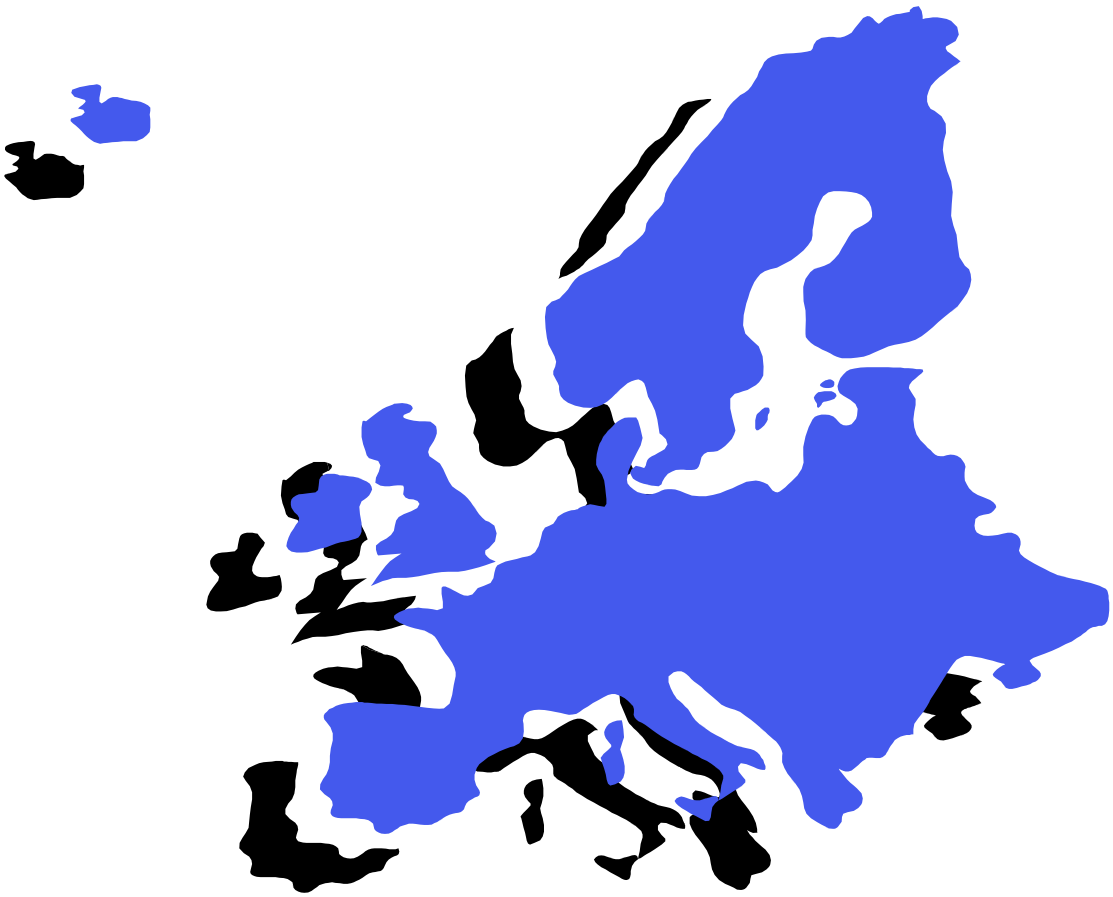

Lecture on the Prague Conference of the European Institute of Retailing and Services Studies (EIRASS). Prag. Czech Republic, July 10th – 13th, 2004

Logistics Costs of Trading in Small Countries. The Icelandic Example

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Biography of the author

Professor Einarsson is the former dean of the Faculty of Economics and Business Administration at the University of Iceland. He obtained his PhD in Germany. He is the author of 6 books on microeconomics, business administration and cultural economics and over 50 journal articles and conference papers and over 400 shorter articles on economics, fisheries and politics in magazines, newspapers, and on

websites. Professor Einarsson is a former Member of the Icelandic Parliament and the chairman of the board of the Central Bank of Iceland and served as a delegate at the General Assembly of the United Nations in New York.

