Organizational Foundations and Closures in a Regulated
Environment: Swedish Commercial Banks 1831-1990

by

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This study analyzes the foundations and **closures** of the total population of Swedish commercial banks in 1831-1990 using both semi-parametric and parametric event-history methods. With reference to the comparatively rigid control of entries and exits in **banking**, five hypotheses are formulated:

(1) acquisitions constitute the principal reason for **closure** in **banking**; (2) the early years are less hazardous for banks than for members of other industries; (3) the survival **patterns** of banks are related to the freedom of **banking** operations; (4) the survival rates of banks are positively related to the general economic activity at the time of foundation; and (5) the survival rates of banks are negatively related to the degree to which **customer** relationships already exist. The findings support the first, **second**, third and fifth hypotheses; some **evidence also** favours the fourth hypothesis.

1. Introduction

The population ecology approach to organisation analysis, initially formulated by Aldrich (1979) and Hannan & Freeman (1977), has attracted increased interest in the last decade. Researchers within this tradition have investigated how specific populations of organisations have changed over time, focusing on questions related to founding and closure rates. Using historical data they have examined the plausibility of an environmental model for selection in populations of organisations (cf. e.g. Singh, Tucker & House, 1986; Hannan & Freeman, 1988a; Hannan & Freeman, 1988b, Singh, 1990 and Tucker, Singh & Meinhard, 1990).

In recent years, this perspective has found a number of applications particularly in the newspaper industry (Carroll & Delacroix, 1982; Delacroix & Carroll, 1983; Carroll, 1984; Amburgey, Lehtisalo & Kelly, 1986, Carroll, 1987 and Carroll & Hannan, 1989). The study of this industry has an unusual relevance, since newspapers constitute such important institutions in modern societies. It is thus common to label the Press as the Fourth Branch of Government beside the Legislative, Executive and Judicial Branches (Siebert, Peterson & Schramm, 1956).

Since the conditions of the environment constitute a key feature of the population ecology approach, it is clearly advisable to study also populations with other environmental conditions. This has been done with respect to telephone companies (Barnett & Carroll, 1987) and labour unions (Hannan & Freeman, 1988). The first of these has a particular interest due to its regulated environment. Since the population ecology approach focuses on the entries and the exits, industries with regulated

environments should be of **particular** interest. **Such** industries may be expected to **have** different founding **patterns** from industries in unregulated environments. Due to the stress of the **liability-of-newness** hypothesis from Stinchcombe (1965) **such** industries may be expected to **have** different **closure patterns** than others. It is therefore fitting, as further studies are undertaken, to **choose** populations where the foundations and the operations are regulated. In addition it is appropriate to follow the earlier tradition and **focus** on important institutions in society. Moving then from the Fourth Branch of Government we here suggest that an industry, which on good grounds **could** be mentioned as the Fifth Branch of Government, the Commercial Banks, should be analyzed by means of the population ecology approach. As **will** be shown in **Section 2**, **such** companies in a **sense** constitute semi-public institutions. As a result they are under **careful** Government scrutiny: their **entry** is **subject** to formal authorization and their operations are continuously scrutinized. These properties, **discussed** in **Section 2**, lead us to five hypotheses concerning survival **patterns** in **banking** populations. **Section 3 deals** with the **statistical** methodology of the population ecology approach, whereas **Section 4** dwells on issues related to data collection. **Section 5** presents the results from a study of the population of Swedish commercial banks, and **Section 6** provides the conclusions of the study.

2. *The Survival Characteristics of the Banking Firm*

2.1. General Characteristics of the Banking Firm

Banks represent important institutions in the modern society in their **roles** as nodes in **financial** networks. They connect those having a surplus of capital with those in need of **credit**, thereby providing liquidity and spreading risks. In addition they hold key positions in **domestic** monetary policy. A crucial feature for the successful achievement of these tasks is trust. **Particularly** those depositing their money in the bank need assurance that it **will** meet its obligations as regards repayment. If this trust is questioned, there is a **danger** of a run on the bank, which in due **course** may spread to other banks and ultimately lead to **financial panic**. In order to prevent **such** events governments tend to **have** elaborate rules for supervision of the **banking** industry. First, even in the present time of deregulation, completely free **entry** is rare. An **entering** bank needs a charter and to obtain this it must fulfil **certain** requirements concerning capital coverage, etc. In addition some countries, like the United States, **have restrictions** on geographic (**McFadden Act**) and **product** (**Glass-Steagall Act**) expansion. For banks in operation supervision constitutes an important part of the environment. Banks are expected to **operate** according to **certain** rules, thereby running a sound and safe business. In the United States this is even **controlled** by unannounced **dramatic inspections** (cf. e.g. Mayer, 1976).

The described features of **banking** imply first that there is a preselection of entrants to the industry through the charter **procedure**. **Second**, there are **restrictions** on risk-taking through the supervision. Both these features are **likely** to reduce the risk of bank failure.

2.2. Hypotheses Concerning Bank Survival Patterns

As a result of these properties in the **banking** industry we expect survival **patterns** of banks to **have** other characteristics than the industries investigated earlier. First, we assume that bank supervision and the efforts to **protect** the system from **distrust** will make liquidations less **likely** than in other industries. The solution to **financial** distress in **banking** firms will therefore be the acquisition by another bank rather than liquidation.

Hypothesis 1: Acquisition constitutes the principal reason for closure in the banking industry.

Second, we expect that the liability-of-newness will be hampered by the regulatory features. This risk **reduction** will **operate** in two ways: the properties of prospective entrants are **screened** in order to reduce the risk of introducing too weak members into the bank population, and the regulating bodies usually **assess** whether the industry would benefit from an additional bank foundation. As a result we expect bank **closures** to **reach** a maximum at later **ages** than for other industries.

Hypothesis 2: The early years are less hazardous for members of the banking industry in comparison with other industries.

A third consequence of the regulated environment of banks is that survival rates can be expected to vary with the degree of bank regulation. In periods of relatively weak regulation we expect banks to exhibit **patterns similar** to those of other industries and **vice versa**.

Hypothesis 3: The survival patterns of banks are related to the freedom in banking operation.

The three presented hypotheses all arise from the regulated environment of the **banking** industry. As **discussed** above regulation is not the only important **property** of banks, however. Another is their significant **role** in the commercial life. This leads us to two additional hypotheses concerning the **interaction** of banks with their commercial environment. First, we shall argue that banks **will** be more sensitive to variations in economic activity than e.g. newspapers. Thus the earlier studies could not confirm a relationship between economic cycles and foundations (cf. e.g. Delacroix & Carroll, 1983). Indeed we could argue that economic decline would influence the bank negatively **particularly** through failures of **customers**.

