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Policy Persistency Risk in Sweden's Life Insurance Market between 1915 and 1947

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Managing Policy Lapse Risk in Sweden's Life Insurance Market between 1915 and 1947

Abstract

We examine the challenges that Swedish life insurers faced in managing the lapse risk of policies written on the lives of the industrial urban working-class between 1915 and 1947. We observe that with the threat of State socialization of insurance in the 1930s, industrial life insurers modified their business practices to better control policy lapses. Using firm-level data, we also analyze the effect of socio-economic changes, such as rising real wages, interest rate fluctuations and unemployment on life insurance policy lapses. Our results support contemporary tests of the emergency fund and interest rate explanations for the voluntary premature termination of life insurance policies.

Keywords: Policy Lapse Risk; Life Insurance; Sweden.

1. INTRODUCTION

The predominance of market capitalism in economy and society has been a central theme of business and economic history research (Braudel, 1982). A key aspect of this scholarly endeavor is how the industrial proletariat not only became integrated into the capitalist system through wage-based labor markets, but also as consumers of financial products, including insurance. Insurance enabled individuals to self-manage the financial consequences of life's uncertainties (e.g., premature death and/or disability) and so better cope with the socio-economic upheavals that characterized the industrial revolutions of Europe and North America during the late nineteenth/early twentieth centuries (Supple, 1984). In Sweden at this time, life insurance was particularly seen as an important major socio-economic mechanism for combating poverty and social distress in times of economic hardship (Eriksson, 2008). However, insuring the lives of the working-class presented insurers with significant business challenges in managing policy lapses, particularly during periods of economic and social turbulence. The rise of market capitalism was also reflected in the growth of bank savings and other investment products that offered better than average returns. The proliferation of substitute financial products could further affect the policy lapse experience of life insurers even amongst working-class policyholders (Johnson, 1985).

From the onset of World War I right up to the end of World War II, international life insurance markets, including Sweden, were affected both by socio-economic developments and major institutional structural changes that created opportunities and challenges for insurers (Andersson, Eriksson and Lindmark, 2010; Andersson and Eriksson, 2015; Eriksson, 2010). Over this period, economic growth and rising standards of living transformed the aspirations of Sweden's working-class and consequently, increased the demand for self-protection through private insurance. Yet, the first-half of the twentieth century was a time of socio-economic turbulence with periods of growth followed by economic downturns with rising unemployment and falling wages which increased lapse risk for industrial life insurers. In response, to such conditions insurance providers in Sweden developed techniques for more effectively managing increased demand for life insurance from the working-class, including strategies (e.g., improved sales practices) to lower the risk of early policy terminations. Another notable feature of the period

was that virtually all industrial life insurers were new entrants to the market, with one major operative - *Folket* - emerging directly from the trades union movement.

In the present study, we examine how the Swedish industrial proletariat became an integral part of the national financial system between 1915 and 1947. In particular, we highlight the challenges that insurance providers faced in managing the growing demand for industrial life insurance. In this regard, we link macro (external) environmental factors, such as changing socio-economic conditions with micro (firm-level) developments such as modifications to sales and underwriting standards to analyze the voluntary premature termination of life insurance policies from just after the introduction of compulsory State pensions in 1913/14 to just before the onset in 1948 of the Swedish welfare state. As the tension between macro-level phenomena and micro-level responses is not exclusive to Sweden's life insurance market between 1915 and 1947, we believe our results could be generalized to other financial services firms operating in other jurisdictions over the same period. In this regard, our study is likely to be of broad appeal to business and economic historians.

The remainder of our paper is structured as follows. The next section provides the institutional context for our study, including the growing demand for life insurance amongst the Swedish working class in the first-half of the twentieth century, and the challenges associated with effectively managing policy lapse risk. The third section examines the determinants of life insurance policy lapse rates over the period 1915 to 1947, while the final section concludes our paper.

2. INSTITUTIONAL CONTEXT

2.1. Life Insurance Policy Discontinuances

Scholars writing during the first-half of the twentieth century, such as Davenport (1907), Henderson (1909), and Trenerry (1926), explicitly acknowledge high policy lapse rates particularly amongst low income households to be an issue of importance. For example, Davenport (1907) notes that the greater rate of policy terminations on industrial life insurance policies in the United States (US) was reflected in mortality premium risk loadings that were higher than those for ordinary life insurance. Davenport (1907) argues that price discrimination exacerbated the rate of policy lapses in industrial life insurers, particularly in periods of social upheaval and economic hardship. In more recent times, Jiang (2010) finds that in economic downturns, and falling

disposable household incomes, life insurance protection, which necessitates the payment of regular premiums over the long-term, tends to become of second-order importance for many policyholders. Studies from North American and European life insurance markets post-World War II (e.g., Cummins, 1973, 1975; Dar and Dodds, 1989; Outreville, 1990) support this so-called *emergency fund hypothesis*. Prior research has also highlighted that many policyholders treat life insurance policies as a form of savings, which they can liquidate in times of personal hardship. This 'put option' held by policyholders can manifest itself through the take-up of policy loans and/or cash surrenders (Smith, 1982). The substitutive relation between life insurance and other financial products is commonly referred to as *interest rate hypothesis*. In fact, Kuo, Tsai and Chen (2003) cite evidence from the US that life insurance policy lapses are directly related to interest rate shocks.

Andersson and Eriksson (2015) report an increased incidence of life insurance policy lapses in 1913/14 in Sweden after compulsory State pensions were introduced by the government (Svensk Författningssamling (Swedish Compulsory Pensions Law), no. 120, 1913). This indicates that public welfare initiatives can effectively substitute for life insurance; yet other institutional changes may also have influenced policy lapsation. Indeed, from the late 1920s/early 1930s, heightened concerns by Sweden's insurance industry regulator, government policymakers, and others with regard to product mis-selling and the increased risk of corporate insolvency prompted greater public scrutiny of the business models used by industrial life insurers (Eriksson, 2010). By the early 1930s this led to the implementation of, what was at the time, novel yet effective life insurance policy lapse risk mitigation strategies in Sweden. Such initiatives included the writing of premium deferral and policy reinstatement terms into the design of life insurance contracts, and the offering of non-cash surrender policies at lower rates of premium. This 'socialization' movement also resulted in insurers adopting more professional sales practices (e.g., as a result of

better training and improved incentive compensation for agents) in order to reduce life insurance policy lapses (Grip, 1987).

