. Door het kunstmatig creëren van economische en politieke obstakels hebben interventies de groei van de sector beperkt en tevens de toegankelijkheid van dagbladen voor de Nederlandse bevolking bemoeilijkt. Toen deze obstakels verwijderd werden,

groeide het aantal dagbladbedrijven explosief. De liberalisatie van de sector is niet alleen essentieel geweest voor het aantal toetreders maar ook voor het vergroten van de overlevingskansen van de dagbladen. De overlevingskansen van dagbladen werden met name bepaald door de concurrentievoordelen die een dagblad had ten opzichte van de andere dagbladen in hetzelfde marktsegment. Naarmate de sector volwassener werd, kwam de concurrentie ook uit de andere segmenten. Door economische en technologische ontwikkelingen veranderde de marktstructuur van een regionaal naar een meer nationaal georiënteerde markt. Als gevolg van deze ontwikkelingen daalden de overlevingskansen van dagbladen en werd het moeilijker voor potentiële onafhankelijke dagbladen toe te treden tot de markt.

Met name de structurele veranderingen veroorzaakten de omslag in de levenscyclus van de Nederlandse dagbladsector. Het aantal dagbladtitels in Nederland is voortdurend gedaald na de roerige periode van de Tweede Wereldoorlog. In de jaren zestig en zeventig werd de concentratiedruk in de dagbladsector vergroot. De dagbladuitgevers begonnen samen te werken of besloten met elkaar te fuseren om schaalvoordelen te krijgen door onder meer de gemiddelde en marginale redactionele kosten en drukkosten te verlagen. Het concentratieproces werd versneld in 1967 toen radio- en televisiereclame werden geïntroduceerd in Nederland. Aan het einde van de jaren zestig werd de roep om overheidsinterventie in het proces van persconcentratie ten behoeve van de pluriformiteit in Nederland te handhaven, sterker. Met name de Nederlandse Dagbladpers voerde de druk voor corrigerende overheidshandelingen op. De overheid beantwoordde het verzoek om de verscheidenheid te waarborgen door de sector diverse keren te helpen. In 1971 besloot de overheid om een tijdelijk fonds in het leven te roepen, dat in 1974 een stichting werd en nog steeds bestaat: het Bedrijfsfonds voor de Pers. Het doel van het Bedrijfsfonds voor de Pers was niet alleen de bestaande dagbladen met financiële middelen bij te staan, maar ook het stimuleren van nieuwe dagbladen. In haar bijna dertigjarige bestaan is het Bedrijfsfonds voor de Pers er niet in geslaagd om haar doelstelling, de verscheidenheid aan dagbladen, over een lange termijn te verwezenlijken. De concentratie in de markt heeft zich doorgezet en het aantal dagbladen is verder afgenomen.

De Nederlandse dagbladsector heeft nooit een prijzenoorlog gekend. Na de Tweede Wereldoorlog werden de prijzen voor een groot deel bepaald door de Nederlandse overheid. Dagbladen mochten hun prijzen binnen door de overheid vastgestelde marges laten stijgen. Wanneer de dagbladen konden aantonen dat de totale kosten meer gestegen waren dan de opbrengsten in de afgelopen jaren werd een prijsstijging toegestaan. Opmerkelijk is dat de prijsontwikkeling een inverse relatie met de evolutie van het aantal bedrijven laat zien. Gelijksortige onderzoeken in andere landen en sectoren vinden geen inverse relatie tussen prijsontwikkeling en het aantal bedrijven. Zij vinden een zelfde patroon voor het aantal bedrijven, maar een afname van de productprijs gedurende de evolutie van de industrieën. Indien de overheid niet zou hebben ingegrepen, dan is het op basis van de resultaten plausibel te veronderstellen dat ook het prijsverloop in de Nederlandse dagbladsector een daling zou hebben laten zien.

Bovenstaande analyse leert dat in de laatste decennia de sector sterk is veranderd door

technologische vooruitgang en culturele en politieke ontwikkelingen. Om het inzicht van de processen die speelden na de Tweede wereldoorlog te vergroten, worden de effecten van macro-economische, sector- en bedrijfsspecifieke ontwikkelingen op de sector in hoofdstuk 5 geanalyseerd. Voordat wordt overgegaan op het daadwerkelijk analyseren van de invloeden van bepaalde ontwikkelingen op de sector, vat het eerste deel van hoofdstuk 5 de literatuur op het gebied van uittreding samen. Hierin wordt uitgebreid stil gestaan bij de verschillende effecten die de drie soorten ontwikkelingen hebben op de overlevingskansen van bedrijven.

