



LUND UNIVERSITY  
School of Economics and Management  
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Masters' Thesis

# **PATTERNS OF TRADE AND SPECIALISATION IN ICELAND**

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## Abstract

During the last decade, Iceland experienced an impressive record of economic growth. This was made possible by a low inflation rate, low unemployment, increased stocks of foreign direct investments and expanded foreign trade. It was, however, primarily the latter two that accounted for this economic success. This thesis studies the structure and implications of Iceland's trade expansion by studying its patterns of trade and specialisation. Iceland's inter-industry trade is analysed through calculations of Balassa's index of revealed comparative advantage and show that Iceland, in accordance with Heckscher-Ohlin assumptions, exports commodities that intensively uses the country's abundant resources of fishing waters, hydro- and geothermal energy and land. The analysis of the Grubel-Lloyd index indicates large emphasis of intra-industry trade in manufactured and capital intensive products. These are also expected results as Iceland's main trading partners are similarly developed countries within the EEA. However, as Iceland has been experiencing a trade deficit in the midst of its trade expansion, the relationship between this and its increased foreign direct investment is also discussed.

Keywords: Iceland, Economic Integration, Inter-Industry Trade, Intra-Industry Trade.

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## List of Acronyms

CFP	Common Fisheries Policy
CU	Customs Union
EEA	European Economic Area
EFTA	European Free Trade Association
EU	European Union
FDI	Free Trade Area
GATT	General Agreement on Tariffs and Trade
GCC	The Cooperation Council for the Arab States of the Gulf
MERCOSUR	The Southern Common Market
IIT	Intra-Industry Trade
RIA	Regional Integration Agreement
RCA	Revealed Comparative Advantage
SITC	Standard International Trade Classification
WTO	World Trade Organisation

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# **I Introduction**

## **1.1 Iceland – A Small Open Economy**

Iceland is the second largest island in Europe but one of the smallest economies. In theoretical literature Iceland is what is known as a small open economy, i.e. an economy that cannot affect world commodity prices through its international trading behaviour. Situated in the periphery of North America and the European continent, in the middle of the North Atlantic, Iceland has rendered itself an important place on the international trading scene by acting as a launch pad between the two trading giants. Furthermore, Iceland has since the establishment of the Bretton Woods institutions, of which the country was a founding member, been a keen participant in international cooperation.

Iceland's export industry is structured around the country's geographical location, its geology and its ability to utilise its comparative advantages by exploiting the abundant natural resources that it is endowed with. Because the country has as an exclusive 200-mile zone extending over 758 thousand square kilometres in the surrounding waters, one of Iceland's main resources is its marine asset, which has made Iceland the 12<sup>th</sup> fishing nation in the world in terms of export values. The second largest export sector is the manufacturing industry which is mainly power-intensive and based on electrical power, producing principally aluminium. During recent years this sector has steadily expanded and merchandise exports are becoming a larger share of Iceland's total exports. This is made possible by Iceland's competitive energy costs and the government encouraging foreign direct investments. These competitive energy costs are the result of extensive resources of hydro- and geothermal energy that Iceland is endowed with. These resources power not only the industrial sector but also 87% of all private residents. The third export sector is the agricultural sector. Because of the unsuitable conditions for cultivation only 20% of the land can be used for agrarian production, and most of this is dedicated to livestock.<sup>1</sup> In 2002, marine products accounted for 63% of Iceland's exports, manufacturing products accounted for 33% and agricultural products a mere 2%.<sup>2</sup>

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<sup>1</sup> The Economy of Iceland 2003:24-30

<sup>2</sup> Iceland External Trade 2002:16.



Despite its size, Iceland reached an impressive record of economic growth during the past decade. This was made possible due to economic reforms and deregulations from the 1990's and onwards, combined with a very low inflation rate, averaging 4,85% from 1990 to 2000, and an unemployment rate of just above 1%.<sup>3</sup> Although international trade steadily expanded during this decade Iceland's balance of trade was negative between the years 1997 and 2001, severely so between 1998 and 2000 when the balance of trade at current exchange rates for these three consecutive years averaged -28 776 million ISK (approximately -\$389 million according to average exchange rates from 1998-2000).<sup>4</sup> In 2001 Iceland fell into a recession with increased rates of inflation and unemployment, from which the country is still recovering.<sup>5</sup>

## 1.2 Objective and Limitations

As stated above, Iceland experienced an impressive economic growth performance during the last decade (1990-2000) where its foreign trade expanded significantly. This is despite the fact that the country had a negative balance of trade for almost the entire second half of that period. The objective of this thesis is therefore to study Iceland's patterns of trade, more specifically the specialisations of inter- and intra-industry trade, and its trade developments during this decade of success. This is to be done in a broad-spectrum approach where the results of the analysis will simply show in what sectors this expansion was experienced, and what overall implications the results have on the country. The time periods chosen is based on world trade data, i.e. because the UN's Handbook of Statistics shows values for trade on three aggregated levels for 1990/1991 and 2000/2001 this thesis has chosen to only calculate trade data for these two periods in order to come to any conclusion for the entire decade.

The limitations to this approach are the problems of apprehending sufficient trade data material. Import and export data corresponding to each other has not been recovered in terms of Iceland's trading relationships with EFTA and EU, which has in turn prevented calculations of intra-industry trade between these countries and therefore any discussion of it.

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<sup>3</sup> Iceland.org

<sup>4</sup> Iceland External Trade 2002 – commodities and countries. Table 16.2 and 16.8

<sup>5</sup> Iceland.org

### **1.3 Outline of Thesis**

Section II presents Iceland's trade policy history and focuses primarily on EFTA and EU. There is also a section devoted to Iceland's reluctance to join the EU. Section III provides an overview of the theoretical framework needed when analysing trade and integration. Reasons concerning why countries chose to trade and what their expected gains are under different theories will be discussed, as well as welfare implications of international trade and integration. Section IV provides the analysis of Iceland's trade development and specialisation patterns, i.e. inter-industry trade and intra-industry trade. Iceland's revealed comparative advantage according to the Balassa Index is calculated as well as the Gruber-Lloyd Index for analysing the share of intra-industry trade in total trade flows. Finally, section V concludes the thesis.

## **II Trade Policy History**

### **2.1 Introduction**

There is a general lack of information about trade and integration concerning Iceland prior to the declaration of the Republic in June 1944, because the country had no Ministry of Foreign Affairs until 1940. When Iceland, after six centuries under Danish control regained its independence through the enactment of the Act of Union between Iceland and Denmark on the 1<sup>st</sup> of December 1918, Iceland became a sovereign state under the Danish crown. However, Denmark continued to carry out Iceland's foreign affairs, although Iceland had full control of its own foreign policy. This political relationship was maintained until Denmark became occupied by Germany on the 9<sup>th</sup> of April 1940, and Iceland consequently lost all its communications with the country. Iceland was thus forced to take full charge of its foreign affairs and as a result, Iceland's Foreign Service predates the birth of the Republic, which took place four years later. Taking advantage of Denmark's weakened state during the war, Iceland declared itself a republic on the 17<sup>th</sup> of June 1944.<sup>6</sup>

Iceland has under the last century shifted from being a developing country with a large agricultural sector to a developed country with the majority of its labour force in the service sector. This economic restructuring was made possible due to Iceland's fisheries, which for the most part experienced favourable export prices and a steady output of marine products. This led to an annual economic growth in Iceland of about 4% on average from 1945 to 2002, higher than in most OECD countries. However, the annual economic growth in Iceland during this period was remarkably unstable. The economic path of development in Iceland can be divided into three periods. During the period 1900 to 1930 Iceland was characterised by high economic growth and had fairly liberal trade policies. This trend was broken off by the Depression and the following World War II when Iceland, together with many other countries, raised their trade barriers and increased their capital controls, which in turn led to serious price distortions and severe exchange rate problems. Iceland's trade policy thus prohibited the country from taking part in the liberalisation of trade and the formation of the European trading blocs. This period of trade restriction ended in the 1960's when a large

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<sup>6</sup> The Ministry of Foreign Affairs, The Trade Council of Iceland

devaluation of the Icelandic króna led to a more efficient allocation of the country's resources and trade barriers were lowered. As Iceland joined the GATT in 1964, the EFTA in 1970, the EEA in 1994 and the WTO in 1995, trade barriers were lowered further.<sup>7</sup>

## **2.2 The European Free Trade Association**

The European Free Trade Association (EFTA) was founded by the Stockholm Convention on the 4<sup>th</sup> of January 1960 by Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom. EFTA was established as an alternative for countries that did not wish to join the European Economic Community (EEC) that was founded in 1957, which in 1992 became the European Community (EC) and later the European Union (EU). The objective of EFTA was the liberalisation of trade in goods, which in turn would serve as a medium for growth and prosperity among the Member States and encourage closer economic cooperation between the Western European countries.<sup>8</sup> However, when the European Community developed into a larger and more integrated area, several countries (both founding members and new) left EFTA to join the EU. Switzerland, Norway, Iceland and Lichtenstein (joined 1991) remained and today form the four Member States of the EFTA. EFTA manages the EFTA Convention, The European Economic Area agreement (EEA) and the EFTA free trade agreements.

### **2.2.1 The EFTA Convention**

The EFTA Convention is the framework for trade liberalisation among the Member States, established at the EFTA foundation, and contains rules and disciplines relating to free trade in goods. In June 1999 the EFTA countries decided to update the EFTA Convention, and two years later, the Ministers of EFTA signed an updated and modernised EFTA Convention in Vaduz, Lichtenstein. The rationale for this update was to reflect the new trade developments in European and world trade since 1960. These included the changing patterns in European and international relations, the expansion of EFTA activities and several bilateral trade agreements between Switzerland and the European Union covering the movements of persons, and transport and technical barriers to trade, set up in 1991. The updated Convention

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<sup>7</sup> The Economy of Iceland 2003:20-21, The Ministry of Foreign Affairs

<sup>8</sup> EFTA Bulletin 2000

extended the EFTA framework with several amendments concerning: mutual recognition of conformity assessments, intellectual property rights, movements of persons, social security and mutual recognition of diplomas, investment and services, land and air transport, public procurement, and agriculture. Furthermore, the functions of the EFTA Council, stationed in Geneva, were broadened.<sup>9</sup> In the EFTA annual report from 2003, the prospects of the new and updated Convention is to: “render the economic relations between the four EFTA Member States more cohesive and to give the Members an improved instrument to manage their internal relations and those with present and potential partner countries”.<sup>10</sup>

### **2.2.2 The European Economic Area**

The European Economic Area is concerned with the relations between EFTA and the European Union (EU), and the agreement was signed the 2<sup>nd</sup> of May 1992 and came into force on January 1 1994. The EFTA states at that time were Austria, Finland, Iceland, Norway, Lichtenstein, Sweden and Switzerland. Switzerland voted against a membership in 1992 and opted to maintain its relationship with the EU through its bilateral trading agreements and Lichtenstein did not become a full participant until the 1<sup>st</sup> of May 1995. After their withdrawal from EFTA in January 1995, Austria, Sweden and Finland have participated in the EEA as EU Member States. In January 2003 negotiations of an EEA enlargement were initiated and concluded in July the same year. On the 1<sup>st</sup> of May 2004 an additional ten countries joined and today, 25 EU Member States and three EFTA Member States are integrated through the EEA.<sup>11</sup>

The EEA is an internal market governed by rules establishing the free movement of goods, services, capital and persons (also called the *four freedoms*). In order for the EEA to provide equal business conditions for all participating countries, the EEA Agreement covers competition and state aid rules. It also includes consumer protection, environment legislation, company law and social policy. The Agreement furthermore includes cooperation outside the four freedoms in so-called flanking areas which covers areas such as R&D, information services, education, training and youth, employment, enterprise and entrepreneurship, and civil protection. However, the EEA Agreement does not cover all EU policy areas. Left out

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<sup>9</sup> The Updated EFTA Convention 2001

<sup>10</sup> EFTA Annual Report 2003:20

<sup>11</sup> EFTA Annual Report 2003:40, Fact Sheet: European Economic Area

policies are; the Common Agricultural Policy, the Common Fisheries Policy, Foreign and Security Policies, Justice and Home Affairs Policies, Customs Union, and Monetary Union.<sup>12</sup>

### **2.2.3 The EFTA Free Trade Agreements**

The EFTA free trade agreements cover third country relations. The rationale behind their formation was to avoid trade discrimination as the EU set up trading agreements around the world. Over that past fifteen years EFTA has established an extensive network of contractual relations outside the European Union, referred to as third countries. These FTAs cover trade in industrial products, processed agricultural products and fish. They also include rules of origin, trade disciplines and competition rules, technical regulations, public procurements, intellectual property rights, state aid, and services and investments. FTAs are established in Central and Eastern Europe as well as in the Mediterranean region, South America, and Asia. At present the EFTA network consists of thirteen FTAs and eight Declarations on co-operations, with several more agreements under negotiation (see Box 1). The objective of the EFTA third country policy is to safeguard the economic interests of the EFTA Member States, to support and reinforce the process of European and interregional integration, and to contribute to world-wide efforts in liberalising trade.<sup>13</sup>

## **2.3 Iceland and the European Union**

As a Member State of EFTA, Iceland is through the EEA part of a free trade area that includes all EFTA countries (except Switzerland) and all European countries participating in the European Union. The EEA is, as described above, an internal market in which goods, services, capital and persons are able to move freely. Since the enlargement of the EU in 2004, the EEA covers almost all European countries and is by far the most significant RIA on the continent. A question might thus arise as to why, considering the many benefits of a full EU participation, EFTA still prevails. For Iceland (and Norway) the answer lies in not wanting to hand over the sovereignty of their most important industry to someone else.

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<sup>12</sup> EEA Info Kit 2004, Fact Sheet: European Economic Area

<sup>13</sup> Fact Sheet: EFTA's Third Country Relations

The fishing industry in Iceland is the largest and most important industry, and it represents an overwhelming share of the country's exports and also serves as an important source of employment. Prior to 1970, over 90% of Iceland's exports consisted of fish products and today it averages over 70%. From the 1950's and onwards, Iceland extended its fishing waters from 3 to 200 miles, which caused several conflicts (the "cod wars") with the United Kingdom. Today Iceland is one of the major fishery powers in terms of resources and trade within Europe.<sup>14</sup> An EU membership would require Iceland to hand over the jurisdiction of its own fishing grounds and all policy decision making to the EU, as stated under the Common Fisheries Policy (CFP). The CFP entails that the fishing vessels of all member states have equal access to common fishing grounds outside the twelve-mile zone, and that fishing stocks do not belong to coastal states but instead are regarded as common to the EU.<sup>15</sup> The objectives of the CFP are to protect the fish resources through conservation, to upgrade the EU fishery fleet, to create a single market for fisheries and to negotiate fishery agreements with third countries.<sup>16</sup> However, handing over the sovereignty of its fishing waters, and its major industry, is to the Icelandic population thought of as unacceptable. In the words of former Prime Minister Davíð Oddsson:

The problem is not merely that key decisions would be transferred to Brussels, nor that other EU countries' fleets would enter Icelandic waters through the back door by so called "quota hopping", which has presented a particular problem to British fishermen. Just as important is the fact that the entire operating environment for fisheries within the EU is completely different from that in Iceland. In the EU, fisheries are largely regarded as a branch of regional development. Iceland has no alternative but to operate its fisheries as a sustainable business sector.<sup>17</sup>

However, the CFP is not the only obstacle deterring an Icelandic membership. The small size of Iceland's economy places the country in a disadvantageous position in relation to the rest of the EU as the actions taken by the country are too small to affect EU policies, such as the exchange rate of the euro. Furthermore, the monetary union is seen as a great hazard though the export sector is not particularly diversified, and the common currency would come at the expense of a weakened industry, causing serious shocks to the economy. A final problem is

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<sup>14</sup> The Ministry of Foreign Affairs

<sup>15</sup> Green Paper on the Future of the CFP

<sup>16</sup> EU Business

<sup>17</sup> Speech by the Prime Minister of Iceland, Davíð Oddsson, at Linacre College, University of Oxford 2004, paragraph 11.

the high per capita contributions to EU common funds that Iceland will have to contribute with on account of its very high national income. Although several positive effects of joining a larger market also exists for Iceland, the vast number of problems just briefly presented has resulted in no political party putting the issue of an EU membership on its policy agenda.<sup>18</sup>

**Box 1: The EFTA Network**

**EFTA has formed Free Trade Agreements with the following thirteen countries:**

<u>Eastern Europe</u>	<u>Balkans</u>	<u>Middle East</u>	<u>Americas &amp; Asia</u>	<u>North Africa</u>
Bulgaria	Croatia	Turkey	Mexico	Morocco
Romania	Macedonia	Israel	Chile	
		Jordan	Singapore	
		Lebanon		
		The Palestinian Authority		

**EFTA have formed bilateral free trade agreements with:**

The European Union                      The Faroe Islands

**EFTA has signed Declarations on co-operations with the following countries and RIAs:**

Albania              GCC              Serbia and Montenegro  
Algeria              MERCOSUR              Ukraine

**EFTA has ongoing FTA negotiations with:**

Canada              South Africa              Tunisia              Egypt

Source: Four European Nations: Facts and Figures p. 4.

