



EXTRA-SMEs

Report on the factors
hindering EXTRA-SMEs
internationalization and
extraversion

NRDA

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Overview

The purpose of EXTRA-SMEs activity A1.4 is the identification of the barriers and bottlenecks that businesses in and around aquaculture face in expanding their activities in new markets and internationalizing their outlook. The report at hand provides an analysis of the outstanding barriers as perceived by aquaculture SMEs in partnership territories. Such analysis can add value on the premise that meaningful sectoral renewal requires first an understanding of and then a strategy for addressing the most significant barriers that stand in the way of small and medium aquaculture businesses to internationalisation.

This report presents research findings from the implementation of the survey among the population of the partnership aquaculture SMEs that was foreseen in the preceding methodology report. The survey administered to businesses in the respective aquaculture value chains yielded fruitful data, which upon analysis, revealing both convergences and divergences among the regions in terms of how barriers are perceived and evaluated. In what follows the reader will find a presentation of raw data and data analysis techniques that were used to quantify perceptions of barriers, compare between partnership average perceptions, regional perceptions and individual business perceptions, and evaluate possible correlations between the prevalence of particular (sets of) barriers and business characteristics, for instance, business size and region of operation. The final section of the analysis provides information on perceptions of assistance and assistance programs available for aquaculture SMEs in partnership regions.

Survey results provide the necessary insight for the development of policy recommendations but also an analytical vantage point from which it is possible to unlock the potential for transferring of practices where obstacles are recurring in adjacent business contexts and eco-systems.



1. EXTRA-SMEs A1.4 Data Collection Analysis

1.1. Data collection aims and outcome

The target for data collection was set in the methodology report at 16 questionnaires per partner. This number was determined according to data on the population of aquaculture businesses in NUTS 1 regions of the partnership, given the available data on aquaculture businesses (see methodology report). The total number of questionnaires thereby foreseen for collection was 128. The actual number of questionnaires collected according to the table below is 43. The collected questionnaires approximately amount to a third of the target figure. However, the sample of questionnaires is valid because most partnership geographical units of reference were NUTS 2 areas with significantly lower numbers of relevant businesses operating.

Table 1. Completed EXTRA-SMEs questionnaires (per partner)

PARTNER	Country	Questionnaires
Region of Peloponnese	EL	4
Liguria Region (+ Liguria Cluster for Marine Technologies (DLTM))	IT	4
Northern Chamber of Commerce in Szczecin	PL	5
Bucharest-Ilfov Regional Development Agency	RO	1
Lapland University of Applied Sciences	FI	2
University of Patras	EL	7
Western Development Commission	IE	4
Public institution National regions development agency	LT	16
Total		43



In more detail and in order to account for the data collection performance rate, more data should be discussed. This data is essential for handling the sample of questionnaires in an unbiased way and obtain a clear picture of what exactly this sample is representative of. To this end, the methodology provided to project partners a data collection documentation form to facilitate the extraction of aggregate territorial business demographics. The table below provides information on the characteristics of the sample per region and available business population figures. Sample representativeness can only be established indirectly and by approximation in certain cases, given the lack of business population figures and response rates.

Table 2. Survey documentation form data

Partner	Lapland UAS	Liguria	NCC	UPAT	NRDA
<i>Administrative unit of analysis:</i>	Lapland	Liguria Region,	Western Pomerania	Region of Western Greece	Lithuania
<i>Population of aquaculture businesses in the unit of analysis:</i>	22	Around 80	97	Fish feed production: 3 Fish production: 26 Hatcheries: 5 Total: 34	16
<i>Number of aquaculture businesses invited to participate in the survey:</i>	8	All through their representatives (cooperatives)	5	Email invitations: 11 Phone invitations: 14 Total: 25	20
<i>Number of aquaculture businesses that completed the questionnaire:</i>	4	4 (2 are representatives of all operating farmers, covering all the producers)	0	7	16
<i>Number of upstream and downstream businesses invited to</i>	-	All through their representatives (cooperatives)	12	10 (some of them also constitute aquaculture businesses)	18



<i>participate in the survey:</i>					
<i>Number of upstream and downstream businesses that completed the questionnaire:</i>	-	All through their representatives (cooperatives)	5	Upstream: 2 Downstream: 5 Total: 7	15
<i>Total number of invitations to participate in the survey:</i>	8	35	17	email invitations: 11 Phone invitations: 14 Total: 25	38
<i>Total number of participant businesses in the survey:</i>	4 most of the companies/organisations are not interested in the export at all and did not find the survey necessary	4	5	7	16

The regions to which the sample corresponds (administrative levels of analysis) are Lapland in Finland, Liguria Region in Italy, Western Pomerania in Poland, the Region of Western Greece, the Region of Peloponnese, all regions in Lithuania and Bucharest-Ilfov Region. For the regions in question the reported population of aquaculture businesses is 253, ranging from 22 in Lapland to 97 in Western Pomerania. The University of Patras, reporting on the Region of Western Greece, provided a detailed breakdown of aquaculture business sub-sector, reporting the operation, within the administrative unit in question, of three companies specializing in fish feed production, an overwhelming majority of fish production companies (26), and five hatcheries.

Regarding the number of aquaculture businesses specifically that were invited to participate in the survey, the following data was obtained:



Table 3. Sample representativeness

Partner	Aquaculture businesses population	Number of businesses invited to participate	Sample representativeness
Lapland UAS	22	8	36.3%
Liguria	app. 80	app. 80	100%
NCC	97	5	5.15%
UPAT	34	25	73.5%
NRDA	-	35	-

The figures in the table above indicate the *intended* sample size per partner which corresponds to the numbers of businesses invited to participate in the survey by project partners. Thus, for Lapland, 1 in 3 aquaculture businesses were reported to have been contacted, nearly 100% of aquaculture businesses in Liguria through their associations, while for Western Pomerania approximately 1 in 20 businesses were invited. For the Region of Western Greece, over seven out of ten aquaculture businesses were invited to participate in the survey.

The following table summarizes data on the response rate:

Table 4. Survey response rates

Partner	Number of businesses invited to participate	Number of businesses that completed the questionnaire	Response rate
Lapland UAS	8	4	50%
Liguria	80	4	5%
NCC	5	5	100%
UPAT	25	7	28%
NRDA	35	16	45.7%



The sample therefore, taking into account the response rate, is representative of the total population of aquaculture businesses thusly:

Table 5. Sample representativeness (actual participants)

Partner	Aquaculture businesses population	Number of businesses that completed the questionnaire	Final sample representativeness
Lapland UAS	22	4	18.1%
Liguria	80	4	5%
NCC	97	5	5.1%
UPAT	34	7	20.5%
NRDA	44 ¹	16	36.3%

* ADR-BI obtained one questionnaire which was included in the subsequent analysis.

¹ The number was obtained through desk research



1.2. Data quality

The data collected with the EXTRA-SMEs survey instrument was of good overall quality and satisfactory in terms of the sections completed. The dataset consists in several sections – a business demographic section, two sections on barriers to internationalisation and a further one on the relevant assistance. The individual sections were completed to variable extend, however the vast majority of questionnaires were fully completed in their main sections. Missing data posing challenges for comparison, were dealt with by determining and presenting explicitly for each section and for certain questions the number of valid responses, where necessary.

More specifically, the business demographic section is largely completed by all participants in the survey and most questions have been correctly answered yielding high quality data. The subsection on international activity is equally satisfactory in terms of data quality.

The section on perceptions of barriers is to a large extend completed correctly by most respondents. Only in three questionnaires out of 43, said sections were either not completed at all or only partially completed. The following section on barriers (the top ten method) equally yielded less than complete data. Partially because this section was preceded by the lengthy ranking drill of 50 barriers, it is likely that this section was not adequately completed in many questionnaires due to the way the survey was contacted in certain cases (phone interviews). The second section on barriers (top ten method) was completed by over 30 respondents. The main reason for this can only be hypothesized and it is associated with the extended questionnaire length.

The last section on government assistance has not been completed by nearly all participants in the survey. However, some interesting data is obtained through this section. Yet, this data is not adequate overall to yield significant information.



2. Aquaculture business demographics

2.1. Size of participant companies

This section presents business demographic information on the aquaculture SMEs that took part in the EXTRA-SMEs survey. The total number of SMEs participating in the survey is 43, corresponding to an equal number of questionnaires collected. As indicated in the previous section, these SMEs operate in all regions of the partnership.

Regarding the size of participating businesses, 15 micro businesses (0-9 employees), 16 small (10-49 employees) and 10 medium (50-249 employees) took part in the survey. 2 businesses participating in the survey did not disclose information regarding their size and the number of employees. The majority of respondents (38%), therefore, represented small businesses

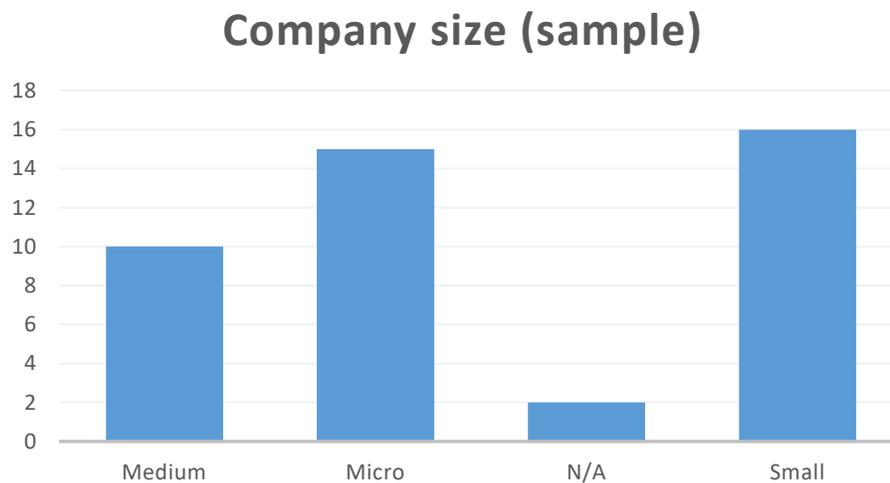


Figure 1. Number of participants in EXTRA-SMES A1.4 survey



Table 6. Company size of participant businesses

Company Size	Number of participants	%
Medium	10	23.80%
Micro	15	33.30%
N/A	2	4.76%
Small	16	38.09%
Total	43	100%

2.2. Year of foundation

The most ancient company that participated in the survey was founded in 1965 and the youngest was founded in 2016. Both companies operate in Lithuania, in the region of Lietuva. The average year of foundation for aquaculture SMEs participants is 1996 (SD, 15.8).