***Hypothesis 4:** The survival **rates** of banks are positively **related** to the general economic activity at the time of foundation.*

Finally, referring to the **importance** of **customer** relationships in the **banking** industry (cf. e.g. Engwall & Johanson, 1990), we **expect** that the degree to which other banks are already operating on the market **will** influence survival rates. Thus the more banks are already serving a **particular** market the more difficult it **will** be for new entrants to survive. These difficulties **will** be the more significant the **longer** the already established banks **have been** operating, since time **will** constitute a crucial **factor** in developing **customer** relationships.

***Hypothesis 5:** The survival **rates** of banks are negatively related to the degree to which **customer** relationships already exist.*

3. The Statistical Methodology

3.1. The Survival and Hazard Functions

The survival function, $S(t)$ is a fundamental concept in the study of organizational survival data. It is defined as the probability of surviving up to a certain time t . As all organizations are alive at the start of the follow-up period we have $S(0) = 1$. The function $S(t)$ decreases monotonically and is related to the usual distribution function, $F(t)$, by the relationship $S(t) = 1 - F(t)$. Another important but less easily understood concept is that of the hazard function (the hazard rate). It shows the instantaneous closure (death) rate at the time t for an individual alive at this time. The formal definition is

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{P(t \leq T \leq t + \Delta t | T \geq t)}{\Delta t} \quad (1)$$

From this it can be inferred that the conditional risk of dying in the short interval $(t, t + \Delta t)$ is $h(t)\Delta t$. It should be noticed that the hazard is a rate and not a risk, which means that $h(t)$ can be larger than 1. The hazard is related to the density function $f(t)$ as follows: $h(t) = f(t) / (1 - F(t))$.

3.2. The Problem of Censored Data

In many statistical applications, the normal distribution is used almost routinely. In survival or duration analysis a number of other distributions are also considered in the description and analysis of the data (cf. e.g. Carroll & Delacroix, 1982; Barnett & Carroll, 1987 and Addison & Portugal 1987). The reason is that they may give a more credible representation of the process which generates the data. In addition, the estimation methods used are

often more crucially dependent on the **specific** assumptions made than is the **case** in standard linear regression analysis. One reason for this is the occurrence of **censored** observations in life-time data, i.e. observations where we know that the survival time is at least a given number. These **occur** in cases when the observation unit is still **alive** at the end of the follow-up period. It is fairly obvious that wrong conclusions might result if the **censored** observations are not suitably **treated**. This **also** explains why standard **statistical** measures and methods only to a **limited** extent are useful for life-time data.

3.3. Three **Functions** to Represent the Hazard **Function**

The shape of the hazard function has important consequences for the **choice** of survival distribution. In many studies on organizational mortality the *Makeham-Gompertz function* has **been** used as the survival model. The reason for this is in many cases the above mentioned liability-of-newness hypothesis, which assumes that the most hazardous period for an organization is very early in its **existence**. The hazard then gradually declines.

If one **suspects**, as we do in the present study (cf. Hypothesis 2), that these **conditions** are not at hand the **Makeham-Gompertz** model, however, has one important limitation: it does not allow a non-monotonical hazard. One way to bypass this problem is to assume that the survival-function is time-dependent, for example by allowing the **basic** distributional parameters to be different for $T < t_0$ and $T > t_0$.¹ In this way it is possible to handle the situation with a hazard which at first increases and then

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¹Singh, House & Tucker (1986) give an example of this.

decreases. However, the point t_0 has to be chosen in some suitable way and the assumption of an abrupt change in parameter values at a certain point hardly seems realistic in practice.

Another alternative is to choose a function which can handle non-monotonical hazards. One such alternative which is very flexible is *the extended generalized gamma-distribution (EGG)* introduced by Stacy (1962) and extended by Prentice (1974). This function has the advantage of incorporating a number of well-known survival functions as special cases. In this way a formal testing procedure can be carried out as the basis for a choice among the special cases. If we assume the survival time T to follow an extended generalized gamma-distribution with a set of explanatory variables X , we have the following formal model

$$\ln T = X\beta + \sigma\omega \quad (2)$$

where β is the parameter associated with the explanatory variables, σ is a scale parameter and the distribution of ω is very complicated.

A second alternative to the Makeham-Gompertz function is *the Cox Proportional Hazards Model (Cox)*, which can be formulated as follows

$$h(t/X) = h_0(t) \exp(X\beta) \quad (3)$$

This model avoids a specific assumption as to the form of the hazard. What is assumed is only that the explanatory variables influence the hazard multiplicatively through the term $\exp(X\beta)$. For a categorical variable the relative hazard compared with the

reference category is obtained as $\exp(\beta)$, where β is the estimated parameter of the variable which represents the category in question. For a continuous variable the factor $\exp(\beta)$ represents the effect on the hazard associated with an increase in the variable by one unit.

It should be emphasized that the parameterization is different in the Cox-model and in the EGG-family of methods. A positive parameter in the former case indicates an increased hazard (shorter survival), while a positive parameter for the EGG family of methods implies an increased survival time.

In conclusion we shall thus, in accordance with the above arguments, use the EGG and Cox models in the empirical studies. A detailed comparison of the results obtained by different models including the Makeham-Gompertz will be presented separately. A major conclusion is that the results are robust with respect to distributional assumptions, which means that by and large the same results as regards the effect of different variables on survival are obtained for several different models.

4. Data Issues and Methodology

4.1. Limiting the Population

The empirical tests of our hypotheses will be undertaken for a population of Swedish banks. In limiting the population we have chosen to focus on the commercial banking system and therefore to exclude savings banks and rural credit societies. This decision left us with four types of commercial banks for consideration: Joint Stock Bank Companies (Bankaktiebolag), Joint Stock Banks with Unlimited Liability (Enskilda sedelutgivande banker), Branch Banks (Filialbanker) and Discount Offices (Diskonter). Of these,

the discount offices, which **existed** between 1772 and 1820, are by several **authors** considered as the first Swedish commercial banks (Kock, 1932, p. 37; Nygren, 1985, pp. 29-34 and Sandberg, 1978, p. 659) or as precursors to the real commercial banks (Thunholm, 1964, p. 42). Notwithstanding we **decided** to **exclude** the discount offices from the present study, **since** there are some difficulties in obtaining the necessary data. The characteristics of the three types of banks studied are summarized in the Appendix.

