THE EFFECTS ON INTRA-COMMUNITY COMPETITION OF EXPORT SUBSIDIES TO THIRD COUNTRIES

The case of export credits, export insurance and official development assistance

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Commission of the European Communities

THE EFFECTS ON INTRA-COMMUNITY COMPETITION OF

EXPORT SUBSIDIES TO THIRD COUNTRIES :

THE CASE OF EXPORT CREDITS, EXPORT INSURANCE

AND OFFICIAL DEVELOPMENT ASSISTANCE

by

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PREFACE

This work forms part of a programme of studies on the functioning of the competitive process in the economy of the European Community.

Various national institutes and experts have been appointed by the Commission to carry out the study programme.

In view of the specific and general interest of these studies and the undertakings given by the Commission to the European Parliament, they are published in full in their original version.

The Commission refrains from commenting, except to say that responsibility for the data and views set out in each study lies entirely with the institute or expert who produced it.

The other studies in the same series will be published by the Commission as soon as possible.

ACKNOWLEDGEMENTS

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GENERAL INTRODUCTION

In view of the internal market liberalisation of 1992, various forms of subsidies, as documented in the Commission's first survey on state aids (Commission of the European Communities, 1989), have attracted renewed attention. This revived interest is consistent with the Commission's long-dating concern for undistorted competition in the EC. The creation of an internal market adds a new dimension to this concern. It is feared that national governments may increasingly rely on state aids in response to the fiercer competition in a unified market.

There are many forms of state aids as the Commission's survey clearly indicates. This report analyzes export financing support programs of Belgium, Germany, France, and the United Kingdom in greater detail. Export financing support by EC member states is most often directed at exports to non-EC countries although official export insurance agencies regularly insure export contracts to EC countries as well.

Export financing takes the form of either export credits, export credit insurance, or official development assistance. An export credit arises whenever a foreign buyer of exported goods is allowed to defer payment and takes the form of interest subsidies. It is given by the government either to its exporters or commercial financial institutions (supplier credits) or to foreign importers (buyer credit) (OECD, 1987, p 7). Official export credit insurance, which we will henceforth call export insurance, is provided by national insurance agencies and covers export transactions, which themselves may or may not be financed by export credits. The insurance represents an export subsidy if the premium rate lies below the going market rate. Finally, official development assistance consists of governmental loans at subsidized interest rates.

This report consists of three chapters. In chapter I, we discuss the legal aspects of export financing. Export financing is subject to regulations and agreements in the context of GATT, the OECD, and the European Community. A detailed review of the existing rules is essential since they profoundly affect the opportunities for subsidization through export financing programs.

The second chapter provides estimates for the subsidies implied in export credits, export insurance and official developments. In the first part of this chapter, a definition of subsidies is given and a method is developed to measure subsidy-equivalents. Subsequently, the methodology is applied to export financing programs in the four countries studied in this report. Insofar as possible, a regional and sectoral disaggregation supplements the total subsidy estimates.

In the third chapter, we link export finance subsidization to intra-EC export performance on third markets. For this purpose, we develop a theoretical model which isolates the factors that determine the success of export financing subsidies in enhancing market shares. Some empirical evidence on these determinants is given. Finally, the last part of chapter III is a first tentative investigation of whether marked changes in export performance occurred in subsidized markets and industries.

Chapter I

LEGAL CONSTRAINTS ON EXPORT FINANCING
FOR EC MEMBER COUNTRIES

I. INTRODUCTION

In post-war history, tariff reductions through GATT and internal liberalization within the European Community have significantly reduced tariff barriers of EC member states. At the same time, the slowdown in the growth of international trade in the '70 and early '80 revived protectionist sentiments in many industrialised countries. Among other nontariff barriers, export subsidies became an increasingly attractive instrument to defend and enhance market share in a stagnating world market.

International institutions were quick to recognize the dangers of an escalation of this renewed interest to a full-fledged export subsidy war. In the GATT Tokyo round and within the OECD, efforts were undertaken to restrict the use of subsidies in international trade. Part of these initiatives were directed towards the control of export financing. In this paper, we focus on the contents of the agreements that were ultimately reached as well as on the EC legislation in this area.

As will become clear in this paper, international restrictions on export financing leave considerable room for export subsidization in the economic interpretation of the concept. Economically speaking, export financing agencies provide a subsidy whenever exporters obtain more favorable credit terms or cheaper insurance than available on the commercial market. However, international agreements only prohibit export financing which entails a charge on the public account.

Generally, government borrowing costs are below what a representative exporter would pay. By providing export financing at or slightly above its own costs but well below commercial rates, governments are therefore able to subsidize exporters without breaching international rules.

The rest of this chapter is structured as follows. First, we discuss the EC legislation on export subsidies. Subsequently, Section III analyzes the OECD "Consensus" and the various sectoral understandings on export credits. In Section IV, we focus on GATT regulations concerning export subsidies. Finally, Section V contains some concluding comments.

II. COMMUNITY LEGISLATION

In accordance with Article 92 of the EEC Treaty, any aid granted by a member state or through state resources in any form whatsoever, which distort competition by favouring certain undertakings or the production of certain goods, is incompatible with the common market. Article 92 forms part of the Community's internal rules on competition. It rules out export credits and export insurance that distort competition among member states insofar as a government agency is involved or state resources are used. Article 93 (2) provides that it is the Commission's task to assess whether a particular form of state aid is contrary to Article 92.

The application of the Treaty articles on competition throughout the years, has led to a consistent approach towards state aids. Export financing support is usually granted by agencies partially or entirely funded by the government. The basic principle of the Commission in establishing whether a subscription of capital is a state aid is to determine to what extent the export financing agency would be able to obtain the capital on the private capital markets. In particular, the test is whether in similar circumstances a private shareholder, having

regard to the foreseeability of obtaining a return and leaving aside all social, regional-policy and sectoral considerations, would have provided the capital in question (European Court Reports,1985, p 2263-2264). This principle is explained into more detail in a Commission paper on public authorities' holdings in company capital (Bulletin of the EC, 1984, 93-95). The Commission regards public holdings as constituting state aids when private investors would not have acted in the same way.

The Commission's distrust of state aids is reflected in the broad definition of public holdings. They include all direct holdings of central, regional or local government, or a direct holding of financial institutions or other national, regional or industrial agencies, which are funded from state resources or over which central, regional or local government exercises a dominant influence. It is clear that all exporting financing agencies are covered by this definition.

In addition, the Commission requires that any capital provided by the state should earn a return, comparable to the return of a private investor under normal market conditions. This rules out any sustained losses of export insurance or export credit agencies. It also indicates that a positive return on capital provided by the state does not suffice if the return is below normal market conditions.

Finally, exceptions for particular countries are rarely made. In the area of export credits, Greece was the only country who successfully justified the use of export credits as a means of restoring balance of payments disequilibria.

Nevertheless, it is not an easy task to determine whether export financing distorts competition between member states on third markets. The standard EC injury criteria are based on the concepts of competitive distortions and affectation of trade. Increased import shares or import price differentiation on the market of the importing country are used as indicators. Often, these indicators do not

suffice in this case because the importing country is not part of the EC. Indeed, one also has to establish that the increased penetration on third markets has harmed other EC producers.

A Policy Coordination Committee for Credit Insurance, Guarantees and Financial Credits was set up to keep the export financing policies of the EC member states under review. Also, a consultation procedure for export credits exists, under which any proposed derogations from Community rules must be notified to the Policy Coordination Committee for consideration. This procedure permits member countries to remain competitive by matching the terms of credits offered by third countries in support of exports to the Community or markets outside the Community (Ray, 1986, p 299). Under this procedure, member countries may request further information or a consultation if they have questions on a proposed action.

III. OECD AGREEMENTS ON EXPORT CREDITS

In addition to EC legislation, EC member countries also participate in international agreements on export subsidies. In this section, we discuss how agreements within the OECD affect the opportunity of countries to provide export credits.

3.1. The OECD "Consensus"[1]

The Arrangement on Guidelines for Officially Supported Export Credits (more commonly called the Consensus) became effective on April 1, 1978. It is an arrangement all OECD countries except Turkey and Iceland. All EC member states are included. However, it is not an act of the OECD council and thus not in a formal sense a legal instrument of the OECD. The main purpose of the Consensus is to

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[1]This section follows Ray (1986, 299-301) and OECD (1987, 7-9)

prevent an export credit race in which countries compete on the basis of who grants the most favorable financing terms. It covers all sectors except for agriculture, nuclear power plants, aircraft, ships and military goods.

In the Agreement a clear distinction is made between (i) pure cover which is limited to guarantees and insurance and (ii) official financing support, which includes credits that are given directly by the export credit agency or that are subsidized by the government. The Consensus does only apply for the latter category and thus does not cover export insurance.

The Consensus deals with actions and policies of official export credit agencies. It sets limits on the terms and conditions for export credits with a duration of two years or more. Within these limits, certain derogations from the rules and some deviations from what is considered normal practice are possible. These must be notified to all other participants in the Consensus who can then match the deviation or derogation.

The Consensus allows tied or partially untied aid financing : that is to say, credits or grants that are wholly or partly (in the latter case they are known as mixed credits) from public funds for development purposes and that are tied to purchases from the donor or, in the case of partially untied aid, to purchases from the donor as well as from developing and some other countries. Their conditions may be more favorable than those discussed below if the overall concessionality level is at least 35% and if the tied or partially untied financing is duly notified. The concessionality level measures the grant element in the aid package and is computed by using a discount factor based on 'commercial interest reference rates' (CIRR), which are adjusted monthly to reflect market rates. Export credits with a concessionality level below 35% are judged to be for the purpose of improving the competitive standing of what is basically a commercial transaction so that the same conditions as in the case of commercial

export credits should apply. When the concessionality level is larger than or equal to 35%, export credits are considered to be aid-motivated and therefore free from Consensus-discipline. As is easily understood, this provides an incentive to expand the use of development aid for competitive purposes.

The most important restrictions the Consensus imposes on export credits are as follows:

a) At least 15% of the contract is to be covered by cash payments

b) The maximum repayment term is 8½ years. This may be extended to 10 years for relatively poor and for some intermediate countries.

c) Minimum rates of interest are set for periods of up to 5, up to 8½ and up to 10 years (see Table 1). These minima, known as the 'matrix', are subject to change every January and July according to an automatic mechanism which ties changes in the matrix to changes in the weighted average of government bond yields for the five currencies making up the International Monetary Fund's special drawing rights (SDR). The matrix rates vary according to the group of countries for which the export credits are destined. It should be noted that, from July 1988 onwards, the group of relatively rich countries is not eligible any longer for subsidized export credits. Moreover, the EC Council directive on aid to shipbuilding of January 26, 1987 rules out aid by EC member states to non-developing non-EC countries.

d) If commercial interest rates for the currency of a participant fall below these minima, any participant may lend in that currency at the earlier mentioned 'commercial interest reference rates (CIRR)'. This opportunity to deviate from 'matrix' rates rules out the possibility that credit market financing in countries with low interest rates becomes more attractive than official export financing. The provision that all participating countries can offer export credits in the

Table 1 : <u>OECD Consensus Arrangement Matrix of Interest Rate Minima</u>
<u>1976-1986</u> (per cent)

	I Relatively rich countries	II Intermediate countries	III Relatively poor countries
Credits for 2-5 years			
July 1976	7.75	7.25	7.25
July 1980	8.50	8.00	7.50
November 1981	11.00	10.50	10.00
July 1982	12.15	10.85	10.00
October 1983	12.15	10.35	9.50
July 1984	13.35	11.55	10.70
January 1985	12.00	10.70	9.85
January 1986	10.95	9.65	8.80
July 1986	9.55	8.25	7.40
Credits for 5-8.5 years			
July 1976	8.00	7.75	7.50
July 1980	8.75	8.50	7.75
November 1981	11.25	11.00	10.00
July 1982	12.40	11.35	10.00
October 1983	12.40	10.70	9.50
July 1984	13.60	11.90	10.70
January 1985	12.25	11.20	9.85
January 1986	11.20	10.15	8.80
July 1986	9.80	8.75	7.40
Credits for 8.5-10 years			
July 1976	–	–	7.50
July 1980	–	–	7.75
November 1981	–	–	10.00
July 1982	–	11.35 (*)	10.00
October 1983	–	10.70 (*)	9.50
July 1984	–	11.90 (*)	10.70
January 1985	–	11.20 (*)	9.85
January 1986	–	10.15 (*)	8.80
July 1986	–	8.75 (*)	7.40

<u>Source</u> : OECD (1987, p. 8).

(*) Available only for countries that were classified in Category III before 6th July 1982.

currency with the lower interest rate is aimed at avoiding distortions among signatories. However, the mixture into one system of 'matrix' and 'market' interest rate currencies has created many problems. It also has proven very difficult to devise CIRR that were acceptable to all participants.

From the conditions above, it becomes clear that the Consensus defines export credits as subsidies when they are financed at an interest rate below the borrowing costs of the governments whose countries' currencies constitute the SDR. The Consensus therefore allows export subsidies in the economic definition to the extent that the market interest rate, which would be paid in absence of export credits, is above the Consensus minimum rate.

Table 2 gives the evolution of commercial bank lending rates to prime borrowers in Belgium, Germany, the U.K. and France. Evidently, only a limited amount of exporters are able to obtain financing at prime rates so that, particularly for countries with intermediate and low GNP levels, the interest differential between Table 2 and the matrix rates in Table 1 represents a lower bound to the actual export subsidy. Even so, we find the prime rates generally to be well above the matrix rates in the period 1980-1983, which shows there was considerable scope for export subsidization under the Consensus. From 1984 on, market interest rates have been decreasing so that subsidizing exports becomes more difficult.

Another important feature of the Consensus is that the maximum interest subsidy allowed is higher for export firms in countries with high market interest rates. In other words, the current system discriminates against countries with low interest rates. This becomes clear in Table 2 when the low German interest rates are compared to the interests rates of the other countries. The German interest rate was below the matrix rate in most years. This obliged the German export credit agency to finance exporters at the CCIR, reflecting

Table 2 : <u>Commercial Bank Lending Rates to Prime Borrowers for Selected</u>
<u>Countries</u>

December	Belgium	France	Germany	U.K.
1976	11.75	11.65	6.50	15.50
1980	15.75	12.25	11.50	15.00
1981	18.00	14.00	13.50	14.50
1982	15.50	12.25	8.75	10.00
1983	13.75	12.25	7.75	9.00
1984	14.00	12.00	7.75	9.50
1985	11.50	10.60	7.25	11.50
1986	9.75	9.45	6.75	11.00
1987	8.75	9.60	6.25	8.50

Source : World Financial Markets
Morgan Guaranty Trust Company of NY

market conditions. As a result, the scope for export subsidization was limited significantly.

The benefits of the Consensus for exporters in economies with high interest rates are reinforced by the opportunity for export credit agencies to lend in other currencies. When the differential between the CIRR of a low interest rate currency and the rate charged by the domestic export credit agency exceeds the costs of forward cover, the interest subsidy to exporters can be increased by contracting in another currency (Taylor, 1984, p 31-32). Nevertheless, the length of the average export contract may seriously hamper the availability of affordable forward cover.

In addition, the possible competitive advantage for high interest countries is influenced by the budgetary cost of export subsidies for government agencies. When the government pays a higher interest rate than the matrix rates, export subsidies at or close to Consensus minimum rates are costly. Table 3 presents information about the average yields of government bonds in Belgium, France, Germany and the U.K. Comparing these figures with Table 1, we find that, in the period 1980-1983, government bonds yields were well above matrix rates in France, Belgium and the U.K. This is exactly the period when the Consensus permitted large interest subsidies to exporters. We conclude that the budgetary cost of an export subsidy policy may have been large.

Finally, the current system facilitates macroeconomic policies which rely on high interest rates to correct current account deficits or maintain a fixed exchange rate (Melitz and Messerlin, 1987). By driving up interest rates, the government increases the maximum export subsidy allowed under the Consensus. This widens the scope for export subsidization and may help to restore current account equilibrium.

Table 3 : <u>Government Bond Yields for Selected Countries</u> (average yields
to maturity in percent per annum)

Year	Belgium	France	Germany	U.K.
1976	9.05	9.49	7.80	14.43
1980	12.04	12.99	8.50	13.79
1981	13.71	15.66	10.38	14.74
1982	13.56	15.69	8.95	12.88
1983	11.86	13.63	7.89	10.81
1984	11.98	12.54	7.78	10.69
1985	10.61	10.94	6.87	10.62
1986	7.93	8.44	5.92	9.87
1987	7.83	9.49	5.84	9.48

<u>Source</u> : IMF Financial Statistics

3.2. Sectoral Understandings on Export Credits

In addition to the Consensus, sectoral understandings on export credits for (i) Ships and (ii) Nuclear Power Plants (iii) Civil Aircraft were concluded in the OECD. An earlier sectoral understanding for Ground Satellite Communications Stations has been included in the general agreement.

i) The Understanding on Export Credits for Ships went into effect at the beginning of 1971 and thus precedes the Consensus. Fourteen OECD countries and the Commission of the European Community participate. The Understanding continues today as a separate OECD agreement and, unlike the Consensus, has been formally accepted by the OECD council. Its content deviates from the Consensus on two essential points. First, the minimum cash payment by delivery is 20% instead of 15%. Secondly, export financing at less than 8% is not allowed, implying that more (less) attractive credit terms can be provided than in the Consensus whenever 'matrix' rates are above (below) 8%. The Understanding only covers sea-going ships. All other ships are subject to the conditions of the Consensus.

The other sectoral understandings complement the Consensus in the sense that, at present, they do not constitute a separate OECD agreement and that the conditions of the Consensus apply except for the provisions specified otherwise.

ii) The 1984 Sector Understanding on Export Credits for Nuclear Power Plants extends the maximum repayment term to 15 years and adopts the 'matrix' rates for credits of 8.5-10 years, augmented by a 100 basis points.

iii) The Sector Understanding on Export Credits for Civil Aircraft was signed in 1986 by OECD producer countries of civil aircraft. A distinction is made between 'large' and 'other' commercial aircraft.

The provisions for other aircraft are similar to Consensus conditions, except that tied aid is prohibited and that shorter maximum repayment terms are specified for some types of aircraft. The agreement for large aircraft deviates quite substantially from the Consensus. It not only extends the maximum repayment term to 12 years, but also adopts a different way of calculating minimum interest rates. More specifically, export financing in US dollars, in a currency basket of the DM, FF, and £, or in ECU are considered separately with minimum interest rates based on government bond yields of the respective currencies plus a common fixed margin.

IV. GATT REGULATIONS ON EXPORT CREDITS AND EXPORT INSURANCE

Member countries of the EC are subject to Article XVI of the GATT and the GATT code on Subsidies and Countervailing Duties which rule out the use of export subsidies on products other than primary products. Specifically, the Illustrative List of Export Subsidies attached to the Subsidies Code prohibits:

- The provision by governments (or special institutions controlled by governments) of export credit guarantees or insurance programmes against increases in the costs of exported products or of exchange risk programmes, at premium rates, which are manifestly inadequate to cover the long-term operating costs and losses of the programmes.

- The grant by governments (or special institutions controlled by and/or acting under the authority of governments) of export credits at rates below those which they actually have to pay for the funds so employed (or would have to pay if they borrowed on international capital markets in order to obtain funds of the same maturity and denominated in the same currency as the export credit), or the pay-ment by them of all or part of the costs incurred by exporters or financial institutions in obtaining credits, insofar as they are used to secure a material advantage in the field of export credit terms.

The following paragraph establishes the link between the OECD
Consensus and GATT regulations, without mentioning the former
by name.

- Provided, however, that if a signatory is party to an internatio-
nal undertaking on official export credits to which at least 12
signatories to this agreement are parties as of 1 January 1979
(or a successor undertaking which has been adopted by those original
signatories), or if in practice a signatory applies the interest rate
provisions of the relevant undertaking, an export credit practice
which is in conformity with those provisions shall not be considered
as an export subsidy prohibited by this agreement.

The GATT subsidy code condones export credits that are allowed by the
OECD Consensus.   Yet,   export   insurance   is   not   covered   by   the
Consensus,   but   is   explicitly   mentioned   in   the   Illustrative   list   of
export subsidies which are prohibited by the GATT subsidy code.
Upon more careful examination,   the description in the GATT code only
mentions   insurance   against   exchange   risk   and   cost   escalation.   As
subsidies   are   never   defined   precisely   in   the   GATT,   (Beseler   and
Williams,   1986,   p   120),   it   is   unclear   whether   the   restrictions   apply
to   insurance   of   other   risk.   More   importantly,   only   export   insurance
programs   are   forbidden   of   which   the   premium   rates   charged   are
manifestly   inadequate   to   cover   the   long-term   operating   costs   and
losses of the system.   This requires the difficult distinction between
long-term and temporary losses.   Are sustained losses over a decade to
be   considered   as   an   export   subsidy   or,   as   the   government   insurance
agency   will   usually   argue,   as   an   unusual   temporary   accumulation   of
claims?

Even if a case against export credits or export insurance is believed
to exist,   GATT procedures may discourage any further action.   This is
particularly   true   for   governments   seeking   action   against   export
subsidies   to   third   markets,   because   then   Track   I   of   the   GATT   Code   on
Subsidies   does   not   apply.   Track   I   allows   for   the   autonomous

imposition of countervailing duties by a signatory if it is established that subsidization causes material injury to a domestic industry on the home market. In order to follow Track I, country A would have to convince country B to impose countervailing duties on subsidized exports from country C to country B. As country B generally benefits from the export financing provided by country C, this is not likely to happen.

This leaves open Track II procedure which does not necessarily require injury to be caused on the domestic market of the importing country. In fact, serious prejudice to country interests, or nullification of the benefits a country derives from GATT are sufficient reasons for seeking the authorisation of countermeasures, and these could arise even though the effect of the subsidization occurred in the market of a third country, or within the subsidising country itself. But the authorization of countermeasures can only be granted by the contracting parties of GATT, or where the country is a signatory of the Code on Subsidies, by the Committee on Subsidies and Countervailing measures (Beseler and Williams, p 118-119). This requires lengthy consultation, conciliation and dispute settlement procedures within GATT instead of the autonomous implementation of countervailing measures under Track I. This may explain why Track II is seldom used.

Economically speaking, GATT regulations on export credits and export insurance permit significant subsidies to exporters because no reference is made to the ability of an exporter to secure funds at favorable rates (DeKieffer, 1985, p 17-4). More explicitly even than the OECD consensus, GATT refers to the cost to the government as the main criterion for export subsidies. Government agencies can provide export insurance at lower premium rates than the market if no long term operating losses are incurred. Likewise, governments are allowed to grant export credits at the government borrowing rate, which is highly attractive to any commercial borrower.

V. CONCLUSION

This paper discussed the legal constraints facing export credit and export insurance agencies of EC member states. We found that, while international agreements and Community legislation impose important limits on export financing, they leave room for export subsidization.