Ladies and gentlemen

Introduction

Iceland, which is the example of the small society in this paper, is 103,000 square km in area, with a population of 290,000. Iceland is an independent country in the North Atlantic and the distance from the capital, Reykjavik, to the mainland of Europe is about 2.000 km. The country achieved independence from Denmark in 1944 and enjoys a very high standard of living. In 2002, Iceland's GDP in PPP in US $ per head was 28,800, which put the country in the 9th place in the world in this category (*OECD in Figures*, 2003).

Iceland is one of the Nordic countries and cooperates closely and extensively with the other Nordic countries, Denmark, Finland, Norway and Sweden. In 2002, fish products accounted for 63% of the export of goods and 42% of foreign currency income. Unemployment in Iceland is low, or 3.3% in 2002, and inflation in the same year was 4,6% (*Statistical Yearbook of Iceland*, 2003). Iceland is a member of the UN, NATO and the EEA (European Economic Area) but is not a member of the EU, which sets Iceland apart from most of the other countries of Western Europe. Iceland is taking an active part in the work of the UN, including UNESCO.

We have a case in point in Iceland, where distance from other countries has had a greater impact on life and history than any other single factor. Although modern technology has cut distances and transport times within and between enterprises, the rather special position of Iceland leaps into perspective if we look at the distance from our capital, Reykjavik, to Iceland's principal trading partners. The average distance to five other

countries, Britain, France, Denmark, Germany and Italy, is 2,400 km. In comparison, the average distance between these countries, including Iceland, is 1,200 km measured from the capitals, Reykjavik, London, Paris, Copenhagen, Berlin and Rome. I point this out here simply to illustrate the special situation of an island, rather than to claim that it is the definitive factor in our environment. Nevertheless, criteria of this kind are familiar to us, because research in our field of study, logistics, started with measurements of this kind more than 250 years ago.

An Icelandic research on logistics costs

Not many research works have been carried out on logistics costs in Iceland. In the year 2003 I was a member of a team which undertook a research to analyze if logistics costs could explain high prices on goods in Iceland. The initiative was taken by the Federation of Trade and Services which is a member of the Confederation of Icelandic Employers. It is a fact the consumer prices in Iceland are higher than they are in the neighboring countries.

There are other explanations for this price difference, i.e. in food prices. Iceland has a very unprofitable system in agriculture, The state support to the agricultural sector, both in the form of direct support for the farmers and indirect support as through costumes and technical import barriers, is about 1,8% of the Gross Domestic Product which is considerably higher than the agricultural support within the EU, but as you known the Common Agricultural Policy in EU is one of their biggest problem.

A big part of the logistics cost is transportation costs and inventory costs in the wholesale sector. The wholesale trade is important in Iceland and includes the import of goods, the transport to Iceland and the distribution to the retailers. In Iceland a big part of the logistics costs are in the manufacturing level and in the wholesale sector and the distribution as well as

in the inventory sector due to the long distance from Iceland to other countries.

High transportation costs are often justified with the distance from Iceland to other countries and a part of the inventory costs results from the very same fact. Among the results of this research as found by interviewing the managers is that these types of logistics costs can be reduced by better management, better organization of the supply chain, new system of orders, increased emphasis on logistics management, outsourcing of warehouse services and transport, more use of electronic and automatic equipments, changes in hierarchical structure, better planning and more information for the upper management level.

Trade is an important factor in the Icelandic economy. In this table we have the contribution of sectors to the Gross Domestic Product.

Table 1: Gross Domestic product by industries 2002 in percentage	
Agriculture	1,5 %
Fishing and fish processing	12,4 %
Aluminium and ferro-silicon production	1,3 %
Manufacturing, other	8,5 %
Electricity and water supply	3,5 %
Construction	7,8 %
Wholesale and retail trade, restaurants and hotels	13,5 %
Transportation, storage and communication	7,5 %
Other private services	22,9 %
Producers of government services	21,1 %
	100 %

The aim of the research was to analyze the logistics costs in Iceland and evaluate the position of Icelandic enterprises in a global context and study how the logistics costs differ by sectors.

We have five research questions.
How much are the logistics cost as a percentage of turnover?
How much are the logistics costs as percentage of consumer's prices?
How to we divide the logistics costs between the management costs, the inventory costs and the transport costs?
How much are the total logistics costs in Iceland?
How can we divide the logistics costs between the capital region and the rural areas?