As **discussed** more extensively in Wallerstedt (1991) data for the selected population were mainly accessible through the Swedish Bank **Inspection** Board (Bankinspektionen) for the years up to 1912 and thereafter from the reference books *Svensk Bankmatrikel* (the Swedish Bank Register issued **each** fifth year from 1886 until 1958), *Uppgifter om Bankerna* (1912-1990; Monthly Banking Statistics, Official Statistics of Sweden), *Svenska Aktiebolag och Enskilda Banker* (1901-1933; Swedish Joint Stock Companies and Joint Stock Banks with Unlimited Liability) and *Svensk Aktiebolag* (1934-1958; Swedish Joint Stock Companies).

4.2. Selected Information

From the above-mentioned sources we **have** collected: (a) date of foundation, (b) date of **closure** (c) **place** at foundation and (d) number of existing banks in the **specific county** at the time of foundation. In **defining the date of bank foundation** three alternatives were considered: the year that the **articles** of association were **passed**, the year when the bank charter was agreed upon, or the year when the business actually **started**. In order to facilitate **comparisons** with Söderlund (1964 and 1978) the last criterion was used. This means that the few **cases** when a chartered

bank has not started its operations have not been included in the population.

When it comes to *the definition of a bank closure* four main cases can be identified: (a) the bank is liquidated, (b) the bank is merged with another bank, (c) the bank changes its legal status and (d) the bank transforms from one Joint Stock Bank Company into a new one. Regarding the first case Carroil (1987, pp. 44-45) raises the problem of "lingering death", i.e. when the real business of an organization has ceased but the corporate identity still exists. The fact that the present study is based on official statistics implies that this kind of measurement error may occur. If so, however, the importance of these errors can be regarded as minor, since the population only contains a very small proportion of liquidations (cf. below in Section 5).

With respect to the merger case it can according to Carroll (1987, pp. 45-46) be seen as a continuum of outcomes. At one extreme there is the case when a small organisation is totally absorbed by a larger one, whereas the other extreme is represented by the case of one organization absorbing another without any impact on its own structure. The case in between is the one when mergers "so change the structure of the partners that new organizations emerge" (*ibid.*, p. 45). In this paper we use Carroll's definition of mergers, i.e. when a small bank has been taken over by a much larger bank, and at the same time lost its own identity (in most cases its name), it has been treated as a bank closure. Simultaneously the larger bank (usually) keeping its name in the merger has been assumed to have mainly kept its organisational structure and has been identified as the dominant partner. The case when two banks of about the same size have

merged into a new one (often manifested by a new name) we **have**, following Carroll & Delacroix (1982, s.170), **treated** it as two bank closures and one bank foundation. The reasons are that they **have been** regarded as two equal partners and that the merged organisation has assumed a different form **compared** with the original ones.

When a bank has changed its legal status, for example from a Joint Stock Bank with Unlimited to one with **Limited** Liability or has changed its identity within the same legal status it has **been** investigated to see whether this **change** was a consequence of a **structural** reorganisation. Only if this was the **case** has the event **been treated** as a bank **closure**. A **similar** scrutiny has **been** performed when a bank has changed its name.

Needless to say the point made by Young (1988, pp. 7-8), that a number of borderline cases exist in the definition of foundations and closures, is **also** relevant for the present study. Analysis of the data indicates that these cases do not **significantly** influence the results, **however**.²

4.3. Defining Founding Cohorts

In order to be able to investigate the impact of the **changes** in the environmental **conditions** (Hypothesis 3) the population has **been divided** into five founding **cohorts**: 1830-1863, 1864-1894, 1895-1918, 1919-1931, 1932-90. This division is **based** on the **changes** in the environmental **conditions** shown in Table 1.

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²For a more profound **discussion** of this question, cf. Wallerstedt (1991).

Table 1. *Basic Periods in Swedish Bank Legislation*

Period	Main Features of Legislation
-1863	Legislation concerning the foundation of banks: Joint Stock Banks with Unlimited Liability (1824 & 1846), Joint Stock Companies (1848) and Branch Banks (1851)
1864-1894	The Bank Reform Act of 1863 in some ways created opportunities for a free market of capital within the banking system.
1895-1918	Legislation aiming to support the concentration of the banking industry. The Banking Law of 1911.
1919-1931	Legislation aiming to prevent the concentration of the banking industry.
1932-	Legislation introducing certain kind of restrictions concerning the legal form of the banks and their right to own shares.

Source: Fritz (1988) and Larsson (1989).

The laws enacted up to 1863 gave the prerequisite of the foundation of different kinds of banks. The first law came in 1824 and regulated the form of charters to be granted for Joint Stock Banks with Unlimited Liability and also stipulated a ceiling on interest rate charges. Although the Act made no mention of the issue of bank notes the banks granted a charter according to this law immediately started to issue their own paper bills. Finally in 1846 these actions were legally formalized (Sandberg, 1978, pp. 659-660). Legislation concerning Joint Stock Companies and Branch Banks was enacted in 1848 and 1851.

In the Bank Reform Act of 1863 the Swedish Parliament decided upon several important changes in the banking system. The former support from the National Bank of Sweden to the Branch Banks, which had been a necessary condition of their existence, ceased. At the same time, however, a new type of banking Company, Limited

Liability Joint Stock Bank Companies without the right to issue bank notes, was introduced. Concerning the banks' **interest** rate the earlier limitations on **changes** now **came** to an end (Sandberg, 1978, p. 663). As a **matter of fact** Brisman (1934, p. 111) has named this period the break-through of the Swedish modern **banking** system. To support this **banking** system two important **banking** measures were undertaken: The National Bank of Sweden, founded in 1668, which in 1866 was given the status of a central bank of the Swedish **banking** system, and the Bank **Inspection** Board established in 1877. The abolition of the **interest** rate **restrictions** combined with the new neutral status of the National Bank of Sweden **vis-à-vis** the **banking** system in a way created a free market of **capital**.

Up until the turn of the century there were still no real obstacles to the founding of new banks. Although a charter was needed for those banks which issued their own bills, there were never really **any** barriers to **entry** (Fritz, 1988, p. 13). During the first **decade** of the twentieth century, however, the Government control of the founding of banks was extended to the Joint Stock Bank Companies by a law of 1911. The same legislation **also** incorporated new stipulations concerning a bank's equity and the size of its deposits. The amount of the minimum **basic** funds was raised from MSEK 0.2 to MSEK 1.0 for nationally operating banks and to MSEK 0.5 for **local** ones. In order to facilitate the adjustment to these stipulations mergers between banks were made possible through a regulated right for **larger** banks to acquire shares in other **banking** companies (*ibid.*, pp. 13-14, 17 and Larsson, 1989, pp. 1-2).