Restrictions on export credits are more comprehensive than those on export insurance. In principle, the EC Treaty rules out credits for exports to other EC countries. Export credits to third markets are allowed when they do not distort competition between EC states or when they match subidies from non-EC suppliers and are approved by the Commission. In addition, the OECD consensus specifies minimum financing rates and maximum repayment terms for most export credits.

Nevertheless, exporters may benefit from interest subsidies to the extent that market rates exceed Consensus matrix rates. When borrowing costs for the government are above matrix rates, this form of export subsidization can be very costly.

Both EC and GATT regulations refer to the use of public funds in defining inadmissable forms of export insurance. Article 92 of the EC Treaty rules out any involvement of government agencies or state resources in export insurance insofar as it would distort competition between Community members. Community also regulations specify that capital of export financing agencies, when provided by the government, should earn a normal return comparable to the private market. The GATT Code on Subsidies, which is seldom invoked in practice, does not oppose involvement of official government agencies as long as the long-term operation of private and official export insurance systems are covered by insurance premiums.

Chapter II

EXPORT FINANCING SUBSIDIES IN BELGIUM,
FRANCE, GERMANY AND THE UNITED KINGDOM

I. INTRODUCTION

In this chapter, estimates of the subsidy equivalents implied in the export financing programs of France, the United Kingdom and Belgium are presented. The export financing programs considered here include export insurance, export credits and Official Development Assistance.

It is not an easy task to arrive at a consistent definition of subsidies for the various forms of export support programs.
In section II, we therefore analyze the different definitions of subsidies that appear in the literature and make a clear difference between cost saving and revenue increasing export subsidies. In effect, export insurance and supplier export credits reduce the costs of exporting firms whereas Official Development Assistance and subsidized buyer export credits increase firm revenue. This difference is important since another estimation method is required in both cases.

Section III develops estimation methods that allow us to practically apply the definition of subsidies. We first present the Cost Difference Method and the Net Present Value (NPV)-Method. In the literature, these methods are mostly used to estimate cost saving export subsidies but we show that they also can be adjusted to estimate revenue increasing export subsidies.

Section IV contains an analysis of the subsidy equivalents for France, the United Kingdom, Belgium and Germany. For France and the United Kingdom, the estimates are based on studies by Messerlin (1986) and Melitz and Messerlin (1987a and 1987b) as well as on our own work. Subsidy equivalents of export credits and export insurance are presented and analysed on an aggregate and an industry basis.

The estimates for Belgium refer to export credits, export insurance and Official Development Assistance. They are based on Feyaerts(1985) and our own calculations. A regional breakdown is provided for Official Development Assistance and export insurance subsidies. Finally, we also present some estimates of German export financing subsidies.

For all countries of the sample, both absolute figures and so-called rates of subsidization are presented. The rate of subsidization relates subsidy equivalents to total exports eligible for subsidization. As will become clear, this facilitates the comparison of subsidy levels across countries.

II. DEFINITION OF EXPORT FINANCING SUBSIDIES

In the literature no generally accepted definition of export subsidies is found. The subsidy implied in a governmental export support program can either be defined as the benefits for the exporter or alternatively as the cost incurred by the government. These two definitions do not necessarily come to the same estimates of the subsidy equivalents. The aim of the study and data availability determine the choice between the two concepts. Measuring the cost to the government facilitates data gathering and is appropriate when the budgetary consequences of a governmental export support program form the main concern of the study. When analyzing the effect of an export support program on the competitiveness of the firms, the use of the other definition appears more appropriate. In this study, a subsidy will be defined as

the benefit for the firms that results from a governmental export support program. Based upon this definition, we analyze the different estimation methods that appear in the literature.

A benefit for a firm implies an increase in profits which results from a cost reduction or a rise in total revenue. The various forms of export financing programs have a different impact on either costs or revenues. More specifically, subsidized export insurance and subsidized supplier credits lower the cost for the firms while subsidized buyer credits and Official Development Assistance increase total revenue. This becomes clear from the following formal treatment.

We analyze **export insurance** first. Consider an exporter operating in a riskless world with a constant marginal and average cost c. He determines an export price P_z that maximises his profits Π :

$$\Pi = P_z x - cx$$

Whereby x are total exports

Confronted with risk, the exporter insures his exports and pays an insurance premium. At the same time, he increases his export price with λ. The magnitude of λ depends on the market conditions. His new contract price becomes :

$$P_c = (1+\lambda)P_z$$

and his profits will be :

$$\Pi = P_c x - cx - \upsilon P_c x$$

In this equation, υ is the % insurance premium per ECU of export contract. When export insurance is subsidized, the cost of the exporter decreases. The new insurance premium becomes $\Theta = \upsilon - s_i$

whereby s_i represents the % subsidy per ECU of export contract.

Profits Π can then be written as :

$$\Pi = P_c x - cx - (v - s_i)P_c x$$
$$= P_c x - cx - \Theta P_c x$$
$$= [P_c(1 - \Theta) - c]x$$

Next, consider **supplier export credits**. Exporting firms receive an interest subsidy based on the value of the export contract. As a consequence, the firm's export financing costs are reduced.

We redefine v as the % export financing cost per ECU of export contract, so that it includes both the insurance and the credit costs. With this definition, a subsidized supplier credit increases s and therefore lowers Θ.

Subsidized buyer credits and Official Development Assistance provide favourable financing conditions to the importer instead of to the exporting firm. This induces the importer to demand more of the exporting firms products. As a result, total revenue of the exporter goes up.

It is worthwhile to discuss this transmission into more detail. Suppose that the importer is confronted with a contract price P_c and an offered payment condition j. Taking into account both elements, he computes P_{mj}, the price used by the importers to compare the offers of different suppliers. This price determines the importers demand for domestic products. P_{mj} can be written as follows :

$$P_{mj} = \gamma_{jm} * P_c$$

γ_{jm} reflects the preference of importer m for payment condition j and is equal to the net present value (NPV) of 1 ECU repaid at payment condition j. The smaller γ_{jm} the greater the importers preference for

payment condition j. If $\gamma_{jm} = 1$ ($P_c = P_m$), the importer will be indifferent between a cash payment and accepting the offered payment condition j. If $\gamma_{jm} > 1$ ($P_m > P_c$) he will prefer a cash payment because the importer judges that the offered financing scheme raises the import price. Finally, if $\gamma_{jm} < 1$ ($P_m < P_c$), he will accept payment condition j.

Which factors determine the importer's evaluation of the various export financing schemes ? The Appendix shows that the interest rate paid by the importer and his subjective discount rate play an important role. A higher interest rate makes export financing less attractive to the importer. Alternatively, importers with a high discount rate have a strong preference for present consumption and will accept a loan which allows them to spread payments over time.

Subsidized buyer credits and official development assistance improve the payment conditions for the importers. They lower γ and in this way P_m, the effective price paid by the importer. In turn, a lower price P_m increases demand for domestic export products without decreasing the contract price P_c for the firm. The revenues of domestic exporters will rise in consequence.

III. ESTIMATION METHODS

In the literature, the benefits of export subsidies for exporting firms are measured by the observed cost savings such subsidies produce. This implies that no comparison is made between profits of the firm before and after subsidization. Nor is there any special consideration for subsidies that increase revenue instead of reducing costs.

In this section, we first discuss how to measure cost savings for the firm resulting from subsidized supplier credits and subsidized export insurance. A comparison is made between the Cost Difference and the

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Net Present Value (NPV) Method. Subsequently, we analyse how measurement methods of cost savings can be applied to revenue increasing support programs such as Official Development Assistance and subsidized buyer credits.

The Cost Difference Method measures for a particular year, the cost savings that occur in that year in consequence of the export support granted in the past. On the other hand, the NPV-method measures in any particular year the NPV of future cost savings that will result from the support programs from that specific year. We explain the difference by means of an example.

Imagine a credit granted by the government in the year 1990. The repayment term is 10 years and the interest rate is significantly below the interest rate that would have been asked in the private market.

The Cost Difference Method then measures for the years 1991 until 2000 the yearly interest savings for the firms as a result of this favourable loan and considers these yearly savings as the subsidies for these years.

Alternatively, the NPV-Method calculates the NPV of this cost saving and allocates this NPV as the subsidy for the year 1990. In both cases the same cost savings are measured. The difference lies in the time period to which the subsidies are conferred.

This difference is not without consequences. In effect, the NPV-Method is most appropriate when analyzing the effects of export support on competitiveness because it measures the discounted total cost savings entailed by the export support programs initiated in one year. It is this discounted value that determines the price setting strategy of the firm and therefore demand decisions by the importer. Conversely, the Cost Difference Method is more convenient for bookkeeping purposes because it measures the yearly financial implications of support programs earlier granted .

3.1. MEASUREMENT OF SUBSIDY EQUIVALENTS OF COST REDUCING EXPORT CREDITS

3.1.1. Cost Difference Method

How does one apply the principle of the Cost Difference Method to the empirical analysis of subsidized supplier credits ? One first takes the difference between the subsidized interest rate and the rate the exporting firms would have paid in the private market. This difference is then multiplied by the loans still outstanding to obtain the implicit subsidy in supplier credits.

Assume that the exporter, in absence of the governmental support program, would have borrowed at an adjustable interest rate on the private market. In that case, the total subsidy for the year K becomes :

$$S_K = \sum_{t=T}^{K} U_t (r_K - \bar{r}_t) \qquad (2.1)$$

whereby :

U_t : total credits authorized in t and still outstanding in K

$\bar{r}_t$: officially supported interest rate on loans authorized in t

T : year during which the oldest still outstanding loans were authorized

r_K : market interest rate charged in K

Consider the following example. There are three subsidized credits still outstanding in the year 1988, amounting to 1.000, 2.000 and 3.000 ECU respectively. The first credit is authorized in 1985, the second in 1986 and the third in 1987.

The interest rates, $\bar{r}_t$, paid by the exporters are respectively 6, 5.5 and 7 %. The comparable market interest rate of 1988, r_k is 12.6 %. If the borrower would have borrowed at an adjustable interest rate we use (2.1) to compute the subsidy for the year 1988 :

$$1.000(0.12-0.06) + 2.000(0.12-0.055) + 3.000(0.12-0.07) = 340 \text{ ECU}$$

A similar case whereby ,in absence of the governmental support program, the exporter would have been able to obtain a fixed rate loan is presented in the Appendix.

3.1.2. Net Present Value Method

The NPV Method defines the implicit subsidy in export credits as the difference between the value of the loan and the NPV of the repayments discounted at the market interest rate

$$S_K = U - \sum_{t=1}^{Z-K} \frac{R_t}{(1+r_K)^t} \tag{2.2}$$

whereby :

U : total value of loans authorized in K
R_t : total repayment in 'payment-year' t on loans authorized in K.
   This includes capital and interest payments.
r_K : market interest rate in year K
Z : last year of repayments on loans authorized in K

Suppose that a ten year export credit of 1.500 ECU was granted in 1988 at a subsidized interest rate of 5 %, while the market interest rate was at 8 %. For 1988, the export subsidy then becomes :

$$S_{1988} = 1.500 - \sum_{t-1}^{10} \frac{150 + 1.500-[(t-1)150]\ 0.05}{(1+0.08)^t}$$

$$= 185 \text{ ECU}$$

3.2. EXPORT INSURANCE SUBSIDIES

When the government supports or organizes an export insurance scheme, the cost saving to the firm amounts to the difference between the actual insurance contributions and the insurance premia that would have been paid in the private market. It should be noted that the Cost Difference and the NPV Method yield the same estimates because insurance premia are paid in the year the insurance contract is concluded.

In effect, the subsidy in year K is defined as :

$$S_K = A_K(v_K - \Theta_K) \qquad (2.3)$$

whereby :

A_K : value of insured contracts in year K

v_K : pure insurance premium in year K (in percentage terms)

Θ_K : subsidized insurance premium in year K (in percentage terms)

When putting equation (2.3) to practical use one first has to measure the true market premium, v.

In insurance theory, the pure premium on a contract is defined as (see Hogg and Klugman, 1984, p 235):

$$\text{pure premium} = \frac{\text{total expected claims}}{\text{value of the insured contract}} \qquad (2.4)$$

The pure premium thus guarantees that the premium income exactly offsets the expected losses from the insurance contract.

The market premium exceeds the pure premium because the insurance company has to be compensated for the expenses of doing business and taking on risk. As official export insurance companies do not systematically charge a fixed percentage of the insured amounts as

administration costs or/and risk charge, we will ignore both elements in our own calculations. By doing this, we may underestimate the market premium and hence also the subsidies implicit in export insurance.

The practical application of this general insurance principle to the case of export credit insurance poses three major problems:

a) On the moment contracts are signed and premiums are paid, one can at best guess future expected claims. In this chapter, we distinguish between an ex post and ex ante approach to measuring expected claims.

In the ex-post approach, we assume that the insurance agency forms rational expectations about the future claims on the insurance contracts concluded in any particular year. A fair premium is charged when premium income covers expected claims. The accumulation over time of sustained losses (claims minus premia) by the insurance agency is then interpreted as an indicator of export subsidization. A short-time mismatch between claims and premia is not necessarily a subsidy because the insurance agency cannot foresee an unanticipated shock such as the breakdown in relations with Iran. On the contrary, sustained losses cannot be explained by expectational errors and hence point to a deliberate policy of subsidization.

The ex-ante approach attempts to derive subsidy-equivalents on a yearly basis by more explicitly modeling expectation formation by an insurance agency. More specifically, one first estimates the pure premium which, based on the available information, the insurance agency must charge to maintain equality between premia and claims. The information set is based on available data on past claims and insurance contracts. In our work, the expected pure premium of any particular year, t_i^e, is computed, for the three most recent years, as an average of the claims as a percentage of insured contracts, namely:

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$$t_i^e = \frac{\dfrac{T_{i-1}}{V_{i-1}} + \dfrac{T_{i-2}}{V_{i-2}} + \dfrac{T_{i-3}}{V_{i-3}}}{3} \qquad (2.5)$$

whereby :

T_{i-j} : $(j = 1, \ldots, 3)$
the actual claims in year i-j. These claims
can be gross or net (= less recuperations)

V_{i-j} : $(j = 1, \ldots, 3)$
value of the outstanding insurance contracts in year i-j

As a second step, the expected pure premium is multiplied by the value of the newly insured contracts of a particular year to obtain expected future claims. Consistent with equation (2.3), the subsidy granted in a year is the difference between the premium income necessary to cover expected future claims, $A_K v_K$, and the actually paid premium income $A_K \Theta_K$.

Again, an example helps to understand this procedure. If two export contracts are insured in 1988 for 1.500 and 2.000 ECU and the expected pure insurance premium is 1% than one expects future claims of 35 ECU. Assume that the official government agency charges a subsidized insurance premium of 0.7 % so that it receives 24.5 ECU in premium income. Hence the subsidy amounts to 35-24.5 = 10.5 ECU.

b) A second major problem concerns the timing of premia and loss payments and is directly relevant for the measurement of the pure premium in equation (3.5). Usually, export insurance companies do not have appropriately matched data on premiums, claims (& recuperations) and total insured constracts. Due to this lack of information, it is not possible to compare the premia and the claims on contracts of a particular year. This is unfortunate because claims take some time to

materialise, and recuperations may continue long after claims have been paid[2]. To solve this problem, information is needed on which part of the claims and recuperations of a year are due to contracts concluded in in previous years. Such information is not available to us. In equation (2.5), we therefore divide claims paid in any particular year by the value of insured contracts outstanding in the same year. This does not only mix stock (outstanding contracts) and flow concepts (claims), but also causes distortions when the structure of export insurance contracts is biased towards long term contracts. Fortunately, this problem does not appear too serious for our study. In the 1980's, 75 % to 90 % of all transactions on account of the Belgian official insurance agency were short term. Empirical evidence for the other countries points in the same direction. In spite of this, it remains true that our estimates may be biased if the time pattern of recuperations abruptly changes insofar as recuperations take place a long time after claims have been paid.

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[2]An example may clarify the problem involved. Suppose the following annual figures in millions of ECU for three consecutive years :

year	premiums	claims	recuperations	newly covered amounts	outstanding insured amounts
x-1	36	216	62	3762	7125
x	42	170	35	4125	6500
x+1	32	177	40	3650	5750

It would not be correct to compare premium income of year x (42 M ecu) with the loss payments and recuperations of the same year x (170 and 35 M ecu respectively), since these figures do not necessarily relate to the same contracts. As it turns out, insurance premia are usually paid in the year the insurance contract is concluded. So, in year x, 42 million ECU is paid to insure a contract of 4125 million ECU (similarly for year x-1, x+1).

In our example, this means that neither the 170 million ECU of the claims in year x nor the 35 million ECU of recuperations of 35 M ecu can be linked directly to the premiums paid in that year.

In this context, Kahane and Parat (1984, p 714) argue that insurance companies themselves seldom match premia and claims on an individual contract basis. Official agencies in particular, base many of their decicions on total amounts of claims, premia and outstanding contracts of the current year and the recent past. If so, our measurement of ex-ante subsidies is likely to be reasonably accurate.

c) A third problem concerns data availability on newly insured and outstanding contracts during a particular year. Ideally, both concepts are needed to compute ex-ante subsidies. Unfortunately, yearly reports of the British, French and German insurance agencies only publish information on the newly covered amounts. Again this does not appear as a major problem because most of transactions are short term. As a result, the total value of newly covered contracts and stock of outstanding contracts are very similar.

3.3. OFFICIAL DEVELOPMENT ASSISTANCE AND SUBSIDIZED BUYER CREDITS

Revenue increasing export support programs such as Official Development Assistance (ODA) and subsidized buyer credits do not reduce the cost of the firms. They nevertheless can contain a subsidy element which can be estimated in accordance with the above mentioned methods. We first consider Official Development Assistance.

3.3.1 Official Development Assistance (ODA)

ODA-credits clearly entail a cost for the government but do not necessarily imply a benefit for the firms. Imagine a small open economy with two industries. The first is confronted with a perfectly elastic demand on the world market and domestic production capacity is restricted. The second industry is monopolistic and there is no capacity restriction.

The government grants ODA to a developing country and stipulates in the contract that this money has to be used to buy products of equal value in both domestic industries. In that case the demand of both industries increases. The final effects on both industries are nevertheless different.

The first industry can neither increase its production (capacity restriction) nor its price (perfectly elastic demand). The destination of the exported products can change and can be directed towards the aided country but total production and revenues are kept constant.

In the second industry, the increased demand entails an increase in price and production. The changes in price and output are determined by industry-specific determinants such as the potential for economies of scale. Total revenue of the exporting firm increases.
The question then becomes to what extent Official Development Assistance can be considered as an export subsidy and how this subsidy should be measured. The literature is silent on this subject.

We argue that Official Development Assistance contains an export subsidy if it increases the revenues of a domestic producer. This was not the case in the first industry of our example so that Official Development Assistance can completely be considered as development aid. On the other hand, the firms of the second sector benefited from the ODA-program and thus received a subsidy.

The magnitude of the subsidy can be estimated in accordance with the earlier mentioned 'cost saving' definition by converting the rise in firm revenue in an equivalent cost saving equivalent. This cost reduction is then measured by the Cost Difference or the NPV Method. More specifically, the subsidy is set equal to the cost reductions a firm would have to achieve in order to obtain the same changes in its sales as those which are entailed by the ODA-program. The intuition is clear. If the government were to subsidize the exporting firm

directly by the amount of this cost reduction, the firm could lower its price and increase its sales and would be indifferent between the direct subsidy and the Official Development Assistance to the importing country.

Algebraicaly, the idea is most easily understood by using the Cost Difference Method[3]. The subsidy equivalent becomes :

$$S_K = \sum_{t=T}^{K} E_t (r_K - \bar{h}_t) \qquad\qquad (2.6)$$

whereby :

E_t : total ODA-loans authorized in t and still outstanding in year K

r_K : market interest rate in year K

$\bar{h}_t$: the interest rate on an 'equivalent loan' authorized in t

An equivalent loan is a loan granted to the exporting firm which, when authorized in t, would have entailed the same changes in revenues as the ODA-loan to the importer.

It is important to realize that the interest rate on an 'equivalent loan', $\bar{h}_t$, is greater than or equal to the ODA-interest rate. In general, only part of the benefit of the ODA loan to the importer is passed on to the firm in the form of higher revenues. This is especially relevant for ODA-loans because they contain an important element of development aid. The interest rates are much lower than would be necessary to make the importer buy the goods of the exporting country.

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[3]A similar expression is obtained with the NPV Method.

3.3.2. Subsidized Buyer Export Credits

The measurement of the subsidies, implicit in the buyer export credits is analogous to the case of ODA. Equation (2.6) can be applied with the understanding that $\bar{h}_t$ reflects the interest rate on an equivalent loan that would have entailed the same revenue expansion as a subsidized buyer export credit. The differential between $\bar{h}_t$ and the interest paid by the importer on the buyer credit is usually smaller than with ODA-loans. Subsidized buyer credits are explicitly aimed at supporting exports and attempt to lower the interest rate on export financing by the minimal amount necessary to obtain export contracts for domestic firms.

In practice, it is impossible to estimate the interest rates on equivalent loans. For the measurement of the subsidy equivalents we therefore set $\bar{h}_t$ equal to respectively the ODA interest rate and the subsidized buyer credit interest rate. In this way, we measure the gains for the importer and overestimate the actual subsidies received by the exporting firms. This bias involved is likely to be minor for subsidized buyer credits, but may significantly distort the subsidies implicit in ODA's.

IV. EMPIRICAL STUDIES

In this section, we present the available estimates of export subsidy equivalents for France, the United Kingdom, Belgium and Germany.

4.1 FRANCE

In the case of France, estimates of the subsidy-equivalents of export credits and export insurance are presented on an aggregate and an industry basis. No regional disaggregation is available. Neither did

Table 1 : <u>Outstanding Export Credits in France, 1969-1984</u>

	Outstanding export credits (billion francs)			Total outstanding credits/ exports[bc] (%)	Share of buyer credits (%)		
	Total[ac]	Medium term[c]	Long term[c]		Total	Medium term[c]	Long term[c]
	1	2	3	4	5	6	7
1969	14.7	6.8	1.2	40.0		3.2	
1970	18.3	7.9	2.0	39.5		4.1	
1971	22.2	9.7	4.6	43.1		6.8	
1972	23.7	11.4	5.6	41.0		10.6	
1973	27.8	12.9	6.7	39.3 .		11.7	
1974	35.1	14.5	7.4	34.0		18.1	45.7
1975	48.2	19.7	8.5	42.5		27.7	48.2
1976	64.2	30.5	9.9	48.9		43.1	56.5
1977	85.8	49.1	10.8	53.5		60.1	61.1
1978	97.8	58.1	11.8	57.6	68.8	65.7	65.3
1979	112.1	67.0	13.3	56.4	73.6	69.2	70.7
1980	128.0	78.4	15.1	53.5	77.1	73.0	72.2
1981	160.9	90.1	18.0	54.1	78.3	75.5	78.3
1982	197.5	105.4	20.7	61.4	78.1	77.5	82.6
1983	231.0	112.0	23.9	63.8	78.3	78.0	84.1
1984	249.9	117.9	28.6	58.3	78.0	80.3	88.8

a : Total credits exclude short-term ones. They include exports in foreign currencies.
b : Total French exports to countries outside the European Community.
c : The time series are totally consistent only since 1977.