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<sup>18</sup> Speech by the Prime Minister of Iceland, Davíð Oddsson, at Linacre College, University of Oxford 2004, paragraph 11.



## III Integration and Trade – Theoretical Considerations

### 3.1 Introduction

Countries engage in economic integration because there are economical as well as political benefits to reap from trade liberalisation. As trade barriers are lowered between nations they form an integrated area in which free trade prevails inside the area but where protection is maintained against the rest of the world. Within the integrated area trade and investment increases and the larger market allows the member countries' growth levels to rise. The economical benefits from forming regional integration agreements (RIAs) are thence the greater level of competition and the more efficient use of resources that accompanies the market enlargement.<sup>19</sup> The political gains come in the form of decreasing costs and other acquired benefits when a government commits itself to free trade.<sup>20</sup>

There are many forms of RIAs: The *free trade area* (FTA), which is simplest form of integration, eliminate tariffs on imports from member countries but maintains the right to set their own tariff rates against the rest of the world, and rules of origin comply inside the FTA. Rules of origin are designed to confine trade within the FTA to products originating or mainly produced inside it, limiting *trade deflection*, which is the redirection of imports through the country with the lowest tariff for the purpose of exploiting the tariff differential. The next step of integration is to form a *customs union* (CU) where the elimination of tariffs among the member countries is further accompanied with the establishment of a common external tariff (CET) on imports from the rest of the world. This eliminates the problem of trade deflection. Further steps along the integration path is the *common market* which entails both a customs union and the integration of factors of production, the *monetary union* which adds a common currency to the common market and the *political federation* which entails the ultimate step of integration.<sup>21</sup>

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<sup>19</sup> Blomström & Kokko 1997:2

<sup>20</sup> Krugman & Obstfeld 2000:219, 221

<sup>21</sup> Robson 1998:5-7, 17, 28

## 3.2 Gains from Trade

A country that is closed and does not trade, i.e. is self-sufficient, is said to be in *autarky*. For the consumers in this country this means that they can only consume what is being offered by the domestic producers, despite different preferences, and the producers only have available the domestic resources for use in their production. This means that the producers are faced with fixed endowments of the production factors, so that if a production process requires more capital or labour to be improved, or if the country wants to start a new production process, production resources would have to be diverted away from some other process in order to be freed up. Consequently, countries under autarky may be self-sufficient, but they would not be on an optimal level of welfare because there are gains to be made from trade.

### 3.2.1 The Traditional Analysis

The Gains-from-Trade theorem comes to the conclusion that consumers will always prefer free trade over autarky because there are gains to be made from trade. This outcome can be dissected into two separate sources; gains from exchange and gains from specialisation. The gains from exchange come about because countries or individuals are endowed with different amounts of goods or have different preferences, thus both can gain by trading with each other. For example, if a landlocked country abundantly endowed with land could find a sea bordering country without any agricultural production, they would gain from trading with each other because the consumers would enjoy a mix of seafood and vegetables over a diet consisting of only one or the other. Thus consumers of both countries would enjoy higher utility under trade than in autarky. However, there are different distributions of the gains from exchange between the countries because one might be smarter in the trading business, thus moving the terms of trade to their advantage. However, the main point of the argument is that if trade is voluntary then trade is mutually beneficial.<sup>22</sup>

Gains from specialisation occur in trade when countries can specialise in the production of goods they produce most efficiently, trading it for products they are less efficient in producing. Because countries are differently endowed with factors of production there are gains from trade to be made here. For example, the two countries A and B are both producing

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<sup>22</sup> Markusen et al 1995:65-66

barley and aluminium, however country A is more productive in barley (being more endowed with land) and country B is more productive in aluminium (being more endowed with capital). By moving workers into the industry in which the country has a production advantage, output increases of both goods. Country A can then trade barley for aluminium and country B vice versa, leaving both countries better off because they are using their factors of production efficiently. This increases their production and the countries can export their excess output in return for imports of the products they are less productive in. In the words of David Ricardo, country A is said to have a *comparative advantage* in the production of barley, being relatively more productive in that than country B, while country B has a comparative advantage in the production of aluminium. However, a country can also have an *absolute advantage* in the production of a commodity if its labour is more productive in both goods as compared to the other country.<sup>23</sup>

Under traditional trade analysis one model that has been of great significance is the Heckscher-Ohlin theorem. The model (two countries and two commodities; one labour intensive and the other capital intensive) assumes complete mobility of capital and labour between industries and concludes that, because countries are differently endowed with factors of production, a country will export the commodity that uses its relatively abundant factor most efficiently. This trade will benefit the owners of the abundant factor while it hurts the owners of the scarce factor. The difference in factor endowments gives rise to different commodity prices between countries, which under this model, are equalised by international trade.<sup>24</sup> Extensions to this theorem have been made by Stolper and Samuelsson concerning relative price increases of one of the commodities, and by Rybczynski concerning increases in the supply of a factor.<sup>25</sup>

### 3.2.2 New Trade Theory

As discussed above, traditional trade theory uses the concepts of comparative advantage, resource allocation and factor endowments to explain the existence and gains from trade in inter-industry trade, i.e. the international exchange of different products. However, it fails to explain intra-industry trade in similar products, such as cars for cars, which today is a large

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<sup>23</sup> Markusen et al 1995:68

<sup>24</sup> *ibid.* 1995:104,123, 129, Krugman & Obstfeld 2000:38

<sup>25</sup> Markusen et al 1995:116, 119

part of world trade and a majority of trade in manufacturers among industrialised countries with similar factor endowments, such as in EFTA and EU. New trade theories are instead focusing on scale economies, product differentiation and imperfect competition as explanations of intra-industry trade.<sup>26</sup>

Scale economies imply that firms face increasing returns in their production, whereby they can lower their average cost by lengthening their production run. In industries characterised by increasing returns, production is more efficient by a small number of large firms than by a large number of small firms. This results in imperfect competition because the firms can set prices above marginal costs and thus make profits. When markets are enlarged through trade an additional benefit apart from the gains from comparative advantage will transpire because competition increases as markets are enlarged.<sup>27</sup> This generates *pro-competitive gains* for the country, which are divided into two components: the *profit effect* which is the result of the fall in price due to the increased competition (however, this competition will not be perfect) and the *decreasing-average-cost effect* which occurs as firms expand their production runs.<sup>28</sup> Hence, in terms of scale economies, intra-industry trade occur because firms specialise in the industry in which they have increasing returns and which uses their resources most efficiently, trading commodities with countries that have specialised in other industries. Because scale economies usually require advanced technology, which is found in high technology industries, it is integrated areas among industrialised countries that are more likely to experience the largest overall gains of these dynamic effects.<sup>29</sup>

However, intra-industry trade is not solely explained by firms' ability to specialise their production, but also because there are gains to be made from product differentiation. These gains stem from the fact that consumers are in fact not homogenous in tastes or incomes (as many trade models assume), but instead prefers to have different options of similar products because these products are not viewed as complete substitutes in consumption. Consumers prefer to have some of several commodities than just more of one (called the *ideal variety approach*) and their choice of what commodity to purchase differ according to their tastes and income levels, creating a consumer demand for product variety (called the *love of variety approach*). Hence, intra-industry trade is also explained by the increased consumer utility of

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<sup>26</sup> Robson 1998:82

<sup>27</sup> Jovanovic 1998:312

<sup>28</sup> Markusen et al 1995:181

<sup>29</sup> Jovanovic 1998:313

product choice, increasing the level of welfare after trade than under autarky. When consumers differ according to their demand, firms can charge different prices in different markets, giving each firm the ability to set prices above marginal costs.<sup>30</sup> Thus specialisation and product differentiation go hand in hand in explaining the large share of intra-industry trade among developed countries in the world today.

### 3.2.3 New Economic Geography

So far, explanations of comparative advantage and scale economies have explained the forces behind trade, both within inter-industry trade and intra-industry trade. However, what both theories fails to explain is the clustering of similar industries in the same region without any advantages of scale economies. Theories of new economic growth talks about the spatial clustering (or agglomeration) of economic activities after economic centres has been developed. These come about because proximity between linked firms reduces transaction costs, gives rise to spill-over effects of knowledge and technology and firms benefit from a shared pool of the labour force. These are called the *centripetal forces* of agglomeration. Conversely, there are also *centrifugal forces* encouraging the dispersion of industries. These include the competition of immobile factors, pollution and other externalities. Also, the dispersion of consumers will encourage the dispersion of producers. Whether the centripetal or the centrifugal forces will have the stronger effect under RIAs depend on circumstances such as comparative advantage and factor endowments.<sup>31</sup>

## 3.3 Welfare Effects of Integration

So far it has been established that countries that trade have a higher level of welfare than under autarky because they can specialise in their most efficient production, trade that for the products they have forsaken, and offer a more diverse supply of products to their consumers, augmenting their utility. However, when trade occurs between countries they are faced with a number of trade policy instruments, or trade barriers, set up by a country to protect its domestic market against competing imports and to raise revenue for the government. These trade barriers come in the form of *tariffs* and *non-tariff barriers* (NTBs) and all have welfare

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<sup>30</sup> Markusen et al 1995:186, 201

<sup>31</sup> Venables 1999, Dicken 2001:2, 11, 20

reducing implications of trade as oppose to trade under integration. Tariffs, for example, are taxes levied on imports and are basically a form of commodity tax that raises the price the consumers face on the domestic market, and also the price the producers receive. To its extreme, this tax can be high enough to eliminate all imports of a certain commodity, in which case it is referred to as a *prohibitive tariff*. The effect of the increased price of the commodity levied with the tariff is that it is made to seem more valuable to the producers than is actually is to the consumers, encouraging domestic producers to produce more of it. The higher price, on the other hand, discourages consumption, which declines and thus imports are also reduced in spite of the country not being a more efficient producer than its trading partner. This behaviour diverts resources away from the true pattern of comparative advantage at the cost of gains from specialisation and from exchange.<sup>32</sup> Export subsidies, quotas, voluntary export restraints, local content requirements and trade-restricting regulations all belong to the category of non-tariff barriers, which like tariffs all distort the prices faced on the domestic market by subsidising exports or limiting the quantity of imports.<sup>33</sup> Consequently, although the welfare of the countries is augmented under trade, it is less than its optimal level because trade barriers distort domestic prices and production incentives.

### 3.3.1 Free Trade Areas

The following analysis is taken from Robson 1995 and is concerned with the welfare effects of two countries involved in a FTA (as seen in Figure 1). In this model it is assumed that the home country (H) and the partner country (P) have similar demand conditions and that country P has a comparative advantage in the production of the commodity (Q). Before the free trade area is formed, country P consumes and produces at price  $T_p$ , its tariff being prohibitive, while country H produces L and consumes N, the difference (LN) being imported from the lowest cost source, i.e. the rest of the world in this case. The government in country H can collect tariff revenue equal to  $LN \times P_w$ . When the two countries form a free trade area the area supply at price  $T_p$  ( $= OM + OL'$ ) would be less than the area demand at the same price ( $M + N$ ), but country P would be able to satiate the supply gap. Thus country P would supply country H's market with  $L'N'$  (which is equal to  $L''M$ ) at price  $T_p$ , and the domestic producers in country H would supply its own market with  $OL''$  and the remaining

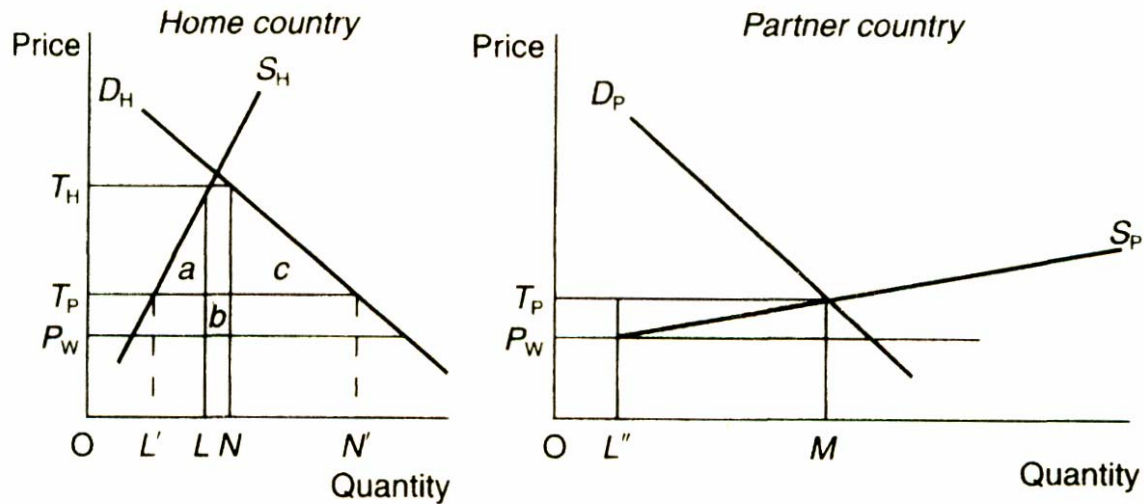
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<sup>32</sup> Markusen et al 1995:247-248

<sup>33</sup> *ibid.* 1995:278-280

requirement (L''M) would be filled with imports from the rest of the world at world price  $P_w$ .<sup>34</sup>

**Figure 1: Welfare effects of a Free Trade Area**



Source: Robson 1998:31

Two effects arise in the context of resource allocation after integration, introduced by Viner (1950). The first one, *trade creation*, refers to the change in production from the higher cost domestic producers to the lower cost partner producers, where without any trade barriers the goods can be imported without any added costs. This change is in itself combined of two aspects. The first one is the *production effect* which is the elimination of domestic production in exchange of imports from the more efficient partner country. The second effect is the *consumption effect* caused by the domestic consumers substituting domestic products with lower costs partner-country products, raising consumer surplus. *Trade diversion*, the second resource allocation effect, refers to the change in the source of imports from a lower-cost external source to a higher-cost partner country. Trade diversion thus results in a cost increase of the goods previously imported from abroad and a loss of consumer surplus also due to the higher costs of the goods. Consequently, a FTA that is on balance trade creating is regarded as beneficial, while an integration that is on balance trade diverting is regarded as detrimental.<sup>35</sup>

<sup>34</sup> Robson 1998:31

<sup>35</sup> *ibid.* 1998:19

After the two countries have formed a FTA, country H's production effect (a) plus consumption effect (c) outweighs the cost of trade diversion (b), thus the integration is beneficial to country H. In country P the same amount is produced and consumed as before, at the same price, but government revenue increases by the amount equal to the hatched rectangle. This represents a national income gain to country P. For the rest of the world, their exports are larger than before ( $L'M > LN$ ) because country P shifted its supplies from its domestic market to satisfy the demand in country H. Also, the price of the commodity in country H is now reduced to the initially lower price in country P. Thus, under the assumptions made for this model, everyone is better off after the FTA is formed than before.<sup>36</sup>

### 3.4 Foreign Direct Investment

Another dimension of economic integration that represents a large proportion of international trade is called foreign direct investment (FDI)<sup>37</sup>. FDI is an investment in a foreign firm or a subsidiary set up in a foreign market in which the engaging company (referred to as a transnational company or a multinational enterprise) acquire ownership and/or control of a business enterprise abroad.<sup>38</sup> The underlying reasons as to why countries chose to engage in FDI rather than serving foreign markets through exports differ, but one obvious explanation is to avoid trade barriers, called "tariff-jumping".<sup>39</sup> To look at the response of FDI after regional integration, Kindleberger coined the concepts of *investment creation* and *investment diversion*. The former is the expanded FDI that is generated by trade diversion and the latter describes the effects of trade creation on already established FDI.<sup>40</sup> Another reason for engaging in FDI is to internalise firm-specific intangible assets in the foreign market. Because firms have inherent disadvantages on foreign markets they need some firm-specific intangible asset in order for them to compete successfully. Technological expertise is an example of such as asset. When the motive behind FDI is the exploitation of intangible assets rather than tariff-jumping, FDI is likely to increase because the integrating region is more attractive to outside investors, and the larger the market the larger is the investment opportunities.

