EXPORT INSURANCE SUBSIDISATION:
RISK COVERAGE, STRATEGIC EXPORT PROMOTION OR AID?

by

Gerda Dewit

University of Glasgow

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Abstract: Although explicitly prohibited by the WTO Subsidy Code, official export insurance agencies in most industrialised countries operate with long term budgetary losses. This practice is labelled as export insurance subsidisation. Official export insurance schemes are often used for several purposes. While their prime objective is the provision of insurance coverage against the risk of default faced by domestic exporters, these insurance programs are not seldom embedded in more global policy objectives of the domestic government. This paper investigates how more general government objectives like strategic export promotion and official development assistance can be comprised in official export insurance.

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Address Correspondence: Gerda Dewit, University of Glasgow, Department of Political Economy, Adam Smith Building, Glasgow G12 8RT, UK; tel.: 44-(0)141-330 4659; fax: 44-(0)141-330 4940; e-mail: G.Dewit@socsci.gla.ac.uk

INTRODUCTION

Part of the literature on trade under uncertainty focuses on the scope for trade policy as a substitute for missing or incomplete insurance markets. While Eaton and Grossman (1985) argue that trade intervention may serve as a second-best (partial) substitute for unavailable insurance contracts, Dixit (1989, 1990) stresses that in most cases the correct policy is not trade related. In this paper, the question is reversed. More specifically, we investigate to what extent insurance policies, given that these are publicly provided, can incorporate trade related goals or other complementary motives. In other words, is it feasible and desirable to use insurance contracts for other purposes beside the prime objective of efficient risk allocation?

We concentrate on the case of export insurance, in most OECD countries provided by (semi-)public agencies. Export insurance policies offer coverage against default risk. Empirical studies (Abraham (1990); Abraham, Couwenberg and Dewit (1992)) indicate that in several countries official export insurers are operating with a sustained budgetary loss. According to the WTO Subsidy Code such practice is labelled as subsidisation and explicitly prohibited. This paper asserts under which circumstances this form of subsidisation can be optimal for individual countries when official export insurers embrace an objective function blended with different goals.

Two alternative policy motives are discussed. First, because this type of insurance is inseparably linked to export activities of domestic firms, the terms at which coverage is provided are likely to contain a strategic element. The now well-established strand in the trade policy literature on strategic export promotion (among others developed by Brander and Spencer (1985), Eaton and Grossman (1986), Dixit (1987) and Helpman and Krugman (1989)) points out that economies can improve domestic welfare by subsidising exports under specific oligopolistic behaviour in the export market. We examine whether and how the optimal strategic trade intervention rule alters when the motive of strategic export promotion is encapsulated in official export insurance programs. Second, the risk of default is predominantly relevant for exports to developing countries. Moreover, official export insurance schemes often are included

in the domestic country's package of official development aid. Hence, the possibility of aid-inspired export insurance subsidies is also explored in this study.

The practice of official export insurance is discussed in general in section one. Section two is devoted to the analysis of the pure insurance motive of official insurers. In section three, the motive of strategic export promotion is introduced and optimal trade policy rules for insured exports are determined. Finally, the scope for aid-inspired export insurance is assessed in section three.

1. OFFICIAL EXPORT INSURANCE: SPECIFIC FEATURES

In this section the main characteristics of official export insurance are described and the instrumental specifics of insurance contracts are discussed. Export contracts stipulating a certain credit term imply defer of payment until the credit expires. In that case, exporters may be confronted with default by the foreign importer at the expiration date of the contract. In most industrialised economies, risk averse firms facing a risk of default can apply for insurance at an official export insurance agency.

Insurance contracts have some specific features which makes them attractive policy instruments. Optimal contracts determine a premium and associated coverage, placing a double instrumental variable at the official insurer's disposal. Moreover, premium and coverage can be either specified in levels or as rates. Hence, the particular form of the insurance contract provides an additional degree of policy freedom.

The maximum coverage rate stipulated in export insurance policies varies between 85% and 100%, often approaching full insurance. With some exceptions, insured exports in most industrialised economies roughly account for 10% to 20% of total exports[1]. A striking feature of official export insurance schemes is that these usually involve export subsidisation. In practice, this means that the premium income collected does not suffice to cover the reimbursements claimed by insured firms.