2.2. Growth of Industrial Life Insurance

In the late nineteenth century, Sweden entered a period of sustained economic growth and an expansion of an urban industrial working-class outside of the traditional agricultural sector (Mikkelsen, 1992). At a time when public social welfare provision was severely limited, the growth of industrial wage-earning households created demand for social and financial protection through private insurance. For example, Figure 1 shows that the number of wage-earners employed outside of agriculture grew from 1.2 million in 1915 to 2.4 million in 1947. Concurrently, the number of life insurance policies issued increased from 0.5 million in 1915 to 2.4 million by 1947, particularly amongst non-agricultural workers.

[INSERT FIGURE 1 HERE]

The increased take-up of life insurance in Sweden further reflected urban demographic growth rates, which increased from about 30% of the national population just before World War I to approximately 45% in the years immediately after World War II. In fact, a cost-of-living survey from 1913/14 showed that 77% of all urban working-class households (comprising two or more adults) had life insurance (Socialstyrelsen, 1919). In contrast, life insurance coverage in rural areas was 10% to 15% lower than in the towns and cities by 1947.¹ Underlying this trend was strong national growth in real wages amongst industrial workers (Prado 2010). Immediately after World War II, real wages for industrial workers were approximately twice as high as compared to 1915. However, even though the underlying growth trend was stable, the path was far from smooth as it was afflicted by both exogenous (global) shocks and internal (domestic) uncertainties. Within this context, the economic means necessary to put aside for sufficient funds to maintain in-force life insurance policies changed both temporarily, and in the longer term between 1915 and 1947. One reason for this was that the Swedish labor market was conflict-ridden, with numerous local

¹Life insurance was relatively less important in rural communities compared with urban areas because farming provided supplementary sources of income and subsistence. Additionally, the support structures of agricultural communities provided a degree of cooperative-based social protection ('social solidarity') for rural dwellers in the event of life cycle risks, such as severe illness and/or disability.

industrial disputes, general strikes, and company lock-outs (Nycander 2002). As Figure 1 shows, relatively few workers had insurance or other means of protection against unemployment (or stoppages) due to limited scope of the trade union membership in the early 1910s. The industrial labor market in Sweden had become organized to a growing extent from the late 19th century, but many unions lost members during the general strike and lock-out in 1909. The union membership began to recover at the outbreak at the World War I. In 1915 the number of union members was 142 thousand (11% of non-agriculture labour force), while the number of members reached 373 in 1920 (27% of non-agriculture labour force). The member figure expanded further in the 1920s and 1930s, reaching 613 thousand in 1930 (34% of non-agriculture labour force) and 925 thousand members in 1939 (44% of non-agriculture labour force) (Åmark, 1986).

[INSERT FIGURE 2 HERE]

Figure 2 shows that periods of economic ‘boom and bust’ were especially prevalent during World War I and its immediate aftermath. For example, in 1915/16 Sweden's economy had falling real wages, followed in 1917 by food shortages and social unrest around the country. Figure 2 also illustrates that soon after the end of World War I, Sweden again experienced high rates of real wage growth between 1919 and 1921. At the same time, the real national annual rate of interest went from a negative level during World War I to a historically high level of over 20% by the early 1920s, as the interest rate was the principal instrument of government deflationary policy'. The ‘boom’ years of 1919/1920s were followed by years of economic downturn and rising unemployment. As the currency-backed gold standard was restored in 1924, Sweden’s economy recovered and levels of unemployment declined. However, real annual interest rates normalized to about 5% per annum from the mid-1920s onwards. Still, the years of economic depression following the 1929 global stock market crash led to a further rise in unemployment and industrial strife that was only resolved in 1938 as a result of government intervention. Against this backdrop, the Swedish life insurance industry recorded highly variable rates of life insurance policy lapses during the inter-war years. This pattern of increased rates of policy lapses was also mirrored in other major economies at the time, such as the United Kingdom (UK) (Wilson and Levy, 1937) and US (Wright and Smith, 2004).

[INSERT FIGURE 3 HERE]

Figure 3 shows that the policy lapse rate was high at the beginning of our period of analysis, reaching close to 5% in the years between 1915 and 1917, falling to 3% in 1919. In the 1920s the lapse rate picked up slightly to around 5% per annum on average, declining during the 1930s to about 2% per annum at the outbreak of World War II. Early policy terminations can be divided between lapses on policies with and without cash surrender clauses (as share of the total stock of policies in-force). Most life insurance policies issued by Swedish industrial life insurers before World War II did not include cash surrender clauses, and as Figure 3 illustrates, it was these types of life insurance policies that tended to be voluntarily discontinued.

2.3. Changing Business Methods

The supply of life insurance to Sweden's working-class was largely neglected by ordinary life insurance companies; rather it was newly formed niche industrial life insurers that satisfied this segment of the market in the first-half of the twentieth century (Eriksson, 2010). In fact, industrial insurance in Sweden first took-off with the establishment of the joint-stock industrial life insurance company *Trygg* in 1899. This company based its business model on British industrial life insurance companies such as the Prudential Assurance Company of London, which began writing industrial life insurance in 1854. At the beginning of the twentieth century up to the start of World War I, industrial life insurance companies expanded rapidly in Sweden. Measured by the total of policies issued, their growth rate was roughly twice that for ordinary life insurance. Between 1900 and 1915 the total number of life insurance policies in-force in Sweden increased from 170,000 to 507,000, with much of this demand accounted for by endowment-type industrial life insurance products sold to the urban wage-earning working class (Eriksson, 2010). Although the demand for industrial life insurance in Sweden grew in the early years of the twentieth century, the average annual level of industrial life insurance contributions was still less than the average annual value of payments made by the working-class into bank savings accounts (SEK60/US\$16) (Eriksson, 2010).

