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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2003

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):
Alsem, K. J., Antufjew, J., Huizingh, K. R. E., Koning, R. H., Sterken, E., & Woltil, M. (2003). *Insurability of export credit risks*. (F07 ed.) Rijksuniversiteit Groningen.

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Insurability of export credit risks[1]

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SOM Research Report 03F07

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Abstract

This report presents an analysis of the market for export credit insurance. Governments of all developed countries offer exporting companies export credit (re)insurance, either directly or indirectly. This raises the questions

1. What are the key determinants of export credit risk insurability by the private market?

2. Which export credit risks can be covered by the private market?

We provide an answer to these questions by means of a literature review and an extensive field study, with special emphasis of the role of the Dutch government as a reinsurer of certain export credit risks.

Key words: export credit risk, insurance, moral hazard, rating

JEL codes: D52, D82, F13, G18, G22.

CONTENTS

iii

List of Figures

iv

PREFACE

This report is the result of contract research by the University of Groningen on behalf of the Ministry of Finance (contract nr. IAZ2002/1642M). First of all, we want to thank all people and companies who have given their time to be interviewed and to answer questions. Furthermore, we want to thank the steering committee at the Ministry of Finance for their comments that have helped in improving the report. Only the research team is responsible for the contents of the report and the views expressed therein.

Groningen, 27th February 2003,

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INTRODUCTION AND RESEARCH QUESTIONS

1.1 BACKGROUND

Firms exporting their goods and services abroad face risks that are different from the risks faced by firms who do not engage in international trade. In the case of large transactions in particular, it is common practice to allow the receiving party to pay in installments. The exporting firm faces credit risk, but as in most countries, Dutch firms can insure such risks. In fact, export credit risk insurance includes more: fabrication risk (the risk that the exporting company cannot deliver the goods due to circumstances beyond its control) and country risk (the risk of restrictions imposed by the government of the receiving country).

To some extent, export credit risks can be insured on the private market. There are private insurance companies that insure short-term risks. On the Dutch market, Gerling NCM, Coface, and Euler-Cobac are active. The Dutch government acts as reinsurer of long-term export credit risks (three years or more), and it accepts such risks from Gerling NCM only. Short-term and medium-term contracts can be reinsured in the private reinsurance market. In almost all OECD countries export credits are officially supported. This can take the form of direct finance for transactions (with or without government insurance), such as in Canada, the United States, Japan, and South Korea. Official support for export credit risks can also take the form of insurance or guarantees, either directly offered by the government or a government agency (e.g. United Kingdom, Italy, Spain) or the government backs a private insurer through a reinsurance agreement (as is the case among others in the

Netherlands, France, and Belgium). The role of this government-backed insurance on exports to certain countries is important as experience has shown that the private market is very reluctant to cover long term export risks to non-OECD countries. Government involvement in a particular country can also be explained from a political point of view: other countries offer such facilities and it would put exporting companies at a disadvantage if long term export credit risk insurance would not be available. The government is not only an important party in the market for export credit risk (re)insurance. Its involvement also affects the allocation of resources, and that may have either positive or negative effects on social welfare. Perhaps risks that are too large are taken on, or perhaps the government corrects a market failure by offering this type of insurance.

To determine the optimal allocation of the risk burden between the government and the private sector, it is important to understand the driving forces behind insurability. Why is the private market willing to absorb certain risks, and not willing to assume others? An answer to this question is relevant not only for export credit insurance, but also for other types of insurance that are offered by the state.

1.2 RESEARCH QUESTIONS

In this report, we try to answer the question of what determines insurability, and more in particular, what determines the insurability of export credit risks. The two questions that are at the center of this research are:

1. What are the determinants of export credit risk insurability on the private market?

2. Which export credit risks can be covered by the private market?

We find an answer to these questions by looking at a number of subquestions:

- How are risks shared between two economic agents? These agents can be: the government and a primary insurer, or an exporting firm and a primary insurer, or a primary insurer and a reinsurer. Two agents have to share the unknown proceeds of a transaction. How can risks be shared if there is incomplete or asymmetric information?

- Given that a market for a certain risk exists, the next question is what are the determinants of the premium to be paid for the transfer of the risk. Are export credit risk insurance policies different from other types of insurance?

- How does the market view export credit risk? What are the perceived determinants of insurability, and how stable are these determinants over time? What are the acceptance criteria for insurers?

- What are the alternatives for export credit risk insurance? For example, can risks be transferred through securitization? To what extend does export credit risk insurance suffer from the moral hazard problem, and can that problem be alleviated by other methods of risk transfer?

1.3 Institutional background

To set the stage for this report, we present some information concerning the institutional background in this section[1].

Broadly defined, an export credit is an insurance, guarantee or financing arrangement which enables a foreign buyer of exported goods and/or services to defer payment over a period of time. Export credits are generally divided into short-term (usually two years), medium-term (usually two to five years) and long-term (usually over five years).

Export credits can be backed by official support. Official support can take the form of direct credits/financing, refinancing, interest-rate support (where the government supports a fixed interest-rate for the life of the credit), aid financing (credits and grants), export credit insurance and guarantees. Institutions dealing with export credits are called Export Credit Agencies (ECAs). In case of official support an ECA can be a government department or a commercial institution administering an account for or on behalf of government, separate of the commercial business of the institution. Officially supported export credits have been subject to agreements and understandings within different frameworks:

- The Subsidy code of the WTO (ASCM) defines what subsidies are permitted and what subsidies are prohibited (article 1 and 3 ASCM). In this framework officially supported export credits are allowed under

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[1]We thank Ester Barendregt of the Ministry of Finance for providing this detailed information.

specific conditions, for instance under the safe haven clause (item k annex I ASCM) for the (OECD) Arrangement (see below) on export credits. Prohibited is official support for export credits at premium rates which are inadequate to cover the long term operating costs and losses of the programmes (item j, annex I ASCM).

- The 'Working Party on Export Credits and Credit Guarantees (ECG)' is a sub-group under the OECD Trade Committee and deals inter alia with issues such as Environment, Bribery and Unproductive Expenditure.

- The Arrangement. The Arrangement is a Gentlemen's Agreement among its Participants[2]; it is not an OECD Act, although it receives administrative support of the OECD Secretariat. The main purpose of the Arrangement is to provide a framework for the orderly use of officially supported export credits. In practice, this means providing for a level playing field (whereby exporters compete on the basis of the price and quality of their products rather than the financial terms provided) and working to eliminate trade distortions related to officially supported export credits. The Arrangement applies to officially supported export credits[3] with repayment terms of two years or more. It places limitations on the terms and conditions of export credits that benefit from official support. Such limitations include minimum premium rates, the minimum cash payment to be made at or before the starting point of the credit, maximum repayment terms and minimum interest rates which benefit from official financing support. There are also restrictions on the provision of tied aid.

- The EC. The Arrangement has been integrated in EC law. The Directive on medium and long term export credit insurance deals with common principles for insurance and guarantee arrangements, premia and cover policies in order to harmonise the rules within the Community. In the field of short-term export credit insurance, a Communication exists which defines 'marketable risks' (risks which may not be covered

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[2]The Participants are: The European Community, Australia, Canada, the Czech Republic, Japan, Korea, New Zealand, Norway, Switzerland and the United States.

[3]Military equipment and agricultural commodities are excluded from the application of the Arrangement. Three Sector Understandings (for Ships, Nuclear Power Plant and Civil Aircraft) are annexed to the Arrangement.

by export credit insurers with the support of the State). These marketable risks are commercial and political risks on public and non public debtors established in EU countries and some other OECD countries, with a maximum risk period of less than two years.

In the Netherlands, official support takes the form of pure cover; the Dutch State reinsures insurance of export credits. In accordance with the EC communication on marketable risks, the Dutch government does not reinsure short term risks on EU countries and some other OECD countries, which are considered as marketable risks. Moreover, the Dutch State in principle does not reinsure export credit risks of transactions to industrialised OECD countries, regardless if the credits are short- term, medium- term or long-term. A reinsurance agreement exists between the Dutch State and Gerling NCM for officially supported cover of Dutch exports with credit terms over two years. This implies that short term export credits in all countries (not only EU and other OECD countries) are in principle not reinsured by the Dutch government. For higher risk countries however, the State does reinsure short term credits for large single transactions.

Gerling NCM therefore acts in the Dutch market both as the only supplier of officially supported export credits and as a supplier of export credit insurance for its own account. As for the risks which qualify for official support according to the above mentioned agreement between Gerling NCM and the State, Gerling NCM is bound to offer all these transactions to the State for reinsurance. If the State decides to reinsure the risks, the insurer Gerling NCM does not keep a proportion of the risk; instead the entire risk is for account of the State.

1.4 Research design and contents

The research design consists of two parts: a literature review and market research. The literature review indicates which factors determine insurability in general, and apply these factors to the risk sharing of export credit risks. Insights are obtained from both the economic and actuarial literature. The second part is the market research. The market research confronts the insights from the literature with actual practice. First, experts were interviewed, and using their expertise, and the conclusions from the literature review we interviewed representatives from four different groups:

- Insurance companies;

- Re-insurance companies;

- Intermediaries;

- Companies demanding export risk insurances.

Of course, there are other participants in the market for export credit risk insurance as well, for example factoring companies and banks. Where possible, we discuss the role of these other participants but because the four groups of participants listed above were singled out as the most important ones early in the research, and because of time limitations only those four different groups have been interviewed extensively.

In the report, we start with a theoretical point of view of insurability in Chapters 2 and 3, and then we confront the views of these chapters with actual practice in Chapters 5 to 7. In Chapter 2 we discuss markets for risks, and in Chapter 3 we discuss risk pricing. Both traditional methods of risk pricing are reviewed, as well as risk transfer through securitization. A detailed description of the approach taken in the market research can be found in Chapter 4. Results of the market interviews are discussed in Chapters 5 to 7. In Chapter 5 we provide a detailed practical view of the most important features of the market for export credit risk insurance (and for this reason, a reader who is unfamiliar with the topic may want to read this chapter first). Criteria of acceptation and premium rating are the topics of Chapter 6, and in Chapter 7 alternative methods of risk sharing are discussed. We end with a summary and conclusions in Chapter 8.

Throughout the report we expand details of the main text in boxes. We use two types of boxes: example boxes, which highlight additional insights, and technical boxes, which provide information to the reader interested in modelling issues. These may be skipped without loss of continuity.

Markets for risks

In this chapter, we give an overview of the relevant literature on the markets for risk. The goal of this chapter is to provide intuition for the general insurance problem, the possibly inefficient working of insurance markets, and the role of government policy. We use the economic theory of asymmetric information. Insurance markets are typically markets where one of the market participants has more information than others, leading to contractual problems and welfare-improving government intervention. The main problem to be addressed in this section is: what are the determinants of public versus market (re)insurance? The more specific goal of this chapter is to provide insight into the main issue we are interested in: the market for export credit risk. We will take this case as our reference example where possible and present a short-list of determinants of public intervention in export credit risk insurance at the end. This implies that we will generally speak of insurance markets, but will focus any example on the market for export insurance.

It is well known that a large spanning of financial markets and a wide range of heterogeneous market participants characterize modern financial systems. Financial transactions can be made on markets or can be dealt with within institutions. In the former case, one can think of loan granting or risk sharing via buying and selling private or public financial assets. In the latter case, one can think of risk sharing in a bank-insurance financial conglomerate or a large multinational company. In all cases, financial transactions are used to transform control rights, maturity, time, place, etc. In this section we focus more on the risk sharing between agents and less on the risk sharing or risk management within financial institutions. Although the latter aspect is important, the main intellectual interest is in the working of markets for risk. We will however, first briefly describe financial development and then discuss

its consequences for the markets for risk (see Section 2.1). After this general introduction on financial systems, we turn to the more specific discussion on risk. In Section 2.2 we discuss the basic and general principles of risk, uncertainty, and expected utility (utility theory is used by economists to rank uncertain outcomes in a preference structure). We deal with a special type of financial transaction: risk sharing. We show how two agents can share risk under symmetric information. It will be shown that this symmetric risk sharing is a theoretical case and does not appeal to real world descriptions of insurance products. Therefore we switch to more realistic cases based on incomplete markets and asymmetric information in Section 2.3. We discuss the impact of the assumption of asymmetric information on the trade of financial claims. Using these theoretical notions we describe the problem of reinsurance and especially the role of public intervention (possibly by reinsurance) in Section 2.4. In what cases can private markets provide risk sharing and in what cases does the government need to supply public support or even intervene? We present in Section 2.5 an overview of insurable risk, especially focused on the market for export credit risk. Finally, we discuss an alternative way of risk transfer in Section 2.6. Recently, some risks that are difficult to insure have been securitized. We show how securitization can deal with the problem of moral hazard. This is the change of behavior after writing a contract under asymmetric information. We briefly discuss possibilities for securitization of export credit risks. We give a short summary at the end of the section.

2.1   Financial systems

In this section, we briefly discuss the development of financial systems that are engaged in handling financial transactions. We do so before we discuss the markets for risk in detail, because a general overview of financial trends is required to understand fully risk sharing in markets and within institutions.

A financial system consists of an interaction of markets and agents that operate on those markets. These agents can be stand-alone consumers or firms, conglomerates, large financial institutions, and regulators. Markets vary from spot to state-contingent markets. In spot markets only current exchange is possible: one trades current local goods for foreign money. Savings and insurance problems cannot be tackled using spot markets. One needs contingent claims markets, markets for forward contracts, to extend feasible consumption sets and allow for hedging of undesired risks (see Eichberger

and Harper (1997)). Various mixes of market types and agents can characterize various systems. It is common to distinguish between so-called market-based and bank-based systems. In the former financiers and borrowers trade directly on well-developed markets, in the latter systems financial intermediaries, like banks, take a larger market-share (see Allen and Gale (2000)). It is natural to argue that market-based systems will be able to offer more possibilities to share risk than bank-based systems. Individual agents are better able to deal with individual risk sharing problems in market economies. Market economies offer opportunities to all financial agents to hedge risks. Bank-based systems provide these opportunities mostly to the large financial institutes only. Large financial agents will be able to hedge large-scale risks internally. But is not completely clear how smaller agents can benefit from this internal hedging. Probably financial intermediaries will charge fees to provide insurance. There is a widespread belief that the more open an economy becomes the more likely financial markets are to develop (see Rajan and Zingales (2001)). For the case of small open economies, like the Netherlands, this implies that a high degree of financial technical progress is made. This would certainly stimulate our case of interest: the market for export credit risk. Globalisation has a great impact on financial development since the 1970s. This driving force of financial development has had numerous consequences. There are a few major trends:

1. Since 1970, especially contingent claims markets have developed. Contingent claims allow for exchange between time periods and states of nature. Examples of contingent claims are options, forward contracts, but also insurance products. As we will explain hereafter, this innovation is also crucial to the market for export credit risk.

2. The so-called microstructure of financial markets has improved. Bid-ask spreads are lower than before and trade is more efficient. This holds especially for large-scale markets, like equity and currency markets. For the market for export credit risk, this implies that contracts can be dealt with more easily.

3. Financial intermediaries have grown. This is due to economies of scale and scope and increases in efficiency. Banking and insurance are no longer separate (this was not allowed for a long time due to regulation). The larger scale of financial firms allows for more internal risk allocation, which is needed due to the larger scale of transactions.

4. Financial regulation has changed. To some extent markets are liberalized, but on the other hand more strict regulation of risk management by financial institutions has been installed. This is a natural tendency: more markets, but also more concern for socially optimal market outcomes.

For insurance markets, these developments have led to two major innovations:

- Large-scale financial conglomerates that offer wide varieties of financial products, like to cross-sell their products and operate sophisticated in-house risk management routines;

- A wider spanning of contingent claim products that can be used in insurance issues (see also hereafter). Examples of such products are catastrophe bonds (see Froot (1999)), so-called cat equity/bonds (see below), etc.

In terms of reinsurance issues (which is one of the major items to be discussed below), these developments seem to shift a larger proportion of risk to markets instead to public reinsurance. First, financial conglomerates are getting more able to internally allocate risk. Second, more market products are available to securitize formerly uninsurable risks. However, the creation of very large financial conglomerates also gives rise to concern about financial stability and regulation. But in general the development of financial markets provides better opportunities for consumers to realize their intertemporal consumption plans via saving and insurance.

2.2 RISK, UNCERTAINTY, AND EXPECTED UTILITY

Risk is endemic to economics. Risk is caused by randomness of processes and so due to uncertainty. Ex post uncertainty and variability coincide, but ex ante the two are distinct. Risk is not a unique phenomenon. All agents that take decisions under uncertainty face various types of risk. In Example Box 2.1 we present some examples of risk. One thing is sure: if an agent faces risk, the decision process is seriously troubled. Decision-making under uncertainty is crucial in economics and is the core of financial economics. A cornerstone of the theory describing these difficult decisions is so-called expected utility theory (see also Gollier (2001)). Expected utility theory provides a

way to rank uncertain outcomes in a preference structure. For instance, how should we compare the following uncertain projects: an exporter can sign a contract to trade two thousand pencils to the U.S. and three million sheets of paper to Russia, or three thousand pencils to the U.S. and one million sheets of paper to Russia. Both outcomes are uncertain, but our exporter is able to assign probability functions to these events. If we assume that our exporter is able to attach individual utilities to both exporting pencils and sheets of paper, he is able to rank the two events (under well-defined conditions). Based on the work of Von Neumann and Morgenstern (1944) we are able to describe the preferences of economic agents in a logical and systematic way. If preferences of agents are so-called complete, transitive, continuous and independent (these are the requirements previously referred to) we can fully describe preferences by an expected utility functions (see Eichberger and Harper (1997)). These expected utility functions are useful, since the risk attitude of agents is fully embedded in such a function.

TECHNICAL BOX 2.1 TYPES OF RISK

It is virtually impossible to describe all kinds of risk financial agents face. A worker for instance faces employment risk, a consumer consumption risk, a producer sales risk, etc. Still it is good to list a few, especially in the field of insurance. According to Greenbaum and Thakor (1995) e.g. banks face three major classes of risk: (1) default or credit risk (the risk that a borrower fails to make the contractual payment on a timely basis), (2) interest rate risk (the risk from variation of market prices), and (3) liquidity (withdrawal) risk (the risk that the asset owner will not be able to realize the full value of that asset at the time a sale is desired). These general risk types come close to risks faced in insurance problems.

Exporters face an extremely wide range of risks (see Example Box 2.6). The three general classes described above (default, market price, and liquidity risk) can be applied. With respect to the interest rate risk (or market price risk) the exchange rate risk should be mentioned as an important additional class.

In general one could observe micro-economic idiosyncratic (or individual) risks that could be shared by economic agents with different preferences at the same moment of time (see also hereafter). There are also macroeconomic risks, which cannot be shared at the same moment of time.

Examples of these are changes in national output, unemployment, infla-
tion and also changes in political, legal or geographical institutions (the
latter including e.g. catastrophes). These general risks cannot be shared
in a cross-section, but need to be hedged in a dynamic way. For exporters
we give a few examples of the two classes (but see also Example Box 2.6).
Micro risks are e.g.:

- Production risk: the exporter is not able to produce the goods in
  time;

- Insolvency: the buyer is not able to pay.

And macro risks are for instance:

- Nationalization, confiscation;

- Transfer risk: export restrictions;

- War risk: local wars;

- Catastrophes (earthquake, flooding, etc).

We come back to these issues hereafter.

If an agent is forced to take a decision under uncertainty, risk with respect
to the outcome of the process is driving the decision. The agent can ignore risk
in some cases: for instance if her expected utility function does not show risk
sensitivity. A so-called risk-neutral agent is not affected by risk. As explained
in Technical Box 2.2 the shape of the utility function reveals the risk attitude
of an agent. So we can simply look at utility functions, or we can try to get
the risk attitude from one figure that is derived from the shape of the utility
function: a coefficient of risk aversion. For instance risk averse agents are
willing to pay an insurance premium to hedge risk. In Technical Box 2.2 we
give the relation between expected utility theory and risk attitude. This box
illustrates that the risk attitude of agents determines the willingness to pay
for insurance. Or in other words, by measuring the degree of risk aversion of
exporters, one would be able to estimate the demand for insurance products.

Once we can describe the preferences of agents in the form of expected utility functions we can interpret the curvature of the utility function as the attitude towards risk. Suppose that we have a concave utility function (see the Figure 2.1 below). There are two possible outcomes, A and B and both are equally likely. In this case the expected value of an uncertain outcome (point 2) will be smaller than the true utility index (point 3). The expected utility value is labelled as the certainty equivalent (1-2), which measures the decision-maker's willingness to pay for a so-called lottery (which is defined as a simple vector of probabilities of certain future states). The difference between the utility index and the certainty equivalent is the risk premium (2-3). This risk premium is positive for risk averse agents. In insurance problems we can interpret the risk premium as an insurance premium. This is the price a risk-averse agent is willing to pay to hedge the disliked uncertainty of the event. Insurance companies have therefore interest in the curvatures of the utility functions of their clients.

The risk attitude of an agent can be characterized by three cases:

- The expected utility function is linear: the agent is risk neutral and the risk premium is equal to zero. Our agent is not willing to buy insurance. A risk neutral agent will not be affected by uncertainty and act as if there is no uncertainty to hedge;

- The expected utility function is concave: the agent is risk-averse and the risk premium is positive (the case above). A consumer is generally to act as if she can be characterised by a concave utility function. In most cases consumers will prefer more of a good, but there will be diminishing marginal returns;

- The expected utility function is convex: the agent is risk loving and the risk premium is negative.

A simple way to express the implied risk attitude of an expected utility function is the following:

1. The Coefficient of Absolute Risk Aversion is given by $I(x) = -u''(x)/u'(x)$. This measures the degree of an individual's aversion to gamble of a (small) fixed absolute size.
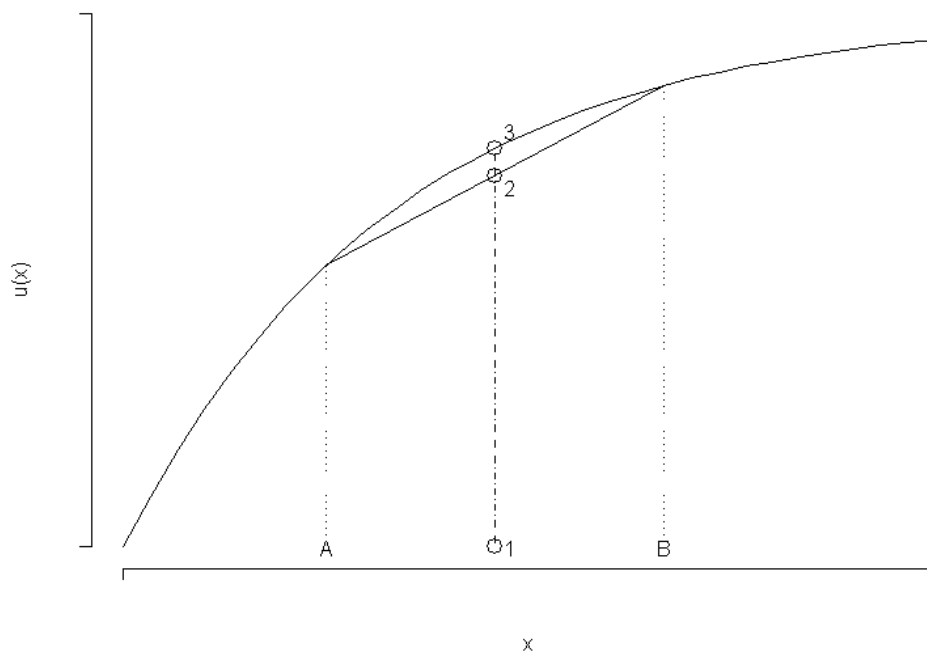
Figure 2.1: Risk aversion and expected utility.

> 2. The Coefficient of Relative Risk Aversion is given by $IR(x) = -xu''(x)/u'(x)$. This measures the degree of an individual's aversion to gamble of a (small) size, which is fixed as a proportion of the individual's initial wealth.
>
> Some classes of utility functions (like the exponential class: $u(x) = \exp(ax)$) exhibit constant absolute risk aversion. Generally this assumption is found to be less realistic than constant relative risk aversion.