[1] For more detailed figures on this measure, we refer to Dewit (1996), p. 9.

Broadly speaking, subsidy rates, measured as the difference between claims and premiums as a percentage of insured contracts, range between 2% and 12%. Although these figures may seem moderate or even rather low at first sight, global subsidy estimates conceal a considerably skewed regional pattern in export insurance subsidisation. More specifically, insured exports to developing countries receive the bulk of the subsidies. These contracts are characterised by a high risk of default. Meanwhile, European countries as well as industrialised economies in general are non-subsidised export destinations.

The prime objective of public insurers should be the provision of efficient insurance against the risk of default. However, because official export agencies are operating for account of the state, their objective function is likely to be embedded in more general policy goals of the domestic government. Two such wider policy goals deserve special attention. First, since this type of insurance clearly is inseparably linked to an economy's risky trade relations, it may be used as an instrument of strategic export promotion against foreign competitors in third markets. Second, developing countries obviously are the export destinations for which official export insurance schemes especially are significant. In practice, they are often claimed to be part of public development aid programs.

Before investigating to what extent official export insurers can design contracts at terms which are combining these different objectives, we discuss the pure insurance goal of a public insurance agency and the effect of this type of insurance on exporters.

2. THE INSURANCE OBJECTIVE

In this section, the insurance objective is isolated from potential alternative goals by assuming perfect competition in the export market, thereby removing any rationale for strategic export intervention. A simple benchmark with symmetric information

between insurer and insured is built, using a one-shot two-stage game[2]. In the first stage, the official agency decides on the terms of the insurance policies offered, while insured firms make their decisions for the foreign export market in the second stage. Solving the game backwards, we start by analysing the exporter's decision in the last stage of the game.

2.1. The export decision of the insured firm with perfect competition

A representative risk averse firm maximises its certainty-equivalent profits (EV) generated by exporting to a particular region. The market structure in the export destination is perfectly competitive. We adopt a mean-variance approach to simplify the formal analysis. Regional default distributions are assumed to be independent and background risk considerations are ignored. Hence, the firm's optimisation problem is given by

$$\max_{x^k} EV^k = E\Pi^k - \frac{\beta}{2}\operatorname{var}\Pi^k \qquad (1)$$

with

$$E\Pi^k = (1 - E\lambda^k)p^k x^k + (E\lambda^k - r^k)\gamma^k p^k x^k - \frac{1}{2}x^{k2} \qquad (2a)$$

$$\operatorname{var}\Pi^k = (1-\gamma^k)^2 (p^k x^k)^2 v^{k2} \qquad (2b)$$

where superscript k denotes a specific export market. $E\Pi^k$ and $\operatorname{var}\Pi^k$ denote the expected profits and the variance of profits. p^k and x^k respectively stand for the given export price and the export volume in market k. β is a parameter measuring the degree of risk aversion. The last term in expression (2a) represents the production cost function. We assume that marginal costs are increasing to avoid indeterminate solutions under perfect competition. The risk of default is captured by λ^k, a stochastic variable distributed with mean $E\lambda^k$ and variance v^{k2} (with Prob $\{\lambda^k < 0\}$=Prob $\{\lambda^k > 1\}$=0). An insured exporter pays the premium rate (i.e., the premium paid per insured currency unit, denoted by r^k) stipulated in the insurance policy for the export

[2] Asymmetric information problems in export insurance leading to moral hazard and adverse selection are respectively discussed in Dewit (1996a) and Dewit (1996b).

market envisaged. If the foreign importer turns out to be insolvent at the expiration date of the contract ($\lambda^k > 0$), the exporter is reimbursed for this loss by the official insurer insofar the insurance policy provides coverage. The coverage rate is symbolised by γ^k ($0 \leq \gamma^k \leq 1$).