We have not yet answered all these questions. We have many categories of goods in our statistics and our plan was to analyze the logistics costs in several sectors but we had to limit our research to food and non-alcoholic beverages. This category is the most important in logistics costs. A new report from Statistics Iceland shows that the households spent 15,9% of their income for food and non-alcoholic beverages. Table 2 shows the household expenditures in Iceland based on this survey.[1]

[1] Statistical Series 2004-4. Statistics Iceland. Reykjavik 2004.

Table 2: Household expenditures in percentage of total expenditures	
Food and non-alcoholic beverages	15,9 %
Alcoholic beverages and tobacco	3,8 %
Clothing and footwear	5,7 %
Housing, water, electricity, gas and other fuels	20,1 %
Furnishing and household equipment	5,8 %
Health	3,6 %
Transport	14,7 %
Communications	3,1 %
Recreation and culture	14,4 %
Education	0,5 %
Hotels, cafés and restaurants	5,4 %
Miscellaneous goods and services	6,9 %
	100 %

Our research was carried out by mail questioning and interviews. Our research aimed to analyze three kinds of goods, food and non-alcoholic beverages, goods used in the construction industry and pharmaceutical goods. We did the research by asking all the involved companies. We did not get enough reliable information from the construction industry and from the pharmaceutical industry but the research did bring reliable results in the sector of food and non-alcoholic beverages.

We define the logistics costs in this research as follows:
Transport costs to a company
Transport costs from a company
Costs of inventory, including packing, picking, equipments and employees
Costs of financing, depreciation and shrinkage
Costs of receiving orders, management of logistics etc.

In this context we use a comparable methodology as they did in Norway in similar research. We look at three categories of enterprises, i.e. manufacturing companies with turnover of 36,9 billion króna, wholesale sector with food and non-alcoholic beverages with turnover of 42,1 billion króna and retail companies in food and non-alcoholic beverages with a turnover of 72,8 billion króna. The total turnover of this is 151,8 billion króna and we got answers from companies with turnover of 47,7 billion króna which is about one third which represents the sector of food and non-alcoholic beverages very well.

The logistics costs vary a lot depending where the company is located in the supply chain. We had few responses from companies operating in the wholesale sector that we can not differ between the sectors in the supply chain. The average logistics costs for the manufacturing companies, wholesale companies and the retail sector for these goods is 8% of their turnover in a year. Of that the transport costs are 3%, the inventory costs are 4,4% and the management costs are 0,5%. The logistics costs in one year in these sectors were 12,1 billion króna, i.e. 8% of their turnover of the enterprises and 1,5% of GDP.

We have the logistics costs in this research as total costs but other researches in other countries usually differ in their analyze between manufacturing enterprises and whole sale companies. In our research the logistics costs in the retail sector is included. Many companies in Iceland are as well in the wholesale sector as in the retail sector.

We have not enough information to conclude much on the difference of the logistics costs between the capital area ant the rural area of Iceland. We have some other researches indicating that transport costs are significant higher on the Eastern part of the country than for other regions.

But we have a strange distribution of population in Iceland. There are 300.000 people living there, as mentioned before. 100.000 or one third are living in the capital, Reykjavik, and 200.000 are living in the capital region or two third of the total population. I believe this is unique in the world. I have been checking it in Europe and I can not find a country where bigger part of the nation is living in the capital region than in Iceland. The other or one third of the inhabitants is living in tiny villages in country which is 100.000 m2. For comparison the Check Republic, where we are now, is 79.000 m2. Iceland is 20% bigger than the Check Republic but has only 3% of their population. This fact indicates that costs of transport and distribution are not as high in Iceland as one might expect.

We see here the development of residence in Iceland for 120 years.

Table 3: Distribution of population in Iceland from 1901 to 2020		
Year	Capital region	Rural areas
1901	13 %	87 %
1930	32 %	68 %
1960	51 %	49 %
1990	56 %	44 %
2020	74 %	26 %

There have been great changes for the last century in the urbanization. It would be interesting to see how the development has been in other countries. This development influences the logistics costs of course quite a lot.