Technical Box 2.2 shows that it is essential in insurance markets to know the risk attitude of participants. It is likely that the buyer of insurance behaves risk averse, while the insurance company will act in a risk neutral way with respect to individual contracts. There are multiple cases in which it is

plausible to assume that agents act in a risk neutral way. For instance in financial economics professional investors are believed to be risk neutral. The same holds for managers of large companies. They should even be paid to act in a risk neutral way in order to explore all business opportunities in selecting investment projects with upside potential. But a tiny difference from this pure risk neutrality opens opportunities for hedging risk. Individual households are believed to be risk averse though. This applies to consumption-asset allocation problems, employment, etc. It might even be so that there is extreme loss aversion, that is the famous case that agents dislike loss many times more than upward potential. In such a case an agent has a so-called asymmetric utility function around zero utility (see Kahnemann and Tversky (1979)). So financial products that pay a positive dividend in bad cases have a high price (e.g. in the consumption based capital asset pricing model, see Blanchard and Fischer (1989)). In other words there is a demand for 'insurance' products: assets that pay out in low consumption and/or utility cases. Or in terms of export insurance: there is a demand for a product that provides a hedge against failure of the export project. We continue in the next section our discussion by highlighting the importance of information problems in insurance markets.

2.3 Market incompleteness and information economics

In a so-called Arrow-Debreu economy, an economy with complete markets and full information available to all agents, (see e.g. Arrow (1964)) markets for all future states of the world exist and risk can be priced on forward markets. For example, there will be a market to trade peanuts for cars on New-years day 2004. Agents can buy and sell forward contracts as they like and risks will be hedged as desired. All financial products can be expressed in terms of Arrow-Debreu securities. Such a security pays one unit in case a certain state occurs, and nothing in all other states. Prices of all assets can now be expressed in terms of linear combinations of these Arrow-Debreu security prices. This implies that all agents are able to price risks, trade in risks and hedge against all risk at preference.

The market completeness is however far from reality (see Magill and Quinzii (1996)). It is more likely that markets will be missing due to all kinds of imperfections. It is not even likely that there will be so-called market spanning: that is markets will not be available to realize all plans of

agents (note that this is less restrictive than the Arrow-Debreu market completeness. Market completeness requires the existence of all financial markets one can think of, while complete spanning requires the existence of markets agents actually want to use). Market incompleteness will lead to sub-optimal plans and therefore government intervention might be useful in order to reach higher Pareto efficiency (Pareto efficiency implies an improvement in terms of utility of at least one agent, without the loss of utility for any other agent). However, in order to know the degree to which governments should interfere in markets is not clear, as long as there is no understanding of the causes of market failure. This topic is outside the scope of this project in a general sense, but returns in a more specific form hereafter.

The most important source of market failures in financial markets is imperfect information. We will discuss a particular case of information problems to review the literature on markets for risk: asymmetric information. One of the market traders knows more about the good or service that is sold than the others. Asymmetric information is the core of modern financial economics. Before discussing this relevant case Technical Box 2.3 gives a benchmark case of risk sharing under symmetric information. This will give a first intuitive insight into the problem of risk sharing under different preferences and expected utility functions. As we show in Technical Box 2.3, the case of symmetric information does not lead to empirically observed insurance contracts. Still it is good to know the basic principles of risk sharing.

TECHNICAL BOX 2.3 RISK SHARING UNDER SYMMETRIC INFORMATION

Suppose we have two agents, labelled 1 and 2 that want to share an uncertain income y at date 1. They will sign a contract at date 0. We suppose that agent 1 is receiving y and has to decide to give $R(y)$ to agent 2. We suppose that $0 \leq R(y) \leq y$ (that is we assume limited liability): an agent can never pay out more than her income. We assume that agent 2 is also able to obtain some so-called outside utility opportunity, where she will receive say z. This might be another investment or consumption opportunity. Agent 1 can be characterized by a utility function $u_1(.)$. Agent 1 now optimizes expected utility $E[u_1(y-R(y))]$ with respect to the repayment $R(y)$ given that agent 2 (with utility function $u_2(.)$) is rational and benefits more from the contract than from the outside opportunity: $E[u_2(R(y))] \geq z$ and the limited liability restriction $0 \leq R(y) \leq y$.

As Freixas and Rochet (1997) show we can characterize the repayment function as follows. First we define the coefficient of absolute risk aversion by $I(.) = -u''(.)/u'(.)$ (see Technical Box 2.2). The repayment function now satisfies: $R'(y) = I_1(y - R(y))/(I_1(y - R(y)) + I_2(R(y)))$. To derive this result one needs to take the following steps. First, one needs to see that in equilibrium there should be a 'fixed' relation between the marginal utilities of agents 1 and 2: $u'_1(y - R(y))/u'_2(y) = A$. A is a constant. Taking logs we get: $\log(u'_1(y - R(y))) - \log(u'_2(R(y))) - \log A = 0$. Differentiating with respect to y gives: $u''_1/u'_1(y - R(y))(1 - R'(y)) - u''_2/u'_2(R(y))R'(y) = 0$. Using the definitions of $I_1(.)$ and $I_2(.)$ we get the required result.

So if the degree of risk aversion of agent 1 (who is splitting the returns) is high, the repayment will be very sensitive to the result y. In other words, if income is high and agent 1 is very risk averse, risk sharing will prescribe a very high payment to agent 2. Otherwise, if the degree of risk aversion of agent 2 (the receiver) is high this sensitivity will be low.

How can we see this example in case of insurance? Suppose that agent 2 is an insurance company. This company receives a certain amount of the returns y generated by the client. If the insurance company is rather risk neutral with respect to an individual client, the repayment function will be very sensitive to the returns. So it would be optimal to have a very large premium payment in case of a high return and a relatively low premium payment under a low return, hence premiums are dependent on cash flow outcomes. Note that this holds under complete symmetric risk sharing. This is hardly observed: it is more likely that there will be a kind of constant premium percentage paid. Therefore we are interested in economic theory that presents explanations of more realistic models of risk sharing. This makes us turn to the more attractive case of asymmetric information risk sharing.

As Technical Box 2.3 shows symmetric information seems not to apply to real world observations: the payment schedules resulting from risk sharing cannot be observed in practice. Therefore it is more plausible to assume that there is imperfect information and market participants have uneven sets of information available. This can lead to various types of problems in designing financial contracts between market participants. Whatever these contracts are, they will never be complete. A contract is incomplete if not al the future states and actions are described. Below we discuss incomplete

contracts, but first we describe the nature of information asymmetry. We denote information problems according to their time span:

EX ANTE That is before signing the contract. Here we have the famous so-called lemons problem (see Akerlof (1970)). Suppose we have an insurance company that offers contracts to a pool of applicants, which are observationally equivalent. The applicants differ in quality, measured by riskiness. More risky applicants will be more eager to accept risk and will be accepting a higher premium. The insurance company however will dislike risk (the profit function will be concave). The profit function will be concave due to a fixed insurance premium and limited liability of the insurance buyer. So the insurance company will act as being risk averse. It would be natural to increase the premium rate if the insurer wants to maximize expected profits, but the low risk applicants will drop out of the market first, increasing the riskiness of the whole pool of active applicants (adverse selection). This will reduce expected profits. One way to circumvent this kind of imperfection would be the ability of the client to signal its quality. The client might come up with internal wealth in financial matters, medical dossiers in medical cases, collateral, signs of quality of human capital, etc. If the insurance companies are willing to take some of these variables as additional screening instruments, rationing (that is leaving clients uninsured) can be avoided.

DURING THE CONTRACT It might be so that clients sign a contract and pretend to be of a high quality and switch to the bad, riskier behaviour after signing the contract. This problem is labelled as moral hazard. There is not so much one can do about this, except monitoring the behaviour of the client. Some monitoring mechanisms encountered in practice are discussed in Chapter 6. Monitoring, of course, is costly.

EX POST After the contract period has ended. In case it is hard to verify the true states of nature information problems even might exist in this phase. This might lead to serious problems. The most famous problem is perhaps the hold-up problem (which also applies to case 2). An insurance company that knows that it will be hard to verify the true states of the world (did the project in Argentina indeed fail? Or was the exporter able to generate a return, which could not be certified by legal authorities?), is aware of the fact that it might be hard to define the

premium and payout policy. Knowing this there will be reluctance in signing contracts. This will possibly lead to sub-optimal cases of uninsured clients. Uninsured clients will most likely cancel other activities if they cannot hedge their risks properly: there will be a slow-down of economic activity (hold-up). So information problems ex post lead to a decrease of economic activity (take the equivalent in real investment issues) ex ante.

The problems mentioned above will lead to the design of so-called incomplete contracts. These contracts do not define precise actions for all future states of the economy, but try to cover the most likely outcomes. In some cases these contracts can be combined with a so-called covenant, or a code of conduct for cases, which are unforeseen. Incomplete contracts generally include simple rules, e.g. with respect to repayment and collateral requirements. Technical Box 2.4 gives some more insight into the general principles of incomplete contracts. These general principles help us in understanding the true nature of insurance contracts.

TECHNICAL BOX 2.4 INCOMPLETE CONTRACTS: DESIGN MECHANISMS

In designing these incomplete contracts a few principles come to the fore:

1. It should be rational to participate in a contract: that is both client and insurer benefit from participation: expected returns exceed outside opportunities;

2. The contract should be incentive compatible: its parameters should be set such that it is in the best interest of both client and insurer to select the best opportunity. An easy example of an incentive compatible contract is the problem of two children who need to share a cake. If number 1 produces the two slices, number 2 can make the first selection. Cheating is avoided, because number 1 will do its best to try to get two equally sized slices.

3. In most cases there will be limited liability: no agent is personally financial responsible.

An efficient insurance contract will state a fixed premium payment and a scheduled pay out at termination for the good cases and provide additional measures for bad times. For instance if the agent is not able to

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> pay the fixed premium due to a low cash flow, the insurer will claim the full cash flow returns.

The design of incomplete contracts is troublesome, but highly relevant to insurance problems. Not all future states can be foreseen and dealt with within the contract. We need the most important mechanisms in the contract and a rule of conduct to deal with the unforeseen cases. The general rules of incomplete contracting apply to whatever insurance contract. It should be rational to sign a contract: if there is an alternative available that provides better opportunities, an agent will not be interested in signing a contract. Contracts should be made incentive compatible. This implies that it should be in the interest for an agent to reveal her true riskiness in a contract. If an insurance company for instance provides two contracts: for high-risk exporters a contract with a high premium rate but a low down-payment and for low risk exporters a contract with a low premium rate and a relatively high down-payment, it should be in the interest of the high- and low-risk exporters to select the appropriate contracts. Note that the description of an efficient insurance contract appeals more to reality than the contract we described under the symmetric information case in Technical Box 2.3. We do observe that there are fixed premium percentages.

Insurance contracts are typically incomplete and cannot foresee all future outcomes and likely actions. A few cases can be dealt with, such as low reported cash flow, financial distress or even bankruptcy. These idiosyncratic risks can probably be priced with available information from balance sheets, etc. But more general macroeconomic risk types, like political turmoil or catastrophes, are typically hard to price. So not only have contracts to deal with unforeseen cases, but also would it be impossible to deal with some cases if the appropriate prices are missing. This could result in market failures.

2.4 Market failure

How do the above theoretical notions affect the markets for risk? The dislike of too risky clients will lead to missing markets and possible rationing of clients in existing markets. Although agents are willing to fulfil all market requirements, such as paying the price set, they will be denied insurance contracts (think of the adverse selection problem for instance). This problem of so-called equilibrium rationing leads to specific problems of govern-

ment intervention. We illustrate these problems in Technical Box 2.5 below. Equilibrium rationing is unlike disequilibrium rationing, where for instance a maximum amount of insurance contracts is set in advance. In such a case an insurance company sets a maximum number of contracts of a specific type. Failure through disequilibrium rationing can be solved slightly easier than the case of equilibrium rationing by government intervention. So one could argue that disequilibrium rationing is the easier case from a policy perspective. The government could back uninsured risks or set premium rates (as we will explain the latter policy will also be a solution option in equilibrium rationing problems). Both types of interventions have serious problems though. If the government acts as an insurer of last resort this can lead to moral hazard. An insurer will take too much risk, knowing the back-up function of the public sector. Excessive risk taking can lead to financial instability. The direct control of premium rates can also lead to misallocation from an equilibrium rationing point-of-view. In equilibrium rationing some of the agents that demand insurance are refused via a too high premium. Their degree of riskiness is too high, which limits the premium set by the insurance company (a high premium would attract bad clients). Too low premium rates can probably attract the safer agents, but will also lower costs for riskier agents, leading to sub-optimal investment choices. So both equilibrium and disequilibrium rationing might be relevant to the insurance markets.

Another type of market failure is directly linked to the theory of incomplete contracts. An agent, who wants to insure some risk and is not able to reveal the true riskiness, will typically get involved in the design of an incomplete contract. The result might be that the agent will not be able to insure the risk, since the insurer has too few informative data available and possibly no credible power to collect payments, and therefore the so-called hold-up problem will originate. Here we can think of an exporting company that cannot credibly signal the future profitability of an export contract. Take the example of a Dutch exporter of TV-sets to Japan. The exporting company cannot credibly communicate its market research of the Japanese market for TV-sets. The insurance company is aware of Japanese competition in the home Tv-sets market and refuses an application due to high uncertainty of the cash flow, especially if it is hard to certify the true returns of the project.

Apart from these general notions of market failures, like missing or incomplete markets, equilibrium rationing, and hold-up problems, the nature of risk can lead to likely misallocations, that the government might want to solve. We illustrate this desire to increase social welfare in markets with

asymmetric information in Technical Box 2.5. This box shows the general wish to interfere in markets with asymmetric information. Box 2.5 starts from the adverse selection problem. The box shows that government intervention in general might be social welfare improving, but there is a limit to the extent that the government can intervene.

TECHNICAL BOX 2.5 SOCIAL WELFARE AND REINSURANCE

To what extent is reinsurance increasing social welfare in a market that is characterized by information asymmetry? Do we need full reinsurance, such that insurance companies have a risk-free return? The answer is no and we illustrate this using a model proposed by Mankiw (1986). Note that Mankiw analyses the credit market (the market for loans to students).

We assume for the sake of simplicity that both insurance companies and investing agents are risk neutral. Each agent considers investing in a project with cost 1 and an expected future payment R. Each agent has a probability P of being successful. The values of R and P vary across agents: each agent knows R and P, but the insurance company is not able to observe them. The density function $f(R, P)$ is known though. An insurance company can invest in a safe asset and obtain a certain return ρ. Alternatively it can provide insurance to agents at a return r (the same across all agents due to unobservability of the degree of risk). Note that the return is defined as the premium rate minus the expected loss rate. Let Π be the average probability of success of the investor. The expected return for the insurance company is Πr. In equilibrium we have $\Pi r = \rho$ (insurance companies do not make a profit on average under full competition).

Each investor must decide on starting the project and invests if the return R is larger than Pr: $R > Pr$. In the figure in this box we denote the investment region in the (P, R)-space. On the horizontal axis is the return on the investment project R, on the vertical axis the probability of success P. Agents in areas A and B invest, since they have a relatively high rate of return R. Agents in areas C and D do not invest. If the insurer's rate of return r increases from r_0 to r_1 the areas A and B will be reduced; given a return R the agents with a high probability of success will be driven out the market (the adverse selection effect). From a social point

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of view we want all projects with a return $R > \rho$ to be undertaken. The government is interested in this solution. It implies that the agents in area A are now investing, while this is not socially efficient, while agents in area D are not investing, while a social planner would like them to invest. But no insurance return r can make the areas A and D disappear. What can the government do in this case? It can subsidize returns r, which would shift the upward sloping line to the left, reducing the area D. It can also guarantee a return $r = \rho$ (say by full reinsurance) and reduce the area D to zero. Of course this implies a large inefficient area A, which reduces social welfare. So it is likely that a trade-off between decreasing area D in exchange for a larger area A will lead to an equilibrium insurance return r^* that exceeds ρ. There is also some concern with respect to the financing issue. Insurance companies will get Πr on average, which is lower than ρ under reinsurance. The government needs to finance the difference by distortionary taxation, which might lead to lower social welfare levels. There is a simple expression for social welfare (ignoring the costs of raising revenues) in this model. It is the surface under the upward sloping line, which can be expressed by the following integral:

$$SW = \int_0^1 \int_{Pr}^\infty (R - \rho) f(P, R) dR dP \tag{2.1}$$

The derivative of social welfare with respect to the rate of return r is (this expresses the change in social welfare due to a government induced change in the rate of return):

$$\frac{dSW}{dr} = -\int_0^1 \int_{Pr}^\infty -P(rP - \rho) f(P, rP) dP \tag{2.2}$$

For positive values of $f(P, R)$ the sign of this integral is determined by $(1/2r - 1/3r)$. So, as Mankiw also shows $dSW/dr > 0$ at $r = \rho$, so there is an increase in social welfare possible under a full reinsurance by increasing r. This implies that full reinsurance is not socially efficient. Because the market solution itself is also not efficient, the true social optimum is partial government reinsurance.

Technical Box 2.5 illustrates that government intervention might be desirable in markets with asymmetric information. Subsidizing returns or even
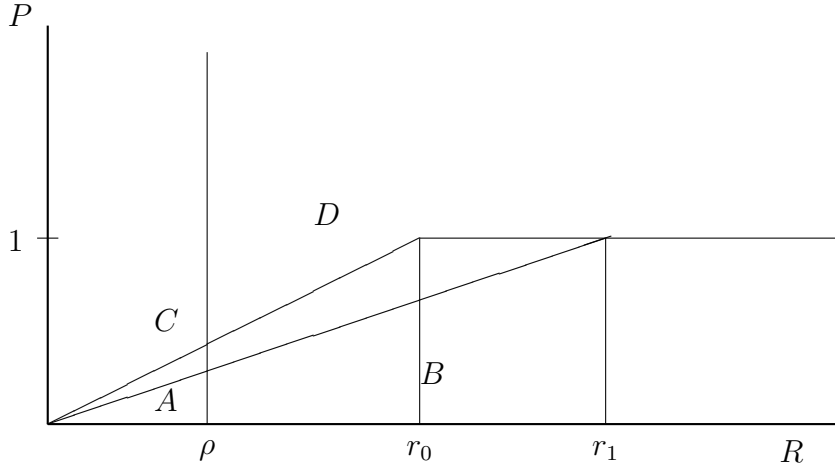
Figure 2.2: Social welfare and reinsurance.

fixing returns (as in our case by providing reinsurance) can lead to an improvement of social welfare. Box 2.5 also illustrates that there is a limit to government intervention. It would not be wise to provide reinsurance to the limiting case of fully hedging insurance companies. Box 2.5 shows that this would lead to a loss of social welfare. But what is to be learned from this? It is important to know the specific types of information problems and types of risk exporters are facing. Which type of risk can be shared cross-sectionally and what should be left over for public insurance? So we are interested in a decomposition of risk into several classes. Example Box 2.6 presents an overview, where we typically focus on the risks faced by exporters. We will use this classification in our work hereafter.

Example box 2.6 Risk classes for exporters

Suppose we have a firm that produces several tradable goods. The firm faces multiple economic risks:

- The availability of inputs (capital goods, labour);

- The price of inputs;

- The production process itself;

- The quantity and selling price of output;

- The prices set by competitors (at home or abroad);

- Market shares.

Besides the firm faces more general risks like the general level of economic activity, legal circumstances, political factors, catastrophe risk, etc. Some of these risks can be diversified within the firm. For example, the firm can minimize the variance for a given expected return of the whole product line using some kind of portfolio analysis. The firm can also decide to cross-subsidize risks within the firm. The firm can also decide to try to change its market status and try to expand activity via mergers or takeovers. Anyhow, there will be a limit to the hedging possibilities within the firm. Second the firm can try to sell risks outside the firm to insurers. Insurers pool contemporaneous risks and invest to make sure that late withdrawals can be financed. An example would be a change of fashion from product A produced by firm Y to a product B by a firm Z. If both firms Y and Z use the same insurer they are able to pool risks. A similar argument can for instance be made with respect to exchange rate risk. As long as there is a market participant with opposed contemporaneous preferences risks can be traded.

A third category of risk is intertemporal risk. Suppose that the firm wants to smooth its income stream out of production, it can buy or sell securities that will pay the necessary income stream. This will only be the case if the firm can credibly sell securities of this type. A fourth category is general macroeconomic risk. If GDP declines and all firms within the country are more likely to get into financial distress, it will be hard to provide hedging. As long as there are different opinions with respect to the future shape of the economy risk sharing can be dealt with, but this is highly unlikely for general macroeconomic variables. This class of risk affects all market players, is both static and dynamic in nature, and can be relatively large as compared to the other components.

Exporters face complicated risk patterns, which are often a mixture of micro- and macro-risk factors. The main issue is whether these types of risk

can be insured via markets. This is our concern in Section 2.5. If we are forced to give a negative answer to this general question the next problem is whether the government should interfere in the market. From the previous it is clear that risks might be hedged at the same moment of time within the firm, outside the firm, or even in a dynamic way by income smoothing. Some risks, especially of the general macroeconomic, political, and legal classes, cannot be hedged in the market and might lead to sub-optimal outcomes. But also the disability to describe loss functions might give rise to special problems in export credit risk insurance. These apply to basic insurance activities, but also in reinsurance. So there might be a serious role for government intervention. Before we turn to intertemporal government insurance Example Box 2.7 presents some reinsurance strategies in general. This box is not needed to get the general idea of government intervention, but merely provides some background information on reinsurance strategies.

EXAMPLE BOX 2.7 REINSURANCE

An insurer can try to sell risky assets (or parts of risky assets) to other insurers (reinsurance or co-insurance) or to the market (securitization). Reinsurance is a form of insurance where the primary insurer reduces the risk through sharing against a premium. The transfer of risk is known as (retro)cession. Co-insurance is a form of insurance whereby two or more primary insurers enter into a single insurance contract. Risk is shared in agreed proportions and each primary insurer is directly liable to the policyholder for its own proportion. Securitization is the wholesale of insurance contracts to a special-purpose vehicle that issues new equity or bonds to finance the claims. In all cases some so-called basis risk can still be apparent. Reinsurance has multiple functions, but the basic idea is pooling risks and reducing volatility. Five primary functions can be observed: (1) it provides flexibility, (2) it pools expertise, (3) it reduces idiosyncratic risk (because a single risk is shared cross-sectionally) and it therefore creates stability, (4) it increases financial capital (asset backing by large reinsurance companies), and (5) it provides protection against e.g. catastrophic events. The latter type relates more to public insurance. It is interesting to know which insurance companies demand more reinsurance. Garven and Lamm-Tenant (2000) argue, based on empirical research, that the demand for reinsurance will be greater, 1) the higher

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the firm's leverage, 2) the lower the correlation between the firm's investment returns and claims costs, 3) for firms which write 'longer-tail' lines of insurance, and 4) the more the firm concentrates its investments in tax-favored assets. A higher leverage will lead to a lower solvency, that in its turn will increase the demand for reinsurance. If the firm expects a relative large return and the costs of claims are correspondingly low, reinsurance will provide an optimal hedge. If a firm underwrites a project with longer claim periods, the same argument as the leverage argument will hold. The last argument is also related to the previous ones. The firm wants equal net returns across projects. A risk reduction should also apply after tax, so increasing the demand for reinsurance if the firm is involved in tax-shielded assets.

Reinsurance in general is a difficult problem. Public insurance is also a topic that is well known, especially in health insurance. If insurance companies cannot observe the true health conditions of clients an obligatory public pooling of contracts is Pareto optimal. In this case one needs to design contracts such that healthy agents still want to insure themselves against the obligatory conditions, while others benefit from the obligatory arrangements. It is better to force agents to pick a standard contract than to let the market select agents. Public reinsurance is perhaps even more troublesome. There is some literature on public reinsurance, especially for catastrophe risk. There are some questions to be answered. First, can the insurance and reinsurance private industry handle the problem by itself? Here we face the benefits of a quick and efficient handling of cases by private insurances companies. But in reality, as Froot (2001) argues, for natural disasters the coverage is low and reinsurance premiums are too high compared to fair pricing. Froot argues that there might be insufficient reinsurance capital, reinsurers' market power, inefficiency of the corporate form of reinsurance, and high transaction costs. Also reinsurers might face capital market imperfections in their attempts to attract funds. Secondly, if the public sector starts to operate as a reinsurer, can the government handle all the problems itself? There are various arguments in pro. First, the government is able to spread risks intertemporaly. Second, the government can spread risks cross-sectionally due to a large information advantage. Third, the government can simply prescribe to insure (which is relevant to catastrophe risks especially). There is almost no empirical work in this direction. A theoretical example is given by

De De Marcellis-Warin and Michel-Kerjan (2001), who describe the French public-private risk sharing Cat-Nat (government involvement in combined private-government insurance of catastrophes) project in a game-theoretic model. But all catastrophe risks probably do not apply directly to the reinsurance problems or exporting companies.