Proposition 1: *When export insurance contracts stipulate a premium and a coverage rate, the export volume of a risk averse firm depends on the distribution features of the default variable, the firm's attitude to risk and the terms of the insurance contract.*

Proof:

The first order condition of (1) with respect to the export volume is then given by

$$(1 - E\lambda^k)p^k + (E\lambda^k - r^k)\gamma^k p^k - x^k - \beta(1-\gamma^k)^2 p^{k^2} x^k v^{k^2} = 0 \qquad (3)$$

which yields the optimal export volume of the insured firm:

$$x^k = p^k \frac{1 - E\lambda^k + (E\lambda^k - r^k)\gamma^k}{1 + \beta(1-\gamma^k)^2 p^{k^2} v^{k^2}} \qquad (4)$$

Clearly, the characteristics of the default distribution ($E\lambda^k, v^{k^2}$), the firm's degree of risk aversion (β) and the terms of the insurance contract (r^k, γ^k) are crucial in the firm's export decision. More particularly, the export volume unambiguously declines as the coverage rate specified in the available insurance policy decreases as long as the premium rate is set at the (less than) fair level ($\frac{dx^k}{d\gamma^k} > 0 \;\; if \;\; r^k \leq E\lambda^k$). This is due to the fact that exporters cannot choose the coverage rate freely[3]. Furthermore, a low premium rate is conducive to exporting more to the region under consideration ($\frac{dx^k}{dr^k} > 0 \; if \; \gamma^k > 0$).

[3] This would be the case with uniform premium rating. Then, given a particular premium rate, export volumes would not be affected by their attitude to risk or the features of the foreign default distribution (see Funatsu (1986), Abraham and Dewit (1996)).

2.2. Optimal official export insurance

The actual terms at which insurance contracts are available are determined by the official export insurance company in the first stage of the game. We assume that the latter disposes of the same information about the risk involved in the contracts as the firms applying for insurance.

A risk neutral public insurance company maximises certainty-equivalent profits of all insured firms corrected for the potential subsidy costs it incurs (denoted by the last term of the objective function in (5)):

$$\begin{aligned} &\max_{r^k,\gamma^k} \; n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k \\ &s.t. \; \left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k\right]_{|r^k = E\lambda^k} \geq \max_{\gamma^k} \left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k\right]_{|r^k = E\lambda^k} \end{aligned} \tag{5}$$

The constraint in (5) guarantees that the insurance contract is efficient. Efficiency implies that, at fair premium rates, the coverage stipulated in the policy maximises certainty-equivalent profits of risk averse exporters.

Proposition 2: *Under symmetric information in insurance and with perfectly competitive export markets, optimal official export insurance policies consist of full coverage and fair premium rates for all risk categories.*

Proof:

From the first stage we know $EV^k{}_{x^k} = 0$ and assuming that the domestic country is small we additionally have no terms of trade effect ($\frac{dp^k}{(n^k - 1)dx^k} = 0$). Hence, with φ (φ>0) denoting the Lagrange-multiplier associated with the constraints in (5), first order conditions with respect to premium and coverage rate are given by

$$-n^k(E\lambda^k - r^k)\gamma^k p^k \frac{dx^k}{dr^k} = 0 \tag{6a}$$

$$(1+\varphi)\beta(1-\gamma^k)(p^k x^k)^2 v^{k2} - (E\lambda^k - r^k)\gamma^k \frac{dx^k}{d\gamma^k} = 0 \tag{6b}$$

yielding

$$r^k = E\lambda^k \tag{7a}$$

$$\gamma^k = 1 \qquad (7b)$$

The resulting contract terms are not surprising. With "insurance" as its only objective, the risk neutral official insurer provides policies at the most favourable terms for risk averse firms facing a risk of default. Meanwhile, the contracts offered are efficient since the uncertainty is completely transferred to the risk neutral agent at a premium rate which covers the expected costs of bearing the risk involved.

The fact that such contracts are efficient can also be inferred from the volume the insured firm exports under this insurance regime. From (4), (7a) and (7b) we obtain the insured firm's export quantity

$$x^k = p^k(1 - E\lambda^k) \qquad (8)$$

which is equal to the export volume of its risk neutral counterpart (i.e., expression (4) with β=0).

3. EXPORT INSURANCE AND STRATEGIC EXPORT PROMOTION

Apart from the pure insurance motive, the official statutes of public insurance agencies stress their role as export promoting institutions. In this section, we determine the scope for strategic intervention via export insurance. Evidently, since this type of trade policy is based on profit shifting, it is only relevant for specific export markets where the market structure is oligopolistic. The literature with respect to this policy issue suggests strategic intervention via export subsidies[4] when a domestic firm is competing in a Cournot-Nash fashion with a foreign rival in a third (export) market (see, among others, Brander and Spencer (1985), Eaton and Grossman (1986), Helpman and Krugman (1989)). Here, we adopt this market structure in the export market and argue that strategic export promotion via official export insurance does not necessarily replicate this standard result.