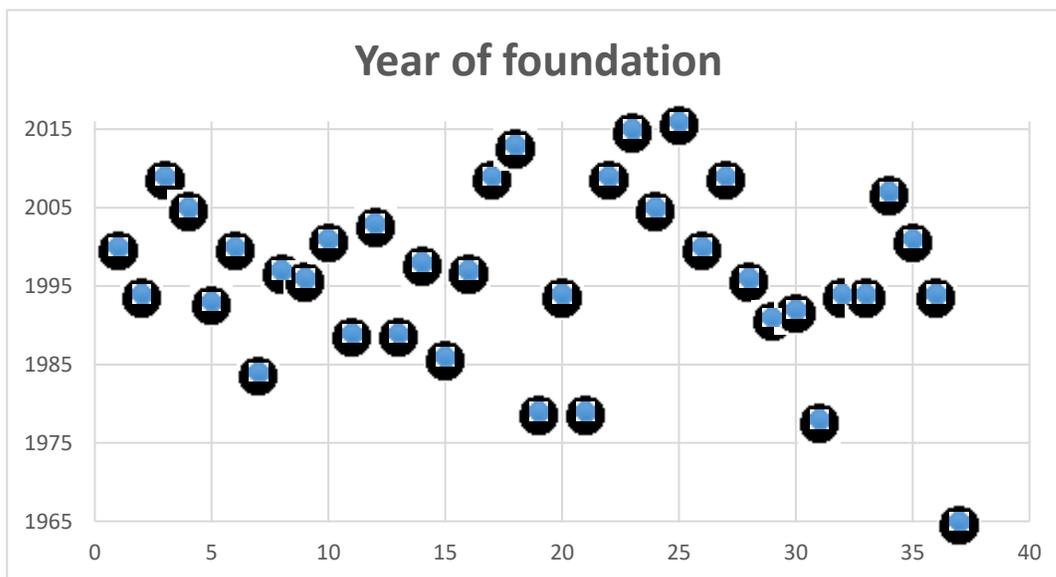


Figure 2. Aquaculture SMEs year of foundation



2.3. Economic activities

The companies participating in the EXTRA-SMEs A1.4 survey represent a diversity of operators working in the aquaculture value chain, which, for clarity reasons, is simply conceptualized as consisting of 3 types of businesses (“upstream”, “aquaculture”, “downstream”). Each of these three types further consists in two types of economic activity, namely offering services and offering products. The boxes below contain pie charts representing the type of economic activities in which participants in the survey engage.

51.1% of the respondents declared engaging in production only across the aquaculture value chain, 61,9% declared offering relevant services and 45,2% that they do both. The next figure shows the sub-categories of economic activities of participant companies.

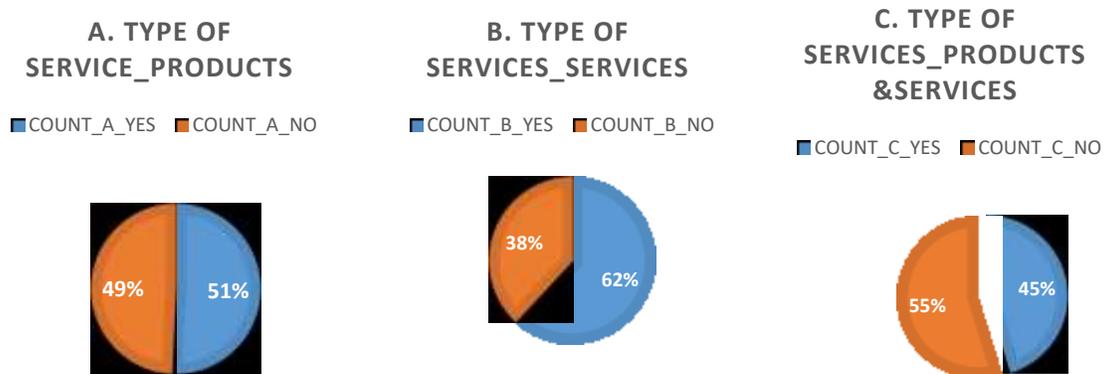


Figure 3. Share of participant businesses offering services, products or both

The majority of participants is engaged in farming and nursery, while many respondents are engaged in multiple retail, professional services, packing, cleaning and warehousing. **The lowest scores observed, among the subcategories of aquaculture related economic activities.** The lowest scores observed were for ‘equipment’, ‘health products’, ‘smoking’, ‘ready meals’ and ‘feed manufacture’. These scores can be interpreted variously: on the one hand, they indicate that the majority of businesses in the aquaculture value chain are evidently clustered around the main aquaculture activities. On the other hand, the data suggests that it was likely more straightforward to contact and interview aquaculture businesses, many of which are also active downstream, while the same does not seem to hold for businesses which are active upstream, that is, providing



input for aquaculture (feed, equipment etc.). This is possibly due to partial mapping, the definition adopted for the respective aquaculture value chains and similar selection bias. Further due to the absence of demographics for the companies that did not participate in the survey but were nonetheless invited, it is too difficult to reach any conclusions on the actual distribution of aquaculture related economic activities. However, given that many of the businesses interviewed are engaged in downstream activities – mostly different types of processing and packing – it is interesting to note the rather low incidence rate of ‘ready meals’ production. It is not argued here that therefore there is a market niche for ready meals, but that this type of products may possibly boost aquaculture products and make them more widely accessible. The same is true for health products, using aquaculture products as raw materials. Health products, what is more, contrary to ready meals which

pose logistic challenges when seen as export products in the international context, do in fact represent an opportunity for aquaculture SMEs to diversify the range of activities they are primarily engaged in. The table in the following page presents participants by specialization.

Aquaculture value chain SMEs respondents		
Characteristics Average Standard deviation		
Year of foundation: 1996* (oldest 1965; newest 2016), SD 15.8		
Started exporting: 19.4 years / SD 10.83		
Company Size		
		%
Medium	10	23.80%
Micro	14	33.30%
N/A	2	4.76%
Small	16	38.09%
Total	42	100%
Produces products: (51,1%)		
Delivers services: (61,9%)		
Does both: (45,2%)		

Table 7. Summary business demographics



2.4. International activities

38 out of a total of 42 businesses provided information on international activities. In detail, 22 out of 38 businesses declared they are engaged in exporting activities. Only 7 companies declared they are inactive in terms of export activities, while only 2 businesses declared they are intending to commence export activities. A significant proportion of participants is engaged in import activities (39.4%).

Among the export active businesses, the average number of years of engagement in export activities is 19.04 years with 10.83 years standard deviation. This number concerns the majority of participants in the sample and the number of years they are engaged in international activities or whether they are engaged in such activities at all. The data collected suggests that the majority of businesses were involved in international export activities concurrently with their foundation or soon after. One notable exception does not match this trend, with one company being founded in 1997 and starting international activities 18 years after, in 2015. For all valid answers, the pattern of selling abroad is regular and respondents engage in monthly activities rather than ad hoc activities.

Regarding top export markets, the following countries are ranked by citation frequency:

Table 8. Target markets sorted by frequency of citation

Main target markets by SME respondents
Rank
1 Germany
2 Italy
3 GB
4 France
5 USA

These results do not diverge significantly from expected results. Germany is the top export market, across the sampled businesses, followed by Italy, GB, France and the US. A number of preliminary points can be made here:

1) Italy ranks second due to a significant sample contribution from adjacent Greece. In fact, from the complete list of responses to this question the conclusion can be reached that for the vast majority of respondents

target export markets are adjacent countries. In other words, the main bulk of export trade takes place between countries sharing borders. The prevalence of cross-border trade is a fact – substantiated in several studies – that should be carefully be reflected upon.



2) Great Britain and the US figure in the top 5 of export markets. This calls for evaluation, for two different reasons. First, trade with Great Britain is due to be subject to new regulations, possibly causing turbulence in ordinary activities. Second, however, the US is a very distant export market, and its high ranking indicates that there is potential for further future capture. The same holds for a great deal of non-EU target markets, most of which are in Asia.

In terms of turnover increase, international activities seem to benefit SMEs a great deal. Although it was not possible to collect representative data since only 10 respondents

shared figures indicating an increase in turnover, it was established that the average turnover increase for these 10 businesses was 47%. That is to say, the average turnover increase as a rough estimation is rather significant, indicating significant turnover boosts upwards. Of course, further detailed analyses are required in order to determine the specific conditions under which this has been possible. This is important because a range of factors are bound to influence the margin of profit, such as national tariffs and quotas on exports, transport costs, economies of scale and relevant externalities.