Like in insurance problems, moral hazard issues also tempt reinsurance. It is costly for the reinsurer to monitor the underwriting activities of the primary insurer and how the latter settles claims with its own policyholders. So there is a quest for 'triggers' that align the interests of reinsurers and insurers. Contracts can be made contingent upon 'general losses' in the industry, so that the contract parameters are correlated with the insurer's losses but are outside control of the insurer, thus reducing the moral hazard problems. Technical Box 2.8 gives a more elaborated example.

TECHNICAL BOX 2.8 MORAL HAZARD AND REINSURANCE

Traditional reinsurance includes controls against moral hazard. These controls are:

- Deductibles: one gets a discount on the contract for certain items;

- Co-payments;

- 'Ex post' settling up (or retrospective rating), which is a retrospective adjustment of the premium based on losses incurred during the policy period;

- Reputational investments in long-term relations. This is a much weaker control;

- Own risk classes.

Reinsurance underwriting costs can be high. Sometimes it is more than half of the first year's premium (see e.g. Froot and O'Connel (1997), and Harrington and Niehaus (1999)). That is the main argument why we can observe new hedge instruments coming up in the last years. These instruments are insurance linked securities: examples are catastrophe bonds, catastrophe options, and so-called cat equity puts. In the latter class the

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payout is not only linked to the firm's own losses, but also on some aggregated index of the losses of many insurers. Securitizing insurance risk so gives also new controls for moral hazard. If a change in behavior after signing the contract leads to more risky behavior the payout will depend on this behavior, so reducing the incentives to behave suboptimally.

What is the intuition of moral hazard in the reinsurance market? Crucial is the distance between insurer and reinsurer. If this distance is large, price controls are likely to do the job. If the insurer and reinsurer are closer it is more likely that monitoring will solve the principle-agent problem. A moral formal approach runs as follows (see Doherty and Smetters (2002)). The insurer contributes equity capital K and receives premiums (net of underwriting expenses) M. Losses are given by L. Total funds are invested at a random rate r. The terminal value of the insurer's equity without reinsurance is equal to investment returns minus losses:

$$T = (K + M)(1 + r) - L. \tag{2.3}$$

The insurer now might consider reinsurance and pays a reinsurance premium P in exchange for a payoff R in case of a loss L bigger than a specified stop-loss deductible S. The insurer can do effort a to mitigate losses $L(a)$. So losses will be reduced if the insurer monitors: $\partial L/\partial a < 0$. Once the reinsurance contract is signed, there will be a moral hazard problem: the insurer will act in its own interest and under-invest in a.

Suppose now that we assume that the primary insurer pays the premium P in two parts: an initial payment and ex post settling. Both payments are conditional on the loss L. A higher loss implies a higher premium. Suppose also that the reinsurer also insures a share h on the primary insurer's losses above S. Now we have to modify our expression for the insurer's expected equity $E[T]$

$$E[T] = (K + M)(1 + E[r]) - E[L(a)] - a - E[P(L(a); S)]$$
$$+hE[R(L(a); S)]. \tag{2.4}$$

In this equation, $E[\cdot]$ is the expectation operator. This equation gives a similar impression like the previous one. Insurers can invest at an expected rate $E[r]$. They incur an expected loss $E[L(a)]$ and pay for the effort a. Moreover they have to pay a premium P but get a return hR.

The optimal mitigation effort a^* is now given by that value of a that maximizes the expected value of equity $E[T]$: $\partial E[T]/\partial a = 0$. Here we can observe different effects. First, more mitigation effort will lower loss L. Secondly more mitigation effort will lower losses and therefore reduce premium payments. Thirdly, a higher loss will lead to a higher repayment. This is the reinsurance option. Lower effort will increase the option value. Doherty and Smetters (2002) show that in the social optimum ex-post settling must take the form: $P(L(a), S) = R(L(a), S) + c$, where c is a constant. So premiums should be a fixed mark-up over the repayment. This is a quite natural result. The insurer should pay a premium to the reinsurer that is equal to a fixed mark-up over the repayment. (Doherty and Smetters) also provide empirical support for their model for the US property-liability insurance market for the sample 1988-1995.

Reinsurance of macroeconomic or general risks could be the task of the government, knowing that a lack of such an instrument could lead to underinvestment. So public reinsurance could be an instrument to reach other goals of economic policy, like enhancing economic growth. This goal of macroeconomic policy of course could be in conflict with other goals, like stability of a market economy: the well-known trade-off between efficiency and stability. It is this difficult trade-off that the government faces in the class of reinsurance as well. Apart from all problems of moral hazard and possibly misuse of government intervention, the efficiency-stability trade-off should not be neglected. In any case the government should try at least to disentangle private and macro risks. It could be hard though to precisely disentangle individual risks to normal idiosyncratic risks and these macroeconomic, institutional, legal, etc. risk classes. But let us assume that this can be done. Why should the government hedge macroeconomic risks?

1. The government needs to provide stability of a market economy. Providing public reinsurance can lead to more stability, but more stability might lead to lower efficiency (see the trade-off as discussed above). Political preferences though should pick the optimal efficiency-stability trade-off point;

2. The government is responsible to optimise social welfare, e.g. by increasing production. Maximizing production might require stimulating exports by offering more competitive power to domestic firms;

3. The government is the single agent that can hedge so-called systematic risks, like a general mistrust in financial institutions. The government is an economic agent that acts in the interest of all. Therefore it is important that the government acts as a lender and insurer of last resort.

4. Linked to the last argument, the government can provide a back up of macro risks, because the government itself has a low social discount rate. Through that the government is able to provide intertemporal hedging, without facing too high costs. Why is the social discount rate so low? The government is always able to attract new finance in the form of tax increases and has therefore a high credit rating.

Besides these advantages there are also problems in the role of the government as insurer of macro risks. First, there can be inefficient costs of reinsurance. Going back to Technical Box 2.5, where we explained what the mechanisms of public intervention in markets with asymmetric information might look like, we showed that reinsurance might increase social welfare, but that full reinsurance most likely is not socially optimal. In this box we ignored costs of reinsurance. If we introduce costs, for instance of servicing the reinsurance contracts, it is likely that the degree of reinsurance that is wanted from a social perspective will drop. Second, moral hazard problems might come to the fore. Risk taking companies e.g. decide to export to political instable countries, knowing that the government will hedge the political risk. By announcing public reinsurance alone the government changes the playing field. Third, political issues might disturb an optimal allocation of hedge funding (see also Niehaus (2002)). Political pressure can lower rates for certain subgroups, which distorts loss control incentives. Finally, it might also be so that the government might have influence itself on risk cases. The government might be involved in support programs for certain countries for which it provides export reinsurance as well.

Probably the most important disadvantage is the moral hazard problem. The economic literature gives some clues to circumvent these problems. For instance one could require the firm to use some fraction of internal wealth in these risky investment projects. Alternatively, one could strive for efficient early liquidation (and a liquidation threat) of the contracts. If negative signals reach the government reinsurance body, the project might be liquidated. This threat of liquidation might lead to more efficient investment in export contracts. A final argument might be reputation: if previous cases

have been handled satisfactorily, one could get a higher rating and benefit from better business opportunities in the future. In Chapter 6 we will see that financial statements of companies applying for export credit risk insurance are screened by the potential insurer. This way, companies can build a good reputation and ask for lower premiums.

2.5 Determinants of insurability

Above we presented the theory of insurance. We showed the general principles starting from information asymmetry. Next we turn to our specific problem in a more conclusive way: what are the determinants of insurability on the market? Or in other words in what cases should the government intervene? One could rephrase the first issue as follows: what are the requisites of an ideally insurable risk? Knowing these requisites we can go a step further and analyse whether our specific case, the market for export credit risk satisfies these general principles. Schmit (1986) defines the requisites of ideally insurable risk as follows:

1. There should be a large number of exposure units. The insurer should be able to estimate loss distributions. This might be doubtful in the case of export credit risk, because this requires too much knowledge on the side of the insurer with respect to world financial and real developments (so this argument holds especially with respect to country risk);

2. Independence among exposure units. This is a problem in the market for export credit risk. Think of for instance contagion problems in currency crises, like the Asia crisis in 1997-1998. Contagion troubles the problem of independence. In general some macroeconomic risks are troubling independence among units and here the role for government intervention starts;

3. Calculable expected loss in monetary values. This problem applies stronger to health insurance than to credit-risk insurance. In general, loss cases in export credit cases can be valued clearly, but it might be hard to verify the losses in court;

4. Definite loss as to time, place, amount, and cause. It should be clear what the loss is, when and how it happened, etc. This could be a problem in export credit risk insurance, because of the argument given under 3 as well;

5. Fortuitous loss (the loss needs to be really coincidental): fortuity is required as a mechanism of abating the incidence of moral hazard. If there is a true accident, this is not in the benefit of the buyer of insurance. In case there is no reported accident needed to claim repayment, there might be incentives to cheat. This might also be a problem in export credit risk cases. Sometimes the loss case is completely out of sight for the insurer and therefore hard to verify;

6. Economic feasibility: if there is a high potential loss and a low probability of loss. In those cases the premium payments are relatively high to the amount of loss and become infeasible. In general this would only apply to very specific cases in the export credit risk insurance. Especially large projects would suffer from this.

7. Avoidance of catastrophe potential. Catastrophe risks are risks on their own and should not interfere with export insurance problems. Avoidance of catastrophe potential could be seen as a derivative of the previous items. Although relevant to exporters it is not in the core of the problem we are interested in.

It cannot be neglected that export credit risk does not meet all requisites as given above. In some cases reinsurance will help, but as discussed above, the costs of private reinsurance might be too high (and sometimes are, see Froot (2001)). A lack of private competition in reinsurance markets might be the cause of this problem. So there is a role for government intervention in order to enhance competition or to act as a reinsurer itself, but the natural question is to what extent. Here moral hazard plays a crucial role.

What is to be learned for our empirical research from the results so far described above? There are three items worth mentioning:

- We need to get insight into acceptation criteria and premium rating. The main hypothesis is that for those cases where loss distributions can be made, premium payments should be lower. This hypothesis can be tested by comparing loss premia between types of industries and countries;

- We need to know the ways of covering export credit risk. This holds for basic insurance and reinsurance.

- We need to get insight into the role of government reinsurance. How is the problem of moral hazard dealt with?

2.6 Securitization of risks

In the previous sections we have argued that moral hazard is as a potentially important obstacle to the offering of insurance contracts. In Chapter 3 we will see that the price of insurance covers depends on the amount of capital of the insurance firm. Capital is required to underwrite any line of (re)insurance business. According to some estimates (Doherty (2000)), the net worth of the US property-liability insurance industry is approximately US\$ 300 billion, and the US capital market represents a capital base of some US\$ 10-12 trillion. These numbers lead naturally to the question whether insurance risks could be securitized. Securitization can be defined as the process of packaging loans and other debt instruments, and converting the package into a security or multiple securities. In the present case, the pay-off on these securities depends on the occurrence of the events that are insured. In this subsection we discuss this issue, first by looking at catastrophe risks (where securitization has taken place already) and after that we focus on export credit risk insurance.

The capacity of the reinsurance market can be affected significantly by one or two large claims. Often, these claims originate from natural disasters like hurricanes, earthquakes, and floods (only four of the 40 most costly insurance losses during the 1970-2001 period are from man-made disasters, all others have natural causes, see Sigma (2001)). To enable reinsurers to manage their exposure to natural catastrophe risks, new instruments (apart from 'regular' reinsurance) have been introduced. These instruments typically are based on securitization of the risks. An example of such an instrument is the catastrophe bond, also known as the cat bond. Payment of the interest and/or repayment of the principal is contingent on a certain catastrophe not to occur. Because of its pay-off structure, such an Arrow-Debreu security[1] has a low correlation with returns on the stock market in general, and hence, it carries little non-diversifiable risk. This argument in favour of adding cat bonds to a portfolio is not convincing, though: an investor could also buy reinsurers' equity if his only interest were investment in securities that have a low correlation with the market return. A more convincing argument for the existence of such bonds is their flexibility: instruments like cat bonds allow insurers to follow a risk management strategy appropriate to their particular needs. An important example of this is the problem of moral hazard between

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[1] A cat bond can be considered to be an Arrow-Debreu security because it pays off when a certain event does not occur, and it does not pay off otherwise.

primary insurers and reinsurers. Ex ante, the primary insurer could fail to prevent future claims, because it is protected by its reinsurance contracts. The reinsurer can solve this moral hazard issue by explicit monitoring, although that is expensive. Ex post, moral hazard arises when the settlement of losses by the primary insurer is too lenient. Especially when a natural catastrophe occurs, the administrative system of the primary insurer may collapse under the number of claims. Careful monitoring of these claims is not feasible. The primary insurer can avoid some of the transaction costs of settling claims by making generous settlements, possible because of the reinsurance contracts. Besides this moral hazard risk, standard reinsurance contracts also suffer from some credit risk: performance on the contract depends on the financial health of the reinsurer. New instruments have been introduced to deal with these moral hazard and credit risk problems. Since 1994, cat options are traded on the Chicago Board of Trade (CBOT). The payoff of these options is defined on (mostly regional) loss indices and their basic structure resembles a stop-loss reinsurance contract[2]. Even when the loss index exceeds the 'strike price', the primary insurer has an incentive to minimize costs of settlements, both ex ante and ex post. The reason for this is that the payoff of these options is to a large extent independent of the losses of the primary insurer. Any reduction of losses, for example by better screening of claims, is not translated in a lower payoff of the reinsurance contract. This line of reasoning is formalized in Technical Box 2.9. These options control the moral hazard problem. The credit risk problem remains, since the writer of the option has to be able to pay any liabilities when the option holder calls for settlement.

Technical box 2.9 Moral hazard and securitization

In this box we look more formally at the relation between moral hazard and reinsurance. Suppose that the primary insurer can put effort into mitigating its losses, for example by screening its clients, inspection of risks, and careful examination of claims. The insurer has equity E, and receives premiums P which are invested at a random rate r. Claims L

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[2]A stop-loss (re)insurance contract is a contract where all losses exceeding a certain level are paid by the (re)insurer. This threshold is known as the 'retention' or 'attachment point'.

are paid at the end of the year, so the terminal value of the insurer T is

$$T = (E + P)(1 + r) - L. \tag{2.5}$$

so the value of the insurer at the end of the year is the equity and premiums received and its return, minus the claims paid. The insurer now buys reinsurance, which costs R. It is a stop-loss policy which pays when the losses on some underlying portfolio I exceed some deductible S. The costs of reinsurance will depend on I and S: $R = R(I, S)$. The payoff of the reinsurance can be interpreted as a call option, so we use the notation $C(I, S)$. The payoff by the reinsurer is $hC(I, S)$, h can be interpreted as the fraction of the portfolio that is insured. Finally, we introduce mitigation. Losses are affected by efforts a by the insurer: $L = L(a)$, but mitigation costs an amount a. The expected terminal value of the insurer is now

$$E[T] = (E + P - R(I, S))(1 + E[r]) - E[L(a)] + hC(I, S) - a. \tag{2.6}$$

The expected value of the insurer now also depends on the cost of reinsurance, the payoff of the reinsurance contract, and the cost of mitigation. The optimal amount of mitigation is found by differentiating this expression and setting the result to 0:

$$\frac{\partial E[T]}{\partial a} = -\frac{\partial E[L(a)]}{\partial a} - 1 + \frac{\partial C}{\partial I}\frac{\partial I}{\partial L}\frac{\partial L}{\partial a} = 0. \tag{2.7}$$

The three terms in this expression reflect the gains of mitigation on expected losses, the costs of mitigation, and the effect on expected payout by the reinsurer. This last term has three components: the marginal effect of mitigation on losses, the marginal effect of losses on the losses on which the reinsurance contract is defined, and the marginal effect of the losses on which the reinsurance contract is defined on the payoff of the reinsurance contract. Because reinsurance is defined on the loss of the primary insurer, we have $\partial I/\partial L = 1$.

Consider now a cat option that pays if some loss index of the industry exceeds a certain threshold, and suppose that the insurer has a portfolio that covers, say, 5% of the market. Hence, the insurer wants to buy a cat option that pays 0.05 times the payoff on the amount by which industry losses I exceed a threshold S. Because I is the sum of all the losses among

all insurers, $I = \sum_i L_i$, spending a_i on mitigation of claims reduces the payoff on the cat options by only $0.05 \times \partial L / \partial a_i$. Because the insurers losses determine the actual payoff on the cat option to a limited extend (5% in this case), the moral hazard problem is alleviated.

Catastrophe bonds can be analyzed similarly. If the principal or interest payments are forgiven based on some industry index, moral hazard is mostly alleviated. If payment of principal or interest depends on the losses of the primary insurer only, the cat bond does not (solve) address moral hazard.

In practice, CBOT requires a margin account for writers, and it maintains a security fund. An instrument that solves the credit risk problem as well is the cat bond. These bonds are issued by a special purpose vehicle and do not suffer from credit risk because the bondholders have agreed ex ante to give up interest payment or repayment of the principal in case a verifiable event occurs. Of course it is important that the insurer cannot manipulate the trigger so as to avoid ex post moral hazard.

The introduction of these new instruments (cat options and cat bonds) has changed management of catastrophic risks in two ways. First, it is possible for investors to take a particular position in, say, a California earthquake. Earlier, investors could invest in reinsurance companies' equity only, which is much cruder. Securitized insurance instruments have expanded the potential capitalization of the industry significantly. Second, by careful design of the contracts of the instruments, it is possible to deal with the moral hazard problem and credit risk. Contract design is more flexible and can be adjusted on a case to case basis.

To which extend can these instruments be helpful in reinsuring export credit risk? As discussed above, securitization of risks offers new opportunities for investors, and it can help to alleviate moral hazard. First we look at the investment opportunities. Nowadays, investors can invest in most international capital markets, and securitization of export credit risks does not offer new investment opportunities (which is the case for catastrophe related securities), it would merely expand investment opportunities in companies of the importing country. Since the return on the securitized object would be correlated with the (global) market index, a risk premium would be required and that would make this option more expensive for the primary insurer of the credit risks. Second, securitization could help solve a moral hazard

problem between the primary insurer (Gerling NCM) and the government. Because Gerling NCM is the only primary insurer that reinsures its risks with the Dutch government, it is not feasible to use an index that depends on the losses by the primary insurer. Perhaps this could be resolved by using a credit rating from external agencies like Moody's or Standard and Poor's. If the credit rating of a country drops below a certain level, and when losses exceed a trigger level, (part of) the interest and/or principal is forgiven. Such an instrument only hedges against country specific risk, not against fabrication risk, or credit risk of the importing company.

2.7   Conclusion

Financial markets and financial institutions operate in order to hedge risks. We show that risk sharing under symmetric information, although theoretically appealing, is not a realistic case. Designing incomplete financial contracts under imperfect information is more realistic. These kinds of contracts will give rise to all kinds of market failures. We discussed the major classes and sketched the problems arising. Government intervention seems to be justified in theory for reinsurance of macro or systematic risks. The government is the only agent that is able to provide dynamic macro insurance. As for all insurance contracts moral hazard problems arise. It might be so that excessive risk taking is financed by public financial capital.

An important issue in assessing the desired degree of public reinsurance is the disaggregation of individual risk into components that can be identified as micro and macro risks. Macroeconomic risks typically are:

- Political risk;

- Business cycle risk (production, unemployment, inflation);

- Legal risk;

- Catastrophe risk;

- Systematic financial risk (like distrust in the financial system).

The government could provide insurance for these risk classes. In order to avoid moral hazard, the government could use the following instruments in designing contracts:

1. Collateral: internal wealth should be used;

2. Reputation: credit ratings;

3. Threat of early liquidation;

4. Varying repayment schedules: such as denoted in Box 2.7 for the new contingent claims.

5. Securitization of risks. In Box 2.9 we have shown that this alleviates the moral hazard problem.

In any case benchmarking of contracts would be a good instrument to assess riskiness and degrees of moral hazard. For example, contracts can be compared on a country-by-country basis, and between different types of insurance. Contracts will differ as far as riskiness and moral hazard are concerned, and monitoring effort and information requirements should reflect these differences.

CHAPTER 3

PRICING RISKS

In the previous chapter we discussed whether or not an insurer will enter the marketplace to take on risks. If the insurer is willing to do so, the question remains what the price of this risk will be. In this section we discuss the most important elements that determine the pricing of risks (also known as rating), where we take the point of view of the insurer. Rating determines the economic feasibility of an insurance cover (see also section 2.5, requirement 6), and hence is one of the elements that determines insurability of risks. If the price of a risk transfer is too high for the agents exposed to that risk, no transfer takes place and no market for that particular risk transfer will develop.

3.1 PRICING RISKS

Individuals and companies are risk averse, so they are willing to pay a premium to be relieved of this risk. As discussed in the previous section, risk aversion is an important parameter that describes the willingness of economic agents to sell risks they are exposed to. Usually, agents sell their risks to an insurance company, which takes on the full risk, or part of it by re-selling part of the risk to other agents.

The central issue for an insurer (or company) is the issue how much risk to retain, and how much to pass on to another party (insurer, re-insurer, government). The amount of risk to retain depends on a number of factors. First of all, there is the amount of capital available to the insurer. More wealthy insurers can retain larger risks for their own accounts than less wealthy insurers. Secondly, there is the risk attitude of the management. A more conservative management will retain less risk. The third factor is the premium that

is charged: will the policy generate a profit for the company? These three elements are discussed in detail in Box 3.1. Finally, the risk itself must be taken into account. An insurer will prefer a portfolio of balanced risks to one of risks that are very unbalanced. An example of an unbalanced portfolio is one, which insures export credit risks to one country only. Unbalancedness of risks in a given portfolio can be measured through the correlation between the risks. These elements can be merged in a formula (Straub (1997)):

$$\text{retention} = \frac{\text{capital} \times \text{profit margin}}{\text{unbalancedness} \times \text{risk aversion}} \quad (3.1)$$

This is a qualitative formula. It is not suitable for empirical implementation, but it can be used to see how the variables are related. Using this simple qualitative formula, we can describe the main problems encountered by an insurer in practice.

1. Rating, that is,

$$\text{profit margin} = \frac{\text{retention} \times \text{risk aversion} \times \text{unbalancedness}}{\text{capital}}$$

   so the profit loading in a given premium should, among other things, depend positively on the unbalancedness of the risks.

2. Reserves can be assessed through

$$\text{capital} = \frac{\text{retention} \times \text{risk aversion} \times \text{unbalancedness}}{\text{profit margin}}$$

3. Underwriting limits can be fixed according to

$$\text{retention} = \frac{\text{capital} \times \text{profit margin}}{\text{unbalancedness} \times \text{risk aversion}}$$

   so a lower degree of risk from an unbalanced portfolio should be kept for own accounts.

4. Finally, the maximum tolerable risk load, given the amount of capital available to underwrite a line of business, the required profit margin, the risk aversion of the management, and the retention is given by

$$\text{unbalancedness} = \frac{\text{capital} \times \text{profit margin}}{\text{retention} \times \text{risk aversion}}$$

These formulas are all qualitative, but they do indicate the direction of the relation between the different variables.

TECHNICAL BOX 3.1 RISK AVERSION AND THE PRICE OF INSURANCE

How much is a company willing to pay to be relieved of risk? Suppose that a company that faces a potential loss at time $t = 0$. The size of the loss is denoted by X, so $X \geq 0$. At $t = 1$ it is clear whether or not the risk has occurred so there is no longer any uncertainty left. The probability that the loss does not occur is strictly positive: $\Pr(X = 0) > 0$. Furthermore, the company has working capital C, so at $t = 1$ the capital of the company is $C - X$. Since the probability that the risk does not occur is positive, there is a positive probability that capital at $t = 1$ is exactly C.