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<sup>36</sup> Robson 1998 :33

<sup>37</sup> Markusen et al 1995:394

<sup>38</sup> Robson 1998:113

<sup>39</sup> Blomström & Kokko 1997:5

<sup>40</sup> Robson 1998:114



When looking at the effects of FDI on individual countries as opposed to the region as a whole, the beneficial outcome of the RIA differ among the countries involved. This transpires because investment increases are not evenly distributed within the RIA and the reduction of trade barriers would most likely encourage a substantial reallocation of production resources to more closely reflect patterns of regional comparative advantage. This would result in production investments being more highly concentrated in regions where the production would most efficiently carry out its activities. Alongside these static benefits there is also scope for dynamic gains such as an increase in the participating countries growth rates, increasing the attractiveness for future investments. Other dynamic benefits accrue to local firms as FDI stimulate technology transfer and diffusion, both directly and through spillovers of their intangible assets. Finally, with the larger market created after integration, firms may acquire certain dynamic effects caused by regional integration influences which may facilitate further FDI. However, the impacts on investment decisions will vary across countries and industries, but generally the overall impact will be conditioned by the distribution of a country's economic activities, its trade and investment pattern and the competitive strength of domestic versus foreign firms.<sup>41</sup>

### **3.5 Distribution of Gains from Integration**

When economic integrated areas are formed, the most common forms being FTAs and CUs, not all actors gain equally from the integration. Some member countries may reap more benefits than others, and some countries may even lose, although in this case compensation by the better off countries is usually established, either ex-ante or ex-post.<sup>42</sup> To look at the overall gains and losses on member countries from forming FTAs or CUs, i.e. if the RIA is on balance trade creating or trade diverting, one can study the comparative advantages of these countries relative to other member countries as well as the rest of the world. In his study, Venable concludes that countries with the comparative advantage most different from the rest of the world are a more potential loser from RIA's than otherwise. This occurs because the more efficient partner country will drive the domestic producers of the commodity out of business and take over the supply, satisfying its own market by importing from the rest of the world. However, in real life, countries do not completely specialise nor trade solely within the RIA. If we assume a model with three countries (A, B and the rest of the world, W), with two

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<sup>41</sup> Blomström & Kokko 1997:11-17

<sup>42</sup> Jovanovic 1998:357

factors of production that are differently distributed among the countries and two tradable goods, then the gains from integration will be greatest for the country (e.g. A) with relative factor endowments close to that of W, and if the country with which it forms a FTA (e.g. B) has a relatively extreme endowment well away from W. The underlying reasons for these outcomes are that countries with endowments close to the rest of the world have little scope for trade and thus little scope for trade diversion, and countries with endowments much different from the rest of the world are more likely to suffer a welfare loss (as explained above). In this framework, FTAs between high income countries will cause convergence of real income levels – although with the highest income country (extreme endowment) experiencing trade diversion, whereas FTAs between low income countries will cause divergence of real income – with the lowest income country (extreme endowment) losing.<sup>43</sup>

Generally, the greater the similarity between the countries contemplating integration, the better is the outcome for everyone involved. For example, optimum partners for customs unions are countries of equal economic size. In terms of intra-industry trade in CUs the adjustment process and the outcome is more beneficial between countries of similar income levels and factor endowments. Gains from inter-industry trade is however more difficult to identify, but in general the bigger the difference in economic size of the countries involved the more likely it is that the smaller economies will lose.<sup>44</sup>

However, within the framework of new economic geography the analysis of the distribution of costs and benefits is slightly different. In this case the question is whether the formation of a FTA will encourage economic activities to take place within a centripetal core, or if it will continue a peripheral production specialisation. By the removal of trade barriers, membership in a FTA makes it easier to supply consumers from a few locations. This favours agglomeration, which can come about on either a sectoral level, where small sectors cluster in different locations, or on an industry level in which some less favoured regions become completely deindustrialised. For industrialised countries, the growing share of intra-industry trade indicates that agglomeration after a FTA is more likely to occur at the sectoral level, where the overall gain is convergence of income levels.<sup>45</sup>

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<sup>43</sup> Venables 1999

<sup>44</sup> Jovanovic 1998: 355-357

<sup>45</sup> Venables 1999, Brühlhart 1998

## **IV Trade and Specialisation in Iceland**

### **4.1 Trade Developments and Foreign Direct Investment**

As stated in the Introduction, Iceland ran a trade deficit between the years 1997 and 2001 (see Appendix II). However, depending on how imports are valued (at cif or fob<sup>46</sup>) the difference between imports and exports differs substantially, with a much larger trade deficit with the former valuation method over a longer period of time (1996 to present time). In 1990/1991 only three product groups showed positive trade balances: food and live animals, animal and vegetable oils, and other commodities. In 2000/2001 these product groups were also accompanied by manufactured goods. A question thus arises how Iceland could reach such economic success in the wake of such a gloomy trade balance, where imports outweighed exports significantly. Although the country's overall foreign trade by market areas (see Appendix III and IV) increased from 1990 to 2002, both in terms of exports and imports, results specific to certain market areas varies extensively. Thus gains in trade with some countries came at the expense of others.

Two related factors (apart from the earlier mentioned) that greatly contributed to Iceland's era of economic growth were increased FDI and generous tax reforms assigned to attract capital and businesses. In terms of foreign direct investment, foreign exchange controls were fully abolished in 1995 and investment in Iceland by EEA residents is principally free under the EEA Agreement, with a few exceptions in areas of particular national political importance. Between the years 1998 to 2003 Iceland experienced a significant increase in stocks of FDI, from approximately 32 million ISK to almost 72 million ISK (see Table 1).<sup>47</sup> Of these stocks, the largest share has been invested in Iceland's manufacturing industry, specifically in metal and mechanical products. Also the trade and repairs industry, the financial industry and the real estate and business activities industry are heavily invested in. On a sectoral level, the power-intensive sector, the software and research sector and the financial sector receive by far the largest shares of the total stocks. In 2003 these sectors accounted for 29,2%, 27,6% and

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<sup>46</sup> Cost, insurance and freight, Free on board

<sup>47</sup> Locate in Iceland 2004:3

19,8% respectively.<sup>48</sup> To encourage FDI, Iceland has adopted one of the lowest corporate tax rates in Europe (18%) and in a study from 2002 Iceland was crowned the lowest cost country in Europe.<sup>49</sup>

**Table 1: FDI stocks by industrial sector (mill of USD)**

	1998	1999	2000	2001	2002	2003
Total	454,20	478,59	534,23	722,69	703,12	1120,77
Agriculture & fishing	0,83	1,62	0,87	0,58	0,59	0,79
Mining & quarrying	7,09	5,99	5,31	1,93	0,50	0,05
Manufacturing	304,17	315,34	349,4	375,20	388,55	460,98
Electricity, gas & water	-	-	-	-	-	-
Construction	7,93	9,40	13,14	28,37	14,21	18,21
Trade & repairs	36,02	49,92	66,99	62,41	122,49	36,75
Hotels & restaurants	-	-	0,03	0,03	3,05	3,48
Transport & communication	14,14	5,25	-0,30	1,64	39,01	46,25
Financial activities	32,07	24,59	31,13	34,53	32,94	17,47
Software, research, management	48,24	57,94	60,30	196,96	99,07	533,59
Other services	3,67	8,55	7,37	21,04	2,69	3,20

Source: Central Bank of Iceland, Statistics Department 2004

**Table 2: FDI inflows by industrial sector (mill of USD)**

	1998	1999	2000	2001	2002	2003
Total	152,29	68,46	170,67	172,0	91,0	340,52
Agriculture & fishing	-0,30	0,76	0,038	-0,21	-0,04	0,04
Mining & quarrying	2,32	0,014	0,29	0,63	-1,53	-0,1
Manufacturing	24,7	38,68	145,25	13,47	61,48	60,13
Electricity, gas & water	-	-	-	-	-	-
Construction	7,44	7,39	2,09	18,49	0,47	-0,36
Trade & repairs	30,6	9,73	13,98	-4,73	66,62	-87,35
Hotels & restaurants	-	-	-0,05	-0,01	1,67	0,17
Transport & communication	-0,46	-4,06	1,6	0,19	11,52	-12,4
Financial activities	45,95	-3,52	7,09	25,30	7,5	-10,0
Software, research, management	40,41	17,84	0,08	131,2	-57,22	391,11
Other services	1,67	1,63	0,29	-11,33	0,51	-0,64

Source: Central Bank of Iceland, Statistics Department 2004

As can be seen in the two tables, the manufacturing sector has by far the largest stock of foreign direct investment, except in 2003 when the software and research sector surpassed the manufacturing sector. These two sectors are also the ones receiving the overall largest inflows of foreign direct investment. This is a likely outcome as Iceland has been investing heavily in these sectors in their attempts to attract foreign direct investment.<sup>50</sup> Table 1 also shows that the increased stocks of FDI came at the same time as Iceland's trade balance turned negative.

<sup>48</sup> Invest in Iceland 2004

<sup>49</sup> Locate in Iceland:2004:3

<sup>50</sup> *ibid.* 2004:3

This outcome is expected as positive inflows of capital in a country will always be matched by a trade deficit.<sup>51</sup> Why this is so is explained by macroeconomic theory not dealt with in this thesis. But in short this occurs because the balance of payments (which consists of the current account, the capital and financial account and the change in reserve assets) must always balance. Any imbalance in one of the accounts, e.g. the current account that deals with exports and imports, will necessarily affect the other accounts, e.g. the capital and financial account that records foreign investment.<sup>52</sup> As one of Iceland's main economic policies to boost its economy has been to encourage and increase FDI, it came at the expense of the trade balance. Hence, why Iceland experienced such a remarkable economic record during the 1990's despite a trade deficit is answered by its increase in stocks of FDI.

## **4.2 Inter-Industry Specialisation**

### **4.2.1 Introduction**

Iceland is, as mentioned in the introduction, well endowed with natural resources, specifically marine assets and renewable hydro- and geothermal energy, and its export base is largely founded on these. The country's exclusive fishing waters has made Iceland the 12<sup>th</sup> fishing nation in terms of export value in the world and its hydro- and geothermal resources provides the country with the most competitive electricity prices in Europe. These energy resources have also provided Iceland with a competitive power intensive manufacturing industry, with aluminium as the number one product. Hence, in the following analysis of inter-industry specialisation, we should find comparative advantage in the above mentioned sectors, i.e. the fishing and fish processing industry and the power intensive manufacturing industry, which in 2004 represented 12,4% and 9,8% respectively of the total industrial structure.<sup>53</sup>

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<sup>51</sup> Krugman 1996:3

<sup>52</sup> Parkin et al 1998:918

<sup>53</sup> Invest in Iceland Agency 2004

## 4.2.2 Revealed Comparative Advantage

Within the field of international trade theory, one of the most widely acknowledged models for determining trade patterns is, as already mentioned, the Heckscher-Ohlin Theorem (presented in section 3.2.1). This model concludes that comparative advantage, defined as differences in opportunity costs between two commodities in relation to another country, is determined by national differences in factor endowments. Countries will specialise in the production of the commodity that most intensively uses the factor that the country is relatively abundant in, exporting this commodity and in return import the less productive one.<sup>54</sup> There exist many models that attempt to explain the direction of international trade through the widely recognized law of comparative advantage. However, difficulties exist in estimating true patterns of comparative advantage because of unobservable country characteristics which have made other, more indirect methods of assessment necessary. These alternative methods measure instead “revealed” comparative advantage on the basis of already existing trade-, production- and consumption information. A predicament arises because these alternative measures may not correspond to true comparative advantage. For example, national and international policy effects distort RCA measures, as does aggregation effects.<sup>55</sup> Thus, to use revealed comparative advantage as a basis for discussing trade patterns is somewhat questionable. Nonetheless, to analyse inter-industry specialisation patterns for Iceland this thesis uses the revealed comparative advantage approach introduced by Bela Balassa. Two indices have been constructed;

$$RCA_1 = (X_{ij} / X_{wj}) / (\sum_{j=1}^n X_{ij} / \sum_{j=1}^n X_{wj})$$

$$RCA_2 = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

$RCA_1$  utilize solely export data as its indicator and is therefore also called the export specialisation index. It measures the relative export performance between countries and industries and is defined as a country's share of world exports of a commodity divided by its share of total world exports. If  $RCA_1 > 1$  a comparative advantage is revealed.  $RCA_2$  refers to a country's own trade performance. This index ranges from -1 to +1, where values  $> 0$  indicate a

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<sup>54</sup> Markusen et al 1994:106

<sup>55</sup> Greenaway and Milner 1993:181,184

comparative advantage.<sup>56</sup> One of the benefits of the export specialisation index is that it avoids policy distortions because import data is omitted due to its more restrictive nature. However, omitting import statistics has the disadvantage of disregarding intra-industry trade and instead misinterpreting it as an aggregation bias. It is thus to remedy the problem of intra-industry trade that the alternative  $RCA_2$  is used because both export and import data are used as indicators, recognising the possibility of intra-industry trade.<sup>57</sup> However, because there are advantages and disadvantages of both indices, both will be used and discussed in this thesis.