Source : Messerlin (1986. p. 389).

we obtain detailed official figures on French official development assistance. According to Messerlin (1986, p 390), this official silence is explained by the leading role of France in providing mixed credits.

A. EXPORT CREDITS

a.1. Global Evaluation

Messerlin (1986) and Melitz and Messerlin (1987a and 1987b) provide detailed estimates of the subsidies included in French export credits, based on data from the French National bank and the Conseil National du Crédit. Here, we first review the aggregate evolution of export credit subsidies.

Table 1 presents information about outstanding export credits in the period 1969-1984 (Messerlin, 1987, p 389-390). We see that the value of outstanding credits ranges from 34 % to 63.8 % of total exports to non-EC countries with a sharp increase after 1975. These credits include both buyer and supplier credits. Buyer credits, which were insignificant at the beginning of the 1970's, became increasingly important after the first oil shock and have dominated the picture since the end of the 1970s.

Evidently, all outstanding export credits cannot be considered as subsidies. The mentioned studies use the Cost Difference Method to measure the benefits of the export credits for French exporting firms. Table 2 presents two different estimates of subsidies implicit in total export credits. Column (1) shows official figures by the French government, in billions of French Francs, for the implicit subsidy granted to French industry through the export credit system. These figures were obtained by multiplying the outstanding stock of export credits by official estimates of the differential between the market interest rate and the rate of the export credit agency involved. These

Table 2 : **Estimates of subsidies implicit in total French export credits**

year	Official estimates			Melitz and Messerlin		
	Implicit subsidy (billion Fr. Francs) (1)	Rate of subsidi- sation (%) (2)	Official interest rate dif- ferential (3)	Implicit subsidy (billion Fr Francs) (4)	Rate of subsidi- sation (%) (5)	Interest rate dif- ferential (6)
1970	0.4	0.8	2.2			
1971	0.3	0.6	1.3			
1972	0.3	0.5	1.3			
1973	0.6	0.8	2.2			
1974	1.1	1.1	3.1			
1975	0.9	0.8	1.9			
1976	1.5	1.1	2.3			
1977	2.4	1.5	2.8			
1978	2.4	1.4	2.5	5.0	2.9	5.8
1979	3.3	1.7	2.9	5.4	2.8	6.1
1980	6.6	2.8	5.2	9.9	4.2	7.9
1981	11.5	3.9	7.1	14.9	5.1	10.5
1982	13.0	4.0	6.6	16.5	5.1	9.5
1983	12.6	3.5	5.5	13.7	3.8	6.7
1984	11.2	2.6	4.5	13.1	3.0	5.9

The rates of subsidisation in columns (2) and (5) are obtained by dividing the implicit subsidy by the total value of French exports to non-EC countries

Source : Official estimates : Messerlin (1986, p. 392)
Estimates in columns (4)-(6) are from Melitz and Messerlin
(1987a, p. 157)

official interest differentials are found in column (3). The second column shows the rate of subidization which equals export subsidies as a percentage of the value of exports to countries outside the EC.

As it turns out, the official interest rate differentials in column (3) are primarily based on short term money market rates and reflect the cost for the government of export credit subsidies. The financing conditions of the French government are usually not available to importers wishing to buy French export goods. For this reason, Melitz and Messerlin use higher market interest rates in computing the reduction in financing costs for exporting firms. The obtained interest rate differentials are given in the last column of Table 2 and are used to compute the implicit subsidy and rate of subsidization in columns (4) and (5). One finds that the larger interest rate differentials lead to higher estimates of the subsidy-equivalents.

Furthermore, Messerlin (1986, p 392) provides separate estimates for the subsidies implicit in medium- and long-term export credits based on interest differentials found in Table 3. Comparing the resulting implicit subsidies in Table 3 with Melitz and Messerlin's total estimates in Table 2, one conludes that the share of medium- and long-term subsidies has declined from more than 80% of total export credit subsidies at the end of the 1970's to 66% in 1984.

On the whole, a uniform pattern emerges from Tables 2 and 3. First of all, one finds that the rate of subsidization on total export credits ranges from a minimum of 0.5 % in 1972 (official estimates) to a maximum of 5.1 % in 1981 and 1982 (estimates by Melitz and Messerlin). This implies that the role of export credit subsidies has become significant. Moreover, these figures represent an average rate of subsidization for the total of non-EC exports. The impact on specific industries may be much more pronounced.

Table 3 : **Estimates of subsidies implicit in medium and long term French export credits**

year	Interest rate differentials		Implicit subsidy (billion franc)	Rate of subsidisation (%)
	Medium term (1)	Long term (2)	(3)	(4)
1969	7.7	4.4	0.6	1.6
1970	8.2	5.2	0.7	1.6
1971	5.2	5.2	0.7	1.4
1972	2.7	2.7	0.5	0.8
1973	2.9	2.9	0.6	0.8
1974	8.6	3.9	1.5	1.5
1975	6.5	4.1	1.6	1.4
1976	9.0	3.1	3.0	2.2
1977	6.4	3.5	3.5	2.1
1978	5.9	3.5	3.8	2.2
1979	6.6	3.3	4.8	2.4
1980	9.5	6.5	8.4	3.5
1981	10.3	6.0	10.5	3.5
1982	7.8	7.2	9.7	3.0
1983	6.6	6.1	9.0	2.5
1984	6.2	4.6	8.6	2.1

Source : Messerlin (1986, p. 392)

(4)

Secondly, there is a clear evolution over time. From 1976 onwards and most markedly during the period 1979-1982 a sharp rise in the rate of subsidization takes place. This is partially the result of an increase in the outstanding export credits as documented in Table 1, which reflects a shift towards more active export promotion. But the rise in interest rate differentials in Tables 2 and 3 also suggest that the growing gap between market and Consensus interest rates was responsible for an important part of the increased subsidization. The narrowing of this interest gap, for that matter, explains why the rate of subsidization declines after 1982.

These results illustrate some of the features of the OECD Consensus discussed in Chapter I. By limiting the reduction in export financing costs to the difference between the market and the Consensus interest rate, it automatically augments export subsidies in periods of high interest rates. Also, substantial subsidies to exporting firms are still possible within the framework of the OECD consensus.

a.2. Sectoral disaggregation

Melitz and Messerlin (1987a, p 162) provide an industry break-down of French export credit subsidies for the years 1981-1984 (see Table 4). The industry classification is comparable to the two-digit NACE level. The first column of Table 4 gives the industry share in total export credit subsidies. The second column shows the rate of subsidization which, as before, measures subsidies as a percentage of eligible exports. Melitz and Messerlin define exports to Non-OECD countries as eligible for subsidies, except for Electrical Equipment, and for Aircraft&Ships for which all exports to non-EC countries are considered. An (arbitrary) distinction is made between benefiting and unaffected industries depending on whether the rate of subsidization exceeds a half percent.

Table 4 : French export credit subsidies by industry : 1981-1984

Industries	% share of total subsidy (1)	Subsidies as a % of eligible exports[a] (2)
A. BENEFITING INDUSTRIES		
Nonelectrical Machinery	26.6	11.4
Metal Products	7.8	9.9
Services	5.6	9.0
Electrical Equipment	19.5	8.1
Automobiles	8.0	5.1
Aircraft&Ships	12.3	4.0
Construction	14.5	4.0
Iron & Steel	1.7	2.5
Petroleum Products	0.6	2.3
Agro-industry	1.8	1.9
Rubber and Plastics	0.5	1.5
Basic chemicals	0.6	0.7
B. UNAFFECTED INDUSTRIES		
Coal	0.0	0.5
Printing and Publishing	0.1	0.4
Nonferrous Metals	0.1	0.4
Textiles	0.1	0.2
Transport Services	0.2	0.1
Construction Materials	0.0	0.1
Wood & Furniture	0.0	0.1
Paper	0.0	0.1
Other Chemicals		
Glass	0.0	0.0
Leather&Shoes	0.0	0.0
Agriculture	0.0	0.0
Meat and Dairy Products	0.0	0.0
Hotels	0.0	0.0
Telecommunications	0.0	0.0
Electricity	0.0	0.0
Economy Average		5.4

[a] : Eligible exports are all exports to non-OECD countries. In the case of Electric Equipment and Aircraft&Ships they include all exports to non-EC countries

Source : Melitz and Messerlin (1987b, p. 84).

The first column of Table 4 makes clear that four industries including Nonelectrical Machinery, Electrical Equipment, Aircraft and Ships, and Construction attract nearly three quarters of total export credit subsidies while a wide range of industries receives virtually no subsidies. We conclude that export credit subsidies are heavily concentrated on a few industries.

The most interesting information concerns the industry rates of subsidization. While the economy average equals 5.4%, the rate for Nonelectrical Machinery, Electrical Equipment, Metal Products and Other Services is close to 10%. Export credit subsidies to Aircraft&Ships, Construction and Motor Vehicles are substantial also. On the other hand, sixteen of the twenty-eight sectors can be considered as unaffected by export credit subsidies. It looks that the French export credit system favors a limited number of industries in a substantial way. The aggregate subsidy figures thus hide a lot of interindustry variation which is relevant for assessing the competitive impact of export credits.

B. EXPORT INSURANCE

b. 1. Evaluation of the total figures

The French export insurance agency COFACE insures export transactions to all destinations. Based on the yearly reports by the French agency COFACE, we computed export insurance subsidies using both the ex-post and ex-ante approach.

As explained in the methodological part of this chapter, the ex-post approach assumes that export insurance gives rise to export subsidies when the insurance premia do not fully cover subsequent claims. One way to practically implement this principle is to subtract for each year total premia from total claims, as is done in the second column of Table 5. It should be remembered that, with this ex-post

Table 5 : Export insurance in France (total figures for COFACE) (in millions of BF unless indicated otherwise)

Year	Insured contracts (billions of FF) (1)	Claims minus premia (2)	Claims minus premia as a % of insured contracts (3)	Claims-premia as a % of total exports (4)	Claims-premia-recoveries (5)	Claims-premia-recoveries as a % of insured contracts (6)	Claims-premia-recoveries as a % of total exports (7)
1973	31.3	-138	-0.44	-0.07	-310	-0.99	-0.16
1974	60.4	-84	-0.14	-0.03	-322	-0.53	-0.12
1975	93.0	-31	-0.03	-0.01	-193	-0.21	-0.07
1976	114.8	-141	-0.12	-0.04	-448	-0.39	-0.18
1977	152.6	-450	-0.30	-0.11	-718	-0.47	0.01
1978	138.0	738	0.53	0.17	43	0.03	0.25
1979	146.8	2338	1.59	0.44	1328	0.90	0.14
1980	168.0	2279	1.36	0.38	816	0.49	-0.02
1981	206.8	2021	0.98	0.28	-143	-0.07	0.28
1982	247.7	4247	1.71	0.54	2179	0.88	-0.19
1984	302.0	5377	1.78	0.51	-1947	-0.64	-0.33
1985	297.1	5327	1.79	0.47	-3703	-1.25	0.41
1986	269.7	9235	3.42	0.86	4383	2.66	0.51
1987	213.8	15690	7.34	0.41	5689	3.53	0.14
1973-'79	736.9	2232	0.30	0.09	-620	-0.08	-0.02
1980-'87	1705.1	44176	2.59	0.48	7274	0.43	0.08

Source : Own computations based on the yearly accounts of COFACE. Data for 1983 are not available.

methodology, the yearly figures in the first two columns should not beinterpreted as subsidies of that particular year. Only the accumulation of losses over a sustained period forms an indication of export subsidization. Also, administrative and other costs of the official export insurance agency are ignored. In the same way as a private insurer, the official agency must recover these costs from its premia in order to break even. This implies that our estimates provide a lower bound for the subsidies actually given.

Columns (3) and (4) express the difference between premia and claims as a % of respectively the value of insured contracts and total exports. In this context, it should be noted that COFACE provides export insurance to all countries so that total exports is the relevant concept to compute subsidization rates.

The last three columns take into account the recoveries on claims which leads to lower estimates of subsidy-equivalents. Nevertheless, these recoveries should be interpreted with considerable caution as they often consist of reimbursements by the French Treasury to COFACE irrespective of whether funds have actually been recovered. These reimbursements compensate for losses as a result of the debt consolidations in connection with the Club of Rome and therefore represent subsidies. For this reason, the improved financial situation of COFACE in 1984 and 1985 is presumably ficticious.

Table 6 uses the ex-ante approach of measuring insurance subsidies. In reality, official as well as private insurance agencies can make mistakes. Optimally, an ex ante approach is required to compute the subsidy-equivalents of export insurance during a specific year. This approach was developed earlier in this chapter and compares the premia to the future claims that can be expected on the moment the export insurance contract is signed. Here again, the time horizon of the studies may be too short to judge the long-run profitability of the official French export insurance system. For this reason, the estimates of export insurance subsidies should be treated with care.

Table 6 : Ex-ante subsidies in French export insurance (total figures for COFACE) (in millions of BF unless indicated otherwise)

Year	Implicit subsidy without recoveries (1)	Subsidy without recoveries as a % of insured contracts (2)	Rate of subsidization without recoveries % (3)	Implicit subsidy with recoveries (4)	Implicit subsidy with recoveries as a % of insured contracts (5)	Rate of subsidization with recoveries % (6)
1973	- 95	-0.30	-0.05	-214	-0.68	-0.11
1974	- 54	-0.09	-0.02	-320	-0.53	-0.12
1975	- 66	-0.07	-0.02	-438	-0.47	-0.16
1976	-308	-0.27	-0.09	-744	-0.65	-0.22
1977	-299	-0.20	0.08	-727	-0.48	-0.18
1978	-548	-0.40	-0.12	-824	-0.60	-0.19
1979	- 73	-0.05	-0.01	-528	-0.36	-0.10
1980	1082	0.64	0.18	326	0.19	0.05
1981	2458	1.19	0.34	1032	0.50	0.14
1982	3353	1.35	0.42	1198	0.48	0.15
1984	3112	1.03	0.30	364	0.12	0.03
1985	3965	1.33	0.35	14	0.00	0.00
1986	4055	1.50	0.38	-2957	-1.10	-0.27
1987	4902	2.29	0.44	-293	-0.14	-0.03
1973-'79	-1443	-0.20	-0.07	-3795	-0.52	-0.20
1980-'87	22927	1.34	0.35	-316	-0.02	0.00

The rate of subsidization is defined as the ratio of the implicit subsidy and total exports.
Source : Own computations based on yearly accounts of COFACE. Data for 1983 are not available.

It is comforting to see that the ex-ante and ex-post measures reported in Tables 5 and 6 show a similar evolution, although the ex-ante procedure leads to lower estimates of the subsidization involved. In the period 1978-1987, premia did not cover the costs of COFACE's activities so that subsidization took place. This represents a clear change w.r.t. to the preceding period, when the cost of export insurance was largely covered by premia and other activities.

Tables 5 and 6 further suggest a steady increase in export insurance subsidies, although there is more year to year variation than in the case of export credits. Nevertheless, the amount of implicit subsidies in export insurance is small when compared to export credits. In effect, we find that export insurance subsidies almost never exceed 1% of total exports. In comparison to export credits, export insurance subsidies only play a minor role.

On the other hand, the estimates in terms of the value of insured contracts indicate that one should not underestimate the possible competitive effects of export insurance subsidies. The difference between claims and premia as % of insured contracts steadily rises to nearly 2% in 1982-1984, and then jumps to 3.4% in 1986 and even 7.3% in 1987. The ex-ante subsidy approach yields estimates of more than 1% in 1981-1986 and more than 2% in 1987. In view of the large increase in claims in 1986-1987, these subsidy rates will increase even further after 1987 because the fair premium in the ex-ante subsidy approach is based on a weighted average of past claims and premia.

These figures suggest that, while only a relatively small share of total exports receive export insurance subsidies, the competitive impact of the subsidized exporters may be significant. Furthermore, the strong expansion of export insurance subsidies combined with the decline in export credit subsidies points to a larger role of the former type of export aid in recent years.

Table 7 : French insurance-subsidies : COFACE's own and Government-Related Activities (Recoveries not included)

Year	Export insurance for French state			COFACE Own export insurance		
	% Share of total contracts insured by COFACE	Claims-premia as a % of contracts	Ex-ante subsidies without recoveries as a % of insured contracts	% share of total contracts insured by COFACE	Claim-premia as a % of insured contracts	Ex-ante subsidies without recoveries as a % of insured contracts
	(1)	(2)	(3)	(4)	(5)	(6)
1973	0.41	-0.60	-0.40	0.59	-0.21	-0.24
1974	0.32	-0.09	0.07	0.68	-0.24	-0.21
1975	0.18	0.01	0.19	0.82	-0.21	-0.26
1976	0.18	-0.10	-0.17	0.82	-0.22	-0.25
1977	0.17	-0.31	-0.14	0.83	-0.23	-0.25
1978	0.21	0.73	-0.47	0.79	-0.17	-0.22
1979	0.24	2.17	-0.05	0.76	-0.20	-0.21
1980	0.25	1.87	0.88	0.75	-0.19	-0.20
1981	0.24	1.33	1.62	0.76	-0.17	-0.19
1982	0.21	2.21	1.88	0.79	-0.17	-0.20
1984	0.24	2.40	1.38	0.76	-0.17	-0.18
1985	0.26	2.26	1.89	0.81	-0.16	-0.20
1986	0.30	4.93	1.80	0.70	-0.08	-0.16
1987	0.42	12.65	2.80	0.58	-0.13	-0.16
1973-'79	0.22	0.49	-0.14	0.78	-0.21	-0.23
1980-'87	0.27	4.62	1.85	0.73	-0.15	-0.18

Source : Own computations based on yearly reports by COFACE

b.2. Export Insurance for the account of COFACE and the French state

Table 7 makes a distinction between the own account of COFACE and the activities on behalf of the French government[4]. With some variation across the years, it is seen that around 70% to 75% of contracts insured by COFACE are concluded on behalf of the French government. Very interestingly, we find that premium income of COFACE's own insurance contracts slightly exceeds claims in all years considered. Likewise, no evidence of ex-ante subsidies is found. Considering that the small surplus in premium income may be needed to cover administrative costs, this suggests that COFACE's own activities are breaking even.

The contrast with the government account is remarkable. Here, persistent and rapidly rising export subsidization is found in the 1980's. In summary, export insurance subsidies are entirely government-related in France and, as a result of the large share of government insurance contracts, explains the observed accumulation of losses by COFACE.

b.3. Sectoral breakdown

A sectoral disaggregation of export insurance subsidies is found in Table 8, based on ex-ante subsidy estimates by Melitz and Messerlin (1987b, p 82-85). Data limitations forced the authors to aggregate Construction and Related Services. Notice that several industries get negative subsidies. This may be due to imperfections in Melitz and Messerlin's methodology to measure ex ante subsidies. Another explanation is that COFACE insurance of longer term credits was compulsory until 1985. This may have forced some industries to pay more than the pure premium.

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[4]Recoveries are not considered in Table 7, but do not alter the results markedly.

Table 8 : Percentage share of French Insurance subsidies by Industry

	1981	1982	1983	1984	81-84
Construction & Services	62.5	90.2	67.6	59.6	69.9
Agro-industry	-1.2	-1.6	17.7	24.4	9.8
Aircraft&Ships	20.4	0.9	3.9	2.8	7.0
Automobiles	5.4	3.7	4.4	2.0	3.9
Electrical Equipment	6.6	1.9	1.6	3.2	3.3
Nonelectrical Machinery	5.1	3.3	2.1	2.4	3.2
Basic Chemicals	-1.5	-1.9	1.8	2.0	0.1
Coal	0.0	0.0	0.0	0.0	0.0
Leather & Shoes	0.0	-0.1	-0.1	-0.1	-0.1
Textiles	-0.5	-0.6	0.2	0.4	-0.1
Wood&Furniture	-0.4	-0.4	-0.3	-0.2	-0.3
Iron&Steel	-3.0	-2.5	0.7	3.1	-0.4
Metal Products	-5.4	-5.3	-3.4	-1.8	-4.0

Source : Melitz and Messerlin (1987b, p. 90)

Three features of Table 8 stand out. With some exceptions, the industries that benefit most from export credit subsidies also receive the bulk of the export insurance subsidies. Secondly, subidies to Construction and Related Services account for the two-thirds of the total. In part, this reflects the developments in Iran in the late 1970's. Note also that the agroindustry was heavily subsidized in 1983 and 1984, which reflects problems with Poland during the international debt crisis. On the whole, export insurance subsidies do not appear to be targeted strategically towards specific industries, but arise from largely exogenous international developments.

4.2. THE UNITED KINGDOM

A. EXPORT CREDITS

a.1. Evaluation of total figures

In this section, we present our estimates of the subsidies implicit in U.K. export credits based on the Cost Difference Method. Export credits include all fixed rate Sterling and foreign currency export financing by the EGCD. Our findings for the years 1978-1987 are reported in Table 9 and are consistent with evidence from Melitz and Messerlin (1987b, p 95) for the subperiod 1982-1984.

It becomes clear from Table 9 that the United Kingdom granted substantially lower export credits than France. Indeed, the French find a rate of subsidization ranges from 2.8 to 5.1 % while the rate varies from 0.6 to 1.7 % in the United Kingdom.

As in the case of France, we observe a strong expansion of outstanding U.K. credits during the 1978-1984 period. Combined with a sharply rising interest differential between the market and the OECD Consensus rate, this resulted in more than a doubling of the rate of

Table 9 : <u>Export credit subsidies in the United Kingdom</u>

Year	Outstanding credits (millions of £) (1)	Interest rate dif- ferential % (2)	Implicit subsidy (millions of £) (3)	Rate of subsidi- zation % (4)
1978	4950.52	2.6	127.581	0.6
1979	5599.28	3.9	218.582	0.9
1980	6393.33	5.6	359.322	1.3
1981	7458.43	6.7	500.386	1.7
1982	8902.03	6.1	546.233	1.7
1983	9858.94	3.3	327.063	1.0
1984	9812.77	4.4	429.802	1.1
1985	9581.90	4.0	385.682	1.0
1986	8648.97	2.6	226.400	0.6
1987	7747.96	2.1	161.188	0.4

The rate of subsidization is defined as the ratio of the implicit subsidy and total exports to non-EC countries.

<u>Source</u> : ECGD (1988, p. 16) and own computations.

subsidization. After 1984 the pattern was reserved. The interest differential decreased to 2.1% only in 1987 and total outstanding credits came down somewhat as well. All of this brought the rate of subsidization down to levels comparable to the late seventies. This is another illustration of the sensitivity of export credit subsidies to the interest rate evolution. Without any doubt, the matrix rate arrangement of the OECD Consensus exerces a profound influence on the scope for export credit subsidization.

a.2. Industry disaggregation

The lower British rates of subsidization are also reflected in the industry disaggregation in Table 10, which is derived from the paper by Melitz and Messerlin (1987b, p 97). In 1982-1984, none of the industries benefited from a rate of subsidization of five percent of more. As in the case of France though, most of the export credit subsidies goes to a limited number of British industries.