In the subsequent period (1919-1931) measures were taken to prevent the **concentration** of banks which had **started** during the

first **decade** of the **century**. A law of 1919 **stated** that mergers between bank companies were not allowed without the permission of the Government and in 1921 the right of the banks to buy shares in other **banking** companies was restricted (Fritz, 1988, p. 14 and Larsson, 1989, p. 1).

The **losses** for the banks **caused** by the world depression in 1929-1932 brought about a revision of the **banking** legislation. A new bank law was introduced in 1932 and from then on the right to own shares in other companies was abolished. In 1934 the possibilities of doing business as a Joint Stock Bank with Unlimited Liability were eliminated (Lindgren, 1987, p. 23).

In short the five periods can thus be regarded as a chain of increasing regulation. Before 1900 restrictions on bank foundations and operations were few. With the passage of time they **have** gradually increased. In the 1980s and early 1990s a shift is **taking place** towards deregulation. Several of the old restrictions on **banking** operations (liquidity quotas, **interest** control, **credit** limits and currency control) **have been** removed (cf. Lybeck & Hagerud, 1988, p. 16). The **effect** of these **changes** could not be considered in **our** analysis, however, **since** they are too **recent**.

5. Empirical Results

The complete **data-set** consists of 176 observations, 11 of which **have censored** survival times, **i.e.** they refer to banks which were still operating in June 1990. Figure 1 shows that the first Swedish commercial bank, which was founded in 1831, attracted some followers in the subsequent years. Around 1855 a rather large number of establishments, primarily of **Branch Banks**, **occurred**.

Though there was some **turbulence** as regards foundations and **closures** in the **years** until 1895, the population of banks seemed relatively **stable** in the period 1865-1895. However, a new wave of bank establishments in the years following made the population grow. It **reached** its peak in 1909 with over 80 commercial banks. The population has thereafter **been** successively reduced to 11 in 1990.³

Fig.1. *Number of Swedish Commercial Banks 1830-1990*

5.1. Investigating the Hypotheses

5.1.1. *Hypothesis 1: Acquisitions constitute a dominant reason for closure in the banking industry*

Investigating the first hypothesis we find in Table 2 that the population, in accordance with our expectations, exhibits a very low ratio of liquidations among the closures: 12 of 176 (around 7 %). The vast majority of the disappearing banks **have** thus **been** acquired. Most of the acquisitions **occurred** in 1900-1929. It must be stressed, however, that an acquisition does not necessarily

³The foreign entries in the 1980s **have** not **been** included in the analysis due to the short follow-up time.

indicate a bank failure. Generally speaking, a merger can result from an explicit strategy of the involved banks, which find that a merger is of advantage in one way or another.

Table 2. *The Swedish Commercial Banks 1830-1990*

Period	Founda- tion	Acquisition	Closure by Liquidation	Remaining in End Year
1830-1839	6			6
1840-1849	2			8
1850-1859	21			29
1860-1869	24	15		38
1870-1879	16	9	2	43
1880-1889	4	1	4	42
1890-1899	26	3	1	64
1900-1909	43	23	1	83
1910-1919	22	58	4	43
1920-1929	5	12		30
1930-1939	—	8		28
1940-1949	1			21
1950-1959	1	6		16
1960-1969	—			16
1970-1979	2	4		14
1980-1989	3	3		14
1990		3		11
Total	176	153	12	11

The liquidations took place in 1872-1919. Of the 12 liquidated banks all, **except** one, were Joint Stock Bank Companies. Five of them were Stockholm banks and the median life time was nine years. All of the liquidated banks seem to **have been** rather small. This means that the negative **effects** of their liquidation **on** the trust in the **banking** system were probably marginal and that they did not lead to intervention from regulators.

5.1.2. Hypothesis 2: The early years are less hazardous for members of the banking industry in comparison with other industries.

A comparison between the early closure risks in the banking and other industries can be made by using the survival function. We then know that, generally speaking, according to Aldrich (1990, p. 5) about 50 per cent of founded organizations are dissolved within the first two years. The same liability-of-newness has been confirmed by Carroll & Delacroix (1982, p. 174) who found that the probability of survival to the age of two years was below 0.20 for the nineteenth-century Argentinian press. A similar pattern was observed for Irish newspapers although the decline in the early part of the survival curve was less steep, the probability of surviving five years being 50 per cent (*ibid.*, pp. 172-176). If we compare these findings with the survival curve computed by the Kaplan-Meier method for the Swedish banking industry (Fig. 2) we first find that survival times vary between 0 and 157 years. The median survival time is 15 years, and only 25 % of the banks had ceased to exist after nine years. If the characteristics of the population are illustrated by the hazard function (Fig. 3) we do not obtain a curve which is continuously decreasing from the first years and onwards. Instead the hazard increases to reach a maximum after about 10 years. After this point the hazard diminishes continuously. Our data thus seem to support the argument that the charter procedure and the supervision system influence the shape of the hazard function. The latter is not continuously declining as we would expect according to the liability-of-newness hypothesis. From a more general point of view this indicates that the environment, and particularly the legislation determining conditions for entry and operations, are crucial for the survival.

Fig. 2. Survival Function for Swedish Commercial Banks

Fig. 3. Hazard Function for Swedish Commercial Banks

Table 3. *Characteristics of Different Founding Cohorts*

Cohort	Number	Censored	Q ₁	Median	Q ₃
-1863	34	0	10	18.5	56
1864-1894	43	0	16	37	51
1895-1918	83	2	7	10	17
1919-1931	9	3	14	23	
1932-1990	7	6			

Note: The **cases** when figures are not given are **such** where there are too few uncensored observations to allow computation.

When we divide the population into founding cohorts (Table 3), we find that the life-time varies **widely** between different cohorts, the median life time ranging between 10 and 37 years. The **lowest** figure is exhibited by the banks in the large 1895-1918 founding cohort and the highest by the preceding 1864-1894 cohort. This is **also** in accordance with **our** expectations, **since** the 1895-1918 period was one in which acquisitions, the main **closure** method in the industry (cf. above), were facilitated. For this cohort we thus find that 25% of the banks had disappeared after **seven** years and after another 10 years only 25 % remained.

5.1.3. Hypothesis 3: The Survival patterns of banks are related to the freedom in banking operation

Fig. 4. Survival Estimates for Different Founding Cohorts

Cohort 1932- not shown due to few observations.