The establishment of *Trygg* led to new formation of other industrial life insurance companies such as *Framtiden* (in 1911) and *Folket* (in 1914) such that by 1930 the volume of

Sweden's industrial life insurance market was more than twice that of the ordinary life insurance market (measured in terms of total policies in force). By 1947 the market share of industrial life insurance was close to 70% of the Swedish life insurance market, with the largest industrial insurance provider (*Trygg*) accounting for almost five times more life insurance policies than the largest ordinary life insurance provider (Bergander, 1967) (see Table 1).

[INSERT TABLE 1 HERE]

The core business model of Swedish industrial life insurance companies was to sell small value policies with premiums payable weekly or monthly and collected by a national network of commissioned agents rather than by salaried sales personnel employed directly by the insurer. Typically, agents' commissions were based on both the amount of new business written and the amount of premiums collected, which differed from ordinary life insurance where premiums were collected quarterly or annually from the insurer's representative office (Eriksson 2010). Another key difference between industrial and ordinary life insurers was that the former did not require prospective policyholders to be subject to a compulsory medical examination before being admitted to the insurance pool. To compensate for potential adverse selection (e.g., the risk of insuring individuals with serious pre-existing and unobservable health conditions), Swedish industrial life insurers, like their counterparts elsewhere, applied 'waiting periods' before issuing policies to prospective policyholders. In addition, industrial life insurance products were standardized contracts that reflected the typical underwriting profile of urban industrial workers (Bergander, 1967).

[INSERT TABLE 2 HERE]

Table 2 indicates that between 1915 and 1947, Swedish industrial life insurers had greater policy lapse rates than their counterparts specializing in ordinary life insurance as well as higher administrative costs. For example, the policy lapse rate (LAPSE TOTAL) for industrial life insurance policies involving weekly premium payments was roughly 7% on average during the period 1915 to 1929, which was about twice that for ordinary life insurance policies where premiums were paid annually. Additionally, the number of early policy terminations for the same period was roughly 14 times greater than the number of mortality claims settled. Many workers, had small and fluctuating incomes, making it hard to maintain premiums in times of economic hardship - a situation that increased policy lapse risk for industrial life insurers. The enhanced level

of policy discontinuances was reflected in higher than average total premium-to-coverage ratios for industrial life insurers compared with the life insurance market as a whole (Bergander, 1967).

Recent studies (e.g., Eling and Kiesenbauer, 2014) argue that high policy lapse risk can result in the non-recovery of new business acquisition expenses (e.g., sales commission) and lead to less funds being available to meet the mortality claims of remaining policyholders. However, the realization of economies of scale from increased volumes of new business, can to some extent mitigate the economic effects of voluntary policy discontinuation (Richardson and Hartwell, 1951). On the other hand, underwriting new policies generates transaction costs (e.g., search and screening expenditures), thereby, creating a 'liquidity strain' for life insurance providers (Jiang, 2010).

Industrial life insurers also made contractual arrangements whereby losses due to lapses became less of a corporate burden - for example, by writing life insurance policies without cash surrender terms (Davenport, 1907). As we noted earlier, the majority of policies voluntarily terminated in our panel data set did not have cash surrender clauses. For industrial insurers, where cash surrender policies were issued, lapse rates on such policies were low compared with those without surrender provisions. Table 2 shows that between 1915 and 1929 the expense ratios of cash surrender policies equaled 13.8% of total incurred claims for industrial insurance companies compared with 22.8% for the same line of business underwritten by ordinary life insurance companies. Policyholders that for years have made premium payments that have accumulated in the reserve fund, will, with a non-cash surrender policy, leave all remaining savings to the life insurer thus improving its financial viability. Indeed, Cummins (1975) argues that 'profits' from prematurely terminated policies could be used to offer new life insurance products at lower premiums, and thereby, promote new business and/or increase bonuses on retained policies. In addition, administrative costs were higher in the industrial life insurance sector than in ordinary life insurance sector - largely due to smaller value policies bearing a disproportionate per unit cost of input costs. We also find that between 1915 and 1947 the annual premium for the average industrial life insurance policy was about six days' wages for an industrial worker. Table 2 further indicates a relatively higher level of insolvency risk for industrial compared with ordinary life insurers between 1915 and 1929, by revealing that that average levels of leverage (i.e., the ratio of

net premiums to surplus) for industrial life insurers was 22.7% compared with 16.8% for ordinary life insurance companies.

2.4. Challenges of Industrial Life Insurance

As we hinted earlier, many Swedish industrial life insurers operating during our period of analysis based their business models on British and North American industrial life insurance companies; yet, there were also some salient differences (Eriksson 2010). Like in Sweden, industrial life insurers in other countries suffered from above market averages of policy lapses and high administrative expenditures. However, the form of industrial life insurance contracts underwritten in the UK, US and British Commonwealth countries (e.g., Australia and Canada) were burial insurance policies that covered funeral expenses and the last medical bill of the insured (O' Malley, 1999; Alborn, 2009). In Sweden, the most common industrial policy was endowment insurance that not only covered mortality and disability risks but also compensated policyholders and their dependents for loss of income at retirement. Endowment-type policies were also generally of greater value than burial insurance (Eriksson 2014).² Premiums on industrial life insurance policies in Sweden were further mostly made on a monthly rather than a weekly basis, as was common elsewhere.

In Sweden during the first-half of the twentieth century some industrial life insurance products were written by small mutual friendly societies connected to a trade or place of work. Swedish industrial life insurers, such as *Framtiden*, *Trygg* and *De Förenade*, sought to persuade the sponsors of small mutual funds to consolidate their insurance interests through group life insurance schemes in order to realize operational scale economies (Grip, 2008). Another feature of the Swedish industrial life insurance sector in the first-half of the twentieth century was that some insurance providers, such as *Folket* - a company founded by the labor movement - actively sought to improve the 'life quality' of workers by providing them with the 'peace of mind' protection provided by endowment life insurance (Grip, 1987). Such cases of altruism typify the social and

² The second most popular industrial life insurance in Sweden during the analysis period was fixed-term coverage, which could again be paid-out at a specific time or to appointed beneficiaries. The third most popular was children's insurance, followed by whole-of-life insurance. These policies provided payments to beneficiaries when the insured died or became infirm, and so they acted as a form of life-cycle savings that provided financial relief in times of unexpected mortality or disability. Industrial life insurance in Anglo-Saxon countries protected the insured against the stigma of a 'pauper's burial'. However, in Sweden the necessity to insure against a 'pauper's burial' was less urgent since a decent funeral was less costly as the State Lutheran Church provided subsidized burial costs (Eriksson 2010).

moral betterment of insurance that emerged alongside rapid industrial and urban growth in Europe and North America during the late nineteenth/twentieth century (Knights and Vurdubakis, 1993).

