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Export Opportunities of Thailand:
A Decision Support Model Approach[1]

Ludo Cuyvers[2]

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1. Introduction

Public export promotion in industrial and developing countries should be basically concerned with the creation of a public good, by pooling of information, and by enhancing the knowledge and capabilities in the field of international trade relations. This can be achieved using various instruments, such as the organisation of outgoing trade missions, centralised information gathering and dissemination, the provision of incentives to acquire more detailed market knowledge through trade fair participation of companies, international marketing training, etc. To the extent that these activities are providing information or are creating know-how that is non-rival and non-excludable (Romer, 1990),[1] the conditions of public good will be fulfilled. This in turn will imply that a public export promotion body, in pursuing these activities, can increase national welfare. In assessing this welfare-increasing effect, one should evidently take into account the social costs involved, which depend on the competence and personal interests of the civil servants, the degree of flexibility of the organisation, the degree of behavioural inertia of people and organisational structures, the quality of the communication channels with the private sector, etc. (see e.g., Hogan, Keesing and Singer, 1991).

Thailand has recently been facing a dramatic fall in its exports and in the Thai press the call for more government support in foreign markets has been voiced louder and louder. As a member of the World Trade Organization, however, the country will have to take into account the various provisions of the Uruguay Round Agreements on subsidies or trade related investment measures.[2] What are, however, Thailand's potentials of improving its export records using the traditional tools of public export promotion ? It is clear that due to a budget constraint these potentials are limited and that, therefore, severe selectivity is required in Thailand's export promotion strategies. This selectivity should be based on a thorough analysis of the potential export opportunities.

From a methodological point of view, the investigation of potential export opportunities of a country is not different from the market research of a company. Therefore, economic policy makers and export promotion agencies, and their respective advisers, have a large tool kit of research instruments at their disposal for assessing the foreign market potentials of the locally produced goods.

In a recent paper (Cuyvers, De Pelsmacker, Rayp & Roozen, 1995), a decision support model for the planning and the assessment of export promotion activities was developed and applied to Belgium. This model consists of four consecutive steps or "filters", leading to a list of realistic export opportunities in countries that have sufficient macroeconomic strength and performance. In the present paper, we report the results of an attempt to use this decision support model, adapted for an analysis of foreign trade data at the SITC 4-digit level, to the case of Thailand. For the reader's convenience, an appendix provides a summary of the selection criteria and definitions used, and shows a list of the symbols.

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[1] According to Romer, goods or services are non-rival and non-excludable if their consumption by one agent does not constrain its consumption by others.

2.   Which countries show preliminary export opportunities for Thai products?

The first step in the analysis consists in determining the countries that in later steps merit closer investigation as potential markets. Interesting markets should show relatively lower commercial and political risks, together with market potential in terms of economic growth and/or size.

Commercial and political risks involved in doing business with foreign countries can be assessed using parameters such as, e.g., the current account deficit as a percentage of GDP, the external debt service as a percentage of export earnings, the stock of foreign debts of a country in proportion to its GDP, etc., as well as the past and future change of these parameters. As this analysis is the same from the point of view of Belgium as that of Thailand, and as in Cuyvers, De Pelsmacker, Rayp and Roozen (1995), the country credit ratings of the *Office National du Ducroire (OND)*, the Belgian public credit insurance agency, was used, we have taken as input the results of the updated OND credit rating model. In this way, the 83 countries belonging to the two highest credit risk groups of the OND were left out, leaving 160 countries.

For 90 of these 160 countries data on GNP and GNP per capita between 1991 and 1993 could be collected.[3] No or incomplete data were available for 70, mostly small countries, such as for instance Abu Dhabi, Bermuda, Curacao, Dubai, Macao, Monaco, and others. In order to select among these 90 countries the more interesting markets, a cut-off point χ is calculated for the GNP and GNP per capita values, such that

$$\chi = \overline{X} - \alpha\sigma_{Xj}   [1]$$

with $\overline{X}$ the average of X (GNP or GNP per capita),

σ_{Xj} the standard deviation of X,

α a factor which is determined in such a way that small changes in its value only marginally affect the number of countries screened out, or when within a small range of values for α that have this property, a comparable number of countries is selected for both criteria.

Countries are selected when the condition applies :

$$X_j \geq \chi   [2]$$

(GNP and GNP per capita, respectively, larger than or equal to the cut-off value) for at least two consecutive years of the most recent three-year period for which data are available.

Here $\alpha = 0.255$ is chosen, in which case 39 countries meet the condition [2] for GNP and GNP per capita, respectively. The union of these two sets of 39 countries consists of 53 countries, that merit further in-depth investigation. Among the countries that are not fulfilling condition [2] we mention, e.g., some East- and Central-European countries (such as Bulgaria, Hungary or Czechoslovakia), a few Asian Less Developed Countries (Nepal, Papua New Guinea and Sri Lanka), some North-Afican

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[2] On this subject, the reader is referred to Cuyvers, De Lombaerde, Dewulf and Van Den Bulcke (1996).
[3] These macro-economic data are from *The World Bank Atlas* of 1991, 1992, 1993, 1994 and 1995, *International Financial Statistics 1993* of the International Monetary Fund, and *Statistical Yearbook of the Republic of China, Taipe, 1993.* The World Bank Atlas is using GNP figures in purchasing power parity (PPP). As data for Taiwan, Saudi Arabia and Brunei were not available, we have used GNP figures in PPP published in *Asiaweek.*

countries (Morocco, Tunisia), a few Latin-American countries (Chile, El Salvador, Paraguay and Uruguay) and Caribbean islands (such as the Dominican Republic, Jamaica, Granada or Trinidad and Tobago). Among the countries that pass the test of this first stage we find the OECD countries, the ASEAN countries (except Vietnam, that until recently belonged to the group of highest credit risk countries of the OND), China, Taiwan, Hong Kong, Korea, India, South Africa, Saudi Arabia and the Emirates, New Zealand and Australia, Brazil, etc.

3. Finding possible export opportunities

In the next stage of the assessment of Thailand's export opportunities, data on imports are analysed for each country selected in the previous section. The data used are at the SITC (Revision 2) 4-digit level.[4] As no trade data are available for Luxemburg and Puerto Rico, the further analysis relates to 51 countries in stead of 53. In total, 27,304 trade figures (henceforth called product/country combinations) will be analysed using growth of imports and import market size as criterion, with the purpose to eliminate the non-interesting product/market combinations.