Another illustration of the differences in life-time between the founding cohorts is provided by their survival functions (Fig. 4). A logrank test (Lawless, 1982, p. 417) gives a $\chi^2(4)$ -value of 37.43, which is strongly significant at all realistic levels. In addition estimates of the D-parameters and their standard errors using the EGG and Cox models with the cohort 1895-1918 as reference (Table 4) show that all other cohorts have longer survival times and consequently lower closure hazards. This is shown by the significant positive parameter estimates for the EGG model and the negative estimates in the Cox model. The differences compared with the reference cohort are considerable. Thus the estimated parameters imply relative hazards of 0.44, 0.39, 0.34 and 0.12 compared with the reference cohort on the basis of the

Cox model. The estimates for the last cohort are very uncertain, however, due to not only to very few observations but **also** a high degree of **censoring** of the available observations. This is illustrated by the 95 per cent confidence interval for the relative hasard of this cohort which is 0.02-0.87 with the Cox model.

Table 4. *Univariate Andlyses of the Founding Cohorts. B-parameters with Standard Errors in Parentheses*

Founding Cohort	EGG	Cox
Constant	2.463 (0.134)	
-1863	0.706 (0.202)	-0.819 (0.219)
1864-1894	1.094 (0.185)	-0.951 (0.198)
1895-1918	Reference (0.000)	
1919-1931	0.930 (0.378)	-1.078 (0.426)
1932-1990	1.544 (0.659)	-2.092 (1.007)

The conclusion which can be drawn from **our** investigation of hypothesis 3 is thus that the 83 banks belonging to the 1895-1918 cohort had a **much** shorter life-time than the banks of other **cohorts**. The main reason seems to be that the legislation aiming to support the **concentration** of the **banking** industry (cf. above Table 1) induced this development. Even though bank legislation ought to **have** had the same **effect** on all existing banks in this period, the newly founded banks were more **likely** to be affected by the new laws than their older **competitors**.

5.1.4. *Hypothesis 4: The Survival rates of banks are positively related to the general economic activity at the time of foundation*

When dealing with economic activity we are hampered by the lack of data due to the long period that we are covering. If we hypothesize that economic conditions in general should be important, the most obvious measurement which we can consider is the GNP, and more precisely the change in this variable, to avoid the problems caused by the secular growth of variables of this type. Other variable formulations which Capture the economic situation would be possible, e.g. the deviation around a computed trend, but the relative change is easy to understand and its behaviour is similar to many other measures.

Figures for GNP are available for Sweden from 1861, which means that a suitable starting point for the analyses involving GNP is 1864. Thus the first founding cohort of banks and all Branch Banks are excluded from the analysis. Starting with the earliest possible year 1862 would add just a few banks but require the consideration of both the first founding cohort and the Branch Banks, a complication which is not warranted by the addition of these few observations.

The development of GNP is familiar but a few characteristics are given in Table 5. The most important part of the Table for our analysis is that prior to 1930, when most of the foundations and closures of the banks occurred. The average growth rate per decade has varied between 2 and 4.5 % with the exception of the 1860s. The most dramatic changes have occurred with respect to the variability between individual years. The period after the Second World War has seen a reduction of the standard deviation of the

growth rate from the not uncommon figures of 7-8 percentage points to about 2 percentage points.

Table 5. *Characteristics of GNP Growth 1862-1990*

Period	Mean	Standard Deviation	Minimum Value	Maximum Value
1862-69	0.6	2.3	-1.3	4.2
1870-79	4.5	7.6	-7.0	20.4
1880-89	2.1	2.8	-2.4	6.2
1890-99	3.2	4.8	-2.8	13.2
1900-09	3.3	4.7	-3.3	11.9
1910-19	2.4	7.6	-8.7	14.6
1920-29	4.0	7.1	-11.9	13.8
1930-39	3.0	5.6	-9.5	9.7
1940-49	4.5	4.1	-1.9	10.4
1950-59	4.0	2.1	-2.2	7.7
1960-69	4.4	1.6	2.1	6.7
1970-79	2.3	2.0	-1.6	5.4
1980-90	1.9	1.1	-0.3	4.0

Source: Johansson (1967) and National Account Statistics

As indicated by the standard deviations for the pre-1940 decades the annual change varied greatly up to the Second World War. The extreme figures were -11.9 % in 1921 and +20.4 % in 1870. In the analysis we shall test whether the economic conditions at the time of the foundation influenced the future survival of the bank. In addition to the annual percentage change we shall also consider a three-year average of the growth rate (GNPRW). The reason is that the individual annual change values possibly give an exaggerated picture of the alteration in the economic situation as perceived by the economic agents.

The estimated parameters with both the EGG and the Cox model have the correct sign. Thus higher values of GNP growth reduce the hasard and increase the survival time (cf. Table 6). The estimated parameters are not significant, however. GNPR is almost

significant ($p = 0.08$ and 0.10 , respectively), while GNPRW is insignificant. Models with three year averages lagged forward or backwards produced even weaker connections between GNP growth and survival.

Table 6. *Univariate Analysis of the Change in GNP. P-parameters with Standard Errors in Parenthesis*

Variable	EGG	Cox
Constant	2.814 (0.151)	2.770 (0.199)
GNPR	0.0296 (0.0170)	-0.0277 (0.0174)
GNPRW	0.0336 (0.0368)	-0.0033 (0.0337)

In some cases the effect of variables such as the GNP itself and not its change are considered. Such formulations imply that the level of economic development, or the size of the total market at the time of the foundation of the organization, should be important. This approach has been tried in Carroll & Delacroix (1982). As we investigate the effect of the size of the market in a more direct way, this approach will not be used here.

The fact that the economic activity differs in different parts of Sweden leads us to investigate variations in survival time between banks in different regions. This approach seems particularly relevant for banks, since most of them have a strong regional basis. The basic regional unit used is then the county ("län") of which there have been about 25 during the period of study. In many counties the number of banks established is too small, however, to allow a detailed analysis based on region.

Therefore the counties have been grouped into four larger regions, denoted CAPITAL, SOUTH, CENTRAL AND NORTH. They correspond to the capital Stockholm, Southern Sweden (Göteborg, counties 5-16), Central Sweden (Svealand except Stockholm, counties 3-4, 17-20) and Northern Sweden (Norrbotten, counties 21-25). Obviously the banks located in Stockholm frequently differed from the other banks, insofar as they often aim at a coverage of the whole country rather than just a specific region.