2.5. Threat of State-Induced Socialization

Despite the altruistic attributes of industrial life insurers such as *Folket*, the Swedish insurance industry increasingly faced negative political and public media criticism during the inter-war period over matters such as aggressive selling, high rates of policy discontinuances, and rising administrative costs. As a result, the Swedish insurance industry was forced to act in ways that the public deemed to be more socially responsible, particularly when the Social Democratic Party came to power in 1932. Under the threat of State-induced socialization of the insurance industry, Swedish life insurers started from the early 1930s to become more socially responsible in their business practices, including the use of better designed policies and improved training of commissioned agents. The political arguments for socialization of the insurance sector in the 1930s then became the template for the post-World War II partnership between the Swedish government and the insurance industry that was encapsulated in the 1948 Insurance Act (Grip, 1987).

Table 2 shows that as a result of the threat of State-induced socialization, overheads (loadings) fell from 30.9 to 25.2 amongst industrial life insurers and from 24.4 to 19.8 for ordinary life insurers during the 1930s. This change in financial performance was also helped by the widespread adoption of mortality tables that enabled more effective underwriting and reduced administration costs - a feature that was mirrored elsewhere in other European insurance markets at the time, including Spain (González and Pons, 2017). Industrial life insurers also increased their reliance on reinsurance in order to mitigate underwriting risk and maintain statutory minimum levels of solvency (Eriksson, 2014). Another important reform set-up by the Swedish life insurance industry in the 1930s to reduce policy lapse risk was the provision for commissioned agents to be remunerated on the size of the sum insured rather than on the volume and frequency of premiums. This reduced the incentives of agents to recommend weekly policies to clients, which in turn reduced the likelihood that policies would be terminated early due to the cash flow problems of working-class policyholders. As Grip (1987) notes, these business initiatives during the 1930s, together with improving economic conditions, helped industrial life insurers to reduce policy

lapses and reduce operating costs to levels commensurate with ordinary life insurance providers by the mid-twentieth century. We now examine the socio-economic and firm-level factors that influenced policy discontinuances in Sweden's life insurance market between 1915 and 1947.

3. ANALYSIS OF THE DETERMINANTS OF LIFE INSURANCE POLICY LAPSES

3.1. Socio-Economic and Corporate Influences

Insurance studies (e.g., Cummins, 1975; Dar and Dodds, 1989; Jiang, 2010) suggest that one of the key external factors influencing policy lapses is changing household economic conditions - a view encapsulated by the *emergency fund hypothesis*. To test this hypothesis, we use the unemployment (UNEMPLOYED) rate among trades union members and real wages growth amongst male manufacturing workers (WAGE GROWTH) as proxies for socio-economic conditions. To determine the impact of industrial disputes on the voluntary discontinuation of life insurance policies, we include in our analysis the number of people involved in strikes and lockouts as a fraction of the total labor forces in a given year (STOPPAGES). While real income growth is expected to lower policy lapses, economic hardship due to unemployment, industrial lockouts and strikes are expected to enhance rates of premature policy termination. Another external variable that could influence life insurance policy lapse risk is the real interest rate (INTEREST), and in this regard, we expect a positive relation between market rates of interest and life insurance policy lapses. This is because a higher real interest rate increases the opportunity cost for policyholders to maintain life insurance policies (Kuo et al., 2003). We thus use the average market based interest rate for Swedish bank savings deflated by the relevant period CPI in our analysis.³

The voluntary early termination of in-force life insurance policies could also be influenced by the introduction of universal social insurance provisions. For instance, Andersson and Eriksson

³ Our use of real interest rates is not only consistent with the *interest rate hypothesis*, but their inclusion in the analysis is more realistic in the context of the present study for two main reason. First, public involvement in the Swedish stock market during the first-half of the twentieth century was very limited; alternative savings in bank deposits and bonds were far more common (Ögren, 2006). Second, the 1903 Insurance Act significantly restricted insurance company investment in equities and so insurer's investment portfolios comprised largely precautionary assets and fixed return securities such as government bonds. Hence, insurers' expected future cash flows on in-force business (the so-called 'embedded value') and policy lapse rates were relatively more sensitive to changes in market interest rates than stock price movements.

(2015) demonstrate that the implementation of compulsory ‘old-age’ State pension’s contributions for all male and female adults over 67 years of age in Sweden in 1913/14 soon after dampened public demand for life insurance and increased policy lapse rates. To control for the possible ‘crowding-out’ effect of State pensions, we include the real annual growth of pensions premiums (REAL PENSION) in our analysis. Since premium growth was probably influenced by real rises in wages and the level of compulsory pensions contributions, we adjust the growth of pensions premiums by changes in real wage rates for manufacturing workers. During our period of study, the average annual wage-adjusted pension premium rate growth was around 1%. To test whether improvements in business practices and life insurance policy lapses followed the election of the Swedish Social Democrat Party in 1932, we introduce a regulatory dummy from 1932 onwards. Moreover, to control for potential war-effects, a dummy variable for the First and Second World War years enters our analysis. As most insurance contracts, especially among the ordinary insurance companies, contained premium exemption clauses for policyholders called-up for national service during war-time, we envision policy lapses to be lower during the war-years.