As in the previous step (see section 2), a cut-off point is calculated for each product group at SITC 4-digit level, using for each criterion the average, the standard deviation and a parameter α, the value of which has to be determined. The cut-off points that are finally used also take into account whether or not Thailand is relatively specialised in the respective products or not, as the so-called "revealed comparative advantage" (RCA) index indicates.[5] The rationale is that if Thailand is relatively specialised in a particular product i (RCA$_i$ > 1), one may allow the selection of interesting markets to be more lax, than if Thailand is not specialised in it (RCA$_i$ 1).

Growth of imports of each product group considered has an important time dimension. As far as short term growth is concerned, the simple percentage growth rate of the imports of each product group j in country i is calculated for 1993. Long-term growth, however, stretches over a longer period and is calculated as the compounded annual growth rate of imports of product group j in country i between 1989 and 1993.

In order to take into account the degree of specialisation in the exports of Thailand of a product group j, we define a scaling factor s_j, following Willemé and Van Steerteghem (1993), such that:

$$s_j = 0.8 + \frac{1}{(RCA_j + 0.85)e^{(RCA_j - .01)}} \quad [3]^6$$

The cut-off point for imports growth of product group j is then

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[4] The data are from the United Nations, as made availbale on CD-ROM *World Trade Data Base* by Statistics Canada.

[5] The RCA index is defined as follows $\frac{X_{Thailand}^j / X_{World}^j}{X_{Thailand}^{tot} / X_{World}^{tot}}$, with X^j the exports of the country/world of product group j, and X^{tot} the total exports of the country/world of all product groups. See Balassa (1965).

[6] The properties of the scaling factor are as follows : $s_j = 2$ for RCA = 0, $s_j = 1$ for RCA = 1, $s_j \approx 0.848$ for RCA = 2 and $s_j = 0.8$ for RCA = ∞.

$G_j = g_{World,j}.s_j \quad$ if $g_{World,j} > 0$, and
$G_j = g_{World,j}/s_j \quad$ if $g_{World,j} < 0$ (see Willemé & Van Steerteghem, 1993 : 6-7)[7]

Hence, the market in a particular country i for product group j will be deemed sufficiently promising, iff :

$$g_{i,j} \quad G_j \quad [4]$$

This procedure is applied to calculate both short-term and long-term cut-off growth rates.

Consider for instance a 1993 growth rate of world imports of a product group j of 20 % and a scale factor of 2, in which case we will select only these countries with a 1993 growth in their imports of product group j of 40 % or more. If, however, world imports of product group j are declining with 40 % in 1993, the cut-off point will be -10 %.

For market size of country i for product group j we, obviously, have not taken the imports value of j in i as a proxy, but rather the share of this market in the world imports of that product group. This criterion enables to also select markets that do not show growth, but are interesting markets because of their size. Taking into account the degree of specialisation of Thailand in a particular product group j, the cut-off point for relative import market size S_j is determined as follows:

$$S_j = 0.02 \ M_{World,j} \ \text{ if RCA}_i > 1$$

$$S_j = [(3 - RCA_i)/100].M_{World,j} \ \text{ if RCA}_i \quad 1$$

with $M_{World,j}$, the aggregate imports in the world of product group j. As can easily be seen, the cut-off points for relative import market size will vary between 3 and 2 % according to the RCA.

Therefore, the relative import market size of country i for product group j will be considered as sufficiently large, and consequently, the product/country combination will be selected as possible export opportunity for Thailand if:

$$M_{i,j} /M_{world,j} \quad S_j \quad [5]$$

Each product/country combination is now assigned a 1 or a 0, according to condition [5] being fulfilled or not. The distribution of the 27,307 product/country combinations according to the various combinations of fulfillment or non-fulfillment of conditions [4] for short-term and long-term market growth, and of [5], is shown in Table 1.

Following Cuyvers, De Pelsmacker, Rayp and Roozen (1995 : 179) we will only consider further the product/country combinations that show **either** sufficient relative import market size, **or** sufficiently high import market growth in the short run and in the long run. This implies that the product/country combinations in the categories 0, 1 and 2 are not selected, and that this stage of the selection process ends up with 10,760 possible export opportunities for Thailand.[8]

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[7] In the original version of the decision support model a different procedure was followed. See Cuyvers, De Pelsmacker, Rayp & Roozen, 1995 : 179, Table 1.
[8] Each criterion considered separately, will in a number of cases lead to distorted results. In combination, however, there is much less room for anomalies, although the fact that we are not considering e.g. category 1 or 2 in

Table 1: **Distribution of product/country combinations according to short-term import market growth, long-term import market growth, and relative import market size.**

Category	Short-term market growth	Long-term market growth	Relative market size	Number of product/country combinations
0	0	0	0	10,377
1	1	0	0	2,952
2	0	1	0	3,215
3	0	0	1	1,807
4	1	1	0	5,870
5	1	0	1	770
6	0	1	1	781
7	1	1	1	1,532
				27,304

4. The selection of realistic export opportunities

The purpose of the third stage of the decision support model used, is to analyse further the 10,760 product/country combinations selected in the previous stage according to their "accessability" for Thai exporters. This "accessability" depends on trade restrictions and other barriers to entry, which can prevent the Thai exporters of a product group j to acquire a significant market position in country i. The decision support model considers two such barriers : the degree of market concentration and import restrictions.

Market concentration is measured using the well-known Herfindahl-Hirschmann index (Hirschmann, 1964):

$$HHI_{i,j} = \sum_{k} \left(\frac{X_{k,i,j}}{M_{tot,i,j}} \right)^2$$

with $X_{k,i,j}$ country's k's exports of product group j to country i

  $M_{tot,i,j}$ country i's total imports of product group j

It is assumed that if an import market is relatively highly concentrated, i.e. supplied by a few countries, it will be more difficult for Thai exporters of the product group at issue to penetrate that market, than if an import market shows a relatively low HHI.

Import restrictions are brought into the picture indirectly, by using as proxy the combined relative market share $m_{i,j}$ of the other ASEAN countries (except Brunei and Vietnam) for product i in country j:

$$m_{i,j} = \frac{\dfrac{X_{Indo,i,j}}{X_{Indo,j}} + \dfrac{X_{Mal,i,j}}{X_{Mal,j}} + \dfrac{X_{Fil,i,j}}{X_{Fil,j}} + \dfrac{X_{Sing,i,j}}{X_{Sing,j}}}{\dfrac{X_{World,i,j}}{X_{World,j}}}$$

Table 1 as interesting export opportunities remains purely arbitrary. This degree of arbitrariness is the price that we pay for selectivity.

which is an indicator of "revealed absence of barriers to trade". The rationale for using $m_{i,j}$ is that when the fellow ASEAN countries of Thailand together have a sufficiently large relative market share in country j for product group i, there is *a priori* no reason why Thailand would not be able to penetrate the same market.

