

The Global Labour Market for Seafarers Working Aboard Merchant Cargo Ships 2003

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Contents

	Page
Introduction	1
Methods	2
Sample Distribution	2
Vessel Type	2
Flag	3
Summary of Sample Distribution Comparison	5
Sample Characteristics	6
Vessels	6
Ship Type	6
Deadweight Tonnage	7
Flag by dwt	8
Flag by Ship Type	9
Crew Size	11
Seafarers	12
Rank	12
Department	13
Nationality	14
Age	15
Profiles of Seafarers by Vessels and Roles	16
Nationality by Rank	16
Nationality by Department	20
Nationality by Ship Type	22
Nationality by Rank and Ship Type	24
Nationality by Department and Ship Type	26
Nationality by Flag	28
Nationality by Rank and Flag	31
Age by Nationality	34
Age by Rank	35
Age by Rank and Nationality	36
Crew size by Ship Type	37
Crew Size by dwt	38
Crew Size by Flag	40
Conclusion	41
References	43
APPENDIX 1	44
APPENDIX 2	46
APPENDIX 3	47

Tables

		Page
Table1	Top 10 Flags of Registration by dwt in the GLMS and WFS Databases	4
Table 2	Frequency of Ship Types	6
Table 3	Top 10 Flags of Registration by dwt	8
Table 4	Flag in Rank Order (Top 5) for Each Vessel Type	10
Table 5	Ranks Within the Sample (%)	12
Table 6	Department	13
Table 7	Top 10 Nationality of Seafarers	14
Table 8	Age of Seafarers (Grouped)	15
Table 9	Top 10 Nationalities of Senior Officers	17
Table 10	Top 10 Nationalities of Junior Officers	18
Table 11	Top 10 Nationalities of Ratings	18
Table 12	Top 10 Nationalities in the Deck Department	21
Table 13	Top 10 Nationalities in the Engine Department	21
Table 14	Top 10 Nationalities in the Catering Department	21
Table 15	Top 10 Nationalities in the Combined Deck and Engine Department	22
Table 16	Top 10 Nationalities on Bulk Carriers	23
Table 17	Top 10 Nationalities on General Cargo/ Container Ships	23
Table 18	Top 10 Nationalities on Tankers	24
Table 19	Top 5 Nationalities by Rank for Bulk Carriers	25
Table 20	Top 5 Nationalities by Rank for General Cargo/ Container Ships	26
Table 21	Top 5 Nationalities by Rank for Tankers	26
Table 22	Top 5 Nationalities by Department for Bulk Carriers	27
Table 23	Top 5 Nationalities by Department for General Cargo/ Container Ships	27
Table 24	Top 5 Nationalities by Department for Tankers	28
Table 25	Top 5 Nationalities by Flag of Vessel (Top 10 Flags by dwt shown in rank order)	29
Table 26	The Percentage of Seafarers Working on Their Own Nationality Vessels (Top 10 nationalities)	30

		Page
Table 27	The Top 5 Nationalities Working on Panamanian Flagged Vessels Split by Rank	33
Table 28	The Top 5 Nationalities Working on Liberian Flagged Vessels Split by Rank	33
Table 29	The Top 5 Nationalities Working on Maltese Flagged Vessels Split by Rank	33
Table 30	The Top 5 Nationalities Working on Greek Flagged Vessels Split by Rank	34
Table 31	The Top 5 Nationalities Working on Cyprus Flagged Vessels Split by Rank	34
Table 32	Descriptive of Age for the Top 10 Nationalities	35
Table 33	Age of Seafarers by Rank	35
Table 34	Mean Crew Size by Vessel	37
Table 35	Mean Crew Size by dwt (Grouped)	39
Table 36	Mean Crew Size by Flag	40

Figures

	Page
Figure 1 The Percentage of Vessels by Type	3
Figure 2 The Percentage of Overall dwt for the Top 10 flags of Registration by dwt	5
Figure 3 Pie Chart Showing Ship Types	7
Figure 4 The Percentage of Vessels in the dwt Groups in the GLMS Dataset	7
Figure 5 Top 10 flags of Registration by dwt	9
Figure 6 Crew Size	12
Figure 7 Pie Chart Showing Ranks	13
Figure 8 Pie Chart Showing Seafarers Department	14
Figure 9 Pie Chart Showing the Top 10 Nationality of Seafarers	15
Figure 10 Bar Graph Showing the Age of Seafarers (Grouped)	16
Figure 11 The Top 10 Nationalities of Senior Officers	19
Figure 12 The Top 10 Nationalities of Junior Officers	19
Figure 13 The Top 10 Nationalities of Ratings	20
Figure 14 For each of the Top 10 Nationalities the Percentage of Seafarers Working On Their National Flagged Vessels	31
Figure 15 Mean Ages by Rank for the Top 10 Nationalities	36
Figure 16 Crew Size by Ship Type	38
Figure 17 Crew Size by dwt	39

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Foreword

The Global Labour Market Survey was initiated by the former Director of SIRC, Professor Tony Lane. Initially the survey was somewhat experimental and data produced in early sweeps was not judged to be very reliable and was not widely publicised. In 2003, however, the data that was collected was considered to be sufficiently robust to warrant dissemination. Following dissemination in various forms the Centre has received a steady, and seemingly un-diminishing, series of requests for data relating to individual requirements. The requests have generally come from people working within the industry and government. They have been met on a case by case basis with the supply of ‘tailor-made’ tables and figures.

At this time we have decided to publish the full findings from the survey as widely as possible (via this report). Whilst the data is fast becoming out of date, it is the only data of its kind that we are aware of and it has proved to be of great value to many ‘end-users’ in the industry. A new data sweep is now required to update the picture and we remain optimistic that the value of the work will encourage individuals or groups to approach us with proposals that would enable us to repeat the study for the year 2009. In the meantime I hope that the data contained herewith is of some benefit and interest to the industry and to the broader maritime sector.

Professor Helen Sampson (SIRC Director)

Introduction

The Global Labour Market for Seafarers (GLMS) study has been conducted by the Seafarers International Research Centre (SIRC) for several years, and data collated from crew lists is available for the periods: 1993-2000; 2002; and 2003. Data from the study have previously been used to consider the profile of the seafaring workforce for the global cargo fleet in terms of characteristics such as age, nationality, ship type, and rank.

The GLMS produces labour market estimates based upon crew lists collected from a sample of world ports. Its innovative methodology offers a valuable alternative to labour market estimates based on surveys of employers which suffer from low and potentially biased response rates as well as from a necessary reliance upon the subjective views of managers. Bias within the GLMS is more transparent, where it exists, and it relates almost entirely to port (sample) selection which can be assessed using comparisons with world fleet composition data.

This report presents an overview of the 2003 data and looks at the profile of those crewing the world fleet, outlining nationality, age, rank and job, as well as the types of vessel they are employed on, and in what capacity.

The data presented here were collected in the final funded year of the SIRC research – 2003. However, data have also been collected from the previous year, and were collected less systematically between 1993 and 2002. The expertise to conduct further data sweeps for this study remains at SIRC, and the centre is currently attempting to raise funds to repeat the research in 2008/9¹.

¹ Should any individual, any organisation, or any consortium, be interested in sponsoring this research, the SIRC Director would be very pleased to hear from them. The research costs approximately £80,000 to carry out per year and multiple sponsorship would be welcomed by the Centre.

Methods

This report is based upon the descriptive statistics derived from a dataset established at SIRC via the collation of information entered upon crew lists which were collected from a range of ports across the world. Specifically it reports on crew lists collected in March 2003.

Although data were only collected from a limited number of ports, these were carefully selected 'hub' ports, at which many of the internationally trading ships operating in the area would be expected to call. Via our large purposive sample we hoped to obtain a broadly representative coverage of the international vessels trading locally.

From the crew lists that were collected in 2003, information on 4,240 vessels, and 80,863 seafarers was recorded. This constitutes approximately 10% of the world fleet as recorded in the generally recognised Lloyd's Register *World Fleet Statistics* (2003).

Sample Distribution

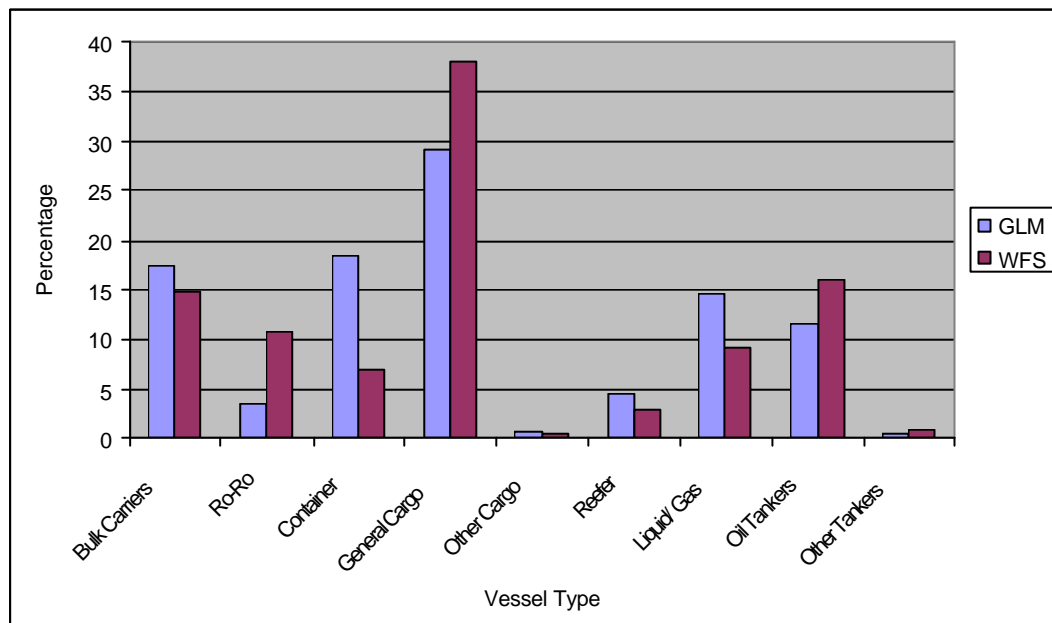
In order to check our sample 'shape' and the distribution of vessel types and flags (the registration of ships) within our sample, we compared it with the detailed breakdown of the world fleet as presented in the Lloyd's Register *World Fleet Statistics* (WFS) (2003).

Vessel Type

Having removed passenger/cruise vessels from both our sample and the WFS data we compared vessel type distribution and the distribution of flag.

We found similarities in the two datasets, particularly in relation to the categories of ‘bulk carrier’, ‘other cargo’, ‘reefers’, and ‘other tankers’. However, there were also a number of apparent differences. Proportionately the GLMS data contained over twice as many container vessels and nearly a third more liquid/ gas carrier vessels than were listed in the WFS. Thus it would seem that these vessel types are over-represented in our sample. By contrast, some vessel types appear to be under-represented in our sample. Proportionately, the WFS contain details of more general cargo vessels (almost a 10% variation), and approximately twenty-five percent more oil tankers than our GLMS sample. However, the most apparent difference was for ro-ro’s where the WFS contained three times more vessels than the GLMS sample (see Figure 1).

Figure 1: The Percentage of Vessels by Type



Flag

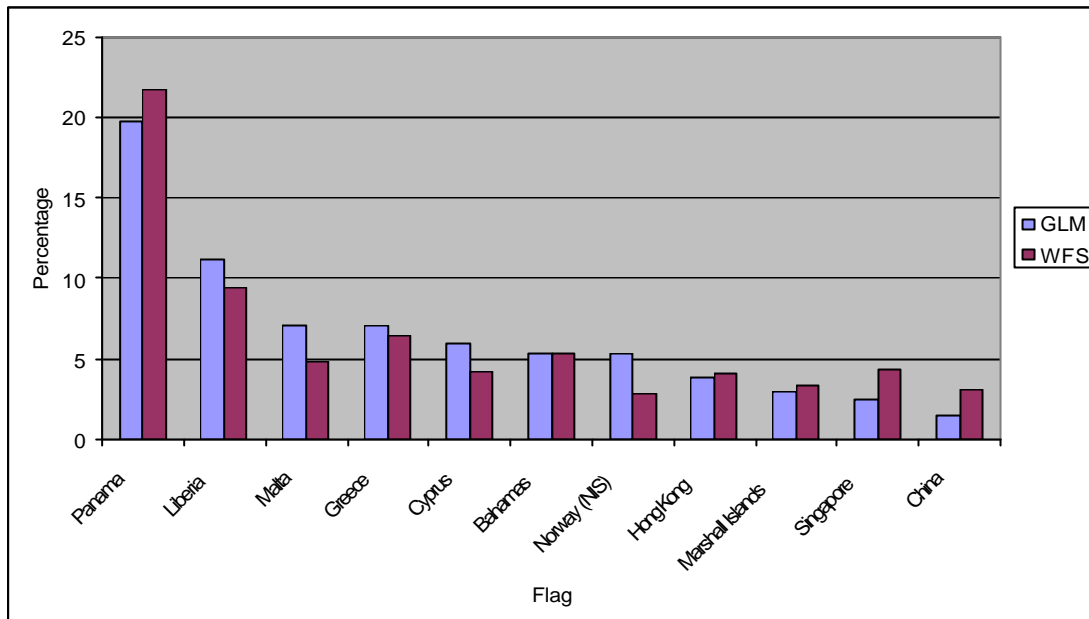
Flag of the vessels listed in the WFS was compared to the GLMS data in relation to deadweight (dwt). Table 1 shows the total dwt as well as overall rank order for the top ten flags by dwt in the two data sets. Flags which are ranked amongst the top ten in one data set but outside the top ten in the other, are highlighted in yellow.

Table 1: Top 10 Flags of Registration by dwt in the GLMS and WFS Databases

Flag	GLMS			WFS		
	<i>Rank order</i>	<i>dwt</i>	<i>Percentage of overall dwt</i>	<i>Rank order</i>	<i>dwt</i>	<i>Percentage of worlds dwt</i>
Panama	1	25,796,449	19.8%	1	183,974,112	21.7%
Liberia	2	14,563,051	11.2%	2	79,787,483	9.4%
Malta	3	9,255,512	7.1%	5	40,797,336	4.8%
Greece	4	9,135,877	7.0%	3	54,519,431	6.4%
Cyprus	5	7,775,396	6.0%	7	35,167,103	4.2%
Bahamas	6	7,007,816	5.4%	4	45,473,151	5.4%
Norway (NIS)	7	6,868,179	5.3%	11	23,979,689	2.8%
Hong Kong	8	5,142,413	3.9%	8	34,456,489	4.1%
Marshall Islands	9	3,729,506	2.9%	9	28,872,911	3.4%
Singapore	10	3,219,759	2.5%	6	35,998,380	4.3%
China	14	2,015,093	1.5%	10	26,257,775	3.1%

The top ten Flag/dwt rankings are very similar in the two datasets, with eight of the ten flags from each source appearing in both sets of top ten rankings. When the percentage of the worlds dwt is compared to the GLMS overall dwt these are also very similar, with the two data sets showing similar patterns of distribution across the flags (see Figure 2). When flags were considered individually, differences could be seen for the percentages for Norway (NIS) and China. In the cases of the Norway (NIS), the WFS data had nearly half the tonnage found in the GLMS sample, whereas in contrast in relation to the Chinese flag, the WFS data has over twice the tonnage found in the GLMS sample.

Figure 2: The Percentage of Overall dwt for the Top Ten flags of Registration by dwt



Summary of Sample Distribution Comparison

Using the WFS as a reference it appears that the GLMS does, approximately, correspond with the world fleet. For example, eight of the top ten flags as defined by tonnage were found to be present in both data sets and further analysis suggested that the percentage of tonnage for each flag across the groups was also fairly similar.

However, when vessel type is taken into account differences between the GLMS data and the WFS become more apparent. It would appear that some of the hub ports included in the survey have a concentration, or specialization in particular trades (e.g. container traffic), whilst attracting fewer vessels engaged in alternative operations (general cargo, oil transportation). Should we be in a position to repeat the survey we will endeavour to adjust our sampling points (ports) to attempt to capture more of the under-represented vessel types within our data.

In summary, in some respects the GLMS sample appears to be a fair match with the world fleet (as recorded by the WFS) however in others it appears to deviate more

markedly (specifically in relation to some vessel types). Thus generalisations from the data should be made with appropriate caution.

Sample Characteristics

Before considering the findings it is worth briefly examining the sample for the GLMS in a little more detail.