Table 9. Status of international activities for survey participants

Export status		
Export experience	Frequency	Percent
Inactive	7	(18,4%)
Aspiring	2	(5,26%)
Active	22	(57,8%)
Total	38	100.00%
Activity mode for international SMEs		
Importing		
Not active	15	(39,4%)
Aspiring	--	
Active	21	(55.2%)
Totals for importing	36	(100%)
Exporting		
Exporting – Not active	7	(18,4%)
Exporting - Aspiring	2	(5,26%)
Exporting - Active		(57,8%)
Totals for exporting SMEs	38	100.00%



3. Barriers' analysis

3.1. Barriers ranking

This section addresses the main theme of the A1.4 EXTRA-SMEs research activity, namely, the main barriers aquaculture SMEs face in developing international activities, notably, exporting products and services. Imports are equally considered as international activities, however, this research activity is more focused on business externalization understood as export related activities. Replicating the OECD survey on SMEs with a number of modifications, survey participants were presented with 48 barriers clustered in two categories and several sub-categories. Respondents were asked to assign a weight representing significance to each barrier, ranging from “not important” (lowest score, 1) to “extremely important” (highest score 5). Two questionnaires provided by Liguria provided no evidence of barriers' perception and incomplete data respectively. All other participants in the survey provided satisfactory data on their perceptions of the gravity of said barriers, with only a few entries missing. After cleaning and sorting the data, analysis proceeded by compiling all answers for all barriers in a single dataset. This resulted in a 48⁴³ score table for all barriers and all respondents (2.064 rankings).

This data permits the calculation of the mean significance score for each barrier by calculating the frequency of each rank per barrier and the mean score is obtained by adding up all ranks multiplied by the number of times they are cited and divided by the total number of responses.

2. Once the mean significance for each barrier across all regions (sample population) is established, the barriers are classified by mean score, and the top 20 barriers are thereby obtained and they are presented in the table in the following page. The table in the following page presents the twenty barriers that accumulated the highest score.



Table 10. Top twenty barriers ranked by average significance in the Likert scale (1.000 – 5.000)

Top twenty barriers (all regions)

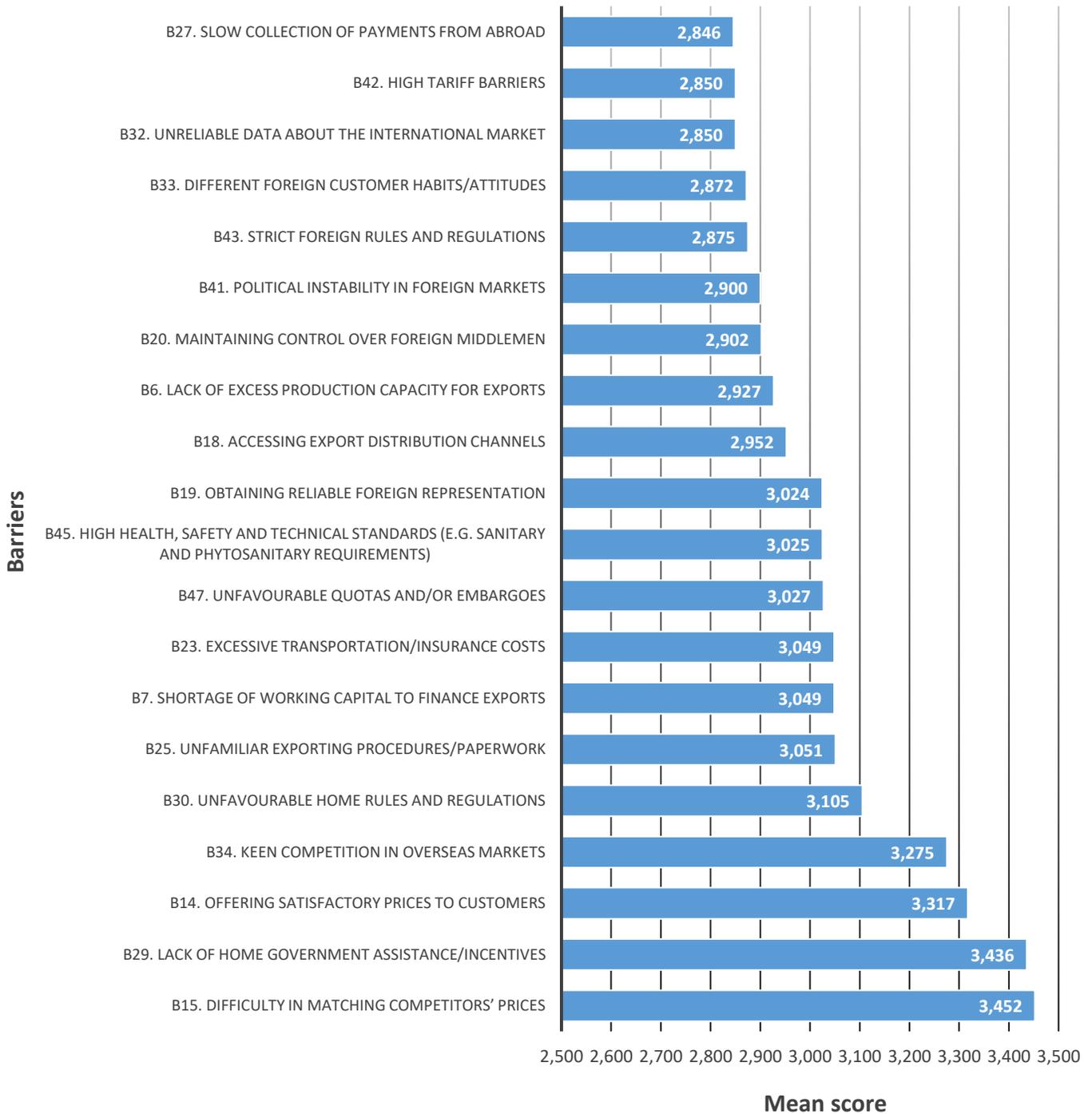




Table 11. Top twenty barriers summary ranking list

<i>B15. Difficulty in matching competitors' prices</i>	3.452
<i>B29. Lack of home government assistance/incentives</i>	3.436
<i>B14. Offering satisfactory prices to customers</i>	3.317
<i>B34. Keen competition in overseas markets</i>	3.275
<i>B30. Unfavourable home rules and regulations</i>	3.105
<i>B25. Unfamiliar exporting procedures/paperwork</i>	3.051
<i>B7. Shortage of working capital to finance exports</i>	3.049
<i>B23. Excessive transportation/insurance costs</i>	3.049
<i>B47. Unfavourable quotas and/or embargoes</i>	3.027
<i>B45. High health, safety and technical standards (e.g.</i>	3.025
<i>B19. Obtaining reliable foreign representation</i>	3.024
<i>B18. Accessing export distribution channels</i>	2.952
<i>B6. Lack of excess production capacity for exports</i>	2.927
<i>B20. Maintaining control over foreign middlemen</i>	2.902
<i>B41. Political instability in foreign markets</i>	2.900
<i>B43. Strict foreign rules and regulations</i>	2.875
<i>B33. Different foreign customer habits/attitudes</i>	2.872
<i>B32. Unreliable data about the international market</i>	2.850
<i>B42. High tariff barriers</i>	2.850
<i>B27. Slow collection of payments from abroad</i>	2.846

The list of the top twenty barriers for all regions includes barriers whose respective mean score does not exceed the “very important” ranking category, with the top barrier cited being “difficulty in matching competitors’ prices” scoring 3.452 as an average tendency across respondents. The majority of 48 barriers received certain individual high scores (>4, “very important”), yet on the whole this has not been the case.

Slightly more than half of the obstacles most frequently cited are ‘external’ ones (12 in total), while ‘internal’ barriers were

cited in a slightly lower rate (less significant and fewer obstacles). This concerns the top twenty list. At the very least, this shows that responses are not biased in what seems to be a normal tendency of positive self-presentation across various surveys.

Regarding the further clustering and sub-division of internal and external barriers, the type of barriers most often cited was ‘Distribution, logistics and promotion barriers’, in particular, ‘*B.23 Excessive transportation/insurance costs*’ (3.049), ‘*B19. Obtaining reliable foreign representation*’ (3.024), ‘*B18 Accessing export distribution channels*’ (2.952) and ‘*B20. Maintaining control over foreign middlemen*’ (2.902).

Among external barriers, the **top ranking barrier category** that figures in the list is the ‘**tariffs & non-tariffs**’ barriers with 4 barriers belonging to this category, namely, ‘*B47. Unfavorable quotas and or embargoes*’ (3.027), ‘*B45. High health, safety and technical standards*’ (3.025), ‘*B43. Strict foreign rules and regulations*’ (2.875) and ‘*B42. High tariff barriers*’ (2.850). However, the external barriers that received the highest scores across all participants were ‘*B29. Lack of home government assistance*’ (3.436), and ‘*B30. Unfavorable home rules and regulations*’ (3.105).



3. Data analysis proceeds with the calculation of the **mean average significance for each barrier per region**. The purpose of this clustering is to reveal potential differences among different classes of obstacles across different regions and make visible in a tentative way the distance between the average tendency across regions and the respective regional averages. A table of mean significance per region results is obtained by a similar approach, that is, by adding the significance rankings per barrier divided by the sample population. In the table above, the scores below the sample average, are marked in red color.

Table 12. Sample mean significance & regional mean significance per barrier (top ten)

Description	Sample Mean	Regional mean scores (1.000 – 5.000)							
		Liguria	Lapland UAS	NCC	RegPel	UPAT	WDC	NRDA	ADR -Bi
<i>B15. Difficulty in matching competitors' prices</i>	3.452	3.333	3.000	1.600	3.250	4.000	2.000	4.313	3
<i>B29. Lack of home government assistance/incentives</i>	3.436	5.000	1.500	3.800	2.333	3.714	4.500	3.133	4
<i>B14. Offering satisfactory prices to customers</i>	3.317	3.333	2.500	2.000	2.750	3.857	2.750	3.933	3
<i>B34. Keen competition in overseas markets</i>	3.275	4.500	3.500	2.400	3.000	3.571	2.500	3.375	5



<i>B30. Unfavorable home rules and regulations</i>	3.105	5.000	3.000	2.800	1.000	3.429	3.750	2.933	3
<i>B25. Unfamiliar exporting procedures/paper work</i>	3.051	4.000	1.500	2.600	1.667	3.143	1.500	3.867	4
<i>B7. Shortage of working capital to finance exports</i>	3.049	3.000	1.500	1.200	3.000	3.286	2.750	3.813	3
<i>B23. Excessive transportation/insurance costs</i>	3.049	5.000	2.000	3.000	2.750	3.429	2.250	3.000	2
<i>B47. Unfavorable quotas and/or embargoes</i>	3.027	5.000	1.000	2.000	2.000	3.833	1.750	3.467	4
<i>B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)</i>	3.025	3.000	1.000	3.800	2.667	3.286	2.000	3.188	4

The table above shows the differences between the sample mean for each of the top ten barriers, and the regional mean for each barrier.² The table includes the top ten barriers as obtained from the previous test, while the complete list is to be found in the ANNEX of this document.