Before continuing with the inter-industry analysis an issue that needs to be highlighted is the problem of constructing RCA indices from the vast amount of internationally traded commodities. Because this amount is so immense, some form of trade data aggregation is required. The United Nations has developed a commodity classification system called the Standard International Trade Classification (SITC) which groups commodities together under five levels of aggregation, the broadest group being on the one-digit level. However, as stated previously, a high level of aggregation may impose distortions on the true pattern of comparative advantage. Nonetheless, to estimate values of revealed comparative advantage values as compatible as possible to true patterns, this thesis uses trade data on the one-, two- and three-digit level. Another problem with the SITC system is that the commodities composed together under different product groups sometimes represent very broad categories, making results difficult to interpret. The United Nations therefore also classifies SITC data based on 7 main export categories and Leamer (1984) presents an aggregated method where the commodity list is “brief enough to be quickly learned and easily remembered, but not so brief that essential features of the trade data are hidden.”<sup>58</sup> Leamer uses 10 aggregates; 2 primary product aggregates (petroleum and raw materials), 4 crops aggregates (forest products, tropical/Mediterranean agricultural products, animal products and cereals) and 4 manufactured aggregates (labour intensive, capital intensive, machines and chemicals).<sup>59</sup> Because the data material collected for RCA calculations is not always compatible with each classification system: the SITC classification; the UN classification by main export categories and the Leamer Aggregation will all be used where suited. This however makes some aggregated comparisons difficult as e.g. the data material used for comparisons between Iceland and the EFTA does not correspond to the data used for Iceland and the world.

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<sup>56</sup> Greenaway and Milner 1993:186

<sup>57</sup> *ibid.* 1993:186

<sup>58</sup> Leamer 1984:60

<sup>59</sup> *Ibid.* 1984:61

Furthermore, as different exchange rates have been used in these calculations by the author of this thesis and the United Nations, the Iceland trade data may differ slightly.

### 4.2.3 Inter-Industry Trade on the Aggregated Level

The results of the revealed comparative advantage index at the one-digit level show that Iceland, in trade with the world, displays a substantial comparative advantage ( $RCA_1$ ) in both periods in food and live animals. In 1990/1991 this product group accounted for over 80% of Iceland's total exports and in 2000/2001 for 62%. A minor comparative advantage is also found in animal and vegetable oils, also for both periods, and in manufactured goods for the latter period (see Table 3). These results correspond to calculation of  $RCA_2$  which also displays revealed comparative advantage for the same product groups as for  $RCA_1$ , for the same time periods (see Appendix IX). Using instead Leamer's aggregation, Iceland exhibits comparative advantage ( $RCA_2$ ) in raw materials, animal products and cereals (see Table 4). These accounted for approximately 10%, 78% and 5% respectively of Iceland's total exports in 1990/1991 and for 21%, 60% and 9% in 200/2001. Although the two methods aggregate different products within each product group (an extensive table for Leamer is found in Appendix VIII), the results of the two indices do correspond to some extent as we will see in the next section where the data is presented on a more disaggregated level.

**Table 3:  $RCA_1$  for Iceland in Trade with the World at the one-digit SITC level**

SITC	Product Group	Iceland	World	$RCA_1$	Iceland	World	$RCA_1$
		1990/1991	1990/1991		2000/2001	2000/2001	
		Mill of \$	Mill of \$			Mill of \$	Mill of \$
	Total	1568,57	3338129		1957,92	5944700	
0	Food and live animals	1263,45	243958	<b>11,02</b>	1224,57	319776	<b>11,63</b>
1	Beverages and tobacco	2,89	21903	0,28	2,00	34301	0,18
2	Crude materials. Inedible	17,95	145360	0,26	31,71	171602	0,56
3	Mineral fuels; lubricants	0,39	324110	0,00	5,64	604384	0,03
4	Animal and vegetable oils, fats	14,91	12124	<b>2,62</b>	33,47	17462	<b>5,82</b>
5	Chemicals and related products	1,06	287613	0,01	38,98	550133	0,22
6	Manufactured goods	219,31	540560	0,86	466,89	828563	<b>1,71</b>
7	Machinery and transp. equipment	23,91	1068775	0,05	100,43	2450092	0,12
8	Misc. manufactured articles	16,37	399425	0,09	33,20	703329	0,14

Source: Own calculations based on data from Iceland Statistics and UNCTAD's Handbook of Statistics



**Table 4: RCA<sub>2</sub> for Iceland in Trade with the World – The Leamer Aggregation.**

Aggregation Group	Export	Import	RCA <sub>2</sub>	Export	Import	RCA <sub>2</sub>
	90/91	90/91		00/01	00/01	
	Mill of \$	Mill pf \$		Mill of \$	Mill of \$	
Total	1541,12	917,17		1815,9	1414,28	
1. Petroleum	0,39	134,49	-0,99	5,63	204,11	-0,95
2. Raw Materials	160,86	58,01	<b>0,47</b>	392,81	128,93	<b>0,51</b>
3. Forest Products	1,24	79,77	-0,97	3,46	82,1	-0,92
4. Tropical Agriculture	3,26	50,76	-0,88	2,55	70,21	-0,93
5. Animal Products	1212,11	18,11	<b>0,97</b>	1112,87	73,94	<b>0,88</b>
6. Cereals	73,27	40,96	<b>0,28</b>	129,46	66,12	<b>0,32</b>
7. Labour Intensive	17,47	203,99	-0,84	31,65	290,16	-0,80
8. Capital Intensive	66,32	159,33	-0,41	81,99	230,12	-0,47
9. Machines	5,43	86,10	-0,88	18,72	113,81	-0,72
10. Chemicals	0,76	85,66	-0,98	36,76	154,78	-0,62

Source: Own calculations based on data from Iceland Statistics

Turning instead to Iceland's trade with the EFTA and the EU (the member countries prior to the enlargement 2004) the United Nations' main categories classification is used. This method is used as this is the only complete source of data found for these RIA's on an aggregated level of SITC and in the time period chosen for this thesis. The results are displayed in Table 5, where trade data for the EFTA and the EU are based on information from 1990 and 2001 but where world trade data (calculated for comparison reasons) is still based on average values from 1990/1991 and 2000/2001. In comparison with the EFTA (here only represented by Iceland, Norway and Switzerland), Iceland exhibits revealed comparative advantage in food items (which correspond to SITC 0 and 4 in Table 3 and to animal products and cereals in Table 4) and metals (which correspond to raw materials in Table 4) for both periods, and also in agricultural and raw materials in 2001 in trade with EFTA. In trade with EU-15 and the world the trade patterns are identical: revealed comparative advantage is found in food items and metals for both time periods. These findings are in accordance with results from Tables 3 and 4, and clearly reveal Iceland's comparative advantage in food and animal products and crude materials on the aggregated level.

**Table 5: RCA<sub>1</sub> for Iceland in Trade with the World, EU-15 and EFTA by Main Categories of Export 1990 and 2001, measured in millions of USD.**

1990	Total	Food Items 0+1+22+4	Agricult. & Raw Mat. 2 (less 22,27,28)	Fuels 3	Metals 27+28+68	Chemical Products 5	Other Manuf. Products 6+8 (less 68)	Machinery & Transp. Eq. 7
Iceland	1586	1265,63	7,93	0	176,05	1,59	93,57	33,31
EFTA RCA <sub>1</sub>	99452	5339,04 <b>14,86</b>	1170 0,43	16350,2 0	5339,32 <b>2,07</b>	15774,67 0,01	30248,59 0,19	24864,43 0,08
EU-15* RCA <sub>1</sub>	960374	104791,2 <b>7,31</b>	24118,76 0,2	29956,6 0	27164,87 <b>3,92</b>	136548,19 0,01	308390,96 0,18	317060,17 0,06
World RCA <sub>1</sub>	3338129	288033 <b>9,25</b>	88868 0,19	324110 0	113148 <b>3,27</b>	287613 0,01	873281 0,23	1068775 0,07

\*No values for 1990 include Belgium, Luxembourg or Germany due to lack of information

2001	Total	Food Items 0+1+22+4	Agricult. & Raw Mat. 2 (less 22,27,28)	Fuels 3	Metals 27+28+68	Chemical Products 5	Other Manuf. Products 6 + 8 (less 68)	Machinery & Transp. Eq. 7
Iceland	2019	1286,1	20,19	4,04	415,91	50,48	119,12	98,93
EFTA RCA <sub>1</sub>	143119	6994,6 <b>13,03</b>	843,56 <b>1,7</b>	36703,2 0,01	7320,81 <b>4,03</b>	26860,34 0,13	30742,38 0,27	30687,38 0,23
EU-15 RCA <sub>1</sub>	2228073	168689,78 <b>8,41</b>	30359,239 0,73	56697,6 0,08	52767,031 <b>8,7</b>	352226,95 0,16	605795,975 0,22	902359,292 0,12
World RCA <sub>1</sub>	5944700	385577 <b>9,82</b>	99353 0,60	604384 0,02	162183 <b>7,55</b>	550133 0,27	1427920 0,25	2450092 0,12

Source: Own calculations based on data from UNCTA's Handbook of Statistics On-Line

#### 4.2.4 Inter-Industry Trade on the Disaggregated Level

In accordance with the results at the one-digit level, the revealed comparative advantage index, RCA<sub>1</sub>, at the two-digit level (see Appendix VI) shows that Iceland has a substantial comparative advantage for both time periods (with the exceptions of SITC 00, 29 and 72 which reveal a comparative advantage only in 2000/2001) in food and live animals, more specifically in live animals (SITC 00), fish (SITC 03) and animal feeds (SITC 08). Moreover, comparative advantage is also found in leather (SITC 61), non-ferrous metals (SITC 68) and machinery (SITC 72) which correspond to manufactured products on the one-digit level. The

commodities belonging to the aggregated group of animal and vegetable oils are lacking in the trade data on the two- and three digit levels, and thus the comparative advantage discussed in the section above are not to be found here. Instead, Iceland exhibits a comparative advantage in hides and skins (SITC 21), crude fertilizers (SITC 27), and crude animal and vegetable materials (SITC 29), all of which belongs to the aggregated one-digit level group of crude materials (which did not exhibit comparative advantage on the one-digit level). Comparing the results of the  $RCA_1$  to calculations of  $RCA_2$  (found in Appendix X) they do no longer correspond to the same extent as on the one-digit level. While only six product groups display comparative advantage in 1990/1991, this number rises to eleven when looking to the  $RCA_2$  index. For 2000/2001 the corresponding result is eight and nine. However, the results from the two indices are not remarkably different from each other. For 1990/1991 both indices show a comparative advantage in SITC 03, 08, 21, 27, 61 and 68.  $RCA_2$  then continues with SITC 00, 01, 02, 41 and 67. Similarly for 2000/2001 the indices correspond to all product groups except SITC 01, 27 and 29, where instead  $RCA_2$  displays comparative advantage in SITC 01 and 26.

Looking instead at Leamer's aggregation on the two-digit level (see Appendix VIII), not all products within each aggregated product group exhibit revealed comparative advantage. For example, in the aggregated group of cereals only two out of the five product groups display comparative advantage in 1990/1991 and three out of five in 2000/2001. Comparing the results of the  $RCA_2$  index to Leamer's aggregation, all but two (SITC 61 and 67) product groups exhibiting comparative advantage are found in both tables, the two left out are categorised under the aggregated group of capital intensive products.

A final look at revealed comparative advantage on the three-digit level for Iceland in trade with the world (see Appendix VII) shows comparative advantage ( $RCA_1$ ) within the same product groups as before, i.e. live animals and food, manufactured goods (aluminium) and animal products. Comparing these results to the  $RCA_2$  index (in Appendix XI) larger differences than were found on the two-digit level appear. In 1990/1991 the  $RCA_1$  index displays eleven products with comparative advantage. In the  $RCA_2$  index this result almost doubles, to 21 products. For 2000/2001 the corresponding numbers are 19 and 23.

## 4.2.5 Concluding Remarks

In conclusion, Iceland reveals comparative advantage in marine products, livestock, crude materials and a range of manufactured commodities. This outcome was expected considering Iceland's factor endowments and natural resources. The trend of comparative advantage between the two time periods is one of diversity. Several commodities have experienced an increase in trade specialisation while others as decreased their share of comparative advantage. The outcome from Leamer's aggregation reveals overall comparative advantages in primary products and processes and not at all in labour or capital intensive commodities. This is quite interesting as they themselves claim to be abundant in skilled and educated labour<sup>60</sup> as well as having large stocks of foreign direct investment. The difference – larger on the disaggregated level – between  $RCA_1$  and  $RCA_2$  accounts for the different data used for both indices. As  $RCA_1$  merely measures relative export performance between countries and industries, it avoids distortions caused by government policies but does not take into account trade of intra-industry type (discussed in the next section). The  $RCA_2$  index, on the other hand, by measuring the net exports of a commodity in relation to the country's total trade of that commodity has the reversed outcome of the first Balassa index. The relationship between intra-industry trade and  $RCA_2$  will be made more clearly below.

## 4.3 Intra-Industry Specialisation

### 4.3.1 Introduction

Intra-industry trade (IIT) is the two-way trade of exports and imports of similar goods within an industry, demanded by consumers from different countries with different preferences. This trade can take the form of horizontal trade which is trade in differentiated products, or vertical trade which is trade in parts and components. As mentioned in section 3.2.2 the traditional trade theories that rely on comparative advantage, factor endowments and factor intensities as incentives for international trade fails to explain this trade overlap among similarly endowed and technologically equipped countries. Empirical evidence has instead pointed to monopolistic competition and increasing returns to scale as justifications of intra-industry trade. There are many possible sources of intra-industry trade, two of which – scale

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<sup>60</sup> Locate in Iceland 2004:3

economies and product differentiation – has been discussed above. Other examples are high transportation costs for a wide range of products that are large and/or heavy, which imply that the markets for these goods are geographically limited, and border trade.<sup>61</sup>

There are many benefits with intra-industry trade that does not occur under traditional trade based on comparative advantage. First, with IIT international trade need not cause any redistribution of income from scarce factors to abundant factors, and demand of scarce and abundant factors will not be affected. Thus, if most trade are within industries rather than between, then any relocation of resources should be relatively minor. Second, IIT augments the gains from trade (discussed in section 3.2.2) by exploiting scale economies, which in turn leads countries to concentrate on a limited number of products within any particular industry. This saves real resources. Third, specialisation stimulates innovation. With greater knowledge and technology, products can be produced at lower costs. Finally, IIT reduces the need for trade protection because there are both exports and imports within an industry.<sup>62</sup>

### 4.3.2 The Grubel-Lloyd Index

The most commonly used measurement for intra-industry trade is the index introduced by Grubel and Lloyd in 1975. This index measures the extent to which exports and imports are matched, for a given industry  $j$ , relative to total trade in the commodity group in question.<sup>63</sup>

$$IIT_i = \frac{(X_{ij} + M_{ij}) - |X_{ij} - M_{ij}|}{(X_{ij} + M_{ij})}$$

Intra-industry trade in country  $i$ 's foreign trade in commodity  $j$  is defined as total trade  $(X_{ij} + M_{ij})$  minus inter-industry trade  $(X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$ , or equivalently that intra-industry trade is the proportion of trade that is not inter-industry:

$$IIT_i = 1 - |RCA_{2i}|$$

If there is no intra-industry trade, then either  $X_j$  or  $M_j$  is zero and the IIT index will be zero. If instead all trade is IIT then the Grubel-Lloyd index takes the value of 1. Thus the closer the

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<sup>61</sup> Markusen et al 1995:204

<sup>62</sup> Ruffin 1999:6

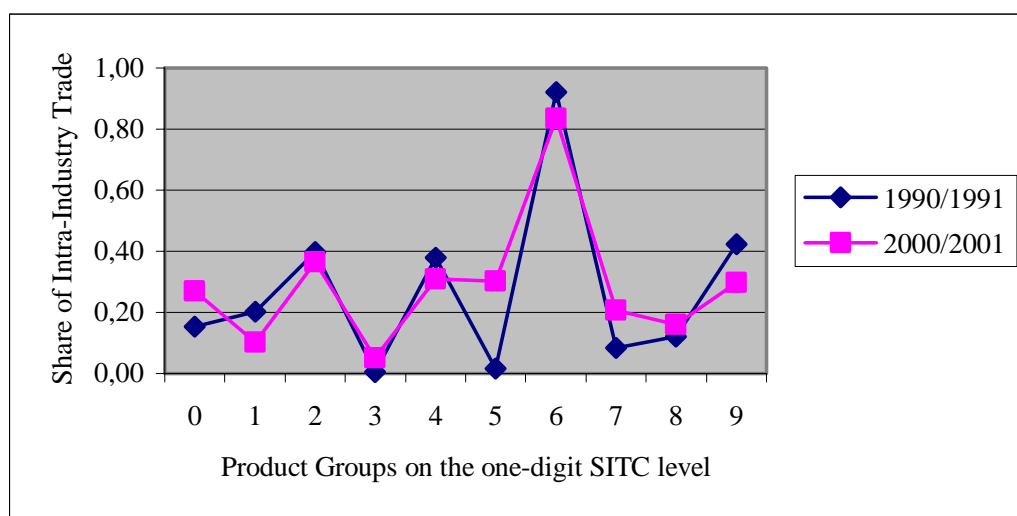
<sup>63</sup> Grenaway and Milner 2003:1

index is to 1 the, greater the level of intra-industrial trade, and values above 0.5 is taken as evidence as prevalence of intra-industry trade.<sup>64</sup> In the next section, the Grubel-Lloyd Index will be estimated on the one-, two- and three-digit SITC level. Furthermore, the methods used for presenting the data material and why they are used comply with the discussion in the final paragraph of section 4.2.2 and the presentation of inter-industry trade.