Vessels

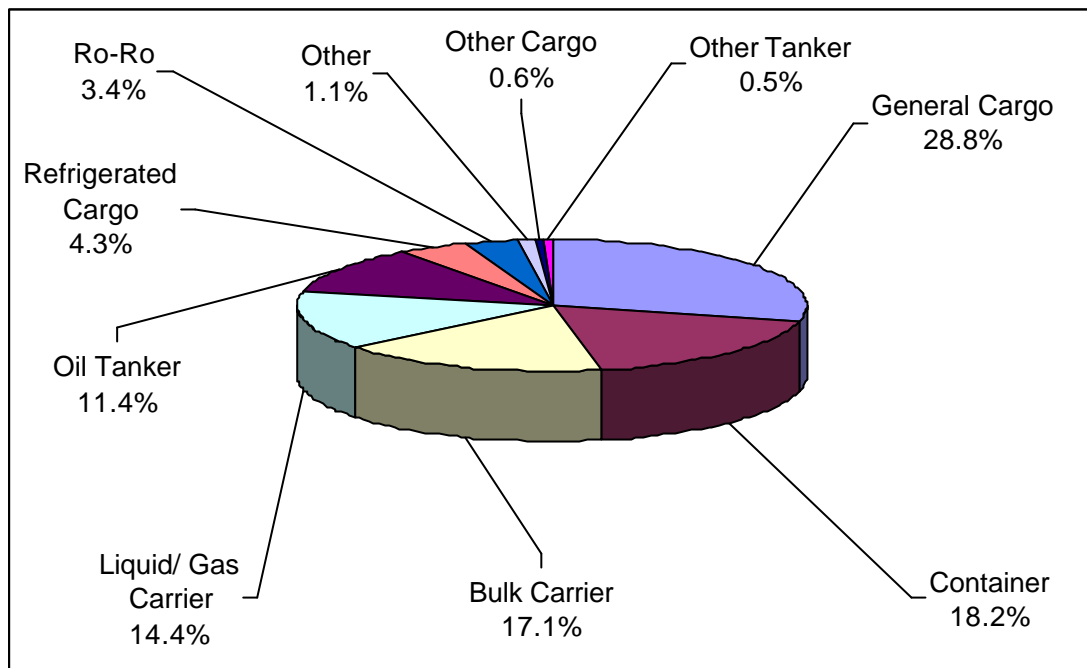
Ship Type

If we consider the sample in relation to the numbers of vessels of each type we observe that general cargo vessels constitute the largest group, container vessels are the next largest group, followed by bulk carriers and liquid/gas carriers (see Table 2). However, if we examine vessel type in relation to dwt we find that bulk carriers constitute our largest group by tonnage, closely followed by oil tankers (see Table 2 and Figure 3).

Table 2: Frequency of Ship Types

Rank Order by freq	Ship Type	Freq	Percent	Total dwt	Percentage of total dwt
1	General Cargo	1223	28.8%	6,850,198	5.9%
2	Container	773	18.2%	22,197,070	19.0%
3	Bulk Carrier	724	17.1%	37,216,155	31.9%
4	Liquid/ Gas Carrier	612	14.4%	9,297,759	8.0%
5	Oil Tanker	484	11.4%	37,147,940	31.8%
6	Refrigerated Cargo	184	4.3%	1,424,531	1.2%
7	Ro-Ro	145	3.4%	1,895,105	1.6%
8	Other	46	1.1%	233,545	0.2%
9	Other Cargo	26	0.6%	293,156	0.3%
10	Other Tanker	23	0.5%	109,018	0.1%
	<i>Total</i>	4240	100.0%	116,664,477	100.0%

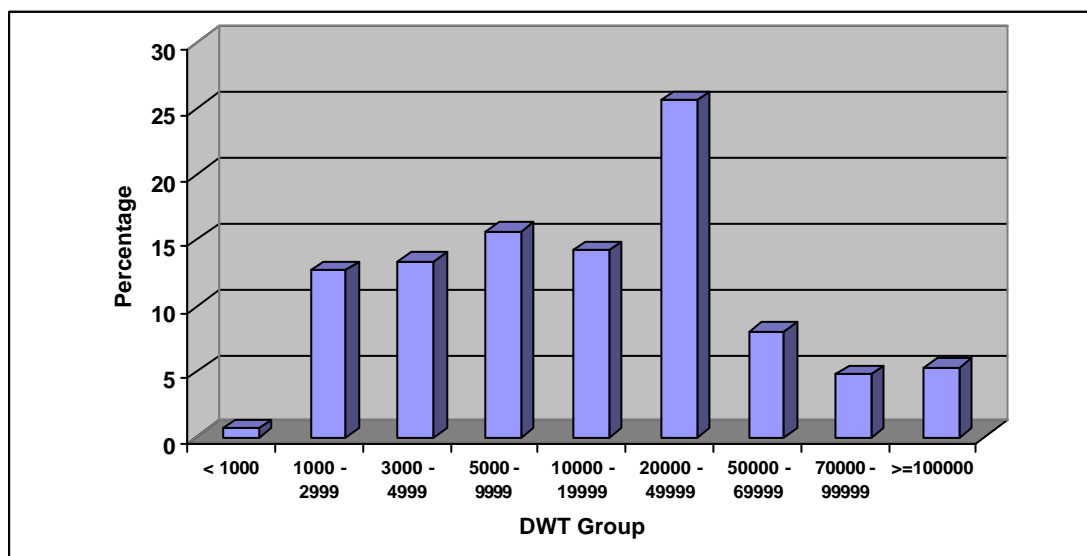
Figure 3: Pie Chart Showing Ship Types



Deadweight Tonnage

dwt was positively skewed with the majority of vessels being at the lower end of the tonnage distribution. However, there was a considerable concentration of tonnage in the 20,000-49,000 dwt category which did not fit with the overall distribution (see Figure 4).

Figure 4: The Percentage of Vessels in the dwt Groups in the GLMS Dataset



Flag by dwt

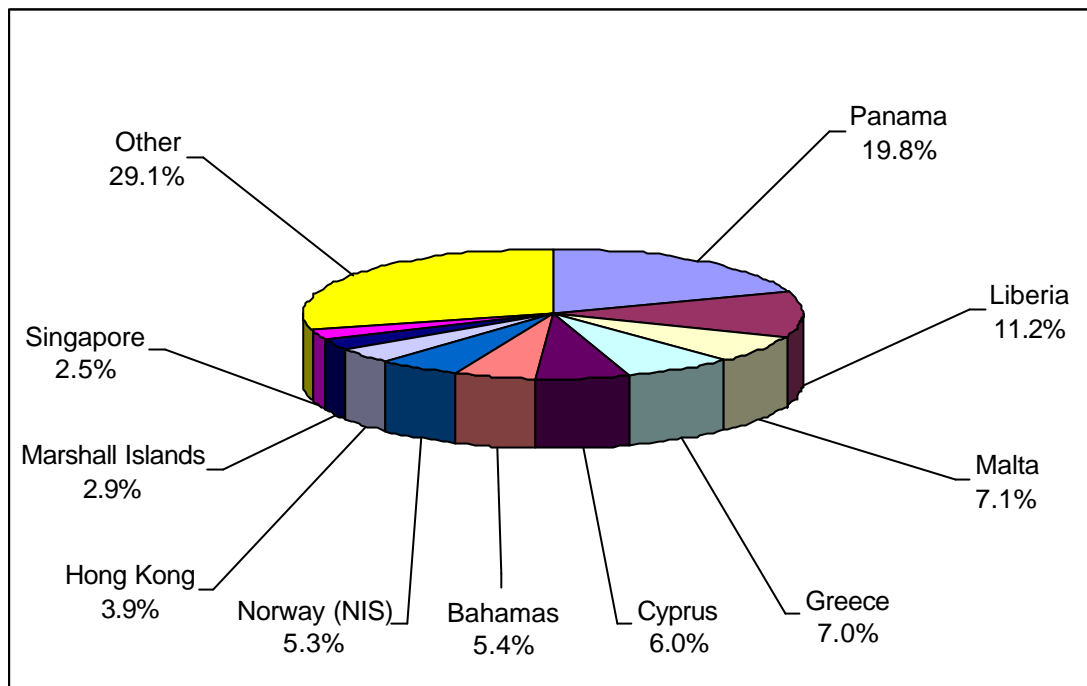
Within the sample Panama was the most significant registry, constituting 16% of the total number of vessels in the sample and 20% of the dwt. Liberia was the second most significant register in relation to dwt but Malta marginally exceeded Liberia in relation to numbers of vessels. The top ten flags as represented within the sample (Panama, Liberia, Malta, Greece, Cyprus, Bahamas, Norway NIS, Hong Kong, Marshall Islands, Singapore) accounted for 71% of the dwt included within the GLMS dataset for 2003 (see Table 3, Figure 5).

Table 3: Top 10 Flags of Registration by dwt

Rank Order	Flag	Percentage of total numbers of vessels	Percentage of overall dwt	Cumulative percentage of overall dwt
1	Panama	15.7%	19.8%	19.8%
2	Liberia	7.2%	11.2%	30.9%
3	Malta	7.4%	7.1%	38.0%
4	Greece	3.2%	7.0%	45.0%
5	Cyprus	4.7%	6.0%	51.0%
6	Bahamas	4.1%	5.4%	56.4%
7	Norway (NIS)	3.3%	5.3%	61.6%
8	Hong Kong	2.5%	3.9%	65.6%
9	Marshall Islands	1.6%	2.9%	68.4%
10	Singapore	1.9%	2.5%	70.9%
	Other	48.4%	29.1%	100.0%
	<i>Total</i>	100.0%	100.0%	---

This is shown graphically in Figure 5.

Figure 5: Top 10 flags of registration by dwt



Flag by Ship Type

When we considered flag by ship type we found that whilst Panama-flagged ships dominated some categories of vessel (bulk, ro-ro, container, reefer, liquid gas carrier) they were less prominent in other categories which were dominated by Netherlands (other tanker, other cargo, other), Malta (oil tanker), and Russia (general cargo). It seems likely that the domination of the Netherlands in the miscellaneous 'other' categories reflects the inclusion of Rotterdam as one of the hub ports and the nature of some of the local trade (see Table 4).

Table 4: Flag in Rank Order (Top 5) for Each Vessel Type

Ship Type	Rank Order	Flag	Percent
Bulk Carrier	1	Panama	21.5%
	2	Malta	11.9%
	3	Cyprus	10.1%
	4	Greece	7.6%
	5	Hong Kong	7.2%
		Other	41.7%
		<i>Total</i>	100.0%
Ro-Ro	1	Panama	38.6%
	2	Norway (NIS)	9.0%
	3	Sweden	6.2%
	4	Bahamas	5.5%
	5	Japan	4.1%
		Other	36.6%
		<i>Total</i>	100.0%
Container	1	Panama	21.6%
	2	Liberia	13.8%
	3	Germany	8.4%
	4	Antigua and Barbuda	7.0%
	5	Denmark (DIS)	3.8%
		Other	45.4%
		<i>Total</i>	100.0%
General Cargo	1	Russian	10.3%
	2	Antigua and Barbuda	9.8%
	3	Netherlands	8.4%
	4	Malta	7.9%
	5	Turkey	6.1%
		Other	57.4%
		<i>Total</i>	100.0%
Other Cargo	1	Netherlands	15.4%
	2	Liberia	11.5%
	3	Netherlands Antilles	11.5%
	4	Indonesia	7.7%
	5	Panama	7.7%
		Other	46.2%
		<i>Total</i>	100.0%
Refrigerated Cargo	1	Panama	24.5%
	2	Bahamas	15.2%
	3	Liberia	13.0%
	4	Malta	9.8%
	5	Cayman Islands	6.5%
		Other	31.0%
		<i>Total</i>	100.0%

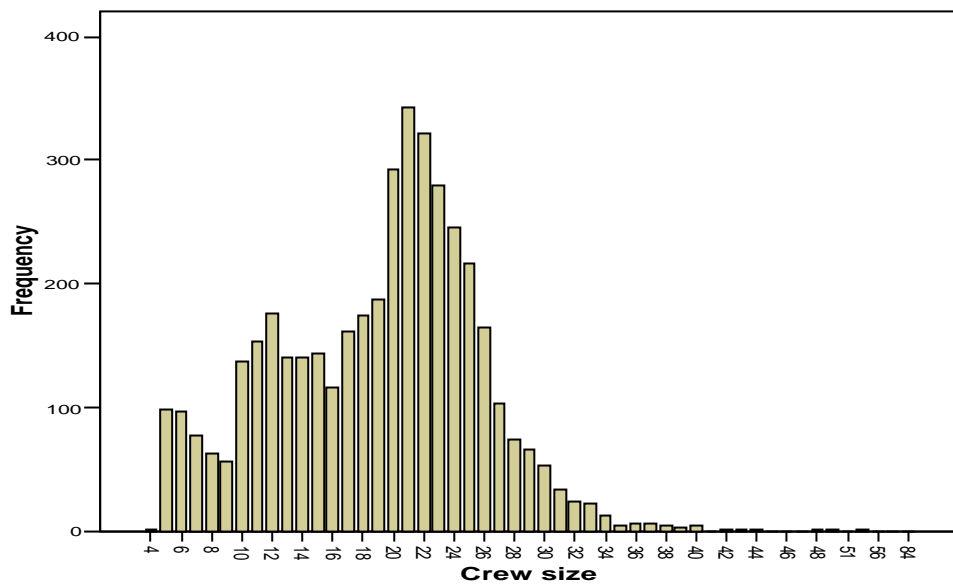
Table 4 (cont): Flag in Rank Order (Top 5) for Each Vessel Type

Liquid/ Gas Carrier	1	Panama	20.8%
	2	Norway (NIS)	11.6%
	3	Liberia	8.3%
	4	Italy	8.0%
	5	Netherlands	5.2%
		Other	46.1%
		<i>Total</i>	100.0%
Oil Tanker	1	Malta	15.3%
	2	Greece	10.5%
	3	Panama	10.3%
	4	Liberia	8.7%
	5	Cyprus	5.8%
		Other	49.4%
		<i>Total</i>	100.0%
Other Tanker	1	Netherlands	17.4%
	2	Denmark (DIS)	17.4%
	3	China	8.7%
	4	Georgia	4.3%
	5	Isle of Man	4.3%
		Other	47.8%
		<i>Total</i>	100.0%
Other	1	Netherlands	13.0%
	2	Bahamas	10.9%
	3	Panama	8.7%
	4	Russian	8.7%
	5	United Kingdom	8.7%
		Other	50.0%
		<i>Total</i>	100.0%

Crew Size

The mean crew size for the GLMS dataset was 19 (s.d.= 7.0), with a considerable range of from 4-84. However, the predominant crew size (mode) was 21. This is illustrated graphically, with the use of a histogram, in Figure 6. Two distinct peaks in the distribution of crew sizes can be seen, one at 12 and another at 22.

Figure 6: Crew Size



Seafarers

Rank

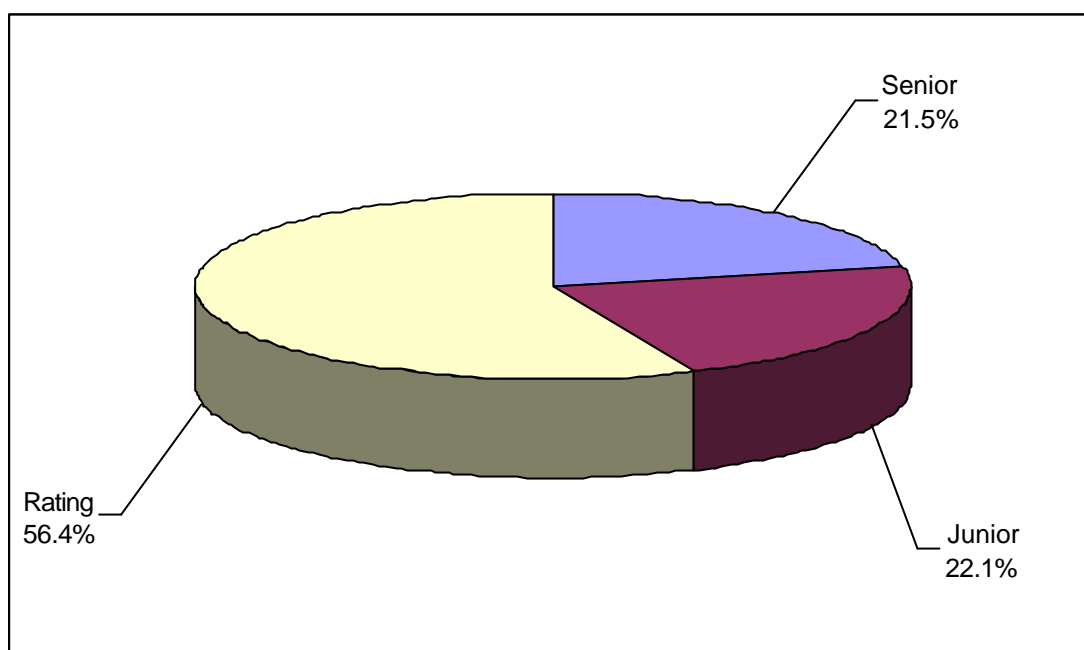
Across the sample there was a distribution of seafarers by rank as follows: 56% of the sample occupied ratings positions; 22% were junior officers and there were approximately the same number (marginally fewer) senior officers (see Table 5).