² With the exception of the data extracted from one questionnaire provided by ADR-BI, in whose case the individual ranking rather than the mean of several rankings is presented.



This classification serves comparison purposes allowing in essence to quantify the distance (i.e. difference) from the mean, or in other words, how much more (or less) significant a respective barrier is considered in comparison to the average tendency. Equally, this measure can be extended to include an estimation of differences between respective regions and between a regional sample population and an individual respondent. For practical reasons all of the abovementioned differences cannot be presented here in detail.

For the first barrier (B15), the highest regional score is observed in Lietuva businesses (NRDA, 4.313), while the lowest (1.600) is observed in Szczecin. This divergence suggests rather different target market structures for the two regions respectively. The variation in regional scores indicates either that ‘competitors’ are not homogeneous (i.e. a common third-party competitor), or that regions are able to secure relatively competitive prices for their products and services. Yet, for several respondents giving high score to B15, without being exporters, it can be inferred that their perception of competitors’ prices are not necessarily informed and that therefore better business intelligence and evidence base for economic decisions is called for.

For the second most significant barrier – an external one – “*B29. Lack of home government assistance/incentives*”, Liguria and WDC provided the highest regional scores. This particular barrier is commonly cited and assigned significance across regional, research and sectoral contexts. As such, it requires careful interpretation because the tendency in self-assessments is to externalize obstacles, i.e. present them as ‘external’ rather than ‘internal’, while it often thematizes the tensions between central government and local/regional governments or private actors. However, the fact that there is a balanced representation of internal and external obstacles in the top twenty list, is a valid counterargument. On the flip side there are regional variations. It is interesting to further note that Lapland assigned lower significance to nearly all the top ten barriers. This is partly explained due to findings to be presented further down. It is not the case that these differences can be attributed to factors annulling the significance of said barriers, or, in other words, that the scores are low because barriers are overcome, but rather because they are marginally relevant, as it will be shown.

When clustering the top twenty barriers in their subcategories, it is observed that the most frequently cited obstacles are ‘distribution, logistics and promotion barriers’, followed



by 'Tariff and non-tariff barriers' and 'administrative barriers'. It is noteworthy that 'Product and price barriers to marketing' accumulate the highest average ranking. This is because in the top twenty list there are four 'Distribution...' barriers while only two 'Product...' barriers, which, however, occupy the first and second position.

Table 13. Top barriers by sub-category

<i>Sub-category description</i>	<i>f</i>	<i>average rank</i>
Distribution, logistics and promotion barriers	4	2.982
Tariff and non-tariff barriers	4	2.944
Administrative barriers	3	3.130
Product and price barriers to marketing	2	3.385
Customer & Foreign competitor barriers	2	3.073
Functional Barriers	2	2.988
Procedural barriers	2	2.949
Business environment barriers	1	2900

Upon closer inspection, it can be argued that 'Product and price barriers' accumulate the highest scores without clustering, namely barriers 'B15. Difficulty matching competitors prices', and 'B14. Offering satisfactory prices to customers', because they arguably condense and reflect nearly all the other barriers, be it internal or external ones, which in aggregate account for the inability to offer 'satisfactory' prices (that is, at least competitive in relation to competitors).

On the other hand, barriers such as the difficulty of obtaining and maintaining control over foreign representation pose concrete distribution and logistics problems and costs, hence their prominent place in the top twenty ranking. As it will be discussed in the end, public



administration and country foreign representation can play a key role in lifting (some of) these barriers.

The table below summarizes **for each barrier the variance of regional (sub-group) mean significance scores vis-à-vis the sample mean**. Variance (deviation) represents the difference in average perception between the respective regions and the sample as a whole. The bigger the variance the bigger the divergence between the respective average perception and regional perceptions. The smaller the variation, the smaller the distance between the average perception and regional perceptions. This is essentially a measure of cohesion.

Table 14. Regional deviation from sample mean (all barriers)

Description	Variance
<i>B15. Difficulty in matching competitors' prices</i>	0.893
<i>B29. Lack of home government assistance/incentives</i>	1.411
<i>B14. Offering satisfactory prices to customers</i>	0.523
<i>B34. Keen competition in overseas markets</i>	0.590
<i>B30. Unfavorable home rules and regulations</i>	1.237
<i>B25. Unfamiliar exporting procedures/paperwork</i>	1.064
<i>B7. Shortage of working capital to finance exports</i>	0.819
<i>B23. Excessive transportation/insurance costs</i>	0.723
<i>B47. Unfavorable quotas and/or embargoes</i>	1.705
<i>B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)</i>	0.866
<i>B19. Obtaining reliable foreign representation</i>	1.150
<i>B18. Accessing export distribution channels</i>	0.527
<i>B6. Lack of excess production capacity for exports</i>	1.244
<i>B20. Maintaining control over foreign middlemen</i>	0.871
<i>B41. Political instability in foreign markets</i>	1.077
<i>B43. Strict foreign rules and regulations</i>	0.526
<i>B33. Different foreign customer habits/attitudes</i>	0.422
<i>B32. Unreliable data about the international market</i>	1.708
<i>B42. High tariff barriers</i>	1.483
<i>B27. Slow collection of payments from abroad</i>	1.159
<i>B11. Meeting export product quality/standards/specifications</i>	0.946
<i>B48. High costs of customs administration</i>	1.514
<i>B3. Lack of competent personnel to contact potential overseas customers</i>	1.184



<i>B10. Adapting export product design/style</i>	0.852
<i>B17. Complexity of foreign distribution channels</i>	0.864
<i>B46. Arbitrary tariff classification and reclassification</i>	0.966
<i>B9. Developing new products for foreign markets</i>	0.450
<i>B24. Adjusting export promotional activities to the target market</i>	0.526
<i>B38. Different socio-cultural traits</i>	0.583
<i>B16. Granting credit facilities to foreign customers</i>	0.433
<i>B28. Difficulties in enforcing contracts and resolving disputes</i>	1.392
<i>B35. Poor/deteriorating economic conditions abroad</i>	0.989
<i>B4. Lack of managerial time to deal with internationalisation</i>	1.043
<i>B36. Foreign currency exchange risks</i>	1.351
<i>B21. Difficulty in supplying inventory abroad</i>	0.966
<i>B31. Unfavorable foreign rules and regulations</i>	1.359
<i>B8. Lack of infrastructure for e-commerce</i>	0.518
<i>B44. Inadequate property rights protection (e.g. intellectual property)</i>	1.317
<i>B1. Lack of competent personnel to locate/analyse markets</i>	0.709
<i>B5. Inadequate quantity of and/or untrained personnel for internationalisation</i>	0.709
<i>B2. Lack of competent personnel to identify foreign business opportunities</i>	0.744
<i>B22. Unavailability of warehousing facilities abroad</i>	1.225
<i>B12. Meeting export packaging/labelling requirements</i>	0.764
<i>B37. Unfamiliar foreign business practices</i>	0.912
<i>B40. Inadequacy of infrastructure for e-commerce</i>	0.871
<i>B26. Difficulties communicating with overseas customers</i>	1.450
<i>B13. Offering technical/after-sales service</i>	0.902
<i>B39. Verbal/nonverbal language differences</i>	0.844

The least variance is observed for “*B33. Different foreign customer habits/attitudes*” ($\sigma^2=0.422$; $\sigma=0.650$). This can be interpreted as being the obstacle for which the least divergence in perceptions between the sample average and the regional averages is observed. That is to say, among the 48 barriers perceived as more or less important by respondents across the various regions, barrier B33 is experienced in the most similar/congruent way. By contrast, the biggest variance is observed for “*B32. Unreliable data about the international market*” ($\sigma^2=1.708$; $\sigma=1.307$). This means that for this barrier – lack of international market intelligence – there is the biggest divergence, compared to all other obstacles, between the average perception and regional perceptions. That is to



say, there are significant differences in how this barrier is experienced in the different regions participating in the survey.

The same classification of variation can take place at the level of the top ten barriers of the list – the ten most significant barriers by average ranking – the following obstacles are obtained: “B14. Offering satisfactory prices to customers” ($\sigma^2=0.523$; $\sigma=0.723$) and “B47. Unfavorable quotas and/or embargoes” ($\sigma^2=1.705$; $\sigma=1.306$). These can be interpreted as the obstacles which present the most and the least congruence respectively, as far as the comparison between sample population average tendency and regional average tendencies goes. It is a measure of the coherence in perceptions, when we compare the average sample perception and regional perceptions.

3.2. Regional Top ten

For each region, a list of 10 most significant obstacles is obtained. The lists per region presented below are obtained from ranking obstacles from highest ranking (higher mean) to lowest ranking mean. From the 8 regional lists a pool of barriers is obtained (8x10). The barriers are then ordered by frequency of occurrence and the first ten are selected. The regional lists and the top ten barriers’ list after regional clustering are presented below.

