

THE JOINT DEVELOPMENT OF INSURANCE AND INVESTMENT MARKETS IN POLAND: AN ANALYSIS OF ACTUARIAL RISKS

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ABSTRACT

The development of the Polish insurance market in the period since liberalisation is discussed. The nature of the investment market and the investment risk faced by insurers are analysed in the context of the liability structure of Polish insurance companies. The likely future developments in insurance and investment markets are outlined, particularly given the structure of the state social insurance system, possible reforms of which are discussed in detail.

KEYWORDS

Poland; Insurance; Investment

1. INTRODUCTION

1.1 The purpose of this paper is to analyse the development of the Polish insurance market, from the point of view of the particular difficulties of the actuarial management of assets and liabilities in a recently developed insurance and investment market. We begin by describing the history and structure of the insurance market in Poland. We then discuss the nature of the products sold in the market and the investment possibilities open to, and the investment policy followed by, insurance companies; particular emphasis is put on the difficulty of developing an investment policy to match assets and liabilities satisfactorily. Possible future developments are then discussed, with regard to: the likely joint development of long-term insurance products and of the investment market; and the influence of prospective social security reforms. A discussion of the demographic background and construction of mortality tables and of the political economy of insurance regulation appears in Booth & Stroinski (1994b).

1.2 The paper develops further the analysis of the difficulties faced by insurers in Poland, particularly given the underdeveloped state of the investment market, covered in Booth & Stroinski (1994a) and Stroinski & Stroinski (1994). We then discuss the investment policy of insurers and the investment risks faced by insurers. The context of this discussion is the qualitative factors which need to be taken into account when matching assets and liabilities, discussed, for example, by Arthur & Randall (1990) and Frost & Hager (1986); although other risks are also important in the Polish situation. The discussion of the role of regulation in the market is in the context of the general legal framework in European Union states, discussed in Ferguson (1989). There would appear to be little analytical work published on the way in which the provision of state social insurance can crowd out the development of long-term savings vehicles in the

private insurance market. However, the issues relating to the provision of state and private social insurance are discussed in Brown (1991).

1.3 The authors were faced with a difficulty in obtaining consistent published data for an analysis, such as the one undertaken in this paper. All available sources have been used, including data published by insurers themselves; where data published by insurers has been used, it has not always been possible to reference such data as formally as we would have wished. There is also little work published on the development of products in the Polish market: this necessitates a somewhat lengthy descriptive portion of the paper. The issues raised are relevant to the development of all post-communist insurance markets, and it is, therefore, hoped that the paper will be useful for actuarial professionals as well as for academics studying the economic difficulties in post-communist countries.

2. THE LIBERALISATION OF THE POLISH MARKET

2.1 In this section we look at the development of the insurance market since liberalisation in the late 1980s. This subject is dealt with more fully in Booth & Stroinski (1994a). Before the Second World War, Poland had one of the most developed and open insurance markets in Central and Eastern Europe (see Rogers, 1988). An actuarial profession also existed until 1939 (see Stroinski, 1992). A further advantage Poland had, when the liberalisation of the insurance market began in the late 1980s, was the particular way in which communism was imposed on Poland after 1945. Communism was imposed step by step; a monopoly insurer was created, but it did not become state owned until 1952. In addition, an attempt was made in the Polish communist system to reflect costs in the prices charged by companies. This was part of the attempt to create a 'market socialist' system. For the market socialist system to work, it was necessary for the central planning authority to process all the information regarding preferences and costs normally processed in the market. It was then necessary to base production and pricing on this information, without the usual signals and incentives provided through the price mechanism. The task of performing this information processing is known as the 'calculation problem'. The Polish economist Oskar Lange was honoured both in the East and the West for his attempts to solve this problem. The 'calculation problem' debate was reviewed, from a socialist perspective, in Lange & Taylor (1938).

2.2 The attempt to develop the Polish economy along market socialist lines was abandoned, in practice, long before the communist political system fell. Nevertheless, the attempt to reflect costs in prices in the insurance system withered only gradually. So, although, at the time of liberalisation, the methods of determining premiums and reserves and of designing policies bore no relation to those used in the west, a body of understanding of actuarial principles still existed. This, and the pre-war insurance tradition, provided a better foundation

from which a free insurance market could arise from liberalisation than exists in most other post-communist economies.

2.3 On 28 July 1990, following minor liberalisation in the 1980s, a new Insurance Act was passed. This act enacted many of the principles enshrined within insurance law in most E.U. countries. Accordingly, composite insurance companies are not allowed to operate under the new law. The former composite state monopoly insurer, PZU was, therefore, split into two companies: a non-life company and a life company. Both companies retained the acronym, PZU. They are referred to as PZU and PZU Life, respectively. Further changes to the Insurance Act were passed on 8 June 1995. Those changes are discussed in Section 8.

2.4 In the life market, PZU Life still retains its dominant position, holding 89.25% of the market by premium income in the first nine months of 1995 (*Rzeczpospolita*, 1995). This level of market share fell from 99.7% in 1992 (*Ubezpieczenia*, 1993), indicating an increase in the degree of penetration by newly licensed companies. Five life companies, other than PZU Life, had licences to transact life business at the end of 1993 (some of these were joint ventures with foreign companies). Seven further companies received a licence by the end of the first half of 1995.

2.5 Two further companies of interest, in relation to the Polish life market, are Westa Life and Warta Vita. Westa Life was the first private insurance company to challenge PZU Life. However, Westa Life was declared insolvent at the beginning of 1993. The reasons for the insolvency were discussed in Booth & Stroinski (1994a). Warta Vita was licensed in 1995, and is a sister company of Warta. Warta is the second largest non-life company in Poland.

2.6 A larger number of companies operate in the non-life sector than in the life sector. By the middle of 1995, 28 companies operated (including three mutual companies), three of which were joint ventures with foreign companies. Excluding Westa, which was declared insolvent at the end of 1992, the two largest companies (PZU and Warta, a privatised former reinsurer) had a combined market share of 80% by premium income in 1994 (*Ubezpieczenia*, 1995). This was a reduction from a combined market share of 89% by premium income in 1992 (*Ubezpieczenia*, 1994). No company other than PZU and Warta had a market share of more than 4% in 1994. Despite this, prima facie, the non-life market could be regarded as being more competitive than the life market.