### 4.3.3 Intra-Industry Trade on the Aggregated Level

Because intra-industry trade is not based on any country specific endowment or factor intensity, there is no economic intuition of in what sectors Iceland will have a predominance of it. Although intra-industry trade is defined as all other trade other than inter-industry trade, because a sector showed revealed comparative advantage in the former section does not indicate that that same sector cannot also show intra-industry trade specialisation. Figure 2 shows the share of intra-industry specialisation for 1990/1991 and 2000/2001 for the 10 aggregated product groups on the one-digit SITC level in relation to the world. The figure indicates that the trend of intra-industry trade have varied much during the last decade, with half of the product groups experiencing an increase of IIT and the other half experiencing a decline. When studying Leamer's aggregation (below), this trend differs slightly as the results instead indicate an increase in six aggregated groups, and a decline in four.

**Figure 2: Share of Intra-Industry Trade 1990/1991 and 2000/2001**



Source: Own calculations based on data from Iceland Statistics

<sup>64</sup> Gustafsson 2003:87

Table 6 and 7 displays Iceland's share of predominance of intra-industry trade in numbers. At the one-digit SITC level the manufacturing sector has a significant G-L index of 0,92 and 0,83 for 1990/1991 and 2000/2001 respectively. This sector showed a minor  $RCA_1$  on the same aggregate level in 2000/2001. Looking instead at Leamer's aggregation, Iceland exhibits a predominance of intra-industry trade in raw materials, cereals and capital intensive goods. The results from both tables are in accordance with expected outcomes as the scope for product differentiation is larger in manufactured and capital intensive products than in primary products, which are more homogenous in nature.

**Table 6: Intra-Industry Trade for Iceland in Trade with the World at the one-digit SITC level**

SITC	Product Group	RCA <sub>2</sub>	IIT	RCA <sub>2</sub>	IIT
		1990/1991		2000/2001	
0	Food and live animals	0,85	0,15	0,73	0,27
1	Beverages and tobacco	-0,80	0,20	-0,90	0,10
2	Crude materials. Inedible	-0,60	0,40	-0,63	0,37
3	Mineral fuels; lubricants	-0,99	0,01	-0,95	0,05
4	Animal and vegetable oils, fats	0,62	0,38	0,69	0,31
5	Chemicals and related products	-0,98	0,02	-0,70	0,30
6	Manufactured goods	-0,08	<b>0,92</b>	0,17	<b>0,83</b>
7	Machinery and transp. equipment	-0,92	0,08	-0,79	0,21
8	Misc. manufactured articles	-0,88	0,12	-0,84	0,16
9	Other commodities	0,58	0,42	0,70	0,30

Source: Own calculations based on data from Iceland Statistic

**Table 7: Intra-Industry Trade for Iceland in Trade with the World – The Leamer Aggregation.**

Aggregation Group	RCA <sub>2</sub>	IIT	RCA <sub>2</sub>	IIT
	1990/1991		2000/2001	
1. Petroleum	-0,99	0,01	-0,95	0,05
2. Raw Materials	0,47	<b>0,53</b>	0,51	0,49
3. Forest Products	-0,97	0,03	-0,92	0,08
4. Tropical Agriculture	-0,88	0,12	-0,93	0,07
5. Animal Products	0,97	0,03	0,88	0,12
6. Cereals	0,28	<b>0,72</b>	0,32	<b>0,68</b>
7. Labour Intensive	-0,84	0,16	-0,80	0,20
8. Capital Intensive	-0,41	<b>0,59</b>	-0,47	<b>0,53</b>
9. Machines	-0,88	0,12	-0,72	0,28
10. Chemicals	-0,98	0,02	-0,62	0,38

Source: Own calculations based on data from Iceland Statistics

#### **4.3.4 Intra-Industry Trade on the Disaggregated Level**

The results on the disaggregated level (see Appendix X) also reveal that Iceland's intra-industry specialisation occurs within the manufacturing sector (with the exception of SITC 02 dairy products and eggs), although many of the commodity groups on the two-digit level are not revealed on the aggregated level. Of particular significance in 1990/1991 are textile fibres (SITC 26), crude fertilizers and minerals (SITC 27), and iron and steel (SITC 67), all of which has a G-L index  $>0.8$ . For 2000/2001 product groups with a similarly high index are crude animal and vegetable materials (SITC 29), and iron and steel (SITC 67). On the three-digit SITC level Iceland continues to show a predominance of intra-industry trade in manufactured and capital intensive goods, although the product groups now reveal a more disperse categorisations. Products showing a significantly high G-L index ( $>0.80$ ) are wool (SITC 268), other crude minerals (SITC 278), leather (SITC 611), household equipment (SITC 697), and other, non-electrical machinery (SITC 745). However, several other products indicate high G-L index, as shown in Appendix XI.

Turning to Leamer's aggregation (Appendix VIII), the results differ slightly. Although the aggregate categorisation captures more of the true nature of IIT specialisation, compared to the UN's two-digit level which indicates a predominance in five product groups for 1990/1991 and seven for 2000/2001, the results from Leamer's aggregation are spread out under several aggregated product groups and not necessarily found in the categories that revealed a predominance of intra-industry trade on the aggregated level. Intra-industry trade specialisation can thus also be found within animal products, labour intensive commodities and chemicals, of which the last two are manufactured aggregates.

#### **4.3.5 Concluding Remarks**

The assumption that intra-industry trade would be more predominant in the manufacturing industries turns out to be correct, both according to the UN's classification and Leamer's aggregation. Although this thesis have been unable to provide IIT data specific to the EU, a likely conclusion is that the geographical proximity to Europe, combined with the possibility of high transaction costs, has boosted Iceland's trade based on specialisation and product differentiation. Despite also being situated fairly close to North America, the European



continent is Iceland's most important trading partner due to the EEA agreement and the economical correspondence of the European countries, which encourages trade in similar but differentiated products. However, as oppose to the results of revealed comparative advantage, intra-industry specialisation accounts for a much smaller share of Iceland's total industrial structure and is scattered over a range of product groups on the disaggregated level, making results on the aggregated level unobservable, e.g. for crude materials.

## V Conclusion

This thesis has studied Iceland's patterns of trade and specialisation during the last decade, during which the country experienced significant economic growth. The expansion of foreign trade has accounted for a substantial part of this success, as has the increased stocks of foreign direct investment. The encouraged policy of FDI brought inflows of capital to Iceland from approximately \$450 000 in 1998 to almost \$940 000 in 2003, at the expense of large trade deficits. However, as will be mentioned below, there are of course other possibilities to Iceland's trade deficit. Whether FDI was brought in to salvage a negative trade balance or if the trade balance was a result of it, is a subject for further research.

The analysis of the Balassa index concerning inter-industry trade shows that Iceland's exports of marine products and livestock – its largest and third largest export sectors respectively – are indeed efficient in that the country specializes in its abundant resources of fishing waters (and thus fish and other seafood) and land available for grazing. This is revealed through significant levels of comparative advantage (both  $RCA_1$  and  $RCA_2$ ) in food, live animals and animal products. For Iceland, the fishing industry is of significant importance as the economic growth and restructuring needed to take the country towards development was made possible due to the country's exclusive fishing waters, favourable export prices and a steady output of marine products. Although it is thanks to specialisation and utilisation of scale economies that have ranked Iceland the 12<sup>th</sup> fishing nation in the world, the country's trade in this industry remains inter-industry. The industry's growth has promoted innovation in industries that intermediate good to fishing and fish-processing companies. Large scale exports and high productivity and competitiveness have made the fishing industry the backbone of Iceland's economy.<sup>65</sup> Iceland's second largest export sector, the power-intensive manufacturing sector, also reveals significant values of comparative advantage in a few products, and also in crude materials. An interesting aspect of the manufacturing sector is that comparative advantage is either found to be extremely high or non-existent. The results of the analysis are concurrent for Iceland in trade with all studied partners, i.e. EFTA, EU and the world. However, depending on the level of aggregation, different outcomes will appear as high levels of aggregation may impose distortions on the true pattern of comparative advantage. Also how

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<sup>65</sup> See Tryggvi Thor Herbertsson and Gylfi Zoega for further discussion.

the commodities have been categories will yield different results. However, in sum it appears that Iceland is undeniably taking advantage of its geographical location (being surrounded by water), its geology (in using hydro- and geothermal energy) and its abundance in land. Specializing in the production of commodities that most intensively uses factors that the country is relatively abundant in and exporting this in return for other products, is exactly the predicted Heckscher-Ohlin outcome.

The analysis of the Grubel-Lloyd index and Iceland's intra-industry trade indicates a large emphasis of IIT in manufactured and capital intensive products, but also in crude materials. This would be expected as Iceland's main trading partners are other developed countries within the EEA, all in geographical proximity, and as the scope for product differentiation is larger in these products than in primary products. Although intra-industry trade make out a smaller share of Iceland's total trade structure than inter-industry trade, in regards to number of products, the gains from IIT is likely to be more substantial. International trade that is not based on comparative advantage provides Iceland with an opportunity to produce and export products other than primary products, which most likely have acted as a catalyst in Iceland's economic growth from a developing country to a developed. These benefits have then further been accompanied by Iceland being able to exploit scale economies in these industries, which in turn have stimulated innovation.

As discussed previously, there are welfare implications from trade depending on the economic size of the countries involved, and their distribution of endowments. According to Venables, for a small country like Iceland to be a potential gainer from a regional integration agreement it should have endowments close to that of its trading partners, both in terms of inter-industry and intra-industry trade. This seems to undermine basic economic intuition behind trade based on comparative advantage, where countries exchange different commodities due to different endowments. However, the point here is that if there is little scope for trade there is little scope for trade diversion. Venables' conclusion that countries of similar economic size and similar factor endowments have a better outcome after integration seems to fit the Icelandic case. First, a significant share of Iceland's trade is within the EEA, a group of countries (disregarding the EU enlargement 2004) with overall very similar economic structure. Second, Iceland's smaller economic size in comparison with its main trading partners is a disadvantage in that it is unable to produce enough exports in return for needed imports, which might also be the cause of the country's negative trade balance.

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## Appendix I: Characteristics of Iceland (2002)

Area	103 000 km <sup>2</sup>
Exclusive Economic Zone	2 199 m
Population	288 471
GDP	US\$ 8,5 billion
GDP per Capita	US\$ 29 600 (in terms of PPP)
International Trade	Exports of Goods and Services: 40% of GDP Imports of Goods and Services: 38% of GDP
Source:	Central Bank of Iceland 2004

## Appendix II: Iceland's Balance of Trade 1993-2002

### Mill of ISK

Year	Exports fob	Imports fob	At current exchange rates	At constant 2002 rate of exchange	Percentage of GDP
1993	94.658	82.576	12.082	14.100	2,92
1994	112.654	93.243	19.411	21.537	4,42
1995	116.607	103.539	13.068	14.512	2,89
1996	125.690	124.836	854	949	0,18
1997	131.213	131.326	-113	-128	-0,02
1998	136.592	162.062	-25.470	-29.483	-4,49
1999	144.928	167.778	-22.850	-26.503	-3,77
2000	149.273	187.276	-38.003	-44.390	-5,77
2001	196.582	203.083	-6.501	-6.342	-0,88
2002	204.303	191.205	13.098	13.098	1,69
Source:	Iceland Statistics				

### Appendix III: Exports by Market Areas 1990-2002

Fob-value at current exchange rates	1990 Mill. ISK	1993 Mill. ISK	1998 Mill. ISK	2000 Mill. ISK	2002 Mill. ISK
<b>Total</b>	<b>92.625,1</b>	<b>94.657,6</b>	<b>136.592,0</b>	<b>149.272,8</b>	<b>204.303,0</b>
<b>EEA</b>	<b>66.880,7</b>	<b>69.467,5</b>	<b>95.337,8</b>	<b>107.350,3</b>	<b>153.462,3</b>
Austria	176,7	94,5	150,8	169,6	224,4
Belgium	976,4	1.415,4	1.716,4	2.231,5	3.209,7
Denmark	4.676,5	5.325,6	7.449,0	6.311,2	9.417,4
Finland	897,6	672,8	1.012,0	918,3	1.867,1
France	8.311,4	7.795,6	9.220,9	6.845,3	7.500,7
Germany	11.777,2	18.245,8	20.486,8	24.509,9	37.747,9
Greece	860,4	780,5	633,0	960,0	1.475,4
Ireland	75,8	97,2	565,6	315,9	329,0
Italy	2.690,6	1.934,6	2.366,7	2.196,2	2.762,9
Luxembourg	30,1	97,2	346,8	32,3	63,8
Netherlands	1.955,9	2.082,9	5.548,0	11.544,9	22.059,4
Norway	1.348,8	3.187,3	6.574,4	5.940,4	9.332,6
Portugal	3.316,6	1.549,1	5.236,9	8.438,8	8.865,0
Spain	4.645,1	4.617,6	6.867,7	6.791,6	10.693,9
Sweden	1.695,4	1.103,8	1.265,9	1.324,8	2.174,3
United Kingdom	23.446,2	20.467,6	25.897,0	28.819,7	35.739,0
<b>Other European countries, e.g.</b>	<b>4.572,2</b>	<b>4.316,3</b>	<b>10.157,1</b>	<b>7.734,9</b>	<b>10.612,6</b>
Bulgaria	24,0	0,4	44,3	6,3	14,4
Czech Republic	-	18,8	27,5	11,7	17,3
Faroe Islands	1.438,5	247,7	691,5	2.168,4	2.188,9
Greenland	160,0	78,7	203,4	231,2	431,6
Latvia	-	2,2	147,9	112,5	542,0
Lithuania	-	11,3	650,4	268,6	1.434,4
Poland	184,9	38,6	299,9	409,9	1.326,0
Russia	-	370,7	1.515,8	610,8	816,1
Switzerland	3.871,6	3.464,5	6.298,6	3.263,3	3.056,4
<b>United States</b>	<b>9.176,9</b>	<b>15.303,5</b>	<b>17.651,8</b>	<b>18.162,4</b>	<b>21.988,8</b>
<b>Japan</b>	<b>5.545,6</b>	<b>8.777,1</b>	<b>6.544,8</b>	<b>7.814,7</b>	<b>6.766,4</b>
<b>Other countries</b>	<b>2.578,0</b>	<b>4.861,9</b>	<b>6.900,3</b>	<b>8.210,5</b>	<b>11.472,9</b>
Australia	69,4	43,6	91,0	187,9	426,6
Brazil	189,4	184,0	618,9	35,4	83,0
Canada	286,7	499,5	2.111,3	2.346,8	1.738,6
China	16,3	8,6	516,4	878,9	1.310,1
Hong Kong	36,6	49,9	10,3	61,2	167,7
Israel	74,5	127,7	130,4	108,3	295,5
Korea, Rep. of	56,1	225,7	146,3	344,2	407,7
Nigeria	588,7	853,4	993,2	1.211,5	3.054,6
Taiwan	879,7	1.845,8	1.010,0	1.360,3	1.704,6
Other countries	380,6	1.023,5	1.272,5	1.676,1	2.284,4