Table 5: Ranks Within the Sample (%)

	Percent
Senior	21.5%
Junior	22.1%
Rating	56.4%
<i>Total</i>	100.0%

The rank of seafarers is illustrated graphically in Figure 7.

Figure 7: Pie Chart showing Ranks



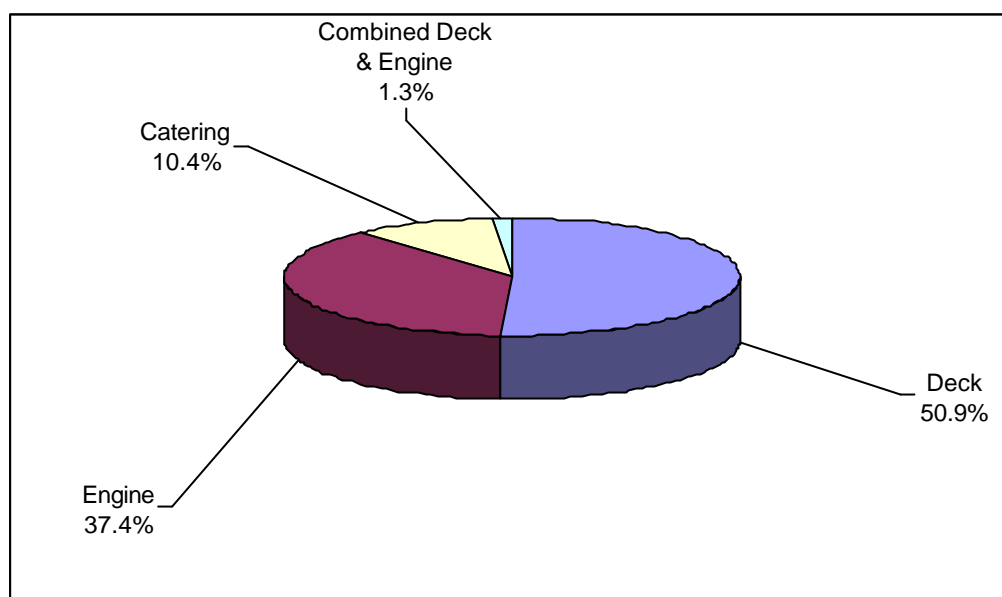
Department

Within the sample 51% of seafarers were classified as working in the deck department, 37% worked in the engine department and 10% worked in the galley or ‘catering’ department (see Table 6 and Figure 8).

Table 6: Department

Department	Percentage
Deck	50.9%
Engine	37.4%
Catering	10.4%
Combined Deck & Engine	1.3%
<i>Total</i>	100.0%

Figure 8: Pie Chart Showing Seafarers Department



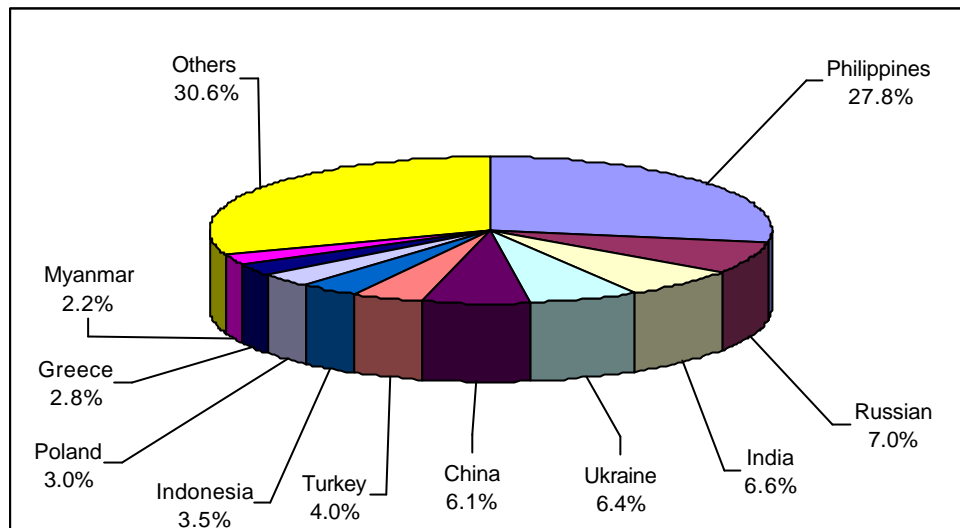
Nationality

As with previous years the Philippines was found to dominate the global seafarer labour market with 28% of the sample holding Filipino nationality. Russians, Indians, Ukrainians, and Chinese nationals all constituted a similar proportion of the sample (between 6 and 7 %) followed by Turkey, Indonesia, Poland, Greece and Myanmar in descending order (see Table 7). These ten nationalities constitute 70% of the total sample (see Figure 9).

Table 7: Top 10 Nationality of Seafarers

Rank Order	Nationality	Percent	Cumulative Percent
1	Philippines	27.8%	27.8%
2	Russian	7.0%	34.9%
3	India	6.6%	41.4%
4	Ukraine	6.4%	47.8%
5	China	6.1%	53.9%
6	Turkey	4.0%	58.0%
7	Indonesia	3.5%	61.4%
8	Poland	3.0%	64.4%
9	Greece	2.8%	67.2%
10	Myanmar	2.2%	69.4%
	Other (n=124)	30.6%	100.0%
	<i>Total</i>	<i>100.0%</i>	<i>----</i>

Figure 9: Pie Chart Showing the Top 10 Nationality of Seafarers



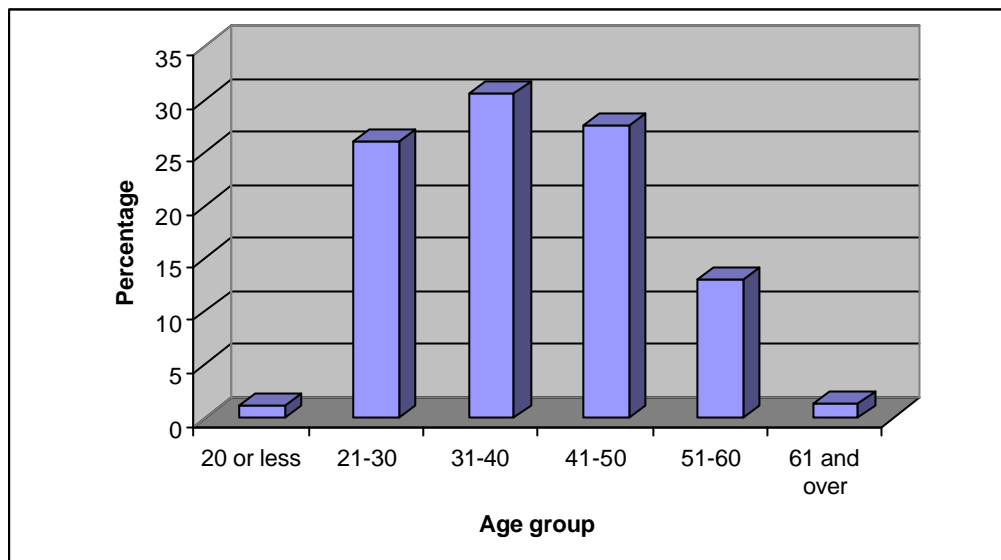
Age

The average age of the seafarers in the sample was 38 (s.d. 10.45). Each age cohort from 31-51 demonstrates attrition (less than 5% between 31 and 41 and about 14% between 41 and 51). However it is noteworthy that there are **more** seafarers in the 31-40 age category than there are in the 21-30 category. Whilst there is nothing conclusive that may be reported on the basis of these data they could be indicative of under-recruitment in the latter category and predictive of a future shortage of seafarers, most particularly amongst those groups that traditionally enter seafaring immediately post-compulsory education (generally officers). See Table 8 and Figure 10 for further details.

Table 8: Age of Seafarers (Grouped)

Age (Grouped)	Percentage	Cumulative Percent
20 or less	1.2%	1.2%
21-30	26.1%	27.4%
31-40	30.5%	57.9%
41-50	27.6%	85.5%
51-60	13.1%	98.6%
61 and over	1.4%	100.0%
<i>Total</i>	100.0%	----

Figure 10: Bar Graph Showing the Age of Seafarers (Grouped)



Profiles of Seafarers by Vessels and Roles

In the previous section a basic outline was given of the vessels and seafarers included in the GLMS dataset. This section presents further details relating to rank, department, and nationality in order to try and build up a picture of the global labour market for the world cargo fleet.

Nationality by Rank

Whilst seafarers from the Philippines dominate the labour market overall, their domination is less marked in relation to senior officer positions than others. They remain the largest nationality group amongst senior officers however nationalities are much more evenly distributed in the senior officer category, than they are in general. Filipinos constituting roughly 11% of senior officers are closely followed by Russians who account for almost 10% of senior officers. Ukrainian, Greek, and Indian officers account for approximately 6-7% of senior officers each, and Chinese, Polish, South Korean, German and Turkish seafarers are all represented at the level of around 4% (each) (see Table 9 and Figure 11). The top ten nationalities in the sample account for

just over 60% of the sample illustrating that there is a greater variety of nationalities represented at senior officer level than there is across the board.

Table 9: Top 10 Nationalities of Senior Officers

Rank Order	Nationality	Percent
1	Philippines	11.2%
2	Russian	9.8%
3	Ukraine	7.4%
4	Greece	6.2%
5	India	5.9%
6	China	4.7%
7	Poland	4.2%
8	Korea, South	4.2%
9	Germany	4.1%
10	Turkey	3.8%
-----	Other (n=87)	38.5%
	<i>Total</i>	<i>100.0%</i>

Amongst junior officers the domination of the labour market by Filipinos appears as a marked feature. 24% of junior officers in the sample were found to be of Filipino nationality and this proportion is considerably larger than that constituted by the second largest national group, Russians, who made up approximately 9% of the sample. Indian, Ukrainian, and Chinese nationals constitute between around 7 and 8% of the sample (each), with Polish, South Korean, Indonesian, and Romanian seafarers constituting smaller groups amongst the top ten nationalities of junior officer (see Table 10 and Figure 12). Other things being equal, this distribution of junior officers suggests that in the future Filipinos will constitute a much larger proportion of senior officers across the fleet. However, should there be any barriers to the transition of Filipino seafarers from junior officer to senior officer status, these figures could suggest that there may be problems in later years for companies wishing to recruit senior officers.

Table 10: Top 10 Nationalities of Junior Officers

Rank Order	Nationality	Percent
1	Philippines	24.2%
2	Russian	9.4%
3	India	7.8%
4	Ukraine	7.8%
5	China	6.8%
6	Greece	3.5%
7	Poland	3.2%
8	Korea, South	3.1%
9	Indonesia	2.9%
10	Romania	2.4%
-----	Other (n=87)	29.0%
	<i>Total</i>	<i>100.0%</i>

By far the largest group of ratings by nationality is Filipino. Filipino seafarers constitute more than a third of all ratings in our sample. Their domination of the ratings labour market is significant and all of the other nationalities, even in the top ten represented amongst ratings, can be considered to represent minor groupings by contrast (see Table 11 and Figure 13).

Table 11: Top 10 Nationalities of Ratings

Rank Order	Nationality	Percent
1	Philippines	36.7%
2	China	6.3%
3	Ukraine	5.9%
4	Russian	5.5%
5	India	5.2%
6	Turkey	4.4%
7	Indonesia	4.1%
8	Poland	2.7%
9	Myanmar	2.6%
10	Bulgaria	2.1%
-----	Other (n=106)	24.5%
	<i>Total</i>	<i>100.0%</i>