Now the company can sell this risk to an insurance company, at a price P. The insurance is a full cover, so if the loss to the company is X, it is fully reimbursed. If the company chooses to buy the insurance, capital at $t = 1$ is know with certainty, and equal to $C - P$. The question is now: will the company choose to buy the insurance, or not? At this moment we need to be more precise about the preferences of the company. According to the Von Neumann-Morgenstern model, preferences can be represented by a concave utility function $u(\cdot)$. Moreover, the decision rules based on this utility function are identical to those derived from maximizing expected utility $E[u(C - X)]$.

The company can now choose between insuring against the risk, so that capital at $t = 1$ is $C - P$. This amount is known with certainty. The expected utility of the company will increase by buying the insurance cover, if $E[u(C - X)] < u(C - P)$. Since utility is non-decreasing, this inequality is satisfied if $P < P^+$, with P^+ the premium that makes the company indifferent between buying the insurance or not, that is,

$$E[u(C - X)] = u(C - P^+). \tag{3.2}$$

P^+ is the maximum price the company is willing to pay to be relieved of the risk. It makes both alternatives (having no insurance and buying insurance) equally attractive.

Using similar arguments, there is a lower price for the cover that is demanded by the insurance company. The insurer, with utility function $U(\cdot)$ and capital W, will offer the insurance cover if the price exceeds a

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minimum price P^-. That minimum price makes the insurer indifferent between offering the insurance or not, and follows from

$$E[U(W + P^- - X)] = U(W). \tag{3.3}$$

The insurer will take on the risk if $P > P^-$. A market for the risk exists only if the maximum price that the company is willing to pay exceeds the minimum price the insurer requires, that is, if $P^+ > P^-$.

The maximum price P^+ and the minimum price P^- can be approximated in terms of the coefficient of risk aversion and the characteristics of the distribution of X. Let μ and σ^2 be the mean and variance of X. It turns out that it is possible to approximate the maximum price a company is willing to pay for its cover (Kaas, Goovaerts, Dhaene, and Denuit (2001), p. 6):

$$P^+ \approx \mu - \frac{1}{2}\sigma^2 \frac{u''(C - \mu)}{u'(C - \mu)} \tag{3.4}$$

The ratio $-\frac{u''(C-\mu)}{u'(C-\mu)}$ is known as the (absolute) risk aversion coefficient, and denoted by $I(\cdot)$ (see also Technical Box 2.2). Because the numerator of $I(\cdot)$ is negative (utility is assumed to be concave), $I(\cdot)$ is positive. The coefficient $I(\cdot)$ is increasing in the amount of risk aversion: the more risk averse a company is, the higher $I(\cdot)$. The maximum premium P^+ to be paid to be relieved of a risk X is thus approximately

$$P^+ \approx \mu + \frac{1}{2}I(C - \mu)\sigma^2. \tag{3.5}$$

This premium depends on the two parameters that characterize the risk, and on the risk aversion, a behavioral parameter. Companies may differ in their degree of risk aversion and hence, may be willing to pay different prices to transfer an otherwise identical risk. The premium is increasing in the expected loss, and the variance of the loss. The premium that the company is willing to offer is increasing in the expected loss (one-for-one), increasing in the risk aversion, and increasing in the variance of the loss. Using similar arguments, the minimum premium required by the insurer is

$$P^- \approx \mu + \frac{1}{2}I^I(W - \mu)\sigma^2. \tag{3.6}$$

The minimum premium required by the insurer is increasing both in the expected loss, and the variance of the loss. Also, the more risk averse the insurer is (as measured by I^I), the higher the premium P^- will be. The term $\frac{1}{2}I^I(W - \mu)\sigma^2$ is sometimes called a 'security loading' because it reflects the difference between the premium and the expected payout. The security loading is related to the uncertainty of the risk: the riskier the risk, the higher the security loading.

As argued earlier, a necessary condition for the existence of a market for the risk X, is that the maximum price the company is willing to pay exceeds the minimum price the insurer demands, $P^+ > P^-$. Therefore, there will be a market for the loss X only if $I^I(W - \mu) < I(C - \mu)$, that is, the risk aversion of the insurer is lower than the risk aversion of the company.

The implications of this simple model are clear: the risk is borne by the party with the lowest (absolute) coefficient of risk aversion. Typically, an insurer has a lot of capital to back its business, its coefficient of risk aversion is lower, and we expect that the insurer is willing to buy the risk. However, different insurers may have different degrees of risk aversion, and the same applies to the different companies seeking insurance. This model of risk transfer allows for the possibility that only some insurers offer the cover, and only some companies are willing to pay the price of the cover. If the capital of the insurer decreases (for example, because of realized losses, or because of adverse developments of the return on capital), the price required by the insurer increases. Capacity of the insurance market varies over time because of such exogenous factors.

Export credit risks have two characteristics that distinguish them from other (industrial) risks: risks are correlated, and risk exposure varies over time. Suppose an insurer offers credit risk insurance to country A, and ten companies buy this insurance. Because typically the same events are covered under the policies, the risks are correlated. If the insurer has to pay out to one company because of say, unexpected import restrictions, it will probably have to pay out to all ten companies. To the insurer, acceptance of these export credit risks basically implies taking on a risk of ten of them, instead of taking on ten more or less independent risks. The unbalancedness of a portfolio of export credit risks can become high, which is also pointed out by the interviewed insurers. Of course, this applies mostly to country risk and

less to the two other main components of export credit risk: fabrication risk and credit risk (of the receiving party). To the extend that foreign trading partners are controlled by the state, it is possible that country risk, fabrication risk, and credit risk are indistinguishable. A detailed analysis of past claim behavior can shed light on correlations between these types of risk.

A second problem is that export conditions to country A depend on the local political situation. The local political situation can change quickly because of external events (events of 11 September 2001), or because of internal events (elections). In both cases this makes it difficult for the insurer to assess the actual risk in an export credit cover, and therefore the insurer may exhibit more risk aversion when assessing these risks. Past claim behavior need not be representative for future claim behavior, especially in the case when long-term contracts are rated. These two characteristics imply that export credit insurance require a high profit margin and high capital requirements (items 1 and 2 above). Both problems relate more to political risks than to trade risks. If these risks were to be insured under separate covers, the political risk cover would be affected most and be relatively expensive.

TECHNICAL BOX 3.2 PRICING CORRELATED RISKS

Following the approach to pricing risks in Box 3.1, we can derive the effect of correlation of risks on the aggregate premium required on a portfolio of risks. Suppose for simplicity that the only risk covered is political risk, and that two exporting companies 1 and 2 are equally exposed to that risk. The potential loss is represented by X_1 and X_2. The expected loss per company is μ and the variance of the risk is σ^2. Because they companies export to the same country, and because the risks are assumed to be perfectly correlated, the expected loss to the insurer is 2μ and the variance of the loss is $4\sigma^2$ (because $\text{var}(X_1 + X_2) = \text{var}(X_1) + \text{var}(X_2) + \text{cov}(X_1, X_2)$). The minimum aggregate premium required on the portfolio (consisting of these two risks) is then approximately

$$P^- \approx 2\mu + 2I^I(W - 2\mu)\sigma^2. \tag{3.7}$$

However, if the risks had been independent, the minimum aggregate premium would be

$$P^- \approx 2\mu + I^I(W - 2\mu)\sigma^2. \tag{3.8}$$

> The loading over the net premium is doubled because of the (full) correlation of the risks.

The theory above only gives bounds on the price that exists in the market place for a given risk. In any specific situation, the insurer usually posts a price that he wants to receive if a certain risk is taken over from a client. This price does not only reflect a price for transfer of the risk itself, but also costs of acquiring and administering the cover. The premium charged depends on the following factors (Booth, Chadburn, Cooper, and Haberman (1999)):

1. the exposure of the policy holder and the insured goods or services to the various insured perils;

2. the degree of risk associated with the policyholder;

3. the expenses of acquiring and administrating the policy;

4. the profit required by the insurer.

The last two factors can be estimated with a reasonable of accuracy, but the first two factors are difficult to estimate with some precision. A cautious insurer will therefore tend to estimate these on the safe (high) side. An important component of the first factor is the 'net premium', that is, the expected payout on a certain cover. Often, this is increased with a safety loading reflecting uncertainty of the payout (see also Boxes 3.1 and 3.2 above), and statistical uncertainty about the parameters of the risk process.

An important element in the determination of the actuarial premium is the incorporation of experience (see for example Herzog (1999), and Bowers, Gerber, Hickman, Jones, and Nesbitt (1997)). There is always pressure on an insurer to decrease the premium of clients that have shown to be 'good risks'. If the insurer would not do so, the client would threaten to leave for another insurer who would be willing to offer a lower rate. Hence, insurers like to distinguish between 'good risks' and 'bad risks' and adjust the rates accordingly[1]. Usually, two different types of rate adjustment are considered:

- a prospective system where the rate is adjusted based on past experience;

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[1] The standard example is the bonus-malus system in car insurance.

- a retrospective system where the rate is adjusted ex post. This system is a profit-sharing system.

The first system is reasonably accurate if past experience provides a good measure of future risks, and we have argued that that is unlikely to be the case for export credit risk insurance. Even though insurers have databases with company- and country-specific information (Chapter 5), it is unlikely that a risk analysis based on past data is appropriate for some future situation. The second system requires that the insurer can monitor the risks taken and the losses incurred with high degree of precision. This is difficult in the export market, since the risk exposure of the exporting company cannot be verified easily by the insurer (as opposed to the case where, say, buildings are insured against a fire), and the company does not have a strong incentive to reveal this information.

Even though an actuarial premium reflects all the costs indicated above, the insurer may have other business goals than achieving an adequate level of profitability on a particular line of business. Other company objectives may include

- to achieve a minimum market share;

- to achieve a certain premium growth rate;

- to obtain a broad spread of business (for example by geographical area, policyholder type or industry mix);

- to be able to present a cover for all possible risks to all clients.

The last possible objective means that insurance companies like to present their customers with a full line of policies. Export credit risk cover may be considered to be one element in the portfolio of covers that is offered, and is offered for that reason and not for the profitability of that line per se.

The premium calculation can thus be considered to be a two-stage process:

1. A costing exercise where the theoretical price of the risk and the associated administrative expenses are calculated;

2. A pricing stage where the actuarial premium developed in the first stage is adjusted to reflect market conditions, uncertainty about the actuarial premium, marketing objectives of the insurer, etc. The adjustments in this stage are usually highly subjective.

In the case of export credit risk insurance, it is reasonable to assume that the second stage is affected by the current institutional arrangements where one insurer (backed by a government) will accept most risks that are not taken by other insurers. Perhaps this decreases the willingness of insurers to offer export credit risk insurance to complete their line of insurance products. In the end, the adjustment in the second stage determines the final price of an insurance product, and if this is perceived as being too high by the market, no market place for that insurance product will develop.

3.2 Conclusion

In this section we have discussed actual pricing of risks, taking the view of the (re)insurer. The price of insurance determine the feasibility of a market in that particular insurance: if the price is too high, no market will develop, and hence it is important to understand the actual determinants of prices for risks. The driving force of the price of insurance products is risk aversion, both of the insured and the insurer. If the risk aversion of the insurer is too high, it is possible that certain risks cannot be insured. Risk aversion depends on the amount of capital available, and therefore the capacity of the insurance market varies with the amount of capital available to (re)insurance companies, and the return on that capital.

Setting a price for export credit insurance is more difficult than, say, for car insurance because of two complications related to setting the actuarial premium: first, the payouts on insurance policies that cover the same country are correlated (for the insurer). This makes a portfolio of export risks more unbalanced, and therefore, requires more capital to underwrite such a portfolio. Alternatively, if the amount of capital of an insurer is fixed, he will limit the insurance capacity offered on the market to maintain a certain balance in his portfolio (see also Chapters 5 and 6). A second problem when rating export credit risks is that risks can change quickly. The local political situation can change quickly, and that makes it difficult for insurers to assess riskiness of a certain cover. The standard tool of credibility in rating export credit risks cannot be used. These two complications imply that export credit insurance will require a high profit margin and high capital requirements. These effects lead to high premiums, which may cause adverse selection of risks (see also Section 2.4). As argued before, there is a trade-off between the level of premiums and the riskiness of applicants.

In practice, the actuarial premium is used as input to the actual rate of

a cover. Subjective adjustments are made to reflect market conditions, marketing objectives, uncertainty of the estimated premium, etc. If these adjustments increase the premium too much, no market for that line of insurance will develop.

Chapter 4

Introduction to market research

4.1 Introduction

In the previous chapters the research problem was addressed by means of a review of relevant literature. The next chapters will describe the results of a field study. The goal of this study is to get a qualitative insight into the relevant factors determining the insurability of export risk in the Dutch market. Following the structure of the market research process (e.g., Malhotra (1999)), the main phases in our study are the following. The field study starts with a definition of the problem and the formulation of the main goals of the study (Section 4.2). In our case, the goals of the field study were derived from the research questions (and subquestions) formulated in Section 1.2. The next three phases in the market research process focused on data collection issues. Since we distinguished four relevant groups of actors (insurance companies, reinsurance companies, intermediaries and companies demanding export risk insurance, see section 1.4), the actual field study consisted of four studies that were executed partly simultaneously and partly subsequently. Based on the research objectives the appropriate data collection methods were determined (Section 4.3). Given the qualitative nature of the project, a list of interview topics was developed that contained the items that had to be addressed in the interviews (Section 4.4). Starting with the research questions, a specific list of topics was developed for each of the four groups of market players. The next step was the selection of respondents. Section 4.5 discusses how the relevant subjects were identified and provides an overview of all organizations and persons that have been interviewed. Finally, Section 4.6 describes the way

the interview data were prepared, analyzed and transformed into a report.

4.2 Goals of the field study

In the field study the findings of the literature study are confronted with actual practice. The findings of the field study should complement those from the literature study in answering the two central research questions with regard to the determinants of export credit risk insurability and the possible risk coverage by the private market. The more specific goals of the market research are to provide:

- A description of the market of insuring export credit risks (Chapter 5). In chapter 5 subquestion 1 (formulated in chapter 1) is addressed: what are the main market players in this market, what are the main trends as perceived by these actors, which risk categories are covered by private companies, and what are the limitations?

- The acceptance criteria, premium rating and moral hazard issue (Chapter 6). Subquestions 2 and 3 are addressed in chapter 6: which acceptance criteria are used in practice, what factors inhibit the possibilities of insuring certain export risks, how important and stable are acceptance criteria and premiums, what factors are important for the premium rating, and how do various market players deal with the possibility of moral hazard?

- Alternative ways of covering export risks (Chapter 7): Subquestion 4 is discussed in chapter 7: what are alternative ways of covering export risks used by various market players?

The findings in the chapters 5, 6 and 7 are based on personal interviews with representatives of the four groups of market players and secondary sources of market information obtained from these organizations.

Given the nature of the research goals, the lack of adequate previous empirical research, and the size of the market segments, the market research study will not be quantitative but qualitative. Qualitative methods are appropriate when the researcher seeks to describe, decode, or translate the meaning and not the frequency of certain phenomena in the social world (Maanen (1979)). The aim of a qualitative study is to gain an in-depth understanding of the situation (Carson, Gilmore, Perry, and Gronhaug (2001)).

Our field study aims at uncovering relevant factors and policies and will be descriptive and exploratory. In exploratory research the information needed is less clearly defined, the research process is flexible and relatively unstructured; samples are small and non-representative, while the analysis of the collected data is qualitative (Malhotra (1999)).

In order to get a complete view of the relevant factors on this market as perceived by the identified market players, information was gathered from these relevant market players. These market players include insurance companies, reinsurance companies, brokers, and companies demanding insurances.

4.3 METHODS OF DATA COLLECTION

In market research there are generally four ways of collecting information from respondents (Malhotra (1999)): by mail, electronic media (e-mail or web sites), telephone or face-to-face (personal interviews). Mail and electronic surveys are suitable for collecting quantitative data that are relatively easy to collect and if a well-structured formal questionnaire is available, usually consisting of a number of fixed-alternative questions. Face-to-face interviews are more useful in collecting qualitative data and have the advantage of getting deeper into the relevant research questions thus enabling the interviewer to get more complex and sometimes confidential information. On the other hand personal interviewing is time-consuming and thus expensive. Telephone surveys can be used for both qualitative and quantitative research and require at least a semi-structured questionnaire. In practice, a trade-off must be made with respect to the quality and richness of the data to be gathered and time and costs considerations.

Since the field study is exploratory by nature, personal interviews are the best way of collecting information. Personal interviewing provides flexibility to the data collection process, it enables us to ask a more diverse set of questions, sample control is high (who is answering the questions?), while the response rates are usually high (Malhotra (1999)). In-depth personal interviews, as we have conducted, allow for gathering a wide range of data, they allow for observation, what people say, written materials, and documentary evidence (Carson, Gilmore, Perry, and Gronhaug (2001)). Actually, in several instances the respondents provided us with relevant company documents during the interviews. Given that quite a few important insurance companies are London-based, we decided to interview firms in London too. Altogether eight companies, two intermediaries and six insurance companies,

were interviewed personally in London. Notwithstanding the advantages of personal interviewing, in a few cases we relied on telephone interviews, for time considerations when it involved companies based in, e.g., Washington, New York, Munich and Zurich. Also, the restricted time forced us to rely on telephone interviewing in case of the companies that demand export risk insurance. However, these companies were interviewed as the last group of market players, at that stage our understanding of the market was quite well developed, and (compared to the other groups of market players) a relatively large number of organizations was interviewed in this group. The actual number of interviews per group of organizations depended upon the size of the group (for further details see section 4.5).

4.4   THE QUESTIONNAIRE

Given our understanding of the market of export risk insurance, based on the literature study and a number of expert interviews (see section 4.5), the in-depth personal interviews could be relatively structured. Structure was provided to the interviews in terms of a list of topics, applied as a semi-structured questionnaire. The topics included the issues that had to be addressed, but did not restrict the interview to them. The topics included general questions (about the company and the market), criteria of acceptation (both the current criteria and the dynamics involved with them), premium rating (again: both current situation and dynamics), moral hazard (how to cope with it and how to avoid it), and alternative solutions to export risk insurance.

For each of the four groups of market players a specific list of topics was developed. The appendix contains the list of topics for each of the groups of market players. Obviously, the overlap between the four lists is large. However, the same topics are addressed from a different angle when interviewing an insurance company or a company demanding export risk insurance.

4.5   THE SAMPLE

In order to get more insight into the issues, to develop the list of topics, and to prepare sample development, eight personal interviews with experts were conducted at the start of the field study. The relevant experts were identified in close cooperation with the Ministry of Finance and Gerling NCM.

To investigate the four groups of market players the following criteria were used to select the organizations to interview:

INSURANCE COMPANIES the largest organizations active in the Dutch market were selected in order to have a large coverage of the market of insuring export credit risks. Since only three suppliers of export insurance services are based in the Netherlands, also a number of companies based abroad were interviewed. The London-based companies were interviewed personally, while the companies that were based in other parts of world were interviewed by telephone.

REINSURANCE COMPANIES two organizations most relevant for the Dutch market, based in Munich and Zurich, were interviewed by telephone.

INTERMEDIARIES the group of intermediaries consists of both small companies specialized in insuring business risks, and large companies that operate as intermediaries but also have other activities. In order to have a broad view of how these companies perceive the relevant factors on this market some small as well as some larger companies were interviewed.

COMPANIES DEMANDING EXPORT RISK INSURANCE This is a large and heterogeneous group, consisting of small companies involved in specific export activities on the one hand, and large companies involved in extensive export projects on the other hand. In some cases the small or medium sized companies are part of a larger consortium of companies engaged in large export projects. Compared to the other groups, it is much harder to identify all of the major organizations in this group. Moreover, this group is quite heterogeneous. Given our research goals we decided to interview a rather limited number (given the size of the group), but heterogeneous selection of companies (Dick (1990)). This selection is not a random, representative sample but is a collection of relevant companies that are chosen purposively, with the objective to collect relevant information rather than representative information (Carson, Gilmore, Perry, and Gronhaug (2001)). To summarize, a quite diverse set of companies, in terms of size, industry and export activities, was selected. In total 21 companies were interviewed.

For each of the groups the selection of the specific companies and the respondents within these companies was done in co-operation with the Ministry of Finance. Gerling NCM provided a list with sixty exporting companies. Fifteen companies of that list were actually interviewed. The list of interviewed

insurance companies and brokers is perceived as representative selection by a number of respondents. Most personal interviews were held in the Netherlands, in addition, as described above, eight personal interviews were conducted in London. Table 4.1 shows, for both the experts and each of the four groups of market players, which companies and respondents were interviewed.

Table 4.1: List of the companies and the respondents that were interviewed.

Category/Company	Respondent	Location	Interview
Expert interviews			
PWC	Mr. J. van Manen	Groningen	Personal
DNB	Ms. Roosegaarde Bisschop	Amsterdam	Personal
Ministerie van Financiën	Mr. T. Muiser	Den Haag	Personal
VNO-NCW	Mr. R Poelhekke	Den Haag	Personal
PVK	Mr. Hendriks	Apeldoorn	Personal
Gerling NCM (short)	Mr. A van den Esschert	Amsterdam	Personal
Gerling NCM (MTB)	Mr. J. Schrijver	Amsterdam	Personal
ABN AMRO	Mr. W. Klaver, R. Pladet and P. Mudde	Amsterdam	Personal
Intermediaries			
AON	Mr. E. Verbeek	Amsterdam	Personal
Meeus	Mr. Noordhaven	Groningen	Personal
Willis Ltd	Mr. Talboys	London	Personal
Marsh	Mr. Van Aubel	Rotterdam	Telephone
IRC	Mr. Heap	London	Personal
Reinsurance companies			
Munich Re	Mr. Zandvliet	Munich	Telephone
Swiss Re	Mr. Schmit	Zurich	Telephone
Insurance companies			
Coface	Mr. M. van der Hoek	Amsterdam	Personal
Gerling NCM (short)	Mr. A. van den Esschert	Amsterdam	Personal
Gerling NCM (MTB)	Mr. J. Schrijver	Amsterdam	Personal
Zurich	Mr. Riordan	Washington	Telephone
Hiscox	Mr. Underwood	London	Personal
Faraday	Mr. Douhgty	London	Personal
Exporters Insurance Comp.	Mr. Law	London	Personal
Coface LBV	Mr. Guest	London	Personal
		Continued on next page	

Table 4.1 – continued from previous page

CATEGORY/COMPANY	RESPONDENT	LOCATION	INTERVIEW
AIG	Mr. Ross	London	Personal
Euler-Cobac	Mr. Van den Akker	Den Bosch	Personal
Euler Trade Indemnituy	Ms. R. Calls	London	Telephone
FCIA	Mr. K. Cavanagh	New York	Telephone
Liberty Syndicate	Mr. Lynch	London	Personal
Companies			
ABB Lummus Global	Mr. Mulder		Telephone
Bauhuis	Mr. Voerman		Telephone
Bulneth	Mr. Langenberg		Telephone
Damen Shipyards	Mr. T. Breukel		Telephone
DHV Water BV	Mr. Mulder		Telephone
DSM	Mr. H. Swinnen		Telephone
Duyvis	Mr. N. Knis		Telephone
Enraf Nonius	Mr. Doodkorte		Telephone
Fontijne	Mr. M. Leentvaar		Telephone
Landustrie Sneek	Mr. A. Krijn		Telephone
NEM BV	Mr. P.L. Beijnes		Telephone
NKF Kabel	Ms. C.H.L. Willems-Blom		Telephone
Rexroth Hydraudyne	Mr. A.H.C. Meuwese		Telephone
Siemed Internationaal	Mr. D.C. Tenbergen		Telephone
Stork	Mr. Noordhoek		Telephone
Anonymous[1]			Telephone
Anonymous			Telephone
Anonymous			Telephone
Anonymous			Telephone
Anonymous			Telephone
Anonymous			Telephone

4.6 INFORMATION ANALYSIS AND REPORTING

Since in this field study qualitative data are collected from small samples, formal statistical analysis is not possible. As usual with qualitative research, we applied a form of content analysis (Carson, Gilmore, Perry, and Gronhaug (2001)). The following procedure was used to analyze the data. For each interview only a short summary of the answers was made. Since the objective of our study is to increase our understanding of the market and not to increase

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[1]Six exporting companies preferred to stay anonymous in this research.

our understanding of the behavior of specific players within the market, no full reports of individual interviews were prepared. The information gathered in each interview was discussed by the researchers and the elements that were identified as relevant for answering a specific research question were transferred to the appropriate chapters and research questions. Then, for each research question the collected data were discussed in order to come to some general (summary) findings. This stage needs some reflection and intellectual input of the researcher which evolve over time, since uncovering patterns, themes and categories is a creative process that requires making carefully considered judgments about what is really significant in the data (Carson, Gilmore, Perry, and Gronhaug (2001)).