Contrary to the original decision support model, we have introduced here a third criterion. In this third step, we only consider product groups j for which Thailand shows an $RCA_j > 0.02$. This criterion enables us to reduce unnecessary time-consuming testing of likely irrelevant product groups, and to delete 2,744 product/country combinations from these selected in the foregoing step.

In order to determine whether $HHI_{i,j}$ is sufficiently low, cut-off points are calculated analogously to the procedure outlined in section 2, using average, standard deviation σ and a parameter α to be determined. Therefore the cut-off point for HHI is defined as:

h_k =   - $0.05\alpha\sigma_h$, for product/country combinations of category 3 (see Table 1),

h_k =   + $0.05\alpha\sigma_h$, for product/country combinations of category 4, 5 or 6 (see Table 1)

h_k =   + $0.15\alpha\sigma_h$, for product/country combinations of category 7 (see Table 1)

$$h_k \quad HHI_{i,j} \quad [6]$$

A visual inspection of the number of product/country combinations that are fulfilling condition [6] does not show a "jump" in that number for varying Æ.[9] We therefore followed a numerical approach to determine such a "jump", which finally leads to Æ = 11.4.[10] Using condition [6] we then calculated the cut-off point, which is h_k = 0.194 (k=category 3), 0.451 (k = category 4, 5 or 6) and 0.709 (k = category 7). Hence, in relatively large markets, we require the degree of concentration of that particular market, measured by HHI to be not higher than 19.4 %. In relatively large and growing markets the degree of concentration is allowed to be higher, and in the most interesting markets (relatively large and growing both in the short and in the long run) the cut-off point is even at 70.9 % concentration.

Next, we proceed by calculating the index of "revealed absence of barriers to trade" $m_{i,j}$. This index shows the share of Thailand's fellow ASEAN countries' exports to country i of product group j in their respective exports of product group j, corrected for the share of that country i in world trade of product group j. As no Æ could be determined unambiguously, we were compelled to use the rule of thumb

$$m_{i,j} \quad 0.95 \quad [7]$$

which implies that, apart from a margin of error of 5 %, Thailand is assumed to have no "revealed barriers to trade" in a market if **at least one** of the four other ASEAN countries has a "revealed comparative advantage" in exporting to that market.

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[9] That number increases monotonously from 5,176 (Æ=0) to 5,973 (Æ=11.7), when it is reaching a maximum.

[10] We have calculated the change in the number of product/country combinations by varying Æ with 0.1 in intervals going from 1 to 4. By considering then the respective sums of these changes per unit of Æ, the smallest sum is found at Æ = 12.5 and an Æ-interval of 2.2. We can then assume that a "jump" in the number of product/country combinations which takes place at Æ = 11.4 (= 12.5 - 2.2/2) will have the smallest impact on the results. We are grateful to Mr. Glenn Rayp for having suggested this approach.

Applying condition [6] leads to 5,963, and condition [7] to 3,441 potential export opportunities out of the 8,016 product/country combinations that were selected in the previous step. Following the original decision support model (Cuyvers, De Pelsmacker, Rayp & Roozen, 1995 : 181) we only consider as realistic export opportunities these that fulfill **both** condition [6] and [7]. This is the case for 2,962 product/country combinations.

Figure 1 illustrates and summarises the subsequent steps in the selection process followed.

Figure 1: Selection of realistic export opportunities for Thailand
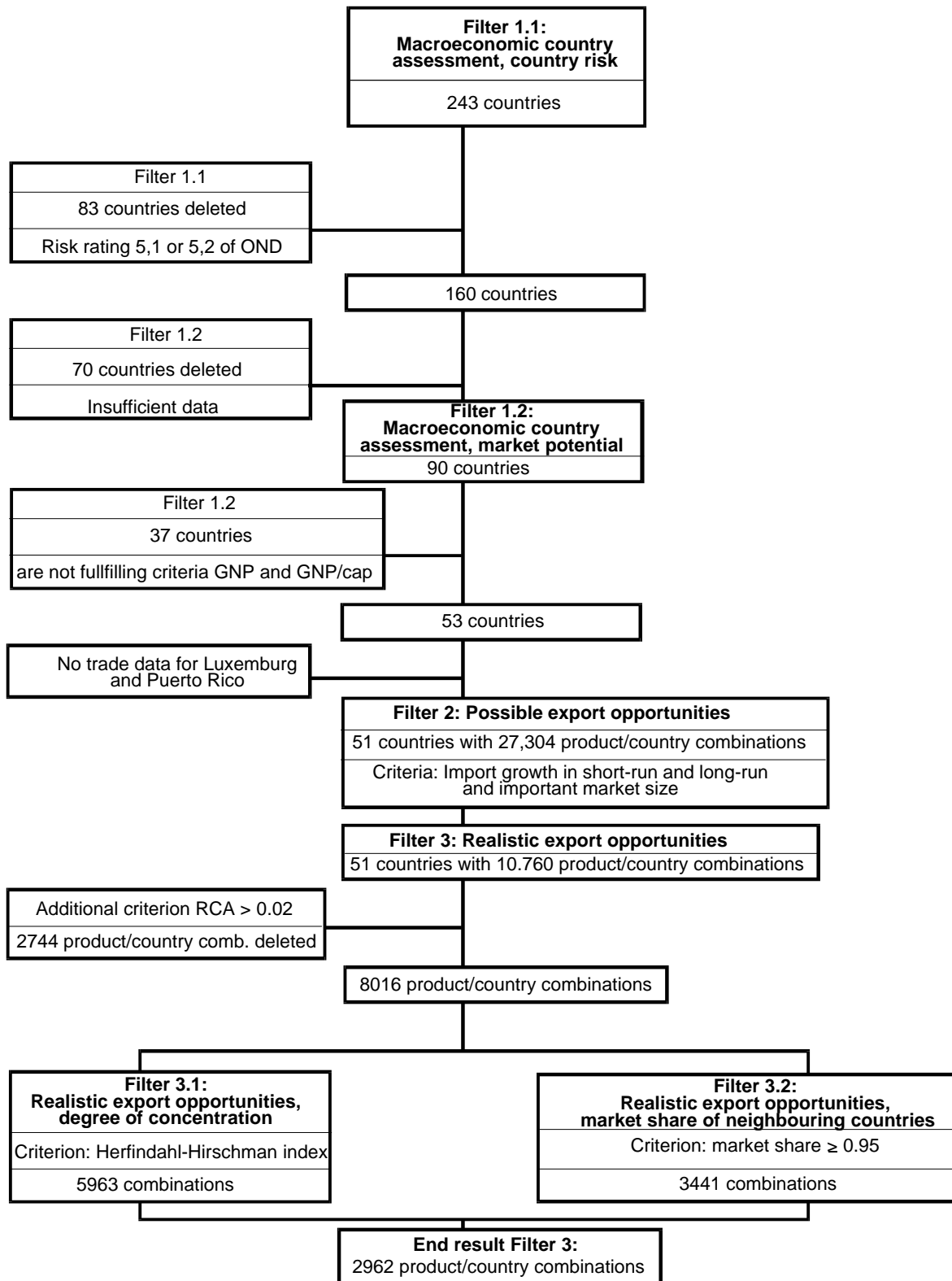
5.   An analysis of Thailand's realistic export opportunities