[4] This policy is advised given that the stability conditions are not violated.

Since insurance premiums have to be the same for a specific export region across domestic industries, we claim that this type of policy may be relevant if that export destination is mainly served by a particular domestic sector. Moreover, the foreign government as well as the government of the third market are assumed to adhere to a laissez-faire trade policy[5].

Again, we first turn to the second stage of the game, where the firm which now has oligopolistic market power, determines its optimal export quantity. We assume that the domestic industry consists of n^k symmetric firms exporting to a specific region, while competing in that market with n^{k*} symmetric foreign rivals.

3.1. The export decision of the insured oligopolist

Assume the products sold by the domestic and foreign firms are homogeneous and the demand function in the export market envisaged is linear[6]. The exporter maximises (1) but now has some price-setting power ($p^k = p^k(n^k x^k, n^k * x^k *)$ with $p' < 0$). The respective first order conditions for the n^k -type and n^{k*} -type of firm are given by:

$$EV^k{}_x = \left[1 - E\lambda^k + (E\lambda^k - r^k)\gamma^k - \beta(1-\gamma^k)^2 p^k x^k v^{k2}\right](p^k + x^k p^{k\prime}) - x^k = 0 \qquad (9a)$$

$$EV^{k*}{}_{x^{k*}} = \left[1 - E\lambda^k + (E\lambda^k - r^{k*})\gamma^{k*} - \beta(1-\gamma^{k*})^2 p^k x^{k*} v^{k2}\right](p^k + x^{k*} p^{k\prime}) - x^{k*} = 0 \qquad (9b)$$

Total differentiation of these first order conditions with respect to the premium rate and solving for $\frac{dx^k}{dr^k}$ and $\frac{dx^{k*}}{dr^k}$ using Cramer's rule yields:

$$\frac{dx^k}{dr^k} = \frac{-\frac{\partial EV^k{}_x}{\partial r^k}\left[\frac{\partial EV^{k*}{}_{x^{k*}}}{\partial x^{k*}} + (n^{k*} - 1)\frac{\partial EV^{k*}{}_{x^{k*}}}{\partial x^{k\prime *}}\right]}{D} \qquad (10a)$$

[5] The case where both of these governments are engaged in active trade intervention is amply discussed in the literature (Brander and Spencer, 1985, and several others).

[6] Hence, the demand structure is such that it cannot be the cause of potential instabilities (see Brander and Spencer, 1985).

$$\frac{dx^k*}{dr^k} = \frac{n^k \frac{\partial EV^k{}_x}{\partial r^k} \frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k}}{D} \qquad (10b)$$

with

$$D = \left[\frac{\partial EV^k{}_x}{\partial x^k} + (n^k - 1) \frac{\partial EV^k{}_x}{\partial x^{k'}} \right] \left[\frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k *} + (n^k * - 1) \frac{\partial EV^k{}_{x^{k*}}*}{\partial x^{k'*}} \right] - n^k \frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k} n^k * \frac{\partial EV^k{}_x}{\partial x^k *}$$

and

$$\frac{\partial EV^k{}_{x^{k*}}*}{\partial x^{k'*}} = \frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k}$$

$x^{k'}$ and $x^{k*'}$ respectively denote export quantities of domestic and foreign rivals.

The effect of an export insurance premium subsidy on export volumes differs from the impact of a direct subsidy in various respects. First, if the domestic insurance policy only provides partial coverage[7], the direct effect of a premium reduction is smaller than an increase in a (direct) ad valorem subsidy. This follows immediately from calculating $\frac{\partial EV^k{}_{x^k}}{\partial r^k}$ from (15a):

$$\frac{\partial EV^k{}_{x^k}}{\partial r^k} = -\gamma^k (p^k + x^k p^{k'}) < 0 \qquad (11)$$

and $\left| \frac{\partial EV^k{}_{x^k}}{\partial r^k} \right|_{\gamma^k = 1} > \left| \frac{\partial EV^k{}_{x^k}}{\partial r^k} \right|_{\gamma^k < 1}$