The content analysis also influenced the structure of the chapters that report the results from the field study. During the interviews, we had separate groups of questions about acceptation criteria and premium rating. However, content analysis revealed that the criteria that are considered to be important for both topics are highly similar; therefore in this report both topics are included in the same chapter.

Description of the export credit insurance market

In this chapter we address the research question: Which export credit risks can be covered by the private market? We divide the private market into the export credit insurance market and the financial market and we discuss solutions (products) provided by these markets respectively in Chapters 5 and 7.

After a brief discussion of the current state of credit insurance in the global economy in Section 5.1, the structure of the export credit insurance market is described. Section 5.2 focuses on the various market players in the export credit insurance market. The products supplied in this market are discussed in Section 5.3, while Section 5.4 contains the main conclusions.

5.1 Credit insurance in the current economy

The year 2001 became a year of economic downturn, with the United States, Europe and Japan all experiencing low or no economic growth. Adverse economic conditions have affected both western economies and emerging economies alike. The worsening of the global trading conditions is reflected in figure 5.1 representing a significant decline of the world GDP and increase of the credit risk in 2001.

Corporate payment defaults have increased reflected in the increase of the claims paid by insurers. The first signs of the increase of the corporate payment defaults came from the steel, paper/cardboard, upstream textile and automotive suppliers markets. The subsequent events of September 11th 2001 had a direct, adverse impact on the airline and tourism industries. The
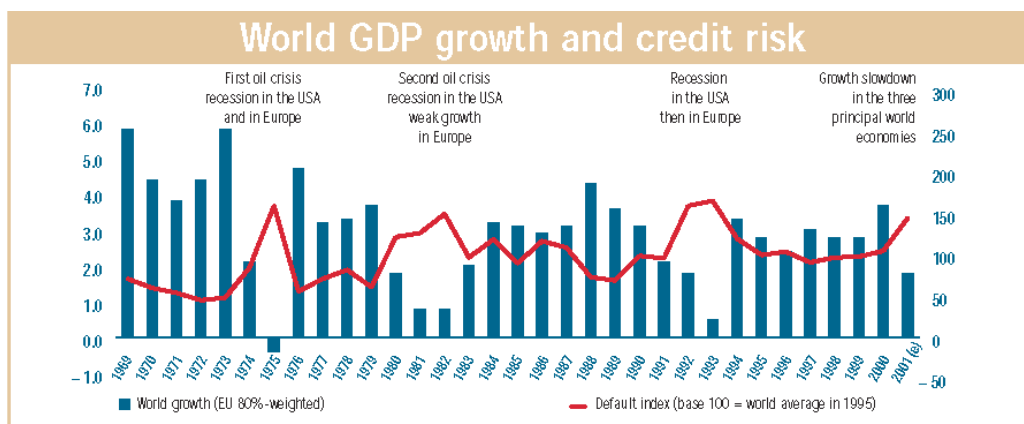
Figure 5.1: World GDP growth and credit risk (Coface yearly report 2001, p. 7).

only sectors spared seem to be pharmaceuticals, food retailing, security and defence. At the time of writing it seems that the end of the economic decline is not reached yet.

Influenced by high claims, insurance companies became very cautious. Policy conditions have become more restrictive. As a result the export credit insurance market made a shift from a buyers market to a suppliers market. The importance of the export credit insurance increased as a consequence of the declining economy. The export credit insurance became highly recommended even for companies exporting to OECD-countries. According to Mr. A.H. Van den Esschert, Director Group Risk Management at Gerling NCM, 'only the Dutch domestic market is doing relatively well without insurance at this moment.'

Besides the economic trends discussed above, the following long term trends are apparent in the export credit insurance industry (Munich Re (2000); Van de Laar (2002)):

- Emancipation of customers;

- Focus on shareholder value;

- Deregulation and consolidation of insurance markets;

- Higher risk retention and restructuring of reinsurance programs;

- Innovative risk management;

59

- Desire to get away from cyclical pricing;

- Shortage of capacity;

- Transparent accounting and disclosure of earnings volatility;

- Convergence of insurance and capital markets.

5.2 MARKET STRUCTURE FOR EXPORT CREDIT INSURANCE

The most important categories of players in the market of the export credit insurance are:

- Exporting companies: the companies demanding export credit insurance;

- Private insurance companies providing export credit insurance to the exporting companies;

- Intermediaries in between the insurance companies and the exporting companies: brokers and banks;

- Private reinsurance companies and the government providing reinsurance services to the private insurers.

The interaction between these parties is presented in figure 5.2. Read from bottom to top, figure 5.2 shows that the exporting companies (demand side of the market) can work either direct with an export credit insurance company (with Gerling NCM) or with brokers (such as AON). Banks may also operate as intermediaries, but they are not depicted in figure 5.2, since they were not part of this study. The suppliers of insurance services in the Netherlands are three private export credit insurance companies: Gerling NCM, Coface Nederland and Euler-Cobac. The business of Gerling NCM can be divided in two parts: Gerling NCM (private account) and Gerling NCM (public account)[1]. Gerling NCM (private account) reinsures her portfolio in the private reinsurance market. The portfolio of Gerling NCM (public account) is reinsured by the Dutch government. Besides these Dutch companies there are a number of export credit insurance companies outside the Netherlands that also serve

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[1] When Gerling NCM is mentioned without the extension 'Private account' or 'Public account', Gerling NCM as a whole is meant.
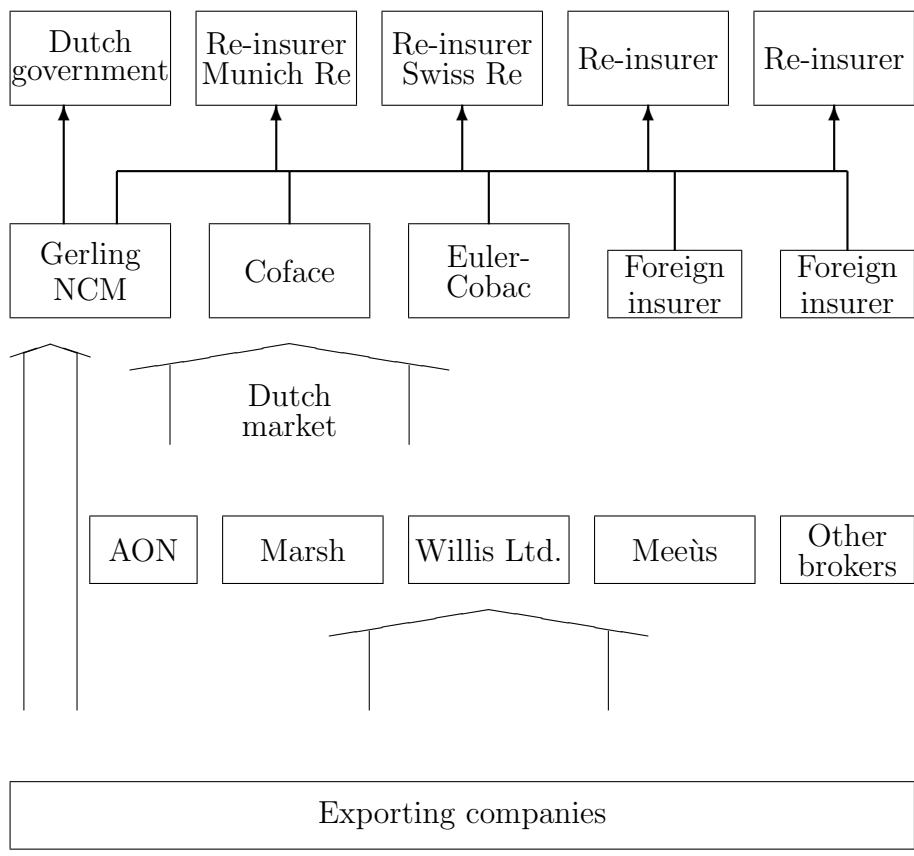
Figure 5.2: Market structure for export credit insurance.

the Dutch market. The insurance portfolios of the insurance companies are reinsured either by the Dutch government or by internationally operating private reinsurance companies. All companies explicitly mentioned by name in figure 5.2 were part of the research sample.

5.2.1 EXPORTING COMPANIES

Compared with other countries, many Dutch companies buy export credit insurance. Still, there are more uninsured than insured companies in the Netherlands (Van de Laar (2002)). The companies without export credit insurance can be divided into three main groups. The first group consists of big multinationals such as Philips and Shell, which can handle the risks themselves. The second group is formed by medium sized companies that

do not insure for several reasons: positive previous experiences, independent risk judgment using the @-rating provided by Coface Nederland, a large spread of risks, low individual risks, too high price of insurance and/or no interest in the whole turnover insurance[2], short term transaction, and usage of alternative solutions as described in chapter 7. The third group consists of untrustworthy companies, which banks refuse to finance even if all export risks are covered by an insurance company. For these companies factoring is appointed as the best solution. Factoring is an alternative solution to export credit insurance and implies selling of a company's accounts receivable, at a discount, to a factor, which then assumes the credit risk of the account debtors and receives cash as the debtors settle their accounts. Factoring and other alternative solutions are discussed in detail in chapter 7.

Within OECD countries exporting companies either do not insure their transactions, or replace export credit insurance with an alternative solution (see chapter 7). The reasons not to insure within OECD-countries are: stable political system, stable economy and long strong relationships with European debtors. Exporters do not share the opinion of Gerling NCM about the necessity of export credit insurance even when exporting to OECD-countries (see section 5.1). Outside OECD-countries the insurance of commercial, political and fabrication risks becomes necessary. Insurance of political risk is mostly considered as more important than commercial credit risk insurance: exporters often have good relationships with their debtors and do not see any potential payment problems, but do not have any influence on the political situation within the country. Additional risks some exporters are interested to insure include exchange transfer risk and bank interest rate risk.

In order to give a profile of a company that makes use of export credit insurance the client groups of domestic and foreign insurance companies and brokers are presented in box 5.1.

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[2]Export credit insurance policies can be defined either on a whole turnover basis or on a specific account basis. Whole turnover policy covers the whole business of the policyholder. The specific account policy can also be called a single transaction policy. A single transaction policy only covers one transaction of the whole exporter's portfolio. Insurance companies prefer to underwrite the whole turnover policies for the short-term business in order to avoid adverse risk selection. Single transaction policies are mostly applied to medium-long term business.

Dutch Insurance Companies and Banks

- Gerling NCM (public account) and Gerling NCM (private account) are serving all businesses regardless of their size.

- Euler Cobac is more targeted at midsize businesses with turnover between €5 million and €50 million;

- Coface Nederland largely works with midsize businesses, which are dependent on financing and good coverage of the export credit risks.

- The target group of the ABN AMRO bank changed in the last two years providing a closer focus on the large multinationals.

Foreign Insurance Companies

- Coface UK serves various clients ranging from small to large companies.

- Euler Trade Indemnity is targeted at all businesses regardless of their size.

- AIG tends to deal with big multinationals: customers with a turnover in a class of a £ 100 million and upwards. Parallel to this AIG is also developing some new products for the middle market with turnover of £ 25 million and upwards.

- The clients of Exporters Insurance Services Inc. are big companies with minimum net wealth of US$ 25 million and upwards. These companies are leaders in their field and can bear a large amount of risk themselves.

- FCIA is looking for midsize or larger American companies or their subsidiaries with well established credit and financial departments, and US$ 10 million in sales or higher. FCIA does not work with small companies because of the minimum premium consideration based on the analysis of own expense structure. Second consideration is discretionary authorities given by the policies to the customers.

- The target group of Liberty Syndicates are exporters, traders and banks.

Brokers

- Willis is targeting banks and multinational corporations. Willis also has a UK retail team dealing with small and midsize companies. Willis considers the size of the company as less important than the size of the deal the company want to insure.

- Marsh deals mostly with big multinationals. Here again the size of the deal is more important than the size of the company.

- IRC Customers serves companies with turnover of £10-15 million and upwards.

- Meeùs deals with all companies regardless their size.

None of the export credit insurers operating in the Dutch market has small companies as a target group except for Gerling NCM. The reason of the broad target group definition of Gerling NCM (public account) lies in many cases by the reinsurance provided by the government. Gerling NCM (private account) does not differentiate among exporting companies based on their size. However Gerling NCM (private account) keeps the right to reject companies in case the administration costs exceed the premium income provided by the company. Companies whose premium payments do not exceed the administration costs are mostly small size companies. The private market in the Netherlands is more open to large companies, not to smaller ones. The same is valid for ABN-AMRO bank that recently started focusing on large multinationals because of profit considerations. The reasons to consider size of clients as an important measure are: more extensive experience of the large companies, better information sources, and large risk share they can take. The administration costs for a small company often exceed the premium, which the company is willing to pay. Consequently we can conclude that private export credit insurance in the Netherlands is only accessible for medium and large size businesses. Small companies are indirectly forced to go to Gerling NCM (public account) and therefore strongly depend on Gerling NCM

(public account). An interesting question is whether Gerling NCM would continue serving small companies without governmental reinsurance. And if the answer on this question would be negative, another question is whether these small companies could be served by other insurance companies. These questions were not part of this study.

The disadvantageous situation to small companies is already changing in the international export credit insurance market. At the first glance the large foreign export credit insurers also have a preference for big multinational clients. When taking a closer look at the target groups of the foreign insurance companies, it can be seen that small and midsize companies get better access to the private market. Still, this trend is only valid for international export credit insurance market. The subsidiaries of the Hermes Group and Coface Group in the Netherlands, Euler Cobac and Coface Nederland, are still targeting mainly midsize companies. In contrast to Coface Nederland, Coface UK already works with small companies. Euler Trade Indemnity (UK) recently set up a separate business unit serving small and midsize businesses as a reaction to the rapid growth of the small and midsize businesses market. Even such a large player as AIG Europe develops some new products for the medium size companies.

Generally, export credit insurance appears not to be well known among Dutch exporters. Most companies familiar with the export credit insurance associate it with Gerling NCM, the market leader in the Netherlands for medium- and long-term export credit insurance. Many exporting companies interviewed in this research are clients of Gerling NCM (public account). Reasons for this include:

- Lack of knowledge about other possibilities;

- Gerling NCM (public account) being the only option on the Dutch market for medium-long term export credit insurance;

- Dependence on the official support and therefore the need to meet the minimum national component requirement;

- Good experience with Gerling NCM (public account);

- Negative risk description at Gerling NCM (public account)[3].

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[3]Negative coverage description means that all possible risks are covered, except the risks explicitly mentioned in the contract.

For the exporting companies export credit insurance is not only a way to hedge the risks of transaction but also a way to gather information about the debtor. Many exporters rely on the country expertise of Gerling NCM. For exporters exploring all different possibilities in the export credit market, Gerling NCM still remains the first export credit insurance company on the list.

Dutch exporters perceive the domestic export credit insurance market as the most attractive one because of its convenience. Exporters dealing with difficult markets in the medium-long term have more experience with the international private export credit insurance market, perceiving it as the 'last resort' market. Brokers located in the international market mention ABN AMRO and ING bank as the main initiators of a relationship between a Dutch exporter and a foreign broker.

In general a Dutch company can insure her transactions in the Dutch as well as in the international private credit insurance market. Difficulties arise if a Dutch firm wants insurance with a government-backed reinsurance of a European country other than the Netherlands. The reasons to want such insurance are (1) more favourable country policy of particular Export Credit Agency and/or (2) problems with minimum national component requirement. Export transactions are only eligible for export credit insurance with government reinsurance if the minimum national component requirement is met. According to this requirement, a minimum amount of value should be added within the country before it can be eligible for officially supported export credit insurance from that country.

The globalisation process within the European market leads to the internationalisation of the economical activity of European companies. Consequently, the meeting of minimum national component requirement in order to buy a policy with government-backed reinsurance becomes complicated for some exporters. Big multinationals such as Philips Medical Systems can solve this problem by replacing their production capacity abroad and by getting the minimum national component in other OECD countries. This ability gives big multinationals an advantage of choosing for the most favorable Export Credit Agency to work with, during a particular project. For example, the project finance insurance for a transaction in the Eastern Europe is considered to be more favourable in Germany than in the Netherlands because of the different country policy. One of experts emphasizes that limiting the support provided by the government to exporters gives the exporters an incentive to replace the production abroad, causing the loss of production

66

capacity in the Netherlands.

Medium-sized companies do not have enough capacity to apply for insurance purposes abroad. When medium-sized companies are not able to meet the minimum national component requirement, they may use the multi-sourcing solution. Multi-sourcing is the participation of a number of companies from different countries in one project. Each participant is responsible for a part of the project and for the appropriate insurance of this part.

When working with foreign insurance companies or when multi-sourcing is not possible, exporters explore other possibilities in the international export credit insurance market. Further, if no appropriate insurance can be provided by both Dutch and international export credit insurance market, own risk administration or financial solutions will be considered. If the exporter fails to hedge the risk by insurance, financial alternative or by own risk administration, the exporter would cancel this activity as mentioned in section 2.3. Companies performing medium-long term transactions experience more difficulties when hedging risks than companies involved in short term business. Reasons for this include: the short-term risks are easier insurable, easier for self-administration and easier to hedge by alternative financial solutions. Unlike companies performing medium-long term transactions, companies working in short term do not depend much on the insurance with government-backed reinsurance (see section 5.3.5).

5.2.2 PRIVATE INSURANCE COMPANIES

The European market of private export credit insurance is characterized by large concentration. There are a number of private export credit insurers offering solutions worldwide and also in the Netherlands, regardless of their location. Three suppliers have a market share of 85% in the European private export credit insurance market: Euler Hermes Group, Gerling NCM Group and Coface Group. The subsidiaries of these groups are the only export credit insurers located in the Netherlands.

THE NETHERLANDS

For several decades NCM was the only insurance company controlling the export credit insurance market in the Netherlands. This situation changed in the 1990's with the appearance of the new suppliers Euler Cobac and Gerling Namur[4], and recently Coface Nederland. NCM, named Gerling NCM after

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[4]The subsidiary of Gerling Namur operating on the Dutch market became a part of

the merger with the Gerling Credit Insurance Group in December 2001, still retains the position of market leader in the export credit insurance on the Dutch market with 65% market share followed by Euler Cobac (20%) and Coface Nederland (15%) (Van de Laar (2002)).

All export credit insurance companies operating in the Dutch market are so called full-service credit insurance companies with a well-developed back-office and extensive databases. The databases serving as decision support systems and requiring large investments form an important entrance barrier for potential competitors. The ability to provide debt collection services forms another important entrance barrier. Coface Group (including Coface Nederland) developed an international network of debt collection agents and lawyers around the world. The information database and debt collection networks eliminate the insurance problem of the lack of informative data and no credible power to collect payments as described in section 2.4. The presence of an extensive information database and the ability of debt collection minimize the non-payment risk. First insurance company can objectively judge transactions. Secondly insurance company can collect debt itself. Therefore export credit insurances with extensive informational database and strong debt collection network are expected to be better able to cover risks in the longer term than insurance companies without these advantages.

Another group of export insurance companies consist of insurers providing individual calamities coverage. These insurance companies have neither a well-developed back-office nor an extensive database, and are not present in the Dutch market.

INTERNATIONAL MARKET

London is considered as the European centre of the export credit and political risks market. Most capacity for export credit solutions is concentrated at Lloyds with her 88 syndicates. Lloyds offers not ordinary solutions, which can not be provided in the local markets, and also solutions with competitive price.

5.2.3 INTERMEDIARIES

THE NETHERLANDS

The Dutch intermediary market can be divided into two groups. The first group is the bank related intermediaries such as ABN AMRO Insurances,

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Coface Nederland in October 2002.

ING, and Van Lanschot CMC. The second group includes the international operating brokers such as AON, Marsh, Meeùs and Finance & Insurance.

The insurance companies Euler Cobac and Coface Nederland are mainly operating through intermediary organisations. Coface Nederland is co-operating with 110 intermediaries, 15 of them are market leaders. In contrary, Euler Cobac works with small intermediaries at the broad scale (Van de Laar, 2002). Gerling NCM (private account) works with intermediaries as well, but that is not necessary for companies in reaching Gerling NCM.

International market

Also brokers located in the United Kingdom play an important role in the export credit insurance system of the Netherlands. They act as main connectors between the Dutch banks and exporting companies, and British export credit insurers.

5.2.4 Private reinsurance companies and the government

There are two main players operating in the Dutch export credit reinsurance market: the government and the private reinsurance companies. The debut of the Dutch government as an important reinsurance institution is dated back to 1922, when the first export credit guarantee facility was established (De Nederlandsche Bank (2002)). In June 2001, the agreement made between the Dutch government and the private insurance company Gerling NCM was reconsidered. The new agreement enabled Gerling NCM to reinsure export credit risks exceeding a three years coverage term by the government. The reinsurance of the risks with the coverage term up to three years was left to the private reinsurance market with some exceptions (see also Box 5.2). The risks mostly reinsured by the government are risks of medium long term transactions.

The Dutch private reinsurance market is internationally oriented. There are about 20 to 30 major private reinsurance companies worldwide, where about 10 of them are important for the Netherlands. The two private reinsurance companies most often named by the private export credit insurers are the internationally operating Munich Re and Swiss Re.

Dutch as well as British and American private insurance companies mostly cover their risks spread over 5 to 10 reinsurers. The reasons are: (1) the risk spreading in terms of minimum concentration, and (2) independence considerations.

Ad (1): The private insurers try to avoid being dependent of one reinsuring company and mostly try to spread their portfolio over several reinsurers. This has the advantage that if one reinsurance company would go bankrupt, the largest part of the portfolio of the insurance company would remain

reinsured by other reinsurance companies. The same reasoning applies to the reinsurance companies, who are not interested to bear a risk of a large amount of claims in the case an insurance company goes bankrupt. So, reinsurance companies always have to decide which part of an insurers' portfolio will be reinsured. When big insurers are involved, they tend to reinsure part of their portfolio, partly because of restricted capacity, partly because of risk spreading considerations as described above. Only when small insurance companies are involved, reinsurance companies tend to reinsure the entire portfolio of these insurance companies, due to administration costs considerations

Ad (2): Insurance companies also want to remain independent from their reinsurers. After high series of losses a reinsurance company may end the relationship with the corresponding insurer. In this situation an insurer reinsured by only one reinsurance company, would get into problems with finding a new reinsurer. When reinsured by a number of reinsurance companies, the largest part of the insurance company portfolio would remain reinsured after series of losses.

All interviewed export credit insurance companies emphasize the decrease in willingness of reinsurance companies to take over risks. According to them, this is due to the economic downturn. Reinsurers either leave the export credit business and use their capacity to underwrite more profitable lines of business, or they impose stricter requirements on their clients. The property and aviation business, marine and traditional types of insurance providing good returns at the moment, have become more attractive to reinsurers. The additional reinsurance capacity in property and aviation business, marine and traditional types of insurance is expected to create overcapacity and consequently a price drop in these sectors. The price decrease in property and aviation business, marine and traditional types of insurance would make the export credit business once again attractive for reinsurance companies. In the insurance industry this process is referred to as 'swinging demand'.

Reinsurance companies are able to put restrictions on the insurance terms. Most international operating export credit insurers emphasize that they are restricted in their actions by the reinsurance companies. The main restriction put by the reinsurance companies is a maximum risk horizon between one and two years. The insurance term handled by most private export credit insurers in the Netherlands is still shorter than the two years restriction imposed by some reinsurance companies (see section 5.3.5).