The 2,962 realistic export opportunities that are detected are analysed in this section according to their product group, the geographical markets involved and some major characteristics of these markets.

Table 2 shows the product composition of the set of realistic export opportunities.

Table 2:   Product composition of Thailand's realistic export opportunities

SITC	Product group	Number of export opportunities
011	Meat, edible meat offals, fresh, chilled or frozen	9
014	Meat and edib. offals, prep./pres., fish extracts	7
022	Milk and cream	9
025	Eggs and yolks, fresh, dried or otherwise preserved	4
034	Fish, fresh (live or dead), chilled or frozen	34
035	Fish, dried, salted or in brine, smoked fish	9
036	Crustaceans and molluscs, fresh, chilled, frozen, etc.	16
037	Fish, crustaceans and molluscs, prepared or preserved	22
042	Rice	7
045	Cereals, unmilled (no wheat, rice, barley or maize)	1
046	Meal and flour of wheat and flour of meslin	2
047	Other cereal meals and flours	6
048	Cereal prepar. and preps. of flour of fruits or vegetables	33
054	Vegetab., fresh, chilled, frozen/pres., roots, tubers	20
056	Vegetab., roots and tubers, prepared/preserved, n.e.s.	21
057	Fruits and nuts (not incl. oil nuts), fresh or dried	14
058	Fruits, preserved, and fruit preparations	41
061	Sugar and honey	17
062	Sugar confectionery and other sugar preparations	7
071	Coffee and coffee substitutes	14
073	Chocolate and other food preptns, containing cocoa	8
074	Tea and mate	10
075	Spices	19
081	Feed. stuff for animals (not incl. unmilled cereals)	16
098	Edible products and preparations n.e.s.	11
111	Non-alcoholic beverages, n.e.s.	5
112	Alcoholic beverages	8
121	Tobacco, unmanufactured ; tobacco refuse	20
211	Hides and skins (except furskins), raw	6
222	Oil seeds and oleaginous fruit, whole or broken	5
223	Oil seeds and oleaginous fruit, whole or broken	5
232	Natural rubber latex, nat. rubber and sim. nat. gums	16
233	Synth. rubb. lat., synth. rubb. and reclaimed, waste scrap	7
245	Fuel wood (excl. wood waste) and wood charcoal	7
246	Pulpwood (incl. chips and wood wate)	2
248	Wood, sumply worked, and railway sleepers of wood	14
251	Pulp and wate paper	8
261	Silk	6
263	Cotton	4
264	Jute and other textile bast fibres, n.e.s., raw/processed	3
265	Vegetable textile fibres and waste of such fibres	5
266	Synthetic fibres suitable for spinning	11
268	Wool and other animal hair (excl. wool tops)	1
269	Old clothing and other old textile articles, rags	3
273	Stone, sand and gravel	8
277	Natural abrasives, n.e.s. (incl. industrial diamonds)	7
278	Other crude minerals	29
282	Waste and scrap metal of iron or steel	6
287	Ores and concentrates of base metals, n.e.s.	6
288	Non-ferrous base metals, waste and scrap, n.e.s.	12
289	Ores and concentrates of precious metals, waste, scrap	4
291	Crude animal materials, n.e.s.	19
292	Crude vegetable materials, n.e.s.	56
334	Petroleum products, refined	17
335	Residual petroleum products, n.e.s. and relat. materials	8
341	Gas, natural and manufactured	3
411	Animal oils and fats	4
423	Fixed vegetable oils, soft, crude, refined/purified	4
424	Other fixed vegetable oils, fluid or solid, crude	14
431	Animal and vegetable oils and fats, processed and waxes	12
512	Alcohols, phenols, phenol alcohols and their derivat.	20
513	Carboxylic acids and their anhydrides, halides	14