2.7 The social insurance system has a considerable impact on the development of long-term insurance in any insurance market, and will be discussed further in Section 6. Currently the Polish Social Insurance Institution, ZUS (*Zakład Ubezpieczeń Społecznych*) provides all social insurance benefits, except those to farmers. The benefits paid by ZUS are high relative to average income. Pension benefits are often up to 80% of average final earnings (see Section 6). Average retirement pension equalled 72.8% of the average national wage in 1995. The amount of an average pension (including invalidity pensions, survivors pensions, as well as retirement pensions) was approximately 63% of the average salary in 1995

(*Kwartalnik ZUS*, 1996). The employers' contribution to the social insurance system has been increased to 48.2% of gross salary.

2.8 It can be seen from this brief description of ZUS, that the social security system in Poland is sufficiently wide ranging, and social security contributions have reduced disposable income to such an extent, that there will probably be a considerable impact on the development of long-term insurance and pension provision by private insurers. Any reform of the social insurance system is likely to have an impact on the kind of products sold and the investment vehicles used by insurance companies.

3. POLICY TYPES IN THE POLISH INSURANCE MARKET

3.1 The lines of insurance sold in the Polish non-life market do not differ significantly from those sold in an insurance market such as the United Kingdom, although there is probably a greater emphasis on more traditional types of business which have a shorter run-off time (such as motor and household). To a large extent, classes such as employers' liability are covered by the state social insurance system. Non-life business is normally categorised into: motor insurance (62.6% of premium income in the non-life sector); industrial, farming, household and other property (31% of premium income); and personal insurance, such as accident or medical expenses (6.4% of premium income) (source: *Ubezpieczenia*, 1995). In the non-life sector, 65.6% of premium income was received in respect of non-compulsory lines of business, such as motor insurance and certain types of property and liability insurance. Overall, the particular mix of business written in the Polish market cannot be said to be unusual. However, when looking at the financial risk attached to the liabilities, the particular economic situation has an impact, with far reaching implications for investment policy. These implications will be discussed in Sections 4 and 5.

3.2 Liabilities written under non-life policies often tend to be short term in nature. In a country such as the U.K., the inflation risk of such liabilities is often regarded as insignificant (although this would not necessarily be the case for business which has a long run-off period). In Poland, however, the inflation risk cannot be ignored for any non-life business. The rate of inflation in Poland has been both very high and variable in recent years. As can be seen from Table 3.1, the rate of inflation has declined from a level of 640% in 1989 to 21.6% in 1995. However, even at current levels, inflation is both very high and variable, and cannot be ignored in managing the financial risk of a non-life company. Problems of matching assets to liabilities are normally associated with life companies, and, as long as short-term real interest rates from Treasury Bills and bank deposits remain positive (see Section 4), the problem of high and variable inflation can be managed effectively by non-life companies. However, a relaxation of monetary policy could quickly lead to lower short-term interest rates and high inflation, causing financial

Table 3.1. Rate of increase in consumer price index since 31 December 1988

Year	Inflation rate %
1989	640.3
1990	249.3
1991	60.3
1992	44.4
1993	37.7
1994	29.0
1995	21.6

Sources: *Main Statistical Office, Warsaw (1990-6)*

difficulties for non-life insurers (see Section 5). If the timing of cash flow is distorted through reinsurance, this may cause further difficulties.

3.3 Notwithstanding the comments made in §3.2, the life market can give rise to more complex problems in the actuarial management of assets and liabilities, because of the possibility of writing life business which has longer and more complex liability profiles than non-life business. The type of business sold by life companies and the relative size of the life and non-life sectors is also important in determining the investment vehicles used by the insurance market as a whole; in turn, this is important for determining the development of the capital markets.

3.4 Premium income in the life sector increased, in real terms, at an annual rate of 67.2% in the period 1990 to 1994 (*Ubezpieczenia*, 1992 and 1995). This growth was achieved despite a reduction in GDP of about 15% between the beginning of 1990 and the end of 1993 (*Sigma*, 1994). In the current climate of increasing national income, the authors expect the growth in the importance of the life insurance market to continue, particularly given the growth of disposable income amongst those income groups with a greater propensity to purchase life insurance.

3.5 Critical to any discussion of actuarial asset liability management in life insurance companies is an understanding of the insurance liabilities arising from the policy types which are sold. Until 1993 there was a decline in the sale of individual, renewable single premium business, relative to short-term group business, as PZU life cancelled a number of smaller individual policies. Since that time, companies selling mainly longer-term individual insurances have increased market share. The structure of the market by premium income and changes in that structure since 1992 are shown in Table 3.2.

Table 3.2. Life insurance premium income by type of policy

Insurance	% of market	
	1992	1994
Group	68.3	69.3
Continued (individual cover continued on guaranteed terms after expiry of group cover)	23.8	25.0
Additional accident	6.4	0.5
Annuities and individual insurance	1.5	5.2

Sources: *Ubezpieczenia*, 1993, 1994

3.6 Both the group life and individual life products which have been developed in Poland are quite complex. Group life products tend to have a very sophisticated benefit structure with a wide range of options for family cover and accident insurance. A typical individual life policy, which many of the competitor companies of PZU Life would tend to concentrate on selling, has a savings and a life cover element and is known as universal life. The savings and life cover proportions can generally be varied. The sum assured payable under the policy is often determined by a method not dissimilar to the unitised with-profits method in the U.K. The benefit payable is increased each year, in line with the interest earned on the insurance company's funds. The existing types of annuity have tended to make a fixed payment: however, companies like PZU Life made *ex-gratia* increases to try to give some compensation for inflation.

3.7 Unit-linked policies have recently been developed, and pay a benefit on death or survival related to the value of the units. A level of guaranteed minimum life cover can also be selected.

3.8 The existence of exchange control, which prevents insurers investing insurance funds in foreign currency assets and prevents the purchase, by a Polish resident, of a foreign insurance contract (1990 Insurance Act, Articles 37 and 63, and Regulations of the Minister of Finance, 18 December 1990, ¶1) has created a demand for a form of savings and protection policy which can give protection against a possible depreciation of the purchasing power of the Polish currency, not compensated for by higher interest rates. In principle, it may be possible to market a policy where the payments are made in domestic currency, but where the amounts of the payments are determined by the exchange rate between the domestic currency and a particular foreign currency, together with the interest rate which can be earned on deposits in that foreign currency. However, despite some tentative proposals, such policies have not become common because of the difficulties of matching with appropriate assets in the presence of exchange controls.