Interestingly, many of the same industries are the main beneficiaries of export credits in France and the United Kingdom. This is true for Engineering (compare to Nonelectrical Machinery in France), Transport Equipment (comparable to Aircraft&Ships), Construction and Related Services, Motor Vehicles, Electrical Equipment, and Metal products.
We conclude that, to an important degree, export promotion through export credits is targeted at the same industries in the United Kingdom and France.

B. EXPORT INSURANCE

Export insurance in the United Kingdom is provided by the EGCD on exports to all destinations. A distinction is made between export credit insurance and overseas investment insurance business. The value of insured contracts in the overseas investment scheme accounted for less than 1% of total insurance in 1978-1988. Moreover, this form of   insurance   has   been

Table 10 : Export credit subsidies in the United Kingdom by industry :
           1982-1984

Industries	% share of total subsidy (1)	subsidies as a % of a eligble exports [a] (2)
A. BENEFITING INDUSTRIES		
Transport Equipment	24.0	4.2
Construction and Services	40.4	3.1
Engineering	21.7	2.9
Electricity and Gas	0.0	2.7
Motor vehicles	7.0	2.5
Office Machinery	0.9	1.5
Metal Products	0.1	1.0
Electrical Equipment	5.6	0.8
B. UNAFFECTED INDUSTRIES		
Instrument Engineering	0.2	0.2
Wood Products	0.0	0.1
Petroleum Products	0.0	0.1
Other Manufactured Goods	0.1	0.1
Agriculture	0.1	0.1
Basic Chemicals	0.1	0.0
Textiles	0.0	0.0
Other Chemicals	0.0	0.0
Paper and Printing	0.0	0.0
Footwear and Clothing	0.0	0.0
Petroleum Products	0.0	0.0
Synthetic Fibres	0.0	0.0
Non-metallic Minerals	0.0	0.0
Nuclear Products	0.0	0.0
Mineral Extraction	0.0	0.0
Nonferrous Metallic Minerals	0.0	0.0
Ferrous Metallic Minerals	0.0	0.0
Cokes	0.0	0.0
Leather	0.0	0.0
Agro-industry	0.0	0.0
Water	0.0	0.0
Coal.	0.0	0.0
Economy Average		1.9

[a] : Eligible exports are all exports to non-OECD countries. In the case of
Electrical Equipment and Transport equipment they include all exports to
non-EC countries.

Source : Melitz and Messerlin (1987b, p. 97)

profitable and should therefore not be considered as a subsidy. For these reasons, we focus on export credit insurance only.

Table 11 summarizes the main facts about export insurance in the United Kingdom. Information is presented about the value of outstanding contracts, claims minus premia, and claims minus the sum of premia and recoveries&interest. The use of outstanding instead of insured contracts is dictated by data availability but is not likely to distort our findings because short term business up to 180 days accounted for 75% of total EGCD insurance. Again we distinguish between a situation with and without recoveries&interest. From a comparison between columns (2) and (6), it is seen that recoveries&interests were substantial and added up to more than 1.8 billion pounds in the period 1978-1987. In view of the earlier mentioned problems with the data on recoveries, it is appropriate to consider these two limiting cases as an upper and a lower bound for the profitability of the EGCD.

In addition to the absolute numbers, Table 11 also shows percentage shares w.r.t. the value of total outstanding contracts and w.r.t. total U.K. exports, which is the relevant variable as the EGCD insures transactions to all countries. In Table 12, we used the earlier discussed ex-ante methodology to compute subsidies in U.K. export insurance. Again the cases with and without recoveries&interest were treated separately.

A very comparable picture as in the case of France emerges. Tables 11 and 12 indicate that rates of subsidization as well as the shares of claims-premia as a % of total exports are below 0.8%. When one adds recoveries&interest, the figures almost fall by half. On the whole, British export insurance was pretty close to break-even in the period 1978-1982. At the same time, however, there was a marked expansion of outstanding contracts which coincided with the rise in export credits.

Table 11 : Export insurance in the United Kingdom (in millions of £ unless indicated otherwise)

Year	Outstanding contracts (1)	Claims minus premia (2)	Claims minus premia as a % of total contracts (3)	Claims-premia as a % of total exports (4)	Claims-premia-recoveries & interest (5)	Claims-premia-recoveries & interest as a % of total contracts (6)	Claims-premia-recoveries & interest as a % of total exports (7)
1978	14515	25.6	0.18	0.05	-18.1	-0.12	-0.04
1979	16235	112.0	0.69	0.20	13.4	0.08	0.02
1980	17048	138.5	0.81	0.21	57.9	0.34	0.09
1981	17502	67.2	0.38	0.10	-12.5	-0.07	-0.01
1982	19090	239.9	1.23	0.33	136.3	0.71	0.19
1983	17700	511.5	2.89	0.63	378.8	2.14	0.47
1984	16500	690.1	4.18	0.75	362.8	2.20	0.39
1985	15500	606.4	3.91	0.59	335.5	2.16	0.32
1986	13569	620.5	4.57	0.63	225.8	1.66	0.22
1987	14975	846.7	5.65	0.79	524.4	3.50	0.49
1978-1987	162634	3858.4	2.37	0.49	2004.3	1.23	0.25

Source : ECGD (1988, p. 10-14) and own computations.

(5)

Table 12 : <u>Ex-ante subsidies in U.K. export insurance</u>

Year	Implicit subsidy without recoveries and interest (millions of £)	Subsidy without recoveries interest as a % of insured contracts	Rate of subsidization without recoveries & interest %	Implicit subsidy with recoveries and interest (millions of £)	Implicit subsidy with recoveries & interest as a % of insured contracts	Rate of subsidization with recoveries and interest %
	(1)	(2)	(3)	(4)	(5)	(6)
1981	11.606	0.07	0.02	-68.973	-0.39	-0.10
1982	-22.025	-0.11	-0.03	-119.733	-0.63	-0.16
1983	220.571	1.25	0.27	133.791	0.76	0.17
1984	314.388	1.91	0.34	218.259	1.32	0.24
1985	450.032	2.90	0.44	280.767	1.81	0.27
1986	471.972	3.48	0.48	269.293	1.98	0.27
1987	653.524	4.36	0.61	322.067	2.15	0.30
1981-1987	2100.068	3.01	0.33	1035.473	1.69	0.17

The rate of subsidization is defined as the ratio of the implicit subsidy and total exports.

<u>Source</u> : Own computations based on Table 9.

This expansion dramatically changed the subsidization implicit in export insurance after 1982. Implicit subsidies without recoveries&interest rose from a negative number in 1982 to 653.5 million pounds in 1987 while the difference between claims and premia reached £ 846.7 million in that year. Even after taking into account recoveries&interest, the increase in export insurance subsidies remains impressive. In fact, for the last years of our sample, the total value of export insurance subsidies comes close to or exceeds the value of U.K. export credit subsidies in Table 9, irrespective of how insurance subsidies are measured. When dividing the absolute figures by total exports, a similar albeit less pronounced evolution is found.

There are other signs that the role of export insurance in British export promotion has increased considerably. In contrast to export credit subsidies, export insurance subsidies as a percentage of total export value are higher in the U.K. than in France. Furthermore, the still relatively low rates of subsidization should not lead to an underestimation of the possible competitive distortions arising from export insurance. In this respect, the information in terms of the value of outstanding contracts is revealing. From column (5) in Table 12, one sees that in 1987 a subsidy of 2.2% is given for every ECU of export contract insured. When recoveries&interest are not taken into account, the subsidy amounts to 4.4 % of every ECU insured. The corresponding rates for the ex-post estimates in Table 11 are 3.5% and 5.7%. This suggests that, while only part of all exports are actually insured, insurance subsidies for this subset of exports may be quite substantial.

4.3 BELGIUM

In Belgium exports are supported in four different ways. CREDITEXPORT grants export credits at favourable interest rates to which COPROMEX adds export subsidies under well-defined conditions. Furthermore, the

Treasury extends official development assistance and the Service du Ducroire/ Nationale Delcredere Dienst (NDD) organizes an export insurance system. In this section we present our estimates of these implied subsidy-equivalents.

A. EXPORT CREDITS

a.1. Creditexport

Creditexport is an organisation in which institutions of the Belgian public and private financial sector participate. It operates for the account of a pool of private and public banks and aims at stimulating exports by providing export credits with terms above two years at interest rates as favourable as possible. Break-even is said to be pursued.

Does Creditexport grant export subsidies ? In the view of the Commission, a subsidy is given if capital, when supplied by the government, earns a lower than normal market return. Creditexport is not a governmental organisation and its actions cannot be considered as pure subsidization. Yet, indirectly, the government takes part in Creditexport through public financial institutions. In effect, the capital input by the public sector in Creditexport amounts to 44 % since 1976. Moreover, in spite of the fact that it does not incur any losses, Creditexport grants export loans below the going market rate. For these reasons, it can be argued that 44 % of the interest subsidy, granted by Creditexport, should be considered as a subsidy.

In the first three columns of Table 13, we present Feyaerts (1985) estimates of G_{ce}, the benefits to the firms derived from export financing by Creditexport. In this table, the NPV method is used for the period 1975-1983. In computing these figures, Feyaerts uses the debet interest rate on investment credits of more then 5 years. In

Table 13 : Feyaerts (1985)   Estimates of the benefits to the firms
thanks to Creditexport 1975-1983

year	G_{ce}	G_{ce} as a % of total export subsidies	G_{ce} as a % of non-EC exports	S_{ce}	S_{ce} as a % of non-EC exports
1975	500	25	0.18	220	0.08
1976	900	38	0.29	369	0.13
1977	-100	-5	-0.03	-44	-0.01
1978	900	31	0.24	369	0.11
1979	800	16	0.19	352	0.09
1980	1.200	21	0.24	528	0.11
1981	1.200	22	0.23	528	0.10
1982	·1.600	21	0.24	704	0.11
1983	400	5	0.05	176	0.02
Average : 822		19	0.18	362	0.08

Source : Feyaerts (1984), p. 44.

the last two columns, the part of G_{ce} is computed that can be attributed to the public capital input.

On average, Creditexport accounts for 19 % of Feyaerts estimates of total Belgian export subsidies and 0.18 % of Belgian non-EC exports. Compared to British and most notably French export credit subsidies, this rate of subsidization is thus low. The rates of subsidization decrease even further if only the exporting firm's benefits from participation of public institutions in Creditexport is considered (see columns 4 and 5). On the whole, subsidization by Creditexport appears limited although one should remember that Creditexport is not the only organization providing export support.

Feyaerts estimates vary considerably over time. For 1977, Feyaerts even obtains an unexplained negative value, which would imply that Creditexport has hampered Belgian exports in that year. Remark further that the values in the third column are less volatile then the values in the first two columns. This indicates that,except for 1977 and 1983, Creditexport follows the evolution in the export market.

The high values for the years 1980-1982 are partially due to the increased difference between the Creditexport interest rate and the market interest rate. At the same time the volume of export credits rises sharply which points to more active export promotion. The sharp decrease in the volume of granted export credits explains the low value for the year 1983. All of this corresponds closely to the time evolution of export credit subsidies in France and the United Kingdom.

a.2.Copromex

Copromex (Comittee for the Export of Belgian Equipment Goods) is com-posed of representatives of different ministeries,some important pu-blic institutions and Creditexport. It advises the minister of fo-reign trade about interest subsidies on export credits with terms

above 2 years. An export subsidy can be granted if exports of a Belgian firm are hampered by more favourable export credit conditions of foreign suppliers.

As discussed in chapter I, subsidies are regulated by two international agreements : The Treaty of Rome and the "Consensus" agreement within the OECD. The former forbids that subsidies should be granted to goods exported to other EC-countries. The latter rules out export subsidies at interest rates below the Consensus minimum rates. In practice, Copromex at most pays the difference between the cost of credit in Belgium (in casu the Creditexport interest rate plus a bank provision of 0.45 %) and the Consensus minimum rates.

The Copromex payments represent pure subsidies because firms save part of the export financing costs. The first two columns of Table 14 present two sets of estimates of the size of these subsidies for the years 1970-1987. The first set reflects the subsidies committed in one specific year (i.e. the total amount of subsidies committed in that year but disbursed in later years). These estimates are comparable to the subsidy equivalents obtained with the NPV-method although its is not clear at this stage whether a discount factor has been applied. The second set of estimates reflects the disbursed payments and is based on the Cost Difference Method. The rates of subsidization for these two methods are given in columns (3) and (4). As before, they are defined as the ratio of export subsidies to non-EC exports. Comparing the rate of subsidization on committed subsidies to other countries, we find that subsidies by Copromex remain below the French and somewhat below the British figures. As in case of France and the U.K., subsidies rose sharply between 1980 and 1983 due to the high market interest rates and the low Consensus-rates. From 1984 on, declining market interest rates and rising Consensus rates reversed the pattern of the previous year. One can expect future Copromex subsidies to decrease even further because the countries participating

in the Consensus agreed to abolish export subsidies to industrialized countries from 15 July 1988 onwards.

The estimates of subsidies implicit in Belgian export credits by the Cost Difference Method mirror the observed pattern of the NPV methodology with a lag of a year or so. This lagged adjustment arises from the fact that the Cost Difference Method measures the subsidies comprised in export credits of the past years. For this reason, the sharp expansion of subsidies starts in 1980 instead of 1970 and is reversed in 1985 instead of 1984.

Table 14 : Copromex subsidies

year	committed subsidies ($\approx$ NPV-Method) (1)	disbursed subsidies ($\approx$ Cost difference Method) (2)	committed subsidies as a % of Belgian non-EC exports (3)	disbursed subsidies as a % of Belgian non-EC exports (4)
1970	65.3	14.1	0.05	0.01
1971	65.0	52.7	0.04	0.04
1972	84.0	70.5	0.05	0.04
1973	233.3	185.9	0.11	0.09
1974	597.8	155.1	0.20	0.05
1975	778.3	246.7	0.27	0.09
1976	1751.3	390.7	0.57	0.13
1977	1261.4	412.1	0.35	0.12
1978	2156.7	845.0	0.58	0.23
1979	1743.2	1048.7	0.42	0.25
1980	5298.0	912.3	1.06	0.18
1981	5801.2	1411.3	1.10	0.27
1982	8555.8	2744.5	1.30	0.42
1983	3255.7	3158.7	0.44	0.43
1984	558.9	4189.9	0.07	0.50
1985	1188.3	3924.5	0.13	0.44
1986	1294.0	3706.8	0.17	0.48
1987	191.6	2802.3	0.03	0.38

Source : Copromex

B. OFFICIAL DEVELOPMENT ASSISTANCE

b. 1. Evaluation of the total figures

Since 1964, the ministries of finance and foreign trade provide mutually arranged credits from state to state. These credits are a form of Official Development Assistance as defined in the previous section. Therefore, our theoretical approach for measuring subsidies implied in Official Development Assistance can directly be applied to these credits.

In practice, the credits are granted to foreign governments or institutions whose activities are guaranteed by their government, their central bank or a competent national development institution. The applying countries present development projects and are expected to spend part of the credit on purchases in Belgium. The financing conditions are favourable. The repayment term is usually 20 years after a grace period of 10 years for the interest and the principal. The interest rate charged is zero or 2 % depending on the yearly per capita income of the receiving country.

In Tables 15 and 16 we estimated the grant elements of Belgian state to state credits during the period 1964-1988. This grant element corresponds to the benefit for the receiving country of obtaining favourable financing conditions[5]. We showed before that this concept overestimates the benefits for exporting Belgian firms because only part of the gains for importers are passed on to the firm.

In Table 15, the NPV-method was used with two alternative assumptions about the discount rate. The first column is based upon a simple 10 % discount rate while in the second column the interest rate on obligations of Belgian public financial institutions was used. All figures are expressed in millions of BF. The third column gives the

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[5]Assuming that the whole credit is used to buy domestic goods.

Table 15 : <u>Grant elements implied in Belgian state to state cre-</u>
<u>dits based on the NPV-method (1964-1988) (in millions of</u>
<u>Bfr.)</u>

year	discount rate		% difference
	<u>% 10</u>	<u>PFI 10 year</u>	
1964	32.2	18.5	41
1965	71.4	39.3	45
1966	28.3	13.5	52
1967	88.2	46.2	48
1968	153.9	77.4	50
1969	233.1	180.4	23
1970	220.2	196.3	11
1971	545.1	459.0	16
1972	384.5	295.7	23
1973	652.0	534.8	18
1974	1075.6	1019.0	5
1975	1029.1	986.0	4
1976	830.0	814.0	2
1977	1301.6	1275.1	2
1978	843.5	794.1	6
1979	2338.1	2324.0	1
1980	2512.8	2647.0	-5
1981	1998.0	2165.0	-8
1982	2104.0	2358.0	-12
1983	2676.5	2825.8	-6
1984	2401.7	2499.3	-4
1985	1864.0	1889.1	-1
1986	2517.2	2379.2	5
1987	719.1	647.3	10
1988	1962.5	1736.3	12

Table 16 : <u>Grant elements implied in the Belgian state tot state cre-
dits based on the cost difference-method (1964-1988) (in
millions of B.F.)</u>

1964	4.6	1977	809.5
1965	15.7	1978	907.7
1966	20.5	1979	1158.1
1967	34.1	1980	1459.2
1968	58.5	1981	1680.6
1969	88.2	1982	1942.6
1970	113.9	1983	2258.5
1971	177.8	1984	2521.6
1972	220.5	1985	2700.2
1973	293.8	1986	2966.6
1974	434.7	1987	3016.8
1975	559.2	1988	3211.0
1976	656.7		

difference between the first two columns as a percentage of the value of the first column. We find that alternative discount rates lead to divergent estimates in the earlier period but that from 1974 onwards the difference seldom exceeds 10%.

The figures in Table 16 are estimated by means of the Cost Difference Method. A discount rate of 10% is used. The figures represent for each year the budgetary consequences of the credits granted in previous years. In Table 17, the figures in the previous tables are related to Belgian exports to non-EC countries in order to obtain rates of subsidization.

From Tables 15-17, we conclude that the rates of subsidization never exceed 0.6% so that, on average, subsidies implicit in development assistance should not be exaggerated. However, this does not rule out that exports to specific countries substantially benefited from the government grants.

Furthermore, a steady increase of both grant elements and subsidy rates is seen during the period 1964-1978. In 1974-1984, the period when a strong expansion of export credits was observed in the countries of our sample, official government grants also rose sharply. This is reflected in an increase in subsidy rates. From 1985 onwards, the NPV results indicate that the growth of official grants is halted and even reversed. But the stock of outstanding low interest development loans remains considerable and explains the continued rise in subsidy estimates by the Cost Difference Method.

b.2. Regional disaggregation

State credits and grant elements are disaggregated regionally in Tables 18 and 19.

Table 18 shows that 45 countries received Belgian state to state credits and that more than 50 % of these credits were directed to five

Table 17 : Percentage rate of subsidization in Belgian state to state credits

year	Cost Difference Method	NPV Method
1964	0.01	0.04
1965	0.02	0.07
1966	0.02	0.03
1967	0.03	0.08
1968	0.05	0.13
1969	0.07	0.19
1970	0.08	0.16
1971	0.12	0.37
1972	0.13	0.23
1973	0.14	0.31
1974	0.15	0.37
1975	0.20	0.37
1976	0.22	0.28
1977	0.23	0.37
1978	0.25	0.23
1979	0.29	0.58
1980	0.31	0.53
1981	0.31	0.36
1982	0.31	0.34
1983	0.32	0.38
1984	0.30	0.29
1985	0.31	0.21
1986	0.38	0.33
1987	0.41	0.10
1988	0.41	0.25

Table 18 : Belgian state to state credits. Regional disaggregation (1964-1988) (in millions of BF)

	current prices		% share		prices of 1988		% share
1	zaire	5050	14.07	1	india	9017.5	16.38
2	india	4760	13.26	2	indonesia	8230.3	14.95
3	indonesia	4730	13.17	3	turkey	6814.3	12.38
4	turkey	3914	10.90	4	zaire	6358.2	11.55
5	china	2993	8.34	5	pakistan	3538.3	6.43
6	pakistan	1850	5.15	6	china	3522.4	6.40
7	bangladesh	1775	4.94	7	bangladesh	2666.0	4.84
8	philippines	1289	3.59	8	philippines	2005.6	3.64
9	tanzania	1067	2.97	9	tanzania	1407.0	2.56
10	cameroon	745	2.08	10	tunesia	1105.6	2.01
11	tunesia	709	1.98	11	morocco	946.0	1.72
12	morocco	631	1.76	12	cameroon	833.0	1.51
13	egypt	610	1.70	13	peru	819.1	1.49
14	peru	525	1.46	14	egypt	817.1	1.48
15	burundi	500	1.39	15	bolivia	644.6	1.17
16	bolivia	450	1.25	16	cote d'ivoire	603.0	1.10
17	cote d'ivoire	406	1.13	17	burundi	573.0	1.04
18	congo	275	0.77	18	colombia	525.2	0.95
19	colombia	275	0.77	19	vietnam	376.6	0.68
20	nepal	250	0.70	20	kenia	346.9	0.63
21	niger	250	0.70	21	niger	334.5	0.61
22	vietnam	250	0.70	22	congo	294.5	0.53
23	gabon	246	0.69	23	gabon	293.9	0.53
24	ethiopia	242	0.67	24	angola	289.7	0.53
25	kenia	230	0.64	25	rwanda	271.1	0.49
26	angola	206	0.57	26	nepal	263.4	0.48
27	ecuador	200	0.56	27	ethiopia	243.6	0.44
28	thailand	195	0.54	28	thailand	243.3	0.44
29	rwanda	145	0.40	29	ecuador	233.4	0.42
30	seychelles	140	0.39	30	seychelles	152.0	0.28
31	benin	115	0.32	31	cuba	150.6	0.27
32	senegal	100	0.28	32	benin	139.4	0.25
33	cuba	100	0.28	33	senegal	132.4	0.24
34	el salvador	90	0.25	34	syria	108.1	0.20
35	zambie	90	0.25	35	madagascar	104.1	0.19
36	liberia	85	0.24	36	liberia	99.2	0.18
37	jamaica	77	0.21	37	el salvador	91.4	0.17
38	syria	75	0.21	38	zimbabwe	91.0	0.17
39	madagascar	75	0.21	39	jamaica	90.4	0.16
40	zimbabwe	65	0.18	40	zambia	90.0	0.16
41	botswana	52	0.14	41	greece	77.0	0.14
42	greece	25	0.07	42	botswana	52.8	0.10
43	lebanon	25	0.07	43	lebanon	34.7	0.06
44	comoros	12	0.03	44	comoros	11.7	0.02
45	mozambique	7	0.02	45	mozambique	7.3	0.01

Table 19 : <u>Grant elements implied in the Belgian state to state</u>
<u>credits. Regional disaggregation (1964-1988) (in millions</u>
<u>of BF)</u>

current prices		% share	prices of 1988		% share
1 zaire	4147.7	14.70	1 india	6691.5	15.98
2 indonesia	3751.6	13.29	2 indonesia	6355.0	15.17
3 india	3670.4	13.01	3 zaire	5147.2	12.29
4 turkey	2875.5	10.19	4 turkey	4684.7	11.18
5 china	2501.8	8.87	5 china	2944.3	7.03
6 pakistan	1414.2	5.01	6 pakistan	2606.1	6.22
7 bangladesh	1391.5	4.93	7 bangladesh	2040.0	4.87
8 philippines	1041.5	3.69	8 philippines	1583.6	3.78
9 tanzania	891.9	3.16	9 tanzania	1176.1	2.81
10 tunesia	584.9	2.07	10 tunesia	902.7	2.16
11 egypt	509.9	1.81	11 egypt	682.9	1.63
12 cameroon	492.0	1.74	12 cameroon	558.9	1.33
13 burundi	418.0	1.48	13 morocco	530.5	1.27
14 morocco	404.6	1.43	14 peru	487.4	1.16
15 peru	336.6	1.19	15 cote d'ivoire	479.5	1.14
16 cote d'ivoire	323.4	1.15	16 burundi	478.9	1.14
17 bolivia	313.5	1.11	17 bolivia	440.3	1.05
18 congo	217.7	0.77	18 colombia	402.0	0.96
19 colombia	211.7	0.75	19 vietnam	318.0	0.75
20 niger	209.0	0.74	20 kenia	290.0	0.69
21 nepal	209.0	0.74	21 niger	279.6	0.67
22 vietnam	209.0	0.74	22 angola	242.1	0.58
23 ethiopia	202.3	0.72	23 congo	233.1	0.56
24 gabon	194.7	0.69	24 gabon	232.6	0.56
25 kenya	192.2	0.68	25 nepal	220.2	0.53
26 angola	172.2	0.61	26 ethiopia	203.6	0.49
27 thailand	163.0	0.58	27 thailand	203.4	0.49
28 ecuador	158.3	0.56	28 ecuador	184.8	0.44
29 seychelles	110.8	0.39	29 rwanda	152.5	0.36
30 rwanda	97.2	0.34	30 seychelles	120.4	0.29
31 benin	96.1	0.34	31 cuba	119.2	0.28
32 senegal	83.6	0.30	32 benin	116.5	0.28
33 cuba	79.2	0.28	33 senegal	110.7	0.26
34 zambia	75.2	0.27	34 madagascar	87.1	0.21
35 el salvador	75.2	0.27	35 syria	85.6	0.20
36 liberia	71.1	0.25	36 liberia	82.9	0.20
37 madagascar	62.7	0.22	37 el salvador	76.4	0.18
38 jamaica	61.0	0.22	38 zimbabwe	76.0	0.18
39 syria	59.4	0.21	39 zambia	75.2	0.18
40 zimbabwe	54.8	0.19	40 jamaica	71.5	0.17
41 botswana	41.2	0.15	41 botswana	41.8	0.10
42 lebanon	19.8	0.07	42 greece	28.6	0.07
43 comoros	10.0	0.03	43 lebanon	27.5	0.07
44 greece	9.3	0.03	44 comoros	9.9	0.02
45 mozambique	5.9	0.02	45 mozambique	6.2	0.01

countries : Zaire, India, Indonesia, Turkey and China. When expressed in prices of 1988, the share of these countries even exceeds 60 %. Among the top five, China is then replaced by Pakistan and Zaire is not on the first place any longer. This indicates that Zaire and China received the major part of their credits in recent years.