There are no large obvious differences in survival between these groups of banks, however (Table 7). This is confirmed by an insignificant logrank-statistic, $\chi^2(3)=2.31$, $p = 0.51$ and the estimated parameters shown in Table 8 all of which imply insignificant differences between the larger regions. In addition to the effects of region, a possible difference between the three largest Swedish cities, Stockholm, Göteborg and Malmö, and the rest of the country has also been tested. The hypothesis of such a difference was firmly rejected.

Table 7. *The Survival Characteristics of the Banks of Larger Regions*

Region	Number	Censored	Q_1	Median	Q_3
NORTH	42	0	10	15	28
CENTRAL	21	0	8	11	56
CAPITAL	40	7	6	17	34
SOUTH	73	4	9	16	45

Table 8. *Univariate Andlyses According to Region. B-parameters with Standard **Errors** in Parenthesis*

Region	EGG	Cox
Constant	2.648 (0.247)	
CAPITAL	Reference (0.000)	
SOUTH	0.331 (0.230)	-0.187 (0.212)
CENTRAL	0.269 (0.302)	-0.272 (0.288)
NORTH	0.203 (0.272)	0.042 (0.234)

In conclusion **our** data indicate that the hypothesis that the survival rates of banks are positively related to the general economic activity as measured by GNP at time of foundation is somewhat doubtful. The hypothesis of affiliation to particular geographical markets is rejected.

5.1.5. *Hypothesis 5: The survival rates of banks are negatively related to the degree to which **customer** relationships already exist.*

Most of the banks that we consider **operate** or **operated** on a market which is **limited** in geographical size. We adjudged the county to be suitable **basic** unit in this connection. The fundamental further argument is that a given region **cannot** support an unlimited number of banks. The actual **number** depends on the size of the market which obviously can be measured in different ways. We **have** used the number of inhabitants in the county at the time of foundation of the bank as this measure. The actual variable used is defined as MARKET, which is the **number** of inhabitants in a **specific** region **divided** by the **number** of banks after a particular foundation. In

Investigating the fifth hypothesis we have also chosen to define two more variables ENTRY and TOTAGE. ENTRY is defined as the number of banks in operation in the county where the foundation takes place. In an effort to take into consideration the importance of time as a factor for the creation of customer relationships, we have introduced TOTAGE, the total age of the banks in the county at the time of the bank foundation.⁴

Table 9 and Fig. 5-7 indicate that the three variables have some explanatory value. There seems to be a definite advantage in being the first bank in a given region, while the effect of the order of entry otherwise is less clear-cut. The banks having the smallest value for the variable MARKET seem to have the shortest survival time, while the opposite is true for those with the largest values. The logrank-test leads to significance for all three variables, yielding values of $\chi^2(4)=18.42$ for MARKET, $\chi^2(5)=15.42$ for ENTRY, and $\chi^2(4)=17.36$ for TOTAGE, all strongly significant values.

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⁴The mean age of the banks was found to have a lower explanatory power than TOTAGE and detailed results with this variable are not reported.

Fig. 5. The Survival Estimates for Banks Obtained when Using MARKET as the Discriminating Variable

Fig. 6. The Survival Estimates for Banks Obtained when Using ENTRY as the Discriminating Variable

Fig. 7. The Survival Estimates for Banks Obtained when Using TOTAGE as the Discriminating Variable

Table 9. Characteristics of the Banks Grouped on the Basis of the Variables MARKET, ENTRY and TOTAGE

MARKET	Number	Censored	Q_1	Median	Q_3
< 50	50	0	9	12	16
50- 75	49	2	6	17	28
75-100	23	1	10	20	39
100-200	42	4	10	23	78
>200	12	4	10	20	79
ENTRY					
1	30	0	10	41.5	81
2	37	2	8	15	37
3	27	0	10	16	38
4	19	0	8	15	27
5	16	4	8	15	48
≥6	47	5	7	11	22
TOTAGE					
0	30	0	10	41.5	81
1- 25	36	0	9.5	22	44.5
26- 50	23	0	6	10	36
51-100	36	2	9	15	20
>100	51	9	6	11	23

As so often, the estimated formal models are easier to interpret than the survival **curves** (Table 10-11). The effect of the variable **ENTRY** is significant in linear form, but this is not the optimal representation of the effect of the variable, as the categorized analysis shows little **difference** between banks with **ENTRY-values** 2 to 5, all of which **have** a **much** larger hazard than the first bank. The relative hazards **based** on the Cox-model vary between 1.78 and 2.18. Banks which **enter** the market with an even higher order number than 5 **have** a still further increased hazard of 2.55. The variable **MARKET** is **also** significant in univariate **analyses** ($p < 0.0001$) with the expected positive connection to survival time. The estimated parameters from the Cox model imply relative hazards for the categories of **TOTAGE** of 1.52, 2.47, 2.36, 2.35, results which are rather **similar** to those obtained for the variable **ENTRY**.

Table 10. *Univariate Analyses of the Variables ENTRY and TOTAGE in Categorized Form. β -parameters with Standard Errors in Parenthesis*

		EGG	Cox
ENTRY			
Constant		3.544 (0.216)	
1	Reference		(0.000)
2		-0.646 (0.258)	0.577 (0.257)
3		-0.574 (0.279)	0.574 (0.274)
4		-0.787 (0.307)	0.779 (0.304)
5		-0.785 (0.335)	0.612 (0.353)
≥ 6		-1.050 (0.248)	0.938 (0.255)
TOTAGE			
Constant		3.539 (0.217)	
0	Reference		(0.000)
1-25		-0.398 (0.256)	0.417 (0.254)
26-50		-0.899 (0.287)	0.906 (0.292)
51-100		-0.823 (0.260)	0.856 (0.268)
>100		-1.024 (0.246)	0.856 (0.256)

Table 11. *Estimates of four Multivariate Cox-models with the Variables ENTRY, MARKET and TOTAGE. p-parameters with Standard Errors in Parentheses*

	Model			
	(1)	(2)	(3)	(4)
ENTRY	0.0731 (0.0288)		0.1503 (0.0538)	0.0428 (0.0671)
TOTAGE		0.00300 0.00120)	-0.00202 (0.00250)	0.00140 (0.00279)
MARKET	-0.00524) (0.00193)	-0.00644 (0.00179)		-0.00568 (0.00213)

It is obvious from the definition that the three variables **ENTRY**, **MARKET** and **TOTAGE** are correlated. There is a very strong correlation between **ENTRY** and **TOTAGE** ($r = 0.90$), while that between **MARKET** and the other two variables is moderate, $r = -0.38$ and -0.18 for **ENTRY** and **TOTAGE** respectively. This means that it should be possible to include **MARKET** and one of the other variables in the same model as explanatory variables. The high correlation between **ENTRY** and **TOTAGE** on the other hand makes it highly doubtful whether both these variables can be included in the same model.