Table 15. Top regional barriers by average significance

	UPAT		LAPLAND UAS
4	B15. Difficulty in matching competitors’ prices	4.5	B6. Lack of excess production capacity for exports
3.8	B14. Offering satisfactory prices to customers	3.5	B34. Keen competition in overseas markets
3.8	B47. Unfavorable quotas and/or embargoes	3	B15. Difficulty in matching competitors’ prices
3.7	B3. Lack of competent personnel to contact potential overseas customers	3	B30. Unfavorable home rules and regulations
3.7	B11. Meeting export product quality/standards/specifications	3	B14. Offering satisfactory prices to customers
3.7	B12. Meeting export packaging/labelling requirements	2	B16. Granting credit facilities to foreign customers



3.7	<i>B19. Obtaining reliable foreign representation</i>	2	<i>B18. Accessing export distribution channels</i>
3.7	<i>B29. Lack of home government assistance/incentives</i>	2	<i>B19. Obtaining reliable foreign representation</i>
3.5	<i>B18. Accessing export distribution channels</i>	2	<i>B23. Excessive transportation/insurance costs</i>
3.5	<i>B20. Maintaining control over foreign middlemen</i>	1.5	<i>B1. Lack of competent personnel to locate/analyse markets</i>

	LIGURIA		NRDA
5	<i>B23. Excessive transportation/insurance costs</i>	4.3	<i>B15. Difficulty in matching competitors' prices</i>
5	<i>B27. Slow collection of payments from abroad</i>	3.9	<i>B14. Offering satisfactory prices to customers</i>
5	<i>B28. Difficulties in enforcing contracts and resolving disputes</i>	3.8	<i>B25. Unfamiliar exporting procedures/paperwork</i>
5	<i>B29. Lack of home government assistance/incentives</i>	3.8	<i>B7. Shortage of working capital to finance exports</i>
5	<i>B30. Unfavorable home rules and regulations</i>	3.8	<i>B41. Political instability in foreign markets</i>
5	<i>B31. Unfavorable foreign rules and regulations</i>	3.7	<i>B10. Adapting export product design/style</i>
5	<i>B32. Unreliable data about the international market</i>	3.5	<i>B17. Complexity of foreign distribution channels</i>
5	<i>B47. Unfavorable quotas and/or embargoes</i>	3.5	<i>B19. Obtaining reliable foreign representation</i>
4.5	<i>B26. Difficulties communicating with overseas customers</i>	3.5	<i>B42. High tariff barriers</i>
4.5	<i>B34. Keen competition in overseas markets</i>	3.5	<i>B4. Lack of managerial time to deal with internationalisation</i>

	ADR-BI		REGPEL
5	<i>B2. Lack of competent personnel to identify foreign business opportunities</i>	5	<i>B41. Political instability in foreign markets</i>



5	<i>B19. Obtaining reliable foreign representation</i>	3.6	<i>B15. Difficulty in matching competitors' prices</i>
5	<i>B34. Keen competition in overseas markets</i>	3.2	<i>B7. Shortage of working capital to finance exports</i>
4	<i>B3. Lack of competent personnel to contact potential overseas customers</i>	3	<i>B20. Maintaining control over foreign middlemen</i>
4	<i>B10. Adapting export product design/style</i>	3	<i>B34. Keen competition in overseas markets</i>
4	<i>B11. Meeting export product quality/standards/specifications</i>	3	<i>B14. Offering satisfactory prices to customers</i>
4	<i>B12. Meeting export packaging/labelling requirements</i>	2.7	<i>B16. Granting credit facilities to foreign customers</i>
4	<i>B1. Lack of competent personnel to locate/analyse markets</i>	2.7	<i>B23. Excessive transportation/insurance costs</i>
4	<i>B25. Unfamiliar exporting procedures/paperwork</i>	2.7	<i>B27. Slow collection of payments from abroad</i>
4	<i>B29. Lack of home government assistance/incentives</i>	2.6	<i>B33. Different foreign customer habits/attitudes</i>

	NCC		WDC
3.8	<i>B29. Lack of home government assistance/incentives</i>	4.5	<i>B29. Lack of home government assistance/incentives</i>
3.8	<i>B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)</i>	3.7	<i>B30. Unfavorable home rules and regulations</i>
3.6	<i>B33. Different foreign customer habits/attitudes</i>	3.2	<i>B6. Lack of excess production capacity for exports</i>
3.4	B38. Different socio-cultural traits	3.2	<i>B16. Granting credit facilities to foreign customers</i>
3	<i>B23. Excessive transportation/insurance costs</i>	2.7	<i>B5. Inadequate quantity of and/or untrained personnel for internationalisation</i>
3	<i>B36. Foreign currency exchange risks</i>	2.7	<i>B7. Shortage of working capital to finance exports</i>
3	<i>B43. Strict foreign rules and regulations</i>	2.7	<i>B11. Meeting export product quality/standards/specifications</i>
2.8	<i>B30. Unfavorable home rules and regulations</i>	2.7	<i>B14. Offering satisfactory prices to customers</i>
2.6	<i>B25. Unfamiliar exporting procedures/paperwork</i>	2.7	<i>B19. Obtaining reliable foreign representation</i>
2.6	<i>B31. Unfavorable foreign rules and regulations</i>	2.7	<i>B21. Difficulty in supplying inventory abroad</i>



The table below is summarizing the results for the top ten barriers after regional clustering. The order of significance is obtained here by citation frequency, from most frequently cited barrier to the least frequently cited barrier, irrespective of the mean regional significance for each barrier.

Description	f
<i>B15. Difficulty in matching competitors' prices</i>	4
<i>B29. Lack of home government assistance/incentives</i>	4
<i>B14. Offering satisfactory prices to customers</i>	3
<i>B30. Unfavorable home rules and regulations</i>	3
<i>B23. Excessive transportation/insurance costs</i>	2
<i>B41. Political instability in foreign markets</i>	2
<i>B34. Keen competition in overseas markets</i>	3
<i>B6. Lack of excess production capacity for exports</i>	2
<i>B7. Shortage of working capital to finance exports</i>	2
<i>B3. Lack of competent personnel to contact potential overseas customers</i>	2

Table 16. Top ten barriers by citation frequency after regional clustering

Comparing the two top ten lists derived from a) the entire sample and b) from the regional clustering resulting in 8 lists compiled into one by frequency ranking, the following table is obtained.



Table 17. Comparison between top ten lists pre- and post- regional clustering

<i>Rank</i>	Top Ten Barriers (significance ranking, sample population)	Top Ten Barriers (frequency ranking, regional clustering)
1	<i>B15. Difficulty in matching competitors' prices</i>	<i>B15. Difficulty in matching competitors' prices</i>
2	<i>B29. Lack of home government assistance/incentives</i>	<i>B29. Lack of home government assistance/incentives</i>
3	<i>B14. Offering satisfactory prices to customers</i>	<i>B14. Offering satisfactory prices to customers</i>
4	<i>B34. Keen competition in overseas markets</i>	<i>B30. Unfavorable home rules and regulations</i>
5	<i>B30. Unfavourable home rules and regulations</i>	<i>B23. Excessive transportation/insurance costs</i>
6	<i>B25. Unfamiliar exporting procedures/paperwork</i>	<i>B41. Political instability in foreign markets</i>
7	<i>B7. Shortage of working capital to finance exports</i>	<i>B34. Keen competition in overseas markets</i>
8	<i>B23. Excessive transportation/insurance costs</i>	<i>B6. Lack of excess production capacity for exports</i>
9	<i>B47. Unfavourable quotas and/or embargoes</i>	<i>B7. Shortage of working capital to finance exports</i>
10	<i>B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)</i>	<i>B3. Lack of competent personnel to contact potential overseas customers</i>

The similarity in the two lists is 70% in terms of the barriers obtained. For the first three barriers there is one-to-one correspondence between the two lists. In each list there are 3 obstacles that do not figure in the other. These are the following:

- B25. Unfamiliar exporting procedures/paperwork,
- B47. Unfavorable quotas and/or embargoes,
- B45. High health, safety and technical standards (significance ranking, sample population),
- B41. Political instability in foreign markets,
- B6. Lack of excess production capacity for exports,
- B3. Lack of competent personnel to contact potential overseas customers.



The first three barriers are common among the two lists, a rather expected outcome. B6 figures in the regional clustering list, while it does not in the sample list, because it figures prominently (high significance score) in regional rankings and therefore it makes it into two regional top ten lists (Lapland and Ireland).

Barrier *B6. Lack of excess production* is worth considering further. Its presence in the second, regional list, as mentioned, is related to the specific characteristics and home market of Ireland and Lapland. Exports are limited due to production capacity in correlation to internal market demand.



3.3. Top ten Method

This section introduces the Top Ten ranking method. This method relates to the third section of the questionnaire, whereby **each respondent was asked to rank the ten most serious barriers to externalization in order of significance**, without attaching a weight to any of them. The weights are derived from the ranking itself (0-10). Therefore, this method yields a list of ten barriers from the most significant to the least significant from each individual company-respondent. The difference to the previous method consists in choosing among 48 barriers, rather than assigning significance to all 48 barriers.

For this section, 33 respondents provided valid answers. All respondents citing at least one barrier are taken into account. 8 respondents did not cite any barrier for this section. For those who did, there is one list of barriers obtained for each respondents, containing between 1-10 barriers, ranked from the most significant to the least significant. The most significant obstacle is assigned a weight of ten (10) and the least significant obstacles is assigned a weight of one (1). All missing values, namely, obstacles not cited, are assigned a score of zero.

The table that follows presents all the barriers ordered by frequency of citation accompanied by their mean score across respondents. As it will be noticed, **when frequency increases it does not necessarily reflect on the mean weighted score, as one barrier may be cited multiple times while scoring low**. Only the first ten barriers by frequency are presented. The full table with all the obstacles are presented in the ANNEX of this document.