Figure 11: The Top 10 Nationalities of Senior Officers

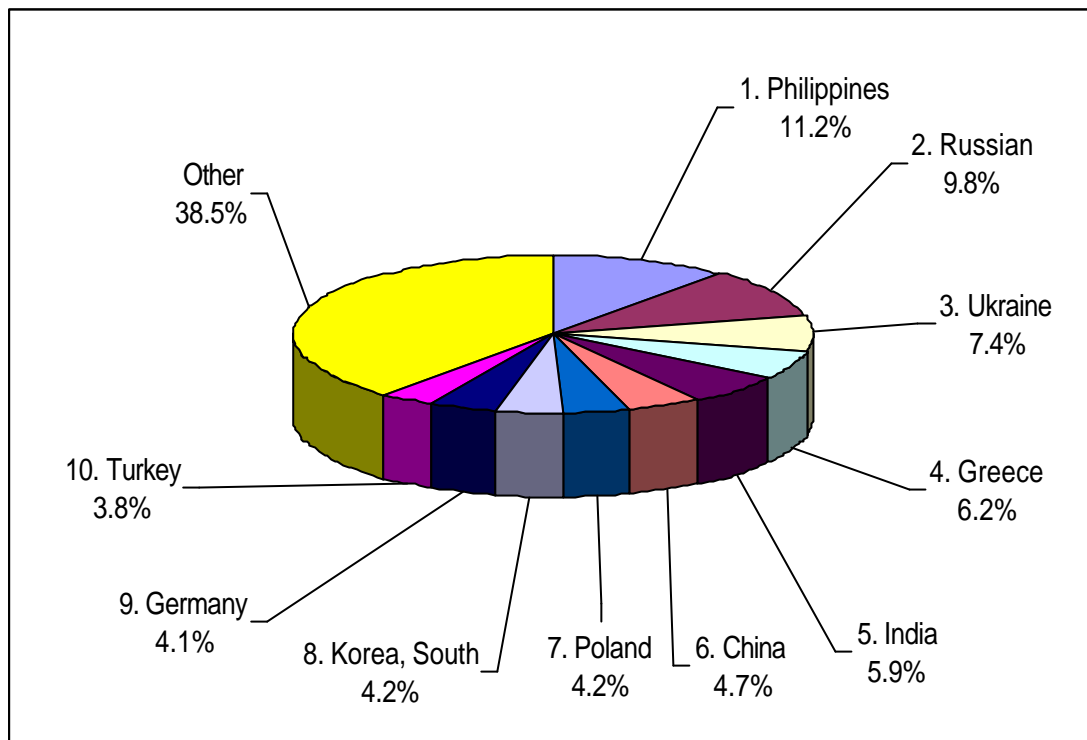


Figure 12: The Top 10 Nationalities of Junior Officers

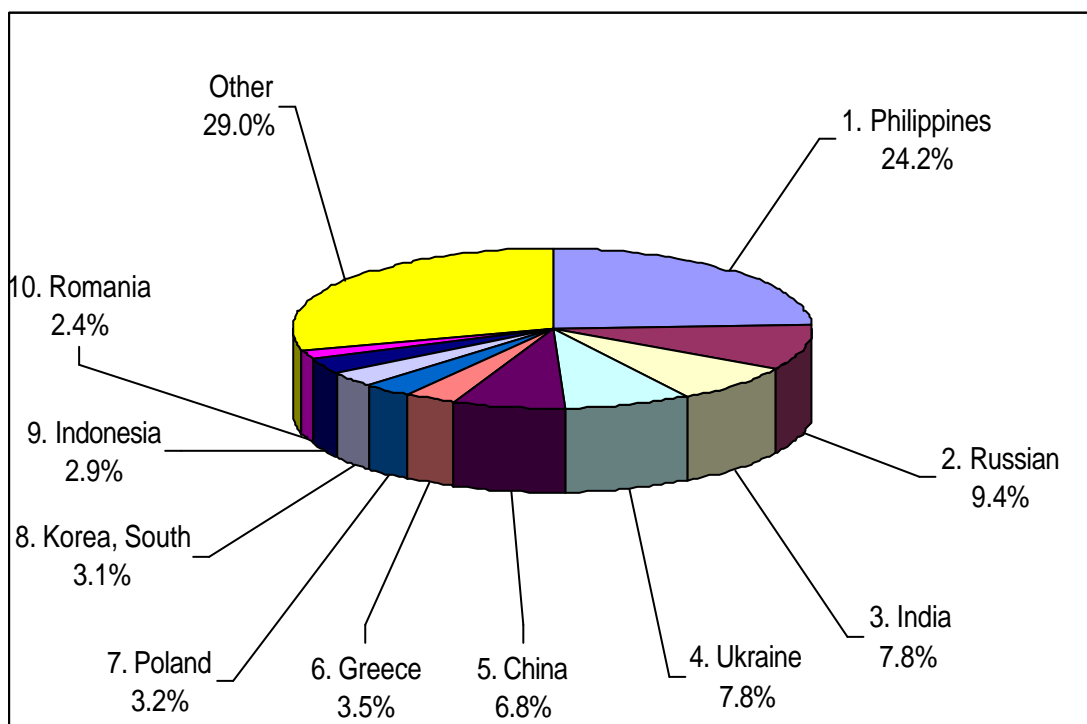
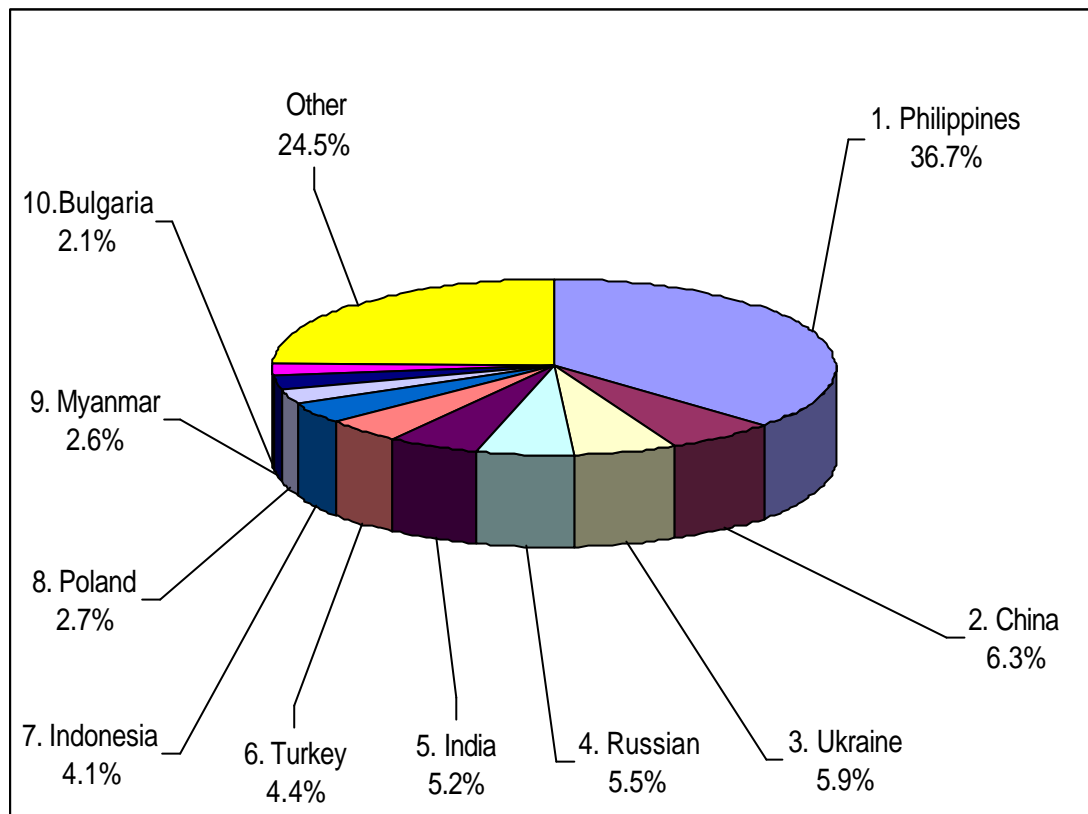


Figure 13: The Top 10 Nationalities of Ratings



Nationality by Department

Filipino seafarers were the most prevalent national group across all departments but were most dominant in relation to the catering, or ‘galley’ department (deck 29%, engine 26%, galley 37%). Whilst their order varied, the same four national groups occupied positions 2-5 in the rankings for all departments. These were Russia, Ukraine, India, and China. Whilst there was some consistency in the national make-up of each department, we nevertheless identified in each department one national group which uniquely appeared in that department’s top ten nationalities. Thus seafarers from Myanmar appeared in the top ten nationalities working in the deck department (but not in any other department), seafarers from Romania were only represented in the top ten nationalities in the engineering department, and seafarers from Taiwan were only represented in the top ten nationalities in the galley department (see Tables 12, 13, 14).

Table 12: Top 10 Nationalities in the Deck Department

Rank Order	Nationality	Percent
1	Philippines	29.0%
2	Russian	7.5%
3	China	6.1%
4	Ukraine	6.0%
5	India	5.5%
6	Indonesia	3.6%
7	Turkey	3.5%
8	Poland	3.0%
9	Greece	2.9%
10	Myanmar	2.3%
-----	Other (n=116)	30.6%
	<i>Total</i>	100.0%

Table 13: Top 10 Nationalities in the Engine Department

Rank Order	Nationality	Percent
1	Philippines	25.7%
2	Ukraine	7.5%
3	Russian	7.2%
4	India	6.8%
5	China	6.1%
6	Turkey	4.1%
7	Poland	3.2%
8	Indonesia	3.1%
9	Greece	2.9%
10	Romania	2.6%
-----	Other (n=105)	30.8%
	<i>Total</i>	100.0%

Table 14: Top 10 Nationalities in the Catering Department

Rank Order	Nationality	Percent
1	Philippines	36.8%
2	Russian	5.6%
3	India	5.5%
4	Ukraine	5.5%
5	China	5.2%
6	Indonesia	4.2%
7	Turkey	4.0%
8	Poland	2.6%
9	Taiwan	2.3%
10	Greece	2.2%
-----	Other (n=75)	26.0%
	<i>Total</i>	100.0%

Few seafarers worked in combined engine and deck departments, however of those who did Indians represented the largest group (19%) with Filipinos, Chinese, and Danish seafarers clustering in the same proportions and constituting around 10% of the sample each (see Table 15).

Table 15: Top 10 Nationalities in the Combined Deck and Engine Department

Rank Order	Nationality	Percent
1	India	19.1%
2	Philippines	10.6%
3	China	10.1%
4	Denmark	9.9%
5	Turkey	7.0%
6	Indonesia	5.4%
7	Russian	4.5%
8	Ukraine	4.2%
9	Latvia	3.9%
10	Poland	2.5%
-----	Other (n=44)	22.8%
	<i>Total</i>	100.0%

Nationality by Ship Type

In order to try and better identify trends in nationality patterns, ship types were categorised into three major groupings excluding a miscellaneous ‘other’ category². This demonstrated that whilst the main nationality groups (Philippines, China, India, Russia, Ukraine) were present in the top ten nationalities of almost all ship types (NB Ukrainians were not amongst the top ten national groups on tankers) there were some nationalities which appeared in relation to only one specific ship type, and who were obscured in the distribution of seafarers across all ships when undifferentiated by type (see Table 7 for comparison). Latvian seafarers, for example, were the fourth largest national grouping aboard tankers (see Table 18); German seafarers were the tenth largest national group in relation to general cargo/container vessels (see Table 17); and Croatian seafarers were the ninth largest group on bulk carriers (see Table 16).

² The categorisation is detailed in Appendix Two.

Table 16: Top 10 Nationalities on Bulk Carriers

Rank Order	Nationality	Percent
1	Philippines	30.5%
2	China	13.5%
3	India	10.0%
4	Ukraine	8.9%
5	Greece	5.6%
6	Turkey	4.8%
7	Bulgaria	3.9%
8	Russian	2.2%
9	Croatia	1.9%
10	Romania	1.7%
---	Other (n=75)	17.1%
	<i>Total</i>	<i>100.0%</i>

Table 17: Top 10 Nationalities on General Cargo/ Container Ships

Rank Order	Nationality	Percent
1	Philippines	23.9%
2	Russian	9.3%
3	Ukraine	8.0%
4	China	4.9%
5	India	4.8%
6	Turkey	4.5%
7	Indonesia	4.1%
8	Poland	4.0%
9	Myanmar	3.2%
10	Germany	2.2%
---	Other (n=102)	31.0%
	<i>Total</i>	<i>100.0%</i>

Table 18: Top 10 Nationalities on Tankers

Rank Order	Nationality	Percent
1	Philippines	33.0%
2	India	7.5%
3	Russian	6.1%
4	Latvia	4.2%
5	Greece	3.9%
6	Indonesia	3.8%
7	Italy	3.6%
8	China	3.3%
9	Korea, South	2.9%
10	Turkey	2.8%
	Other (n=87)	28.9%
---	<i>Total</i>	<i>100.0%</i>

Nationality by Rank and Ship Type

Aboard bulk carriers and tankers Filipinos occupied the position of the largest national grouping of senior officers (see Table 19 and 21). However, they were less significant as a national group (occupying third place in the rank order) when the senior officers of general cargo/container vessels were considered (see Table 20). Bulk carriers and tankers also shared other crewing characteristics with regard to the composition of the senior officer cohort, with India and Greece appearing in the top ten national groupings for both ship types (but not aboard general cargo/container vessels). Aboard container vessels Polish and German senior officers were prevalent amongst senior officers but they did not constitute one of the top five national groups on either tankers or bulk carriers. Similarly South Korean seafarers uniquely constituted one of the largest five national groups of senior officers aboard tankers but did not appear amongst the top five groups of senior officers on bulk carriers or general cargo/container vessels. Chinese seafarers were not one of the five largest national groups for any rank, senior officer, junior officer, or rating, aboard tankers.

A more consistent pattern was identified for junior officers when ship type and rank were considered. Filipinos constituted the largest national grouping aboard all the three vessel categories although they were more dominant in relation to bulk carriers

and tankers. Indian junior officers also appeared in the top five rankings by nationality for all three categories of vessel. However, Latvian junior officers were uniquely concentrated aboard tankers (see Table 21) and, as for senior officers, Russians did not constitute one of the five national groups of junior officers aboard bulk carriers (although they did on tankers and general cargo/container vessels). As amongst senior officers, Greek seafarers did not constitute one of the top five largest groups of junior officers aboard general cargo/container vessels (Table 20) but they were ranked amongst the top five on bulk carriers and tankers (Tables 19 and 21).

When the distribution of ratings by nationality is considered across ship types, Filipinos are found to be strongly dominant and appear in the greatest proportion of any nationality aboard bulk carriers, general cargo/container vessels and tankers. Ratings from Ukraine, China, and Turkey are represented amongst the five largest national groups on both bulk carriers and general cargo/container vessels, whilst Latvians and Indonesians only appear amongst the five largest national groups of ratings on tankers (see Table 21).

Table 19: Top 5 Nationalities by Rank for Bulk Carriers

Senior Officers		Junior Officers		Ratings	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Philippines	18.9%	Philippines	28.3%	Philippines	35.9%
Greece	15.6%	China	14.5%	China	13.6%
China	11.9%	Ukraine	11.0%	India	8.5%
Ukraine	9.5%	India	10.5%	Ukraine	8.4%
India	9.5%	Greece	6.0%	Turkey	5.1%
Other (n=56)	34.6%	Other (n=53)	29.8%	Other (n=63)	28.5%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

Table 20: Top 5 Nationalities by Rank for General Cargo/ Container Ships

Senior Officers		Junior Officers		Ratings	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Russian	13.4%	Philippines	20.4%	Philippines	32.9%
Ukraine	9.6%	Russian	12.6%	Ukraine	7.3%
Philippines	8.4%	Ukraine	9.5%	Russian	7.0%
Germany	6.8%	India	6.1%	Turkey	5.1%
Poland	5.6%	China	5.6%	China	4.9%
Other (n=83)	56.2%	Other (n=76)	45.7%	Other (n=90)	42.7%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

Table 21: Top 5 Nationalities by Rank for Tankers

Senior Officers		Junior Officers		Ratings	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Philippines	11.6%	Philippines	27.9%	Philippines	44.0%
Greece	8.7%	India	9.2%	India	6.0%
Russian	7.3%	Russian	8.3%	Russian	5.4%
India	6.9%	Greece	5.2%	Indonesia	4.5%
Korea, South	6.4%	Latvia	4.2%	Latvia	4.0%
Other (n=63)	59.1%	Other (n=67)	45.1%	Other (n=71)	36.1%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

Nationality by Department and Ship Type

For each category of ship there is considerable consistency in the make-up of crews across departments in terms of nationality. Aboard bulk carriers the top five nationalities are the same across all departments and the top two nationalities appear in the same rank order (first and second) across all three main departments (Filipino and Chinese). Aboard general cargo/container ships and tankers there is great consistency across departments with only one nationality (in the top five) found in only one department: on cargo/container vessels Turkish seafarers are only found in the galley/catering department; aboard tankers Indonesians are only represented amongst the top five nationalities in the galley/catering department. This indicates that companies are not generally specialising in relation to the recruitment of deck or engine personnel but are tending to select personnel from several major supply

sources. It may also indicate that in relation to the galley, there may be some specialisation occurring, with Turkish and Indonesian seafarers being recruited to catering departments whilst not being well represented across others. It is not immediately obvious why this is the case. It is also worth noting that Chinese seafarers were not amongst the top five nationalities in any of the three main departments on tankers. This confirms that not only are Chinese seafarers not present in numbers aboard tankers (see Tables 19, 20, 21) but that there is no departmental specialisation in relation to the Chinese labour market which might have been obscured when looking at nationality and vessel type alone.

Table 22: Top 5 Nationalities by Department for Bulk Carriers

Rank Order	Deck		Engine		Catering	
	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
1	Philippines	32.6%	Philippines	28.7%	Philippines	34.8%
2	China	14.0%	China	12.9%	China	12.8%
3	India	8.9%	Ukraine	10.6%	India	9.2%
4	Ukraine	8.3%	India	9.4%	Ukraine	8.1%
5	Greece	6.1%	Greece	5.2%	Greece	4.9%
---	Other (n=72)	30.2%	Other (n=67)	33.1%	Other (n=40)	30.2%
---	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>

Table 23: Top 5 Nationalities by Department for General Cargo/ Container Ships

Rank Order	Deck		Engine		Catering	
	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
1	Philippines	25.1%	Philippines	22.1%	Philippines	32.0%
2	Russian	10.1%	Russian	9.4%	Russian	7.3%
3	Ukraine	7.8%	Ukraine	9.1%	Ukraine	6.8%
4	China	4.8%	India	5.4%	Indonesia	4.7%
5	Indonesia	4.3%	China	4.8%	Turkey	4.7%
---	Other (n=99)	47.9%	Other (n=90)	49.1%	Other (n=66)	44.5%
---	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>

Table 24: Top 5 Nationalities by Department for Tankers

Rank Order	Deck		Engine		Catering	
	Nationality	Percent	Nationality	Percent	Nationality	Percent
1	Philippines	33.6%	Philippines	30.0%	Philippines	46.1%
2	India	6.5%	India	7.5%	India	6.5%
3	Russian	6.4%	Russian	6.6%	Russian	5.0%
4	Greece	4.1%	Latvia	4.7%	Indonesia	4.7%
5	Latvia	4.0%	Greece	4.1%	Latvia	3.5%
---	Other (n=84)	45.4%	Other (n=76)	47.1%	Other (n=55)	34.1%
---	Total	100.0%	Total	100.0%	Total	100.0%

Nationality by Flag

There are interesting variations in crewing practices in relation to nationality aboard vessels registered with different flag states (see Table 25). Whereas the Philippines is the predominant nationality in relation to eight of the ten flags examined, Filipino seafarers are not the most prevalent aboard Greek and Hong Kong-flagged vessels. In each case nationals (Greeks and Chinese) are favoured over Filipinos. Filipinos make up a significant proportion of seafarers (ranked second) aboard Greek vessels, but are less prevalent (only 13% of crew) on Hong Kong-flagged ships. Hong Kong-flagged vessels employ significant numbers of Indian seafarers in addition to their Chinese personnel. In total Indian seafarers are found in numbers aboard the vessels flagged with seven of the ten flag states considered here. However, they do not appear in the top five nationalities found on Maltese, Greek, and Cypriot, ships. On these ships, there appears to be a stronger East European influence with Ukraine, Russia, Poland, Latvia, and Romania appearing in the top five labour supply countries. Just as the European-based flags appear to have a stronger preference for European seafarers, so too do some other flags demonstrate that there may be some regional preferences at work in relation to flag and crew selection. Hong Kong-flagged vessels do not have any European groups represented in the top five most prevalent nationalities found on board and for Singapore-flagged ships the picture is the same with Asians dominating. By contrast vessels flagged with the Marshall Islands, Liberia, and Bahamas, employ a mixture of seafarers from East and West with Asian and East European seafarers appearing in the top five most common nationalities on board.