SITC	Product group	Number of export opportunities
514	Nitrogen function compounds	8
515	Organo-inorganic and heterocyclic compounds	5
516	Other organic chemicals	3
522	Inorganic chemical elements, oxides and halogen salts	35
523	Other inorganic chemicals	9
533	Pigments, paints, varnishes and related materials	25
541	Medicinal and pharmaceutical products	18
551	Essential oils, perfume and flavour materials	9
553	Perfumery, cosmetics and toilet preparations	6
554	Soap, cleansing and polishing preparations	16
562	Fertlizers, manufactured	6
582	Condensation, polycondensation and polyaddition prod.	11
583	Polymerization and copolymerization products	11
591	Disinfectants, insecticides, fungicides, weed killers	2
592	Starches, inulin and wheat gluten, albuminoidal subst.	20
598	Miscellaneous chemical products, n.e.s.	14
611	Leather	9
612	Manufactures of leather/of composition leather n.e.s.	13
621	Materials of rubber (e.g., pastes, plates, sheets, etc.)	15
625	Rubber tyres, tyre cases, etc. for wheels	20
628	Articles of rubber, n.e.s.	23
634	Veneers, plywood, improved or reconstituted wood	29
635	Wood manufactures n.e.s.	33
641	Paper and paperboard	31
642	Paper and paperboard, cut to size or shape	26
651	Textile yarn	49
652	Cotton fabrics, woven	18
653	Fabrics, woven, of man-made fibres	27
654	Textile fabrics, woven, oth. than cotton/man-made fibr.	6
656	Tulle, lace, embroidery, ribbons and other small wares	10
657	Special textile fabrics and related products	35
658	Made-up articles, wholly/chiefly of textile materials	41
659	Floor coverings, etc.	14
661	Lime, cement, and fabricated construction materials	19
662	Clay construct. materials and refractory constr. mater.	13
663	Mineral manufactures, n.e.s.	33
665	Glassware	12
666	Pottery	42
667	Pearls, precious and semi-prec. stones, unwork./worked	10
671	Pig iron, spiegeleisen, sponge iron, iron or steel	7
672	Ingots and other pri;ary forms, of iron or steel	3
673	Iron and steel bars, rods, angles, shapes and sections	10
674	Universals, plates and sheets, of iron and steel	12
677	Iron/steel wire/wheth./not coated, but not insulated	6
678	Tubes, pipes and fittings, of iron or steel	27
679	Iron and steel castings, forgings and stampings, rough	18
681	Silver, platinum and oth. metals of the platinum group	3
682	Copper	7
684	Aluminium	6
685	Lead	1
686	Zinc	3
689	Miscell. non-ferrous base metals employed in metallurgy	8
691	Structures and parts of structures, iron, steel, aluminium	6
692	Metal containers for storage and transport	6
693	Wire products and fencing grills	15
694	Nails, screws, nuts, bolts, etc. of iron, steel, copper	11
695	Tools for use in hand or in machines	28
696	Cutlery	8
697	Househols equipment of base metals, n.e.s.	12
699	Manufactures of bese metal, n.e.s.	51
712	Steam and other vapour power units, steam engines	3
713	Internal combustion piston engines and parts	13
714	Engines and motors, non-electric	3
716	Rotating electric plant and parts	10
721	Agricultural machinery and parts	10
722	Tractors, fitted or not with power take offs, etc.	3
723	Civil engineering and contractors plant and parts	6
724	Textile and leather machinery and parts	14
725	Paper and pulp mill mach., mach. for manuf. of paper	7
726	Printing and bookbinding machinery and parts	7
727	Food processing machines and parts	5
728	Mach. and equipment specialized for particular ind.	23
736	Mach. tools for working metal or met. carb., parts	16
737	Metal working machinery and parts	4

SITC	Product group	Number of export opportunities
741	Heating and cooling equipment and parts	29
742	Pumps for liquids, liq. elevators and parts	8
743	Pumps and compressors, fans and blowers, centrifuges	11
744	Mechanical handling equip. and parts	15
745	Other non-electrical mach. tools, apparatus and parts	8
749	Non-electrical parts and accessories of machines	37
751	Office machines	26
752	Automatic data processing machines and units thereof	11
759	Parts of and accessories suitable for 751 or 752	2
761	Television receivers	15
762	Radio-boradcast receivers	13
764	Telecommunications equipment and parts	44
771	Electrical power machinery and parts thereof	12
772	Elect. app. such as switches, relays, fuses, plugs, etc.	12
773	Equipment for distributing electricity	12
774	Electric apparatus for medical purposes (radiolog)	5
775	Household type, electr. and non-electrical equipment	47
776	Thermionic, cold and photo-cathode valves, tubes, parts	16
778	Electrical machinery and apparatus	45
782	Motor vehicles for transport of goods/materials	7
784	Parts and accessories of 722, 781, 782, 783	5
785	Motorcycles, motor scooters, invalid carriages	14
786	Trailers and other vehicles, not motorized	7
792	Aircraft and associated equipment and parts	7
793	Ships, boats and floating structures	7
812	Sanitary, plumbing, heating, lighting fixtures	22
821	Furniture and parts thereof	18
831	Travel goods, handbags, brief cases, purses, sheats	17
842	Outer garments, men's, of textile fabrics	53
843	Outer garments, women's, of textile fabrics	46
844	Under garments of textile fabrics	25
845	Outer garments and other articles, knitted	41
846	Under garments, knitted or crocheted	22
847	Clothing accessories of textile fabrics	27
848	Art. of apparel and clothing accessories, no textile	47
851	Footwear	27
871	Optical instruments and apparatus	13
872	Medical instruments and appliances	11
874	Measuring, checking, analysing instruments	43
881	Photographic apparatus and equipment, n.e.s.	20
882	Photographic an cinematographic supplies	6
883	Cinematograph film, exposed-developed, neg. or pos.	1
884	Optical goods, n.e.s.	20
885	Watches and clocks	14
892	Printed matter	32
893	Articles of materials described in division 58	32
894	Baby carriages, toys, games and sporting goods	34
895	Office and stationery supplies, n.e.s.	17
896	Works of art, collectors pieces and antiques	7
897	Jewellery, goldsmiths and other art. of precious m.	13
898	Musical instruments, parts and accessories	29
899	Other miscellaneous manufactured articles	57
931	Special transactions and commodities, not class. to kind	3
941	Animals, live, n.e.s., incl. zoo-animals	13
971	Gold, non-monetary	3

From this Table 2 it clearly appears that the realistic export opportunities of Thailand are found in a large number of product groups. Some 190 product groups at 3-digit level of SITC are mentioned. A number of these export opportunities are present in a lot of countries, as is evidenced by the associated number of product/country combinations.

Top scorers are:

- Orthopaedic appliances, surgical belts, basketwork, wickerwork, etc. of plaiting materials, small wares and toilet articles, and manufactured goods n.e.s. (SITC 899) : 57 product/country combinations,

- Overcoats and other coats for men, men's suits, trousers and other outer garments of textile fabrics (SITC 842) : 53 product/country combinations,

- Miscellaneous articles of base metal, articles of iron and steel, copper, nickel, aluminium, lead, zinc, tin and semi-manufactured goods of tungsten, molybdenum, etc. (SITC 699) : 51 product/country combinations,

- Yarn of wool or animal hair, yarn containing synthetic fibres, yarn of regenerated fibres, etc. (SITC 651) : 49 product/country combinations,

- Articles of clothing, of leather and plastic (SITC 848) : 47 product/country combinations,

- Coats and jackets, women's suits and costumes, women's dresses and skirts, all of textile fabrics (SITC 843) : 46 product/country combinations,

- Telephonic and telegraphic apparatus, microphones, loadspeakers, amplifiers, and parts (SITC 764) : 44 product/country combinations,

- Measuring, controlling and scientific instruments, and parts (SITC 874) : 43 product/country combinations,

- Tableware and other articles of porcelain, china, etc., ornaments and articles of adornment (SITC 666) : 42 product/country combinations,

- Jerseys, pull-overs, dresses, skirts, suits, other outer garments, knitted or crocheted (SITC 845) : 41 product/country combinations,

- Bed linen, table linen, toilet and kitchen linen, etc. (SITC 658) : 41 product/country combinations,

- Unfermented fruit and vegetable juices, and prepared or preserved fruit (SITC 058) : 41 product/country combinations,

The importance of a number of textile products is striking. On the other hand, the low number of agricultural products strikes the eye.