Table 18. Top ten barriers by mean score and frequency (per respondent)

Description	f	Mean score
B7. Shortage of working capital to finance exports	12	8.41
B30. Unfavourable home rules and regulations	12	7.5
B6. Lack of excess production capacity for exports	14	7.42
B15. Difficulty in matching competitors' prices	15	7.4



B23. Excessive transportation/insurance costs	9	7.33
B29. Lack of home government assistance/incentives	13	6.53
B25. Unfamiliar exporting procedures/paperwork	10	6.5
B14. Offering satisfactory prices to customers	12	5.75
B11. Meeting export product quality/standards/specifications	9	5.44
B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)	13	3.07

It is interesting to counterpose frequency of citation and significance because in terms of frequency barrier 'B15. Difficulty in matching competitors' prices' is through this method too in the top position, while another obstacle, namely, 'B7. Shortage of working capital to finance exports' attains the highest significance score. This is notably different from the previous results, as in the previous tables (sample top ten and top ten after regional clustering), B7 occupies the 7th and the 9th position respectively. **When asked to choose the ten most significant barriers and rank them, participants attributed the highest significance overall to the shortage of working capital.** Approximately, 1 in 3 participants when constrained to select barriers, gave the highest significance score to the lack of working capital.

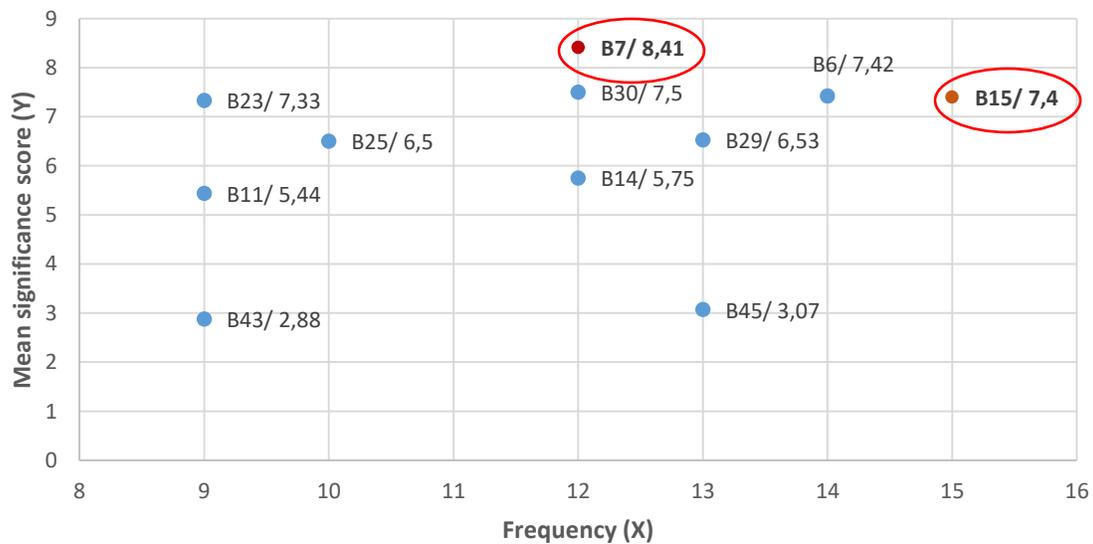
By contrast, as already explained, in the overall ranking of all 48 barriers, more significance is attributed to barriers that emphasize roll-on consequences of pertinent internal barriers. Hence, through the first method, the results indicate an emphasis on customers and competitive prices, while through the second method, the emphasis is on the first links of the causal chain that leads to externalization dysfunctions, namely, production drivers.

The figure in the next page represents for the top ten barriers selected by respondents the plot of mean significance score and citation frequency. The highest score is for *B7. Shortage of working capital to finance exports* (8.41), while the most frequently cited obstacle by individual participants is *B15. Difficulty in matching competitors' prices* ($f=15$). The slope ($m=0.2582$) tells us that for every additional frequency unit (citation) the mean average significance increases by 0.2582. There seems to be a positive correlation, which



makes sense because significance rises with higher frequency. However, as the correlation coefficient shows, the dispersion is high and as a result the scatterplot below depicts the weak linear relation between significance and frequency of citation. The point of emphasizing this is to provide an understanding of why this is the case. One possible explanation may be that frequency of citation reflects the overall visibility of a certain barrier, namely, it is associated with a barrier being overall pertinent and commonly perceived as a barrier. On the other hand, the significance score reflects a subjective evaluation of a given barrier and its actual import/impact on the respondent. Interpreting the fact that an internal barrier '*B7. Shortage of working capital*' receives the highest score in terms of significance, while B15 'Difficulty in matching competitors price', along the abovementioned line, leads the analysis to the hypothesis that a) mean significance is more important than frequency of citation, and b) that B7 is more important because its score reflects an acutely experienced problem, while the high frequency of B15 citation is likely to reflect a commonly available perception. What is more, it is a perception regarding 'competitors' prices' which is more likely to be misinformed, not adequately driven by market data, contrary to a perception about a company's own production capacity, working capital etc.

Figure 4. Mean significance – Citation frequency Plot (Top Ten Barriers)





3.4. Correlation between key variables

Section three of the questionnaire, whereby respondents provided one list of ten barriers each, selected from the pool of 48 barriers, is suitable for clustering responses based on company size. It can be hypothesized that **as the size of the company increases the overall significance of internal barriers tends to be reduced**. In that sense, it is expected that medium size companies should perceive internal barriers as less significant, than micro size companies and this should reflect in the top ten ranking. Further, according to several studies, it can safely be assumed that **as company size increases, perceptions of access to finance as a barrier tend to decrease**. That is to say that the bigger a company is, the more likely it is to consider access to finance as feasible. Survey results show that internal barriers are less frequently cited by medium sized companies (34%), compared to small sized companies (55%) and micro-size companies (57%).

Table 19. Internal barriers' prevalence per company size class

Company size	Internal barriers	External barriers
Micro	57%	43%
Small	55%	45%
Medium	34%	66%

Informational, functional, product and price, distribution and logistics and promotion barriers, are perceived by SMEs to be decreasing, as their size increases. Personnel costs associated with competent staff for international commerce activities are normally manageable by bigger companies, while functional barriers, such as working capital availability, are expected to play a lesser role. Production capacity, equally, to cover international demand in addition to internal market demand, should increase as company size increases.

To put this claim to the test, a chi-square test is performed to determine whether the two variables (size, and barrier type) are independent. The boxes below contain the observed



values for the said variables and some random values which however confirm the hypothesis that size and type of barriers experienced are not independent.

Size	Observed		Size	Expected	
	Internal (%)	External (%)		Internal (%)	External (%)
Micro	57.00	43.00	Micro	60.00	30.00
Small	55.00	45.00	Small	40.00	50.00
Medium	34.00	66.00	Medium	30.00	70.00

The null hypothesis H_0 is that the two variables are independent. If they are independent, the difference between the observed and the expected value is significant. ($\alpha > 0.05$)

The alternative hypothesis H_a is that the two variables are not independent. If they are not independent, the difference between the observed and the expected values is not significant. ($\alpha < 0.05$)

For $df=1$, the test returns a value of $0.00177293 < 0.05$, indicating that the null hypothesis is false. Therefore, it is true that increase in company size is associated to a decrease in experiencing internal obstacles, and vice versa, that increase in company size is associated to increase in the experience of external barriers.

Taking an exemplary external barrier such as 'B29. Lack of home government assistance', often also framed as access to finance, the following can be deduced from the data collected. First, there are 11 'B29' citations. These responders represent 3 micro, 2 small and 5 medium (1 N/A) companies respectively. It is noteworthy that out of 21 exporters participating in the survey, 11 cited B29 barrier. In other words, **among exporters, nearly half of them perceive of government assistance as inadequate**. As mentioned, there does not seem to be any correlation between company size and perceptions of support availability. However, it should be noted that the sample is rather small to make safe inferences.

By contrast **regional differences are likely more important**. To mention certain characteristics cases, all NCC respondents attributed high significance to lack of government support, irrespective of company size, while the same holds true for Greece, whereby, all three company size classes assign significance to B29. There were no Lithuanian respondents citing B29, irrespective of company size. Company size, given the



sample in question, cannot be said to influence perceptions of government assistance, including financing.

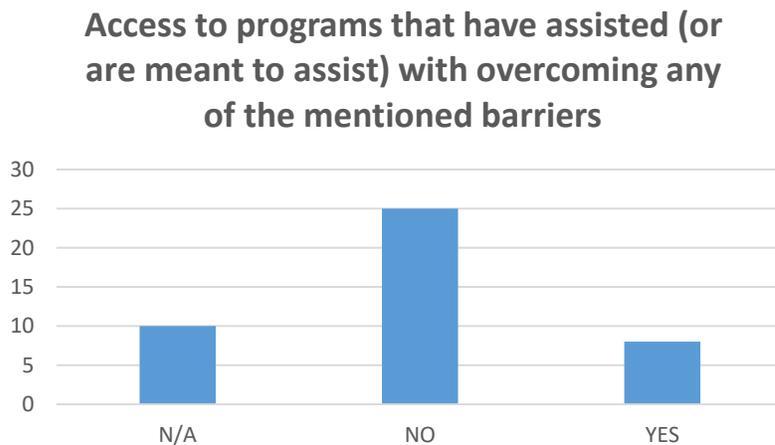
Regarding the question of access to assistance, the data from the last part of the questionnaire could yield insights in combination with the aforementioned data. These are discussed in the next section.



3.5. Assistance programs

To the question regarding access to assistance programs for business externalization and uptake of international activity, 8 respondents indicated that they have access to such programs, 25 that they don't, and 10 did not provide data.

Table 20. Access to assistance



Data methodology foresaw questions aiming to yield more specific information (type of programs, and support, appraisal of usefulness, as well as one question on the kind of support respondents themselves would find useful. The response rate to these questions is negligible, with certain exceptions. Only one respondent from Ireland provided clarifications, indicating that they would find useful assistance in the form of sustained counselling services whereby companies would be brought to take account of their fault lines and improve performance by own means.