Second, it is ambiguous how the foreign firm will adjust its export volume as a result of a domestic premium reduction. This crucially hinges on whether marginal certainty-equivalent profits of the foreign firm will decrease as domestic exports rise. From (15b), we calculate

$$\frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k} = \left[1 - E\lambda^k + (E\lambda^k - r^{k*})\gamma^{k*} - \beta(1-\gamma^{k*})^2 p^k x^{k*} v^{k2} \right] p^{k'} - \beta(1-\gamma^{k*})^2 v^{k2} (p^k + x^{k*} p^{k'}) x^{k*} p^{k'} \qquad (12)$$

Clearly, if the foreign coverage rate is sufficiently small, the sign of $\frac{\partial EV^k{}_{x^{k*}}*}{\partial x^k}$ may be positive. This is due to the fact that, with a large fraction of foreign exports uncovered by insurance, lowering the price in the third market by increasing domestic exports

[7] This will be the case if moral hazard problems enter into the picture, or if the official agency installs coverage rate ceilings to limit risk exposure of its total contract portfolio.

may lead to a decrease in the variance of foreign profits. If the latter effect dominates the reduction in the foreign firm's expected profits, $\frac{\partial EV^{k*}_{x^{k*}}}{\partial x^k} > 0$. Note that D has to be positive ($\frac{\partial EV^{k*}_{x^{k*}}}{\partial x^k}$ and $\frac{\partial EV^{k}_{x}}{\partial x^{k*}}$ need to have the same sign and, in addition, $\left|\frac{\partial EV^{k}_{x^k}}{\partial x^k}\right| - \left|\frac{\partial EV^{k}_{x^k}}{\partial x^{k*}}\right|$ and $\left|\frac{\partial EV^{k*}_{x^{k*}}}{\partial x^{k*}}\right| - \left|\frac{\partial EV^{k*}_{x^{k*}}}{\partial x^k}\right|$ have to be positive) for stability reasons.

In the next subsection, we derive the optimal terms at which official export insurance should be provided if the objective function of the government agency is inspired by a concern for efficient risk allocation as well as a motive for strategic export promotion.

3.2. Optimal insurance and strategic export promotion

Strategic export promotion via export insurance subsidisation involves setting premium rates below their fair level. Still, is this always advisable when strategic intervention is channelled through this export financing instrument?

For the domestic official insurer, the simultaneous use of the premium and the coverage rate for efficient insurance as well as strategic export promotion is likely to generate solutions which are suboptimal for either purpose. While the motive of strategic export promotion tend to dictate a premium subsidy, efficient risk allocation would advocate fair premium rating. Meanwhile, strategic premium subsidisation may induce the export insurance agency to reduce the coverage foreseen in its policies, thereby reducing total subsidy costs, whereas public insurance contracts should entail full coverage in this set-up. As a result, partial coverage policies at highly subsidised premium rates would be provided, not only implying inefficient insurance but also narrowing the scope for strategic intervention as the insured share of risky exports would have shrunken.

Hence, guaranteeing efficient use of both insurance policy variables implies linking each of the objectives to a specific instrument. While the coverage rate is instrumental in efficient insurance, the premium rate is manipulated for the purpose of strategic export promotion. Formally speaking, the public insurer faces an optimisation problem similar to (5), but now domestic firms have market power in the importing country:

$$\max_{r^k,\gamma^k} \; n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k p^k x^k$$

$$s.t. \;\; \left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k p^k x^k\right]_{\left| r^k = E\lambda^k \right.} \geq \max_{\gamma^k} \left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k p^k x^k\right]_{\left| r^k = E\lambda^k \right.}$$

$$\text{with } \; p^k = p^k(n^k x^k, n^k * x^k *) \qquad (13)$$

Proposition 3: *There is less scope for strategic export subsidisation via export insurance than via direct export subsidies since*

(i) if domestic official export insurance contracts deviate from full coverage, there is less scope for profit shifting.

(ii) if foreign official export insurance contracts deviate from full coverage, the optimal trade intervention rule for a Cournot duopoly may involve a premium tax instead.