Table 19 shows that Zaire, India, Indonesia, Turkey and China also received most of the subsidies implied in these credits. Their share amounts to 51 % when expressed in current prices and 62 % when expressed in prices of 1988.

This higher share indicates that the destination of Belgian state to state credits has become somewhat less concentrated during the years. Nevertheless, we find that the most of the aid goes to a limited number of countries including Belgium's former colony but also Asian countries with whom Belgium has no special relationship.

C. EXPORT INSURANCE

In Belgium, the National Delcredere Dienst (NDD) insures export contracts against a wide variety of risks. In contrast to the agencies of France, the United Kingdom and Germany, only non-EC destinations are covered. The agency operates for its own account as well as on account for the Belgian state.

c.1. An analysis of total figures

Tables 20 and 21 report our findings for Belgian export insurance subidies for all NDD activities (own account and account of the Belgian state) using both the ex-post and ex-ante approach. A distinction is made between the case with and without recoveries. It should be noted that recoveries represent funds actually recovered instead of reimbursments by the Belgian government. Due to lack of data for the period 1973-1980, interest payments on consolidations are

Table 20 : Export insurance in Belgium (NDD account) + account of Belgian State (in millions of BF unless indicated otherwise)

Year	Insured contracts (billions of BF)	Claims minus premia	Claims minus premia as a % of newly insured contracts	Claims-premia as a % of total exports	Claims-premia-recoveries	Claims-premia-recoveries as a % of newly insured contracts	Claims-premia-recoveries as a % of eligible exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1973	40.2	-51	-0.13	-0.02	-306	-0.76	-0.15
1974	64.9	-117	-0.18	-0.04	-486	-0.75	-0.17
1975	76.7	131	0.17	0.05	-195	-0.25	-0.07
1976	111.7	-51	-0.05	-0.02	-389	-0.35	-0.13
1977	166.3	-30	-0.02	-0.01	-799	-0.48	-0.23
1978	115.9	1902	1.64	0.52	1429	1.23	0.39
1979	102.5	3250	3.17	0.80	2249	2.19	0.56
1980	116.7	2243	1.92	0.47	788	0.68	0.17
1981	149.6	747	0.50	0.14	83	0.06	0.02
1982	176.7	2796	1.58	0.45	1585	0.90	0.26
1983	144.2	5139	3.56	0.73	3672	2.55	0.52
1984	151.4	7206	4.76	0.86	4710	3.11	0.56
1985	162.6	5272	3.24	0.60	3785	2.33	0.43
1986	144.9	5797	4.00	0.75	4259	2.94	0.55
1987	145.2	7114	4.90	0.96	6239	4.30	0.84
1973-'79	678.2	5034	0.74	0.24	1503	0.22	0.07
1980-'87	1191.3	36314	3.05	0.65	25121	2.11	0.45

Eligible exports are exports to non-EC countries
Source : NDD and own computations.

Table 21 : Ex-ante subsidies in Belgian export insurance (NDD-account) + account of Belgian State (in millions of BF unless indicated otherwise)

Year	Implicit subsidy without recoveries (1)	Subsidy without recoveries as a % of newly insured contracts (2)	Rate of subsidization without recoveries % (3)	Implicit subsidy with recoveries (4)	Implicit subsidy with recoveries as a % of newly insured contracts (5)	Rate of subsidization with recoveries % (6)
1973	-185.1	-0.46	-0.09	-395.4	-1.23	-0.19
1974	-194.9	-0.30	-0.07	-578.5	-1.91	-0.20
1975	-269.0	-0.35	-0.10	-658.6	-2.01	-0.24
1976	-528.1	-0.48	-0.18	-1044.7	-2.60	-0.35
1977	-26.8	-0.02	-0.01	-664.2	-1.02	-0.19
1978	-372.9	-0.32	-0.10	-783.4	-1.02	-0.21
1979	-17.2	-0.02	0.00	-337.1	-0.30	-0.08
1980	467.5	0.40	0.10	18.1	0.01	0.00
1981	666.1	0.45	0.12	-9.1	-0.01	0.00
1982	1273.3	0.72	0.20	471.4	0.46	0.08
1983	318.5	0.22	0.04	-310.4	-0.27	-0.04
1984	1000.9	0.66	0.12	410.3	0.27	0.05
1985	1980.0	1.22	0.22	1000.7	0.57	0.11
1986	2649.3	1.83	0.34	1703.3	1.18	0.22
1987	2800.2	1.93	0.38	1768.1	1.17	0.24
1973-'79	-1594.0	-0.24	-0.07	-4461.9	-0.66	-0.21
1980-'87	11155.8	0.94	0.20	5052.4	0.42	0.09

The rate of subsidization is defined as the ratio of the implicit subsidy and total eligible exports.
Source : NDD and own computations.

not included. In addition to the absolute figures, we also express the subsidy-equivalents as a percentage of the total value of exports and newly insured contracts.

The rates of subsidization in both the ex-ante and ex-post approach are very similar to those in France and the United Kingdom. When compared to the total value of eligible exports, the Belgian export insurance agency is not a major source of export subsidies. Even without taking into account recoveries, rates of subsidization are less than 1%. Furthermore, one should note that the Service Du Ducroire only insures 10% or so of total Belgian exports and does not cover exports to EC countries. This contrasts markedly with the situation in France and the United Kingdom. As a consequence, the competitive impact on exports to EC countries is likely to be smaller.

Subsidy rates per ECU of insured exports are similar to our estimates for the United Kingdom and France. Without recoveries, claims-premia reach a maximum of 4.9 % of insured contracts in 1987 while the corresponding rate for ex-ante subsidies amounted to 1.9%. Taking into account recoveries, the figures for 1987 decrease to 4.3% and 1.2%. This indicates that the small group of exporters who rely on the Belgian insurance agency, obtain cheaper insurance than they would have obtained on the private market.

The evolution over time is also comparable to France and the United Kingdom. Up to 1977, premium income covers or even exceeds paid claims paid. From 1978 on, the official agency is confronted with steadily rising losses although the magnitude of the implicit subsidy varies considerably from year to year. It is doubtful that future recoveries on past claims will be sufficient to compensate all of the insurance losses of the past decade, so that some movement towards increased subsidization is to be expected.

Table 22 : Activities of the NDD, on its own account and on account of the Belgian State

Year	NDD Account Share in total outstanding contracts (%) (1)	NDD Account Claims-premia-recoveries as a % of newly insured contracts (2)	Account of Belgian State Share in total outstanding contracts (%) (3)	Account of Belgian State Claims-premia-recoveries as a % of newly insured contracts (4)
1973	86.0	-0.69	14.0	-2.2
1974	87.9	-0.70	12.1	-2.4
1975	89.8	-0.24	10.2	-0.7
1976	89.9	-0.36	10.1	-0.2
1977	86.1	-0.41	13.9	-0.9
1978	81.8	1.46	18.2	-0.2
1979	81.9	2.17	18.1	2.5
1980	83.0	0.43	17.0	4.8
1981	80.7	0.17	19.3	-0.8
1982	81.5	0.67	18.5	4.9
1983	79.0	2.80	21.0	0.7
1984	79.7	2.82	20.3	9.6
1985	76.0	2.24	24.0	3.1
1986	74.7	2.58	25.3	10.9
1987	75.9	3.53	24.1	27.8

Source : Own computations based on data provided by the NDD.

c.2. The NDD's own account versus the account of the Belgian state

Table 22 differentiates between the NDD's own and government—related activities. In contrast to the French situation, the bulk of the contracts are on account of the NDD, although the share of own activities declined from 86% in 1973 to 75.9% in 1987.

An interesting time pattern emerges from the comparison of ex—post subsidy rates as a percentage of newly insured contracts. The accumulation of losses by the NDD since the end of the 1970's is accompanied by a widening gap between the subsidy rates of the NDD's state—related and own activities. This is particularly true for the period 1984—1987, when state—related losses rose sharply. As in the case of France, export insurance on account of the government is characterised by more extensive subsidization.

c.3. Regional disaggregation of Belgian export insurance subsidies

A regional disaggregation of the export insurance figures reveals some interesting facts about Belgian official export insurance. Table 23 provides a regional breakdown of the outstanding export insurance contracts for the period 1981—1988. A distinction is further made between the NDD's own and state—related activities.

The NDD's own activities are primarily targeted at Asia (33—42%), and Africa (nearly 30%) with an increasing share of Belgium's former colonies since 1986. Eastern Europe, and the American continent each account for 10—20% of outstanding contracts. The share of non—EC European countries is less than 10% but has been rising in recent years.

Government—related export insurance concentrates more on Africa, which accounts for nearly half of the total value of export contracts.

Table 23 : Regional disaggregation of Belgian export insurance contracts (% shares of total outstanding contracts)

	1981	1982	1983	1984	1985	1986	1987	1988
1. NDD Account								
- Non-EC Western Europe	4.1	3.2	2.6	3.1	4.6	6.3	8.1	8.7
- Eastern Europe	17.0	15.0	12.4	14.2	18.1	19.0	21.0	17.6
- South and North America	15.3	12.3	24.4	11.9	11.6	10.9	11.8	13.8
- Africa	29.5	27.5	25.8	31.2	29.7	28.8	25.1	24.3
of which former colonies[a]	1.7	1.3	0.9	1.0	1.2	8.1	9.0	8.8
- Asia	33.8	41.7	34.5	38.8	35.0	34.3	33.2	34.8
- Oceania	0.2	0.2	0.2	0.8	0.9	0.6	0.7	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Account of Belgian State								
- Non-EC Western Europe	5.6	5.5	4.3	3.6	8.4	10.4	15.7	13.5
- Eastern Europe	35.3	34.3	28.2	28.2	27.6	25.0	30.7	20.6
- South and North America	0.3	0.2	2.6	3.3	5.4	5.6	7.5	6.9
- Africa	47.0	42.0	50.4	49.2	46.3	44.9	46.1	42.0
of which former colonies[a]	3.5	2.9	1.9	1.4	0.9	2.7	4.0	3.0
- Asia	11.8	18.1	14.5	15.6	12.4	14.1	0.0	17.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a Former colonies include Rwanda, Burundi and Zaire.
Source : Own computations based on NDD data
No contracts to Oceania were insured on account of the Belgian State.

Table 24 : Regional disaggregation of Belgian ex-post export insurance subsidies
(Claims-premia-recoveries-interest payments on consolidations as a % share of newly insured contracts)

	1981-1984	1985-1988	1981-1988
1. NDD Account			
- Non-EC Western Europe	-10.9	-4.2	-6.2
- Eastern Europe	2.6	-0.3	1.2
- South and North America	5.2	9.7	7.6
- Africa	4.9	8.4	6.4
of which former colonies[a]	6.9	-0.3	1.5
- Asia	-1.0	-1.5	-0.1
- Oceania	-0.6	-0.5	-0.5
2. Account of Belgian State			
- Non-EC Western Europe	22.0	-7.6	-5.5
- Eastern Europe	4.6	2.6	3.8
- South and North America	-3.4	2.6	-0.1
- Africa	2.5	14.2	6.4
of which former colonies[a]	206.9	-0.4	28.9
- Asia	-2.9	5.6	2.0

[a] Former colonies include Rwanda, Burundi and Zaire.

Source : Own computations based on NDD data

Likewise, Eastern Europe receives a larger, albeit declining share of export insurance contracts from the Belgian government than from the NDD's own funds. Conversely, the shares of Asia (less than 20%), South and North America (less than 10 %) and Belgium's former colonies are lower when compared to the NDD own activities. Finally, state-tied export insurance to Western European non-EC countries has expanded considerably in recent years.

In Table 24, regional ex-post subsidy rates as a percentage of newly insured contracts are compared. Ex-post subsidies are defined as to include recoveries as well as interest payments from consolidations and should be treated as lower bounds for the subsidy-equivalents of Belgian export insurance[6].

As is seen from this table, subsidy rates vary considerably over time. More importantly, some country groups receive large subsidies, while other countries appear to pay premia well above the break-even rate. In effect, we find that premium income paid on export contracts to non-EC countries in Western Europe far exceeds net claims. On the other hand, export transactions to Eastern Europe and most of all to African countries, including the former colonies, benefit from both state-related and own export insurance by the NDD. South and North American countries are subsidized by the NDD's own export insurance. Where state-related export insurance is concerned, the subsidization of the former colonies is impressive : in the period 1981-1984 claims were more than double the sum of premium income, recoveries and interest on consolidations. The better balance in the subsequent years is largely due to repeated consolidations and debt rescheduling.

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[6]Data are not presented on a yearly basis because in some years the value of newly insured export contracts to specific country groups is zero.

Those findings indicate that the Belgium official export insurance agency uses the higher premium income paid by some exporters to subsidize others. For this reason, the impact of export insurance subsidies on the export performance on specific markets may be profound, even if the aggregate rates of subsidization are not all that large.

4.4 GERMANY

A. EXPORT CREDITS

Export credits are granted by (i) the Kreditanstalt für Wiederaufbau (KFW), a corporation under public law, and (ii) the AusfuhrKredit-Gesselschaft (AKA), a private company set up as a syndicate of 55 commercial banks, comparable to Creditexport in Belgium.

a.1. Kreditanstalt für Wiederaufbau (KFW)

The export financing by the KFW can be divided in four categories :

1. *Loans to developing countries* are given at the OECD consensus rates or more often at the 'Commercial Interest Reference Rates' (CIRR), because the German market rate usually lies below the Consensus rates (see Chapter I). The CIRR is based on German market interest rates. Our definition of subsidies is based on the advantage exporting firms derive from borrowing at a more favorable condition than the market interest rate. If the CIRR truly reflect market interest rates, we would conclude that the KFW's export financing does not contain any subsidies.

Nevertheless, the situation is more complex. First of all, a substantial part of the export financing consists of buyer credits, which reduce financing costs of importing countries in the third world. It is likely that for these importers borrowing at German market interest rates represents a source of cheap financing not available to them on the private market. Unfortunately, our data are not sufficiently disaggregated to identify the alternative market conditions for each individual export financing contract. Such information is essential to avoid major distortions in subsidy estimates.

Secondly, part of the loans to developing countries are financed by the public budget in the framework of the European Recovery Program (ERP). The ERP provides a revolving credit of DM 500 million as well as a yearly allocation that is reimbursed to the government when the loans are amortised. In the definition of the EC, the use of public funds would point to subsidization. Unfortunately, the yearly accounts of the KFW do not allow us to separate the part of the export financing that is financed by public funds from the amount that is fincanced by market funds in the form of loans taken up by the KFW on domestic and foreign capital markets.

2. A second form of export financing concerns *commercial* [8] *loans* financed by KFW Market funds. Those loans are granted at market interest rates to non-developing countries. Here, one suspects that the implied subsidies are relatively small because exporters or importers would have been able to attract export financing on the private market at comparable rates.

3. Loans in connection with the financing of Aircraft and Ships represent a third form of export credit financing. Here again, we lack the necessary information to estimate the implied subsidies.

4. Finally the KFW also provides *grants under the Shipyard Assistance Program*. This program aims at facilitating the purchase of ships by foreign buyers and presumably contains a large subsidy element.

Table 25 : <u>Export credit financing by the KFW</u>
(in millions of DM)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1. Loans	1064.5	1693.0	2985.9	2997.5	3841.7	3124.2	4098.5	3116.1	2439.8	3112.1
of which										
a) export of capital goods and related services	690.8	878.8	2559.9	1721.8	2894.4	1930.6	2944.8	1947.2	1400.6	1846.0
b) ships	214.2	690.7	169.5	921.3	487.6	1124.5	915.3	1001.1	962.3	736.6
c) aircraft	159.5	123.5	256.5	354.4	459.7	69.1	238.4	167.8	76.9	502.5
2. Grants for exports of ships	59.3	198.1	53.8	392.7	134.5	217.7	73.1	293.9	144.9	234.3
Total	1123.8	1891.1	3039.7	3390.2	3976.2	3341.9	4171.6	3410.0	2584.7	3346.4

<u>Source</u> : KFW, Annual reports

Table 25 provides a summary of the KFW's export financing. The figures indicate total loans and grants as they are reported in the KFW's annual accounts. For reasons mentioned above, we lack the information to compute subsidy-equivalents. In spite of this, the total figures reveal an evolution comparable to what we found in the other three countries. A strong expansion of export credits in the period 1979-1984 is followed by a levelling off and even a reduction in the period 1985-1987. The fact that those subperiods coincide with increasing respectively decreasing market interest rates suggests that the evolution in implied subsidy-equivalents would be even more marked.

Table 25 further reveals that export credits in the form of loans for capital goods and related services are primarily responsible for the pattern in the total figures described above. There are reasons to believe that export credits were used to maintain exports of these products and services during the slump in international trade in the early 1980's. Conversely, no clear pattern is observed in loans to the aircraft industry and grants to the shipbuilding industry.

Finally, it is interesting to note that export credits are directed towards industries which are also among the main beneficiaries of the French and British export credit system.

In Table 26 a regional disaggregation of the KFW loans is given. We find that, in the period 1978-1987, between 64% and 98% of total export credit loans relate to exports to developing countries, which make it probable that subsidization took place. A comparison among country groups learns that the share of developing countries on the American continent is gradually declining. As a consequence, Asian developing countries have become the primary targets of the German export credit program.

Table 26 : <u>Regional Distribution of Export Credit Loans by the KFW</u>
(% shares in total loans)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Developing countries	81	83	96	92	98	89	98	97	64	69
Europe	8	5	18	9	24	16	20	16	14	18
America	45	31	44	28	24	12	32	18	14	14
Africa	15	16	13	21	13	12	16	28	11	9
Asia, Australia, Oceania	13	31	22	33	38	49	30	35	25	28
Industrial countries	19	17	4	8	2	11	2	3	36	31
Europe	5	16	1	1	2	0	1	0	18	7
America	9	1	1	2	1	0	0	0	17	14
Africa	0	0	0	3	0	9	1	2	1	10
Asia, Australia, Oceania	5	0	2	2	0	1	0	0	0	0

<u>Source</u> : KFW, Annual reports

a.2. AusfuhrKredit-Gesselschaft (AKA)

As mentioned earlier, AKA is a syndicate of commercial banks aimed at financing export credits. The government is not involved directly nor indirectly through public financial institutions. The absence of publicly controlled financial institutions differentiates AKA from its Belgian counterpart Creditexport.

This difference is essential in determining whether AKA provides export credit subsidies. AKA makes a distinction between Funds A, B, and C. The resources for Funds A and C come from member states at market interest rates and cannot be considered as a subsidy. The loans related to Fund B are obtained by rediscounting by the Bundesbank at 1.5% above the Bundesbank interest rate, but usually below market rates. This rediscounting facility is limited to DM 5 billion and is generallly used to finance buyer credits up to 70% of the contract value. In 1988, Fund B financed DM 814 million of export credits, which is a relatively small amount in comparison to KFW export credits.

Fund A and Fund B loans can be combined. In that case, the composite interest rate must adhere to the interest rate provisions of the OECD consensus, since government supported funds are involved. If the rate is below Consensus rates, the exporter has to pay the difference to a non-profit organization named by AKA upon expiration of the export credit. We have no information of how this principle is applied in practice.

B. OFFICIAL DEVELOPMENT ASSISTANCE

German official development assistance is given by (i) the German government, (ii) loans and grants by the KFW.