We also examine factors that could have differentially influenced the policy lapse experiences of industrial and ordinary life insurance firms during the period 1915 to 1947 by estimating two identical but separate models for ordinal and industry insurance companies. Prior studies from the UK (e.g., Richardson and Hartwell, 1951), US (e.g., Jiang, 2010) and Sweden (e.g., Eriksson, 2010) suggest that aggressive selling by commissioned agents engaged by industrial life insurers was a major contributory factor for the large scale premature termination of policies. To establish whether this was the case during our period of analysis, we also include the variable NEW POLICIES (the share of new life insurance policies issued in a year to the total number of policies-in-force) in our estimations.

Additionally, we expect larger life insurers to have a proportionately greater rate of policy lapses than their smaller counterparts because they are able to spread the economic losses arising from policy lapses across larger and more diversified underwriting and investment portfolios (Dar and Dodds, 1989). Moreover, because large life insurers operate at a national scale they are potentially more susceptible to a higher rate of premature policy lapses than small local life insurers that, especially in Sweden, have generally stronger local ties with customers and relatively higher rates of policy retention (Andersson et al., 2010). Bigger life insurers are also better placed

than their smaller counterparts to benefit financially from economies of scale and scope, and a more prominent brand-name (Adams et al 2012). Organizational form could also have an impact on the rate of life insurance policy lapses. For example, Adams et al (2011) report that mutual insurers can secure economic advantages over stock insurers by only admitting 'good risk-types' to the insurance pool. This can mitigate adverse selection and moral hazard problems – two information asymmetry problems inherent in insurance transactions (Pearson, 2002). All else equal, this attribute is likely to reduce the rate of policy terminations in mutual life insurers compared with stock life insurers.

Furthermore, policy lapses tend to be greater for life insurers that write large volumes of standardized policies with low insured values compared with life insurers that write fewer, but individual-specific policies with higher sums insured (Cummins, 1973). Therefore, we include the variable POLICY SIZE in our analysis, where size is measured as the average policy value (sum insured) in real prices (deflated by CPI). The length of time that a life insurer has been operating in the market could further influence the rate of policy lapses as new entrants could be motivated to relax underwriting standards during the early years of operation in order to grow product-market share (Eling and Kiesenbauer, 2014). Therefore, we predict that policy lapse rates will be inversely related to the number of years (AGE) a life insurer has been operating in Sweden. As we noted earlier, Eriksson (2014) reports that industrial life insurance sold in Sweden in the first-half of the twentieth century tended to be higher value (and hence, more expensive) endowment policies than smaller value (cheaper) funeral insurance policies. Therefore, we expect a positive relation between life insurance production and servicing costs and policy lapses amongst our panel sample of Swedish life insurance firms. This is particularly likely to be the case during periods of extreme economic downturn when long-term savings-type endowment policies become unaffordable for many households. In this study, the expense of administering life insurance policies is represented by the proxy LOAD, which is the percentage annual share of overhead costs to annual gross written premiums.

3.2. Empirical Analysis

To investigate the importance of (external) socio-economic and (internal) corporate influences on life insurance policy lapses in Sweden between 1915 and 1947, we adopt a panel data design incorporating random-effects and fixed-effects modeling. In business and economic history research, firm-level data are normally only available for such an analysis because of systems changes and restructuring that occur in firms and their business environments over time. As a result, most prior research, including this study, focuses on the effects of macro-factors on life insurance policy lapses. To do this, we employ an unbalanced panel data set comprising audited financial information on all domestic life insurers' providers in Sweden between 1915 and 1947. The panel data set comprises 635 firm/year observations collected from official statistics (e.g., Försäkringsinspektionen, 1915/47; Statistiska Centralbyrån, 1960, 2015; Mitchell, 1978; Krantz and Schön, 2007). The results are reported in Table 3.

[INSERT TABLE 3 HERE]

Table 3 shows a positive and statistically significant relation between UNEMPLOYMENT and LAPSE TOTAL in both the random-effects and fixed-effects models when all domestic life insurance companies are included. These results support the *emergency fund hypothesis*, which predicts that the level of unemployment is positively related to policy terminations in life insurance markets. When running estimations for industrial and ordinary life insurance companies separately, we find that the effect for the former is about twice that for the latter, suggesting that life insurance policy lapses for industrial insurers are more sensitive to periods of high unemployment. Table 3 also indicates that the coefficient estimates for WAGE GROWTH are negative and statistically significant for policy lapses for all life insurance companies in the random-effects and fixed-effects models. This finding again accords with the *emergency fund hypothesis* and the prediction that policyholders are less likely to terminate their life insurance policies in the periods of growing wage earnings. The size of the effect further implies that WAGE GROWTH helps lower the policy lapse rate as personal living standards gradually improve over time. In addition, the coefficient estimates for INTEREST RATE are statistically significant with regard to the discontinuation of life insurance policies, again supporting the *interest rate hypothesis*. This result, however, is less strong for the industry life insurance policyholders; but

for holders of ordinary life insurance policies, the effects are larger and statistically significant in both the random-effects and fixed-effects models. Given that ordinary life insurance policyholders were more likely to have policies with cash surrender options, the opportunity to change their savings portfolios from life insurance to banking products was therefore potentially attractive.

[INSERT TABLES 3 ABOUT HERE]

We find that the introduction of compulsory State pensions did not have a significant 'crowding-out' effect on policy lapses for industrial and ordinary life insurers. However, we find evidence of a strong and significant impact for regulatory-effects during the early 1930s, with the period dummy revealing a reduction in policy lapse rates of between 1.4 and 1.3 times for all life insurance companies in our panel data set, with industrial life insurance providers lowering policy lapses by up to 1.8 fold. As a result, the changes resulting from the threat of State-induced socialization seems to have substantially improved sales practices and lowered policy lapse risk, particularly in industrial life insurers. After controlling for socio-economic changes, along with interest rates and social insurance, we still find a substantial effect of regulation in the industry life insurance business from the early 1930s. When controlling for war-effects we also observe a fall in the rate of policy lapses as many insurance providers, especially ordinary life insurers, offered premium exemption terms for policyholders called-up for national service during war time.