As can be seen in Table 3, the geographical markets for these export opportunities are also very diverse, with the countries of the Pacific Rim showing the largest numbers (the United States, Japan, Hong Kong, Korea, Taiwan, and the other ASEAN countries), but also some European countries (e.g., the United Kingdom, Germany, the Netherlands) coming close. As a matter of fact, the largest number of realistic export opportunities for Thailand are found in the European Union, which consists now of 15 countries (675 product/country combinations).

Table 3:   Realistic export opportunities per country

Rank	Country	# Opport.	Rank	Country	# Opport.
1.	US	237	25.	Spain	36
2.	Singapore	224	26.	Brazil	34
3.	Japan	211	27.	Saoudi Arabia	30
4.	Hong Kong	189	28.	South Africa	29
5.	China	164	29.	Brunei	27
6.	United Kingdom	151	30.	Colombia	17
7.	Korea	128	31.	Israel	17
8.	Germany	125	32.	Cyprus	15
9.	Philippines	119	33.	Qatar	15
10.	Taiwan	115	34.	Ireland	12
11.	Indonesia	111	35.	Switzerland	12
12.	Malaysia	108	36.	Bahrein	11
13.	Netherlands	107	37.	Austria	10
14.	France	86	38.	Mexico	10
15.	United Arab. Em.	85	39.	Poland	10
16.	Italy	83	40.	Sweden	10
17.	Australia	67	41.	Greece	7
18.	Pakistan	54	42.	Malta	5

19.	Canada	53	43	Portugal	5
20.	Nieuw Zealand	51	44.	Norway	4
21.	India	49	45.	Denmark	3
22.	Turkey	43	46.	Finland	3
23	Oman	41	47.	Barbados	1
24.	Belgium-Lux.	38	48.	Iceland	1

As the realistic export opportunities can be further grouped according to their relative market importance for Thailand, and according to their relative size and growth rate, Table 4 depicts this grouping tentatively.

For each choosen exporting country n, we define the degree of market importance of country n's exports of product group j to country i as

$$\mu_{n,i,j} = \frac{X_{n,i,j} / X_{World,i,j}}{X_{n,j} / X_{World,j}}$$

with $X_{n,i,j}$ country n's exports of product group j to country i,

           $X_{world,i,j}$ the world's exports of product group j to country i,

           $X_{n,j}$ country n's total exports of product group j

           $X_{world,j}$ the world's total exports of product group j.

A comparison can now be made for any particular product/country combination selected in the previous section, of Thailand's $\mu_{Thailand,i,j}$ with $\mu_{Six,i,j}$, the combined degree of market importance of the six exporting countries with the largest exports of the product category to the country at issue.[11] By calculating the difference between Thailand's degree of market importance and that of the six dominant exporting countries of product group j to country i, we can now determine whether Thailand's relative market share is high or small. We, therefore, are using the following rule of thumb :

$\mu_{Six,i,j}$ - $\mu_{Thailand,i,j}$ > 3 : relatively small market share of Thailand,

1.5 < $\mu_{Six,i,j}$ - $\mu_{Thailand,i,j}$ 3 : relative market share of Thailand intermediate small,

0 < $\mu_{Six,i,j}$ - $\mu_{Thailand,i,j}$ 1.5 : relative market share of Thailand intermediate high,

$\mu_{Six,i,j}$ - $\mu_{Thailand,i,j}$ 0 : relative market share of Thailand relatively high.[12]

From Table 4, it appears that the vast majority (almost 70 %) of the realistic export opportunities found, is corresponding to product/country combinations with a relatively small market share for Thailand. Taking into account the relatively limited resources that Thailand can devote to its public export promotion activities, an obvious policy option could be not to actively promote the export opportunities in the cells 1-5 of Table 4, but rather gather and disseminate market information to the Thai exporters regarding these opportunities. It is even defensible to act accordingly regarding the export opportuni-

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[11] We have restricted the analysis to the combined degrees of market importance to 58 countries that have sufficient exports.

[12] An alternative rule would be to divide the 2,962 product/combinations in four groups that are about equal in size. This rule was used in our previous research on Belgium's realistic export opportunities (Roozen, Cuyvers, De Pelsmacker & Rayp, 1992). The upper and lower bounds for $\mu_{Six,i,j}$ - $\mu_{Thailand,i,j}$ that were found in that research, are used here for the sake of comparability, but as we will see, the groups thus determined are far from equal in size. As Belgium and Thailand are competing in the same global market, it seems defensible to use the

ties in the cells 6-10, although these opportunities could be explored further in depth using the official trade counsellors at the Thai embassies abroad and the services of Thailand's Department of Export Promotion.

At the other extreme we find the product/country combinations of cells 16-20. Since the relative market share of Thailand for these combinations is already large, a defensive strategy of "market maintenance" seems appropriate. In the Belgian case, we argued that the need of promotion into these market segments could best be judged by the exporters themselves (see Cuyvers, De Pelsmacker, Rayp & Roozen, 1995 : 184). Contrary to the Belgian case, however, it might well be that Thai exporters that are supplying these market segments are less experienced than their Belgian colleagues and still need public export promotion support here, not to mention the small and medium sized exporters.

Table 4: **Thailand's realistic export opportunities according to its relative market position and the market characteristics**

	Market share of Thailand relatively small	Intermediate small	Intermediate high	Market share of Thailand relatively high	Total
Large product/market	(CELL 1) 307	(CELL 6) 54	(CELL 11) 6	(CELL 16) 8	375
Growing (long and short term) product/market	(CELL 2) 1048	(CELL 7) 173	(CELL 12) 71	(CELL 17) 105	1433
Large product/market short term growth	(CELL 3) 162	(CELL 8) 63	(CELL 13) 44	(CELL 18) 19	288
Large product/market long term growth	(CELL 4) 153	(CELL 9) 31	(CELL 14) 13	(CELL 19) 18	215
Large product/market short and long term growth	(CELL 5) 359	(CELL 10) 153	(CELL 15) 79	(CELL 20) 60	651
Total	2065	474	213	210	2962

An active and offensive export promotion strategy of "market expansion" can be implemented by Thailand's Department of Export Promotion for the product/country combinations in the cells 11-15. In these market segments, the Thai exporters have already shown considerable success. The successes and experience gained there by the Thai exporters, however, allow further future expansion of Thailand's market shares. Thailands export promotion for these product/country combinations has to be carefully designed in order to get the most synergetic effects with the private sector's efforts.