Univariate analyses with the variables in linear form show that **ENTRY** is the most strongly significant variable in both EGG and Cox analyses. **TOTAGE** is more strongly significant than **MARKET** with the EGG model, while the opposite is true for the Cox model. Irrespective of the model used all the variables are very strongly significant, the p-values always being of the order 0.0001.

In a multivariate model containing all three variables only **MARKET** is significant and the explanatory power of this model is no **better** than the best models with only **two** of the variables included. Among these, the Cox model with **TOTAGE** and **ENTRY** gives

the result that **TOTAGE** is insignificant with the wrong sign while **ENTRY** is significant. In the other two possible models with **MARKET** as one of the variables both variables are significant and neither of the models is inferior to the model with all three variables. Thus **MARKET** and either **ENTRY** or **TOTAGE** must be considered in the definite multivariate model. Which of the **latter** two variables is to be preferred must be judged on the basis of these full multivariate analyses.

In the final **decision** between **TOTAGE** and **ENTRY**, one further point should be taken into account. The explanatory variable **TOTAGE** for a given bank includes part of the survival time of **certain** other banks. If the **residuals** of different banks really are uncorrelated as assumed this should cause no problem. If **such correlation** is present, however, it may cause the estimates to be biased. This argues in favour using **ENTRY** if all other things are equal.

5.2. Multivariate Models

The results **reported** so far describe the **effect** of individual variables without correction for the **effect** of other explanatory variables (with the exception of the efforts to disentangle the **effects** of **ENTRY**, **TOTAGE** and **MARKET**). This approach may of **course** lead to erroneous conclusions. Table 12 shows results for a number of models with all or most of the variables included. The first two models are **based** on all the 176 observations, while the inclusion of GNP in model (3) reduces the number of available observations to 141.

In the univariate **analyses** we earlier found no regional **effects** and the same is true in multivariate analyses. This

variable, therefore, was excluded from the **analyses** reported in Table 12. In the univariate **analyses** the variable **ENTRY** was previously considered with six different categories. As the estimated parameters for several of these categories were very **similar** in the multivariate analyses, the number of categories was reduced to increase the precision of the estimates.

We start the multivariate **analyses** by trying to **decide** whether **ENTRY** or **TOTAGE** should be included. For the Cox model **based** on all observations, i.e. without GNP, **ENTRY** is found to be more important ($p = 0.17$) than **TOTAGE** ($p = 0.92$). In a model with GNP included **similar** results are obtained. The same conclusions are **reached** on the basis of models with the EGG distribution. As a consequence of these results, the future modelling **will** be carried through with the variable **ENTRY**.

The results are very **similar** irrespective of whether we use the EGG or the Cox model, which means that the **exact** distributional assumptions should not influence the results unduly. Even after correction for type of bank, considerable **differences** between cohorts are found. All other cohorts have a **significantly longer** survival time than the reference cohort 1895-1918. The **difference** is considerable, which is shown by relative hazard values of 0.40 and 0.31 for the cohorts 1864-1894 and 1919-1931.5

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⁵This is according to model (1) which **will** form the basis for the subsequent hazard figures unless otherwise **stated**.

Table 12. *Estimates of Multivariate Models Including All or Almost All Explanatory Variables. β -parameters with Standard Errors in Parentheses*

Model	EGG (1)	(2)	(3)	Cox (1)	(2)	(3)
COHORTS (Reference = 1895-1918)						
Constant	3.181 (0.258)	2.975 (0.333)	3.033 (0.353)			
Cohort -1863	1.162 (0.392)	1.090 (0.396)	-	-1.175 (0.500)	-1.082 (0.502)	
1864-94	0.936 (0.189)	0.937 (0.188)	0.949 (0.205)	-0.927 (0.239)	-0.949 (0.240)	-0.896 (0.241)
1919-31	0.986 (0.323)	0.931 (0.327)	1.010 (0.353)	-1.168 (0.430)	-1.076 (0.436)	-1.122 (0.429)
1932-	1.559 (0.628)	1.280 (0.702)	1.685 (0.678)	-2.217 (1.008)	-1.724 (1.072)	-2.270 (1.008)
TYPE OF BANK (Reference = AB)						
ESB	0.086 (0.241)	0.082 (0.240)	0.093 (0.263)	-0.184 (0.309)	-0.177 (0.309)	-0.238 (0.316)
FB	-1.730 (0.387)	-1.664 (0.392)		1.948 (0.513)	1.841 (0.520)	
ENTRY (Reference = 1)						
2	-0.383 (0.234)	-0.349 (0.232)	-0.341 (0.369)	0.434 (0.294)	0.400 (0.288)	0.293 (0.418)
≥3	-0.656 (0.244)	-0.533 (0.271)	-0.636 (0.343)	0.762 (0.308)	0.564 (0.332)	0.609 (0.385)
MARKET		0.00180 (0.00190)			-0.00312 (0.00236)	
GNPR			0.0311 (0.0137)			-0.0306 (0.0153)

It should be noticed that these results are those obtained after correction for order of entry into the market, too. There is no difference between the Note Issuing and the Joint Stock Bank Companies, while the survival time of the Branch Banks was much shorter, the relative hazard being as high as 7.0. The Bank Reform Act of 1863 drastically changed the conditions for the Branch Banks. This means that the proportionality assumption of the Cox model cannot be strictly true for this variable. The estimated parameter must be treated as an average across the two regimes before/after 1863. It would in theory be possible to estimate separate effects before and after 1863 for the Branch Banks but as all Branch Banks survived until after 1863 no estimates are in practice possible. The fact that we find no regional differences means that the banks located in the capital do not have a survival which differs from that of the other banks.

The order of entry into the market is still important. The relative hazard for the second bank is 1.54 although insignificant. For the banks with a higher order number than two the relative hazard is higher or 2.14. In the multivariate models, the variable MARKET is not significant ($p = 0.34$ with the EGG model and $p = 0.19$ with the Cox model). Inclusion of MARKET leads to a reduction in the numerical values of parameter-s of the ENTRY variable, and with the Cox model the category ≥ 3 falls short of significance ($p = 0.09$).

In the univariate analyses we were not able to find a significant effect of the economic conditions at the time of foundation as measured by the change in GNP. In the multivariate EGG model on the other hand such an effect ($p = 0.023$) ensues when the variable GNPR is used. With the Cox model we obtain a similar

but slightly weaker **effect** ($p = 0.047$). As mentioned above the data set is reduced in models involving GNP. Nevertheless, the estimates do not **change much** between models (1) and (3) which indicates that the model used is fairly robust with **respect** to the **exact choice** of data set.