Source: Iceland External Trade 2002

## Appendix IV: Imports by Market Areas 1993-2002

Cif-value at current exchange rates	1990 Mill. ISK	1993 Mill. ISK	1998 Mill. ISK	2000 Mill. ISK	2002 Mill. ISK
<b>Total</b>	<b>96.620,9</b>	<b>91.306,6</b>	<b>176.072,1</b>	<b>203.222,1</b>	<b>207.607,5</b>
<b>EEA</b>	<b>62.876,5</b>	<b>64.226,8</b>	<b>115.193,0</b>	<b>132.474,7</b>	<b>125.599,4</b>
Austria	706,5	747,7	1.058,9	1.185,7	1.123,4
Belgium	1.746,2	1.747,6	3.266,8	3.082,9	3.683,6
Denmark	8.324,8	8.563,6	13.519,8	16.152,5	17.654,2
Finland	1.602,5	1.801,4	2.823,3	2.871,9	3.478,3
France	2.942,7	3.108,3	6.343,3	7.586,0	6.436,3
Germany	12.257,4	10.880,9	20.175,8	24.098,3	22.165,4
Greece	83,9	131,4	102,8	99,3	126,3
Ireland	391,0	693,8	2.603,7	2.859,2	2.836,3
Italy	2.993,2	3.188,4	5.668,5	6.130,1	6.206,7
Liechtenstein	-	-	12,0	8,9	8,2
Luxembourg	33,6	19,4	97,1	171,7	157,0
Netherlands	10.022,4	5.476,4	10.477,1	15.236,7	12.504,9
Norway	4.869,6	11.298,7	16.137,1	16.512,4	16.600,6
Portugal	854,5	928,3	1.195,1	1.312,0	1.011,5
Spain	877,5	1.267,5	3.530,5	3.533,6	3.852,8
Sweden	7.388,7	6.186,6	11.154,4	13.407,8	12.294,3
United Kingdom	7.782,0	8.186,8	17.026,6	18.225,6	15.459,6
<b>Other European countries, e.g.</b>	<b>6.612,4</b>	<b>3.785,5</b>	<b>13.673,7</b>	<b>14.766,6</b>	<b>23.855,6</b>
Czech Republic	-	299,1	757,4	655,3	786,1
Estonia	-	96,7	415,7	1.255,8	6.425,9
Faroe Islands	47,1	97,0	975,8	603,8	528,2
Greenland	45,7	266,0	531,8	412,2	325,2
Hungary	52,5	51,6	232,9	407,4	697,1
Latvia	-	16,9	516,5	758,8	1.044,5
Lithuania	-	2,2	293,9	755,5	624,6
Poland	1.098,3	437,6	2.570,7	2.888,0	1.346,2
Romania	22,7	29,5	202,5	231,8	285,6
Russia	-	2.309,6	3.792,0	3.612,2	7.898,2
Slovakia	-	16,9	92,0	210,1	213,1
Switzerland	1.174,9	1.569,2	2.624,8	2.095,2	2.225,5
Turkey	82,9	81,2	313,5	554,6	815,6
<b>United States</b>	<b>13.949,5</b>	<b>8.510,8</b>	<b>19.540,2</b>	<b>22.313,6</b>	<b>23.024,8</b>
<b>Japan</b>	<b>5.419,3</b>	<b>5.059,8</b>	<b>8.933,3</b>	<b>10.039,9</b>	<b>6.514,2</b>
<b>Other countries</b>	<b>6.687,8</b>	<b>8.150,9</b>	<b>18.732,0</b>	<b>23.627,3</b>	<b>28.613,5</b>
Australia	2.499,2	2.202,5	5.485,4	5.343,6	6.072,3
Brazil	256,2	280,7	184,8	159,4	185,8
Canada	510,2	567,3	1.487,8	1.867,3	1.646,2
China	431,5	931,1	2.418,3	3.772,7	6.112,3
Hong Kong	599,7	526,2	807,9	747,3	679,6
Israel	50,5	60,6	211,3	400,6	455,6
Korea, Rep. of	543,7	761,5	2.123,2	1.657,0	1.706,8
Taiwan	606,3	844,3	1.457,7	1.652,2	1.910,5
Other countries	1.190,3	1.976,6	4.555,4	8.026,9	9.844,5

Source: Iceland External Trade 2002



**Appendix V: Revealed Comparative Advantage (RCA<sub>1</sub>) for Iceland in Trade with the World at the one-digit SITC level – based on average values from 1990/1991 and 2000/2001**

SITC Product Group		Iceland 1990/1991 Mill of \$	World 1990/1991 Mill of \$	RCA <sub>1</sub>	Iceland 2000/2001 Mill of \$	World 2000/2001 Mill of \$	RCA <sub>1</sub>
Total (incl. entries not shown here)		<b>1568,57</b>	<b>3338129</b>		<b>1957,92</b>	<b>5944700</b>	
0	Food and live animals	1263,45	243958	<b>11,02</b>	1224,57	319776	<b>11,63</b>
1	Beverages and tobacco	2,89	21903	0,28	2,00	34301	0,18
2	Crude materials. Inedible	17,95	145360	0,26	31,71	171602	0,56
3	Mineral fuels; lubricants	0,39	324110	0,00	5,64	604384	0,03
4	Animal and vegetable oils, fats	14,91	12124	<b>2,62</b>	33,47	17462	<b>5,82</b>
5	Chemicals and related products	1,06	287613	0,01	38,98	550133	0,22
6	Manufactured goods	219,31	540560	0,86	466,89	828563	<b>1,71</b>
7	Machinery and transp. equipment	23,91	1068775	0,05	100,43	2450092	0,12
8	Misc. manufactured articles	16,37	399425	0,09	33,20	703329	0,14

**Appendix VI: Revealed Comparative Advantage (RCA<sub>1</sub>) for Iceland in Trade with the World at the two-digit SITC level – based on average values from 1990/1991 and 2000/2001 (some selected commodities)**

SITC Product Group		Iceland 1990/1991 Mill of \$	World 1990/1991 Mill of \$	RCA <sub>1</sub>	Iceland 2000/2001 Mill of \$	World 2000/2001 Mill of \$	RCA <sub>1</sub>
Total (incl. entries not shown here)		<b>1568,57</b>	<b>3338129</b>		<b>1957,92</b>	<b>5944700</b>	
00	Live animals	3,00	9656	0,66	3,61	8635	<b>1,27</b>
01	Meat and meat preparations	7,16	33936	0,45	5,63	43310	0,39
02	Dairy Products and eggs	0,73	20131	0,08	0,87	26241	0,10
03	Fish, crustaceans, molluscs etc.	1195,14	32994	<b>77,09</b>	1085,44	47561	<b>69,29</b>
04	Cereals and cereal preparations	0,05	38161	0,00	0,43	48757	0,03
05	Vegetables and fruit	0,21	51360	0,01	0,16	68725	0,01
06	Sugars, sugar prep. and honey	0,16	14063	0,02	0,39	15059	0,08
08	Animal feeds, excl. unmilled cereals	56,95	16063	<b>7,55</b>	127,64	20947	<b>18,50</b>
09	Miscellaneous edible products	0,04	8207	0,01	0,33	15839	0,06
11	Beverages	2,89	21903	0,28	2,00	34301	0,18
21	Hides, skins and furskins, raw	3,94	4963	<b>1,69</b>	5,95	5112	<b>3,54</b>
25	Pulp and waste paper	0,11	16258	0,01	0,11	20624	0,02
26	Textile fibres and their wastes	1,32	18329	0,15	1,06	15148	0,21
27	Crude fertilizers, crude minerals	9,22	9413	<b>2,08</b>	5,45	10694	<b>1,55</b>
28	Metalliferous ores, metal scrap	1,21	37031	0,07	7,56	47517	0,48
29	Crude animal and veget. materials	2,14	13973	0,33	11,37	17531	<b>1,97</b>
33	Petroleum, petroleum products	0,39	271266	0,00	5,63	503099	0,03
52	Inorganic chemicals	0,01	25530	0,00	0,02	33566	0,00
54	Medicinal and pharmaceutical prod.	0,42	39181	0,02	0,45	119158	0,01

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55	Oils, toilet and cleansing prep.	0,02	21234	0,00	0,51	45151	0,03
58	Plastic manufactures	0,01	64750	0,00	27,13	112663	0,73
59	Chem. materials & products n.e.s.	0,30	34081	0,02	0,49	62092	0,02
61	Leather and dressed furskins	16,06	13292	<b>2,57</b>	0,00	21550	0,00
62	Rubber manufactures, n.e.s.	0,18	24842	0,02	0,50	43026	0,04
63	Cork and wood manufactures	0,08	17815	0,01	8,13	30047	0,82
64	Paper, paperboard, articles thereof	1,16	64053	0,04	7,87	99572	0,24
65	Textile yarn etc., n.e.s.	6,24	108083	0,12	0,40	151214	0,01
66	Non-metallic min. manufactures n.e.s.	1,33	68896	0,04	0,56	120682	0,01
67	Iron and steel	36,72	106708	0,73	2,90	138322	0,06
68	Non-ferrous metals	150,43	66704	<b>4,80</b>	13,73	103972	0,40
69	Manufactures of metal n.e.s.	7,11	70167	0,22	1,76	120178	0,04
71	Power generating machinery	0,10	79454	0,00	51,28	155170	1,00
72	Machinery for part. industries	5,18	117032	0,09	379,80	157704	<b>7,31</b>
73	Metalworking machinery	0,16	30738	0,01	8,59	38726	0,67
74	Gen. industr. machinery & equipm.	4,79	132501	0,08	2,04	222395	0,03
75	Office machines and computers	0,72	131440	0,01	16,48	335569	0,15
76	Telecom equipment etc.	0,09	118094	0,00	0,20	290605	0,00
77	Elec. machinery, app. and appliances	0,67	191677	0,01	33,86	544806	0,19
78	Road vehicles	0,15	165154	0,00	1,08	543924	0,01
79	Other transport equipment	12,06	102685	0,25	0,77	161193	0,01
81	Prefab. buildings; fixtures	0,01	9178	0,00	6,58	16451	<b>1,22</b>
82	Furnit., matr., cushions etc.	0,07	30629	0,00	2,03	61968	0,10
84	Apparel and clothing accessories	10,82	106198	0,22	0,12	188252	0,00
87	Prof., scient. & contr. instruments	0,20	53319	0,01	0,26	119912	0,01
88	Photogr. equip., opt. goods; watches	0,01	39179	0,00	2,70	55013	0,15
89	Misc. manufactured articles n.e.s.	5,26	126548	0,09	0,14	213848	0,00

**Appendix VII: Revealed Comparative Advantage (RCA<sub>1</sub>) for Iceland in Trade with the World at the three-digit SITC level – based on average values from 1990/1991 and 2000/2001 (some selected commodities)**

SITC	Product Group	Iceland 90/91 Mill of \$	World 90/91 Mill of \$	RCA <sub>1</sub>	Iceland 00/01 Mill of \$	World 00/01 Mill of \$	RCA <sub>1</sub>
	Total (incl. entries not shown here)	<b>1568,57</b>	<b>3338129</b>		<b>1957,92</b>	<b>5944700</b>	
001	Live animals	3,00	9656	0,66	3,61	8635	<b>1,27</b>
022	Milk, cream and milk products	0,01	8827	0,00	0,10	13164	0,02
024	Cheese and curd	0,72	8074	0,19	0,01	10394	0,00
034	Fish, fresh, chilled or frozen	781,82	14987	<b>111,02</b>	636,21	21687	<b>89,07</b>
036	Crustaceans and molluscs	118,96	11532	<b>21,95</b>	29,53	16494	<b>5,44</b>
037	Marine prod., prep. or preserved	25,99	6475	<b>8,54</b>	134,76	9380	<b>43,62</b>
048	Cereal, flour and starch preparation	0,05	10088	0,01	0,41	18313	0,07
054	Vegetables, fresh, chilled or frozen	0,01	17945	0,00	0,02	24049	0,00
057	Fruit and nuts, fresh or dried	0,03	19785	0,00	0,03	26662	0,00
081	Animal feeds, excl. unmilled cereals	56,95	16063	<b>7,55</b>	127,64	20947	<b>18,50</b>
111	Non-alcoholic beverages n.e.s.	2,54	2962	<b>1,83</b>	1,83	5427	<b>1,02</b>
112	Alcoholic bevarages	0,35	19387	0,04	0,17	28874	0,02
211	Hides and skins, raw	0,69	4963	0,29	2,17	5112	1,29
268	Wool; other animal hair; wool tops	1,30	5583	0,50	0,97	3198	0,92
273	Stone, sand and gravel	0,14	2647	0,11	0,36	3778	0,29
278	Other crude minerals	8,04	6766	<b>2,53</b>	2,39	6916	<b>1,05</b>
282	Ferrous waste and scrap	0,24	5053	0,10	3,13	7277	<b>1,30</b>
288	Non-ferrous waste/scrap n.e.s.	0,97	5816	0,36	4,43	8148	<b>1,65</b>
291	Crude animal materials n.e.s.	2,02	2631	<b>1,64</b>	9,83	3322	<b>8,99</b>
292	Crude vegetable materials	0,12	11342	0,02	1,54	14209	0,33
334	Petroleum products, refined	0,01	84068	0,00	3,18	153311	0,06
541	Medicinal and pharm. products	0,05	39181	0,00	0,72	119158	0,02
553	Perfumery, cosmetics/toilet prep.	0,02	10468	0,00	0,22	23847	0,03
554	Soap, cleansing/polishing materials	0,01	7075	0,00	0,11	13186	0,03
582	Plates, sheets, etc., of plastics	0,01	16424	0,00	0,37	29886	0,04
598	Misc. chemical products n.e.s.	0,13	21874	0,01	8,10	42449	0,58
611	Leather	0,69	9075	0,16	0,08	15003	0,02
612	Manuf. of leather or compos. leather	0,08	4217	0,04	0,55	6547	0,25
621	Materials of rubber	0,15	4036	0,08	0,17	7422	0,07
635	Wood manufactures n.e.s.	0,08	8482	0,02	0,54	16564	0,10
641	Paper and paperboard	0,01	50497	0,00	0,01	74817	0,00
642	Articles of paper or paperboard	1,15	13556	0,18	2,89	24755	0,35
651	Textile yarn	1,43	23643	0,13	1,25	30962	0,12
654	Other textile fabrics, woven	0,38	8112	0,10	0,01	8626	0,00
655	Knitted or crocheted fabrics	0,34	6534	0,11	0,53	13051	0,12
657	Special yarns and fabrics	2,66	11501	0,49	11,59	19997	<b>1,76</b>
663	Mineral manufactures n.e.s.	1,31	8649	0,32	1,67	13359	0,38
671	Pig iron, spiegeleisen etc.; ferro-alloys	35,73	6416	<b>11,85</b>	50,70	8757	<b>17,58</b>
679	Pipes, fittings etc. of iron or steel	0,04	2621	0,03	0,28	4685	0,18
682	Copper	0,00	23411	0,00	0,04	30243	0,00
684	Aluminium	150,43	28394	<b>11,27</b>	379,76	47676	<b>24,18</b>