For Thailand's export promotion policies a case can be made, however, for still higher selectivity, especially with due regard to the budget constraint and the limited resources that can be devoted to public export promotion, by taking two additional criteria into account. One criterion is the degree of homogeneity of the products. Homogeneous goods tend to be traded in well-developed international markets, where competition is primarily on a price basis. It can be argued that in such markets the marginal social benefits for exporters of export promotion will be less than in the markets of less-homogeneous goods, where non-price competition, standards, reputation, and information needs are high. If we assume for the sake of the argument, that the products of SITC 0-5 are falling in the category of relatively homogeneous goods, Thailand's export promotion institutions might better devote less attention to the 31.5 % of the product groups listed in Table 2 which belong to these SITC catego-

same criteria for comparing Belgium's and Thailand's relative market shares. However, the opposite view is equally tenable.

ries. On the other hand, access to the national markets of quite a number of these homogeneous products is restricted by technical regulations, health and safety measures, etc. , so that there is an objective need for e.g., general as well as specific information, or direct exposure of potential export-ers through trade mission or trade fair participation, and therefore for public export promotion.

Another criterion is the value-added creation in Thailand, related to the products for which realistic export opportunities were detected. As Thailand has been increasingly used as an export base by multinational companies, there is not much point in promoting exports of products that are already exported by foreign subsidiaries to other subsidiaries belonging to the same multinational group, or to promote such exports to countries that are outside the strategic scope of the multinationals at issue. Of course, if in the sectors involved, also local Thai producers are active, there still can be a good case for promoting the exports of these companies.[13] In both situations, export promotion activities in favour of product categories that fall into these categories have to be carefully planned and coordi-nated with the private sector.

Moreover, one should not forget that even in subsidiaries of multinational companies, there can be considerable room for local strategic decision-making on e.g., export destinations, depending on the availability of local competitive skills and on the importance of the local market for the group as a whole (Bartlett and Goshal, 1989: 105-113). In many industrial sectors in Thailand these skills are still underdeveloped, though not in all and they are increasing. More importantly, however, we are con-vinced that the impact of the improving local competitive skills in Thailand is further strengthened by the liberalization of intra-ASEAN trade under AFTA. For ASEAN export destinations, local strategic decision-making might well become increasingly important within the group of multinational subsidiar-ies and joint ventures in Thailand, making public export promotion in ASEAN target markets more effective than before.

6. The case of export opportunities in the European Union

With 675 export opportunities selected in the foregoing sections, the countries of the European Union are clearly a leading exporting target for Thailand. In the EU, the United Kingdom and Germany alone account for 276 export opportunities, i.e. more than the United States, Japan or Singapore, respec-tively. The European Union as a whole shows a few more export opportunities than the latter three countries taken together, but has a somewhat lower proportion of product/country combinations with a high or relatively high market importance for Thailand. Although the purpose of this paper is not to suggest export promotion strategies, we can tentatively conclude that Thailand's Export Development Committee[14] should take these differences into account.

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[13]If, however, access to export promotion benefits would be restricted to Thai companies, the Department of Ex-port Promotion of Thailand, in our opinion, would be treading on insecure ground, because of violating the spirit of the national treatment obligation of the Uruguay Round Agreements on Trade Related Investment Measures or on Subsidies.

[14] The Export Development Committee was established in 1977. It is headed since 1987 by the Deputy Prime Minister, with the Minister of Economic Affairs among the most prominent members. The EDC counts also repre-sentatives from the private sector among its members. The secretariat of the EDC is with the Department of Export Promotion.

Table 5 shows Thailand's export opportunities in the EU per member-country and the relative market importance for Thailand of the respective opportunities.

Table 5: Thailand's realistic export opportunities in the EU (numbers)

	Total	Relative low market importance (1)	Relative high market importance (2)	High market importance (3)
Austria	10	9	1	
Belgium-Lux.	38	34	3	1
Denmark	3	3		
Finland	3	3		
France	86	85	1	
Germany	125	125		
Greece	7	7		
Ireland	12	12		
Italy	83	81	2	
Netherlands	107	104	1	2
Portugal	5	5		
Spain	35	34	1	
Sweden	10	10		
UK	151	148	2	1
Total	675	660	11	4

(1) Cell 1-10
(2) Cell 11-15
(3) Cell 16-20

For most of the EU countries, Thailand's export promotion strategies should be adapted to the relatively low market importance of the export opportunities found, i.e. should be of a more passive and exploratory type, as we argued in the previous section. The Scandinavian countries (Denmark, Finland and Sweden), Greece, Ireland and Portugal (i.e. the poorest member countries) do not seem to present export opportunities with high or relatively high market importance for Thailand. It is striking that Germany only presents export opportunities, although large in number, with relatively low market importance.

The diversity of the EU markets is illustrated, by the diversity of product groups that appear as export opportunities with high or relatively high market importance for Thailand, as found in Table 6, and that call for an active and offensive export promotion strategy.

Table 6: Realistic export opportunities of Thailand in the EU with relatively high or high market importance

	Relatively high importance	High market importance
Austria	1213 Tobacco refuse	
Belgium-Lux.	2771 Industrial diamonds 6519 Yarn of textile fibres 8983 Gramophone records and similar sound recordings	762A Radio-broadcast receivers
France	8996 Orthopaedic appliances, surgical belts and the like	
Italy	0711 Coffee, whether or not roasted 625A Rubber tyres, tyre cases, etc.	
Netherlands	6664 Tableware & other articles of porcelain or china	0730 Chocolate & other food preptns. containing cocoa 6353 Builders' carpenting and joinery
Spain	0545 Other fresh & chilled vegetables	
UK	075A Spices 2232 Palm nuts & palm kernels	612A Manufactures of leather

In 1994, Thailand's Department of Export Promotion listed 15 export targets. Although the detailed information on the export promotion targets of Thailand in the EU that is needed for an in-depth analysis is lacking, a quick inspection shows that only five of these 15 targets are found among the realistic export opportunities with sufficient market importance in the EU:

- radio-broadcast receivers
- industrial diamonds
- manufactures of leather
- tableware, etc.
- rubber tyres.