Table 27 : <u>German Official Development Assistance</u>
<u>(in millions of DM)</u>

	1980	1981	1982	1983	1984	1985	1986
1. Bilateral aid by the Federal Republic of Germany	5219	5074	5502	5368	5316	5826	5736
of which							
- grants	4098	3050	3226	3253	3569	4198	3905
- loans and other capital flows	1121	2024	2275	2116	1746	1628	1831
2. Aid by the KFW	3599	3441	2982	2210	3584	2377	2362
Total	8818	8515	8484	7578	8900	8203	8089

<u>Source</u> : KFW, Annual Reports

Table 28 : Distribution of Project-Tied Commitments by the KFW Capital Aid[a] between Investment Sectors

Investment sector	Commitments in DM million		Commitments in % of project-tied commitments	
	1985	1986	1985	1986
Agriculture[b]	424	399	20	21
Raw materials	103	19	5	1
Energy	571	513	27	27
Producing sector	141	94	7	5
Transport and communications	244	268	11	14
Social infrastructure	357	295	17	15
Development banks[b]	178	214	8	11
Others	107	105	5	5
Total	2,124	1,907	100	100

a Not including Special Fund for Project Preparation or Training Fund.
b Commitments for agricultural development banks are shown under Agriculture.

The Federal Republic of Germany provides official development assistance in the form of loans and grants. Part of this aid is on a multilateral basis (for instance contributions to international institutions) and is not likely to lead to any export subsidization. Yet, most of the development assistance is contracted on a bilateral basis and takes the form of grants and long-term loans. The average maturity of the loans was 36.2 years in 1987 with a grace period of approximately 5 years. The interest rate paid on the loans is very low e.g. 2.67% in 1986 and 2.78% in 1987.

The other type of German official development aid is made up by loans and grants by the KFW at favorable conditions which are financed from general budget funds. This form of export support is aimed at developing countries and is most often tied to a specific development project.

Table 27 presents empirical evidence on German official development assistance. Total aid for 1980-1986 adds up to 57.6 billion DM between 1980-1986, which is more than double the amount of export credits given in this period. Direct bilateral aid by the German governments accounts for 64.3 % of total aid. There is no noticeable expansion in the period considered, which suggests that official development may have declined in real terms.

A sectoral disaggregation of project-tied commitments by the KFW is found in Table 28 for 1985 and 1986. The data indicate a clear orientation towards typical development projects such as Agriculture, Transport and Communications, Social infrastructure and Energy. It is hard to evaluate the benefits German companies derive from this type of development projects.

Table 29 : Export insurance in Germany on account of the German State (in millions of DM unless indicated otherwise)

Year	Insured contracts (billions of DM)	Claims minus premia	Claims minus premia as a % of insured contracts	Claims-premia as a % of total exports	Claims-premia-recoveries	Claims-premia-recoveries as a % of insured contracts	Claims-premia-recoveries as a % of total exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1976	34.0	-269	-0.79	-0.09	-365	-1.07	-0.18
1977	51.3	-162	-0.32	-0.05	-505	-0.98	0.13
1978	32.5	-23	-0.07	-0.01	-148	-0.45	-0.17
1979	34.7	69	0.20	0.02	-172	-0.50	-0.05
1980	46.3	221	0.48	0.06	- 27	-0.06	-0.01
1981	55.9	120	0.21	0.03	- 99	-0.18	-0.02
1982	59.9	263	0.44	0.06	-122	-0.20	-0.03
1983	49.8	975	1.96	0.20	752	1.51	0.16
1984	44.3	1561	3.52	0.29	1247	2.82	0.23
1985	37.4	1140	3.05	0.19	774	2.07	0.13
1986	27.6	1422	5.15	0.25	938	3.40	0.16
1987	28.0	1829	6.53	0.32	1444	5.16	0.25
1976-'87	501.7	7146	1.42	0.14	3717	0.74	0.07

Source : Computations based on Hermes annual reports

C. EXPORT INSURANCE

In Germany, export insurance is granted by Hermes to exports of all destinations. The reports by Hermes provide a consistent data set on transactions for the German government only. Tables 29 and 30 present the subsidy estimates in respectively the ex-post and ex-ante approach. A picture comparable to the other countries emerges. When related to the value of exports, export insurance subsidies are small. As a percentage of insured contracts, we find that subidies excluding recoveries increase markedly in the 1980's to reach a maximum of 6.5% (3.7%) in 1987 in the ex-post (ex-ante) approach. Including recoveries the rates of subsidization are lower but, as mentioned before, the data on debt consolidations are harder to interprete. A striking feature of the German case is the strong buildup of deficits in the last three years of the sample.

V. CONCLUSION

In this chapter, we estimated the subsidies implicit in export financing programs. We provided estimates for export credits, export insurance and Official Development Assistance in France, Belgium, Germany and the United Kingdom.

An important part of this chapter is taken up by methodological issues. In an effort to adopt a consistent definition for all forms of export financing, a subsidy was defined as the benefit for the exporting firm. This benefit can arise from both an increase in revenue or a reduction in costs. In particular, buyer export credits and Official Development Assistance raise revenue while export insurance subsidies and supplier export credits reduce costs.

Table 30 : Ex-ante subsidies in German export insurance (on account of the German state) (in millions of Bef unless indicated otherwise)

Year	Implicit subsidy without recoveries (1)	Subsidy without recoveries as a % of insured contracts (2)	Rate of subsidization without recoveries % (3)	Implicit subsidy with recoveries (4)	Implicit subsidy with recoveries as a % of insured contracts (5)	Rate of subsidization with recoveries % (6)
1979	-181	-0.52	-0.05	-428	-1.23	-0.12
1980	- 39	-0.08	-0.01	-419	-0.90	-0.11
1981	- 60	0.11	0.01	-455	-0.81	-0.10
1982	160	0.27	0.03	-230	-0.38	-0.05
1983	163	0.33	0.03	-146	-0.29	-0.03
1984	349	0.79	0.07	-121	-0.27	-0.02
1985	546	1.46	0.09	- 56	-0.15	-0.01
1986	649	2.35	0.11	191	0.69	0.03
1987	1046	3.73	0.18	483	1.72	0.08
1979-'87	2633	0.96	0.08	-1181	-0.43	-0.03

The rate of subsidization is defined as the ratio of the implicit subsidy and total exports.
Source : Computations based on Hermes annual reports.

The benefit for the exporting firm can be estimated by using the Cost Difference or Net Present Value methods found in the literature. These methods are generally used to measure cost reductions. They are therefore reasonably well suited to compute subsidy-equivalents in supplier credits and export insurance, although for the latter some additional choices had to be made. For revenue increasing subsidies the available methods are less adequate because they measure the gain for the importer rather than the benefit for the firm. As is usually the case in this kind of studies, one should therefore interprete the obtained estimates with the necessary caution. This is particularly true for cross-country comparisons where institutional and accounting factors further complicate the comparison between export financing schemes.

Turning to the empirical results, we conclude that, on the whole, export credits have been the most important source of export subsidization. This is particularly true for France where the average rate of subsidization went up to 4-5% in the early 1980's and where subsidies in some industries amounted to 10% of the value of eligible exports. Export credit subsidies in Belgium and the United Kingdom were much lower with rates of subsidization well below 2% and often less than 1%.

A clear time pattern is found in export credit subsidies of all countries. In the late seventies and early eighties, a sharp expansion of outstanding credits and implicit subsidies is observed. To some extent, this expansion forms a deliberate attempt to offset the negative consequences on exports of the stagnation in world trade. An even more important explanation is perhaps the sharp rise in interest rates which led to a substantial differential between market and OECD Consensus rates. Falling interest rates combined with a recovery of most industrial economies explain the marked reduction in export credit subsidization in the mid 1980's. All of this highlights the sensitivity of export credit subsidies to changes in interest rates, world trade and the institutional set-up of the OECD Consensus.

The subsidies implicit in <u>export insurance</u> are not all that large when related to total export values. Rates of subsidization are generally well below 1%. The United Kingdom, Belgium and France provide more insurance subsidies than Germany although the German figures comprise only state-related export insurance.

In spite of the low rates of subsidization, there are several reasons for not discarding possible competitive effects of export insurance subsidies thoughtlessly. The estimation of insurance subsidies does not take into account administrative and other costs of the official insurance agency and therefore underestimates the implicit subsidy. More importantly, our results indicate that the subsidy given per ECU of insured contract is considerably higher than the subsidy per ECU of exports. This suggests that the export contracts that are actually insured may benefit substantially from official insurance subsidies. In addition, the rates of insurance subsidization have started to rise rapidly in the early eighties and there is no evidence that this pattern will be reversed soon. Unlike the sixties and seventies, official insurance agencies now accumulate sustained losses because premia have not been adjusted to the riskier international environment. It is not very likely that future recoveries will be sufficient to compensate past losses. If this trend continues, the role of export insurance subsidies may become significantly more important in the coming years. This conclusion applies equally well to all countries considered in this study.

Another reason to cautiously evaluate the competitive impact of export financing schemes, comes from the industry disaggregation for France and the United Kingdom. It was found that most of the export credit and insurance subsidies are directed towards a limited number of industries. This concentration leads to high rates of subsidization in industries such as Construction and Services, Transport Equipment, Electrical Equipment, Nonelectrical Machinery and Automobiles. Very often, the same industries receive the bulk of export credits and insurance alike. It is also remarkable that the United Kingdom and

France seem to target their export credit subsidies at many of the
same industries.

The impact of export financing subsidies may also vary considerably
across export markets. In this respect, we found that the Belgian
export insurance system implies substantial subsidies to Africa, the
former colonies and, to a lesser extent, to Eastern Europe. Part of
these subsidies were paid in the form of higher insurance premia on
exports to non-EC countries in Western Europe.

In assessing the competitive distortions arising from export insurance
subsidies, the distinction between state-related and other activities
was found to be important. In the last decade or so, Belgian and
French export subsidization rates have been significantly higher for
contracts insured on account of the respective governments.

Finally, export insurance may have a direct impact on intra-EC trade.
Unlike export credits, official insurance in Germany, France, and the
United Kingdom is provided on exports to EC and non-EC countries
alike. Unfortunately, we lack the data to compute separate insurance
subsidy rates on exports to EC markets. In Belgium, export insurance
is limited to non-EC markets so that the competitive distortions on
the Community market are expected to be smaller. The exclusion of
intra-EC exports is also reflected in a significantly smaller share of
total exports insured by the Belgian official insurance agency. o

For Belgium, we were able to obtain regionally disaggregated data on
state to state credits which are a form of export-related Official
Development Assistance. When related to eligible exports, we find
low subsidization rates of less than 0.6%. As this represents the
gain for the importing country, the benefit for the exporting firm may
be lower still. The time pattern of state to state grants is very
comparable to the evolution of export credits with a strong expansion
in the early 80's and a reversal of the trend afterwards. Most
interesting is the regional concentration of the subsidies in a small
number of countries including Zaire, China, Indonesia, Turkey and

India. This suggests again that the actual support for Belgian firms, exporting to these countries, is more extensive than suggested by the average subsidization rates.

Total German official development assistance exceeds the funds involved in export credit financing. In contrast to the time pattern of export credits and export insurance in the 1980's, official German development aid stagnated in nominal terms and therefore declined in real terms. The available sectorally disaggregated information did not allow us to evaluate the benefits of German development assistance for German exporting firms.

Where does all this leave us for the study of the distortionary effects of export financing schemes ? We view export financing as one among many determinants of export performance whose overall impact is hard to assess. The competitive position of certain industries as well as exports to specific countries may well have benefited substantially from the existing export support programs. In this respect, not only the magnitude of the subsidy but also factors as market structure, demand conditions and comparative advantage play an important role. In order to analyze those determinants into more detail, the first part of next chapter develops a theoretical model for the export financing subsidies considered in this study.

Chapter III

THE COMPETITIVE EFFECTS OF EXPORT FINANCING SUBSIDIES

I. INTRODUCTION

In this chapter we analyze the impact of export financing subsidies on competition between France, Belgium, Germany and the United Kingdom. The chapter is divided in two parts. In a first part presented here, the theoretical aspects of the relation between export financing and competitiviness is discussed. We will show that several factors, related to market structure as well as to cost and demand conditions are essential to understand the transmission from subsidization to export performance. A clear understanding of these determinants will help us in the second part of this chapter to interprete the empirical evidence on the competitive effects of export financing subsidies.

This theoretical part starts off with a model of international oligopoly which incorporates the different forms of export financing considered in Chapter II. This model is then explicitly solved for export production and export prices by competing countries on a third market.

Based on this model, Section III shows that export financing subsidies by a government agency stimulate exports of the subsidized firms at the expense of firms in countries that do not provide subsidies. The price paid by the importer falls. The market share of the subsidized firms expands unless the other exporting countries decide to provide favorable export financing conditions too.

Section III also isolates several determinants of the effectiviness of export financing subsidies in stimulating exports. Not surprisingly, the size of the subsidy is important. Essential is also that the country has a comparative advantage in the subsidized industries. In addition, the price elasticity of market demand, the degree of competition in the industry, and characteristics of sectoral and regional product differentiation play an important role. We relate these aspects to some empirical evidence about import demand elasticities and concentration ratios.   o

Section IV expands the model to incorporate spill-over effects of export financing subsidies across export markets. Economies of scale or learning effects in production, research and development, sales or distribution make it plausible that export financing subsidies on exports to say non-EC markets improve export performance on the EC market. This point is relevant because estimates for economies of scale suggest that several of the industries receiving export financing subsidies are characterized by significant economies of scale.

In Section V, we present some tentative empirical findings on the relation between export financing programs and export performance on third markets for Belgium, France, Germany and the United Kingdom. Section V summarizes the results and discusses the main implications for EC competition policy.

II. A MODEL OF INTERNATIONAL OLIGOPOLY

2.1 Assumptions   .

In this section, we use a partial equilibrium, conjectural variation model of international oligopoly based on Dixit (1988, p 57-61) to analyze the consequences of export subsidies. The analysis focusses

on a typical EC country, denoted as the domestic country. Only one oligopolized industry with n domestic firms is considered. Although domestic firms may be selling their products in different countries, complete market segmentation and constant marginal costs is assumed. These assumptions will be relaxed later but, for now, allow us to focus on each market separately.

In what follows, competition on one representative third market is considered. A third market is a non-OECD market in the case of official development assistance or export credits, but can be any market when export insurance is considered. In this third market, n domestic firms compete with n^f foreign firms, part of which come from other EC countries. The domestic and the foreign good are imperfect substitutes in consumption. It should be clear that "domestic" and "foreign" refer to the country of origin of the exporting firms and not to the importing country.

We consider a symmetric equilibrium where each home (foreign) firm exports x (y) and earns profit π (π^f) on the third market. Total consumption on the third market is the sum of total domestic exports X = nx and total foreign exports $Y = n^f y$.

2.2. Export financing subsidies, costs and market demand

The domestic government provides export subsidies either directly or indirectly through private agencies. As in Chapter II, a distinction is made between cost reducing and revenue increasing export financing subsidies.

Export insurance subsidies and supplier export credits reduce export financing costs for the firm. We showed in Chapter II that the domestic exporting firm's profits, π, can be written as :

$$\pi = [P_c(1-\theta) - C] \, x$$

where P_c is the contract price, C = domestic average cost without export financing and θ measures the domestic firm's export financing cost per ECU of export contract. A higher export insurance or supplier credit subsidy leads to a smaller θ and hence lowers total costs and raises profits for the domestic exporting firm.

The second type of subsidies comprises <u>development assistance and buyer export credits</u>. As discussed in Chapter II, these export subsidies improve the financing costs for the importer and therefore lower the price for the importer below the contract price P_c. More specifically, we write :

$$P = \gamma_s \, P_c \qquad\qquad\qquad (1)$$

In this equation, P is the importer's price for export goods from the domestic country. This price amounts to the contract price P_c reduced by the favorable export financing conditions in the form of buyer credits or development assistance. The parameter γ_s measures the importer's price reduction factor due to export financing which, from here on, is referred to as the import price factor.

Buyer credits and development assistance make goods cheaper for the importer and stimulate demand for the exporting firms' products. This effect is formalized in an import demand function which reflects the importer's willingness to pay for imports. Assuming a linear specification, we write the demand function for export products of the domestic country as :

$$X = \tilde{a} - \tilde{b} \, P + \tilde{k} \, P^f \qquad\qquad\qquad (2a)$$

where P^f = price of the foreign product in the importing country.

All parameters in equation (2a) are positive. The coefficient $\tilde{b}$ relates domestic exports to changes in the price paid by the importer. More favorable payment conditions for the importer decrease P and lead to higher demand for domestic exports.

Furthermore, the parameter $\tilde{k}$ reflects the assumption that domestic and foreign goods are substitutes. In effect, a lower foreign price shifts the importer's demand away from domestically produced exports. For this reason, buyer credits or development assistance from the foreign to the importing country have a negative impact on demand for exports from the domestic country.

Similarly, we write market demand for the foreign export product as :

$$Y = \tilde{a}^f - \tilde{k} P + \tilde{b}^f P^f \tag{2b}$$

Equations (2a) and (2b) can be inverted to obtain inverse demand functions, which represent the demand constraint for the exporting firms on the third market considered here :

$$P = a - b X - k Y \tag{3}$$
$$P^f = a^f - k X - b^f Y \tag{4}$$

Equation (3) gives the price the importer is willing to pay for the domestic product as a function of total exports by the domestic and the foreign country. Equation (4) presents the same information for the foreign export product. Two important points should be noted here.

First, inverse market demand for domestic and foreign firms is downward sloping : higher domestic (foreign) production leads to a lower price for the domestic (foreign) product. The slope of the inverse demand curves is given by b for domestic and b^f for foreign firms.

Secondly, domestic and foreign products are substitutes. Because an increase in foreign production results in a lower price of foreign products, consumers buy more of the foreign good and reduce their spending on exports from the home country. Likewise, an expansion of domestic production reduces demand for the foreign product.

The degree of substitutability is reflected in the parameter k. A large k indicates limited product differentiation between the domestic and the foreign good. In the extreme case of homogeneous products, the consumers do not differentiate between the goods, which would imply $b = b^f = k$ and $\tilde{\Omega} = b \, b^f - k^2 = 0$. In all other cases, $\tilde{\Omega} > 0$.

2.3 Profit maximization and equilibrium

Domestic firms maximize profits. With the assumption of market segmentation and constant marginal costs, this amounts to maximizing the profit on each market separately :

$$\pi = [P_c(1-\theta) - C] \, x = \left[\frac{P(1-\theta)}{\gamma_s} - C\right] x \tag{5}$$

subject to the inverse demand equation (3).

Using the superscript f for foreign variables, foreign firms maximize profits :

$$\pi^f = [P_c^f(1-\theta^f) - C^f] \, y = \left[\frac{P^f(1-\theta^f)}{\gamma_s^f} - C^f\right] y \tag{6}$$

subject to equation (4).

For the third market considered here, the profit-maximizing first-order condition for any domestic firm becomes :

$$\frac{P - X V}{\gamma_s} = \frac{C}{1-\theta} \tag{7}$$

This is the familiar condition that marginal revenue should be equal to marginal cost. Marginal revenue is found at the left hand side of the equation and is higher for a smaller import price factor γ_s : buyer credits and development assistance raise marginal revenue by stimulating demand for domestic exports. Export insurance and supplier credit subsidies lead to a smaller θ and therefore lower marginal costs at the right hand side of equation (7).

Furthermore, V is the domestic aggregate conjectural variation parameter :

$$V = [b\{1+(n-1)v^{dd}\} + kn^f v^{df}]/n$$

where the superscripts d and f refer to the foreign and the domestic country. In this expression, v^{dd} (v^{df}) denotes the amount by which each domestic firm believes that each other domestic (each foreign) firm will respond to a unit increase in the output of the domestic firm.

The domestic aggregate conjectural variation parameter V reflects the domestic exporting firms' conjectures of how much the import price of the domestic product will fall when they increase their production marginally. A smaller V indicates that domestic firms do not feel they have a large impact on the price of their product. In the extreme case of V = 0, domestic firms act as perfect competitors. Conversely, large values for V reveals a significant degree of perceived market power by domestic firms.

There is a first-order condition for each market to which domestic firms are exporting. For foreign firms we obtain an analogous set of

first-order conditions. For the third market considered here, we obtain:

$$\frac{P^f - Y \, V^f}{\gamma_s} = \frac{C^f}{1-\theta^f} \qquad (8)$$

The superscript f refers to the foreign country. The foreign aggregate conjectural variation parameter V^f is equal to $[b^f\{1+(n^f-1)v^{ff}\}+nv^{fd}]/n^f$ and has an interpretation analogous to V.

The first-order conditions (7) and (8) can be solved for domestic and foreign exports to the third market considered here :

$$X = z - \frac{(b^f+V^f)}{\Omega} \; C \; \frac{\gamma_s}{1-\theta} + \frac{k}{\Omega} \; C^f \; \frac{\gamma_s^f}{1-\theta^f} \qquad (9)$$

$$Y = z^f + \frac{k}{\Omega} \; C \; \frac{\gamma_s}{1-\theta} - \frac{(b+V)}{\Omega} \; C^f \; \frac{\gamma_s^f}{1-\theta^f} \qquad (10)$$

where $\Omega = (b + V)(b^f + V^f) - k^2 \geq \Omega \geq 0$, and z and z^f are constants.

From (9) and (10), the evolution of market shares is derived easily. In effect, the market share of domestic exporting firms is defined as X/(X+Y).

The equilibrium import prices on the third market of exports by the domestic and foreign country are :

$$P = m + \frac{(\Omega + bV^f)}{\Omega} \; C \; \frac{\gamma_s}{1-\theta} + \frac{kV}{\Omega} \; C^f \; \frac{\gamma_s^f}{1-\theta^f} \qquad (11)$$

$$P^f = m^f + \frac{kV^f}{\Omega} \; C \; \frac{\gamma_s}{1-\theta} + \frac{(\overset{\wedge}{\Omega}+b^fV)}{\Omega} \; C^f \; \frac{\gamma_s^f}{1-\theta^f} \tag{12}$$

Here again, m and m^f are constants.

III. THE EFFECTS OF EXPORT FINANCING SUBSIDIES ON EXPORTS TO NON-EC MARKETS

From equations (9)-(12) the effects of export financing on export quantities, prices and market shares can be derived. Three important effects of export subsidies can be distinguished.

First, subsidized export financing leads to an *export expansion by the subsidized firms*. Consider export financing subsidies granted by the government of the domestic country. As a result of the subsidies, the importer pays a lower price for goods and services from the subsidizing exporting country. The importer buys more products from the domestic country. Domestic firms experience an expansion of their market share.

The model allows us to mathematically specify the relation between export financing subsidies by the domestic government and export performance of domestic firms. Consider an increase in development assistance or buyer credits which reduces the import price of domestic exports by 1 percent ($d \gamma_s = - 1\%$). Equation (9) indicates that this would raise total domestic exports to the third market by $\frac{(b^f+V^f)}{\Omega} \; C$

$\frac{1}{1-\theta}$ percent. Similarly, a subsidy that reduces the cost of export insurance by 1% ($d \theta = - 1\%$) stimulates exports by $\frac{(b^f+V^f)}{\Omega} \; C \; \frac{\gamma_s}{(1-\theta)^2}$

percent. It is important to see that the ratio $\frac{(b^f+V^f)}{\Omega} \; C$ matters in

the transmission from export financing to exports for both cost

reducing and revenue increasing subsidies. This symmetry indicates that the same factors determine the success of export subsidies in diverting market share towards domestic exporting firms. This is not surprising because those determinants are related to market structure as well as to demand and cost conditions, which are relevant to the firm irrespective of the form of the subsidy.