4. INVESTMENT POLICY OF INSURANCE COMPANIES IN POLAND

4.1 We begin by describing the nature of the various categories of investments which are available to insurance companies in Poland, including stock market investments. We then discuss the distribution of investments held by the insurance market as a whole, and by life insurers.

4.2 Bank deposits often form the greatest proportion of insurance company assets. Such deposits are short term, and the interest rates paid normally follow the refinancing rate of the Polish National Bank (the Central Bank). A feature of the reforms in Poland was the almost immediate removal of price control and the imposition of a tight monetary policy, in 1991, in order to reduce inflation. As one would expect in such an environment, real interest rates from short-term deposits have generally been positive.

4.3 Stroinski & Stroinski (1994) implied that bank deposits were close to risk

free. In fact, bank deposits do carry considerable default risk in Poland (see Section 5). The larger banks, which are generally regarded as having less default risk, tend to offer lower interest rates than smaller banks. Term deposits do exist for periods of twelve months (occasionally longer) at interest rates which generally reflect preference for liquidity by lenders and any anticipated changes in the rate of refinancing credit. On 23 September 1993 the average interest rates on term deposits of the 14 largest banks were: 29.4% for three-month deposits; 32.9% for six-month deposits; 36.8% for one-year deposits (source: PZU Life internal calculations, unpublished).

4.4 Of most interest is the real rate of interest which can be obtained from bank deposits. The twelve-month rate of inflation to September 1994 was 33%. On the basis of this rate of inflation, the real return from twelve-month bank deposits from September 1993 was 2.9%; a rate not dissimilar to that which could be achieved from similar investments in the West. The current level of short-term interest rates is 28% (*Rzeczpospolita*, 1995). A rate a little below this could normally be obtained on sight deposits from private banks. On the basis of the current rate of monthly inflation and on Government forecasts of future inflation, this would give a positive real rate of return.

4.5 A number of Government issued short-term investment instruments are available in the form of Treasury Bills and short-term bonds. Treasury Bills are issued for terms of between four weeks and one year. They are sold by auction, at a discount to face value, with no interest being paid. The rate of return from Treasury Bills is comparable with the rate of return from bank deposits of a similar term. There is, of course, no default risk with Treasury Bills.

4.6 The existence of high and variable inflation has made it difficult, both for the Government and the private sector, to develop effective long-term borrowing instruments. The bond market has not been established long enough for long-term index-linked bonds to be issued. It is impossible to envisage the market accepting long-term, conventional, fixed-interest, domestic currency bonds, although an increasing range of two and five-year fixed return bonds have recently been issued. Two investment instruments have been developed to circumvent the problem of issuing bonds in times of economic instability: three-year floating coupon bonds and one-year index-linked bonds. More recently, ten-year floating coupon bonds have been issued.

4.7 The three-year bonds pay a quarterly coupon C , determined by the following formula:

$$C = (1.1) \times F \times \frac{N}{360} \times J$$

where :

F is the face value

N is the number of days in a given quarter

J is the arithmetic average of interest rates calculated on the basis of the last four 13-week Treasury Bills sales.

The interest rates on the sale of 13-week Treasury Bills r_k are calculated as:

$$r_k = \frac{d_k}{1 - d_k} \times \frac{360}{91}$$

where d_k is the average discount in each of the Treasury Bill sales. The quarterly bond coupon, if the number of days in the quarter is equal to 91, is, therefore, based on the quarterly effective interest rate received from Treasury Bills. The coupon from the bond is slightly higher than the effective rate of interest on the Treasury Bill, and, of course, the final payment is deferred to the end of three years. In general, the floating rate bond provides a similar, but alternative, investment to bank deposits and Treasury Bills, with the possibility of a slightly higher return and a different pattern of payments. Ten-year floating coupon bonds pay 'basic interest', calculated as a weighted average of the interest from 52-week Treasury Bills sold on tender in September and October of the year in which interest is paid plus an additional 1%.

4.8 One-year bonds have been issued, which provide investors with, more or less, complete protection from inflation, even if short-term *real* interest rates fall below the rate of inflation. The coupon is paid at the end of the year, and is the sum (n.b. not the product) of the annual percentage rate of inflation with a two-month lag and 5%. The bond can be valued as follows. The real present value of the payments, at an annual effective real rate of return, j , is:

$$P = \frac{5}{1+j} \times \frac{Q_0}{Q_{12}} + \frac{CPI_{12}}{CPI_0} \times \frac{Q_0}{Q_{12}} \times \frac{100}{1+j}$$

where P is the present value, Q_0 and Q_{12} are the values of the retail price index calculated at the time of issue and redemption respectively. CPI_0 and CPI_{12} are the levels of the consumer price index announced in the month, two months before issue and in the month, two months before redemption respectively. Q_0 and Q_{12} could be calculated by log linear interpolation between relevant CPI numbers (see Wilkie, 1984). Further analysis of Polish index-linked bonds, including the risks arising from the inflation lag and non-indexation of the coupon amount appears in Booth & Stroinski (1994b).

4.9 The rate of inflation for 1994 was 29% (see above). This would give a total annual effective nominal return from an index-linked one-year bond issued in January 1994 of 34%. This would have been a little less than the effective return from a 52-week Treasury Bill, issued in January 1994, of 35.1%. The index-linked bond, however, has the advantage of providing protection against unanticipated inflation.

4.10 Investment in real property often provides institutional investors with long-term protection against inflation. However, all property-related investments

are difficult to use in Poland for a number of reasons. First, the development and leasing of property is hindered by regulation. A potentially more serious problem is related to the possibility of dispute of title. In Poland, particularly in Warsaw, nearly all title records were lost in the Second World War; after which property was illegally appropriated by the communist government. There is, therefore, the dual uncertainty of who held the original title and, if original title could be established, would the holders of that title become the legal owners of the property? Insurance companies, therefore, tend to limit their investment in real property to that which is necessary to set up offices. Investment in residential mortgages is hindered by the above factors and the additional problems of: high nominal interest rates and the absence of a market in index-linked mortgages; the high cost of purchase of residential property relative to average salaries; and the degree of regulation surrounding the residential property market.