Export credit insurance companies, having enough capital to write business without reinsurance, are not strongly affected by the 'swinging demand'

phenomenon. Exporters Insurance Services Inc. and to some extent Liberty Syndicates are two examples of this kind of companies. Exporters Insurance Services Inc. even provides reinsurance services for other insurance companies and Export Credit Agencies. Liberty Syndicates is able to write a limited amount of risks without reinsurance. None of the private export credit insurers in the Netherlands has enough capital to write risk on their own books.

5.3   Product description

After discussing the demand and the supply side of the export credit risk insurance market, we now turn to a more detailed description of the 'goods' traded in this market. Three different types of transactions based on transaction term and corresponding export credit insurance products are introduced in section 5.3.1. Both insurance products are further described in terms of coverage description (section 5.3.2), maximum coverage provided by these products (section 5.3.3), risks that can be covered by these products (section 5.3.4).

5.3.1   Export transactions

Three different forms of export credit can be distinguished based on the credit duration:

1. Short-term export credit;

2. Medium-term export credit;

3. Long-term export credit.

Short-term credits are credits for raw materials, semi-manufactured products, and consumer goods, with a credit term up to one year. The medium and long term credits refer to capital goods and contract work, with duration of one to five years for the medium term and five and more years for the long term export and project vs. object finance transactions.

   Depending on the market, the country and the sector a company is working in, a company chooses for a short term or a medium long term transaction. Sometimes a short term transaction serves as the introduction into the market with the purpose of further development of a long- term relationship in the form of a medium long term transaction. There are more short term transactions than medium long term transactions performed by Dutch

companies, because of the relative small amount of companies in the Dutch market able to perform large medium long term projects.

Private export credit insurance companies in the Netherlands offer contracts for short- term export credit insurance. Usually, they restrict their policies to a 180 days credit period[5] and a maximum risk horizon of 360 days[6]. No private insurance company is willing to accept a non-payment risk caused by political reasons for periods longer than 180 days after delivery except for Gerling NCM (private account). The two reinsurance companies in our research provide reinsurance for risks with a maximum risk horizon of 360 days. 95% of the Munich Re portfolio are short-term risks. Munich Re emphasized its increased caution towards medium-long term business.

The regular Dutch private export credit insurers do not provide medium- and long-term export credit insurance except for Gerling NCM, covering non-payment risk caused by commercial reasons for short and medium long term. The reinsurance of the risks covered by Gerling NCM, with credit period of two years and a maximum risk horizon of three years takes place on the private market. Gerling NCM (private account) covers whole turnover policies in short-term business, single transactions in short-term business on top emerging and transition markets, and short and medium-long term single transaction business on good markets (OECD). In addition there is privatisation of short-term business on all other markets for single transactions up to €4,500,000 and €11,000,000 per buyer. The reinsurance of non-marketable risks covered by Gerling NCM, with short and medium-long term duration are taken care of by the Dutch government in order to support Dutch exporters and to assist by the development of the emerging markets.

The government also reinsures transactions exceeding €4,500,000 and any transactions lifting the risk per buyer over €11,000,000. For single transactions (1-off-deals) in the medium term business the following rule is set: the Dutch government reinsures risks for capital goods with maximum risk horizon over one year for Dutch export business (not for SENO[7] and special facility Cuba).

The representatives of the private market give the following reasons for not accepting medium- and long-term business:

1. The volatility of the private market. In contrary to the government

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[5]180 days after delivery.

[6]Sum of the credit risk period and preshipment period.

[7]SENO: Stichting voor Economische Samenwerking tussen Nederland en Oost-Europa.

providing tax- financed reinsurance, the private market is not able to recover after series of huge losses. Even the government considers stopping to insure export to particular countries with political risk exceeding a certain value defined by the government itself (e.g. Argentina). According to Mr. R.A.J. Poelhekke, VNO NCW, 'if the private market was expected to provide medium-long term political risk coverage, exporting to several countries in East Europe would become impossible'.

2. The profit orientation of the private market. The responsibility of the private market lies by the management, whose objective is profit maximisation and satisfied shareholders.

3. The law of big numbers. This law as well as the law of spread-of-risks does not work for medium- and long-term business. The high quantity and broad spread of risks are difficult to achieve by not insuring the whole turnover of a company. There is no large number of exposure units (see section 2.5).

4. Economic infeasibility. High potential loss and low probability of loss lead to very high premiums that no company is willing to pay (see section 2.5).

5. High amount of investment necessary to introduce and maintain a medium-long term market unit.

In the medium-long term business the transactions of a company are characterised by low quantity and high value. There are not many transactions on a yearly basis, but each transaction has a high value in terms of amount of money involved. The total value of these transactions often exceeds the capacity of an insurance company resulting in the incapability of the insurance company to insure the whole medium-long term portfolio of the exporter. The option to insure a part of a medium-long term portfolio is not attractive for the insurer. The less transactions of an exporter are insured by an insurance company, the worse spread of risks this insurance company creates within her portfolio. The only possibilities for insurance and reinsurance companies to cover medium-long term risks are:

1. Having a very high volume of risks;

2. Setting high premiums or restricting the contract as much as possible to make the law of big numbers and the law of risk spreading work.

One respondent refers to the international operating export credit insurer AIG as a company having enough volume to underwrite medium- and long-term credit. The second possibility for insurance and reinsurance companies to cover medium-long term risks is criticized by an expert, who stresses that higher premiums and severe contract restrictions endanger the competitive position of Dutch exporters on foreign markets. Providing some kind of tax privileges is considered in this research as one possibility to motivate the private market to cover more risks. This privilege already exists in the Dutch market in the form of financial reserves for difficult debtors.

Theoretically, the private export credit insurance market in the Netherlands offers some facilities for all different sorts of export credit insurance in a favourable economic environment. However, the private market operates more selective during periods of economic decline. The economic downturn in 2001 caused the short-term business orientation by the private export credit insurers and reinsurers.

An expert describes the capabilities of the private market as being 'highly overestimated during the last eight years'. All interviewed parties stress the importance of the governmental reinsurance facility providing coverage for risks that can not be taken by the private export credit insurers and reinsurers. In theory the only situation when reinsurance by the government would probably become unnecessary is the situation when all countries in the world would have a status comparable to the status of the OECD-countries.

INTERNATIONAL MARKET

The international market offers many more possibilities for the export credit insurance in comparison with the Dutch market. The short-term orientation is still prevailing. Euler Trade Indemnity and Coface UK offer equal insurance terms as their Dutch colleagues do: 180 days credit risk and 360 days maximum risk horizon. The average insurance term of Faraday is 9 months, but for unique and special transactions coverage up to 5 years can be given. Often the definition of the short term is more much generous in the international export credit insurance market: instead of 180 days credit risk and 360 days maximum risk horizon international export credit insurers offer commercial risk coverage for 2 years credit risk and the maximum risk horizon up to four years (AIG), political risk coverage for the maximum risk horizon up to two years (Liberty Syndicates), commercial and political risk coverage for the maximum risk horizon up to three years (Hiscox). The medium term coverage up to 5 and 7 years can respectively be provided by

75

FCIA and Zurich. Up to 5 years credit duration and 7 years risk horizon insurance can be provided by Exporters Insurance Services Inc. The insurance term up to 10 years is possible by AIG for political risk.

The reasons not to provide longer insurance terms than described above are: strategy considerations, risk considerations and reinsurance difficulties. International export credit insurers explain their ability to give longer term coverage than Dutch insurers do by the careful choice of the customers and high re-share policy: high deductibles, high own risk or even the condition of buying insurance company's shares. High re-share policy enables supporting multinationals in very difficult markets.

BROKERS

International brokers located in the Netherlands and in London mostly work with companies on the short-term business up to two years. Two years insurance deals are the preferred ones because beyond that term the capacity of the European private market is limited. Short-term deals are quite easy to insure in the Dutch market. Requests for the medium-long term insurance would be turned in at Lloyds in London. The intermediation of insurance provided by Gerling NCM (public account) is not often considered by the brokers, because of the commission absence. American insurers AIG and Chubb, French insurer Unistrat, and MIGA are considered as alternatives to Lloyds.

In some exceptional cases international brokers are able to get up to 7 years for credit and political risk combination. With respect to confiscation cover, pure asset confiscation can be insured up to 10 years.

5.3.2 COVERAGE DESCRIPTION

Export credit insurance companies distinguish between a positive and a negative coverage description. Negative coverage description means that all possible risks are covered, except the risks explicitly mentioned in the contract. A positive coverage description implies a list of defined risks that are covered by the insurance contract. If a risk is not on the list, no coverage will be given in case of loss caused by this particular risk. Most interviewed parties consider a negative coverage description to be better in terms of meeting the exporters' interests. According to several respondents, in some countries of export destination it is very difficult to describe risks in the positive way. Coface Nederland operates with a negative coverage description. Gerling NCM (public account) still uses a negative coverage description, but is currently

76

considering changing this into a positive coverage description. Gerling NCM (private account) and Euler Cobac apply a positive coverage description.

5.3.3 Maximum coverage

The Netherlands

Coface Nederland and Euler Cobac provide up to 90% coverage for commercial and political risks. For the medium-long term deals reinsured by the government, the government provides up to 95% coverage for commercial risk and in specific cases up to 98% coverage for political risk. In technical box 2.5 a full reinsurance guaranteeing a risk-free return for insurance companies is described as not necessary. This applies to short term transactions, where no bank financing is required. The empirical research shows different results in the case of the medium long term transactions, where bank financing is necessary. The fact that Dutch government provides 2% less political risk coverage than the British ECA does, gives rise to concern at ABN AMRO. Two widely debated problems are addressed when less than 100% political risk coverage is given by the government for the medium long term transactions. The first problem is a worse competitive position of the Dutch banks, providing that foreign banks are enabled to offer better deals to their clients when 100% of the political risks is covered. The second problem concerns debt remission. In the case of non-payment the government can decide to remit a part of the debt. The money of the bank sharing the risk would also be partly remitted. The result of this situation is that banks are considering not giving any finance for the projects carried out in the countries where debt can potentially be remitted. Those are mainly the countries where the Dutch government would like to contribute to the market development.

International Market

Coface UK insures up to 90% of the eligible contract value without making difference between political and commercial risks. The remaining 10% is considered as the profit margin and therefore can not be covered. FCIA gives maximum coverage of export credit of 90-95% for both political and commercial risks. Exporters Insurance Services Inc. usually insures 75-80% of the eligible contract value. Lloyds offers higher maximum coverage for export credit in order to be able to compete with the governmental ECA.

5.3.4 Risks

One of the risks that cannot be covered by any insurance or reinsurance company is the risk of the war between two of the five world powers: Russia, UK, France, China, and US, nuclear war, and radiation. Risks of war other than a war between two of the five world powers, such as a war between two other countries, and the risk of terror in the country of export destination are normally covered as political risks. There are a number of countries defined by the UN-resolution the insurance companies are not allowed to provide any services for. Those countries are North Korea, Iraq, etc.

Both the interviewed insurance companies and experts pointed out, that most insured risks are commercial risks. 'Because of privatisation process, the political risk share has been diminishing over the past 20 years.' - emphasizes Mr. F. Law, London Representative at Exporters Insurance Services Inc. The ratio of political and commercial risks within a transaction depends on the nature of the transaction. For some transactions to distant foreign countries the share of political risk can reach 70-80% level. For some insurance companies the ratio of political and commercial risks is essential for the deal acceptance. Euler Cobac for example would insure a transaction only when the share of the political risk is less than 10% of the value of export transaction.

When looking at revenues, political risks generate more revenues than trade risks. Political risks tend to be the largest claim in the market place and therefore higher premiums are paid for political risks than for trade risks.

The risks that can be covered by Dutch and foreign export credit insurance companies are presented in box 5.3.

EXAMPLE BOX 5.3 RISKS COVERED BY DUTCH AND FOREIGN EXPORT CREDIT INSURERS

THE NETHERLANDS Coface Nederland and Euler Cobac cover the risk of non-payment caused by commercial and political reasons. Gerling NCM (public account) and Gerling NCM (private account) cover the risk of non-payment caused by commercial and political reasons in the short and medium-long term business for all different country-categories. All interviewed brokers mediate as well commercial as political risk coverage.

INTERNATIONAL MARKET The export credit insurance companies operating in the international market cover the risk of non-payment caused as well by political reasons (AIG, Coface UK, Euler Trade Indemnity, Exporters, Faraday, FCIA, Hiscox, Liberty Syndicates and Zurich) as by commercial reasons (AIG, Coface UK, Euler Trade Indemnity, Exporters, Faraday, FCIA, Hiscox and Zurich) reasons. The political reasons are defined as follows: confiscation and exchange transfer (AIG); contract frustration: the failure of the government buyers or sellers to honour their obligations and the failure or inability of private buyers or sellers to honour their obligations as a result of government interference (Liberty Syndicates). Political risks that are not covered by Euler UK are exchange transfer, confiscation, expropriation, and nationalisation. Commercial reasons include insolvency and protracted default (AIG, Euler Trade Indemnity and Coface UK). The catastrophe risk is covered within the standard policy (Exporters and FCIA). Most insurance companies deny insuring disputes between the buying and selling party until they are resolved.

Both commercial and political credit risks can be covered in the Dutch as well as in the international market. The main distinction between the services provided by Dutch and foreign export credit insurance companies lies not in the type of risks being covered, but in the insurance term (see section 5.3.5).

5.3.5 TERM OF EXPORT CREDIT INSURANCE

The following solutions for minimizing the variance for given expected return of the whole product line are mentioned in example box 2.6: (1) Portfolio analysis and (2) Cross-subsidy of risks within the company.

Ad (1): The goal of portfolio analysis is development of an optimal spread of risks. The number of countries in the world reflects the main limiting factor of the spread of risks. Based on different criteria countries can be grouped into various categories: power blocks, economic categories, etc. However, most respondents consider these groupings to be positively correlated. The main reason of the positive correlation is the process of globalisation. In order to keep the portfolio balanced it is considered to be better not to look at

countries but at particular economic indicators, like oil prices. If the oil price increases, some companies suffer, others benefit.

Theoretically, the process of risk spreading starts when the exporters choose their customers and product portfolio. Usually, small and medium-sized exporters do not pay much attention to the risk spreading issue, leaving it to the export credit insurer in the best case.

Insurance companies follow the macroeconomic developments in order to minimise risks. Euler Cobac follows the macroeconomic developments and derives country scores for particular countries from those observations. A concentration of business in one or two countries is seen as highly dangerous. An important issue is the alternation of good and bad risks. Banks, export credit insurance companies and reinsurers use a number of country and region limits, and try to spread risks over different countries and different sectors within these countries. Important for all parties is that new business they are writing does not aggregate with the existing business. Once a limit is exceeded none of the insurance companies would write more business in this area even at a higher price. According to Mr. D. Riordan, Zurich, 'the temptation of premium is not one that drives the company to make decisions that would violate the company structure'. Dutch government makes an exception. After the limit is reached the government would consider insuring a few more transactions for particular countries.

In order to balance their portfolios insurance companies and reinsurers try to balance exposure in different countries. Liberty Syndicates handles low prices for insurance in the countries where they have low exposure and tries to make these countries attractive for exporters. The country concentration program of Exporters Insurance Services Inc. has the same goal. Companies interested in buying cover in the country where exposure of Exporters is less than £50 million do not have to buy any shares. Such portfolio balancing is considered as very attractive by reinsurance companies, because their portfolio is automatically getting balanced too.

Ad (2): None of the interviewed parties does cross-subsidize risks within the company.

5.4 CONCLUSIONS

This chapter focuses on the export credit risks that can be covered by the private export credit insurance companies. In general we can conclude that there are no particular risks, which cannot be covered in the private market.

The possibilities of the private market are only limited in terms of coverage duration and target group.

The Dutch private export credit insurance market focuses on the insurance of all types of the export credit risks for the short-term transactions with maximum risk horizon of 360 days. The only party in the Netherlands accepting medium-long term transactions to non-OECD countries is Gerling NCM (public account) with government-backed insurance. Only Gerling NCM (private account) covers medium-long term transactions to OECD countries, Euler-Cobac and Coface cover short term transactions only. The international private export credit insurance companies offer policies up to 7 and 10 years for respectively commercial and political risks. The most frequent insured transactions in the international market are transactions with 2 years duration. All insurance companies are being restricted by private reinsurance companies in terms of policy duration. Still, the interviewed foreign insurers emphasize that coverage provided by the private reinsurance companies is never less than 2 years. In this context the two reinsurers interviewed in this research and providing reinsurance with maximum risk horizon of 360 days seem to be an exception. Since these reinsurance companies are not the only two the Dutch insurers work with, there is a clear discrepancy between the coverage provided by the most private reinsurers and the maximal policy duration of the Dutch private export credit insurers. In other words, private export credit insurers in the Netherlands are probably able to raise their coverage up to 2 years. The difference in coverage duration given by Dutch and international insurers may be explained by the competitive situation in these markets. With only three private export credit insurers there is a lack of competition in the Dutch market. Moreover, Dutch exporters still consider the domestic market as the most convenient place to insure their transactions. The international market is far more competitive. Only at Lloyds there are 88 syndicates. Competition between insurers could be increased by promoting the international insurance possibilities among Dutch exporters. As a consequence, more Dutch exporters would consider the international market as an alternative. In order not to lose customers, Dutch private export credit insurers would be forced to offer more attractive products. Still, they will not be able to cover medium-long term transactions because of the reinsurance restrictions, the volatility of the private market, profit orientation of the private market, law of big numbers that is not working in the case of medium-long term transactions, economic infeasibility and high investments required for a medium-long term market unit.

The Dutch private export credit insurance market is not suited for small companies, except for Gerling NCM (public account) that targets small companies because of the government-backed insurance. The government-backed insurance is considered to be essential for small businesses and for the medium-long term transactions in the first place. The government can still take longer risks than the private market, especially when credit risk is involved.

Criteria of acceptance and premium ratings

In this chapter, we focus on the research question: What are the determinants of export risk insurability on the private market? The main determinants of export risk insurability are risk aversion, acceptance criteria and premium rating. The degree of risk aversion determines the acceptance criteria. Both issues are discussed in respectively Section 6.1 and Section 6.2. The stability of these determinants over time is also addressed in Section 6.2. Section 6.3 focuses on the moral hazard problem. The factors that determine the premium are discussed in Section 6.4, while the final Section 6.5 contains the conclusions of this chapter.

6.1 Risk aversion

As mentioned in Sections 2.2 and 3.1, risk aversion is an important factor that describes the willingness of economic agents to sell the risks they are exposed to. Buyers of insurance (exporting companies) are risk averse, while the insurance company acts in a risk neutral way with respect to individual contracts. Insurance companies are more risk averse with respect to the whole risk portfolio. In the market research we found that insurance companies are more risk averse than exporters, and act in a risk averse way with respect to both individual contracts and the total portfolio. Insurance companies are less likely to accept risks in countries where they already have taken on several risks. This confirms the finding in Chapter 3 that an insurer will prefer a portfolio of balanced risks to one with risks that are unbalanced.

There are two opinions regarding the risk aversion of the government. Ac-

cording to the first opinion the government is a risk neutral. The government is able to accept risks that are not accepted by private agents. The government can also carry more losses over a longer period; it does not necessarily have to make a profit, like (re)insurance companies. The government can also make agreements with the Paris Club for a payment plan over a longer period. According to the second opinion the government is risk averse. The risk-avoiding attitude of the government can be explained by its responsibility towards the tax-payers. The government has to spend the tax revenues in a responsible way. Moreover, the government is constrained in its actions by its intertemporal budget restriction. The government has to cover its costs in export credit insurances, as is agreed internationally.

In contrary to the government, (re)insurers and brokers are profit oriented and base their decisions on possible loss-calculations. The difference in risk aversion between the government and these private institutions is related to solvency. A government has access to capital at a lower cost than (re)insurance companies do. Because of this cheaper access to capital, the government can accept a more unbalanced portfolio than a private insurer does, for given total costs of capital (see Section 3.1). Generally, there is no real difference between the risk aversion of an insurance company and a reinsurer.

According to some brokers, the degree of risk aversion of Dutch exporting companies is too low. They tend to underestimate the importance of insuring and too many exporters do not hedge risks while exporting.

6.2 Acceptance Criteria

This section will discuss the criteria of accepting risks for reinsurers, brokers, insurers and exporting companies. Section 6.2.1 focuses on the approach of (re)insurers and brokers, and is followed by a discussion of the approach of exporting companies in 6.2.2. The measurability of the criteria is the topic of 6.2.3 and in 6.2.4 the stability of the factors over time is discussed.

6.2.1 Reinsurers, brokers and insurance companies

Insurance companies are often in a long-term partnership with their reinsurers. Private reinsurers apply high underwriting standards that allow them to remain in business over economic cycles at profitable terms. Moreover, they evaluate insurance companies on the risk in question, the usual buyer

underwriting, the expertise of the insurer and the premium price. Of most importance is the experience of the reinsurer with a particular insurance company. In most cases, the reinsurer hardly considers the individual risks of the insurer. The degree of freedom[1] of the insurer is pretty large. The insurer can make its own decisions and the risks will be reinsured automatically by means of the current reinsurance contract. When reinsurers have built up a long-time relationship with the insurance companies, reinsurers will only explicitly consider large risks that are not automatically covered in the arrangement. In some cases, when they consider the risk as (too) large, they will increase the premium price.

Brokers heavily rely on their trust in both the exporter and the industry of the exporter when making the decision to accept their business. According to brokers, many Dutch companies use brokers as a last resort after they did not get a direct coverage at Gerling NCM. Some brokers use an application form in order to gather information. Insurance companies rely much on the judgment of brokers. The single bank involved in our research, ABN AMRO, applies a similar procedure as insurance companies and brokers do. The bank checks the track record of clients in acceptance of the deal. The experience with the debtor is an important factor: do the bank and the client have a shared history, or is it a new client? The bank prefers certain industries and aims at spreading risks.

Thus, before deciding to provide cover to an exporter, insurance companies and brokers try to collect as much information as possible, e.g., information about the risks, the solvency of the buyer, the country of the buyer, the size of the buyer, what did/do other insurers, the possibilities to re-insure, and information from references. The following criteria are important for insurance companies and brokers considering the acceptation of risks:

TRACK RECORD Important elements of a track record are the history of the exporting company, its year accounts over a period of 3 years, its solvency and its capacity. Especially Coface has a well-developed and extensive database with track record information about clients.

MANAGEMENT PERFORMANCE An important aspect of management performance is credit management. Credit management refers to the way the exporters handle their clients and it also includes the terms and ways of

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[1]Freedom to accept clients and judge the risk on own expertise without conferring it with the reinsurer.

payment. Insurers and some brokers use experts to analyse managers' performance. They want to know the names of the managers involved, and how selective an exporting company is in choosing clients. Exporting companies evaluate their customers before doing business with them on several factors, e.g., their own experiences before or experiences or relevant other information of other companies (references). Companies can also receive information gathered by Gerling NCM or banks, and check of reports by the DNB or annual reports. Some companies even check the history of a client in terms of a track record.

TERM The following terms of the insurance are of great importance to insurance companies: the fabrication period, the terms of payment and the nature of the project. In Chapter 5 we described the terms on the market for export credit insurances. In general, in the Netherlands, most export credit insurances are hedged in the short run. The government provides coverage in the long run. In foreign countries, insurance companies also cover projects on the long run.

COUNTRY INFORMATION The country in question is evaluated on specific classifications. These scales will be discussed in Section 6.3 and are different for different insurance companies. However, in general, the main distinction is between OECD countries and non-OECD countries. The decision to accept the insurance application is made in favour of the applicant when the country involved is evaluated as having low political risks. The commercial risks are evaluated in the track record of exporting companies and their evaluation of their clients.

INDUSTRY AND RELATIONSHIP Another important factor is the industry involved. Some sectors and industries cannot find coverage with a private insurer or Gerling NCM (public account). Examples of such uninsurable exports are trade in narcotics, weapons, fur, and diamonds. The kind of relationship between the exporting company and its client is also important. An insurance company can still be willing to cover even though the country involved is defined as one with large (political) risks. The reason for this can be found in the specific industry of the exporter, or in the excellent relationship between the exporter and its client.