Of course, if Thailand is gaining quickly competitive advantage in the production and the exporting of the other 1994 DEP export targets, an active, in stead of a more passive and exploratory export promotion strategy, can be appropriate as well.

7. Some tentative conclusions

In this paper, we have endeavoured to select the realistic export opportunities of Thailand. The methodology used was that of the decision support model developed in Cuyvers, De Pelsmacker, Rayp and Roozen (1995). In a first stage, countries showing high credit risks were deleted, after which the remaining list was analysed further according to macro-economic characteristics such as relative size of the market (measured by GNP) and relative wealth of the inhabitants (measured by GNP per capita). By defining a cut-off point for these macro-economic variables, the least interesting countries were dropped.

In a second stage, four-digit import trade data for the countries selected in the first step were investigated with respect to long-term and short-term growth and relative import market size, compared to the rest of the group of countries. The respective cut-off points used in this stage take into account the degree of specialisation of Thailand in exporting each product group considered : the selectivity is more lax for a product group for which Thailand has "revealed comparative advantage", than for other product groups.

The third stage looked at the "accessability" for Thai exporters of the product/country combinations selected in the previous stage, as measured by market concentration and an index of the "revealed absence of barriers to trade". The list of combinations thus selected according to these criteria was further grouped according to the market characteristics of long-term market growth, short-term market growth and relative market size on the one hand, and the relative market importance for Thailand on the other hand. This grouping enables an in-depth discussion to better design suitable export promotion strategies for Thailand, particularly their offensiveness and the appropriate export promotion "policy mix".

It is found that Thailand's realistic export opportunities detected relate to a large number of product groups, but are noteworthy in specific textile products and garments, as well as some technology-

intensive products. Apart from unfermented juices, processed or unprocessed agricultural products are hardly important as export opportunity. Thailand's realistic export opportunities are found in the major industrial countries, but also in the Asian NICs and the other ASEAN countries. The export opportunities for Thailand in the European Union are briefly checked with the 1994 export targets of Thailand's Department of Export Promotion. Although few targets seem to be realistic export opportunities, more in-depth research is needed to assess the DEP targets, also taking into account the quick changes in Thailand's competitive advantages.

In using four-digit trade data, the decision support model that was originally designed for data at a two-digit level, had to be adapted to suit this lower level of aggregation. One of the problems encountered was the difficulty to find "jumps" in the number of product/country combinations selected for varying selection parameters, i.e. to determine the selection parameter which only marginally affects the number of countries or product/country combinations selected. This problem was solved in this paper in a heuristic way, but further research is needed to better apply the methodology in the future.

Another problem is related to the non-availability of more recent data and, hence, to the fact that the results obtained and the selection performed, depends on trade data that are already three years old. This problem cannot be solved, implying that the application of the results of our "data filtering" to the problems of designing export promotion strategies can only be considered as one, although an important, element of the considerations of the policy-makers, the Export Development Committee and the Department of Export Promotion in Thailand.

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APPENDIX : SELECTION CRITERIA, DEFINITIONS AND VARIABLES

Filter 1.1 : Macro-economic country assessment, country risk

Country risk rating of OND < Risk rating of risk category 5,1 and 5,2 of OND

Filter 1.2 : Macro-economic country assessment, market potential

$$\chi = \overline{X} - \alpha\sigma_{Xj}$$

$$X_j \geq \chi$$

Filter 2 : Possible export opportunities

$G_j = g_{World,j} \cdot s_j$ if $g_{World,j} > 0$, and
$G_j = g_{World,j}/s_j$ if $g_{World,j} < 0$

$$s_j = 0.8 + \frac{1}{(RCA_j + 0.85)e^{(RCA_j - .01)}}$$

$g_{i,j} \quad G_j$

$S_j = 0.02\ M_{World,j}$ if $RCA_j > 1$
$S_j = [(3 - RCA_j)/100] \cdot M_{World,j}$ if $RCA_j \quad 1$
$M_{i,j}/M_{world,j} \quad S_j$

Filter 3.1 : Realistic export opportunities, degree of concentration

$h \quad HHI_{i,j}$

$h = \quad - 0.05\alpha\sigma_h$, for product/country combinations of category 3 (see Table 1),

$h = \quad + 0.05\alpha\sigma_h$, for product/country combinations of category 4, 5 or 6 (see Table 1)

$h = \quad + 0.15\alpha\sigma_h$, for product/country combinations of category 7 (seeTable 1)

$\alpha = 11.4$

Filter 3.2 : Realistic export opportunities, market share of neighbouring countries

$$m_{i,j} = \frac{\dfrac{X_{Indo,i,j}}{X_{Indo,j}} + \dfrac{X_{Mal,i,j}}{X_{Mal,j}} + \dfrac{X_{Fil,i,j}}{X_{Fil,j}} + \dfrac{X_{Sing,i,j}}{X_{Sing,j}}}{\dfrac{X_{World,i,j}}{X_{World,j}}}$$

$m_{i,j} \quad 0.95$

with :

$\quad X_j \quad$ country j's GNP or GNP per capita

$\quad \overline{X} \quad$ the average of X (GNP or GNP per capita),

$\quad \sigma_{Xj} \quad$ the standard deviation of X,

$\quad \sigma_h \quad$ the standard deviation of HHI

α   an exogeneously determined factor

χ   the cut-off value of X

$g_{World,j}$ the rate of growth of world imports of product group j

$g_{i,j}$ the rate of growth of the imports in country i of product group j

s_j a scaling factor

G_j the cut-off value for the rate of growth of imports of product group j

RCA_j the revealed comparative advantage index of Thailand in trading product j

$M_{world,j}$ the aggregate imports in the world of product group j

S_j the cut-off value of relative import market size $M_{i,j}/M_{world,j}$ of country i

$HHI_{i,j}$ the Herfindahl-Hirschmann index of country i's import market of product group j

h the cut-off value of the Herfindahl-Hirschmann index

$m_{i,j}$ the index of "revealed absence of barriers to trade" in product j in country i

$X_{.,i,j}$ neighbouring country .'s exports of product group j to country i

$X_{world,i,j}$ the world exports of product group j to country i

$X_{.,j}$ neighbouring country .'s exports of product group j

$X_{world,j}$ the world exports of product group j