A second effect concerns the *effects of export financing on nonsubsidized firms*. We find that export financing reduces quantities exported and prices charged by nonsubsidized firms. Again consider subsidized official export financing by the domestic government, which lowers the import price of domestic exports. To the degree that foreign and domestic products are substitutes in demand, the importer replaces exports of foreign firms by goods produced in the domestic country. Foreign firms are confronted with a decline in demand and market share. They lower their price to regain some of the lost market share.

This effect can be seen from equations (10) and (12). Subsidized export financing by the domestic country, which causes a decline in the ratio $\dfrac{\gamma_s}{1-\theta}$ by 1%, reduces foreign exports by $\dfrac{k}{\Omega}$ C percent and the import price of the foreign product by $\dfrac{kV^f}{\Omega}$ C percent. The contraction in foreign exports raises the market share of domestic exporting firms.

A third and final effect has to do with the degree of *countervailing export financing subsidies* by governments of competing countries. The gains in market share due to subsidized export financing depend on the subsidy policies of other countries. In equations (9) and (11), we find that an increase in subsidies by the foreign country, which lowers $\dfrac{\gamma_s^f}{1-\theta^f}$ by 1 percent, causes a decline in domestic exports by

$\dfrac{k}{\Omega}$ C^f percent while the price of domestic exports would fall by $\dfrac{kV}{\Omega}$ C^f

percent. In this way, foreign subsidies may neutralize and even reverse the export expansion from subsidies by the domestic government. The ultimate impact on market shares depends on the magnitude and effectiviness of export subsidies by the foreign and the domestic country. Insofar as advantageous export financing is common practice in most EC countries, it is possible that even large subsidies do not achieve major changes in market shares.

This has important consequences for the study of the competitive effects of export subsidies. Indeed, export promotion may still distort competition, even if one does not observe any significant changes in market shares or export prices. As we found that the bulk of export financing subsidies by France and the U.K are directed to a comparable group of industries, this scenario should be taken seriously. In such situation, it is advisable to act against subsidization even if no clear proof of competitive distortions can be established. This would protect countries that are not subsidizing. It would also benefit the subsidizing countries that are drawn into a costly subsidization program that does not produce any clear benefits, but from which they do not want to retreat out of fear that competitors will continue to subsidize.

From the mathematical analysis of the three effects considered above, it becomes clear that the link between export financing subsidies and market shares is determined by the magnitude of the parameters of the model. In what follows, we analyze this relationship in closer detail by discussing the economic interpretation of the various coefficients. Insofar as possible, we also provide some empirical estimates of their magnitude. The chosen approach highlights several industry and market characteristics that are of interest for assessing the competitive distortions arising from subsidized export financing.

3.1 The size of the subsidy

It is evident that the effectiveness of an export subsidy in stimulating exports depends on the size of the subsidy. Information on the subsidy-equivalents of export financing subsidies as well as on their sectoral and regional disaggregation were presented in Chapter II.

3.2 Comparative advantage

Export credits are only efficient in diverting market share if they are aimed at industries and markets in which the subsidizing country has a comparative advantage. In equation (9), we find that exporters from the domestic country only succesfully penetrate the market if their production cost does not lie significantly above their competitors' cost level ($X = 0$ for high values of C and low values of C^f). Said differently, export subsidies do not improve export performance when the cost disadvantage with respect to foreign competition is too large. Conversely, cheap export financing does not enhance market share significantly in industries and markets where domestic exporting firms have a very strong competitive advantage. In such cases, domestic firms would have dominated the market without subsidies so that export subsidization mainly benefits the importer in the form of lower prices. We conclude that export subsidies have the largest impact on the domestic market share when cost differences between domestic and foreign firms are not too large.

This reasoning would suggest that export financing may have distorted competition between France, Germany, Belgium and the U.K. on third markets. As factor endowments, technology, and factor prices are comparable in those four countries, one expects production costs to be similar in many industries. Export financing subsidies can then provide a cost advantage which may be decisive in obtaining export contracts. This would particularly be relevant for industries where

European economies maintain a comparative advantage vis-à-vis (some of) their non-EC competitors. As examples one could mention industries such as Nonelectrical Machinery, Electrical Equipment, Aircraft, Autos, and Construction and Services which, based on the sectoral data for France and the U.K., benefited significantly from subsidized export financing. For other subsidized industries such as Iron and Steel, Metals and Ships the picture is less clear. Subsidized export financing may have helped to divert contracts from the one EC country to the other but the ultimate impact on export performance is limited by the fact that EC countries are faced with more cost-efficient non-EC competitors.

Evidently, the comparative advantage may also stem from transport costs, tariffs and nontariff barriers. In this respect, export insurance subsidies may be particularly harmful in distorting competition between EC member states. As mentioned in previous chapters, official export insurance agencies are allowed to insure exports to other EC countries. Any insurance subsidy, which augments the market share of an EC country on another EC market, is therefore likely to hurt other EC producers to some extent.

3.3 Elasticity of market demand

A price elastic market demand *reinforces the export expansion of domestic firms* resulting from subsidized export financing, while limiting the price reductions to the importer. As mentioned before, development assistance or buyer credits by the domestic country decrease the import price of domestic products directly. Subsidized export insurance also leads to lower prices as exporting firms pass on a part of the cost reduction to the buyer. Elastic market demand means that even small price reductions entail a substantial expansion of demand. This explains the effectiveness of export subsidies in

promoting exports in markets and industries where market demand is sensitive to price changes.

Figure 1 illustrates the relationship between domestic export financing subidies, domestic exports and the elasticity of market demand in the case of cost reducing subsidies. We assume that the demand curve D represents total demand for domestically produced goods on the third market. The curve MC_0 measures marginal cost of producing total domestic exports and is obtained by summing the marginal cost curves of all individual domestic firms. The market equilibrium before subsidization is at the intersection of the marginal cost curve MC_0 and the marginal revenue function MR_0. Exports by the domestic country to the third market equal OX_0. The importer pays a price OP_0 at point A on demand curve D.

The domestic government decides to provide subsidized export insurance to domestic exporters. This shifts the marginal cost curve from MC_0 to MC_1. If the demand and marginal revenue curve remain the same, domestic exports expand from OX_0 to OX_1 and the import price falls from OP_0 to OP_1 (point B on demand curve D). Now assume that market demand is more elastic. In Figure 1, we consider the extreme case where the market demand and marginal revenue curves are perfectly elastic at price OP_0 for export levels exceeding OX_0. In this situation, cheaper export financing results in a new equilibrium point at C on the demand curve D_e. The export expansion $X_1 X_2$ is larger than with the less elastic market demand curve but the price remains fixed at OP_0.

The previous argument can also be shown mathematically. In equation (3), the coefficient $b = - \dfrac{1}{dX/dP}$ equals the inverse of the slope of

Import Price
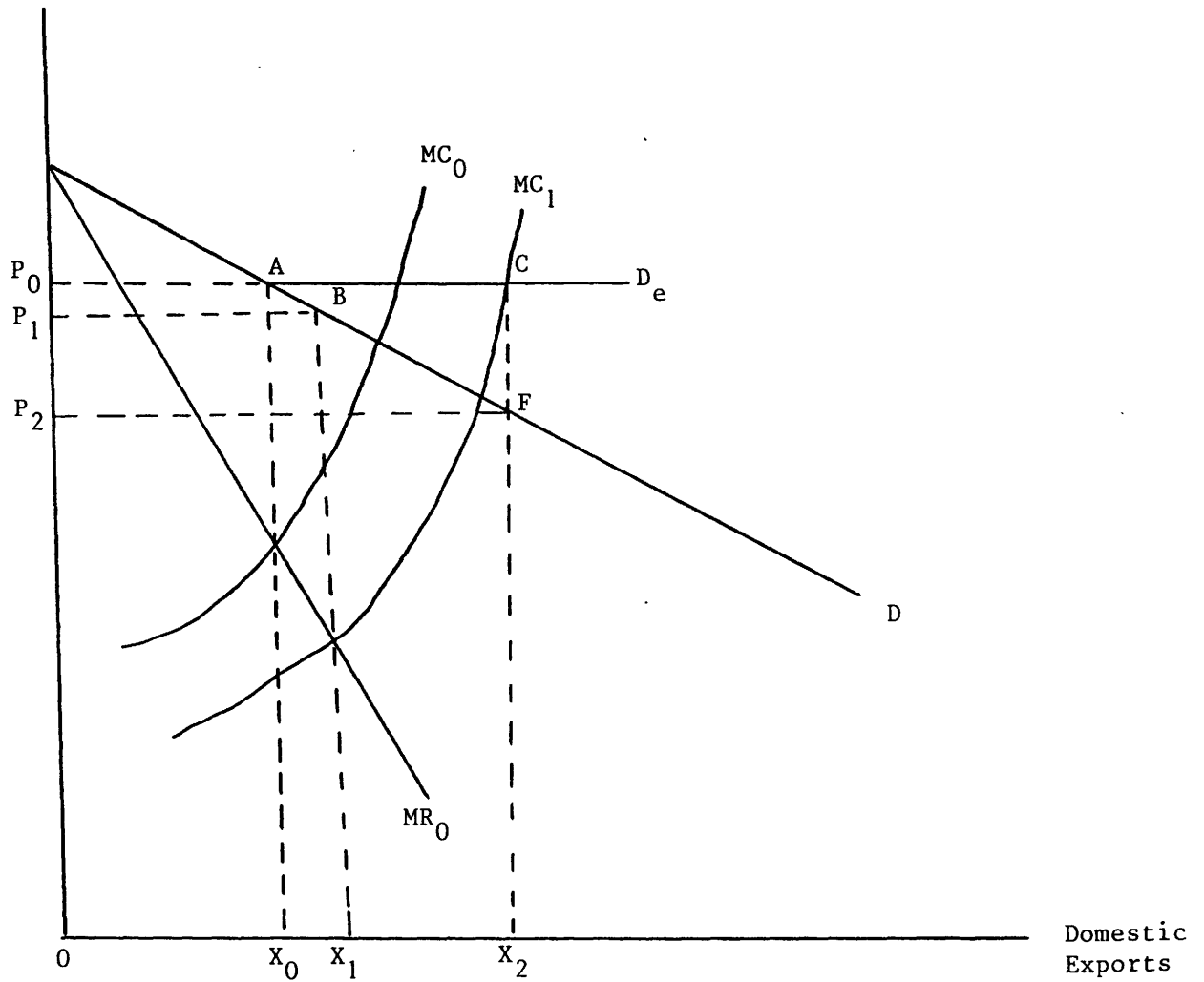
Figure 1 : Export Financing Subsidies, Market Demand Elasticity and
the Degree of Competition

the market demand function. More elastic market demand implies a smaller b. Now the ratio $\frac{(b^f+V^f)}{\Omega}$ C, which determines the strength of the relation between export financing and exports, can be rewritten as $\frac{(b^f+V^f)\ C}{(b+V)(b^f+V^f)-k^2}$. A smaller b raises the value of this expression and therefore enhances the production effects of domestic export subsidies on export performance of domestic firms.

In addition, *an elastic market demand strengthens the negative effects of domestic export subsidies on foreign exports.* As mentioned earlier, even small domestic subsidies achieve a substantial export expansion of price elastic goods by domestic firms. The importer's willingness to pay for foreign products falls accordingly. In terms of Figure 1, foreign export firms would be confronted with an inward shift of the demand curve for their products. Mathematically, the negative impact between domestic export subsidies and foreign exports was seen to depend on the value of $\frac{k}{\Omega}$ C = $\frac{k\ C}{(b+V)(b^f+V^f)-k^2}$ and is larger in the case of a small b (a price elastic market demand).

On the other hand, a price elastic market demand also *reinforces the effectiveness of retaliatory subsidies* by the foreign government. By lowering the import price of foreign export products, the foreign government recaptures an important part of the lost market share. In our mathematical model, the link between foreign subsidies and domestic exports is determined by $\frac{k}{\Omega}$ C^f and is stronger for small values of b. This implies that, with elastic market demand, retaliatory subsidies are effective in offsetting the market gains achieved by one country's subsidies. We conclude that distortions of competition between EC countries are likely to be pronounced for industries with price elastic demand provided that subsidies are not merely offsetting subsidization by competing countries.

Table 1 : <u>Elasticities of import demand</u>

Industries	ISIC Code	Import demand elasticity
Rubber products	355	-5.26
Wearing apparel	322	-3.92
Metal products, excl. machinery	381	-3.59
Transport equipment	384	-3.28
Furniture and fixtures, excl. metal	332	-3.00
Printing and publishing	342	-2.85
Pottery, china, & earthenware	361	
Industrial chemicals	351	
Other chemical products	351	-2.53
Plastic products, n.e.c.	356	
Footwear	324	-2.39
Other manufacturing industries	390	-2.06
Other non-metallic mineral products	369	-2.00
Beverages	313	-1.64
Glass products	362	-1.60
Leather products	323	-1.58
Iron & steel basic industries	371	-1.42
Non-ferrous metals basic industries	372	-1.38
Textiles	321	-1.14
Tobacco	314	-1.13
Food products	311/312	-1.13
Prof., photog. goods, etc.	385	-1.08
Machinery, excl. electrical	382	-1.02
Electrical machinery	383	-1.00
Petroleum Refineries	353	
Misc. prod. of petr. & coal	354	-0.96
Wood products, excl. furniture	351	-0.69
Paper and paper products	341	-0.55

<u>Source</u> : Stern, R.M. et.al. (1976).

Table 1 presents some estimates of import demand elasticities based on the well-known summary of empirical studies by Stern et al.(1976). Evidently, those estimates should be interpreted with caution because they are not recent and do not necessarily apply to the importing countries considered in this study. The industry disaggregation is based on the ISIC code and is comparable but not equal to the sectoral breakdown in Chapter II.

No uniform picture emerges from Table 1. Of the industries that received most of the export credit and export insurance subsidies, Transport Equipment and Metal products are found to have high import demand elasticities. For those products export financing subsidies may be an effective way to shift demand towards domestic exporting firms, although the fact that countries appear to subsidize the same industries mitigates this effect. Other subsidized industries including Nonelectrical Machinery and Electrical Machinery are characterized by inelastic import demand. It follows that the impact of export financing subsidies of comparable magnitude on export perfomance may vary considerably across industries.

3.4 The degree of competition and strategic behavior

Another determinant concerns the firms' perception of how their actions influence market behavior. In general, the impact of export financing subsidies on market shares and intra-EC competition on third markets is stronger in a more competitive market structure.

First, we consider the impact of subsidized export financing by the domestic country on *exports of domestic firms*. In a competitive industry with many firms, an individual firm typically believes that its export decisions has only a limited impact on total exports and the market price. Take the extreme case where domestic firms see their demand curve as horizontal at price P_0 in Figure 1. Firms have

a strong incentive to export more when subsidized because they believe they will get the same price as before. Starting from point A, domestic firms would expand their exports by $X_0 X_2$. Let D be the actual market demand curve for domestic exports. To absorb total exports of OX_2, the price would fall to OP_2.

The decline in prices and the expansion of exports would be more restrained in an oligopolistic market structure. Oligopolists attempt to anticipate how prices will respond to their own strategy, taking into account the expected reactions of their competitors. They realize that part of the profit gains from increasing exports in response to export subsidies is compensated by a decline in prices. Assume that their conjectures about the evolution of demand are consistent with the actual market demand curve D. Then point B would be reached with a smaller export expansion $X_0 X_1$ and a higher price P_1 than in the case of more competitive market structures.

The relation between market structure and the competitive effects of export financing is also seen from equation (9). As explained earlier, the domestic conjectural variations parameter measures how much a domestic firm perceives the price to fall in response to a marginal increase in exports. A low V implies competitive market behavior and raises $\dfrac{(b^f + V^f)\, C}{(b+V)(b^f + V^f) - k^2}$. As a consequence, domestic exports to third markets expand more in more competitive market structures. Note that V is negatively related to the number of domestic firms in the industry. This implies that export subsidies distort competition between EC countries less in industries with a high degree of concentration.

A look at equations (9) and (10) learns that a low value of V also *reinforces the foreign export contraction* as a consequence of domestic subsidies *as well as the decline in domestic exports resulting from foreign export financing.* The larger price reduction of domestic

Table 2 : Concentration ratio's in World and Belgian Production (1982)

Industry	NACE Code	World Concentration Ratio	Belgian Concentration Ratio
Tobacco	429	0.76	0.86
Instrument Engineering	37	0.65	0.57
Office Machinery	33	0.57	0.61
Rubber Products	481/482	0.57	0.75
Aircraft Construction	364	0.41	0.95
Automobiles	351	0.39	0.69
Petroleum	14	0.31	0.86
Textiles, Leather and Confection	43-45	0.28	0.30
Electrical Engineering	34	0.27	0.72
Industrial Chemicals	256	0.24	0.53
Paper and Wood	46/47	0.24	0.42
Mechanical Engineering	32	0.19	0.52
Metal Products	31	0.17	0.35

Source : Kesteloot and Veugelers, 1989

exports in a more competitive market translates into a stronger decline of demand for foreign exports. On the other hand, foreign export subsidies are more effective in recapturing lost market shares in a more competitive industry, because the price of foreign exports falls more in response. We conclude that export subsidies by one government affect market shares more in a competitive setting, provided that they are not countervailed by subsidies from other governments.

One measure to capture some aspects of the degree of competition is the concentration ratio. The concentration ratio in column (1) of Table 2 measures for a set of industries the combined market share of the four largest world producers. The second column presents the same information on the Belgian level. A higher concentration ratio often points to the absence of severe competition.

Once more, no clear message is derived from Table 2. In effect, there exists no systematic difference between the concentration in subsidized and non-subsidized industries. Among subsidized industries there are pronounced differences also. Concentration ratios in Electrical Engineering, Mechanical Engineering, and Metal Products are rather low, which would suggest that subsidization is rather effective in diverting market shares. The opposite is true in other subsidized industries including Instrument Engineering, Office Machinery, Automobiles, and Aircraft Construction where we find high concentration ratios. As in the case with demand elaticities, we conclude that a case-by-case approach is needed to evaluate the impact of export financing subsidies on market shares.

3.5 The degree of product and regional differentiation

In assessing the competitive effects of export financing subsidies, the coefficient k plays an important role. As seen from equations (9)-(10), a higher value for k implies that domestic export subsidies

effectively stimulate domestic exports at the expense of foreign exporters. At the same time, it reinforces the effectiveness of foreign subsidies to counteract domestic export subsidization.[7]

As mentioned earlier, k measures the degree of substitutability in demand for foreign and domestic exports. When product differentiation is not pronounced, importers switch easily from exports of the domestic country to similar exports goods from foreign competitors. Hence, changes in the relative price of foreign and domestic exports, induced by subsidized export financing, affect competitors' market share profoundly, independent of the direct effects on the subsidized firms. In short, one expects more severe distortions of competition in industries and markets with homogeneous products.

In the context of this study, the assumption of product differentiation has an interesting geographical interpretation. Due to colonial ties or historical reasons, specific countries have a privileged position on some markets. This allows them to differentiate their products from similar goods supplied by their foreign competitors (a small k). As a consequence, export financing distorts competition less in those markets than in markets with equal access for all firms. On the other hand, subsidies may be effective in a dynamic framework in deterring entry from potential competitors.

The regional disaggregation for Belgian official development assistance and export insurance in Chapter II provides an interesting example. We found that Belgium devotes a significant part of its aid

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[7]From equations (9) and (10), one derives that an increase in domestic export financing, which decreases $\gamma_s/(1-\theta)$ by 1% leads to a reduction in foreign exports by kC/Ω % and an increase in domestic exports by $(b^f+v^f)/\Omega$ %. An equivalent increase in foreign subsidies leads to contraction of domestic exports by kC^f/Ω %. The parameter Ω is a negative function of k. A high degree of substitutability between domestic and foreign exports, as measured by a large value of k, raises the value of all three multipliers.

to its former colonies and most of all to Zaïre. In view of this relationship between the two countries, there is reason to believe that, even with lower subsidies, many of the export contracts would still have gone to Belgian firms. Nevertheless, the continued subsidization may be needed to maintain the special relationship. It was pointed out in Chapter II that Indonesia, China, Turkey and Pakistan are also among the main beneficiaries of Belgian state to state credits. As Belgium does not benefit from any specific advantage on these markets, the impact of development assistance on Belgian export performance is likely to be more pronounced.

IV. EXPORT FINANCING AND MARKET INTERDEPENDENCY

So far we have assumed market segmentation and constant marginal costs in our model. In this way, the effects of export financing subsidies to a specific market are confined to that market. Hence, promotion of exports to non-EC countries by EC member states does not affect intra-EC competition on the internal EC market. In this section, we show that the model is easily extended to incorporate linkages between export markets. Such linkages make export performance on one market dependent on export subsidies aimed at expanding exports elsewhere (Krugman, 1984).

The source of the market interdependency considered here concerns economies of scale (EOS), which can take various forms. In some industries, the average fixed cost of investments in plant and equipment falls significantly when total production is expanded (technical EOS). In other industries, research and development or marketing and distribution costs are more easily recovered when output levels are sufficiently high. A third important form of EOS concerns learning through experience. In services, construction and some other activities, the cost efficiency of production improves drastically when firms become more experienced in carrying out projects. In all cases, export financing subsidies may help firms to bring down average

costs by expanding exports. This gives them a cost advantage vis-à-vis their foreign competitors. This advantage applies to their entire production range irrespective of the market of destination.

To integrate EOS in the mathematical model, we have to change the set-up slightly. We suppose that average costs are declining in total firm output. Denote x_i as the sales of a representative domestic firm in market i. Let the firm sell a total production of $\sum_{i=1}^{m} x_i$ in m different markets. With EOS, average costs are declining for a relevant range of production levels. Mathematically, average cost C is no longer a constant but a function $C\ (\sum_{i=1}^{m} x^i)$ with $\dfrac{\partial C}{\partial x^i} = \dfrac{\partial C}{\partial x^j} =$ $C_x \leq 0$ for all i and j. The first-order conditions for a profit maximum for domestic exporting firms on a particular market i are similar to equation (7). In effect,

$$\frac{P^i - X^i\ V^i}{\gamma_s^i} = \frac{C + C_x\ X^i/n^i}{1-\Theta^i} \tag{7a}$$

All variables are defined as before but the subscript i refers to market i. In a profit maximum, the marginal cost of production at the right hand side of the equation is equal to marginal revenue at the left hand side. This is true for every market in which the domestic firm operates : there exists a total of m first-order conditions. Analogous conditions for foreign firms can be derived.

Equation (7a) makes clear how export subsidies interact with EOS. Export financing subsidies stimulate exports and thus increase production. Average costs fall which amounts to an decrease in the value of C. In its turn, this reduction in average costs reinforces the export expansion of domestic firms.

Moreover, export financing subsidies achieve the strongest export expansion in industries with significant EOS. In equation (7a), we find that the marginal cost of producing goods for any market i is decreased by the negative coefficient C_x. This coefficient measures the impact of a small increase in output on the firm's average cost. When there is a large potential for EOS in the domestic industry, C_x is large in absolute value so that expanding production by subsidizing exports achieves considerable savings in marginal and average costs.