Table 25: Top 5 Nationalities by Flag of Vessel (Top 10 Flags by dwt shown in rank order)

1. Panama		2. Liberia		3. Malta		4. Greece		5. Cyprus	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Philippines	39.2%	Philippines	32.7%	Philippines	27.9%	Greece	48.8%	Philippines	41.3%
China	11.3%	Russian	9.9%	Ukraine	19.0%	Philippines	39.3%	Ukraine	11.1%
India	9.8%	India	8.4%	Russian	11.1%	Romania	2.1%	Russian	8.4%
Korea, South	9.3%	China	5.8%	Turkey	7.2%	Ukraine	1.4%	Poland	6.6%
Taiwan	4.3%	Latvia	5.7%	Romania	6.2%	Honduras	1.3%	Latvia	6.2%
Other (n=70)	26.3%	Other (n=65)	37.6%	Other (n=46)	28.6%	Other (n=41)	7.0%	Other (n=43)	26.5%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

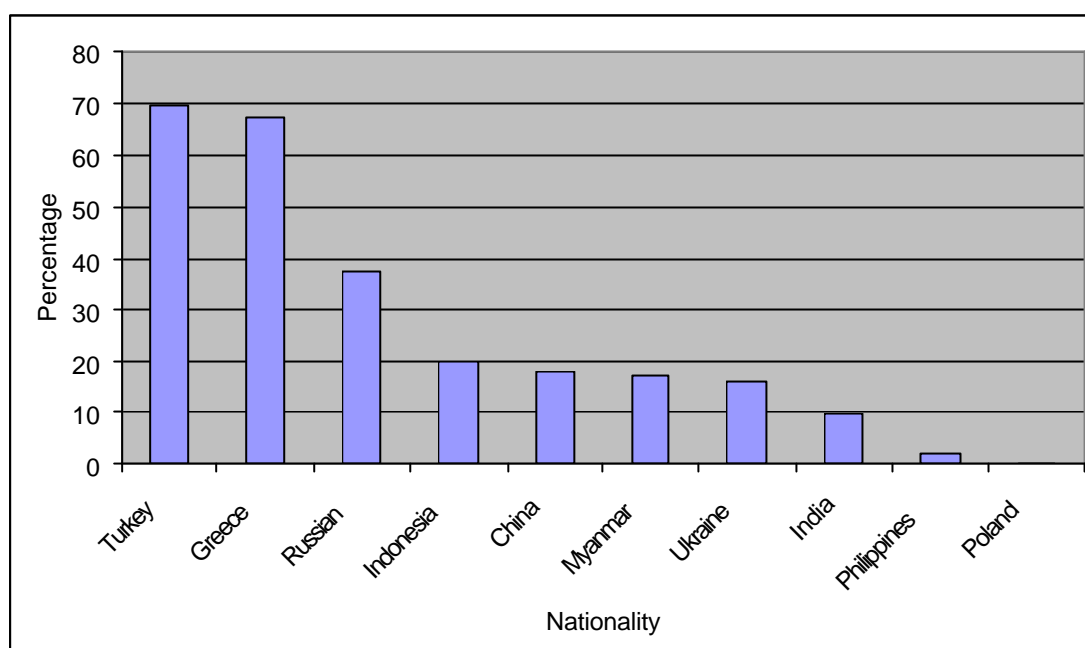
6. Bahamas		7. Norway (NIS)		8. Hong Kong		9. Marshal Islands		10. Singapore	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Philippines	34.1%	Philippines	52.3%	China	54.3%	Philippines	35.0%	Philippines	33.1%
Poland	9.9%	India	18.2%	India	16.6%	Poland	7.9%	India	15.7%
Ukraine	8.8%	Norway	10.4%	Philippines	12.7%	India	7.7%	Indonesia	11.1%
India	8.0%	Poland	5.2%	Taiwan	2.0%	Myanmar	7.0%	China	9.5%
Russian	5.4%	Latvia	3.6%	Indonesia	1.8%	Romania	6.2%	Myanmar	6.0%
Other (n=58)	33.9%	Other (n=28)	10.4%	Other (n=24)	12.5%	Other (n=30)	36.3%	Other (n=23)	24.7%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

In order to consider the prevalence of preference for own nationals we undertook an analysis of numbers of seafarers working on their ‘own’ nationally flagged ships (see Table 26 and Figure 14). Of the top ten nationalities found in our sample Turkish and Greek seafarers were the most likely to be working aboard their own nationally flagged vessels (70% and 67% respectively). Nearly 40% of Russian seafarers were found to work aboard Russian vessels whilst similar proportions of Chinese, Myanmar, and Ukrainian seafarers worked upon ‘their own’ nationally flagged ships (18, 17, 16% respectively). Filipinos and Poles were the least likely to be working on ships carrying a flag of the same nationality. A full breakdown of all crew nationalities for all flags is given in Appendix 3.

Table 26: The Percentage of Seafarers Working on Their Own Nationality Vessels (Top 10 nationalities)

Nationality	<i>National Flag Percent</i>
Turkey	69.8%
Greece	67.1%
Russian	37.3%
Indonesia	19.7%
China	17.8%
Myanmar	17.3%
Ukraine	16.0%
India	9.7%
Philippines	2.1%
Poland	0.2%

Figure 14: For each of the Top 10 Nationalities the Percentage of Seafarers Working On Their National Flagged Vessels



Nationality by Rank and Flag

When we consider rank and flag we find that aboard Liberian-flagged vessels Filipinos are not amongst the top five nationalities at senior officer level. They are also significantly under-represented (given their overall dominance of the labour market) amongst senior officers on Greek-flagged vessels (0.4%). However, it is clear that Greek vessels remain predominantly populated by Greek officers at the senior level in line with flag state restrictions on crewing³. Filipinos are present in smaller proportions than expected amongst senior officers aboard Maltese (14%) and Cypriot (17%) ships. By contrast aboard Panamanian flagged vessels, where South Korean senior officers are concentrated (20%), we find Filipino officers present in significant numbers and they constitute the biggest single group of senior officers by nationality (22%).

³ Greek vessels are obliged to carry Greek officers in specific ranks (Master and Mate) and to carry a specified number of Greek officers and ratings in relation to tonnage-linked manning scales on ocean going Greek-flagged ships (Hill Dickinson 2008).

European officers are most likely to be present in significant numbers aboard Liberian, Greek, Cypriot, and Maltese vessels. Aboard Liberian vessels Indian seniors are also found and Cypriot registered ships carry Filipino seniors alongside those from Greece, Ukraine, Poland and Russia. Panamanian vessels in contrast do not have any European nations appearing in the top five nationalities of seniors. Alongside Filipinos and South Koreans they also carry Indian seniors and uniquely, of the five top registers (by tonnage), they also employ significant proportions of Chinese and Taiwanese seafarers (9% and 7% respectively).

The picture alters somewhat when junior officers are considered and here we see Filipino seafarers in much greater numbers. Filipinos are the largest group of junior officers found aboard Cypriot, Maltese, Liberian and Panamanian ships. Only aboard Greek flagged vessels do they appear to be under-represented, constituting only 16% of junior officers, most of whom (70%) are Greek. This pattern suggests that, all other things remaining equal, we will see a considerable shift away from the employment of European senior officers aboard the world fleet and towards the employment of senior Filipino officers in the next five to ten years. This is already true of the Panamanian fleet where the distribution of junior officers by nationality is relatively closely matched to that of senior officers although amongst junior officers there are more Filipinos found than amongst seniors, and fewer South Koreans than amongst seniors. This implies that the domination of senior officer positions by Filipinos is likely to strengthen.

Filipinos constitute almost half of the ratings aboard all of the vessels registered with the top five flags with the exception of Malta. Aboard Maltese vessels Ukrainian ratings seem relatively common and Filipinos only make up just over a third of all ratings on board.

Table 27: The Top 5 Nationalities Working on Panamanian Flagged Vessels Split by Rank

Senior		Junior		Rating	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Philippines	22.2%	Philippines	34.9%	Philippines	48.1%
Korea, South	20.2%	Korea, South	12.6%	China	12.5%
India	11.6%	India	11.9%	India	6.7%
China	8.7%	China	10.9%	Korea, South	4.6%
Taiwan	6.7%	Taiwan	4.4%	Indonesia	4.5%
Other (n=53)	30.6%	Other (n=41)	25.3%	Other (n=48)	23.6%
<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>

Table 28: The Top 5 Nationalities Working on Liberian Flagged Vessels Split by Rank

Senior		Junior		Rating	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Germany	13.5%	Philippines	26.9%	Philippines	43.8%
Russian	12.1%	Russian	14.2%	Russian	8.2%
Poland	9.3%	India	10.8%	India	6.5%
India	8.8%	China	7.3%	Latvia	5.9%
Croatia	8.2%	Latvia	5.0%	Myanmar	5.9%
Other (n=41)	48.1%	Other (n=37)	35.8%	Other (n=41)	29.7%
<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>

Table 29: The Top 5 Nationalities Working on Maltese Flagged Vessels Split by Rank

Senior		Junior		Rating	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Ukraine	21.8%	Philippines	23.9%	Philippines	33.5%
Russian	16.5%	Ukraine	22.9%	Ukraine	17.3%
Philippines	13.5%	Russian	13.2%	Russian	9.0%
Greece	10.4%	Romania	6.0%	Turkey	7.8%
Turkey	7.1%	Bulgaria	5.9%	Romania	6.9%
Other (n=27)	30.7%	Other (n=25)	28.2%	Other (n=34)	25.3%
<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>	<i>Total</i>	<i>100.0%</i>

Table 30: The Top 5 Nationalities Working on Greek Flagged Vessels Split by Rank

Senior		Junior		Rating	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Greece	97.0%	Greece	70.3%	Philippines	60.6%
Netherlands	0.6%	Philippines	15.5%	Greece	25.2%
Norway	0.4%	Ukraine	3.9%	Romania	2.9%
Philippines	0.4%	Bulgaria	2.3%	Honduras	2.1%
Ukraine	0.4%	Romania	2.2%	Indonesia	1.8%
Other (n=6)	1.3%	Other (n=17)	5.9%	Other (n=27)	7.3%
<i>Total</i>	100%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

Table 31: The Top 5 Nationalities Working on Cyprus Flagged Vessels Split by Rank

Senior		Junior		Rating	
<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>	<i>Nationality</i>	<i>Percent</i>
Greece	17.7%	Philippines	41.1%	Philippines	50.2%
Philippines	17.3%	Ukraine	14.2%	Ukraine	10.0%
Ukraine	12.9%	Russian	10.9%	Russian	6.9%
Poland	12.0%	Poland	5.4%	Latvia	6.0%
Russian	11.6%	India	5.3%	Poland	5.7%
Other (n=28)	28.7%	Other (n=24)	23.1%	Other (n=29)	21.1%
<i>Total</i>	100.0%	<i>Total</i>	100.0%	<i>Total</i>	100.0%

Age by Nationality⁴

When we consider the age of the top ten nationalities found in our sample we find that European seafarers (Greeks, Poles, Russians, and Ukrainians) tend to be of a higher average age than non-Europeans (Filipinos, Indonesians, Chinese, Indians, Myanmar nationals and Turks). Table 32 shows the mean ages and their distributions for the top ten nationalities of seafarers found in the GLMS database.

⁴ In this sections age has been cropped by removing ages below 16 and above 80 in order to remove outliers which may skew the distributions.

Table 32: Descriptive of Age for the Top 10 Nationalities

Nationality	Mean	Std. Deviation	Minimum	Maximum
Greece	44.5	11.3	16	73
Poland	43.5	10.1	18	67
Russian	39.7	9.6	17	71
Ukraine	39.4	10.4	16	75
Philippines	37.3	8.5	17	73
Indonesia	36.8	9.5	18	64
China	36.4	9.7	16	71
India	36.3	10.4	18	62
Myanmar	36.3	9.3	17	64
Turkey	34.8	10.1	18	72

Age by Rank

The average age of senior officers is higher than that of junior officers by some margin (eight years and seven months). This is to be expected given the anticipated progression of (young) seafarer cadets from junior to senior officer status over time and with experience and further qualification. The difference in the average age of ratings as compared with the average age of senior officers may relate to the nature of the work involved (ratings may be expected to do far more strenuous physical work than senior officers for example, and may leave the workforce with the onset of age related conditions such as arthritis and occupational injuries associated with repeated heavy work). Table 33 shows the mean ages of seafarers by rank.

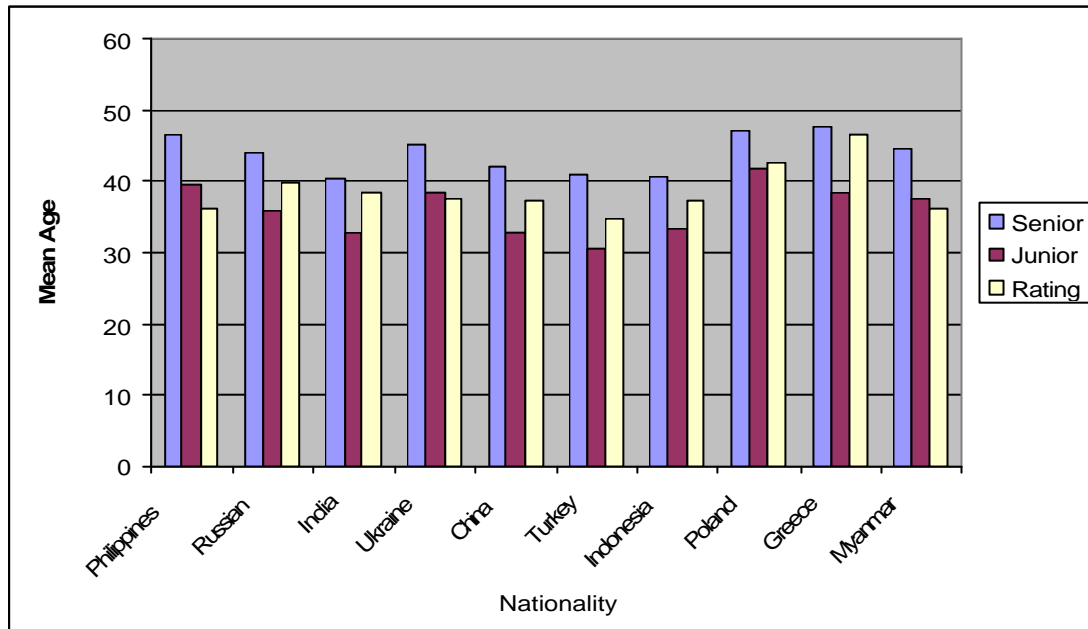
Table 33: Age of Seafarers by Rank

Rank	Frequency	Mean	Std. Deviation
Senior	16394	44.9	9.1
Junior	16901	36.3	9.5
Rating	43030	37.7	9.7

Age by Rank and Nationality

This pattern of age and rank was found for most nationalities of seafarer where in most cases senior officers were of the highest average age, junior officers were of the lowest average age and the average age of ratings fell between the two. However for three of the top ten nationalities the distribution was not observed. It was not found in the case of seafarers from the Philippines, Ukraine, and Myanmar. In these three cases senior officers had the highest average age, junior officers had the next highest average age, and ratings had the lowest average age (see Figure 15).

Figure 15: Mean Ages by Rank for the Top 10 Nationalities



Crew Size by Ship Type

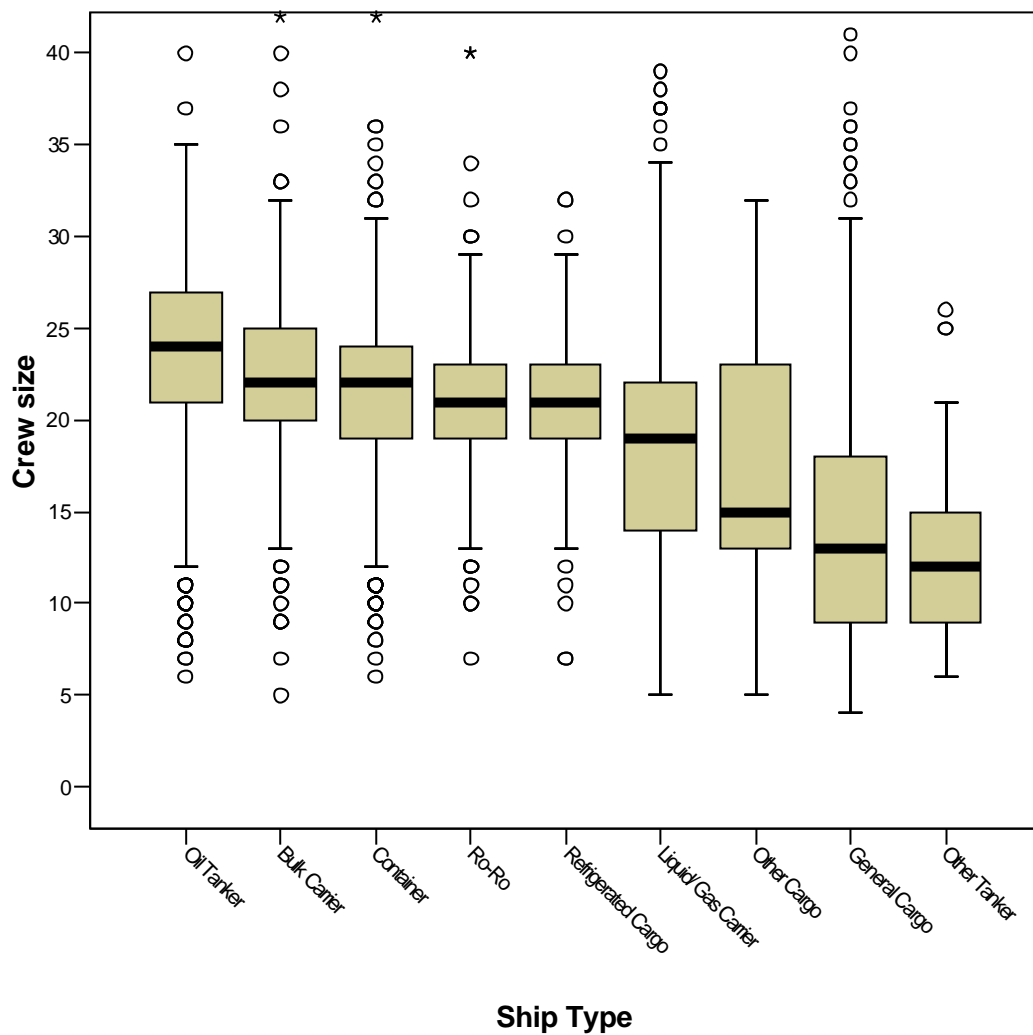
Crew sizes vary considerably with the highest variation found amongst general cargo vessels (standard deviation 6.8) and tankers (s.d. 6.5) and the most consistency in crew size found aboard reefers (s.d. 3.8) and bulk carriers (s.d. 4.3). The biggest average crew size (23.1) was found for tankers and the smallest crews, on average, were found aboard general cargo vessels (13.7) and 'other tankers' (13.3). See Table 34 and Figure 16 which show the mean crew sizes for each vessel type.