Some other quite interesting findings resulted from this research. Table 4 shows the quantity and the transport costs of the companies in the survey.

Table 4. Transport by quantity and costs in the companies		
	Quantity	Costs
Land Transport	65 %	30 %
Sea Transport	34 %	66 %
Flight Transport	1 %	4 %

The reason why the Sea Transport is so low in quantity but high in costs is that the enterprises get most of their goods by car but when they get goods by sea they come from abroad and over much greater distance and therefore it is a more expensive way of transport.

Of the companies which took part in the research 44% of them have a special logistics department. In the other 56% of the companies the import of goods and other logistics tasks was taken care of in the resource department or in the marketing department. Most of the companies buy their goods, i.e. food and non-alcoholic beverages, from other domestic companies

(59%), from EU-companies (34%), and from the USA (6%). The deliverance of the goods is by third fourth in the capital region, where most of the companies are also located.

We also asked in the survey what the managers regard as the most important logistic function. We list the result in Table 5 in a scale from 1 to 10 where 10 is the highest score.

Table 5: The most important logistic function (1-10)	
Deliverance reliability	9,7
Delivery accuracy	9,3
Access to goods	9,3
Transport of return goods	8,3
Delivery time	8,3
Special services	8
Information	8

When companies fail to deliver goods in time the reasons for that are to 84% due to a mistake and/or delay caused by an other seller and 16% are due to a mistake and/or delay in handling or transport.

We also asked the companies what they believe will be the most important factor in their competitive advantage. Results are in Table 6

Table 6: The most important factor for competitive advantage	
Quality	9,75
Price	9,25
Delivery services	8,75
Marketing	6,25

We asked the managers what they believe will be the five main tasks of logistics in the next years and the results are in Table 7 on a scale from 1 to 3 with 3 as the highest score

Table 7: The most important tasks of logistics in the next years	
Increased competition with suppliers and other companies	2,8
Decrease of unit prices and increased productivity	2,5
Increased of total costs and increase of fuel costs	2,3
Better use of information and communication technology	2,3
Better services through transport enterprises	2
Increased focus on consumers	1,8
Better roads and infrastructure	1,3

Other foreign researches

If we compare this Icelandic research to other research work we see some interesting findings. This figure shows the logistics costs as they are presented as a percentage of turnovers in some European researches.

Table 8: Logistics costs in some researches in Europe				
Research	Manage-ment costs	Inven-tory costs	Transpor-tation costs	Total costs as % of turnover
Iceland 2002, food/n-a beverages, manufacturing, trade	0,5%	4,4%	3%	8%
Norway 1997, manufacturing industry	1%	2,8%	7,9%	11,7%
Norway 2001, manufacturing industry	0,9%	2,6%	5,6%	9,1%
Norway 1997, whole sale sector				14,3%
Norway 1999, whole sale sector	1%	4,1%	4,1%	9,2%
Finland 1990, manufacturing, trade, construction, m/t/c	0,7%	5,5%	4,8%	11%
Finland 1995, m/t/c	0,8%	4,9%	4,7%	10,3%
Finland 1999, m/t/c	0,6%	5,0%	4,6%	10,2%
Europe 1987, Kearney				14,3%
Europe 1993, Kearney				10,1%
Europe 1998, Kearney, 200 companies	1,2%	3,4%	3,1%	7,7%

We see in this figure three parts of the logistics costs, i.e. the management costs, the inventory costs and the transportation costs. The first research in the Table 8 is the Icelandic one I

have been referring to. The next two are researches in Norway in the manufacturing industry and we see great improvements in these 4 years. The same thing happens in the next 2 researches in the wholesale sector in Norway. Then we have three researches from Finland with relative high logistics costs and not much difference between these three researches. The company A.T. Kearney has done some surveys for the European Logistics Association (ELA) and we see great improvements in these 11 years. These surveys were done among the 2.000 members of the ELA and about 200 companies answered the last survey.

We have to be careful when we interpret these results and compare them. These researches have different background and the data are not always comparable. The retail sector is i.e. included in the Icelandic research. It seams to me that the logistics costs in Iceland are similar to those in Norway. Although Iceland is far more away from other countries the market in the capital region is more concentrated than elsewhere although the country is rather big.