4.11 Investment in the market for listed equities would expose investors to a relatively small number of stable companies (a total of 72 in March 1996 on both the basic and parallel markets) which have low dividend yields and very volatile share prices. A market total return index (the WIG) is published at the end of every session by the stock market. From these data we can obtain some idea of the real returns and volatility level of the index and, with additional published data, the price earnings ratio on which the market stands.

4.12 The performance of the Polish equity market has been analysed by Prins & Strzalkowska (1994) and by Pau (1994), and, in the analysis below, we have used figures published by these authors, together with *Cedula* (1994), *Main Statistical Office* (1994) and *Warsaw Stock Exchange* (1995). The real return, as measured by the WIG adjusted for inflation, in the first nine months of operation of the market, from April 1991 was -28.53%; in 1992 the real return was -20.8%; in 1993 the real return was +767.95%; in 1994 the real return was -53.4%; and up to September 1995 the real return was -13.4%. The average price earnings ratio was 15.3 in 1994 (compared with 3.4 in 1993). In 1994 the average dividend yield was 0.03%.

4.13 The Polish stock market would appear to exhibit the behaviour often shown by emerging markets: potentially high returns; high short-term volatility of returns; and the apparent existence of cycles. Prins & Strzalkowska find an average annual performance of 146.1% in the two years and two months to September 1993 (although allowance should be made for average annual inflation of approximately 50% during that period). Furthermore, they find that the Polish equity market had the highest monthly standard deviation of returns of the 20 markets considered, during this period, and a coefficient of variation of returns which was smaller only than that of Malaysia and the Philippines. Pau finds that the market fails even the most basic tests of stock market weak form efficiency (a definition of weak form efficiency, is given in Adams, 1989). However, it should be emphasised that there are problems with standard tests of efficiency, because of the use of the trading rule that suspends trading if the share price moves by more than 10% on any particular day.

4.14 In theory, at least, one method by which Polish insurers could obtain protection from high inflation is by investing in foreign currency investments (for example United States dollar deposits). This would provide a real return equal to the dollar interest rate compounded with the dollar exchange rate appreciation devalued according to the Polish inflation rate. Such investment is allowed under the Polish Insurance Act of 1990 (Article 63, ¶13) in respect of liabilities denominated in a foreign currency. However, the same Polish Insurance Act (Article 37) prevents a Polish national from purchasing an insurance, the benefits from which are paid in a foreign currency. Foreign currency investments, therefore, have limited use, although a number of foreign companies will have reserves in respect of share capital invested in foreign currencies, and Polish companies could, under the Insurance Act 1990 (Article 63, ¶14) invest free reserves in a foreign currency after a general permission which could be issued by the Minister of Finance. The Insurance Act, it should be borne in mind, is always subject to the (codified) general provisions of law. We now move on to consider the actual breakdown of investments held by insurance companies in Poland.

4.15 In an analysis of investment policy, it is important, as far as possible, to consider separately the investment policy of non-life insurers and life insurers. In addition, it is important to analyse the investment policy of life insurers according to the type of liability written (i.e. by long-term individual liabilities and short-term group liabilities). Such an analysis will help us to determine whether the main determinant of investment strategy is the type of liability written by insurance companies or other factors. In turn, this will help us to analyse whether the development of investment markets or the development of new products will lead to changes in investment behaviour of insurance companies and greater participation by insurance companies in long-term capital markets.

4.16 A breakdown of insurance company investments by category has been produced at the end of 1994 by The Polish Chamber of Insurance, split by life and non-life funds. This is shown in Table 4.1.

Table 4.1 Structure of investments of insurance companies in Poland at 31 December 1994

Investment category	Share in % life	Share in % non-life	Share in % whole market
Bank deposits	19.6	41.5	31.7
Treasury Bills and government bonds	76.0	27.2	51.3
Listed shares	1.6	6.0	4.0
Unlisted shares	0.3	12.6	3.2
Real estate	2.0	5.9	4.2
Other	0.5	6.8	5.6

Source: *Ubezpieczenia*, 1995

4.17 During 1992-1994 there was a reduction in the share of bank deposits held by all insurers by 43.7%; this may have been largely due to the perceived increased risk of bank deposits. It is believed that the real estate proportion relates to property

purchased for companies' own use. The total rate of return earned on life insurance funds in 1994 was 24%.

4.18 It can be seen from this that a large proportion of investments are held in bank deposits and Treasury Bills, and a very small proportion in equities. The proportion held in real estate and equities is particularly small, for reasons we have already discussed and because large scale equity investment is not appropriate, given the nature of the market and the fact that, for most policies, the insurer bears the investment risk. The major differences between the investment policy of the life and the non-life market at the end of 1994 are the higher investment in government bonds by life insurers and the lower investment in bank deposits. The proportion invested in shares is also somewhat higher in the non-life market. If anything, investment in the non-life market would appear to be in categories which could be regarded as 'more risky' (in terms of default risk and capital value volatility) than in the life market. However, the higher proportion in bank deposits is probably explained by the desire for liquidity among non-life insurers.

4.19 The major differences between the structure of investments held by U.K. life companies and Polish companies are between the proportions held in short-term bank deposits and short-term government bonds (negligible in the U.K.), the proportions held in equity and property investments (negligible in Poland) and the proportions held in longer-term government bonds (in Poland, all government bonds are shorter-term).

4.20 The policy types written by the market, as a whole, tend to be, on average, of a shorter-term nature than those sold by new companies, now beginning to compete with PZU Life. The newer companies, in general, sell more individual life policies, which have a savings element. One such company (which cannot be identified) has a similar proportion of assets invested in Treasury Bills and government bonds and invested in bank deposits as the life market as a whole. The proportion invested in the three-year government bonds is around 5%. The liability structure does not appear to have led the company to invest a greater proportion of assets in longer-term investments (equities or property), despite the fact that individual life policies tend to pass the investment risk to the customer and do not give guarantees of particular long-term returns (either real or nominal). We now move on to look at the risk of the investment categories described in this section, and discuss the design of policies, specifically from the point of view of the way in which policy design has dealt with the specific risks in the investment market.

5. INVESTMENT RISK AND POLICY DESIGN

5.1 We begin by looking at the important areas of risk of the investment categories discussed above. In particular we will look at: default risk; inflation and re-investment risk; short-term volatility risk; and mismatching risk.