Table 34: Mean Crew Size by Vessel

Ship type	Mean	Std. Deviation	Minimum	Maximum
Oil Tanker	23.1	6.5	6	55
Bulk Carrier	22.7	4.3	5	48
Container	21.1	4.9	6	49
Ro-Ro	21.1	5.0	7	40
Refrigerated Cargo	20.8	3.8	7	32
Liquid/ Gas Carrier	18.9	6.3	5	44
Other Cargo	17.2	6.4	5	32
General Cargo	13.7	6.8	4	57
Other Tanker	13.3	6.2	6	26

This is represented in Figure 16, where the dark bar on each box plot represents the mean, and the upper and lower points of each box represent the standard deviation.

Figure 16: Crew Size by Ship Type



Crew Size by dwt

To consider vessel type without taking tonnage into account is likely to be misleading as some categories of ship type may contain much higher proportions of small ships, which may require smaller crews than others, or they may be engaged in more labour intensive activities than others. When crew size is considered in relation to deadweight tonnage a clear size effect can be demonstrated (see Table 35), with crew size increasing on average with increase in size⁵ (see Table 35, Figure 17). Statistical tests further confirm this relationship, as a strongly significant positive correlation is found between crew size and dwt [$r(4238) = .456, p=000$]. This indicates clearly that

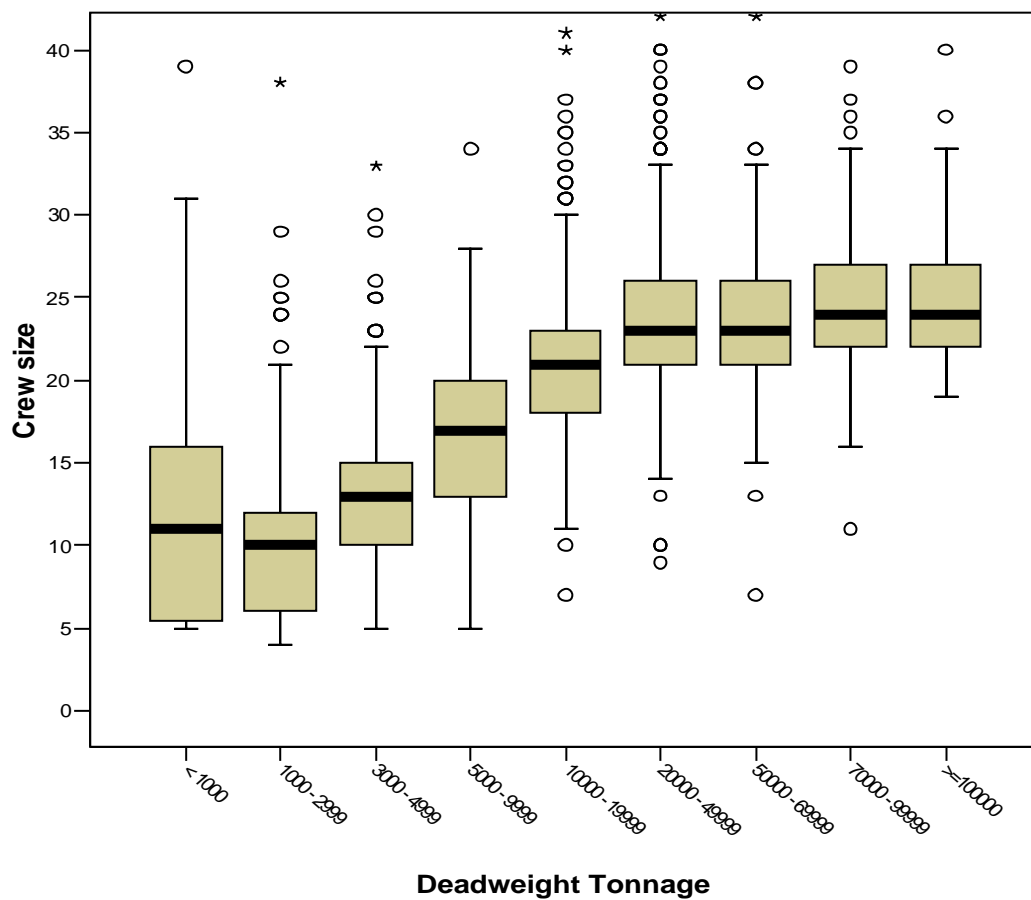
⁵ NB we have not included vessels under 1000 dwt as we had insufficient numbers of these in the sample.

vessel and ship type need to be combined in order to properly understand the relationship between vessel type and crew size and we have previously made an effort to undertake this comparison and to further consider the impact of flag (see Winchester, Sampson, Shelly 2006).

Table 35: Mean Crew Size by dwt (Grouped)

dwt Group	Mean	Std. Deviation	Minimum	Maximum
1000 - 2999	10.0	4.8	4	51
3000 - 4999	12.8	4.0	5	33
5000 - 9999	16.8	4.6	5	49
10000 - 19999	21.3	5.8	7	84
20000 - 49999	23.5	4.3	9	55
50000 - 69999	23.6	4.4	7	46
70000 - 99999	24.4	4.0	11	39
>=100000	25.3	4.2	19	48

Figure 17: Crew Size by dwt



Crew Size by Flag

Crew size appears to be influenced by flag, with Greek flagged vessels generally having the largest crews (mean crew size 23), and Antigua and Barbuda flagged vessels generally having the smallest crews (mean crew size 11). A clear difference can be seen between the Russian, Netherlands, and Antigua and Barbuda flagged vessels, which tend to have smaller crews than the other flagged vessels. In fact when tested this difference is found to be statistically significant ($F=96.995$, $d.f.=10$, $p=.000$). Flag type, ship type, ship size and crew size are considered in considerable detail in an earlier SIRC publication (Winchester, Sampson, Shelly 2006).

Table 36 shows the mean crew sizes for the top 10 flag⁶.

Table 36: Mean Crew Size by Flag

Flag	Frequency	Mean	Std. Deviation	Minimum	Maximum
Greece	134	23.0	4.5	7	32
Liberia	303	22.5	4.5	8	39
Norway (NIS)	141	21.4	7.6	5	38
Panama	665	21.1	4.2	7	51
Malta	313	20.9	5.8	6	37
Bahamas	175	20.6	8.9	5	84
Cyprus	200	20.1	6.5	5	32
Russian	151	14.4	5.0	9	39
Netherlands	184	11.2	6.8	5	33
Antigua and Barbuda	189	10.8	5.0	4	23

⁶ In this case the top 10 flags are defined by frequency, not by dwt (as in the rest of the report), as a relationship has been found between dwt and crew size, which may mask the influence of flag on crew size.

Conclusions

Within the GLMS dataset Filipino seafarers were found to dominate the global labour market for seafarers constituting almost a third of the total number of seafarers in the sample. Seafarers from Eastern Europe, from Russia, from India, and from relatively new labour supply countries such as Myanmar were also found amongst the top ten labour supply countries although their share of the labour market remains relatively insignificant when compared with the Philippines.

However Filipinos were less dominant in relation to the labour market for senior officers than in relation to that for junior officers or ratings. The labour market for senior officers was the most diverse of the three rank categories and Filipinos only constituted 11% of the total numbers of senior officers in the sample, with Russians, Ukrainians, Greeks, Indians, Chinese, Polish, South Korean, German and Turkish seafarers all maintaining a share. Amongst junior officers the position of Filipinos in the labour market strengthened (relative to seniors) and they made up almost a quarter of the junior officers in the sample. However, it was when ratings were considered that the real strength of the grasp of the Philippines on the global seafarer labour market is revealed, with 37% of the ratings in the sample originating from the Philippines.

National specialisation with regard to department was not identified as a strong feature of the labour market in this study. Some specialisation was noted within the galley department but this was limited and seemed to involve a degree of concentration amongst Turkish and Indonesian seafarers on some vessels. Specialisation by ship type was also not found to be a very strong feature, however, it was noted that Chinese seafarers were not amongst the top five nationalities in any of the three main departments on tankers⁷ where Latvian seafarers maintained a stronger presence than aboard other vessel types. Additionally German seafarers were found amongst the top ten nationalities aboard general cargo/container vessels, and Croatians were the ninth largest group of seafarers aboard bulk carriers, despite

⁷ Chinese seafarers had the fifth largest nationality group in the sample overall (see Table 8).

neither national group appearing amongst the top ten sources of labour overall (see Table 7).

As might be expected, given that some flags retain crewing requirements with regard to nationality, flag did impact upon crew composition. In contrast with the ‘norm’ Filipino seafarers were not the most prevalent national group aboard vessels flagged with two registers: Greece and Hong Kong. Aboard Maltese, Greek, and Cypriot flagged vessels Russian and East European (Polish, Ukrainian) seafarers were more commonly concentrated than on other ships. Indian seafarers did not appear in the top five nationality groups of vessels carrying these same flags (i.e. Maltese, Greek, Cypriot) in contrast with those flagged with other registers. Whilst Europeans were concentrated aboard some European-flagged vessels they were notably absent from Hong Kong-flagged ships which did not have any European national groupings represented in the top five nationalities found on board. This pattern was repeated for Singapore-flagged ships where, as with the Hong Kong fleet, most seafarers were found to originate from Asia.

In relation to rank and flag there were some interesting variations in crewing patterns. Most notably, Greek officers were concentrated aboard Greek vessels and Filipino senior officers were present in smaller numbers than expected aboard Maltese and Cypriot ships. Similarly, Filipino senior officers did not constitute one of the five largest national groups of senior officers aboard Liberian flagged vessels.

European seafarers tended to be older, on average, than non-Europeans, and as would be expected, senior officers were, on average, older than junior officers, and ratings were younger than senior officers (but older, on average, than junior officers).

A clear size effect was demonstrated when considering crew size by ship size (dwt) with a positive correlation found between ship size and crew size (i.e. the bigger the ship the bigger the average crew size). There also seemed to be an independent flag effect in relation to crew size with Greek vessels carrying larger than average crews and Antigua and Barbuda, Netherlands and Russian vessels carrying smaller crews than found aboard other vessels.

References

Hill Dickinson (2008) '*International Ship Registration Requirements*' on line www.hilldickinson.com/downloadfile.aspx?10=185 accessed 19/2/08.

Winchester, N., Sampson, H., Shelly, T. (2006) *An Analysis of Crewing Levels: Findings from the SIRC Global Labour Market Study*, SIRC: Cardiff University, ISBN: 1-900174-27-8.

APPENDIX 1

Vessel Type Recoding for GLMS database Comparison to Other Sources

GLMS Database			WFS Data		GLMS	WFS	GLMS	WFS
<i>Main type categories</i>	<i>Type</i>	<i>Frequency</i>	<i>Type</i>	<i>Frequency</i>	<i>Totals</i>	<i>Totals</i>	<i>Percent</i>	<i>Percent</i>
Bulk Carriers	Bulk / Oil Carrier	18	Bulk / Oil Carrier	174	724	6500	17.3%	14.9%
	Bulk Carrier	660						
	Cement Carrier	10						
	Ore / Oil Carrier	3						
	Ore Carrier	13						
	Self-Discharging Bulk Carrier	8	Self-Discharging Bulk Carrier	168				
	Wood Chips Carrier	11						
	Stone Carrier	1						
			Bulk Dry	5,046				
			Other Bulk Dry	1,112				
Ro-Ro	Container Ro-Ro Cargo Ship	1			145	4,658	3.5%	10.7%
	Ro-Ro Cargo Ship	48	Ro-Ro Cargo Ship	1,921				
	Passenger / Ro-Ro Cargo Ship	4	Passenger / Ro-Ro Cargo Ship	2,737				
	Vehicles Carrier	92						
Container	Container Ship	773	Container Ship	3,055	773	3,055	18.4%	7.0%
General Cargo	General Cargo Ship	1219	General Cargo Ship	16,253	1223	16,593	29.2%	38.0%
	Passenger / General Cargo Ship	2	Passenger / General Cargo Ship	340				
	Palletised Cargo Ship	2						
Other Cargo	Other Cargo	2			26	250	0.6%	0.6%
	Barge Carrier	5						
	Deck Cargo Ship	2						
	Heavy Load Carrier	10						
	Landing Craft	2						
	Livestock Carrier	5						
			Other Dry Cargo	250				

Vessel Type Recoding for GLMS database Comparison to Other Sources (cont.)

Reefer	Refrigerated Cargo Ship	183	Refrigerated Cargo Ship	1,272	184	1,272	4.4%	2.9%
	Fruit Juice Tanker	1						
Passenger			Passenger					
Liquid/ Gas	Chemical / Oil Products Tanker	330			612	4008	14.6%	9.2%
	Chemical Tanker	170	Chemical Tanker	2,828				
	LNG Tanker	5	LNG Tanker	153				
	LPG Tanker	107	LPG Tanker	1,027				
Oil Tankers	Crude Oil Tanker	269	Crude Oil Tanker	1,810	484	6,946	11.5%	15.9%
	Oil Products Tanker	215	Oil Products Tanker	5,136				
Other Tankers	Bitumen Tanker	9			23	371	0.5%	0.8%
	Edible Oil Tanker	5						
	Fish Oil Tanker	1						
	Vegetable Oil Tanker	7						
	Wine Tanker	1						
			Other Liquid	371				
Other	Other Ship							
			Fish catching					
			Other Fishing					
			Offshore supply					
			Other offshore					
			Research					
			Towing/ pushing					
			Dredging					
			Other Activities					
		4,194		43,653	4,194	43,653	100.0%	100.0%

N.B. The shaded out types in others indicate those which were excluded from analysis.