De observatie-eenheid in dit deel van het onderzoek is het moederblad. Een dagblad wordt gedefinieerd als moederblad ofwel als zelfstandige dagbladtitel wanneer het dagblad een zelfstandige hoofdredacteur heeft. Vanaf 1950 is het aantal moederbladen in Nederland gereduceerd van 68 tot nog slechts 37 zelfstandige dagbladtitels in 1996. Met behulp van duuranalyses is het concentratieproces in de Nederlandse dagbladmarkt nader bestudeerd. De bevindingen laten zien dat conform de marktwerking er een proces in de dagbladsector op gang is gekomen dat er op neer komt dat door de ontwikkelingen zowel aan de aanbodzijde als aan de vraagzijde een concentratiebeweging is ontstaan, die de pluriformiteit van de pers bedreigde. Overheidsinterventies, waaronder ontheffing van het verbod op prijsafspraken en het Bedrijfsfonds voor de Pers, hebben niet kunnen voorkomen dat het aantal zelfstandige dagbladtitels in Nederland voortdurend is afgenomen. Deze interventies hebben de concentratietendens in een door groeiende schaalvoordelen gekenmerkte sector slechts kunnen vertragen met als gevolg dat dit proces versneld is uitgevoerd in de laatste jaren. Met name de kleine dagbladen zijn verdwenen. Om dagbladen rendabel te kunnen exploiteren is een steeds groeiende minimale oplage vereist. Door fusies en opheffingen van dagbladen werden de vereiste oplagen bereikt. Het gevolg was dat de overgebleven dagbladen inhoudelijk zoveel mogelijk rekening gingen houden met hun verschillende politieke en levensbeschouwende lezers (-groeperingen). De resultaten verklaren dat voornamelijk de sector- en bedrijfsspecifieke ontwikkelingen ten grondslag liggen aan het concentratieproces. Tevens komt in dit hoofdstuk naar voren dat als gevolg van tijdsafhankelijke ontwikkelingen de invloeden van de sector- en bedrijfsspecifieke factoren op de uittredingskansen sterk fluctueren over de tijd.

Alhoewel de minimale vereiste omvang van dagbladen om winstgevend te kunnen zijn steeds is toegenomen na het omslagperiode in de levenscyclus, de Tweede Wereldoorlog, blijkt toch dat geografische product differentiatie een belangrijk strategisch instrument is voor de dagbladen. De dagbladsector kan namelijk gesegmenteerd worden in een landelijke en twaalf provinciale deelmarkten. Om de concurrentie van dagbladen te meten wordt er vaak vanuit gegaan dat de concentratiemaatstaven op geaggregeerd niveau de juiste intensiteit weergeven ongeacht het belang van marktsegmentaties. Het nadeel van deze methode is dat de dynamiek tussen de dagbladen onderling niet adequaat wordt gemeten. Daarom wordt in hoofdstuk 6 de evolutie van marktaandeel van de dagbladen in de diverse marktsegmenten geanalyseerd. Voor de analyse wordt een maat voor de mobiliteit van marktaandeel

gesplitst in de transfers van marktaandeelen van dagbladen in dezelfde deelmarkt en tussen dagbladen in diverse marktsegmenten. De resultaten tonen aan dat met name de landelijke dagbladen marktaandeel aan het veroveren zijn op de regionale dagbladen. Echter om te concurreren met de landelijke dagbladen zijn de provinciale dagbladen met elkaar gaan samenwerken of fuseren. Met als gevolg dat er op de provinciale deelmarkten slechts nog enkele grote dagbladen zijn overgebleven.

Tenslotte worden in hoofdstuk 7 de resultaten van de eerdere hoofdstukken samengevat. Verder wordt voor wat betreft het onderzoek naar de dynamiek van markten en overheidsinterventies een aantal aanbevelingen gedaan. De resultaten in dit proefschrift laten zien dat het aantal toetreders en de overlevingskansen van bedrijven sterk gecorreleerd zijn met de positie waar de sector en of industrie zich in de levenscyclus bevindt en met de interventies van overheden. Tevens is aangetoond dat overheidsinterventies een levenscyclus van een sector of een industrie kunnen versnellen en / of vertragen. Onderzoeken naar de dynamiek van markten en overheidsinterventies zullen rekening moeten houden met de levenscyclus van de desbetreffende sector. Daarbij zal de inbreng van een goede analyse in welke fase van de levenscyclus de sector zich bevindt essentieel zijn.

Curriculum Vitae

Hans van Kranenburg was born on April 12th, 1970 in Geldermalsen, The Netherlands. He studied Econometrics at Tilburg University, specializing in Mathematical Economics. In the academic year 1993-1994 he studied Agricultural Economics at University of Exeter, Exeter, United Kingdom. After his graduation in April 1995 he started his Ph.D. research at Maastricht University. In the summer of 1997 he participated in an internship for conducting survey research projects at National Opinion Research Center in Chicago, USA. Since June 1999 he is employed as an Assistant Professor in Management Science at Maastricht University.

Hans van Kranenburg werd geboren op 12 april 1970 te Geldermalsen. Hij studeerde Econometrie aan de Katholieke Universiteit Brabant te Tilburg met als specialisatie Wiskundige Economie. In het academisch jaar 1993-1994 studeerde hij Agrarische Economie aan de University of Exeter te Exeter in het Verenigd Koninkrijk. Na zijn afstuderen in april 1995 begaf hij zich naar de Universiteit Maastricht, alwaar hij zijn proefschrift schreef. In de zomer van 1997 verbleef hij aan de National Opinion Research Center in Chicago, USA, en volgde een opleiding voor het opzetten en uitvoeren van survey onderzoeken. Sinds juni 1999 werkt hij aan de Universiteit Maastricht als universitair docent bij de vakgroep management wetenschappen.