5.2 In the U.K., it is generally accepted that investment in a diversified portfolio of blue chip company bonds or in private bank deposits does not carry a signifi-

cant default risk. Furthermore, reliable information is available and, if primary analysis is not carried out by the investor, credit rating agencies can be used to make a reasonably reliable assessment of risk. This is by no means the case in Poland. First, the information available to investors, even in the best conditions, is far from transparent; accounting information would appear to suffer from all the problems which cause difficulties in interpretation, identified in Holmes & Sugden (1990): high inflation makes the interpretation of money amounts difficult; the complete change in the capital structure of companies due to the change in the political and economic situation and the complete change in trading conditions, due to price liberalisation, makes analysis even more difficult. These problems are not eased by the use of bank deposits as investments, rather than direct investment in companies; indeed they can be exacerbated. Banks will tend to invest money derived from their deposits in companies, so that analysts, in theory, need to consider the security of the bank and the security of the companies to which the bank has lent money. *The Economist* (1994) covers further the issue of default risk for banks.

5.3 Short-term deposits, Treasury Bills and index-linked bonds are normally regarded as giving reasonable protection from inflation. However, there are circumstances in which short-term investments give rise to considerable inflation risk. First, when expectations of inflation are not formed rationally, or are formed from actual inflation with a considerable lag, real interest rates can often be negative; secondly, intervention in the market mechanism by governments may lead interest rates to reflect time preferences and the productivity of capital imperfectly; thirdly, the pursuit of a very loose monetary policy can reduce real interest rates.

5.4 In the U.K., it is possible that all three of these conditions existed in the 1970s, which led to an average level of real Treasury Bill returns of -3.3% p.a. (Daykin *et al.*, 1994). In Poland, unless there is an extreme, sudden burst of hyperinflation, it is unlikely that inflationary expectations will lag significantly behind actual inflation. However, there is pressure on the Polish Central Bank to loosen monetary policy significantly (*Nowa Europa*, 1994). In addition, the current government and President (elected in 1995) may well be more inclined to intervene in the market pricing mechanism than their predecessors. Short-term interest rates on government Treasury Bills in Poland, on the basis of some inflation forecasts, recently became slightly negative. Official short-term interest rates on government Treasury Bills, have recently been negative in Russia and the Czech Republic (*The Economist*, 1994). Thus, it can be seen that the short-term investment instruments available to insurance companies in Poland do not, necessarily, provide the inflation protection which may be needed, even if the investment time horizon is very short. We will return to this problem when we discuss mismatching risk.

5.5 As investors in other countries with high inflation have discovered, index-linked bonds with indexation lags often provide a less than perfect hedge against inflation. In particular, in the case of Polish government index-linked bonds, the coupon is not indexed, and there is an indexation lag on the capital payment of

2 months. The extent of possible inflation risk is demonstrated in Booth & Stroinski (1994b).

5.6 Despite the existence of an investment category which provides the investor with reasonable protection against inflation in the short term, there is no category of investments which provides long-term protection. The absence of any possibility of building a diverse portfolio of real investments (property, equities of well established companies, long-term index-linked bonds and foreign equity investments) means that long-term guarantees cannot be provided on policies, of either a real or nominal nature. The use of short-term index-linked bonds, to match long-term real liabilities, would be inappropriate, given the degree of reinvestment risk which would exist. Given the comments made in ¶5.4, there would be a significant mismatching risk from relying on short-term deposits and Treasury Bills to provide a stable real return to match longer-term liabilities.

5.7 On the whole, policy types have been developed so that mismatching risk is insignificant. However, there is still some residual risk, even given the short-term nature of the liabilities written by both life and non-life companies. In the U.K., certain aspects of investment mismatching risk of short-term business are often ignored as insignificant. In particular, non-life insurers will often invest a significant proportion of funds in short-term bonds, despite a theoretical inflation risk. If inflation is higher than expected, the bonds will give rise to fixed payments, but claims payments, may be higher than anticipated. In Poland, however, even short-term inflation is highly unpredictable. There is, therefore, a potential mismatching risk from the use of any kind of fixed-interest investment to match even the shortest-term real liabilities. The volatility of the stock market is such that any stock market investment could be deemed inappropriate in respect of any liability which carried any kind of guarantee. Thus, despite the fact that policy types have been developed to meet the particular situation which exists in Poland, investment policy still needs to be considered very carefully by actuaries, and the problems of mismatching assets and liabilities remain. Booth & Stroinski (1994a) demonstrate that one of the difficulties which led to the insolvency of Westa, in 1993, was inappropriate investment policy.

5.8 In the life market, products have essentially developed to circumvent the problem of asset/liability matching in an investment market which has limited long-term investment opportunities. There has been a growth in the proportion of group business with more complex benefit structures, such as contingent insurances, whereby benefits are paid on the deaths of family members occurring before the deaths of the insured. Also, payments are often made on the birth of children to the insured. Group life insurance does not require the long-term investment of reserves, and premiums and benefits can be increased each year to reflect the increase in the cost of living.

5.9 Recently developed forms of individual life insurance, with a high savings element, have essentially passed the investment risk to the customer. It has not even been possible to develop a product similar to the traditional U.K. with-profits style, with limited investment guarantees. There is, however, the advantage of investment

pooling through contracts, a little like U.K. unitised with-profits, contracts (see ¶3.7).

5.10 Longer-term policies have been developed, but not widely marketed, where benefits are paid in Polish domestic currency, but increased according to any appreciation of the U.S. dollar against the Polish currency. These present significant investment problems, as insurance companies cannot invest in U.S. dollar denominated investments in respect of these types of liability. Banks do offer a type of U.S. dollar futures contract, which may be appropriate. However, at this early stage in the development, it is not easy to say how the banks match their own commitments. As yet policies have not been developed which have long-term indexation of premiums and benefits, and it is unlikely that such a policy could be marketed until longer-term index-linked bonds were developed.

5.11 Three developments could be identified which would aid the development of a greater variety of products in the life market. First, the development of a market in real property, free of political uncertainty, would provide insurers with the possibility of constructing a more diverse portfolio of long-term real investments. Secondly, the issue of longer-term index-linked bonds would help insurers match longer-term liabilities with guarantees expressed in real terms. Thirdly, a greater experience and better risk analysis of private sector investments should help provide a more stable stock market environment and more secure bank deposits; there is an important role for the actuary to play in this analysis. We now move on to explore further the possible future development of insurance products, particularly keeping in mind the likelihood of social security reforms.