Conclusion

The results of the survey conducted on the barriers the aquaculture sector and value chains in the respective partnership regions individually and as a whole constitute a basis on which policy work can focus.

The research design principally aimed at extracting information regarding the problems aquaculture SMEs face in carrying out international activities, which are going to be summarized further down. However, data collection in partnership regions revealed **a wealth of different value chain structures**: participants in the survey share certain characteristics and differ in other attributes. The companies that participated were of variable size, age, and production capacity, area of specialization and status of international activity. While most participants are engaged in some international activity, others are not, forming a mosaic of regional businesses with an overall considerable potential to expand and capture market segments beyond EU and national borders.

Despite the diversity of business demographic attributes, participants provided data that reveal **a certain degree of convergence regarding the kinds of barriers perceived as important**. In this context, **the major barrier perceived by aquaculture SMEs is the inability to offer products in satisfactory/antagonistic prices**. In principle, this prevalence can be seen in relation to external and internal parameters. On the one hand, the inability to offer products in satisfactory for consumers prices reflects problems associated to the operating company itself and its functional characteristics, the domestic market and the relevant demand for such products, as well as the regulatory framework in the 'export' country. On the other hand, there are several issues concerning the respective target market structures, as well as the business model and characteristics of third-country competitors. Further, the most significant barriers, as perceived by the SMEs themselves concern home regulations and the lack of assistance – notably funding – including administrative, bureaucratic and procedural barriers.

Two categories of problems therefore seem to emerge from the analysis as most pertinent: a) **Product and price barriers to marketing**, and b) **procedural barriers**. Although three other categories of barriers occupy the first three positions in the relevant clustering (Distribution, logistics and promotion barriers, Tariff and non-tariff barriers, and administrative barriers), since they were more represented in the top twenty list, product and price barriers as well as procedural barriers were assigned more significance than the latter. There is no one-way, conclusive interpretation of such finding, hence further triangulation with additional data is



required in order to proceed to safe conclusions. Regional clustering enabled the analysis to move to an insight provoking comparison between the average partnership tendency and the respective regional tendencies in experiencing certain kinds of problems and obstacles to internationalisation. These comparisons were instrumental in understanding the specific business environment and business characteristics of regional aquaculture value chains. Making explicit the convergences and divergences and the distance between the perceptions of barriers across the regions, can decisively facilitate exchange of expertise and peer learning, as partners with similar problems can work through these together, while partners for whom certain problems are not pertinent and which have been adequately dealt with can transfer knowledge to regional sectors that encounter grave barriers to developing international trade activities.

Prior to providing conclusive remarks for the regions represented in the survey, a general remark in terms of correlating data findings.

1) Participating businesses provided evidence that product diversification and processing and packaging are not among frequently cited specialization activities. Combining this fact with the main finding concerning all regions, namely, the difficulty of competing abroad, it can be said that **a great deal of effort should be given to product innovation and diversification**. Should competition for deep/freshly frozen products is structurally rather hard to deal with, it is likely more productive to consider allocating more resources for the production of goods that provide superior value to customers, for instance health products and various kinds of packaged/branded goods.

2) Company size does matter in the formation of barriers' perceptions. Smaller companies tend to consider internal barriers as more important, while larger companies tend to consider external barriers as more important. Analysis showed that company size and barrier type prevalence (internal/external) are significantly correlated, therefore they are not independent variables. However, it should also be stressed that perceptions of barriers are influenced by factors that do not necessarily reflect objective conditions, for instance, inadequate business intelligence. Small business size does not imply objective barriers for all cases.

3) Export status by contrast does not seem to alter significantly the perception of barriers or the prevalence of either internal or external barriers. Export status in turn is not associated with company size.



4) Regional differences, that is, differences in perceptions of the business external circumstances, notably, regulatory framework, government assistance etc. seem to play a more significant role.

Based on the Top Ten barriers per region the following conclusive remarks are provided:

Liguria Region

Liguria presents a composite picture regarding the types of barriers aquaculture businesses face in the region. The most significant barriers experienced by participants in the survey from Liguria are related to transportation costs, slow collection of payments from abroad, enforcing contracts abroad, and rules & regulations at home and abroad. The prevalence of reported external barriers shows that regional authorities need to focus, first, on communication strategies for existing assistance programs and procedures in order to increase the visibility of programs and the accessibility to paperwork procedures that may be complex for new entries in the arena of international trading activities. Administrative and other forms of support including financial support should be more publicized and encouraged to be sought by aspiring exporters. Second, the prevalence of reported external barriers should alert authorities to reviewing the operation of certain internationalisation enablers. In this respect, the operation of export hubs both at home and in destination countries could facilitate to a great extent the establishment of credible links between businesses and third parties (potential customers, middlemen, associates etc.), while it can leverage state resources and networking assets abroad that an individual company cannot have access to reducing thus its capacity to handle the costs of opening to new markets.

Lapland

The main issue the region of Lapland faces with regard to export aquaculture activities is the lack of excess production for exports. This is likely not irrelevant to the fact that unfavorable home rules and regulations are figure high in this regional barrier list. The lack of excess production for exports requires increasing production capacity, which, in turn, requires innovation in production mode, technological/infrastructure change, in short, investments and finance options, public and private alike. It requires also concrete political decisions for routing



a portion of production abroad and counter measures to handle possible risks and lack in covering domestic demand. A number of barriers regarded as significant in the context of Lapland concern business intelligence, export distribution channels, foreign representation. Addressing these barriers can likely trigger an improvement in how competition abroad is dealt and how competitors are perceived. Just like in the case of Liguria discussed above, policy work should focus on providing better information and administrative support services abroad, likely through commerce offices in embassies, participation in sectoral fairs in target countries. Equally, policy work should be carried out in developing market intelligence collaborations between administrative authorities and candidate export businesses to increase the levels of confidence for implicated businesses and provide sound, evidence-based planning support to businesses willing to capture foreign markets with key aquaculture products.

West Pomeranian Region

Given the most significant barriers reported for the region of Szczecin, the aquaculture sector is in need of overall government support and a policy priority of renewing the standard business models so as to meet the necessary standards for export marketing and trade. Typically, such support should in a soft approach familiarize aquaculture businesses with foreign procedures, consumption habits but also with domestic procedures, which, have to be clear and easily accessible to aspiring exporters. More concrete issues, such as transportation costs and currency risks can be addressed by prioritizing export activities and in doing so provide incentives in the form of tax reductions and tariff reductions for companies willing to take on export activities. Reducing risks for companies should include efforts to provide business intelligence support and assurance needed to engage in trade activities in new markets.

Region of Peloponnese

Among the barriers cited by aquaculture businesses in the Region of Peloponnese, the shortage of working capital to finance exports figures prominently and in conjunction with that, transportation costs. These are two areas policy work can focus on by priority, because improvements in these areas can have a decisive impact. It must be ensured that a sectoral policy makes provisions for financing instruments and assistance for exports. Financing the sector should place exports at the forefront of requirements to provide incentives to companies to diversify their activities and take on necessary actions for international trade. Foreign



middlemen and collection of payments from abroad can be overcome by promoting sectoral consultations with trade authorities and their contingencies in countries abroad. Liaising sectoral representatives with representatives of home country abroad and trade services abroad, can increase the sense of feasibility for businesses to undertake restructuring of commercial options for their products.

Region of Western Greece

The sector in western Greece can benefit from specialized programs for product diversification and assistance in that direction. Given overarching concerns among businesses in Western Greece, regarding export product quality, standards and specifications, as well as packaging/labelling requirement, it is evident that the sector is in need of innovative production to compete abroad. Authorities should carefully consider the nature of international markets in consultation with the business representatives and work out a strategy to be included in a sectoral operational plans for the near future. Part and parcel of these consultations should be the development of training measures for the familiarization of businesses with standardization procedures and branding/packaging procedures. These are partly administrative, technical and marketing support actions.

Ireland (Border, Midland and Western)

Given the perceptions of companies operating in the regions of Ireland, the outstanding problems are associated to regulations and lack government assistance for the sector. Regional authorities should provide evidence-based advice to central government regarding the benefits and prospects of aquaculture obtaining an international outlook. These efforts should be accompanied by efforts to increase production and implement innovative production approaches and techniques. Essentially, finance opportunities for the sector, imply both the possibility for sectoral innovation and facilitation of exports thereby to compete abroad. Authorities should equally consider the ways in which the presence of the sector will be visible abroad and secure its position by eliminating relevant risks (e.g. lack of commercial networks, untrusted middlemen etc.). Drawing on existing networks related to trade could leverage in this respect the establishment of aquaculture presence in foreign markets.



Lietuva

Aquaculture businesses operating in the region can benefit from receiving market intelligence support to obtain an objective and data driven picture of what really the dynamics are in target markets. Support should also focus at a fundamental level on finance opportunities with explicit provisions and incentives for aspiring exporters. Familiarity with foreign markets, that is, overcoming complexities associated with external distribution channels, or obtaining foreign market representation, requires sustained efforts on the part of authorities to liaise with existing commercial networks abroad and increase visibility of the aquaculture sector in such way as to present an opportunity for foreign market representatives to cooperate with a sector with a great deal of potential. Administrative support is necessary to be articulated as a common practice and procedural standardization and simplification is required for the sector to be able to attempt to capture foreign market segments.

Bucharest-Ilfov

The dominant perceptions of barriers to aquaculture businesses in the region indicate that companies experience internal obstacles and lack market intelligence. Competent personnel is required for that and support from authorities must be inclusive of measures for training sectoral representatives, or creating a sectoral network for exports whose purpose would be to familiarize aspiring exporters with approaches to assessment of foreign markets, data collection and business restructuring to meet export requirements. Similarly, efforts should concentrate on establishing sectoral presence in markets abroad, initially by securing stable liaisons and trade services in collaboration with trade offices of target markets.