Proof:

(i) The first order condition with respect to the premium rate is equal to

$$n^k\left[\left[EV^k{}_{x^k} + (n^k - 1)EV^k{}_{x^{k'}}\right]\frac{dx^k}{dr^k} + n^k * EV^k{}_{x^{k*}}\frac{dx^{k*}}{dr^k}\right]$$

$$- n^k(E\lambda^k - r^k)\gamma^k\left[\left((p^k + x^k p^{k'}) + (n^k - 1)x^k p^{k'}\right)\frac{dx^k}{dr^k} + n^k * x^k p^{k'}\frac{dx^{k*}}{dr^k}\right] = 0 \qquad (14)$$

After some rearranging, we obtain the optimal premium rate

$$r^k = E\lambda^k - \frac{\left[(1 - E\lambda^k) - \beta(1 - \gamma^k)^2 p^k x^k v^{k2}\right]x^k p^{k'}\left[n^{k*}\frac{dx^{k*}}{dr^k} + (n^k - 1)\frac{dx^k}{dr^k}\right]}{\gamma^k(p^k + x^k p^{k'})\frac{dx^k}{dr^k}} \qquad (15)$$

If domestic coverage falls below complete insurance, the profit shifting motive for strategic export promotion becomes smaller ($(1-E\lambda^k)-\beta(1-\gamma^k)^2 p^k x^k v^{k2} < 1-E\lambda^k$ for $\gamma^k < 1$).

(ii) Since the sign of a premium rate subsidy (i.e., the sign of the second term of (15)) crucially depends on the reaction of the foreign export volume to a domestic premium reduction, a premium rate tax ($r^k > E\lambda^k$) constitutes the optimal strategic trade prescription if the foreign insurance coverage is sufficiently small (in other words, if $\frac{dx^{k*}}{dr^k} < 0$).

Now that the importance of determining the coverage rate together with the premium rate has been shown, we maximise (20) with respect to γ^k.

Proposition 4: *Export insurance premium rates to markets where the risk of default is high, are more likely to be determined by risk considerations than by strategic export promotion.*

Proof:

Net certainty-equivalent profits are maximised when policies stipulate full coverage, which is precisely the contract implied by the left hand side of the constraint in (20). In fact, the optimal coverage rate is immediately obtained from the constraint associated with efficient insurance,or

$$\begin{aligned}(1-E\lambda^k)p^k x^k\big|_{r^k=E\lambda^k} - \frac{\beta}{2}(1-\gamma^k)^2(p^k x^k)^2\big|_{r^k=E\lambda^k} v^{k2} - \frac{1}{2}x^{k2}\big|_{r^k=E\lambda^k} \\ = (1-E\lambda^k)(p^k x^k)_{|r^k=E\lambda^k} - \frac{1}{2}x^{k2}\big|_{r^k=E\lambda^k}\end{aligned} \qquad (16)$$

which amounts to

$$\gamma = 1 \qquad (17a)$$

Hence, once again the official insurer should offer full coverage. Consequently, the optimal premium rate is equal to

$$r^k = E\lambda^k - \frac{(1-E\lambda^k)x^k p^{k\prime}\left[n^{k*}\frac{dx^{k*}}{dr^k} + (n^k - 1)\frac{dx^k}{dr^k}\right]}{(p^k + x^k p^{k\prime})\frac{dx^k}{dr^k}} \qquad (17b)$$

Since $\gamma = 1$, we know from (10a), (10b), (11) and (12) that $\frac{dx^k}{dr^k} < 0$, $\frac{dx^{k*}}{dr^k} > 0$, signing the second term in (17) positive for n^k sufficiently small. Assuming that the relative number of domestic firms versus foreign competitors is relatively small, the optimal premium rate contains a subsidy. However, this subsidy element decreases if expected default is large (tending to zero for $E\lambda^k \to 1$) while at the same time risk considerations dictate a higher premium rate.