6. THE INFLUENCE OF SOCIAL SECURITY AND DEVELOPMENTS IN INSURANCE PRODUCTS

6.1 The common feature of almost all the social security systems in Eastern Europe is the very high level of contributions and the level of benefits provided. There are a number of difficulties caused by this which are of interest to the development of long-term savings vehicles which have an insurance aspect. Specifically, the high levels of contributions can reduce disposable income to such an extent that the demand for long-term insurance based products is reduced. Secondly, the need for employees and employers to make long-term provision for retirement is reduced. The social security system in Poland covers a wide range of benefits, including: retirement pensions (including for early retirement due to disability and other causes), health care, maternity benefits and unemployment benefit. In a country such as the U.K., individuals would insure some of these contingencies explicitly. Also, individuals would use a variety of long-term savings instruments, many of them combined with insurance products, to make provision for these contingencies. In Poland, the social insurance system is still the system which was designed to cover all eventualities, without any supplementation from the private sector.

6.2 The current contribution rate is 48.2% of salary, with no limit, despite a cap on benefits. The scheme provides a number of benefits, including retirement pen-

sion. The retirement age for men is 65 and for women 60. However, there are provisions for early retirement, without loss of pension, after men have worked for 35 years and women for 30 years. There are also a number of industry specific privileges, including early retirement and enhanced pensions. The system also provides for a wide range of other benefits: in 1995, 30.7% of all pensions were for disability (*Kwartalnik ZUS*, 1996); in addition, there are workers' compensation, sickness, maternity and child support benefits.

6.3 A number of attempts have been made to curb the costs of the system. First, the early retirement benefits were limited by prolonging the period of earnings which counted towards final salary. This failed to achieve the objective of reducing costs, at least in the short term, as it simply brought forward large numbers of early retirements.

6.4 The second attempt to reduce the cost of the system involved a restriction on the pensionable earnings formula. It is likely that the first involvement of the private sector in pension provision is likely to arise, not due to any major structural reform, but due to this more minor adjustment. The formula for the pensions benefit is as follows:

$$\text{Benefit} = 24\% * \text{NAE} + (1.3\% * \text{CS} + 0.7\% * \text{NCS}) * \text{RPB}$$

where:

$$\text{RPB} = \min \{ 250\% * \text{NAE}, \text{FAE} \}$$

$$\text{Minimum Benefit} = 39\% * \text{NAE}$$

NAE National average earnings

CS Contributory service

NCS Non-contributory service

RPB Retirement pension base

FAE Final average earnings = (in 1996: Annual earnings from best consecutive 7 years out of last 16 before retirement; up to year 2000 gradually increasing to best 10 years out of last 20 years before retirement).

The two major adjustments to the formula in 1990 were the gradual introduction of the use of the best ten, rather than the best five, years of consecutive service, and the limitation of the pension to a figure based on 250% of national average earnings. It can be seen that, for an individual below average earnings, the weighting from the first term will give a very large pension as a proportion of final salary (see ¶2.7). At the top end, the benefit level now has a cut off point which will have greater effect as the distribution of incomes becomes wider. This may not simply lead to private provision in respect of that part of salary above the cut off point for state pension purposes; the high degree of non-compliance which the high contribution rate and the cut off encourages, may leave some individuals without provision at all, unless alternatives to state provision are taken out.

6.5 The main developments in the use of insurance companies as vehicles for

long-term saving may arise as a result of major social security reform. There has been a general framework document set out; however, this only suggests a basis for possible future reform. The framework document, 'Strategy for Poland' (28-29 May 1994; *Rzeczpospolita* 126 (3775) 1-2 June 1994) suggests splitting the contributions into health and pensions contributions and suggests legislation to allow supplementary private provision on top of the reformed state system. A further proposal from the Ministry of Labour was presented on 25 April 1995. This suggested the extension of women's retirement age to 65 to match that of men, as well as possible changes to the basic entitlement formula. However, proposed reform did not go very far and did not include any proposal for the creation of a private pension system.

6.6 This proposal was followed by an extensively documented proposal of 27 November 1995 from the Ministry of Finance, proposing indexation of pensions to prices, limiting early retirement, setting retirement age at 65 for both males and females, curtailing disability benefits which cost 24.7% of all social security benefits (compared with 42.7% of expenditure for pensions) and introducing institutional reform of ZUS. Under the proposal, alongside a universal basic pension guaranteed by the government, an obligatory second pillar would be created with a defined contribution capital reserve funding and involving management by licensed private management companies. The state system will be retained for those who would opt to stay under the current system. Recognition bonds of the value of pensions accrued under the state system would be distributed to those who decide to opt for the capital reserve scheme. Redemption of such bonds would be at the legal retirement age. This proposal has many similarities with the reform of the social security system in Chile. The recognition bond system recognises the pensions which individuals have nominally accrued under the state pay-as-you-go system. The recognition bond makes explicit the implicit debt of social insurance commitments, and allows those who have accrued state benefits to transfer them to the private sector in an orderly way, at a particular age, which can be managed by the government in its debt funding and public spending plans. The long-term effect should be to increase the private savings ratio, as individuals make provision for themselves and as they purchase annuities with 'cashed-in' recognition bonds. Such a long-term increase in the savings ratio appeared to happen in Chile, and it is believed that this set their economy on a permanently higher growth path. See Holzmann (1995).

6.7 The introduction of reforms, similar to those described in ¶6.6, should create a demand for long-term retirement provision. In turn, this will lead to a demand from insurance companies, if they are approved for provision of the tier of non-statutory provision, for long-term investments which provide the investor with inflation protection. The reform is, however, subject to a political process, and it is not known, at this stage, what shape or form the new system will take. The mechanism which can then facilitate the simultaneous development of the insurance and investment markets is discussed in Section 7.

6.8 We now turn to the development of long-term insurance policies other than

pensions policies. The difficulties for insurance companies began with the inflation levels of 1989/90 (see Table 3.1). There was a very rapid decline in the real value of insurance funds and in the real value of the benefits paid out under long-term policies. Some *ex gratia* revaluations of benefits were carried out without increasing premiums. Despite this, the value of all individual life benefits and annuities was more or less eradicated by inflation. Group life policies did not suffer in the same way, owing to the short time period the benefit was to cover. PZU Life still has close to one million individual policies, with insignificant sums assured (source PZU Life, internal reports, unpublished).