All these factors are important in evaluating an application for insurance. Each factor is relevant, but there is a trade-off: a negative score on one factor

can be offset by a positive score on another. Also, these factors give the broker or insurance company insight in the motives of the exporter implying that possible moral hazard activities can be discovered at an early stage. The moral hazard issue will be discussed in more detail in Section 6.3.

In order to obtain information about buyers, insurance company Euler Trade Indemnity has so called Risk Offices. Analysts of these offices gather information (about management accounts, management situations, strategies, and targets of the company), and write reports with recommendations for insurance. These recommendations are input for the risk underwriter in the head office when making the decision to cover risks or not. Currently, these Risk Offices are only active in the UK.

6.2.2   Exporting companies

The previous section discussed the criteria of accepting applications from exporting companies by insurance companies and brokers. Exporting companies themselves also have criteria to evaluate insurance companies and alternative ways to secure their risks. We found no large differences in the criteria of evaluation (and risk aversion) between companies on the capital good market and the market for services[2] . When exporting companies consider (private) insurers, and/or brokers, the following factors determine the selection decision:

- Price (premium) and quality in terms of coverage worldwide: exporting companies consider this is as the most important factor;

- Possible coverage on countries and clients;

- Speed in decision of accepting risk;

- Experience of insurer in industry/country;

- Knowledge of markets of insurer;

- Possibility to cover certain risks, not all: selection.

Of course, the insurance company in question has to agree to accept the risks. As mentioned earlier, most companies apply at Gerling NCM. However, the exporters in the survey reported two disadvantages of Gerling NCM:

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[2]This market is covered by projects and advices from the engineering industry.

1. The low speed of dealing with the coverage application. Companies prefer a fast dispatch of their insurance application. A maximum duration of the decision process of two weeks to a month is preferred.

2. There is no possibility to select preferred risks. Some companies reported that it would be preferable to select risks for example on a country base. This is not the general policy of Gerling NCM, and when it is possible, the selection of risks will result in a higher premium.

Exporting companies prefer negative risk description over positive risk description, but in the opinion of the companies a free selection of risk description would even be better. Companies that consider these disadvantages as important turn to the foreign private insurance market (e.g., London Underwriting). These exporters are not satisfied with the possibilities of the other Dutch private insurers either. When exporting companies are satisfied with their relationship with Gerling NCM, they are not very sensitive for lower premiums of competitors of Gerling NCM. When explicitly asked for, exporting companies point out the importance of the premium prices. In reality, price sensitiveness seems to be of minor importance then the relationship with an insurer (Gerling NCM) or for the exporter to insure out of sheer habit.

6.2.3 Measuring criteria of acceptance

Many acceptance criteria are hard to measure for insurers and brokers. Databases are an important tool for insurance companies to gather information about the acceptance criteria, to predict claims and to keep the information on their clients, industries and markets up to date. Such databases need much detailed and preferably quantitative information. However, most acceptance criteria are of a qualitative nature, making them hard to measure. The track records of companies (historical data and year accounts) and the terms of insurances are relatively easy to convert into a database, in contrary to information on management performance, countries, industries and possible relationships. Also, due to international occurrences (threat of war, disasters of environment) it is hard to interpret data and extrapolate expectations over time. There are too many variables of different nature (qualitative and quantitative) to examine and to put in the database. This is also a problem in determining the premium price.

Reinsurers have searched for ways to measure their acceptance criteria.

One reinsurer has internal scoring systems that allow the tracking of measurable criteria such as risk, quality and performance of the insurer. Due to the different nature of risks, there are different criteria to underwrite each of the products.

6.2.4 Stability of the acceptance factors over time

The acceptance criteria for evaluating exporting companies change over time. This is mainly related to the country involved, e.g., economic and political changes and the individual risks of a country. The industry/sector of trade is important in the decision making process of insurers, although there are no specific industries that cannot get any coverage. One Dutch insurance company expects that the demand for insurances by Dutch companies will increase, because they will become more interested in insuring themselves for the increased risks.

In case of an economic recession, insurance companies will become more careful in accepting risks, because they need to make a profit. Currently, there is less demand for export credit insurances, partly caused by the situation in the insurance market, and partly caused by the decreasing demand of the 'far foreign countries' for export products.

6.3 Moral hazard

In Chapter 2 we discussed situations in which moral hazard can occur. In Section 2.3 moral hazard has been defined in general terms as the problem that occurs when an agent signs an insurance contract while pretending to be of low risk, and after signing the contract the agent switches to more risky behavior, knowing it is insured. In the case of export credit risk insurance, this means that the exporting company acts carelessly when investing in or exporting to a country with high potential risks, knowing that these risks are covered by an insurer or by the government. Also, as mentioned in Section 2.4, the moral hazard problem applies to the relation between insurance companies and the reinsurers or government (in the role as reinsurer).

The current situation is that moral hazard activities are hard to prove and do not seem to occur often, neither towards insurers, nor towards reinsurers. An explanation of this can be found in the substantial own risk for exporting companies. Often the amounts involved in the transaction are so large that when moral hazard activities would be discovered and the insurance will

not be covered, the companies would suffer a huge loss. Still, the involved market parties consider possible moral hazard activities to be relevant. In Section 6.3.1 we will discuss the possible activities for reinsurance companies to prevent moral hazard actions from insurance companies. Section 6.3.2 will discuss the moral hazard issue from exporting companies towards insurance companies and/or brokers.

6.3.1 Prevent moral hazard insurance company towards reinsurer

Insurance companies have to carry a percentage of own risk, according to reinsurers. The system of quota-share treaties is used, where the complete portfolio of the insurer will be supplied. Around 20-30% of this portfolio will stay with the insurance company and about 70% of the risks will be reinsured. Most insurance companies have their risk reinsured by several reinsurers, usually five to ten. This pool of reinsurers will be organised by the insurance company itself. The contracts between reinsurers and insurers usually have a duration of one year. When a reinsurer identifies moral hazard activities of an insurer within this period, the reinsurer cannot do anything yet, apart from taking legal steps at the end of the period of a year. When the reinsurer decides not to continue the contract, the insurance company will have great difficulties in finding other reinsurers, because several reinsurance companies are involved in the contract.

Note that this mechanism does not apply to the relation between Gerling NCM (public account) and the Dutch government as reinsurer. Their contract is not for a fixed duration, and it is not feasible for the Dutch government (in its role as reinsurer) to terminate this contract whenever moral hazard problems are suspected. Moreover, Gerling NCM does not retain any own risk on its public account.

6.3.2 Prevent moral hazard exporting company towards insurance company/broker

In Section 2.5 and 2.6, several instruments have been discussed that mitigate the moral hazard problem.

1. Collateral;

2. Reputation;

3. Threat of early liquidation;

4. Varying repayment schedules;

5. Securitization of risks.

We leave the issue of collateral aside, because this is hard to realize in export credit insurance. As discussed in section 6.1, reputation and repayment schedules are included in the acceptance criteria. Securitization of risks will be discussed in Chapter 7 as an alternative solution for export credit insurance. In the field study we identified a sixth instrument, namely increasing the volume of own risk. This leaves two options in order to avoid moral hazard on the market (Dutch as well as foreign):

1. Threat of liquidation: stop the coverage immediately at the discovery of moral hazard actions. However, in practice, moral hazard activities are seldom discovered. When this is the case, liquidation of the cover is a logic consequence.

2. Increase the own risk of companies. As explained before, the coverage of an insurer goes up to a certain percentage. The remaining percentage is called own risk, for account of the exporter. With a certain amount of own risk, the company will stay involved.

According to the insurance companies, moral hazard is hard to be avoided. No private debtor will announce its plans; therefore it is hard to discover bad intentions of companies. Insurance companies do not treat the second option purely to prevent moral hazard. There are countries that are considered as too risky and export to these countries will not be covered. When the risk is too high, moral hazard is excluded. The own risk percentage is (nearly always) in terms of political risks because these risks cannot be influenced by any market party. Insurance companies mostly maintain an own risk percentage for exporting companies when the countries involved are risky (of political nature). Thus, political risks might be a reason to increase the own risks. Therefore the level of own risk cannot be seen as purely an instrument for preventing moral hazard. Also, increasing the own risk of a company may not be effective for all companies, because the amount of own risk varies in size and perception. Some companies are not restrained from possible moral hazard activities by the increased percentage of own risk. According to one insurance company some other insurance companies would have a rule

implying that the insured exporting companies are prohibited to announce they are insured. Coface (International) has an arrangement included in its policy stating that clients have to handle risks as a good buyer. This means that an insured company has to behave as if not being insured. Coface checks the behaviour of its clients frequently.

Moral hazard activities towards brokers occur seldom. Still, brokers have to be cautious in treating exporting companies. The procedure of brokers is to rely on their experience by having conversations with exporters. Next to these conversations, brokers gather information on exporters from well known established international data-providers. According to brokers, moral hazard is related to the moral standards of the company, and increasing the own risk of exporting companies does not necessarily lead to a significant increase in the involvement of the company.

The British company Exporters Insurance Company has found a way to prevent moral hazard in a structural way. Every company that wants to be insured by Exporters, needs to buy shares. The term a company can get insured varies, short term as well as medium to long term (3-5 years and longer). The share is a function of the amount of capacity an exporting company wants to use. The amount of capacity an exporting company can use is 100 times the investment of the company, the minimum investment is US$100,000. Exporters are unique in offering cover through buying shares. No other insurance company in the international market for export credit insurance offers an alternative like this. With this risk sharing system, moral hazard activities by exporting companies will have negative effects for themselves.

6.4 Premium

This section will discuss the following subquestion formulated in Section 1.2: What are the determinants of the premium to be paid for the transfer of the risk? According to the discussion in Chapter 3, the premium required by the insurer depends on whether losses can be estimated with some degree of precision or not. This section starts with a discussion of the prediction of claims (Section 6.4.1), followed by a discussion of premium setting and the factors that determine the premium. In Section 6.4.3 we focus on the point of view of exporting companies.

6.4.1 PREDICTING CLAIMS

When claims could be completely predicted, insurance companies and reinsurers would suffer no more losses. Unfortunately, this is not the case. The reinsurer's estimates of expected loss ratios are based on macroeconomic factors and by underwriting and risk management considerations. In a way, it is possible to predict claims. For larger risks, the reinsurer will gather information, balance sheets, reports, and information agencies to judge all the risks.

Insurance companies are aware of the difficulties of predicting claims. Political risks are easier to predict than commercial risks in terms of sensitiveness of countries, threat of war and economic stability. Gerling NCM makes a prognosis every year, based on a statistical method, for which losses they will have to pay (in terms of volatility, price-sensitivity, and price differences). Its predictive value is of most importance for the short run, up to a few months, but predictions can only be made for situations for which a large quantity of data is available. It is possible to predict some problems in industries, and then the insurance companies can decide to withdraw from that segment of the market.

Claim behaviour can be modelled only to a certain extent. As discussed in Chapter 3, past data need not be relevant for modelling future risks. The insurance companies confirm this view. Both brokers and insurance companies agree that it is easier to predict political risk then credit risks. Banks in particular put a lot of effort in calculating the probability of default. However, not only claims are hard to predict, their size is even harder to predict.

6.4.2 PREMIUM DETERMINATION

The premium asked by Gerling NCM (public account) depends on two factors, a category division of countries, and a category division of debtors. Box 6.1 has an example of a debtor classification. The country classes are determined by risks and difficulties in countries. For the commercial risks there are seven categories of debtors. This is a clear and straightforward system. The system makes it easy to determine what the amount of premium will be in different cases, but does not solve the problem of determining the degree of risk of the transaction. There are discussions by insurers and exporting companies about quitting this system, because it can lead to unfair deci-

sions[3]. The solution would be a risk management system in which premiums are determined based on the characteristics of a single transaction. However, such a system may lead to extensive discussions about the premium for each transaction.

EXAMPLE BOX 6.1 DEBTOR CATEGORIES

The seven categories of debtors used by the government:

1. Monetary Authorities;

2. Central Government;

3. Lower Government;

4. Good Banks;

5. Standard Banks;

6. Good Private Debtors;

7. Standard Private Debtors.

The country classes are the same as the categories mentioned in Chapter 5.

The export credit insurance for account of the government is complementary to the market and cover costs over a certain period of time. The country in question and the term of agreement (short, medium or long term) are important in setting a premium price.

The determination of premiums for political risks within OECD countries has been harmonized. The harmonized premium price is largely based on the average premium prices of the various ECA's for OECD countries. This harmonization is established to limit competition between OECD countries. According to the agreement the price of the political premium may go up, but it is not allowed to decrease. For commercial premiums there is no harmonization yet, but this may change in the future. Another issue of setting

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[3]It can occur that a debtor rated lower in the category of debtors has to pay a higher amount of premium while there are reasons to believe the premium might be lower (lower risk, relationship with exporter, etc).

premium prices is the risk description. Dutch (private and public) insurance companies (used to) maintain a negative risk description (see Chapter 5). In the opinion of exporting companies a change to a positive risk description may have consequences for the premium price. However, the Dutch government has indicated that the change will not affect the rate of the full package of risks, but it may affect the rate for part of risks.

On the private market, premiums are priced at capacity. When the capacity is getting smaller, and the risks increase, the premium price increases. The private market is compliant for market fluctuations. When the economic situation is in a bad condition, private insurers may leave a market, at least faster than the government. The insurance companies become more cautious in taking high risks and losses.

As argued in Chapter 5, capacity in the insurance market depends on the business cycle. The number of companies offering export credit risk insurance depends on the moment in the cycle. Premiums tend to be higher when there are fewer insurers active in the market.

The opinion of the insurer about the risk is of great importance. The premium depends on the market situation, the sort of risk and the country. For OECD countries, only the commercial risks will be taken into account. The exact determination of the premium by Dutch insurers varies per insurance company. For example, Coface offers one premium for all OECD countries; Gerling NCM and Euler-Cobac have a country policy, as explained before. Per industry and per country, Euler-Cobac uses a risk category with a scale from 1-10. Euler-Cobac uses a rating scale for evaluating countries, one that is also used by many insurance companies, which indicates the risk of countries (AAA, BB, C, D). A country with a D-notification is not insurable. A country committee determines the scores of countries on this scale.

One Dutch broker indicated that the reputation of the company may be beneficial in setting the premium and accepting the transaction. Some insurance companies have special agreements with intermediaries (banks or brokers, for example Gerling NCM with ABN AMRO, Coface with Meeùs, and Euler-Cobac with Rabobank). Another Dutch broker acknowledges that the premium charged is partly determined by the way the risks are presented. However, it seems that the premium requested by the insurance company depends more on macro factors, such as the economic situation, than the opinion of the broker.

From the interviews, in general the following factors are involved in determining the premium: profit of a company, terms of payment (30-180 days),

spread of risks, own risk of exporters, balancedness of the portfolio, possible amount of and probability of losses, industry and country involved. Generally, these factors overlap with the acceptance criteria.

Calculating premium rates

Since a large number of factors are important for calculating premium rates, databases are required to develop a model. However, these data are often not available because of the instability over time. Also the export credit data tend to be more qualitative than other insurances (see also the discussion of databases in Section 6.3).

Most private reinsurers do not have their own premium calculation models. They follow the premiums of their clients, the insurers. When they consider a premium as too low (for example they have noticed higher premiums at other insurance companies for the same country in the same sector), they will try to have it increased.

6.4.3 Exporting companies and premium prices

According to many Dutch exporting companies, the insurance market and in particular the policy of Gerling NCM (public account as well as private account) is changing. The exporting companies perceive that premium prices have been increased and coverage is not extended automatically (depending on the country and the industry). Some companies however, consider the premiums as too high and decided to manage the risks themselves. According to companies involved in projects such as engineering companies, the premium price depends less on the economic climate but more on the duration of the project, the country involved and the size of the project.

Premiums are most often passed on to the clients of exporting companies. When exporting to a risky country, companies take the bad behavior of payment into account and may charge an extra amount for that in the transaction price. Export credit insurance is noticeable when a company is passing it on to its clients. These clients then know about the existence of the export credit insurance and the associated premium.

According to a Dutch broker, exporting companies often perceive premiums as very high. Insurance companies are interested in lowering the premium prices when companies will take a larger percentage of the coverage for their own account. Companies do not evaluate this as a possible option. Especially companies in the market for capital goods are not interested in this option. They prefer to have a coverage as high as possible, with a matching premium,

instead of less coverage and a lower premium. Their objective is to control the risks. Other companies are willing to consider this option only per case and up to a certain degree. In some cases, Gerling NCM and exporting companies are already discussing this possibility.

6.5 CONCLUSIONS

The difference in risk aversion between the government and private (re)insurers is related to solvency. The government is able to accept risks that are not acceptable for the private market. An exporting company is mainly focused on its long run turnover and its continuity.

The acceptance criteria for insurers do not differ much from the criteria of brokers and reinsurers. The following criteria are important for accepting risks: track record, term, management performance, country information, industry and relationship of the exporting company with its client. Exporting companies also have criteria to evaluate insurance companies. Their most important evaluating factor is the premium price asked for by insurers. However, the importance of the existing relationship with insurers and habits of exporting companies must not be underestimated. The criteria for acceptance change over time, often related to the country involved. In general, the main acceptance criteria and their stability over time are related to the spread of risks and the available information about markets and industries. Therefore, gathering information has to be relatively easy for insurers and exporting companies, and markets should be transparent.

According to all interviewed parties moral hazard is hard to be avoided. There is no way to be sure that exporting companies will not act in line with moral hazard. Most insurance companies and brokers trust on their experience. Moral hazard activities of insurance companies towards reinsurers hardly ever occur, because if insurers would do so, they will not get any coverage in the future by any other reinsurer. Besides, they have to carry an own risk percentage (in the relationship private insurance companies and reinsurers).

The economic and political developments in countries and industries are the main factors affecting the premium. The premium also depends on the country class and the kind of debtor. Other factors determining the premium price are the spread of risks and the terms of payment. Claims are hard to predict for (re)insurance companies, though political risks are easier to predict than commercial risks. Generally, companies are not willing to take

a higher percentage of own risks for their account in exchange for a decrease in the premium price.

Alternative solutions for export credit insurance

In this chapter we address alternative methods to export credit insurance. Various solutions that can be seen as alternatives for the export credit insurance are described. We distinguish between three major categories of alternative solutions: own risk administration (Section 7.1), financial support (section 7.2) and alternative risk transfer techniques (section 7.3). Recently, alternative techniques for transferring credit risks have been discussed in Bank for International Settlements (2003) as well.

Brokers have par excellence the broadest view of all alternatives to export credit insurance when compared to other market parties. Most brokers are aware of all possible alternatives when working with clients, and consider export credit insurance just as one option. Most alternative solutions are provided by the financial markets, which is not surprising. The market of political and credit risks is quite a small niche in the insurance market, that is much closer to banking and finance then it is to the rest of the insurance market.

7.1 Own risk administration

The own risk administration techniques are:

- No export credit insurance as described in subsection 5.2.4.

- Prepayment: full prepayment by a strong market position of the exporter, partial prepayment, and positive cash flow. Prepayment appears to be a standard requirement, and in combination with letter

of credit it is often considered as a viable alternative to export credit insurance. Within OECD-countries the following prepayment rules are common: 5% prepayment and 10% at delivery. The amount of prepayment required for transactions outside the OECD-countries depends on the nature of the project and the relationship with the debtor. Most often exporters try to get 100% payment at delivery when exporting to non-OECD countries. Prepayment technique hedges the commercial risk for the exporting company.

- Captives—own small insurance companies created by large corporations with a strong capital base in tax havens and/or countries with a limited regulatory regime. The main goal of the captives is to retain more risk by means of risk management solutions deploying self-financing mechanisms (Munich Re (2000)). Exporters Insurance Services Inc. has started as a captive, created by telecom companies and banks by putting capital together in order to provide cover for the risks not available in the market. Examples of Dutch companies using captives are such multinationals as Philips and DSM. Captives is an own risk administration technique that requires a huge capital amount and can be used by large companies only. The technique of captives provides coverage against both commercial and political risks.

- Reserved property rights agreement. Due to this agreement the property rights for the export or investment object pass to the debtor after the payment only. However, this method cannot be applied to every export or investment product. It is essential to be able to prove the origin of the product. Gerling NCM (public account) always demands a reserved property rights agreement from her clients for several markets. Reserved property rights agreement hedges the commercial risk.

7.2 Financial support

The solutions involving financial support are mostly provided by banks. Only the single risk insurance is provided by insurance companies.

- Letter of credit: a document issued by a bank that guarantees the payment of a customer's drafts for a specified period and up to a specified amount (Investorwords (2002)). One respondent mentioned a decline in the usage of letters of credit because of increasing costs. Still, let-

ter of credit remains the most important alternative for export credit insurance used by exporting companies. A letter of credit is suited for coverage of commercial risks and is very popular in combination with an export credit insurance policy for political risk. When good arrangements are made with a bank, a letter of credit can even serve as a protection against the political risk. Letters of credit are widely used for short-term transactions. For the medium-long term transactions letter of credit may become very expensive. Still, when the medium-long term transaction is financed by the exporter, a letter of credit is considered as the first possibility to hedge commercial risk. If no letter of credit for a particular transaction is available, an exporter will ask an export insurance company for coverage (most often Gerling NCM (public account)).

- Bank guarantee: Acceptance of responsibility by a bank for an obligation if the entity with primary responsibility for the obligation does not meet it (Investorwords (2002)). Bank guarantees can be used to cover commercial risks, but not political risks. Only a few Dutch exporters use bank guarantee.

- Structured Finance: non-standard lending arrangements, customized to the needs of specific clients. Such arrangements are often not fungible. Structured finance helps to hedge the country risk. None of the interviewed exporters uses structured finance technique.

- Single risk insurance: the possibility to insure short term single risks instead of the whole turnover insurance. Single risk insurances are not very popular in the insurance market. In the Netherlands, only Coface Nederland offers a single risk insurance option. Gerling NCM (private account) usually accepts short and medium single risk insurance when the export is to OECD countries. In the international market single risk insurance is quite common at Lloyds. Single risk policies are provided by Exporters Insurance Services Inc., AIG (for political risks) and FCIA.

7.3 Alternative risk transfer techniques

The alternative risk transfer techniques mentioned by the respondents basically fall into the following three categories:

- Finite risk solutions;

- Insurance securitization;

- Insurance derivatives.

7.3.1 FINITE RISK SOLUTIONS

Finite risk insurance is considered as a good balance protection for businesses. During at least five years an exporter pays a premium to the insurance company. In the case of a loss the claim will be paid by the insurer. If no loss occurs, the exporter receives part of the paid premium back diminished with the costs. A similar agreement, called finite risk reinsurance, can be developed between the insurer and the reinsurer and serves the reinsurance purposes.

Finite risk solutions are suited to cover both political risks and commercial risks. None of the interviewed parties in the Netherlands and abroad have ever made use of a finite risk solution.

7.3.2 INSURANCE SECURITIZATION

Insurance securitization is a way to transfer some portfolio risks to the capital market. The developments that started to take place on securitization of export credit were stagnated by the rapid economic decline over the 2001. Most of the new alternatives disappeared. According to one respondent there is a lot of demand for securitization because of the restricted capacity in the current insurance and reinsurance markets. Zurich is already trying to work with securitization products. Two examples of securitization products that are used in practice are factoring and bond issue.

FACTORING

This method concerns the selling of a company's accounts receivable, at a discount, to a factor. The factor then assumes the credit risk of the account debtors and receives cash as the debtors settle their accounts. Depending on the debt collection tasks factoring and invoice discounting can be distinguished, where respectively the factor or the seller collects debt. Factoring and invoice discounting are considered to be appropriate for small and mid-size companies. Based on the receivables pollution (e.g., the amount of bad debts) factor would finance up to 80% of the invoice value. Factors provide bad debt protection without paying the insurance premium tax. This is what makes factors the main competitors of the export credit insurance. Both political risks and commercial risks can be covered by factoring.

Exporting companies and insurance companies are already using factoring. The insurers that use factoring as reinsurance alternative are Euler Cobac and Coface UK. However, exporting companies tend to consider factoring as an expensive solution.