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692	Metal containers for storage/transport	0,03	4994	0,01	0,11	6615	0,05
693	Wire products and fencing grills	0,07	3482	0,04	0,54	4730	0,35
697	Household equipment of base metal	4,89	6197	<b>1,68</b>	3,96	10937	<b>1,10</b>
699	Manufactures of base metal n.e.s.	2,09	24376	0,18	3,55	48161	0,22
713	Intern.-comb. piston engines and parts	0,05	36470	0,00	0,16	66663	0,01
716	Rotating electric plant and parts	0,00	13910	0,00	0,38	29621	0,04
718	Power generators; parts n.e.s.	0,04	3468	0,02	0,10	4937	0,06
721	Agricultural machinery and parts	0,28	8836	0,07	0,02	10796	0,01
723	Civil engineering/contractors equipm.	0,11	18575	0,01	1,24	26005	0,15
724	Textile and leather machinery	0,77	21070	0,08	0,07	18666	0,01
726	Printing and bookbinding machinery	0,11	10701	0,02	0,29	13827	0,06
727	Food-processing machines	3,52	5231	<b>1,43</b>	12,27	5585	<b>6,67</b>
728	Other mach. for particular industries	0,31	39076	0,02	2,18	68691	0,10
737	Metalworking machinery n.e.s.	0,10	6948	0,03	0,16	8666	0,06
741	Heating/cooling equipm.; parts n.e.s.	0,07	23870	0,01	2,13	40477	0,16
742	Pumps for liquids; liquid elevators	0,01	11585	0,00	0,36	19325	0,06
743	Pumps, air compressors and fans etc.	0,05	20275	0,00	0,10	39451	0,01
744	Mechanical handling equipment	0,43	23411	0,04	1,46	35877	0,12
745	Other non-electrical machinery	4,12	16216	0,54	28,77	22660	<b>3,86</b>
749	Non-electric parts etc. of mach. n.e.s.	0,01	37099	0,00	0,68	64605	0,03
752	Computers and units thereof	0,12	69307	0,00	0,71	181403	0,01
759	Parts for office mach. and computers	0,60	50762	0,03	0,27	141754	0,01
761	TVs, video monitors/projectors	0,00	17132	0,00	0,04	27719	0,00
764	Telecom. equipment and parts n.e.s.	0,09	60169	0,00	0,65	198729	0,01
771	Electric power machinery and parts	0,02	10984	0,00	0,32	30693	0,03
772	Electrical apparatus	0,06	36607	0,00	0,16	86345	0,01
775	Household equipm. electr. & non-electr.	0,03	21281	0,00	0,04	35090	0,00
778	Electrical machinery and app. n.e.s.	0,52	38259	0,03	0,32	91250	0,01
784	Parts etc. for motor vehicles	0,00	84817	0,00	0,13	138726	0,00
786	Trailers/semi-trailers; non-mech.vehicles	0,00	7240	0,00	0,02	10642	0,01
792	Aircraft and associated equipment	5,47	71362	0,16	0,51	111333	0,01
793	Ships, boats and floating structures	6,58	26364	0,53	36,66	41407	<b>2,69</b>
821	Furniture and parts thereof	0,07	30629	0,00	0,18	61968	0,01
842	Women's wear of woven fabrics	0,23	17665	0,03	0,16	45411	0,01
845	Apparel, n.e.s.; babies' clothing	7,41	26508	0,60	2,08	42936	0,15
846	Accessories, of textile fabrics n.e.s.	1,54	12943	0,25	0,17	30780	0,02
892	Printed matter	0,53	18805	0,06	1,91	26084	0,22
893	Articles of plastics n.e.s.	2,89	29675	0,21	6,04	62283	0,29
895	Office and stationery supplies n.e.s.	0,01	4482	0,00	0,02	7327	0,01
896	Artwork, coll. pieces and antiques	1,08	9734	0,24	1,16	7640	0,46
897	Jewellery, gold/silversmiths' wares	0,01	13292	0,00	0,03	21487	0,00
899	Misc. manufactured articles n.e.s.	0,65	10926	0,13	17,49	21545	<b>2,46</b>

**Appendix VIII: Revealed Comparative Advantage (RCA<sub>2</sub>) and IIT for Iceland in Trade with the World – based on average values from 1990/1991 and 2000/2001. The Leamer Aggregation.**

SITC	Aggregation Group	Export 90/91 Mill of \$	Import 90/91 Mill of \$	RCA <sub>2</sub>	IIT	Export 00/01 Mill of \$	Import 00/01 Mill of \$	RCA <sub>2</sub>	IIT
	<b>1. Petroleum</b>	0,39	134,49	-0,99	0,01	5,63	204,11	-0,95	0,05
33	Petroleum, petroleum products	0,39	134,49	-0,99	0,01	5,63	204,11	-0,95	0,05
	<b>2. Raw Materials</b>	160,86	58,01	<b>0,47</b>	<b>0,53</b>	392,81	128,93	<b>0,51</b>	0,49
27	Crude fertilizers & minerals	9,22	6,27	<b>0,19</b>	<b>0,81</b>	5,45	12,79	-0,40	<b>0,60</b>
28	Metalliferous ores, metal scrap	1,21	41,96	-0,94	0,06	7,56	95,23	-0,85	0,15
68	Non-ferrous metals	150,43	9,78	<b>0,88</b>	0,12	379,8	20,91	<b>0,90</b>	0,10
	<b>3. Forest Products</b>	1,24	79,77	-0,97	0,03	3,46	82,1	-0,92	0,08
63	Cork and wood manufactures	0,08	25,96	-0,99	0,01	0,56	27,2	-0,96	0,04
64	Paper, paperboard, etc.	1,16	53,81	-0,96	0,04	2,9	54,9	-0,90	0,10
	<b>4. Tropical Agriculture</b>	3,26	50,76	-0,88	0,12	2,55	70,21	-0,93	0,07
05	Vegetables and fruit	0,21	27,30	-0,99	0,01	0,16	38,63	-0,99	0,01
06	Sugars, sugar prep. and honey	0,16	9,37	-0,97	0,03	0,39	8,62	-0,91	0,09
11	Beverages	2,89	14,08	-0,66	0,34	2,00	22,96	-0,84	0,16
	<b>5. Animal Products</b>	1212,11	18,11	<b>0,97</b>	0,03	1112,87	73,94	<b>0,88</b>	0,12
00	Live animals	3,00	0,03	<b>0,98</b>	0,02	3,61	0,15	<b>0,92</b>	0,08
01	Meat and meat preparations	7,16	0,03	<b>0,99</b>	0,01	5,63	0,96	<b>0,71</b>	0,29
02	Dairy products and eggs	0,73	0,27	<b>0,46</b>	<b>0,54</b>	0,87	2,03	-0,40	<b>0,60</b>
03	Fish, crustaceans, molluscs etc	1195,14	13,84	<b>0,98</b>	0,02	1085,44	58,54	<b>0,90</b>	0,10
21	Hides, skins and furskins, raw	3,94	0,33	<b>0,84</b>	0,16	5,95	0,01	<b>1,00</b>	0,00
29	Crude animal and veget.mat.	2,14	3,61	-0,26	<b>0,74</b>	11,37	12,25	-0,04	<b>0,96</b>
	<b>6. Cereals</b>	73,27	40,96	<b>0,28</b>	<b>0,72</b>	129,46	66,12	<b>0,32</b>	<b>0,68</b>
04	Cereals and cereal prep.	0,05	19,47	-0,99	0,01	0,43	34,99	-0,98	0,02
08	Animal feeds	56,95	5,28	<b>0,83</b>	0,17	127,64	6,31	<b>0,91</b>	0,09
09	Miscellaneous edible products	0,04	14,05	-0,99	0,01	0,33	24,31	-0,97	0,03
26	Textile fibres and their wastes	1,32	1,99	-0,20	<b>0,80</b>	1,06	0,51	<b>0,35</b>	<b>0,65</b>
41	Animal oils and fats	14,91	0,17	<b>0,98</b>	0,02	-	-	-	-
	<b>7. Labour Intensive</b>	17,47	203,99	-0,84	0,16	31,65	290,16	-0,80	0,20
66	Non-metallic min. manufac.	1,33	21,01	-0,88	0,12	1,76	32,77	-0,90	0,10
82	Furnit., matr., cushions etc.	0,07	30,35	-1,00	0,00	0,18	55,77	-0,99	0,01
84	Apparel and clothing acc.	10,82	73,92	-0,74	0,26	2,7	88,97	-0,94	0,06
89	Misc. Manufac. articles n.e.s.	5,26	78,71	-0,87	0,13	27,01	112,65	-0,61	0,39

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	<b>8. Capital Intensive</b>	66,32	159,33	-0,41	<b>0,59</b>	81,99	230,12	-0,47	<b>0,53</b>
61	Leather and dressed furskins	16,06	1,31	<b>0,85</b>	0,15	7,87	1,22	<b>0,73</b>	0,27
62	Rubber manufactures, n.e.s.	0,18	15,82	-0,98	0,02	0,4	19,54	-0,96	0,04
65	Textile yarn etc., n.e.s.	6,24	37,80	-0,72	0,28	13,73	41,6	-0,50	<b>0,50</b>
67	Iron and steel	36,72	29,07	<b>0,12</b>	<b>0,88</b>	51,28	38,22	<b>0,15</b>	<b>0,85</b>
69	Manufactures of metal n.e.s.	7,11	62,86	-0,80	0,20	8,59	98,13	-0,84	0,16
81	Prefab. buildings; fixtures	0,01	12,47	-1,00	0,00	0,12	31,41	-0,99	0,01
	<b>9. Machines</b>	5,43	86,10	-0,88	0,12	18,72	113,81	-0,72	0,28
71	Power generating machinery	0,10	26,86	-0,99	0,01	2,04	33,16	-0,88	0,12
72	Machinery for part. industries	5,18	51,54	-0,82	0,18	16,48	73,02	-0,63	0,37
73	Metalworking machinery	0,16	7,69	-0,96	0,04	0,20	7,63	-0,95	0,05
	<b>10. Chemicals</b>	0,76	85,66	-0,98	0,02	36,76	154,78	-0,62	0,38
52	Inorganic chemicals	0,01	7,35	-1,00	0,00	0,51	8,8	-0,89	0,11
54	Med. and pharmaceut. prod.	0,42	29,87	-0,97	0,03	27,13	65,77	-0,42	<b>0,58</b>
55	Oils, toilet and cleansing prep.	0,02	19,98	-1,00	0,00	0,49	28,36	-0,97	0,03
58	Plastic manufactures	0,01	15,28	-1,00	0,00	0,5	23,04	-0,96	0,04
59	Chem. materials & prod. n.e.s.	0,30	13,17	-0,96	0,04	8,13	28,81	-0,56	0,44

**Appendix IX: Revealed Comparative Advantage (RCA<sub>2</sub>) and IIT for Iceland in Trade with the World at the one-digit SITC level – based on average values from 1990/1991 and 2000/2001**

SITC	Product Group	Export 90/91 Mill of \$	Import 90/91 Mill pf \$	RCA <sub>2</sub>	IIT	Export 00/01 Mill of \$	Import 00/01 Mill of \$	RCA <sub>2</sub>	IIT
	Total	1568,57	1535,6			1957,92	2400,89		
0	Food and live animals	1263,45	104,39	<b>0,85</b>	0,15	1224,57	191,77	<b>0,73</b>	0,27
1	Beverages and tobacco	2,89	25,85	-0,80	0,20	2,00	36,85	-0,90	0,10
2	Crude materials. Inedible	17,95	72,35	-0,60	0,40	31,71	141,57	-0,63	0,37
3	Mineral fuels; lubricants	0,39	142,12	-0,99	0,01	5,64	218,36	-0,95	0,05
4	Animal and vegetable oils, fats	14,91	3,49	<b>0,62</b>	0,38	33,47	6,15	<b>0,69</b>	0,31
5	Chemicals and related products	1,06	125,41	-0,98	0,02	38,98	218,22	-0,70	0,30
6	Manufactured goods	219,31	257,43	-0,08	<b>0,92</b>	466,89	334,52	<b>0,17</b>	<b>0,83</b>
7	Machinery and transp. equipment	23,91	548,55	-0,92	0,08	100,43	869,98	-0,79	0,21
8	Misc. manufactured articles	16,37	253,77	-0,88	0,12	33,20	379,79	-0,84	0,16
9	Other commodities	8,34	2,24	<b>0,58</b>	0,42	21,08	3,68	<b>0,70</b>	0,30

**Appendix X: Revealed Comparative Advantage (RCA<sub>2</sub>) and IIT for Iceland in Trade with the World at the two-digit SITC level – based on average values from 1990/1991 and 2000/2001 (some selected commodities)**

SITC	Product Group	Export 90/91 Mill of \$	Import 90/91 Mill pf \$	RCA <sub>2</sub>	IIT	Export 00/01 Mill of \$	Import 00/01 Mill of \$	RCA <sub>2</sub>	IIT
	Total (incl. entries not shown here)	1568,57	1535,6			1957,92	2400,89		
00	Live animals	3,00	0,03	0,98	0,02	3,61	0,15	0,92	0,08
01	Meat and meat preparations	7,16	0,03	0,99	0,01	5,63	0,96	0,71	0,29
02	Dairy products and eggs	0,73	0,27	0,46	<b>0,54</b>	0,87	2,03	-0,40	<b>0,60</b>
03	Fish, crustaceans, molluscs etc.	1195,14	13,84	0,98	0,02	1085,44	58,54	0,90	0,10
04	Cereals and cereal preparations	0,05	19,47	-0,99	0,01	0,43	34,99	-0,98	0,02
05	Vegetables and fruit	0,21	27,30	-0,99	0,01	0,16	38,63	-0,99	0,01
06	Sugars, sugar prep. and honey	0,16	9,37	-0,97	0,03	0,39	8,62	-0,91	0,09
08	Animal feeds, excl. unmilled cereals	56,95	5,28	0,83	0,17	127,64	6,31	0,91	0,09
09	Miscellaneous edible products	0,04	14,05	-0,99	0,01	0,33	24,31	-0,97	0,03
11	Beverages	2,89	14,08	-0,66	0,34	2,00	22,96	-0,84	0,16
21	Hides, skins and furskins, raw	3,94	0,33	0,84	0,16	5,95	0,01	1,00	0,00
26	Textile fibres and their wastes	1,32	1,99	-0,20	<b>0,80</b>	1,06	0,51	0,35	<b>0,65</b>
27	Crude fertilizers, crude minerals	9,22	6,27	0,19	<b>0,81</b>	5,45	12,79	-0,40	<b>0,60</b>
28	Metalliferous ores, metal scrap	1,21	41,96	-0,94	0,06	7,56	95,23	-0,85	0,15
29	Crude animal and veget. materials	2,14	3,61	-0,26	<b>0,74</b>	11,37	12,25	-0,04	<b>0,96</b>
33	Petroleum, petroleum products	0,39	134,49	-0,99	0,01	5,63	204,11	-0,95	0,05
41	Animal oils and fats	14,91	0,17	0,98	0,02	0,0	0,0	0,00	0,00
52	Inorganic chemicals	0,01	7,35	-1,00	0,00	0,51	8,8	-0,89	0,11
54	Medicinal and pharmaceutical prod.	0,42	29,87	-0,97	0,03	27,13	65,77	-0,42	<b>0,58</b>
55	Oils, toilet and cleansing prep.	0,02	19,98	-1,00	0,00	0,49	28,36	-0,97	0,03
58	Plastic manufactures	0,01	15,28	-1,00	0,00	0,5	23,04	-0,96	0,04
59	Chem. materials & products n.e.s.	0,30	13,17	-0,96	0,04	8,13	28,81	-0,56	0,44
61	Leather and dressed furskins	16,06	1,31	0,85	0,15	7,87	1,22	0,73	0,27
62	Rubber manufactures, n.e.s.	0,18	15,82	-0,98	0,02	0,4	19,54	-0,96	0,04
63	Cork and wood manufactures	0,08	25,96	-0,99	0,01	0,56	27,2	-0,96	0,04
64	Paper, paperboard, articles thereof	1,16	53,81	-0,96	0,04	2,9	54,9	-0,90	0,10
65	Textile yarn etc., n.e.s.	6,24	37,80	-0,72	0,28	13,73	41,6	-0,50	<b>0,50</b>
66	Non-metallic min. manufactures n.e.s.	1,33	21,01	-0,88	0,12	1,76	32,77	-0,90	0,10
67	Iron and steel	36,72	29,07	0,12	<b>0,88</b>	51,28	38,22	0,15	0,85
68	Non-ferrous metals	150,43	9,78	0,88	0,12	379,8	20,91	0,90	0,10
69	Manufactures of metal n.e.s.	7,11	62,86	-0,80	0,20	8,59	98,13	-0,84	0,16
71	Power generating machinery	0,10	26,86	-0,99	0,01	2,04	33,16	-0,88	0,12
72	Machinery for part. industries	5,18	51,54	-0,82	0,18	16,48	73,02	-0,63	0,37
73	Metalworking machinery	0,16	7,69	-0,96	0,04	0,2	7,63	-0,95	0,05
74	Gen. industr. machinery & equipm.	4,79	64,33	-0,86	0,14	33,86	93,41	-0,47	<b>0,53</b>
75	Office machines and computers	0,72	39,64	-0,96	0,04	1,08	91,86	-0,98	0,02
76	Telecom equipment etc.	0,09	39,03	-1,00	0,00	0,77	93,15	-0,98	0,02
77	Elec. machinery, app. and appliances	0,67	94,51	-0,99	0,01	6,79	147,9	-0,91	0,09
78	Road vehicles	0,15	116,79	-1,00	0,00	2,03	188,61	-0,98	0,02
79	Other transport equipment	12,06	130,10	-0,83	0,17	37,17	141,26	-0,58	0,42
81	Prefab. buildings; fixtures	0,01	12,47	-1,00	0,00	0,12	31,41	-0,99	0,01
82	Furnit., matr., cushions etc.	0,07	30,35	-1,00	0,00	0,18	55,77	-0,99	0,01
84	Apparel and clothing accessories	10,82	73,92	-0,74	0,26	2,7	88,97	-0,94	0,06