4. EXPORT INSURANCE, STRATEGIC EXPORT PROMOTION AND OFFICIAL DEVELOPMENT ASSISTANCE (ODA)

In this section we argue that, besides their involvement in strategic export promotion, governments may still grant export subsidies to insured exporters if some special political interest in the importing country is reflected in their objective function. As these benefits are not provided for (static) domestic welfare improvements in the traditional sense, and this type of policy may generate positive welfare effects in the recipient country we label this motive as politically inspired development aid. Evidently, the reasonwhy such aid is granted lies in the likelihood that the beneficial welfare effects in the developing country may (partly) spillover to the donor country in the long run. The results of comprising this political issue in export insurance are consecutively discussed with perfect competition in the export market and when domestic exporters are competing in a Cournot fashion with foreign firms in a third market with oligopolistic features.

4.1. ODA in public export insurance

Suppose the domestic government has some political interests in a particular export market. Providing cheap insurance to its risk averse domestic exporters gives the latter a competitive edge in that region. In other words, it gives them the opportunity to "tie" foreign consumers to the cheaply imported products. Obviously, this politically inspired consumer-tying is only valid to the extent that foreign buyers in the export market value those products. One way of modelling this motive is by including the foreign consumer surplus engendered from consuming the product involved into the objective function of the public insurance agency. Focusing on the effect of this motive on premium rating we return to the initially assumed market structure of perfect competition in the third market, hence removing any reason for strategic intervention. However, we now assume that the exporting economy may be large enough to affect its terms of trade. This is reasonable since the domestic government is more likely to include a political concern for the developing country involved if its export products are important for the domestic exporting industry.

Formally, the official insurer's objective function is hence formulated as:

$$\begin{aligned} &\max_{r^k,\gamma^k} \; n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k + a\left[V^{**}(E^{**}, p) - E^{**}\right] \\ &s.t.\left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k\right]_{|r^k = E\lambda^k} \geq \max_{\gamma^k}\left[n^k EV^k - n^k(E\lambda^k - r^k)\gamma^k px^k\right]_{|r^k = E\lambda^k} \end{aligned} \tag{18}$$

The squared bracketed term in the objective function in (18) denotes the consumer surplus from buying the (domestically subsidised) product. ** indicates variables associated with consumers in the export market with V** and E** standing for the indirect utility function and the expenditure level respectively. a is a positive constant parameter symbolising the weight of the political aid motive in the agency's general objective formulation.

Proposition 5: *There is more scope for ODA-related subsidies to a particular destination if the product involved is provided by few domestic exporters and is important enough in the importing country's import package.*

Proof:

Again, the efficient-insurance constraint guarantees full coverage ($\gamma^k = 1$), reducing the first order condition of (25) with respect to the premium rate to

$$n^k(1-E\lambda^k)p'(n^k-1)x^k\frac{dx^k}{dr^k}-n^k(E\lambda^k-r^k)(p'x^k+p)\frac{dx^k}{dr^k}\ -ap'X^{**}n^k\frac{dx^k}{dr^k}=0 \quad (19)$$

After some rearranging, we obtain:

$$r^k = E\lambda^k - \frac{(n^k-1)p^{k\prime}x^k(1-E\lambda^k)}{(p^{k\prime}x^k+p^k)} + \frac{a^k p^{k\prime}X^{**}}{(p^{k\prime}x^k+p^k)} \quad (20)$$

The second term of (20) clearly reflects the terms of trade effect, pleading for a premium tax and decreasing with the number of domestic firms. The last term of (20) is the (unambiguously signed) ODA-inspired premium subsidy. This subsidy element is large if the foreign import demand (X^{**}) is large or, alternatively, when there is a broad basis for consumer-tying.

The subsequent section presents the derivation of the optimal export insurance terms when the public insurer's objective entails a combination of the insurance motive, the strategic goal underlying export promotion and the political imperative of providing a particular form of ODA via export insurance to developing countries.

4.2. Efficient coverage, strategic export promotion and ODA in official export insurance

An official export insurance agency blending the motives of efficient insurance provision, strategic export promotion and politically coloured ODA-granting faces the same optimisation scheme as in (25), but now firms have oligopolistic market power.