ANNEX

Top ten barriers by respondent business size and internal barriers share

Size	Top ten barriers										INT Average
Micro	1	1	0	0	1	1	0	0	0	0	60%
Micro	0	0	N/A	100%							
Micro	0	1	1	1	1	1	1	1	1	1	10%
Micro	0	1	1	1	1	1	1	1	1	1	10%
Micro	0	0	0	0	0	1	1	N/A	N/A	N/A	70%
Micro	0	0	1	0	1	1	1	1	1	1	30%
Micro	0	0	1	0	N/A	N/A	N/A	N/A	N/A	N/A	75%
Micro	0	0	0	1	1	0	0	1	0	0	70%
Micro	0	0	0	0	0	0	0	1	0	0	90%
Micro	0	0	0	0	0	0	1	1	0	0	80%
Micro	1	1	1	1	0	0	0	1	1	N/A	30%
Small	0	1	1	0	0	1	1	0	0	1	50%
Small	0	0	0	1	N/A	N/A	N/A	N/A	N/A	N/A	75%
Small	0	0	0	0	1	1	1	1	1	1	40%
Small	1	0	0	1	0	1	0	1	1	0	40%
Small	1	1	1	0	1	0	0	0	0	0	60%
Small	0	0	0	0	1	1	1	1	1	1	40%
Small	0	1	1	1	0	0	1	0	0	0	60%
Small	0	0	0	0	0	0	0	0	0	0	100%
Small	1	0	0	0	0	0	0	0	1	0	80%
Small	0	0	0	1	1	1	0	0	1	0	60%
Small	1	N/A	0%								
Medium	0	0	1	1	1	1	1	1	1	1	20%
Medium	0	0	1	1	1	1	1	1	1	1	20%
Medium	1	0	0	0	1	1	1	1	0	1	40%
Medium	0	0	0	0	0	1	1	1	1	1	50%
Medium	0	1	1	0	0	0	0	1	1	1	50%
Medium	1	1	N/A	0%							
Medium	1	0	1	0	1	1	1	0	0	1	40%
Medium	1	1	1	0	0	1	0	0	1	1	40%
Medium	0	0	0	1	1	0	1	1	N/A	N/A	50%

The table below summarizes the frequency rate of internal obstacles for the valid responses to this section. External barriers are coded with “1” and internal by “0”.



Mean significance for all barriers and mean barrier significance per region.

	Mean all	Mean Liguria	Mean Lapland	Mean Szecehin	Mean Peloponnesse	Mean WesGr	Mean Ireland	mean Lith
B1.	2.57	2.67	1.50	1.00	1.50	3.00	2.50	3.19
B2.	2.55	3.33	1.50	1.00	1.75	3.43	2.25	2.75
B3.	2.80	3.50	1.00	1.00	2.50	3.71	2.00	3.31
B4.	2.67	4.00	1.50	1.00	1.75	2.71	2.00	3.50
B5.	2.57	3.33	1.00	1.20	2.25	3.14	2.75	2.88
B6.	2.93	4.33	4.50	1.00	1.67	3.14	3.25	3.13
B7.	3.05	3.00	1.50	1.20	3.00	3.29	2.75	3.81
B8.	2.60	3.33	1.50	2.40	1.50	3.00	1.75	2.94
B9.	2.74	3.00	1.50	2.20	1.75	3.14	2.25	3.25
B10.	2.78	2.67	1.50	1.20	2.00	2.86	1.75	3.75
B11.	2.83	3.33	1.00	1.40	2.25	3.71	2.75	3.13
B12.	2.45	2.67	1.00	1.40	2.25	3.71	1.50	2.56
B13.	2.19	2.67	1.00	1.40	1.50	3.00	1.50	2.44
B14.	3.32	3.33	2.50	2.00	2.75	3.86	2.75	3.93
B15.	3.45	3.33	3.00	1.60	3.25	4.00	2.00	4.31
B16.	2.71	3.00	2.00	1.20	2.75	3.14	3.25	2.88
B17.	2.76	3.00	1.50	1.80	2.00	2.86	1.50	3.56
B18.	2.95	3.33	2.00	2.20	2.25	3.57	2.25	3.31
B19.	3.02	3.67	2.00	1.00	1.67	3.71	2.75	3.56
B20.	2.90	3.67	1.50	1.00	3.00	3.57	2.50	3.31
B21.	2.62	3.67	1.50	1.20	2.00	3.17	2.75	2.88
B22.	2.54	3.67	1.00	2.00	1.00	2.43	1.00	3.50
B23.	3.05	5.00	2.00	3.00	2.75	3.43	2.25	3.00
B24.	2.73	3.00	1.50	1.60	2.00	3.29	2.25	3.20
B25.	3.05	4.00	1.50	2.60	1.67	3.14	1.50	3.87
B26.	2.28	4.50	1.00	1.40	1.00	2.71	1.00	2.81
B27.	2.85	5.00	1.50	1.40	2.67	3.29	2.25	3.20
B28.	2.69	5.00	1.50	1.20	1.50	3.29	2.25	3.00
B29.	3.44	5.00	1.50	3.80	2.33	3.71	4.50	3.13
B30.	3.11	5.00	3.00	2.80	1.00	3.43	3.75	2.93
B31.	2.62	5.00	1.50	2.60	1.67	3.14	2.25	2.47
B32.	2.85	5.00	1.00	1.20	2.00	3.57	1.75	3.50
B33.	2.87	3.00	1.50	3.60	2.67	2.71	2.00	3.20
B34.	3.28	4.50	3.50	2.40	3.00	3.57	2.50	3.38
B35.	2.68	4.00	1.00	1.80	2.33	3.29	1.50	3.19
B36.	2.67	3.50	1.00	3.00	1.50	3.14	2.25	2.81
B37.	2.43	4.00	1.00	1.20	1.67	2.29	2.25	3.00
B38.	2.73	2.00	1.50	3.40	2.67	2.14	2.50	3.13
B39.	2.08	2.00	1.50	1.40	1.00	2.29	1.25	2.69
B40.	2.33	2.50	1.00	2.00	1.00	2.86	2.00	2.67
B41.	2.90	3.00	1.00	2.00	3.67	2.71	1.25	3.81
B42.	2.85	3.50	1.00	1.60	2.67	3.14	1.75	3.56
B43.	2.88	3.50	1.00	3.00	2.67	3.14	2.50	3.00
B44.	2.58	3.50	1.00	1.00	1.00	2.86	1.50	3.38
B45.	3.03	3.00	1.00	3.80	2.67	3.29	2.00	3.19
B46.	2.74	4.00	1.00	1.80	2.67	3.50	1.75	3.06
B47.	3.03	5.00	1.00	2.00	2.00	3.83	1.75	3.47
B48.	2.82	4.50	1.00	2.20	2.33	3.00	1.50	3.33



Regional variance and standard deviation from sample mean for all barriers

Description	Variance	σ
B15. Difficulty in matching competitors' prices	0.893	0.945
B29. Lack of home government assistance/incentives	1.411	1.188
B14. Offering satisfactory prices to customers	0.523	0.723
B34. Keen competition in overseas markets	0.590	0.768
B30. Unfavorable home rules and regulations	1.237	1.112
B25. Unfamiliar exporting procedures/paperwork	1.064	1.031
B7. Shortage of working capital to finance exports	0.819	0.905
B23. Excessive transportation/insurance costs	0.723	0.850
B47. Unfavorable quotas and/or embargoes	1.705	1.306
B45. High health, safety and technical standards (e.g. sanitary and phytosanitary requirements)	0.866	0.930
B19. Obtaining reliable foreign representation	1.150	1.072
B18. Accessing export distribution channels	0.527	0.726
B6. Lack of excess production capacity for exports	1.244	1.115
B20. Maintaining control over foreign middlemen	0.871	0.933
B41. Political instability in foreign markets	1.077	1.038
B43. Strict foreign rules and regulations	0.526	0.725
B33. Different foreign customer habits/attitudes	0.422	0.650
B32. Unreliable data about the international market	1.708	1.307
B42. High tariff barriers	1.483	1.218
B27. Slow collection of payments from abroad	1.159	1.077
B11. Meeting export product quality/standards/specifications	0.946	0.973
B48. High costs of customs administration	1.514	1.230
B3. Lack of competent personnel to contact potential overseas customers	1.184	1.088
B10. Adapting export product design/style	0.852	0.923
B17. Complexity of foreign distribution channels	0.864	0.929
B46. Arbitrary tariff classification and reclassification	0.966	0.983
B9. Developing new products for foreign markets	0.450	0.671
B24. Adjusting export promotional activities to the target market	0.526	0.725
B38. Different socio-cultural traits	0.583	0.763
B16. Granting credit facilities to foreign customers	0.433	0.658
B28. Difficulties in enforcing contracts and resolving disputes	1.392	1.180
B35. Poor/deteriorating economic conditions abroad	0.989	0.995
B4. Lack of managerial time to deal with internationalisation	1.043	1.021
B36. Foreign currency exchange risks	1.351	1.162
B21. Difficulty in supplying inventory abroad	0.966	0.983
B31. Unfavorable foreign rules and regulations	1.359	1.166



B8. Lack of infrastructure for e-commerce	0.518	0.719
B44. Inadequate property rights protection (e.g. intellectual property)	1.317	1.148
B1. Lack of competent personnel to locate/analyse markets	0.709	0.842
B5. Inadequate quantity of and/or untrained personnel for internationalisation	0.709	0.842
B2. Lack of competent personnel to identify foreign business opportunities	0.744	0.863
B22. Unavailability of warehousing facilities abroad	1.225	1.107
B12. Meeting export packaging/labelling requirements	0.764	0.874
B37. Unfamiliar foreign business practices	0.912	0.955
B40. Inadequacy of infrastructure for e-commerce	0.871	0.933
B26. Difficulties communicating with overseas customers	1.450	1.204
B13. Offering technical/after-sales service	0.902	0.950
B39. Verbal/nonverbal language differences	0.844	0.919