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87	Prof., scient. & contr. instruments	0,20	23,35	-0,98	0,02	2,5	48,69	-0,90	0,10
88	Photogr. equip., opt. goods; watches	0,01	16,42	-1,00	0,00	0,3	20,81	-0,97	0,03
89	Misc. manufactured articles n.e.s.	5,26	78,71	-0,87	0,13	27,01	112,65	-0,61	0,39

**Appendix XI: Revealed Comparative Advantage (RCA<sub>2</sub>) and IIT for Iceland in Trade with the World at the three-digit SITC level – based on average values from 1990/1991 and 2000/2001 (some selected commodities)**

SITC	Product Group	Export 90/91 Mill of \$	Import 90/91 Mill pf \$	RCA <sub>2</sub>	IIT	Export 00/01 Mill of \$	Import 00/01 Mill of \$	RCA <sub>2</sub>	IIT
	Total (incl. entries not shown here)	1568,57	1535,6			1957,92	2400,89		
001	Live animals	3,00	0,03	<b>0,98</b>	0,02	3,61	0,15	<b>0,92</b>	0,08
012	Other meat and meat offal	7,15	0,01	<b>1,00</b>	0,00	5,56	0,28	<b>0,90</b>	0,10
022	Milk, cream and milk products	0,01	0,02	-0,57	0,43	0,10	0,92	-0,80	0,20
024	Cheese and curd	0,72	0,08	<b>0,81</b>	0,19	0,01	0,74	-0,98	0,02
025	Eggs	0,00	0,17	-0,95	0,05	0,26	0,37	-0,18	<b>0,82</b>
034	Fish, fresh, chilled or frozen	781,82	0,89	<b>1,00</b>	0,00	636,21	9,14	<b>0,97</b>	0,03
035	Fish, dried, salted or smoked	268,37	0,64	<b>1,00</b>	0,00	284,94	0,84	<b>0,99</b>	0,01
036	Crustaceans and molluscs	118,96	11,44	<b>0,82</b>	0,18	29,53	47,32	-0,23	<b>0,77</b>
037	Marine prod., prep. or preserved	25,99	0,87	<b>0,94</b>	0,06	134,76	1,24	<b>0,98</b>	0,02
048	Cereal, flour and starch preparation	0,05	13,95	-0,99	0,01	0,41	23,36	-0,97	0,03
059	Fruit and vegetable juices	0,17	3,03	-0,90	0,10	0,10	4,08	-0,95	0,05
062	Sugar confectionary	0,16	3,43	-0,91	0,09	0,39	3,89	-0,82	0,18
081	Animal feeds, excl. unmilled cereals	56,95	5,28	<b>0,83</b>	0,17	127,64	6,31	<b>0,91</b>	0,09
098	Edible products and prep. n.e.s.	0,04	13,92	-0,99	0,01	0,32	23,66	-0,97	0,03
111	Non-alcoholic beverages n.e.s.	2,54	0,12	<b>0,91</b>	0,09	1,83	1,30	<b>0,17</b>	<b>0,83</b>
112	Alcoholic bevarages	0,35	13,97	-0,95	0,05	0,17	21,67	-0,98	0,02
211	Hides and skins, raw	0,69	0,33	<b>0,35</b>	<b>0,65</b>	2,17	0,01	<b>0,99</b>	0,01
212	Furskins, raw	3,25	0,00	<b>1,00</b>	0,00	3,78	0,00	<b>1,00</b>	0,00
251	Pulp and waste paper	0,11	8,22	-0,97	0,03	0,11	0,02	<b>0,71</b>	0,29
268	Wool; other animal hair; wool tops	1,30	1,69	-0,13	<b>0,87</b>	0,97	0,26	<b>0,58</b>	0,42
269	Worn clothing; rags	0,02	0,09	-0,61	0,39	0,09	0,04	<b>0,37</b>	<b>0,63</b>
277	Natural abrasives; indust. diamonds	1,04	0,07	<b>0,87</b>	0,13	2,70	0,06	<b>0,96</b>	0,04
278	Other crude minerals	8,04	5,33	<b>0,20</b>	<b>0,80</b>	2,39	9,60	-0,60	0,40
288	Non-ferrous waste/scrap n.e.s.	0,97	0,00	<b>1,00</b>	0,00	4,43	0,07	<b>0,97</b>	0,03
291	Crude animal materials n.e.s.	2,02	0,33	<b>0,72</b>	0,28	9,83	8,80	<b>0,06</b>	<b>0,94</b>
292	Crude vegetable materials	0,12	3,28	-0,93	0,07	1,54	3,45	-0,38	<b>0,62</b>
334	Petroleum products, refined	0,01	131,95	-1,00	0,00	3,18	197,80	-0,97	0,03
411	Animal oils and fats	14,91	0,17	<b>0,98</b>	0,02	33,45	1,65	<b>0,91</b>	0,09
533	Pigments, paints, varnishes etc.	0,03	10,36	-0,99	0,01	0,09	14,50	-0,99	0,01
541	Medicinal and pharm. products	0,05	5,06	-0,98	0,02	0,72	5,07	-0,75	0,25
542	Medicaments, incl. veterinary med.	0,37	24,85	-0,97	0,03	26,41	60,70	-0,39	<b>0,61</b>
553	Perfumery, cosmetics/toilet prep.	0,02	11,88	-1,00	0,00	0,22	18,34	-0,98	0,02
554	Soap, cleansing/polishing materials	0,01	7,33	-1,00	0,00	0,11	8,96	-0,98	0,02
575	Other plastics, in primary forms	0,02	4,55	-0,99	0,01	1,37	5,57	-0,60	0,40
579	Waste, scrap etc. of plastics	0,14	0,00	<b>0,96</b>	0,04	0,28	0,03	<b>0,83</b>	0,17
592	Starches, wheat gluten, glues	0,16	2,38	-0,87	0,13	0,02	2,78	-0,99	0,01
598	Misc. chemical products n.e.s.	0,13	7,22	-0,96	0,04	8,10	21,29	-0,45	<b>0,55</b>
611	Leather	0,69	0,80	-0,07	<b>0,93</b>	0,08	0,48	-0,73	0,27
612	Manuf. of leather or compos. leather	0,08	0,38	-0,65	0,35	0,55	0,65	-0,09	<b>0,91</b>
613	Furskins, tanned or dressed	15,29	0,13	<b>0,98</b>	0,02	7,25	0,09	<b>0,97</b>	0,03



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621	Materials of rubber	0,15	3,41	-0,92	0,08	0,17	2,73	-0,88	0,12
629	Articles of rubber n.e.s.	0,03	4,22	-0,99	0,01	0,20	4,67	-0,92	0,08
635	Wood manufactures n.e.s.	0,08	6,73	-0,98	0,02	0,54	15,52	-0,93	0,07
641	Paper and paperboard	0,01	29,53	-1,00	0,00	0,01	25,86	-1,00	0,00
642	Articles of paper or paperboard	1,15	24,28	-0,91	0,09	2,89	29,05	-0,82	0,18
651	Textile yarn	1,43	3,20	-0,38	<b>0,62</b>	1,25	4,00	-0,52	0,48
652	Cotton fabrics, woven	0,03	4,27	-0,98	0,02	0,04	2,27	-0,97	0,03
654	Other textile fabrics, woven	0,38	0,95	-0,43	<b>0,57</b>	0,01	0,78	-0,97	0,03
655	Knitted or crocheted fabrics	0,34	1,51	-0,63	0,37	0,53	0,98	-0,30	<b>0,70</b>
657	Special yarns and fabrics	2,66	11,65	-0,63	0,37	11,59	17,83	-0,21	<b>0,79</b>
663	Mineral manufactures n.e.s.	1,31	2,80	-0,36	<b>0,64</b>	1,67	6,84	-0,61	0,39
665	Glassware	0,00	4,98	-1,00	0,00	0,07	5,41	-0,97	0,03
666	Pottery	0,01	2,74	-0,99	0,01	0,00	3,62	-1,00	0,00
671	Pig iron, spiegeleisen etc.	35,73	0,15	<b>0,99</b>	0,01	50,70	0,24	<b>0,99</b>	0,01
679	Pipes, fittings etc. of iron or steel	0,04	9,25	-0,99	0,01	0,28	13,65	-0,96	0,04
682	Copper	0,00	1,63	-1,00	0,00	0,04	2,39	-0,97	0,03
684	Aluminium	150,43	7,31	<b>0,91</b>	0,09	379,76	17,22	<b>0,91</b>	0,09
692	Metal containers for storage/transp.	0,03	5,66	-0,99	0,01	0,11	8,47	-0,97	0,03
693	Wire products and fencing grills	0,07	7,63	-0,98	0,02	0,54	6,26	-0,84	0,16
697	Household equipment of base metal	4,89	5,18	-0,03	<b>0,97</b>	3,96	5,64	-0,17	<b>0,83</b>
699	Manufactures of base metal n.e.s.	2,09	20,84	-0,82	0,18	3,55	26,75	-0,77	0,23
713	Intern.-comb. piston engines & parts	0,05	7,77	-0,99	0,01	0,16	7,81	-0,96	0,04
716	Rotating electric plant and parts	0,00	6,90	-1,00	0,00	0,38	9,52	-0,92	0,08
718	Power generators; parts n.e.s.	0,04	3,55	-0,98	0,02	0,10	10,75	-0,98	0,02
723	Civil engineering/contractors equip.	0,11	16,96	-0,99	0,01	1,24	21,08	-0,89	0,11
724	Textile and leather machinery	0,77	1,84	-0,41	<b>0,59</b>	0,07	2,15	-0,94	0,06
725	Paper manufacturing machinery	0,09	0,35	-0,59	<b>0,41</b>	0,39	0,34	<b>0,07</b>	<b>0,93</b>
727	Food-processing machines	3,52	8,10	-0,39	<b>0,61</b>	12,27	7,55	<b>0,24</b>	<b>0,76</b>
733	Machine-tools for working metal	0,02	0,51	-0,91	0,09	0,02	1,47	-0,97	0,03
737	Metalworking machinery n.e.s.	0,10	5,72	-0,96	0,04	0,16	0,57	-0,55	0,45
741	Heating/cooling equipm.; parts n.e.s.	0,07	8,54	-0,98	0,02	2,13	16,80	-0,78	0,22
744	Mechanical handling equipment	0,43	14,69	-0,94	0,06	1,46	24,31	-0,89	0,11
745	Other non-electrical machinery	4,12	7,40	-0,29	<b>0,71</b>	28,77	12,25	<b>0,40</b>	<b>0,60</b>
752	Computers and units thereof	0,12	25,56	-0,99	0,01	0,71	75,93	-0,98	0,02
759	Parts for office mach. and computers	0,60	9,53	-0,88	0,12	0,27	12,70	-0,96	0,04
772	Electrical apparatus	0,06	20,10	-0,99	0,01	0,16	24,06	-0,99	0,01
773	Equipm. for distributing electr. n.e.s.	0,04	9,88	-0,99	0,01	0,09	12,70	-0,99	0,01
775	Household equipm.	0,03	14,43	-1,00	0,00	0,04	17,39	-1,00	0,00
792	Aircraft and associated equipment	5,47	81,05	-0,87	0,13	0,51	67,68	-0,99	0,01
793	Ships, boats and floating structures	6,58	26,91	-0,61	0,39	36,66	73,56	-0,33	<b>0,67</b>
813	Lighting fixtures and fittings, n.e.s.	0,00	8,08	-1,00	0,00	0,12	12,47	-0,98	0,02
821	Furniture and parts thereof	0,07	30,35	-1,00	0,00	0,18	55,77	-0,99	0,01
841	Men's wear of woven fabrics	0,03	13,90	-1,00	0,00	0,09	16,00	-0,99	0,01
844	Women's wear, knitted or crocheted	1,16	5,18	-0,63	0,37	0,04	5,30	-0,98	0,02
845	Apparel, n.e.s.; babies' clothing	7,41	20,59	-0,47	<b>0,53</b>	2,08	27,82	-0,86	0,14
848	Accessories, non-textile; headgear	0,10	4,67	-0,96	0,04	0,10	5,83	-0,97	0,03
873	Meters and counters n.e.s.	0,02	1,50	-0,98	0,02	0,86	1,08	-0,11	<b>0,89</b>
874	Measuring/checking instrum. n.e.s.	0,18	15,76	-0,98	0,02	1,43	34,01	-0,92	0,08
882	Photo/cinematographic supplies	0,01	7,03	-1,00	0,00	0,02	8,25	-0,99	0,01
892	Printed matter	0,53	12,83	-0,92	0,08	1,91	15,46	-0,78	0,22
893	Articles of plastics n.e.s.	2,89	26,04	-0,80	0,20	6,04	33,47	-0,69	0,31
896	Artwork, coll. pieces and antiques	1,08	0,22	<b>0,66</b>	0,34	1,16	0,33	<b>0,55</b>	0,45
899	Misc. manufactured articles n.e.s.	0,65	6,52	-0,82	0,18	17,49	11,04	<b>0,23</b>	<b>0,77</b>