Table 3 presents some empirical evidence on EOS by industry (European Economy, 1988, p 109). More specifically, data on the cost gradient at half the minimum efficient scale are provided. This indicator measures the percentage increase in average costs that would result from reducing output from the cost minimizing production level to only half this optimal level. A large number indicates that important EOS exist in the industry. Of course, such data are only estimates and should be treated with the necessary caution. In addition, the level of aggregation in Table 3 hides a lot of interesting variation across product groups, which is described further in the column of remarks. For this reason, a range for the cost gradient is most often given and the type of EOS is specified in more detail.

A comparison of Table 3 with the sectoral subsidy equivalents in Chapter II suggests that there are significant EOS in many of the subsidized industries, including Nonelectrical Machinery, Electric Equipment, Aircraft, Metals and Motor Vehicles.

This finding deserves further emphasis because it becomes possible that export financing subsidies to non-EC markets may have distorted competition on the internal EC market. In effect, with EOS the export performance on a specific market is not only strenghtened by export financing subsidies to that market. Any subsidy which expands production of domestic firms lower average costs. Mathematically,

Table 3 : Branches of manufacturing industry ranked by size of economies of scale

NACE Code	Branch	Cost gradient at half METS[1]	Remarks
35	Motor vehicles	6- 9 %	Very substantial EOS[2] in production and in development costs,
36	Other means of transport	8-20 %	Variable EOS : small for cycles and shipbuilding (although economies are possible through series production level), very substantial in aircraft (development costs).
25	Chemical industry	2,5-15 %	Substantial EOS in production processes. In some segments of the industry (pharmaceutical products), R&D is an important source of EOS
26	Man-made fibres	5-10 %	Substantial EOS in general.
22	Metals	> 6 %	Substantial EOS in general for production processes. Also possible in production and series production.
33	Office machinery	3- 6 %	Substantial EOS at product level,
32	Mechanical engineering	3-10 %	Limited EOS at firm level but substantial production
34	Electrical engineering	5-15 %	Substantial EOS at product level and for development costs.
37	Instrument engineering	5-15 %	Substantial EOS at product level, via development costs.
47	Paper, printing and publishing	8-36 %	Substantial EOS in paper mills and, in particular, printing (books),
24	Non-metallic mineral products	> 6 %	Substantial EOS in cement and flat glass production processes. In other branches, optimum plant size is small compared with the optimum size for the industry.
31	Metal articles	5-10 % (castings)	EOS are lower at plant level but possible at production and series production level.
48	Rubber and plastics	3- 6 %	Moderate EOS in tyre manufacture. Small EOS in factories making rubber and moulded plastic articles but potential for EOS at product and series production level.
41-42	Drink and tobacco	1- 6 %	Moderate EOS in breweries. Small EOS in cigarette factories. In marketing, EOS are considerable.
41-42	Food	3,5-21 %	Principal source of EOS is the individual plant, EOS at marketing and distribution level.
49	Other manufacturing	n.a.	Plant size is small in these branches. Possible EOS from specialization and the length of production runs,
43	Textile industry	10 % (carpets)	EOS are more limited than in the other sectors, but possible economies from specialization and the length of production runs,
46	Timber and wood	n.a.	No EOS for plants in these sectors. Possible EOS from specialization and longer production runs,
45	Footwear and clothing	1 % (footwear)	Small EOS at plant level but possible EOS from specialization and longer production runs.
44	Leather and leather goods	n.a.	Small EOS .

[1] Minimum efficient technical scale
[2] Economies of scale
Source : European Economy (1988, p. 104).

this is seen by noting that C and C_x depend on total output of the firm $\sum_{i=1}^{m} x_i$, which depends on the export subsidization policy in all markets.

Such spill-over effects of export subsidies should direct the attention of policy-makers to the total amount of subsidies granted to an industry instead of only focussing on the exports markets to which the subsidies are allocated.

V. EMPIRICAL EVIDENCE ON THE COMPETITIVE EFFECTS OF EXPORT FINANCING

In this section, we present some tentative empirical findings on the relationship between export financing and export performance. First, we relate export performance on an industry basis to the sectoral disaggregation of export credits and export insurance provided in Chapter II. Subsequently, we concentrate on the regional disaggregation of Belgian official development assistance and export insurance and analyze whether export performance on subsidized markets has changed markedly.

5.1 Export financing subsidies and industry export performance

In Chapter II, we showed that export insurance and/or export credit subsidies in France and the United Kingdom were directed towards a limited set of usually the same industries. France provided more export credit subsidies than any of the other countries considered, while the subsidization through export insurance was more equally distributed. Rates of export credit subsidization rose sharply at the end of the seventies and declined again from 1982 onwards. Export insurance subsidies have been steadily increasing in the last decade.

Table 4 : Export financing and sectoral disaggregation of non-EC exports
(industry shares as a % of total non-EC exports)

	NACE CODE	1977	1979	1981	1983	1985[a]
1. FRANCE						
Mechanical Engineering	32	18.0	13.5	12.9	12.4	10.5
Instrument Engineering	37	1.2	2.5	2.3	1.7	1.9
Metal Products	31	1.0	3.3	3.5	1.4	1.4
Electrical Equipment	34	11.0	9.4	8.6	9.7	9.4
Motor Vehicles	35	4.8	6.6	7.0	3.0	2.8
Other Transport Equipment	36	9.2	16.1	16.9	7.4	7.5
Iron and Steel	22	11.0	8.6	8.7	7.3	7.4
Petroleum Products	14	2.4	2.7	2.8	3.0	2.4
Food, Beverages and Tobacco	41	4.6	6.9	4.9	3.8	5.1
Rubber and Plastics	48	2.7	4.3	4.8	2.7	3.3
Chemicals	25	11.0	15.7	14.2	10.0	12.0
2. UNITED KINGDOM						
Other Transport Equipment	36	7.7	10.4	9.9	5.5	10.0
Mechanical Engineering	32	19.9	16.6	16.3	12.8	13.0
Motor Vehicles	35	3.6	3.6	3.2	1.7	1.6
Office Machinery	33	0.2	0.9	1.0	0.4	0.4
Metal Products	31	0.3	1.5	1.4	0.2	0.2
Electrical Equipment	34	11.8	8.0	8.3	8.7	8.6

[a] The data for sectors 22, 32 and 34 refer to 1984.
Source : Computations based on data provided by INCAP

To assess the sectoral impact of export financing subsidies on third markets, Table 4 presents an industry breakdown of non-EC exports in France and the United Kingdom for the period 1977-1985. The selected industries correspond to those that were found in Chapter II to benefit most from export financing subsidies, although different industry classification systems rule out a perfect correspondence. As in Chapter II, industries are ranked according to the rate of export subsidization.

An interesting picture emerges in the case of France. In the period 1977-1981, we observe a significant increase in the share in total non-EC exports of several of the subsidized industries including Instrument engineering, Metal Products, Motor Vehicles, and Other Transport Equipment. The data for 1983 and 1985 shows this trend to be reversed in subsequent years. This observed pattern in export shares is consistent with the sharp rise in export credit subsidization between 1977 and 1982 followed by a decrease afterwards. This suggests that export credits may have oriented French non-EC exports towards the subsidized industries in the 1977-1981 period but that this shift was not maintained when export subsidization was reduced.

The evidence for the United Kingdom is mixed. An temporary expansion of export shares in 1977-1981 is seen in Motor Vehicles, Office Machinery, and Metal Products but the changes are not as marked as in the case of France. The export share of Other Transport Equipment falls between 1981 and 1983 but jumps up again in 1985. On the whole, a clear correlation between export financing and export orientation seems harder to detect. This should not come as a surprise since the rates of British export credit subsidization are well below the French figures.

In view of this evidence, the crucial question then becomes whether the sectoral shift in French export orientation also resulted in any competitive distortions between EC member states on third markets. For this purpose, we gathered data on the percentage sectoral shares

Table 5 : Sectoral export performance on third markets and export financing
(% share in combined non-EC exports for an industry by France,
Belgium, Germany and the U.K.)

	NACE CODE	1977	1979	1981	1983	1985[a]
1. FRANCE						
Mechanical Engineering	32	17.9	18.4	18.4	18.8	17.1
Instrument Engineering	37	30.0	38.5	36.7	35.9	39.1
Metal Products	31	10.0	32.7	35.1	14.2	13.7
Electrical Equipment	34	21.2	24.2	23.6	24.3	24.0
Motor Vehicles	35	20.4	25.2	25.2	33.5	30.7
Other Transport Equipment	36	25.8	31.1	31.4	37.5	29.5
Iron and Steel	22	20.7	23.6	25.2	23.1	23.6
Petroleum Products	14	26.0	35.3	32.7	32.3	27.2
Food, Beverages and Tobacco	41	22.4	25.2	25.7	23.7	24.7
Rubber and Plastics	48	9.9	12.1	22.4	8.6	9.2
Chemicals	25	21.0	24.5	24.2	23.7	22.2
2. UNITED KINGDOM						
Other Transport Equipment	36	23.2	20.6	19.7	29.3	41.6
Mechanical Engineering	32	21.5	23.2	25.0	20.4	21.9
Motor Vehicles	35	16.3	14.2	12.4	19.9	18.3
Office Machinery	33	6.7	9.5	10.4	14.3	14.1
Metal Products	31	13.6	19.2	18.1	10.7	9.6
Electrical Equipment	34	24.5	21.2	24.4	22.9	22.5

[a] The data for sectors 22, 32 and 34 refer to 1984.
Source : Computations based on data provided by INCAP

of French and British industries in combined non-EC exports by France, Belgium, Germany and the United Kingdom. Table 5 indicates that, with the exception of Mechanical Engineering, and Rubber and Plastics, the French relative position in the subsidized industries improved between 1977 and 1985 with respect to the three other countries. This evolution is consistent with the fact that French export credit subsidies were well above those in the other countries during this period.

Furthermore, we find that in Metal Products, Petroleum Products, Rubber and Plastics and Chemicals a gain in relative market share in the period 1977-1981 is followed by a weakening position in the years 1981-1985. In those industries, the reduction in export financing subsidization may have eroded the French competitive advantage.

No uniform picture emerges from the British data. Some industries, including Other Transport Equipment and Office Machinery, performed better on third markets in 1985 than in 1977, while the relative position of Motor Vehicles and Metal Products remained relatively constant or weakened. British relative export position in the subsidized industries also shows more pronounced year to year fluctations which should caution against any premature conclusions.

On the whole, the sectoral analysis of Table 5 suggests that export financing may have bolstered export performance of certain French industries on non-EC markets. Evidently, many other factors influence sectoral export orientation and market shares. Also, the period considered is short and the number of subsidized industries is small so that one risks to derive biased conclusions from too small a sample. To explicitly isolate the specific role of export financing subsidies, further research would clearly be required.

5.2 Export financing subsidies and regional breakdown of Belgian export performance

In this section, we examine the relationship between export subsidies and export performance for Belgium. Before we proceed, it is useful to shortly review the main trends in Belgian export subsidization.

We found that the rate of subsidization in export credits increased in the period 1974-'84, and especially during the years 1980-'83. From 1984 onwards, the rate of subsidization started to decline.

A comparable evolution was also found for state to state credits provided by the Belgian Government. An important share of this form of state aid was granted to a limited number of countries including Zaire, China, Indonesia, India and Turkey. In recent years, Zaire and China have been the main beneficiaries.

Where Belgian export insurance is concerned, premium income exceeded claims before 1977. From the end of the seventies onwards, losses of the Belgian insurance agency increased steadily with a marked acceleration in the mid-1980's. As a consequence, subsidization implicit in official export insurance augmented considerably. Especially African countries, including Belgium's former colonies, as well as Eastern Europe benefited substantially from this expansion of export insurance subsidies.

One then wonders whether exports to the mentioned countries became relatively more important in total Belgian non-EC exports as export subsidies increased.

To answer this question, we compare the evolution of export shares of those countries in total Belgian non-EC exports to the pattern of export subsidization described above (see Table 6).

Table 6 : Belgian exports to individual countries as a percentage share in Belgian non-EC exports

	Zaire	China	Indonesia	India	Turkey	Eastern Europe[a]	Africa	Total
1974	2.2	0.4	0.4	1.1	1.1	9.8	10.1	22.9
1975	1.9	0.3	0.4	1.9	1.3	10.1	11.4	25.4
1976	1.5	0.5	1.0	1.7	1.3	9.1	11.7	25.3
1977	1.7	0.5	0.7	2.5	1.3	7.2	12.8	25.0
1978	1.4	1.6	0.5	3.7	0.6	6.8	13.4	26.6
1979	1.3	0.9	0.4	2.6	0.7	7.0	12.9	24.5
1980	1.4	0.6	0.4	2.0	0.8	7.1	13.5	24.4
1981	1.2	0.7	0.6	3.4	1.1	6.9	12.7	25.4
1982	1.3	1.4	0.8	4.0	0.9	6.2	12.2	25.5
1983	1.2	1.4	0.9	3.9	1.1	7.4	10.7	25.4
1984	1.4	1.6	0.6	4.3	1.2	6.0	10.7	24.4
1985	1.5	1.7	0.6	4.5	1.4	6.6	10.1	24.9
1986	1.5	1.9	0.4	4.4	1.7	5.5	10.1	24.0
1987	1.4	1.3	0.5	4.8	2.4	5.0	8.5	22.5

[a] We have considered the following countries : Hungary, Poland, Roemenia, Bulgaria, Czechoslovakia
Eastern Germany and the USSR

Source : IMF, Direction of Trade Statistics

On the whole, we find that the export shares of the countries involved remained relatively constant during the period 1974-'87. A closer look at the individual countries export shares confirms this lack of correlation between export performance and export subsidization. Only for the period 1981-'83, during which export credit subsidies heavily increased, we observe an increase in the export shares of China, India and Eastern Europe. We conclude that Belgian export financing has not achieved a noticeable shift of export orientation towards the more subsidized countries.

In Table 7, we analyze whether the export performance of Belgian companies in subsidized markets has improved significantly in the period 1974-'87.

For this purpose, we computed the percentage share of Belgian exports in the total imports of the countries which benefited most from Belgian export financing subsidies. Again, Belgian export shares on most of the subsidized markets remain relatively constant during the period 1974-'87 with the exception perhaps of China. The Belgian import penetration of the Chinese market rises sharply in 1978 and shoots up again in 1982-'83.

Evidently, the absence of any marked change in market share does not necessarily mean that export subsidies were ineffective. Subsidized export financing may have prevented a weakening of the position of Belgian companies on some export markets. The former colony Zaire may provide an interesting example in this respect. As is seen from Table 7, Belgian firms account for 15.0 to 22.5 % of total imports by Zaire. The observed substantial subsidization in the form of export insurance and official development assistance may very well have been effective in protecting this sizeable market share.

Table 7 : Belgian exports as a percentage share in total imports of individual countries

	Zaire	China	Indonesia	India	Turkey	Eastern Europe	Africa
1974	16.9	0.5	0.9	1.8	2.5	2.8	2.8
1975	15.0	0.5	0.7	2.7	2.4	2.3	2.6
1976	14.9	0.6	1.6	2.7	2.1	2.0	2.7
1977	20.9	0.8	1.2	4.2	2.7	1.6	3.0
1978	21.5	2.1	0.9	5.6	1.7	1.6	3.3
1979	20.2	0.9	0.9	4.0	1.9	1.6	3.6
1980	22.5	0.6	0.6	2.6	1.8	1.4	3.3
1981	18.4	0.7	0.8	3.4	2.1	1.2	2.6
1982	19.6	1.2	0.8	3.7	1.6	1.2	2.6
1983	18.2	1.2	1.2	3.9	1.8	1.4	2.7
1984	20.9	1.0	0.9	4.0	1.9	1.3	2.9
1985	21.7	0.7	1.3	4.3	2.0	1.3	3.0
1986	19.8	1.0	0.8	4.7	2.9	1.3	3.6
1987	15.6	0.7	1.3	5.5	3.9	1.3	3.2

Source : IMF, Direction of Trade Statistics

VI. CONCLUSION

In this chapter, we addressed the link between export financing subsidies and competitive distortions. In a theoretical part we modelled the impact of export financing subsidies on exports and import prices. It was found that both cost reducing and revenue increasing export financing subsidies by a EC country expand exports of its firms to third markets at the expense of exporting firms in non-subsidizing countries. The importer pays a lower price. We conclude that export support programs distort competition between EC countries and that the distortion is linked to the size of the subsidy as measured in Chapter II. Nevertheless the relation between export support and export performance is complex.

Summarizing, we can derive four principles for policy-makers seeking to establish whether export financing subsidies have distorted intra-EC competition on non-EC and EC markets.

A first lesson is that observed changes in exports and import price depend on the response by other countries. Export financing subsidies in EC countries that are directed to a comparable group of industries affect the competitive environment but do not necessarily alter market shares or import prices.

A second principle is that industry-specific conditions matter. We found that subsidies stimulate exports most when 1) subsidies are substantial, 2) the cost difference between competitors is not too large, 3) market demand is price elastic, 4) competition within the industry is intense 5) product differentiation is limited and 6) there exist economies of scale in the industry.

Applying those conditions to the industries that receive the bulk of the export financing subsidies in the United Kingdom and France, yields mixed results. Only the Metal Products sector satisfies most

of the above requirements. For other subidized industries a more detailed approach based on industry-specific characteristics is necessary.

In spite of this, we found some evidence for a relation between export financing subsidization and sectoral export performance on third markets in the case of France. During the period of intensive export credit subsidization from 1977-1982, a shift of French non-EC exports towards the industries that benefited most from the subsidies was noted. This trend was reversed when export credit subsidization was reduced in the subsequent years. No such pattern was found in the United Kingdom, which is consistent with the fact that British export credit subsidies were below French levels in the period considered.

In addition, the export performance of most subsidized French industries on third markets improved during the years of extensive export credit subsidization when compared to the other countries of this study. From the viewpoint of this study, this finding is particularly relevant for the industries that benefit most from French export credit subsidies including Instrument engineering, Metal Products, Electrical Equipment and Motor Vehicles. This suggests that export financing subsidies might have helped to boost exports of French firms at the expense of their Belgian, British and German competitors. In this context, it is also interesting that several of the subsidized French industries lost at least part of the obtained gains in market share when subsidies decreased. Evidently, an analysis of this sort is by no means conclusive but should nevertheless put competition policy makers on guard against the potential competitive distortions of sectoral export financing subsidies.

As a third factor in the relation between subsidization and competitive distortions, policy-makers should analyze the features of the importing country. Export subsidization is most efficient in diverting market share in "contestable markets" where no privileged access is granted to exporting firms of a particular country. On the

other hand, maintaining the privileged relation may require a continued stream of subsidies. In the Belgian example, official development assistance and export insurance helps to maintain a priviliged access in the former colonies. Conversely, the direct impact of subsidies on export performance is likely to be felt more directly on the more competitive Asian markets. Likewise, export insurance subsidies to other EC countries are likely to affect intra-EC competition directly because of the protection given by transport cost, tariffs and non-tariff barriers to EC firms.

In the empirical part of this chapter, no clear correlation was established between the regional breakdown of Belgian export subsidies and export performance. In the last decade or so, Belgian export orientation did not shift gradually to these non-EC markets which primarily benefited from export insurance subsidies and official development assistance. Nor did import penetration by Belgian firms alter markedly in these countries. As mentioned before however, export financing subsidies may have prevented an erosion of the Belgian position in these markets, which would be an interesting hypothesis for further research.

This brings us to a fourth and last point. In spite of the role of regional and market-specific factors, the total amount of subsidies granted provides important information about the scope for successful export promotion. Indeed, it was found that there are substantial economies of scale in many of the subsidized industries. To the extent that export support programs lower average costs, export performance on all export markets is improved. Such spill-over effects form a concern for EC competition policy. Indeed, official support for exports to non-EC countries infringes on Article 92 of the EC Treaty when it also improves export performance on the internal market.

APPPENDIX

A. Importers evaluation of repayment terms

Algebraicaly γ_{jm} can be written as :

$$\gamma_{jm} = \sum_{t=1}^{T_j} \frac{1/T_j + \{1-[(t-1) * 1/T_j]\} * r_j}{(1+i_m)^t}$$

As can be seen γ_{jm} depends on T_j, the payment term, r_j, the interest rate paid by the importers and i_m, the discount rate of the importer. A rise in T_j or i_m will lower γ_{jm} while a rise in r_j achieves the opposite effect. The discount rate i_m can differ between different importers but will be the same for one importer when comparing the offers of different suppliers.

Table A.1. provides some intuition for this mathematical definition. The left hand side of the table illustrates the role of the interest rate paid by the importer. Suppose that an importer with a time preference of 10 % ($i = 0.1$) evaluates a payment term of 10 years ($T = 10$). His preference is reflected by γ_{jm}. If the interest rate equals zero, γ_{jm} becomes 0.614. The importer obtains an interest free loan and therefore accept the payment scheme ($\gamma < 1$). With an interest rate of 5 % γ_{jm} becomes 0.807, so that the importer is still interested in the loan provided by the government agency if another country does not offer a better deal. At a 10 % interest rate, γ_{jm} becomes equal to one : the importer is indifferent between paying cash or accepting the loan. Interest rates above 10 % are rejected by the exporter.

If the contract price P_c is 1.000, this implies that P_m becomes respectively 614, 807, 1000 and 1.193. The importer will accept the first two payment conditions, be indifferent about the third, and reject the fourth. In the last case, he prefers paying cash.

The last two columns of table A.1. illustrate the importance of the subjective discount rate. It is seen that the same payment conditions are evaluated differently by importers with different time preferences. A payment term of 10 years with an interest rate of 10 % will be accepted by importers with a discount rate higher than 10 % and refused by those with a discount rate lower than 10 %. Importers with a time preference of 10 % will be indifferent between accepting and refusing the payment condition.

Table A.1.: γ values

T = 10			
i = 0.1		r = 0.1	
r	γ	i	γ
0	0.614	0.15	0.834
.0.05	0.807	0.1	1
0.1	1	0.05	1.228
0.15	1.193	0	1.55

B. Export subsidies in the case of a fixed rate loan

If the exporter would have obtained a fixed rate loan, the total subsidy for year K becomes :

$$S_K = \sum_{t=T}^{K} U_t(r_t - \bar{r}_t)$$

whereby :

U_t : total credits authorized in t and still outstanding in K

r_t : market interest rate in t

$\bar{r}_t$: officially supported interest rate on loans authorized in t

T : year during which the oldest still outstanding loans were authorized

The difference between this expression and expression (2.1) lies in the definition of the market interest rate, the rate that would have been charged in absence of export support.

Let us reconsider our earlier example and assume that the adjustable interest rates paid by the exporters are respectively 6, 5.5 and 7 %. The subsidy for 1988 amounts then to :

$$1.000(0.11-0.06) + 2.000(0.1-0.055) + 3.000(0.125-0.07) = 305 \text{ ECU}$$

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