The results given in Table 3 further show that the underwriting of new life insurance policies (NEW POLICIES) is positively related to the rate of policy termination for both regression models estimated. When running the models for industry and ordinary insurance separately, it is shown that the size of the effect is substantially larger for industry life insurer providers than ordinary life insurers. In terms of policy-type, the risk of discontinuation is significantly higher in the case of non-cash surrender policies even after controlling for value of the sum insured. Additionally, we find a positive and statistically significant relation between FIRM SIZE and policy lapse rates, indicating that the control of lapse risk was less strong in the large relative to small industrial life insurance companies. We further observe that for industrial life insurers, the rate of early policy discontinuation was greater for mutual compared with stock forms of organization. What is more, we find a statistically significant link between POLICY SIZE and lapse rates for industrial life insurers, suggesting that industrial life insurance policyholders are

more likely to terminate their policies even if the size of the sum insured is larger than average. Additionally, AGE is negatively weakly associated with the rate of policy discontinuation, suggesting that more recently established life insurers faced a greater policy lapse risk than more mature life insurance companies. Moreover, the variable LOAD is positive and statistically significant in the random-effects and fixed-effects models with respect to policy lapses in industrial life insurers, but not for the ordinary life insurance providers. Therefore, the claim that high administrative costs are a major cause of high policy lapse risk is tentatively supported in the case of industrial life insurance providers. Finally, the main determinants of life insurance policy lapses in Sweden between 1915 and 1947 were macroeconomic, particularly rising unemployment, and institutional, such as increased competition from large life insurers seeking volume growth and increased product-market share.

4. CONCLUSION

The incorporation of the working-class into the capitalist system was one of the great social and economic transformations of the early years of industrialization in the nineteenth and twentieth centuries. A key aspect of this transformation process was the inclusion of the working-class into the financial system, with life insurance being one of the first financial products demanded by the proletariat in newly industrialized countries, including Sweden. Between 1915 and 1947, life insurance in Sweden and other countries was regarded by politicians and wider society as an important financial vehicle for combating poverty and protecting workers' standards of living from life cycle risks such as premature death or disability. However, selling life insurance to the working-class presented major challenges for insurance providers, particularly in terms of policy lapses. Increased life insurance policy lapse risk made it more difficult for insurers to calculate reserves, maintain statutory minimum levels of solvency, and control expenses. This was particularly the case in the turbulent social and economic conditions that characterized Sweden during our period of analysis, 1915 to 1947. This period saw sharp shifts in Swedish government monetary policy, and consequently, fluctuating market rates of interest that encouraged many holders of life insurance, particularly ordinary life insurance, to terminate their policies in favor of alternative forms of savings that offered better returns. In contrast, the working-class policyholders

of industrial life insurance companies tended to have more precautionary motives for holding life insurance. We also observe that life insurance policy lapses fell after 1932 with the election of the Social Democratic Party, a phenomenon reflective of the political threat of socialization of the Swedish insurance sector, and which motivated life insurers to improve sales practices and lower administrative costs. The 1930s led to more stable social and economic conditions in Sweden, and more socially responsible business practices that in combination helped reduce the rate of life insurance policy lapses towards the end of our period of analysis.

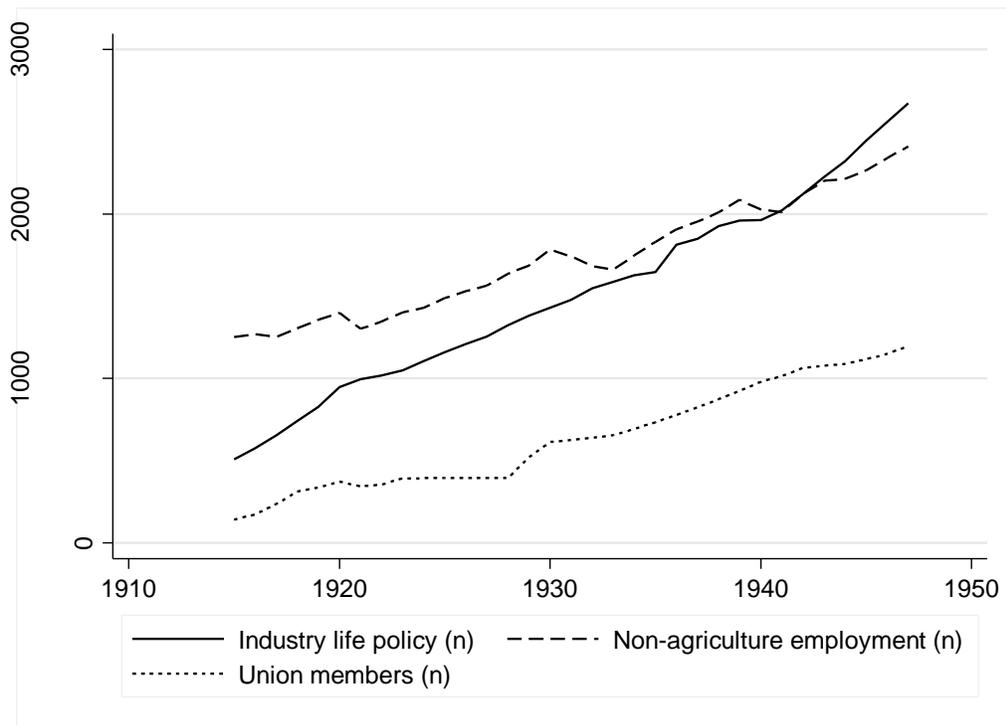
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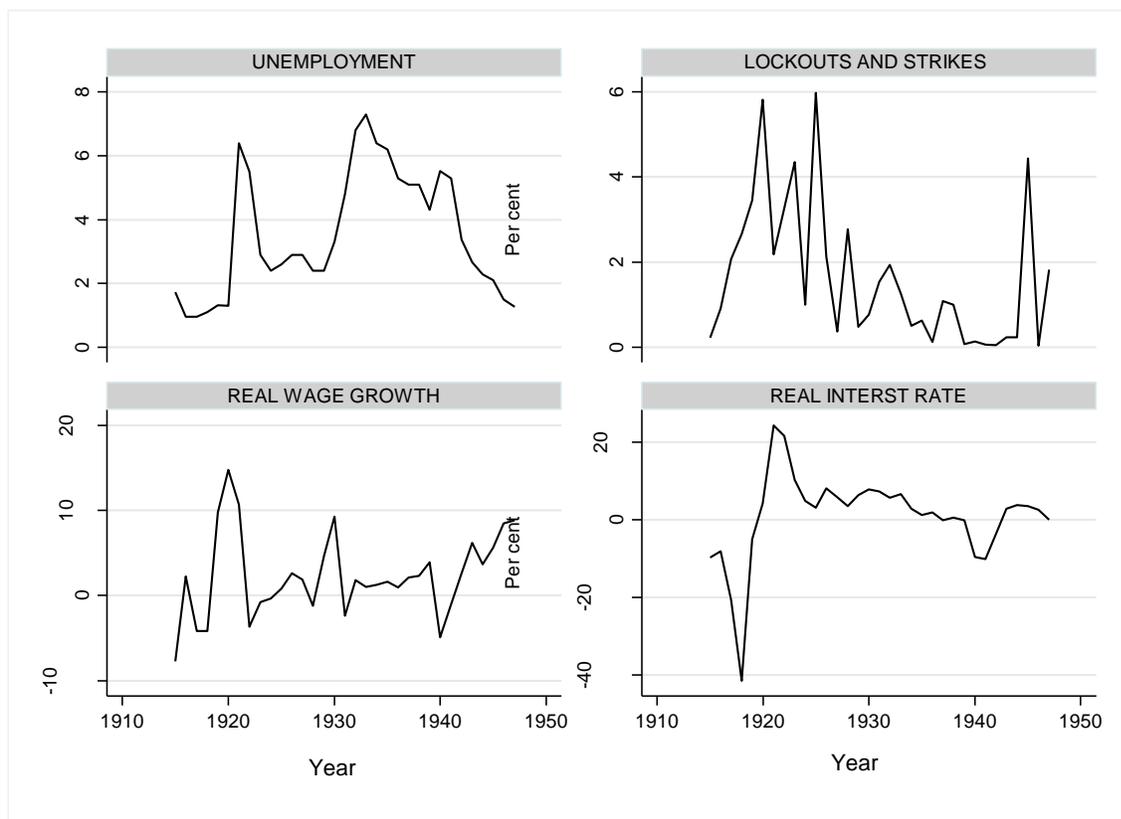
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Figure 1. Growth of non-agriculture employment, industry life policy and union members between 1915 and 1947.