Proposition 6: *Public export insurance contracts for a particular export destination should not contain ODA-related subsidies and strategic subsidies simultaneously.*

Proof:

Since efficient insurance requires complete coverage, $\gamma^k = 1$, the ultimately obtained premium rate of the optimal insurance contract for exports to region k is equal to

$$r^k = E\lambda^k - \frac{(1-E\lambda^k)x^k p^{k\prime}\left[n^{k*}\frac{dx^{k^*}}{dr^k} + (n^k - 1)\frac{dx^k}{dr^k}\right]}{(p^k + x^k p^{k\prime})\frac{dx^k}{dr^k}} + a^k \frac{x^k p^{k\prime}\left[n^{k*}\frac{dx^{k^*}}{dr^k} + n^k \frac{dx^k}{dr^k}\right]}{(p^k + x^k p^{k\prime})\frac{dx^k}{dr^k}} \quad (21)$$

While the second term of expression (21) represents the strategic premium element, the third term stands for the ODA-related subsidy. If the export market is oligopolistic, the strategic premium subsidy is large if the number of foreign firms relative to domestic ones is high. However, the converse is true for the aid-inspired premium subsidy. A subsidy-induced increase in domestic exports to market k could be more than compensated by a foreign export contraction to that market (i.e., if $\left|n^{k*}\frac{dx^{k*}}{dr^k}\right| > \left|n^k \frac{dx^k}{dr^k}\right|$), culminating in a price raise of the imported product for local consumers . In fact, if foreign firms are relatively well represented in the third market, domestic export premium subsidies may harm consumers in the importing country. Then, the political ODA motive would suggest a domestic premium tax for exports to region k. This follows directly from the fact that the actual price in the importing country will mainly be the result of the strategic interactions between the competing firms.

Meanwhile, the case for profit-shifting subsidies becomes stronger if foreign firms are relatively well present in the market involved. Hence, we conclude that political export insurance subsidies are more likely to flow to countries where domestic exporters are dominant, while strategic premium reductions will be directed to destinations where domestic exporters face fierce competition from foreign rivals.

CONCLUSION

In this paper we examined the provision of export insurance when the public export insurance agency is not only concerned about efficient risk coverage of export contracts involving a risk of default, but also uses its insurance program for strategic export promotion purposes, and is in addition committed to politically motivated

grants to developing countries. More particularly, the implications of these potential policy motives behind subsidy-incorporated export insurance schemes are investigated.

Providing efficient risk coverage implies full insurance at fair premium rating for all export destinations. Yet, if the objective function of the official insurer contains additional motives framing in the general policy of the government, fair premium rating will not prevail. Including strategic export promotion and politically motivated development aid is likely to result in export insurance subsidisation. However, the scope for this type of subsidisation is limited.

First, *strategic* premium subsidies can only be considered for oligopolistic export markets where a few domestic exporters compete with foreign rivals.

Second, the model reproduces the well established results in the literature that a premium subsidy is advised only with complete coverage being offered by the domestic government and the foreign competing economy. Still, even with complete insurance, expected profits of firms are decreasing as the expected default rises. Therefore, the scope for profit shifting subsidies will be relatively narrow for export markets with a high default rate. This conclusion is reinforced if coverage for high-risk regions is incomplete. Then, premium subsidies will enhance the variability of domestic profits, thereby mitigating the positive strategic effect on expected profits.

Third, taxing insured exports may be preferable to subsidising if foreign exporters are offered merely partial coverage by their respective official insurance agencies.

Fourth, the scope for politically dictated development assistance via export insurance subsidisation is limited too. A necessary condition for ODA-related subsidies is that domestic exporters have sufficient market power in a particular developing country. Only then, the premium subsidy embodied in the insurance contract generates a lower import price, leading to a consumer surplus enlargement in the importing developing country.

Finally, in export markets where firms interact strategically, the motives of profits shifting and political ODA influence the optimal export insurance subsidisation in opposite ways.

Summarising, although efficient export insurance would imply full coverage contracts at fair premium rates, the actual policy of official export insurance agencies is often affected by general goals of the domestic government. The practice of export insurance subsidisation is likely to be engendered by such a multiple-goal objective function. The relevance of each of these motives will generally differ across export destinations. Moreover, alternative goals will have opposite implications for premium rating. Oligopolistic export markets with a low default risk offer a relatively wide scope for strategic subsidisation. Conversely, high-risk destinations in developing countries where exports from the domestic economy account for a large share of local import demand are more likely to benefit from ODA-inspired premium subsidies.

Naturally, the regional pattern observed in export insurance subsidisation is likely to stem from a combination of the three motives discussed here.

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