APPENDIX 2

Vessel Type Groupings for Analysis

Vessel Types	Original Vessel Type	Frequency	Percent of Group
Bulk Carriers	Bulk Carrier	724	100.0%
	<i>Total</i>	<i>724</i>	<i>100.0%</i>
General Cargo/ Containers	Ro-Ro	145	6.2%
	Container	773	33.2%
	General Cargo	1223	52.6%
	Refrigerated Cargo	184	7.9%
	<i>Total</i>	<i>2325</i>	<i>100.0%</i>
Tankers	Liquid/ Gas Carrier	612	54.7%
	Oil Tanker	484	43.3%
	Other Tanker	23	2.1%
	<i>Total</i>	<i>1119</i>	<i>100.0%</i>
Others	Other Cargo	26	36.1%
	Other	46	63.9%
	<i>Total</i>	<i>72</i>	<i>100.0%</i>

APPENDIX 3

The Percentage of Seafarers Working on Their Own Nationality Vessels

Flag	Seafarers Nationality	Percent
Albania	Albania	100.0
Antigua and Barbuda	Bangladesh	1.1
	Belgium	0.4
	Bolivia	0.0
	Canada	0.1
	Cape Verde	1.8
	Croatia	2.9
	Cyprus	0.1
	Czech Rep	0.0
	Estonia	0.5
	Finland	0.1
	Georgia	0.0
	Germany	6.2
	Ghana	0.5
	Hungary	1.0
	Iceland	2.4
	India	0.6
	Latvia	0.3
	Lithuania	5.5
	Myanmar	4.4
	Netherlands	0.2
	Norway	0.2
	Philippines	32.9
	Poland	14.6
	Portugal	0.1
	Moldova Rep	0.0
	Romania	2.9
	Russian	8.5
	Slovakia	0.0
	Slovenia	1.6
	Spain	0.0
	Sri Lanka	0.1
	Switzerland	0.0
	Taiwan	0.4
	Turkey	0.2
	Ukraine	9.8
	Yugoslavia	0.1
	Total	100.0
Azerbaijan	Azerbaijan	88.3
	Russian	11.7
	Total	100.0
Bahamas	Australia	0.0
	Bangladesh	0.3
	Belarus	0.1
	Belgium	0.1
	Bosnia and Herzegovina	0.1
	Brazil	0.1

	British Virgin Islands	0.1
	Bulgaria	0.6
	Canada	0.1
	Cape Verde	0.1
	Chile	0.1
	China	4.2
	Colombia	0.0
	Croatia	4.3
	Cuba	0.9
	Czech Rep	0.5
	Denmark	0.1
	Ecuador	1.1
	Egypt	0.7
	Estonia	0.1
	Finland	0.6
	France	0.4
	Georgia	0.1
	Germany	0.1
	Greece	1.6
	Guyana	0.2
	Hungary	0.0
	India	8.0
	Indonesia	0.6
	Ireland	0.1
	Italy	0.3
	Latvia	2.1
	Lithuania	1.0
	Malaysia	0.1
	Maldives	1.2
	Myanmar	1.0
	Namibia	0.0
	Netherlands	0.2
	Nigeria	0.1
	Norway	1.3
	Pakistan	0.9
	Panama	0.3
	Philippines	34.1
	Poland	9.9
	Portugal	0.1
	Korea, South	0.5
	Romania	1.3
	Russian	5.4
	Saint Lucia	0.0
	Singapore	0.0
	Slovakia	0.1
	Slovenia	0.1
	South Africa	2.4
	Spain	0.3
	Sweden	0.3
	Switzerland	0.0
	Taiwan	0.6
	Turkey	0.5

	Ukraine	8.8
	United Kingdom	1.5
	Tanzania	0.0
	Yugoslavia	0.3
	312	0.0
	Total	100.0
Bahrain	Egypt	16.7
	India	16.7
	Iraq	3.3
	Maldives	3.3
	Philippines	56.7
	Syrian	3.3
	Total	100.0
Bangladesh	Bangladesh	100.0
Barbados	Canada	1.1
	Cape Verde	5.4
	Czech Rep	1.1
	Estonia	1.1
	Ghana	2.2
	Hungary	1.1
	India	48.9
	Lithuania	2.2
	Poland	26.1
	Romania	2.2
	Russian	1.1
	Trinidad and Tobago	1.1
	United Kingdom	1.1
	Yugoslavia	5.4
	Total	100.0
Belgium	Belgium	23.1
	Germany	1.9
	India	1.9
	Malaysia	3.8
	Morocco	1.9
	Netherlands	17.3
	Philippines	30.8
	Singapore	1.9
	Thailand	3.8
	Ukraine	13.5
	Total	100.0
Belize	Austria	1.5
	Denmark	0.7
	Germany	0.7
	Indonesia	20.4
	Latvia	3.6
	Myanmar	7.3
	Netherlands	0.7
	New Zealand	0.7
	Philippines	4.4
	Russian	35.8
	Thailand	2.2
	Ukraine	3.6

	United Kingdom	0.7
	Viet Nam	16.8
	Yugoslavia	0.7
	Total	100.0
Bermuda	Bulgaria	10.4
	China	17.2
	Croatia	12.7
	India	14.2
	Latvia	10.4
	Lithuania	3.0
	Philippines	17.9
	Poland	0.7
	Romania	0.7
	Russian	1.5
	Turkey	9.0
	United Kingdom	2.2
	Total	100.0
Bolivia	Egypt	73.1
	Romania	19.2
	Sudan	3.8
	Syrian	3.8
	Total	100.0
Brazil	Brazil	71.7
	Ukraine	28.3
	Total	100.0
Bulgaria	Bulgaria	100.0
Cambodia	Azerbaijan	1.5
	Bulgaria	4.5
	China	2.4
	Egypt	10.2
	Georgia	0.4
	Greece	0.2
	India	2.9
	Indonesia	5.9
	Latvia	0.6
	Lebanon	0.2
	Myanmar	2.1
	Palestinian Territory	0.2
	Philippines	1.6
	Korea, South	0.7
	Moldova Rep	0.2
	Romania	1.6
	Russian	19.1
	Syrian	11.8
	Turkey	6.9
	Ukraine	25.5
	Venezuela	0.1
	Viet Nam	1.5
	Total	100.0
Canada	Canada	100.0
Cayman Islands	Australia	0.3
	Austria	0.1

	Bangladesh	0.2
	Belarus	0.1
	Belgium	0.1
	Bulgaria	1.8
	Canada	0.3
	Croatia	3.0
	Czech Rep	1.2
	Denmark	0.2
	Finland	0.1
	Georgia	0.5
	Germany	0.1
	Greece	1.0
	India	2.7
	Ireland	0.2
	Italy	0.4
	Latvia	11.8
	Lithuania	0.8
	Netherlands	1.3
	Norway	3.5
	Philippines	46.4
	Poland	3.4
	Romania	0.1
	Russian	10.0
	Slovakia	0.5
	South Africa	0.1
	Spain	0.3
	Sri Lanka	0.2
	Sweden	1.1
	Turkey	1.1
	Ukraine	3.9
	United Kingdom	2.6
	Yugoslavia	0.4
	Total	100.0
Chile	Chile	100.0
China	China	70.9
	France	0.1
	Indonesia	0.5
	Myanmar	3.7
	Philippines	3.9
	Taiwan	20.9
	Total	100.0
Colombia	Colombia	100.0
Comoros	Egypt	12.4
	Greece	3.4
	Lebanon	7.9
	Pakistan	37.1
	Romania	6.7
	Syrian	19.1
	Ukraine	12.4
	United Kingdom	1.1
	Total	100.0
Croatia	Croatia	99.5

	Slovenia	0.5
	Total	100.0
Cyprus	Australia	0.0
	Austria	0.0
	Bangladesh	0.0
	Belarus	0.1
	Belgium	0.2
	Bulgaria	1.8
	Cape Verde	0.1
	Chile	0.0
	China	0.9
	Croatia	0.6
	Cuba	2.8
	Cyprus	0.1
	Denmark	0.0
	Egypt	0.0
	Estonia	0.1
	Georgia	0.1
	Germany	0.6
	Greece	4.6
	Iceland	0.0
	India	6.0
	Indonesia	1.1
	Italy	0.1
	Kazakhstan	0.0
	Kiribati	0.5
	Latvia	6.2
	Lithuania	0.3
	Malaysia	0.0
	Maldives	0.2
	Myanmar	1.2
	Netherlands	0.1
	New Zealand	0.0
	Pakistan	0.1
	Philippines	41.3
	Poland	6.6
	Korea, South	0.4
	Romania	1.3
	Russian	8.4
	Sri Lanka	1.0
	Syrian	0.0
	Togo	0.2
	Turkey	0.0
	Tuvalu	0.2
	Ukraine	11.1
	United Kingdom	0.2
	United States	0.0
	Uruguay	0.0
	Viet Nam	0.4
	Yugoslavia	0.2
	Total	100.0
Korea, North	Azerbaijan	3.4

	Korea, North	23.4
	Egypt	8.3
	Greece	2.1
	India	1.4
	Lebanon	2.1
	Myanmar	4.8
	Romania	8.3
	Sudan	2.1
	Syrian	22.8
	Turkey	3.4
	Ukraine	17.9
	Total	100.0
Denmark	Denmark	96.0
	Faeroe Islands	4.0
	Total	100.0
Ecuador	Ecuador	100.0
Egypt	Egypt	100.0
Equatorial Guinea	Azerbaijan	10.0
	Turkey	90.0
	Total	100.0
Estonia	Belarus	3.3
	Estonia	53.3
	Latvia	16.7
	Russian	20.0
	Ukraine	6.7
	Total	100.0
Ethiopia	Ethiopia	90.6
	Ghana	9.4
	Total	100.0
Faeroe Islands	Denmark	3.6
	India	14.3
	Norway	67.9
	Poland	7.1
	Sweden	7.1
	Total	100.0
Finland	Estonia	2.4
	Finland	75.0
	Philippines	22.6
	Total	100.0
France	Croatia	25.0
	France	27.5
	Philippines	47.5
	Total	100.0
Georgia	Azerbaijan	0.5
	Egypt	14.7
	Estonia	0.3
	Georgia	1.9
	Romania	5.6
	Russian	15.8
	Sudan	0.5
	Syrian	17.6
	Turkey	12.8

	Ukraine	24.3
	Yugoslavia	5.9
	Total	100.0
Germany	Austria	0.2
	Azerbaijan	0.1
	Cape Verde	0.5
	Chile	0.1
	China	0.1
	Croatia	0.4
	Denmark	0.1
	Egypt	0.1
	Estonia	0.1
	Germany	27.9
	Ghana	0.1
	Hungary	0.1
	India	0.3
	Indonesia	0.1
	Iraq	0.1
	Kiribati	3.1
	Latvia	0.2
	Lithuania	0.5
	Myanmar	1.7
	Philippines	55.7
	Poland	0.8
	Portugal	0.3
	Korea, South	0.3
	Russian	3.1
	Spain	0.3
	Sweden	0.1
	Turkey	0.2
	Tuvalu	1.4
	Ukraine	1.9
	United Kingdom	0.3
	Uruguay	0.1
	Yugoslavia	0.1
	Total	100.0
Gibraltar	Austria	0.3
	Cameroon	0.6
	Cape Verde	0.3
	China	0.3
	Croatia	0.6
	Cuba	0.3
	Germany	4.4
	Ghana	0.6
	Greece	3.0
	Guyana	0.8
	Hungary	0.3
	Indonesia	3.6
	Israel	0.3
	Kazakhstan	0.3
	Latvia	1.1
	Lithuania	1.1

	Philippines	29.5
	Poland	17.9
	Romania	2.5
	Russian	16.0
	Sweden	0.3
	Turkey	0.3
	Ukraine	14.9
	United Kingdom	1.1
	Total	100.0
Greece	Belgium	0.0
	Bulgaria	1.0
	Canada	0.0
	Chile	0.2
	China	0.7
	Costa Rica	0.1
	Cote d Ivoire (Ivory Coast)	0.2
	Croatia	0.0
	Cyprus	0.1
	Denmark	0.2
	Ecuador	0.0
	Egypt	0.2
	El Salvador	0.3
	Finland	0.0
	Germany	0.0
	Greece	48.5
	Guinea	0.1
	Honduras	1.3
	India	0.2
	Indonesia	1.1
	Italy	0.1
	Japan	0.0
	Latvia	0.2
	Malaysia	0.3
	Maldives	0.1
	Mali	0.0
	Mexico	0.1
	Morocco	0.2
	Myanmar	0.6
	Netherlands	0.1
	Nicaragua	0.2
	Norway	0.1
	Pakistan	0.1
	Panama	0.1
	Philippines	39.0
	Poland	0.4
	Romania	2.1
	Russian	0.2
	Slovenia	0.0
	Sri Lanka	0.0
	Syrian	0.0
	Turkey	0.0
	Ukraine	1.4

	United Kingdom	0.0
	United States	0.1
	Yugoslavia	0.1
	Total	100.0
Honduras	Colombia	8.5
	Greece	6.0
	Honduras	4.3
	Indonesia	39.3
	Japan	0.4
	Lebanon	3.0
	Myanmar	0.9
	Panama	1.3
	Philippines	2.1
	Romania	8.1
	Syrian	3.0
	Thailand	17.1
	Ukraine	4.3
	United States	1.7
	Total	100.0
Hong Kong	Australia	0.1
	Bangladesh	0.8
	Belarus	0.0
	Canada	0.1
	China	54.3
	Croatia	1.4
	Germany	0.4
	Ghana	0.2
	Greece	1.7
	India	16.6
	Indonesia	1.8
	Ireland	0.1
	Latvia	0.0
	Lithuania	0.0
	Malaysia	0.4
	Myanmar	1.7
	Pakistan	0.3
	Philippines	12.7
	Poland	0.3
	Korea, South	0.8
	Romania	0.4
	Russian	0.4
	Singapore	0.3
	Sri Lanka	1.0
	Taiwan	2.0
	Ukraine	1.2
	United Kingdom	0.5
	United States	0.4
	Yugoslavia	0.0
	Total	100.0
	System	
India	India	100.0

Indonesia	Indonesia	99.3
	Myanmar	0.4
	Sweden	0.4
	Total	100.0
Iran	Bangladesh	3.3
	China	0.3
	Gambia	0.3
	Ghana	3.3
	India	5.6
	Iran	83.7
	Nigeria	0.3
	Pakistan	2.0
	Sri Lanka	0.3
	Ukraine	1.0
	Total	100.0
Ireland	Ireland	12.2
	Kiribati	18.4
	Poland	40.8
	United Kingdom	28.6
	Total	100.0
Isle of Man	Australia	0.4
	Bangladesh	0.1
	Bulgaria	2.0
	Canada	0.1
	China	0.2
	Croatia	2.1
	Czech Rep	0.1
	Denmark	0.2
	Estonia	0.5
	Germany	2.7
	Iceland	2.1
	India	5.6
	Ireland	0.3
	Kiribati	0.8
	Latvia	1.0
	Lithuania	1.5
	Namibia	0.1
	Netherlands	0.4
	New Zealand	0.1
	Norway	1.2
	Oman	0.3
	Pakistan	8.5
	Philippines	40.9
	Poland	6.2
	Portugal	0.1
	Romania	0.8
	Russian	6.7
	South Africa	3.8
	Tonga	0.6
	Turkey	0.4
	Turkmenistan	0.4
	Ukraine	2.4

	United Kingdom	7.6
	Total	100.0
Israel	Bulgaria	21.8
	Ghana	0.7
	Hungary	0.7
	Israel	42.9
	Philippines	7.5
	Poland	0.7
	Romania	20.4
	Singapore	0.7
	Tajikistan	0.7
	Turkey	2.0
	Ukraine	1.4
	Yugoslavia	0.7
	Total	100.0
Italy	Argentina	0.2
	Belarus	0.1
	Cape Verde	0.1
	Croatia	0.7
	Estonia	0.1
	Georgia	0.1
	Greece	0.1
	India	8.3
	Italy	63.1
	Pakistan	0.1
	Philippines	10.5
	Poland	1.3
	Portugal	0.1
	Romania	9.4
	Russian	2.6
	Spain	1.0
	Taiwan	0.1
	Ukraine	1.4
	Yugoslavia	0.6
	Total	100.0
Jamaica	Russian	100.0
Japan	Indonesia	3.1
	Japan	26.8
	Philippines	70.1
	Total	100.0
Kuwait	Bosnia and Herzegovina	1.1
	Bulgaria	2.2
	Egypt	8.9
	India	14.4
	Ireland	1.1
	Kuwait	3.3
	Pakistan	5.6
	Philippines	56.7
	Poland	1.1
	Syrian	1.1
	United Kingdom	4.4
	Total	100.0

Lebanon	Egypt	10.0
	Lebanon	25.0
	Poland	2.5
	Romania	3.8
	Syrian	56.3
	Ukraine	2.5
	Total	100.0
Liberia	Armenia	0.0
	Austria	0.0
	Azerbaijan	0.0
	Bangladesh	0.3
	Belarus	0.1
	Brazil	0.9
	British Virgin Islands	0.0
	Bulgaria	2.3
	Chile	0.2
	China	5.8
	Croatia	3.5
	Czech Rep	0.0
	Denmark	0.0
	Ecuador	0.0
	Egypt	0.0
	El Salvador	0.0
	Estonia	0.1
	Fiji	0.0
	Finland	0.0
	France	0.0
	Georgia	0.1
	Germany	3.5
	Ghana	0.0
	Greece	0.5
	Haiti	0.0
	Hong Kong	0.0
	Hungary	0.0
	India	8.4
	Indonesia	2.6
	Italy	0.1
	Japan	0.3
	Jordan	0.0
	Kiribati	2.3
	Latvia	5.7
	Lithuania	0.6
	Malaysia	0.1
	Maldives	0.4
	Mexico	0.1
	Myanmar	4.6
	Netherlands	0.1
	Norway	0.5
	Pakistan	0.2
	Panama	0.0
	Peru	0.0
	Philippines	32.7