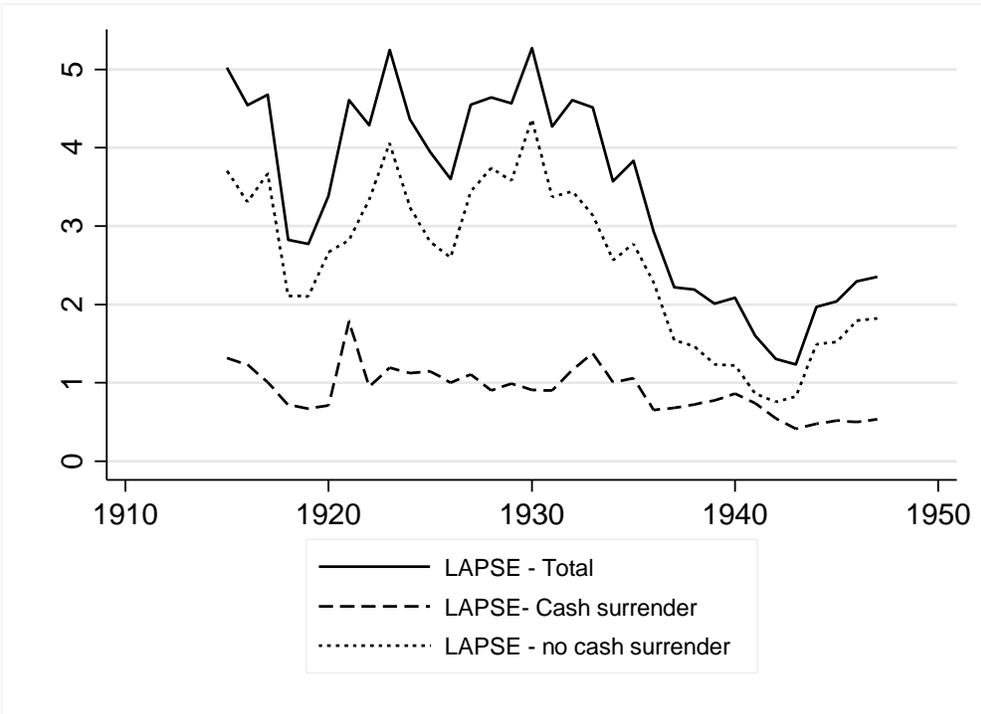
Source: Försäkringsinspektionen (1915-1947), Krantz, O. and Schön, L. (2007), Åmark, 1984; Statistiska Centralbyrån (1960).

Figure 2. Macroeconomic conditions in Sweden between 1915 and 1947.



Notes: (1) Unemployment is measured as the percentage of union members; (2) Lockouts and strikes represent the percentage of people involved in industrial disputes relative to the size of the national labor force; (3) Real income growth, represents the real annual wage growth in manufacturing industry (i.e., the average annual wage deflated by the annual consumer price index (CPI)); and (4) Real interest rate is the market based bank deposit interest rate deflated by the annual CPI.
 Sources: Mikkelsen (1992); Krantz and Schön (2007), Edvinsson, Jacobson and Waldenström, (2010). Statistiska Centralbyrån (1960).

Figure 3. Average annual lapse rates for life insurance policies with and without surrender values in Sweden between 1915 and 1947



Source: Försäkringsinspektionen (1915-1947).

Table 1. Market structure by industrial and ordinary life insurance in Sweden, 1915, 1930 and 1947.