6.9 New individual life policies which can adapt to the relatively unstable situation have only recently been developed. Savings policies of an endowment type and universal life policies have been developed, and their sales have been growing rapidly, albeit from a low base (unpublished sources suggest real growth of around 600% for one company between 1993 and 1994 and for the same company real growth of premium income has been 275% during 1995). PZU Life has introduced a product similar to French products, where the sum assured and premiums are increased in line with the increase in policy reserves insofar as the increase arises from additional investment income. Again, the development of such individual life policies, under which significant reserves are built up, should stimulate the development of the investment market in Poland.

6.10 The development of mutual funds (unit trusts) is a relatively recent phenomenon in Poland. The only mutual funds available for purchase at the moment are those marketed by Pioneer and Korona (Creditanstalt). Customers purchase units in these open-ended funds. Pioneer markets three funds: one invests in a mixture of bank deposits and government bonds, the second in bonds and shares, and the third in shares only. The companies obtain profits from initial charges and a regular management charge. An important factor determining whether the long-term capital of public companies will tend to be held by banks (as in Germany) or insurance companies and pension funds (as in the U.K.) will probably be the success of insurance companies in marketing unit-linked policies, possibly tied to an insurance benefit (for example unit-linked personal pensions). Inconsistencies in regulation of insurance companies and mutual funds, at the moment, limit the scope of insurance companies for using mutual fund vehicles, although linking to internal units is possible.

7. THE SIMULTANEOUS DEVELOPMENT OF THE INSURANCE AND INVESTMENT MARKETS

7.1 In Sections 4 to 6 we have discussed the availability of investments, the risk factors relating to various different categories of investment, and the possible development of new insurance products (particularly relating to potential social security reforms). It is tempting to suggest that the development of insurance products depends on the development of investment possibilities. See, for example,

Stroinski & Stroinski (1994). Conversely, it could be suggested that the availability of long-term investment vehicles will depend only on the demand by insurance and other long-term funds. In reality, a general equilibrium approach to such questions is necessary, which recognises the simultaneous interaction of supply, demand and price (or rate of return on investment funds) in the market process. Such an approach was used by Hayek (1941) in developing a pure theory of capital. Wilkie (1986) introduced similar ideas to the actuarial audience. However, this work related to the determination of the supply and demand for, and price of, capital in total, or with reference to a particular project. Theoretical work has not, in general, related to the relative demand for investment instruments by, and issue of investment instruments to, different operators in the capital markets. We discuss some of these issues here.

7.2 Possible reforms in the social insurance system may well bring about a limitation of state provided benefits and the desire by individuals to make other provision. The stabilisation of the Polish economy has allowed the development of insurance products which facilitate long-term saving. Two factors are critical in the simultaneous development of insurance and investment markets: the propensity of individuals to save; and whether savings are channelled through insurance products (including unit linked products) or through banks or direct investment.

7.3 The price mechanism co-ordinates the independently made decisions of those who demand and those who supply investment instruments. This can happen in the following way. An increase in the sale of long-term insurance products may increase demand for investment vehicles which provide long-term opportunities and some inflation protection (for example shares). This may lead to an increase in the price of equities, so that they stand on a long-term expected return which is lower. This could cause the substitution of equity capital for other forms of capital or an increase in the total amount of capital issued by the company.

7.4 If the productivity of capital projects in which the company could invest was higher than the rate of return that investors would accept from an equity investment, existing investors would benefit from the issue of further equity capital. For simplicity, consider a placing or offer for sale at the current share price, rather than a rights issue. The net present value of the project would be greater than the cash paid for the shares, at the rate of interest investors wish to earn on the equity capital (as the present values are equal at the higher rate of return expected to be earned on the project). The value of the company would, therefore, rise, as a result of the share capital issue, by more than the cash raised. A similar effect would take place with a rights issue, except that the whole of the added value would accrue to existing shareholders. The increased availability of long-term investment instruments requires a demand; although the demand will only arise if it is possible for the supply to come forth. The interaction of supply and demand bringing forth an increase in the capital in issue is essentially a reaction to the marginal productivity of capital being greater than the investor's time preference.

7.5 Of course, the long-term investment instruments that arise as a result of this process are likely to be riskier than similar investments in the West. There is no

reason why forms of capital may not evolve which have a different degree of risk (as happened in the last century in the U.K., with shares, preference shares and debentures being issued). However, in general terms, it has to be accepted that a given investment instrument will be riskier in a developing economy. The risk can be controlled and packaged in different ways, but cannot be eliminated; although it should also be recognised that an economy with a lower degree of capitalisation is likely to provide higher expected returns.

7.6 The process by which the government can crowd out private sector investment and capital accumulation is also of interest. If the government borrowing requirement is substantial, it will need to offer higher rates of interest in order to attract funds from alternative investments (or offer other benefits such as tax incentives). It would not be beneficial to a company to increase the level of capital unless the productivity of capital were higher than the equilibrium rate of interest which would exist after the government had increased its borrowing. It is clear, from Table 4.1, that the Government sector has the ability to 'crowd out' significant private investment. It is also of note that recent government borrowing levels have been around 6% of GDP. See Schwartz *et al.* (1994). This excludes any implicit debt of the state social insurance system.

7.7 Thus, critical to the joint development of the insurance and capital markets is the freedom for the markets to develop and for investors to accept risks which are inevitable in a developing economy. In addition, private capital formation will not take place unless there is an adequate savings ratio and stable economic conditions, which include not too great a degree of crowding out by government borrowing.

8. THE DEVELOPMENT OF INSURANCE REGULATION

8.1 In this section we consider regulation from three aspects: first, any regulation which prevents the development of insurance products; secondly, regulation which directs the investment of insurance funds; and thirdly, the reporting requirements and intervention capabilities of the government. Relevant comparisons are made with the U.K., and comments are made on the development of the actuarial profession.