BOND ISSUE

With the most common insurance securitization model via an insurance risk bond, the insurer, acting as the sponsor of the transaction, concludes a reinsurance agreement with the reinsurer, who then cedes the risk to a special purpose reinsurance company (SPC) under a retrocession agreement. This SPC covers any liabilities from the retrocession agreement by issuing a bond (Munich Re (2000)). The necessary volume of the bond issue is considered to be in the range of US\$ 100 to 200 million in order to offset costs involved. The parties that could be interested in buying a bond include life insurance companies, reinsurance companies, property causality companies looking for long term investments, and banks. The term of securitization by means of a bond issue starts with five years and goes up to 10 years because of cost considerations. Both political risks and commercial risks can be covered by the bond issue, although the political risks are more difficult to bind in a portfolio because of low severity and heterogeneity.

Because of the current difficult situation on the financial markets, bonds are described as too expensive solutions. A company interested in securitization via bond issue has to have a large volume and a high number of well-rated risks. The whole risk can be hardly insured in the financial market. Below investment grade risks[1] are very expensive in the financial market. Provided a company has covered all her best risks on the financial market, it would be nearly impossible or very expensive to cover the rest of the risks, in the export credit insurance market.

Currently, securitization via bond issue is used by insurers as reinsurance alternative only, e.g., Zurich has been involved in securitization by enhancing bond issues for emerging markets companies in order to securitize part of its portfolio. Securitization of the exporter's risks via bond issue has not been done yet. The capital markets are interested in the whole portfolios, for risk spreading purposes, and do not want to be involved in the securitization of a single company.

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[1]Below investment grade risk is normally defined as risk taken by the company which has less than AAA rating from the rating agency like SNT or Moody's.

7.3.3 Insurance derivatives

Insurance derivatives, which transfer insurance risks to the capital market and which, in contrast to insurance risk bonds, do not provide prior liquidity to safeguard the maximum liability, can be structured as swaps or options. The basis for such a transaction may be a market loss index (e.g., the PCS index of the Property Claims Service in the USA) or a parametric trigger. A market loss index reflects the losses incurred in the insurance industry after a natural catastrophe. A parametric trigger links the trigger of cover to a natural catastrophe, which must comply with precisely defined and transparent criteria in terms of severity (magnitude of earthquakes, wind velocity or air pressure for windstorm) (Munich Re (2000)).

The insurance derivatives transactions are available for reasonably sized deals. The market for insurance derivatives is considered to be limited. Only companies having a rating from an approved credit agency can be involved in a deal with insurance derivatives. The term of the insurance derivative is self-limiting depending what and if the financial market is ready to pay for the derivative. One respondent describes insurance derivatives as an efficient reinsurance alternative in terms of taxes, which have to be paid. Currently, no insurance derivatives are being used to cover export credit risks by any insurance or reinsurance company. The attempt to create a market for political risk derivatives five years ago did not succeed because of the restricted demand.

Derivatives do not seem to be an interesting alternative for the export credit insurance, because of the additional uncertainty built-in into these transactions. The parties financing the derivatives transactions face additional risks. A problem is the need to cover pre-issue guarantee that the derivative exposure will always be present for the period of derivative.

7.4 Conclusions

Own risk administration and financial support are the most popular alternatives to export credit insurance in the Netherlands. Still, there are more non-insured exporters in the Netherlands than insured. Most non-insured companies replace export credit insurance by a combination of prepayment agreements and a letter of credit in order to hedge commercial risk. This combination is very popular among Dutch exporters. When good arrangements are made with a bank, a letter of credit may even serve as a protection

against the political risk. A letter of credit is also widely used in combination with an export credit insurance against political risk. A letter of credit is very well suited for short-term transactions; for the medium-long term transactions a letter of credit may become very expensive. Still, when the medium-long term transaction is financed by the exporter, a letter of credit is considered as the first possibility to hedge commercial risk. Few Dutch exporters use bank guarantee in order to hedge commercial risk.

Captives are mostly used by large multinationals such as Philips and DSM because of high capital requirements. By creating captives, companies hedge both political and commercial risks. The own risk administration technique gaining in importance in the Netherlands is reserved property rights agreement. Export credit insurance companies invite exporters to use this kind of agreement in order to hedge commercial risk. Gerling NCM (public account) always demands a reserved property rights agreement from her clients for several markets. None of the interviewed exporters mentioned to make use of structured finance techniques, which can help hedge the country risk. The option to insure single risks instead of whole turnover insurance is still rarely available in the Netherlands when the export is to non-OECD countries. Despite the fact that exporters are highly interested in single risk insurance, currently only Coface Nederland offers this option in the Netherlands. In the international market single risk insurance is quite common.

The alternative solutions are not very popular in the Netherlands. The only Dutch export credit insurance company using factoring as an alternative to reinsurance is Euler Cobac[2]. The lack of expertise in the area of the alternative risk transfer techniques is the main reason of the low use of these methods. Still, most of insurance companies consider using alternative risk transfer techniques in the future, provided that the knowledge of those techniques would be present within the company. Export credit insurance companies may use alternative risk transfer techniques for reinsurance purposes only, and not as main a product, since alternative risk transfer techniques are not the core business of the export credit insurers. For the exporting companies, export credit insurance still remains the cheapest alternative.

The international insurance companies are more developed in terms of alternative risk transfer techniques exploitation. Factoring and securitization via bond issue are occasionally used. Finally, we can conclude that the alternative methods to export credit insurance described in this chapter form a

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[2]Euler Cobac uses factoring as reinsurance alternative via her subsidiary.

better solution for short-term transactions than for medium-long term transactions.

Summary and conclusions

8.1 Summary

This report presents an analysis of the market for export credit insurance. This market is of substantial importance to the development of the Dutch economy. Dutch exports contribute a large amount to the development of GDP-growth. Dutch exporters benefit from the role played by Gerling NCM and the Dutch government as insurer respectively reinsurer of their risky export projects. In insurance, however, a government should operate carefully, because too large government interference will probably lead to socially undesirable solutions. For example, one can think of under-pricing of government reinsurance, which will lead to excessive government expenditure and improper functioning (lack of private competition) of the export insurance market. Government interference therefore requires careful analysis of the problems facing exporting firms and insurance companies. Therefore two issues are central in this report: (1) What are the key determinants of private export credit risk insurability? and (2) Which export credit risks can be covered by the private market? We need to answer problem (1) first in order to address problem (2) satisfactorily. The report consists of two main parts: a theoretical description of the insurance problem in Chapters 2 and 3 and a field study (Chapters 4 to 7).

Chapter 1 introduces the research problem and presents more detailed research issues. In order to address the problems stated above we need to know how economic theory explains the existence of insurance contracts, the premiums paid, and handles the problem of private versus public insurance. Chapter 2 presents a theoretical overview of the markets for risk. Insurance markets are central to financial systems. Opening of financial markets leads

to more opportunities to share risks. Recent changes in the financial system, due to deregulation, liberalization, and internationalization, open additional opportunities for risk traders. It is shown that the key to explain the existence of markets for risk is the desire to exchange risks by various economic agents. Based on expected utility theory we show that risk aversion by individual agents provides opportunities to explain exchange of risks. The willingness to pay for insurance depends on the degree of risk aversion. The main key to explain the functioning of insurance markets is the existence of asymmetric information. Imperfect information leads to incomplete financial contracting. Insurance contracts are such incomplete contracts: one simply cannot foresee all future states of the world. We show that it is likely that asymmetric information will lead to (equilibrium) rationing of demanders of insurance products. This gives rise to put forward the issue of government interference as a (re)insurer. If governments provide (re)insurance, this will help potentially profitable projects, that are rejected in the private market due to a lack of information. There is one main negative side-effect though: moral hazard. If a private insurance company knows that a government is easily accepting reinsurance applications, it will probably increase its own riskiness. This might lead to excessive government financing and financial instability. We also present general principles of insurability and discuss solutions to moral hazard problems in insurance via securitization of risks. We conclude that there is a serious role for public insurance of macroeconomic risks. The government in her unique role is able to use a very low social discount rate, which allows the government to spread macroeconomic risks through time. It is also argued that the empirical determination of macroeconomic risks is troublesome (and probably very costly). Chapter 3 discusses more in detail the pricing of insurance contracts. It is argued that setting a price for export credit insurance is more difficult than car or anti-theft insurance. Often risks attached to various projects are correlated (for the insurer), which forces the insurance company to hold a portfolio that is carefully spread out over various countries. A second problem in export credit insurance is the relative large variance of the uncertain variables. For instance, a political situation can change rapidly, at least during the contract period. A normal procedure for insurers to price products is through mark-up pricing.

Chapters 4 to 7 present a description of an extensive field survey. Chapter 4 introduces the set-up of the field study. The character of the field study is explorative. It is argued that in-depth interviews with field experts and market participants are more likely to reveal the answers to the research

questions than sending out a questionnaire. A limitation of field research via face-to-face interviews is that formal statistical analysis is not possible; an important advantage is that a detailed and thorough understanding of this complicated market is gained. Four groups of market participants are interviewed: firms demanding export credit insurance, insurance companies, intermediaries, and reinsurance companies.

Chapter 5 presents an extensive overview of the market for export credit insurance. On the demand side it is argued that size matters. Large companies can probably hedge risks internally and will not demand export credit insurance to a large extent. Medium-sized firms are the most likely demanding firms. Small firms face large informational problems, at least in the Netherlands (within Europe there is more supply). The European market for export credit insurance faces a concentrated supply by insurance companies. Three insurance groups dominate: Gerling NCM, Coface Nederland, and Euler-Cobac. Gerling NCM has a dominant market position in the Netherlands (a share of 65% in 2001). Other financial intermediaries operate on the export credit insurance market: private banks, such as ABN-AMRO Insurances, ING, and Van Lanschot CMC, and international operating brokers such as AON, Marsh, Meeùs and Finance & Insurance. The Euler Cobac and Coface Group mainly operate through the latter class of intermediaries. The Dutch government and about 10 foreign reinsurance companies (Swiss Re and Munich Re being the most prominent ones) supply export credit reinsurance products. Chapter 5 furthermore describes the products transacted on the Dutch market. There are two main product classes: export insurance and investment insurance. The chapter gives a description of the various properties of the products. It is concluded that there are no particular risks, that cannot be covered in the private market. The possibilities of the private market are limited in terms of coverage duration (with problems for contracts longer than 2 years) and the selection of a target group (especially small firms, which can only apply to Gerling NCM). Moreover, it appears that the private insurance market is characterized by large fluctuations in capacity.

Chapter 6 presents the major findings with respect to the formulation of acceptance criteria, the pricing of contracts, and moral hazard issues. First, an impression is given with respect to the perceived risk attitude of market participants. In the eyes of insurers exporting firms behave too much risk loving. Insurers themselves are believed to operate in a risk averse way. They act being risk averse in dealing individual contracts (which contradicts economic theory) and in spreading risks internally through portfolio decisions

109

(which is in line with economic theory). The government can take a little more risk, because its internal (social) discount rate is lower than the market rate. The acceptance criteria for insurers do not differ much from the criteria used by brokers and reinsurers: track record of the applicant, term of contract, management performance, country information, industry and the nature of the relationship of the exporting company with its client. Exporting firms compare the offers by insurance companies on the basis of price arguments mainly. The acceptance criteria are hard to measure: there is a lack of appropriate databases and relevant qualitative and quantitative knowledge. According to the insurance companies, moral hazard is hard to be avoided, but at the same time they do not believe that it is an important practical problem. This might be due to the impact of own-risk clauses in the contract. The economic and political developments in countries and industries are the main factors affecting the premium. The premium also depends on the country class and the kind of debtor.

Chapter 7 discusses the alternative solutions to deferring export credit risks. Own risk administration and financial support are the most popular alternatives to export credit insurance in the Netherlands. Most uninsured companies replace export credit insurance by a combination of prepayment agreement and a letter of credit in order to hedge commercial risk. A letter of credit (in combination with export insurance) may even serve as a protection against the political risk. A letter of credit is perfectly suited for short-term transactions; for the medium-long term transactions a letter of credit is considered to be very expensive. Some Dutch exporters use bank guarantees in order to hedge commercial risk. Captives are mostly used by large multinationals such as Philips and DSM because of high capital requirements. By creating captives, companies hedge both political and commercial risks. None of the interviewed exporters mentioned to make use of structured finance techniques, which can help to hedge country risk. This product that insures a single risk instead of the whole turnover insurance is still rarely available in the Netherlands. Despite the fact that all exporters are highly interested in single risk reinsurance, currently only Coface Nederland offers this type of contract. In the international market single risk insurance is quite common. The only Dutch export credit insurance company using factoring as an alternative to reinsurance is Euler Cobac. The lack of expertise in the area of alternative risk transfer techniques is the main reason of the low popularity of these solutions. Still, most of the insurance companies consider using the alternative risk transfer techniques in the future provided that the

110

knowledge of those techniques would be present within the company. Export credit insurance companies might use alternative risk transfer techniques for reinsurance purposes only, and not as a main product, since alternative risk transfer techniques are not the core business of the export credit insurers. For the exporting companies the export credit insurance still remains the cheapest alternative. The international insurance companies are more developed in terms of alternative risk transfer techniques exploitation. Factoring and securitization via bond issue are occasionally used.

8.2 CONCLUSIONS

The main research questions to be answered in this report are: (1) What are the key determinants of private export credit risk insurability? and (2) Which export credit risks can be covered by the private market? And as an extension, what classes of risk should be covered by the public sector? We will answer these questions on a macro level, using the information gathered from the literature review and the field research.

First, we discuss the determinants of private export credit risk insurability. Economic theory predicts that firms that operate risk averse are willing to pay an insurance premium. Large (say listed) firms operate at a relative low degree of risk aversion. These firms can use internal risk hedging as a useful alternative to private export credit risk insurance. Medium-sized firms are more likely to apply for export credit risk insurance, while small firms probably face problems (since for this group there is only one supplier of insurance active). Why do these small firms face problems?

- It is rather unlikely that export credit insurance companies are able to estimate loss distributions for all export cases Dutch exporters face. Development of databases is very expensive and troublesome (and generally considered to be one of the main impediments to market entry). A lack of competition among export credit insurers is through that established;

- Insurance companies face correlated risk problems. This leads to low hedge opportunities in terms of Dutch reinsurance. Being risk averse themselves, portfolio arguments dominate application decisions;

- If small firms are thinking about large export projects economic feasibility of insurance contracts is threatened;

111

- Private insurance companies point at public (re-)insurance being a reasonable alternative. The government has a low required internal rate of return and therefore should accept marginal cases;

- Insurance companies put effort into avoiding moral hazard problems: they screen management, require financial disclosure of the applicant, etc. These costs incurred by the insurer lead to high transaction costs when a small company wants a small transaction to be insured.

A related problem to insurability is the high market concentration of supply. Market dominance leads to monopolistic rent extraction. In the case of the Netherlands this might apply to Gerling NCM. In our survey Gerling NCM is criticized for its low speed of decision making in application issues and a lack of supply of specific risk contracts. On the other hand relationship insurance seems to be a popular model. In our survey, firms point at a preference for long-lasting relations. Most exporters seem to have low price elasticity of insurance demand. Economic theory predicts moral hazard to be an important determinant of insurability. The issue of moral hazard, though recognized by insurance companies, does not dominate the perception of insurability. The price of export credit insurance is largely determined by macroeconomic risk factors, such as political risk.

This brings us to our second main issue: what role should the government play on the market for export credit risk insurance? This is a difficult problem, though we have some clues for answers right now. We argue the following:

- In markets with asymmetric information it is likely that profitable projects will be denied insurance. If the government considers export growth as one of its main goals, it should interfere in the market by lowering relative prices;

- The government is equipped to hedge intertemporal risks due to a low social cost of capital. In our survey some market participants point at the responsibility the government should take, especially in the case of small exporting companies;

- The government should offer opportunities to hedge macroeconomic risks, such as political/country risk. These risk types are seen as the main drivers of export insurance premium contracts;

- Moral hazard of public (re-)insurance might be a problem, but is not perceived as such in our survey by (re)insurance companies operating in the private market. The reason for this is that private reinsurers have a credible threat point: they can stop to accept a certain insurer when it is suspected that moral hazard has become an issue. Moreover, private reinsurers never accept full cover, the insurer always retains part of the risk. The relation between the Dutch government and Gerling NCM differs in this respect: Gerling NCM retains no risk on its public account, and the government cannot end its relation with Gerling NCM. Therefor, moral hazard could be a problem in this insurer/reinsurer relation;

- Besides direct interference, the government should take care of prudential regulation of the insurance sector. Monopolistic behaviour should be avoided by appropriate regulation. Especially contracts that have a large geographical nature are subject to at least monopolistic competition. Clients who are not satisfied with the monopoly supplier should be able to meet other suppliers (at home or abroad). This holds especially for long-term contracts.

In all cases the government should operate in a prudential way.

8.3 RECOMMENDATIONS

Based on our research, we recommend the following:

1. It seems that the industrial organization of the market for export credit insurance is an important issue. Exporting firms perceive a monopolistic supply for some products. Some of the exporting firms experience the monopoly position by Gerling NCM in some transaction types to be an obstacle for future development. Moreover, it is most likely that the government uses its advantageous position of having low costs of funding. This leads to inefficiencies, such as unfair low-cost barriers to entry, that would be resolved by 'fair' competition. For all segments of the export credit insurance market the government should strive for a minimum level of private competition. Some of the firms interviewed argue that the London market offers many more profitable contracts. For smaller Dutch firms though the costs of applying for products in the London market are too high. This reinforces the idea of increasing competition within the Netherlands.

2. A related issue is the large barrier to entry' relevant to the export credit insurance market. An insurance company needs an extensive database to get into business. Old firms have competitive advantage just by controlling a dataset. In general terms human knowledge is important. For the Dutch market this would imply to try to convince other insurance companies to interfere in the Dutch markets. An alternative would be to cooperate with the London-based insurance companies. There might also be a role for public data collection, probably not at the national level, but at the EU-level.

3. The government also has a role in sending information to the market related to alternative risk instruments. A national campaign explaining and informing about the alternative risk products will help exporters find a better solution for reducing export credit risk they are exposed to. More and more risk instruments become available through the increase in the number of new financial products (especially contingent claims). So the government could inform the financial markets a bit better on the use of new financial products in constructing insurance contracts.

A last policy recommendation relates to research. Given the importance of the subject it is rather surprising to note that so little is known about the problems discussed above. In general terms there is little known about the empirics of private-public interaction in markets with asymmetric information. In particular with respect to export credit insurance this problem is even larger. An agenda for future research could focus on:

- How should we cope with the changes in the organizational structure of suppliers? Think of the large bank-insurance companies that seem to dominate the financial landscape. Banks provide liquidity insurance using their loan and deposit policies. It is most likely that they extend their insurance portfolios into other sectors as well. In our field research we did not explicitly analyze bank behavior.

- Given the argument above, how should we regulate the sector in terms of capital adequacy requirements (and other forms of regulation)?

- The increase in choices among alternative financial contracts (other than the original export credit insurance contracts) must lead to more research into the use and control of the risk instruments.

- More research is needed with respect to the issue of moral hazard. This type of research requires large cross-sectional data sets of firms with information on the contract level. This type of information is generally unknown in the Netherlands (as opposed to other European countries). The creation of such a data set would definitely help future research.

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List of questions and topics for the interviews

General Questions (Market Description)

1. What export risks does the private market cover at this moment?

2. Are there export risks, which can be but are not yet covered by the private market?

3. What export credit risks cannot be covered by the private market and why not?

4. What are the possibilities to motivate the private market to cover more risks? (Difference between political and standard risks)

5. Is it an option to divide risks in general and specific compartments in order to appoint these compartments respectively to the private market and the government?

6. What percentage of risk is political and commercial?

7. How does the need for capital to insure credit risks relate towards other insurances?

8. Is there evidence of cross-subsidies made by insurers? Do any insurers offer export credit insurance next to other insurances in order to retain their customers?

9. Which market (private vs. public) of export credit insurance is at this moment more attractive for exporting companies and why?

10. Which insurance companies are more attractive for Dutch exporting companies: Dutch or foreign? Why?

11. The private market for export credit insurance is mostly for short till middle term projects. Are there possibilities to extend this term?

12. Are medium sized and small companies interested in export credit insurance on the private market, on which conditions?

13. Which risks are exporting companies interested to insure?

14. What are the possibilities for project finance? What is the difference between the insurance of the export credit and project financing?

15. What are the characteristics of exporting companies that apply for the export credit insurance vs. companies that do not apply for export credit insurance?

ACCEPTANCE CRITERIA

1. On which aspects does the risk aversion of an insurer differ from the risk aversion of a applicant?

2. How risk averse is an exporting company? Does this differ per size, industry, etc.

3. What are the general acceptance criteria for insurances on the private market?

4. What are the acceptance criteria for export credit insurance on the private market?

5. What are the general acceptance criteria for insurances used by the government? (Gerling NCM)

6. What are the general acceptance criteria for export credit insurances used by the government? (Gerling NCM)

7. What are the criteria for exporting companies to evaluate insurance companies?

8. Are these acceptance criteria (question 3-7) correlated with any extern factors (politic, legislative, environmental, economical, demographical, etc.)? How are they correlated?

9. What happens during a recession; decrease of demand or supply?

10. How can the acceptance criteria for export credit insurance be measured?

11. What are the possibilities to deal with the problem of correlated risks within one country?

12. Do the insurance companies check the management performance and overall past performance of the applicant?

13. What is the influence of the applicant on her foreign partner and is it measurable?

14. Are the acceptance criteria of reinsurance companies different for applicants with high volume and those with low volume?

15. Which term contracts do (re)insurers accept? Why?

Moral hazard

1. Are the following regulations being used on the export credit insurance market in order to avoid moral hazard?

   If not, why not? Go to question 4. If yes, go to question 2.

   (a) The 'threat of liquidation'.
   (b) Setting an appropriate level of deductible, that is, retention of part of the claim cost by the policyholder for each claim. Own risk of the policyholder instead of zero or very low risk.
   (c) Which other alternative regulations are being used on the (Dutch) export credit insurance market to avoid moral hazard?

2. Are these regulations effective on the (Dutch) market? (Are companies held from doing moral hazard activities or not?)

3. Which percentage of the claim costs can be for account of the policyholder? (ability)

4. Which part of the claim costs are the policyholders willing to share? (willingness)

5. Is there any evidence or presumption of the export risks being taken into account in price calculation for risky countries compared to other export countries?

6. Ask companies directly if they set different prices in different countries.

Premium rating

1. Are the premium ratings different for each country? (OECD vs. non-OECD countries).

2. How are the premium ratings being calculated, what criteria do the insurers use?

3. To which extent are statistical models available for premium rating calculations?

4. Are there enough various data available for statistical modelling purposes?

5. What are the measurable rating factors associated with the individual applicant?

6. What are the measurable rating factors associated with the risk unit which the applicant seeks to protect?

7. What are the measurable rating factors relating to the coverage being sought?

8. What are the difficulties regarding the premium rating calculation?

9. Is it possible to predict the claims of export credit insurance?

10. What data should be analyzed to predict the claims of export credit insurance?

11. Is there any influence on the decision process of the insurer concerning premium rating calculations?

12. Are the policyholders interested in lower premium ratings if taking some claim costs for their account?

13. Did exporting companies notice a change in the height of premium prices over the last 3-5 years?

Alternative solutions

1. What are the alternative solutions for export credit insurance being used on the (Dutch) market at this moment?

2. Are following solutions being used on the market? If not, why not? Are these solutions effective? Attractive for exporting companies?

    (a) Catastrophe options based on an index determined by estimates of insured property damages

    (b) Catastrophe bonds

    (c) Project obligations

    (d) Tax-deferred catastrophe reserves, reducing the tax costs associated with holding capital

    (e) Letter of Credit

    (f) Other ideas regarding additional possibilities

3. Are there instruments, which can completely replace the export credit insurance?

RISK MINIMIZATION

1. Are there negative correlated risks in export business?

2. Does the value of claims correlate with the number of claims (independency issue)? In which way?

3. To which extend are the insurers able to control their portfolio?

This is a complete list of questions. The topics of this list are discussed in the interviews, depending on the interviewed party (insurer, exporting company, etc).