Variables	Industrial life insurance			Ordinary life insurance		
	1915	1930	1947	1915	1930	1947
Number of policies	507 131	1 429 491	2 671 611	403 647	720 526	1 205 926
Firm size, average	101 426	285 898	534 322	25 228	60 044	100 494
Firm size, largest	280 247	479 867	787 722	78 667	142 253	208 734
Market share %	56	66	69	44	34	31

Table 1 . Summary statistics on ordinary and industrial life insurance, 1915-1929 and 1930-1947

Variable	Definition	1915-29			1930-47		
		Industrial	Ordinary	Sig*	Industrial	Ordinary	Sig*
DEATH RATE	Death rate across all policies (n) in %	0,51	0,78	**	0,39	0,76	***
LAPSE TOTAL	Lapse rate of all policies	7,24	4,63	***	3,07	3,02	***
SHARE OF LAPSE NO							
CASH SURRENDER	Lapse rate of non-cash surrender policies (n) in % of LAPSE TOTAL	91,5	78,7	***	72,8	59,6	***
SHARE OF LAPSE							
CASH SURRENDER	Lapse rate of cash surrender policies (n) in % of LAPSE TOTAL	8,48	21,34	***	27,23	40,40	***
EXPENSE CASH	Expenditure share of cash surrender in relation to total claims						
SURRENDER	(death claims, cash surrender claims)	13,8	22,8	***	14,1	22,7	***
REVIVED POLICIES	Ratio of revived policies in relation to lapse no cash surrender t-1 in %	18,0	10,6	***	19,0	12,9	***
POLICY COST	Average (annual) premium payment per policy, deflated by consumer prices (1915=1)	24,7	69,7	***	40,3	93,8	***
POLICY SIZE	Average size of policy in SEK deflated by consumer prices	824	2346	***	1420	2485	***
LOAD	Overhead costs to annual premiums written in %	31,0	24,5	***	25,2	19,8	***
BONUS	Bonus to policy holders in relation to total claims (death claims, cash surrender claims) %	12,1	20,6	***	8,3	9,9	
DIVIDENDS	Dividends in relation to paid up equity capital in per cent	5,1	11,0	***	5,1	9,0	***
LIQUIDITY	Liquidity is measured as the annual amount of cash and cash equivalents divided by current liabilities in per cent	3,3	4,5		1,4	2,5	*
REINSURANCE	Reinsurance activity is measured as the annual amount of reinsurance premiums ceded divided by gross annual premiums written	27,9	10,6	***	20,1	7,7	***
PROFIT	Underwriting profitability is represented by annual net premiums (P) minus net claims (C) and overhead expenses (E) normalized by net premiums [(P-C-E)/P] in per cent*	31,4	24,3	**	21,1	20,7	

LEVERAGE	Ratio of net premiums to surplus (equity + reserves) in per cent	22,7	16,8 ***	11,6	12,3
BALANCE	Annual net savings in relation to net premiums in per cent	48,8	39,2 ***	49,7	53,4 **
FIRM SIZE	Log of number policies in force	11,9	10,1 ***	12,7	10,9 ***
GROWTH	Annual growth of number policies in force in %	11,0	6,6 ***	4,0	6,7 *
NEW POLICIES	Share of new policies in relation to lapse rate	11,86	9,6 ***	8,3	7,6

Source: Försäkringsinspektionen (1915 - 1947).

Table 2. The determinants of lapse rates, regression results by the random-effects (RE), fixed -effects (FE).

	All companies						Industrial life						Ordinary life					
	RE-Model			FE-Model			RE-Model			FE-Model			RE-Model			FE-Model		
<i>EXTERNAL</i>	Coef.	SE	SIG	Coef.	SE	SIG	Coef.	SE	SIG	Coef.	SE	SIG	Coef.	SE	SIG	Coef.	SE	SIG
UNEMPLOYMENT	0.15	0.04	***	0.14	0.04	***	0.26	0.08	***	0.19	0.09	**	0.12	0.05	**	0.11	0.05	**
STOPPAGES	-0.002	0.004		-0.001	0.004		0.010	0.007		0.008	0.007		-0.005	0.005		-0.004	0.005	
WAGE GROWTH	-0.060	0.010	***	-0.051	0.010	***	-0.045	0.018	**	-0.059	0.019	***	-0.061	0.012	***	-0.054	0.012	***
INTERESTRATE	0.035	0.008	***	0.039	0.008	***	0.021	0.015		0.031	0.016	**	0.044	0.009	***	0.046	0.009	***
PENSION	-0.001	0.007		-0.001	0.007		-0.008	0.011		-0.007	0.011		-0.003	0.008		-0.003	0.008	
REGULATION	-1.42	0.28	***	-1.27	0.28	***	-1.75	0.47	***	-1.17	0.61	**						
<i>INTERNAL</i>																		
NEW POLICIES	0.14	0.01	***	0.17	0.01	***	0.26	0.02	***	0.29	0.02	***	0.09	0.01	***	0.11	0.02	***
SHARE NO CASH SUR.	0.042	0.006	***	0.036	0.006	***	0.036	0.012	***	0.038	0.016	**	0.043	0.006	***	0.038	0.006	***
FIRM SIZE	0.39	0.16	***	0.40	0.25	***	1.24	0.32	***	3.18	0.78	***	0.30	0.21	**	0.29	0.25	**
ORG. FORM	-0.029	0.541					0.864	0.296	***				-0.043	0.726				
POLICY SIZE	0.000	0.000		0.000	0.000		0.004	0.001	***	0.003	0.001	***	0.000	0.000		0.000	0.000	
AGE	-0.021	0.011	**	-0.029	0.015	**	-0.009	0.017		-0.116	0.051	***	-0.025	0.013	*	-0.030	0.016	*
LOAD	0.003	0.009		0.003	0.010		0.035	0.019	*	0.036	0.019	**	0.009	0.010		0.009	0.011	
CONSTANT	-4.44	1.69	***	-4.78	2.53		-20.43	4.25	***	-41.49	8.81	***	-3.02	2.01		-3.06	2.39	
R-sq: within	0.54			0.54			0.77			0.78			0.44			0.45		
R-sq: between	0.36			0.30			0.99			0.02			0.37			0.34		
R-sq: overall	0.50			0.44			0.78			0.48			0.43			0.40		