6. *Conclusions*

The major argument for studying banks from an ecological point of view which was mentioned by way of **introduction** was that they are highly regulated in terms of foundations, operations and **closures**. Our analysis has provided **evidence** showing that these particular **conditions** are very important for survival patterns. Acquisitions, not liquidations, **have been** found to be the major way of closure. This in turn can be attributed to the efforts of Government bodies to uphold the trust of the general **public** in the **banking** system. The depositor should always be sure that money left with the bank **will** be available on request. Acquisitions are then a solution if banks encounter difficulties.

We **have also seen** that the hazard function in the studied population deviates from the **pattern** expected from the **liability-of-newness** hypothesis. The highest closure risk has not **been** found in the very early years but instead after about 10 years. This is true for both the whole population and the different **cohorts** for which meaningful hazard computations **have been** possible. The explanation is **again** the high degree of supervision and the different kind of **restrictions** which **have been** imposed on the banks. The **careful** screening **procedures** both before a bank is founded and **during** its operations are here of particular

importance. The charter **procedure** reduces the number of high risk entries, regulation **restricts** risk-taking, and supervision provides opportunities to counterbalance problems more than in other industries.

The importance of regulation has **also been** underlined by our analysis of different founding **cohorts**. It is clear that hasard rates of the banks **have been** highly dependent on the **specific** legal **conditions** under which they **have been** operating.

In addition to legislation the degree to which **customer** relationships **have been** developed in the market **proved** to **have** an important impact on survival rates. The more banks are already in operation and the **longer** they **have been** there the more difficult it has **been** for entrants to survive. This **derives** from the frequent **existence** of long-term relationships in **banking**, making it more difficult to switch **customer** habits in this industry in **comparison** to other industries. As a result there seem to be **particular** first mover advantages in the **banking** industry. Those banks which were established in the early years **have thus been** more successful as regards median survival time. In **fact** the eight banks which were established before 1850 had a median survival time of 83.5 years. In **comparison** with the 34 banks which were established after 1910 which had a median survival time of 7.5 years this **difference** is impressive. There **also** seems to **have been** a definite advantage of being the first bank in a given region. The first bank to be founded in a given region (there were in all 30 **such** banks) had a median survival time of 41.5 years, while the **second** to the fifth which were founded in a region had a median survival time of 15-16 years.

When it comes to the question of whether the survival rates of banks are positively related to the general economic activity at the time of foundation, we could not document a significant effect in the univariate analyses. In the multivariate analyses a significant effect was obtained, indicating a positive relationship between economic activity and survival time. The hypothesis of different survival patterns in different geographical markets was finally rejected.

In further research it would be interesting to extend the analysis to allow for time-dependent explanatory variables. Although leading to considerable complications such an approach might give useful results. There is one particular context where this is the case. The effect of the economic conditions in general could be modelled by including a time dependent variable which reflects changes in economic conditions confronting the bank during the whole period of its existence and not just at the time of foundation. This is a major complication and it remains to be seen whether it is possible to carry through. A simplification of this general approach would be to study the effect of specific events such as the First World War and its immediate aftermath.

APPENDIX. THREE TYPES OF SWEDISH **BANKING** FIRMS.

As mentioned in **Section 4.1** there are three different sets of banks in the population: joint stock banks with unlimited liability (enskilda sedelutgivande banker), **branch** banks (filialbanker) and joint stock bank companies (bankaktiebolag). This appendix provides some **background** information on these three types of banks.

A.1. *Joint Stock Banks with Unlimited Liability*

Through a **Royal Proclamation** in 1824 it was made possible to start private banks (enskilda banker) in Sweden. In the beginning these were characterized by their owners having a joint liability for the bank's undertakings. These private banks were not supposed to issue their own paper money (bills). The first commercial bank, **Skånska** Privatbanken founded in 1831, however, immediately issued such bills. As the authorities did not explicitly **object**, this right was legalized in 1846.

The charters for the joint stock banks with unlimited liability were **granted** for ten years at a time, and the last bank with the right to issue its own bills, Norrbottens Enskilda Bank, was chartered in 1893. **Around** the turn of the **century** the charters for this type of bank **came** to an end and from then on no issuing of bills was allowed.

The joint stock banks with unlimited liability never became popular. One reason for this unpopularity was their right to issue bills of their own, leading to an over-abundance of different kinds of bills circulating in the country. Another important reason was that the amount of money for borrowing was **rarely** in a

proper proportion to the number of available paper bills **in** the region. A further reason was the **rumour** that they made unreasonably high profits (Rosenberg, 1878, pp. 69-70 and Sandberg, 1978, pp. 659-660).

A.2. *Branch Banks*

The above mentioned **criticism against** the joint stock banks with unlimited liability was the **ultimate** reason for the establishment of branch banks. They were privately owned provincial banks, without the right to issue bills. They were **closely** connected to the Central Bank of Sweden, which provided them with the necessary paper bills, all of the same kind. The intention was that they would **replace** the joint stock banks with unlimited liability. This did not happen, however, **since** the Swedish Parliament in its session 1862-63 **decided** to forbid the Central Bank of Sweden to use their funds for the benefit of branch banks (Rosenberg, 1878, p. 76 and Sandberg, 1978, p. 662).

A.3. *Joint Stock Bank Companies*

When the branch banks had **been** rejected by the Swedish Parliament **interest arose** in finding an alternative form. The joint stock bank companies were then chartered on the basis of an **Act** from 1848 about **limited** companies. The main **differences** between them and the first category of banks (cf. above) were that they were not allowed to issue bills and that the owners had a **limited** responsibility. At the beginning the joint stock bank companies were not supposed to be commercial banks in the proper **sense** of the word. The oldest **such** bank, Skandinaviska Kreditaktiebolaget in Gothenburg, for instance, was **planned** to be a **finance** Company

on a foreign **pattern**, with the pure aim to attract capital for industry (Rosenberg, 1878, pp. 144-145). Several of the later joint stock bank companies had the same characteristic.

The Swedish commercial banks to-day are all joint stock bank companies. Gradually they **have** added the services, which are currently considered to be provided by the modern bank (Ekonomiskt **ABC**, 1985): instruments of **credit**, receiving money on deposit, money-lending business, payment agency, foreign **banking** activities, stockbroker activities, and other activities on the capital market **such** as for instance trustee activities. The forerunners of the commercial banks of today, however, only in different degrees executed these kind of activities.

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