8.2 Regulation was developed in four phases in Poland. The law of 20 September 1984, allowed the creation of further state insurance companies, co-operatives or stock companies with a majority state holding. On 17 May 1989, limitations on the ownership of insurance companies were abolished, but there was no provision made for licensing new companies. On 28 July 1990, a complete liberalisation took place, with a law being enacted based on the E.U. Directives of July 1973 and March 1979. This legislation had a number of goals. It was intended to liberalise the market and open the market to foreign insurers (although the date at which foreign insurers can enter without setting up joint ventures, initially set at the end of 1992, has been postponed to the end of 1998, by the provisions of the Insurance Act 1990, as amended in 1992). A licensing mechanism and monitoring

provisions were set up, together with proposals for a form of policyholder's protection fund. Further changes were passed on 8 June 1995 in the form of amendments to the 28 July 1990 Insurance Act. The amended Act deals with some inconsistencies in the original Act, but also creates a State Insurance Supervision Office (PUNU), as an independent body overseeing insurers, and the Insurance Spokesman to represent the insured and insurance beneficiaries. The new Act further details the licensing of new companies, introduces the Guarantee Fund to protect policyholders in the case of an insurer's bankruptcy, and strengthens the Polish Chamber of Insurance. However, the new legislation goes a step back in its support for the actuarial profession, as a profession independent of companies and the state. On the one hand it demands that actuarial examinations are taken by people who are to be recognised as actuaries, but it gives the responsibility for the syllabus and the examinations to the Ministry of Finance. It is hoped, however, that this solution is only temporary and, after the strengthening of the Polish Society of Actuaries, the examining responsibility will be returned to the professional body.

8.3 Daykin (1993) discusses the role of actuaries in Poland and other Central and Eastern European countries. Ferguson *et al.* (1989) discuss regulation in E.U. countries, and the effect the regulation has on policy design in various countries. It can generally be said that the Polish law is liberal in this respect. No explicit regulations exist regarding policy design and premium setting that could be said to be detrimental to the free evolution of the market. However, in the general code of Polish Law, as has been mentioned above, various restrictions exist on the holding, by Polish citizens, of foreign currency contracts. Given the currency instability in Poland, this is an important restriction on the design of policies, which is likely to be detrimental to the development of long-term insurance contracts.

8.4 The regulation of investments is covered in more detail in Booth & Stroinski (1994a). Only the main principles will be re-iterated here. First, there are restrictions on the concentration of investments. There are no other restrictions on the investment of insurance funds in bonds. However, not more than 30% of insurance funds can be invested in listed and unlisted shares combined, and not more than 15% in unlisted shares. Real estate investment cannot exceed 25% of the value of the fund. These limits do not apply to unit-linked insurance funds. The restrictions are similar to those which exist in Germany. In current conditions, the limits could not be regarded as being close to being breached by any insurer. The investment risk of equity investment is generally so great that it is likely to be passed to the consumer through the development of unit-linked products. The real estate limit is also not close to being breached, for reasons discussed in Section 4. However, if the institutional and legal background to property investment were more favourable, it is likely that insurance companies would wish to increase real estate investment.

8.5 Restrictions on foreign currency investment are, perhaps, a greater hindrance to the market developing products which can provide consumers with protection from economic instability. A combination of the general code of Polish Law and the Insurance Act makes it very difficult for consumers to purchase foreign

currency investments for the purpose of providing protection against inflation or for diversification of benefits.

8.6 The 28 July 1990 Insurance Act established licensing provisions and ongoing reporting requirements and intervention capabilities. The licensing requirements are similar to those in the E.U. Licences must be obtained before starting any insurance activity, and can be granted for some or all of the sub-groups of life or non-life insurance (composites are not allowed). The application for the licence must include the statement of how capital requirements are to be met, a plan of operation and enough capital to cover solvency requirements. If a licence is to be granted for transaction of life insurance, the company must employ at least one actuary.

8.7 The licence can be revoked if, at any time, the conditions necessary to obtain a licence are not fulfilled, if the insurer is engaged in illegal activity, or if the insurer does not fulfil, in a specified period, any required financial or short-term solvency plan. Under certain circumstances, the newly created State Insurance Supervision Office (PUNU) can also limit the financial operation of a company (including investments) and appoint a manager.

8.8 Insurers are obliged to report annually to PUNU. Six forms need to be submitted within 90 days of closing books at a year end. These forms relate to: the balance sheet; technical calculations of reserves; calculation of results; investments; reserves; and the capital of the company. If the forms are not provided or are not satisfactory, then there is a *prima facie* case for intervention. Intervention would also take place if the company failed to meet the appropriate solvency margins, as laid down in the July 1990 Act, which are similar to the solvency margins required in E.U. countries. More extensive reporting is likely to be introduced by PUNU.

8.9 It can be seen that, in general, the Polish insurance market operates against a background of a relatively liberal insurance law. However, with regard to the exchange of foreign currency, neither the Insurance Act nor the Polish Civil Code provide the freedom which exists in most E.U. countries. In addition, other provisions regarding investment are similar to those of the less liberal E.U. countries. In general terms, however, regulation is no obvious restriction on the joint development of the insurance and investment markets in Poland.

9. CONCLUSION

9.1 In this paper, we have traced the development of the Polish insurance and investment markets. We find that policy types sold are such that liabilities tend to be relatively short term in both the life and non-life markets. There are particular problems, relating to the development of the Polish economy and to the dominance of the state social insurance system, which have made it more difficult to develop policy types with longer-term liabilities.

9.2 In Poland's investment market, a number of shorter-term investments exist. These include index-linked bonds, which provide good protection from inflation

over one year, Treasury Bills and bank deposits. Short-term real interest rates have tended to be positive. The equity market is in the early stages of development and tends to be very volatile. The development of real property has been stunted by institutional and legal difficulties.

9.3 The state of evolution of the investment market makes it difficult to develop long-term insurance products. Even short-term investments carry certain risks. Certain longer-term products are being developed which will pass the investment risk to the consumer. The development of long-term products will depend, to some extent, on reform in the social insurance system, which currently has an all-embracing system of benefits. Some reform has been carried out, but more major reform is expected.

9.4 The development of the insurance and investment markets cannot be seen in isolation from each other. Given the correct regulatory framework, they will tend to evolve together. In Poland, the regulatory framework is generally liberal, although appropriate safety mechanisms exist. The economic background could now be regarded as stable, but fragile. The actuarial profession is embryonic, but does have a formal structure. These factors suggest that it is likely that the long-term insurance product market will develop. However, the asset liability matching problems are such that investment risk would tend to be passed to the consumer.

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