	Poland	3.8
	Portugal	0.1
	Korea, South	0.4
	Moldova Rep	0.0
	Romania	1.1
	Russian	9.9
	Saudi Arabia	0.1
	Singapore	0.0
	Slovakia	0.0
	Slovenia	0.0
	South Africa	0.0
	Spain	0.2
	Sri Lanka	0.7
	Sweden	0.1
	Taiwan	1.1
	Trinidad and Tobago	0.1
	Turkey	0.9
	Turkmenistan	0.0
	Tuvalu	0.9
	Ukraine	2.7
	United Kingdom	0.7
	United States	0.4
	Venezuela	0.0
	Yugoslavia	0.4
	312	0.0
	Total	100.0
	System	
Libyan	Egypt	4.8
	Libyan	28.6
	Romania	38.1
	Syrian	28.6
	Total	100.0
Lithuania	Lithuania	88.5
	Russian	7.7
	Ukraine	3.8
	Total	100.0
Luxembourg	Algeria	0.4
	Belgium	19.8
	Canada	0.8
	Cape Verde	0.8
	Chile	0.4
	Croatia	5.8
	Estonia	0.4
	Finland	1.9
	France	1.6
	Germany	1.9
	India	6.2
	Indonesia	0.8
	Italy	3.1
	Malaysia	1.9
	Morocco	0.4
	Netherlands	1.9

	Norway	0.4
	Philippines	27.6
	Poland	7.4
	Portugal	0.4
	Romania	8.2
	Russian	6.2
	Slovakia	0.4
	Spain	0.4
	Ukraine	0.8
	Total	100.0
Malaysia	Bangladesh	1.1
	China	0.3
	Gambia	0.1
	Ghana	0.7
	India	4.3
	Indonesia	26.2
	Malaysia	47.1
	Myanmar	7.1
	Netherlands	0.1
	Nigeria	0.5
	Pakistan	1.3
	Philippines	9.4
	Korea, South	0.7
	Russian	0.1
	Singapore	0.4
	Sri Lanka	0.1
	Thailand	0.7
	Yugoslavia	0.1
	Total	100.0
Maldives	India	5.6
	Maldives	88.9
	Sri Lanka	5.6
	Total	100.0
Malta	Austria	0.0
	Azerbaijan	0.2
	Bangladesh	0.0
	Belarus	0.0
	Benin	0.1
	Bosnia and Herzegovina	0.0
	Bulgaria	4.1
	Canada	0.0
	Chile	0.1
	China	2.1
	Costa Rica	0.0
	Croatia	1.4
	Cuba	0.4
	Ecuador	0.0
	Egypt	0.4
	Estonia	0.0
	Georgia	0.8
	Germany	0.0
	Ghana	0.2

	Greece	3.0
	Honduras	0.4
	Hungary	0.1
	India	3.7
	Indonesia	0.7
	Iran	0.0
	Israel	0.3
	Italy	0.6
	Jordan	0.0
	Latvia	3.4
	Lithuania	0.2
	Maldives	0.2
	Myanmar	0.5
	New Zealand	0.0
	Palestinian Territory	0.0
	Pakistan	0.3
	Philippines	27.9
	Poland	2.4
	Portugal	0.0
	Moldova Rep	0.0
	Romania	6.2
	Russian	11.1
	Slovenia	0.0
	Sri Lanka	0.5
	Syrian	1.3
	Taiwan	0.0
	Togo	0.0
	Turkey	7.2
	Ukraine	19.0
	United Kingdom	0.0
	Tanzania	0.1
	Yugoslavia	0.8
	Total	100.0
Marshall Islands	Bulgaria	0.3
	Canada	0.2
	Chile	3.0
	Croatia	3.6
	Denmark	0.1
	Egypt	0.3
	Estonia	0.1
	Georgia	4.2
	Germany	1.2
	Greece	3.1
	Hungary	0.1
	India	7.7
	Indonesia	0.2
	Ireland	0.1
	Italy	0.1
	Latvia	1.4
	Lithuania	0.2
	Myanmar	7.0
	New Zealand	0.1

	Norway	0.1
	Philippines	35.0
	Poland	7.9
	Korea, South	1.1
	Romania	6.2
	Russian	3.9
	South Africa	0.1
	Spain	0.3
	Sweden	0.1
	Thailand	0.3
	Turkey	3.6
	Tuvalu	0.4
	Ukraine	6.2
	United Kingdom	1.6
	Venezuela	0.1
	Yugoslavia	0.1
	Total	100.0
Mexico	Mexico	100.0
Morocco	Germany	1.2
	Morocco	97.6
	Ukraine	1.2
	Total	100.0
Myanmar Netherlands	Myanmar	99.4
	Philippines	0.3
	Yugoslavia	0.3
	Total	100.0
	Belgium	0.4
	Benin	0.0
	Brazil	0.0
	Burkina Faso	0.0
	Cape Verde	2.0
	Chile	0.1
	Croatia	0.4
	Denmark	0.2
	Estonia	0.9
	Germany	0.5
	Ghana	0.1
	Indonesia	18.1
	Ireland	0.0
	Latvia	0.2
	Liberia	0.0
	Lithuania	0.4
	Malaysia	0.1
	Netherlands	38.2
	Norway	0.1
	Philippines	20.3
	Poland	3.8
	Portugal	1.7
	Romania	0.5
	Russian	6.0
	Slovenia	0.0
	Spain	1.2

	Sweden	0.0
	Ukraine	4.1
	United Kingdom	0.1
	Total	100.0
Netherlands Antilles	Belarus	0.2
	Bulgaria	8.5
	Canada	0.7
	Cape Verde	0.7
	Croatia	0.7
	Estonia	1.2
	Germany	0.7
	India	0.2
	Indonesia	0.2
	Ireland	0.2
	Latvia	5.8
	Lithuania	2.9
	Netherlands	2.2
	Norway	0.5
	Philippines	19.7
	Poland	5.1
	Portugal	0.2
	Romania	1.7
	Russian	20.2
	Sweden	0.2
	Ukraine	27.5
	Yugoslavia	0.2
	Total	100.0
Norway	Bangladesh	0.5
	India	1.5
	Latvia	2.0
	Norway	79.9
	Philippines	14.6
	Spain	0.5
	Sweden	0.5
	United Kingdom	0.5
	Total	100.0
Pakistan	Pakistan	100.0
Panama	Argentina	0.0
	Azerbaijan	0.0
	Bangladesh	1.1
	Belarus	0.0
	Belgium	0.0
	Bosnia and Herzegovina	0.0
	Bulgaria	1.0
	Chile	0.3
	China	11.3
	Colombia	0.1
	Costa Rica	0.0
	Croatia	1.2
	Cuba	0.1
	Korea, North	0.2
	Denmark	0.0

	Ecuador	0.0
	Egypt	0.4
	Estonia	0.0
	Finland	0.0
	France	0.1
	Gambia	0.0
	Georgia	0.1
	Germany	0.0
	Ghana	0.1
	Gibraltar	0.0
	Greece	0.6
	Grenada	0.0
	Guatemala	0.0
	Honduras	0.3
	Hungary	0.0
	India	9.8
	Indonesia	3.7
	Ireland	0.0
	Italy	0.8
	Jamaica	0.0
	Japan	1.2
	Jordan	0.0
	Kazakhstan	0.0
	Latvia	0.7
	Lebanon	0.0
	Lithuania	0.0
	Madagascar	0.1
	Malaysia	0.1
	Mexico	0.0
	Myanmar	2.8
	Netherlands	0.2
	Nicaragua	0.1
	Norway	0.0
	Pakistan	0.1
	Panama	0.2
	Peru	0.4
	Philippines	39.2
	Poland	0.8
	Korea, South	9.3
	Moldova Rep	0.0
	Romania	0.6
	Russian	1.1
	Samoa	0.0
	Singapore	0.0
	Slovenia	0.0
	Spain	0.5
	Sri Lanka	0.2
	Sudan	0.0
	Sweden	0.0
	Syrian	0.0
	Taiwan	4.3
	Thailand	0.3

	Tunisia	0.0
	Turkey	0.4
	Ukraine	3.5
	United Kingdom	0.3
	United States	0.0
	Venezuela	0.0
	Viet Nam	0.9
	Yugoslavia	0.9
	Total	100.0
	System	
Philippines	Bangladesh	0.2
	China	3.8
	Greece	0.2
	Lithuania	0.2
	Philippines	95.0
	Korea, South	0.4
	United Kingdom	0.2
	Total	100.0
Poland	Philippines	78.6
	Poland	21.4
	Total	100.0
Portugal	Benin	1.9
	Bulgaria	1.9
	Chile	4.8
	Italy	5.7
	Lithuania	1.0
	Peru	4.8
	Philippines	24.8
	Poland	1.0
	Portugal	30.5
	Romania	2.9
	Spain	5.7
	Togo	1.9
	Ukraine	13.3
	Total	100.0
Qatar	Egypt	15.6
	India	11.1
	Iraq	4.4
	Pakistan	7.8
	Philippines	60.0
	Saudi Arabia	1.1
	Total	100.0
Korea, South	China	7.2
	India	0.5
	Indonesia	3.4
	Myanmar	12.5
	Philippines	7.2
	Korea, South	68.7
	United Kingdom	0.5
	Total	100.0
Reunion	France	23.1
	Malaysia	73.1

	Romania	3.8
	Total	100.0
Romania	Romania	98.1
	Russian	1.3
	Ukraine	0.6
	Total	100.0
Russian	Azerbaijan	0.0
	Belarus	0.1
	Georgia	0.0
	Italy	0.0
	Kazakhstan	0.1
	Russian	97.3
	Ukraine	1.8
	United Kingdom	0.5
	Total	100.0
Saint Vincent	Azerbaijan	0.3
	Belarus	0.1
	British Virgin Islands	0.1
	Bulgaria	10.1
	Cape Verde	0.4
	China	7.5
	Colombia	0.2
	Croatia	3.0
	Ecuador	0.6
	Egypt	3.5
	Estonia	0.2
	Georgia	1.1
	Germany	0.2
	Ghana	0.1
	Greece	3.0
	Iceland	0.1
	India	2.7
	Indonesia	0.6
	Latvia	1.9
	Lebanon	0.2
	Lithuania	0.7
	Malaysia	0.1
	Maldives	1.8
	Morocco	0.1
	Nicaragua	0.1
	Pakistan	2.1
	Philippines	14.2
	Poland	1.2
	Portugal	0.2
	Romania	2.2
	Russian	8.5
	Slovenia	0.7
	South Africa	0.1
	Syrian	3.3
	Turkey	6.7
	Ukraine	22.0
	United Kingdom	0.2

	United States	0.1
	Total	100.0
Sao Tome and Principe	India	10.5
	Russian	5.3
	Ukraine	84.2
	Total	100.0
Saudi Arabia	Bangladesh	3.3
	Croatia	0.7
	Egypt	6.6
	India	29.8
	Iraq	2.6
	Latvia	4.6
	Pakistan	3.3
	Philippines	44.4
	Russian	2.0
	Ukraine	0.7
	United Kingdom	2.0
	Total	100.0
Seychelles	Russian	100.0
Singapore	Bangladesh	0.7
	Chile	0.1
	China	9.5
	Croatia	4.9
	Estonia	0.4
	Germany	0.2
	Ghana	0.5
	India	15.7
	Indonesia	11.1
	Japan	0.1
	Latvia	1.3
	Lithuania	0.1
	Malaysia	1.6
	Mexico	0.1
	Myanmar	6.0
	Netherlands	0.1
	Pakistan	0.2
	Philippines	33.1
	Poland	1.2
	Korea, South	0.1
	Romania	0.1
	Russian	3.5
	Singapore	3.0
	Sri Lanka	0.8
	Taiwan	1.8
	Thailand	3.2
	Ukraine	0.6
	Yugoslavia	0.1
	Total	100.0
Slovakia	Turkey	94.7
	Ukraine	5.3
	Total	100.0
Spain	Spain	100.0

Sri Lanka	Sri Lanka	100.0
Sweden	Austria	0.2
	China	0.2
	Denmark	0.2
	Finland	0.9
	Germany	0.2
	Kenya	0.2
	Norway	0.2
	Philippines	29.7
	Poland	8.7
	Singapore	0.2
	Spain	0.9
	Sweden	57.6
	United Kingdom	0.5
	Total	100.0
Switzerland	Bulgaria	3.4
	Cape Verde	3.4
	Croatia	65.5
	Lithuania	6.9
	Poland	6.9
	Romania	6.9
	Sweden	6.9
	Total	100.0
Syrian	Egypt	7.0
	Jordan	0.2
	Lebanon	1.2
	Palestinian Territory	2.1
	Romania	3.2
	Syrian	84.6
	Ukraine	1.7
	Total	100.0
Thailand	China	0.1
	India	9.5
	Myanmar	0.6
	Philippines	4.1
	Thailand	85.6
	Total	100.0
Tonga	Egypt	15.2
	Greece	0.7
	Italy	0.7
	Latvia	0.7
	Lithuania	3.4
	Norway	0.7
	Pakistan	6.9
	Philippines	1.4
	Romania	2.8
	Russian	8.3
	Somalia	1.4
	Sudan	2.1
	Syrian	34.5
	Ukraine	21.4
	Total	100.0

Turkey	Romania	0.0
	Turkey	100.0
	Total	100.0
Tuvalu	Germany	16.7
	Latvia	25.0
	Poland	8.3
	Russian	16.7
	Tuvalu	25.0
	Ukraine	8.3
	Total	100.0
Ukraine	Cambodia	0.1
	Georgia	0.4
	Moldova Rep	0.2
	Russian	1.9
	Ukraine	97.4
	Total	100.0
United Arab Emirates	Egypt	21.7
	India	41.7
	Pakistan	6.7
	Philippines	28.3
	Syrian	1.7
	Total	100.0
United Kingdom	Australia	0.1
	Bangladesh	0.1
	Belarus	0.1
	Belgium	0.1
	Bulgaria	7.8
	Canada	0.1
	Cape Verde	1.4
	Croatia	0.4
	Denmark	0.1
	Estonia	0.5
	Germany	1.2
	Ghana	0.2
	Guyana	0.5
	Hungary	0.1
	India	2.9
	Ireland	1.0
	Latvia	2.4
	Lithuania	0.3
	Namibia	0.1
	Netherlands	0.1
	New Zealand	0.9
	Nigeria	0.1
	Norway	0.7
	Pakistan	0.2
	Philippines	31.9
	Poland	4.9
	Romania	3.8
	Russian	2.1
	South Africa	2.8
	Sri Lanka	0.1

	Sweden	0.9
	Taiwan	1.3
	Thailand	1.3
	Turkey	1.8
	Ukraine	2.6
	United Kingdom	25.1
	Total	100.0
United States	Australia	0.2
	Honduras	1.2
	India	3.6
	Morocco	0.2
	Netherlands	0.2
	Philippines	5.8
	Trinidad and Tobago	0.2
	United States	88.6
	Total	100.0
Vanuatu	Croatia	0.8
	Japan	1.5
	Malaysia	8.4
	Philippines	61.8
	Poland	18.3
	Korea, South	6.9
	Yugoslavia	2.3
	Total	100.0
Venezuela	India	90.9
	Italy	9.1
	Total	100.0
Viet Nam	Viet Nam	100.0
Denmark (DIS)	Belgium	0.1
	Croatia	0.4
	Denmark	45.3
	Egypt	0.1
	Faeroe Islands	0.1
	Germany	0.4
	India	0.8
	Latvia	2.7
	Lithuania	1.6
	Netherlands	0.6
	Norway	0.8
	Philippines	25.6
	Poland	11.1
	Russian	0.2
	Spain	0.2
	Sweden	0.1
	Thailand	9.4
	Ukraine	0.3
	United Kingdom	0.3
	Total	100.0
French Southern (Antarctic) Territory	Australia	0.6
	Bulgaria	4.5
	Canada	0.3
	Croatia	3.1

	France	40.4
	Philippines	24.3
	Romania	23.7
	Senegal	2.3
	United Kingdom	0.8
	Total	100.0
Madeira (Portugal)	Chile	0.9
	Colombia	1.8
	Cuba	1.8
	Germany	18.4
	Guatemala	0.9
	Honduras	4.4
	Peru	4.4
	Philippines	43.0
	Russian	1.8
	Spain	13.2
	Ukraine	7.0
	United Kingdom	2.6
	Total	100.0
Norway (NIS)	Australia	0.1
	Bangladesh	0.1
	Brazil	0.0
	Canada	0.0
	China	0.8
	Croatia	1.3
	Denmark	0.1
	Estonia	0.1
	Ethiopia	0.0
	Finland	0.1
	France	0.0
	Germany	0.0
	Greece	0.1
	Guinea	0.5
	India	18.2
	Indonesia	1.5
	Latvia	3.6
	Lithuania	0.9
	Malaysia	0.1
	Myanmar	0.0
	Norway	10.4
	Philippines	52.3
	Poland	5.2
	Portugal	0.2
	Romania	0.1
	Russian	1.8
	Singapore	0.2
	Slovakia	0.0
	Spain	0.4
	Sweden	0.8
	Switzerland	0.0
	Ukraine	0.4
	United Kingdom	0.6

	Total	100.0
Spain (Csr)	Denmark	1.4
	Spain	98.6
	Total	100.0