Some remarks on retail trade

As mentioned before the retail sector is included in our research and one of the tasks of the future is to increase the cooperation within the firm and between firms. In connection with more cooperation I believe that the methodology of Jan Carmichael from the General Mills can be useful as presented in an international Retail conference in Iceland last year. He illustrated following concept.[2]

Partnerships are like bridges and you have to have a plan, which deals with attitude (premise, objectivity, mutuality, trust), motivation (knowledge, no profit), shared language (definitions, deliverables), duration, width and depth, shared investment, fact

[2] Carmichael Jan. Bulding Bridges. Partnering in the U.S. Grocery Industry. Nordic Retailing Conference 2003. Breaking the Ice. Building New Bridges and Partnerships. Reykjavik. October 7th-9th 2003.

bases (quantifiable, replicatable) and closure (read and report, implications, next steps).

The structure of the retail trade in the Nordic countries is different.[3] Very big shops are common in Iceland, Finland and Denmark but smaller shops are common in Norway and to some extend in Sweden. The hypermarkets have been increasing very much the last 20 years in Europe.

In all the five Nordic countries the big companies control the retail trade and these big companies regard the whole world as their home market. The biggest retailer company in the world, Wal-Mart, has a turnover of 200 billion Euros in 2002 which is 500 times the size of the Iceland's GDP and almost three times more than the Czech's GDP.

People are now visiting on average food shops 2-3 times per week but it was 1,5 times 10 years ago. Less than 2% of the costumers cover more than half of a store today.[4]

In Iceland one company, Baugur, has the 46% market share in food retail trade with three different types of stores. The same company has 28% market share of the pharmaceutical market.[5] The reason for its success is that strategic investments have been made in location, Information Technology and logistics. This company has also big operations in Sweden and Britain. There are around 100 grocery stores in the capital area in Iceland and the general consumption is very high. In the retail market 70% of the volume of the goods is imported.

[3] Næss Björn, What´s going on in te Nordic Grocery Retail Trade? Nordic Retailing Conference 2003. Breaking the Ice. Building New Bridges and Partnerships. Reykjavik. October 7th-9th 2003.
[4] Scamell-Katz, Siemon. The new Dynamic: Need States and Shopping Missions. Nordic Retailing Conference 2003. Breaking the Ice. Building New Bridges and Partnerships. Reykjavik. October 7th-9th 2003.
[5] Björnsson, Jón. Small fish in a small tank – how it works in a micro market. Nordic Retailing Conference 2003. Breaking the Ice. Building New Bridges and Partnerships. Reykjavik. October 7th-9th 2003.

A new Icelandic dissertation on trade

An interesting aspect of trade in small countries as we are discussing here is the use of gravity models to explain export in a small country like Iceland. We have a new dissertation in this field defended at the University of Iceland only few weeks ago in international economics with the title “Determinants of Exports and Foreign Direct Investment in a Small Open Economy”. The analyze is based on international economics and has of course much to do with logistics and logistics costs.

Following World War II the capacity of the industrialized countries to produce and distribute various manufacturing goods, both rebuilt it and increased substantially. Over the last part of the twentieth century, trade grew by twice the rate of world GDP and foreign direct investment grew at twice the rate of trade. These patterns highlight the importance of understanding international trade and investment in the modern economy.

Because of Iceland’s small economy and population, the country is highly dependent on international trade. Generally, small economies export a greater proportion of their gross domestic product than larger economies. One could therefore expect Iceland’s export ratio to be high relative to other nations. This is however not the case since the export ration in Iceland did not exceed export ratios of there small nations in Europe from 1988-1997.

Some scientists explain the low export ratio of Iceland by its geographical isolation, lack of intra-industry, trade and resource depends of the Iceland economy. In the dissertation these suppositions were analyzed using the popular gravity model of exports in which trade depend on distance and economic size. The gravity concept is originated in physics, referring to Newton’s law of gravity. One conclusion of this research is that distance does reduce exports but the market size of Iceland is

not correlated with exports, instead market size and wealth seem to be more important. It is very interesting to connect this methodology to future research tasks in logistics.

Thank you for your attention.