CRUISE SHIPS IN ROTTERDAM – DATA DESCRIPTION AND FIRST ANALYSES

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1. INTRODUCTION

This paper is the first in a series of papers on cruise ships and the cruise industry in relation to Rotterdam. It contains a description of the data used for the analysis of the cruise ships that call at Rotterdam. It also provides some descriptive statistics. Throughout, it focuses for 2020 on planned calls to show where things were heading in the absence of the Corona virus. I find a fivefold increase in the number of cruise ships that call at Rotterdam over the past 10 years. The number of calls by ships that are more than 30 years old has increased from 0 in 2016 to 34 in 2020. In 2020, ships built in the 1990s call 22 times. Few ships built after 2010 call regularly at Rotterdam. Finally, the environmental performance of cruise calls in Rotterdam, as measured by the ship's Environmental Ship Index, an index promoted by the port authorities around the world, including the Rotterdam Port Authority, has worsened substantially over the past 5 years. In 2020, 91 out of 108 planned calls are by ships without an ESI score or with a score that is too low to merit a discount on port fees for good environmental performance.

2. DATA SOURCES

Data for this study comes from a number of sources.

(1) Dates of cruise calls over the period 2016-2020 were obtained from archived webpages of Cruise Kalender Rotterdam, accessed through the Internet Archive website in November 2019. This source appears to report planned calls and to provide updated versions a few times per year. The actual number of calls may differ for two reasons: planned calls may not take place and actual calls may fail to make it onto this website. A new ship that fails to be

ready at the planned date can be a reason for for the first difference; bad weather on the North Sea can be a reason for either. In general, data from the website gives an accurate picture of the call dates as calls are typically planned more than a year in advance, and passengers, captains and ship owners dislike changing planned itineraries.

(2) Environment Ship Index scores of cruise ships were obtained from ESI website, accessed in December 2019.

(3) The year a ship was built was obtained from the Shipping Intelligence Network database of Clarksons Research through an Erasmus University subscription. An alternative and public source for this information is Wikipedia-List of cruise ships or Wikipedia pages of individual cruise ships. As building a ship the size of a cruise ship typically takes more than one year, various years could be used. I use what the database of Clarksons Research refers to as 'year built.' A comparison with Wikipedia information shows that this is the year in which the ship enters service. Data consistency between Wikipedia and Clarksons Research is high. Only when a ship changed name when it changed ownership a Wikipedia article may refer to the year in which this happened as the year it entered service.

(4) The number of actual calls over the period 2009-2015 was obtained from De Zeecruise en Rotterdam, a report published in 2017 by the city of Rotterdam and the Rotterdam Port Authority.

For 2020 we present the planned calls and ignore that because of the Covid-19 pandemic no regular cruise calls have happened from mid-March 2020 until the moment of writing; nor do we include cruise ships that called in Rotterdam to repatriate crew. Throughout this paper, we ignore cruise ships that come to Rotterdam for repair, maintenance etc. We remove from the 2019 calendar the planned calls of the AIDAnova and the Costa Smeralda, as these calls did not take place. We add to the planned calls for 2020 the calls of the Black Watch and the Oceana in February.

3. Descriptive statistics

This section presents some descriptive statistics of the cruise ships that berth in Rotterdam.

3.1. **Total number of calls.** Table 1 shows the number of yearly calls over the period 2009-2020. The number of yearly calls has increased more than five-fold over the past 10 years. Some of this growth reflects the overall growth of the cruise industry during that period. The jump in numbers from 2018 to 2019 is likely to reflect also the introduction of a tourist tax for cruise passengers in Amsterdam.

The 2017 report De Zeecruise presents various scenarios for the growth of the number of calls in Rotterdam. Of the three scenarios presented, the one with the highest growth assumes 100 calls for 2030. It is striking that within 2 years of writing of the report that number had been reached. This may reflect a lack of control over the number of calls, in line with the footloose nature of the cruise industry, and, as a consequence, the industry's strong reactions to changes elsewhere.

TABLE 1. Number of yearly cruise calls, 2009-2020

Year	Number	Year	Number
2009	18	2015	38
2010	17	2016	57
2011	28	2017	72
2012	27	2018	65
2013	27	2019	101
2014	28	2020	108

TABLE 2. Cruise ships in Rotterdam

	Period built			
Year	–1989	1990-1999	2000-2009	2010-2020
2016	0	12	5	40
2017	4	13	5	50
2018	8	8	4	45
2019	24	9	14	54
2020	34	22	12	40

3.2. **Period built.** When were the ships built that call in Rotterdam? We distinguish four periods of construction, until (and including) 1989, 1990-1999, 2000-2009 and 2010-2020. Table 2 shows for each year in the period 2016-2020 the number of calls made by ships built in each of these four periods.

The data show that in 2016, the vast majority of calls was by ships built after 2010 – in the period 2010-2016 to be precise. In fact, the AIDAprima, built in 2016, called 35 times in Rotterdam; this number further increased in 2017, to 41 calls. In 2016, no ship built before 1990 called at Rotterdam.

Over the next five years, the picture has changed completely. Cruise ships that call in Rotterdam have become much older. In 2020, 34 calls are by ships built before 1990. In fact, the ship calling most frequently in 2020, 19 times, the Columbus of Cruise & Maritime Voyages, was built in 1989. The ship with the second highest number of calls, 17, is the Rotterdam of the Holland America Line; it was build in 1998. The number of calls by ships built after 2010 is the same as in 2016. This is striking, as the post-2010 period is now four years longer than in 2016, many new ships have entered the market, and the total number of calls nearly doubled.

Table 3 gives an overview of all ships built during 2010-2020 that have made at least one call in Rotterdam over the period 2016-2020. It shows that apart from the AIDAperla, the AIDAmar and the MSC Preziosa, no ship built over the past ten years calls regularly at Rotterdam in 2019 and 2020. Note incidentally, the decline from 2019 to 2020 in number of calls by AIDA ships that were built

over the past ten years. The table also shows where they were scheduled to sail in 2020. Ships that received considerable attention in the local press, because of their technology, like the AIDAnova, Costa Smeralda and MSC Grandiosa, sail in the Mediterranean (or around the Canary Islands).

TABLE 3. Call frequency cruise ships built after 2010

		Calls in Rotterdam			
Built	Cruise ship	2016–2018	2019	2020	2020 sailing area
2010	Azura	0	1	0	Car. (w); Med., Balt. (z)
	MSC Magnifica	1	0	0	W., Med. (z)
	Queen Elizabeth	9	0	0	Pac.
2011	AIDAsol	0	0	1	Med. (w), Fj. (z)
	Celebrity Silhouette	0	0	1	Car. (w); Balt., Fj. (z)
2012	AIDAmar	5	15	9	N., Balt., Can.
2013	MSC Preziosa	1	8	11	Car. (w), W. Eur. (z)
	Royal Princess	1	0	0	Amerika's
2014	Norwegian Getaway	1	1	0	Car. (w), Med. (z)
	Regal Princess	4	1	0	Car. (w), UK (z)
2015	Britannia	0	2	0	Car. (w), Med. (z)
	Norwegian Escape	0	0	1	Car. (w), Balt. (z)
2016	AIDAprima	76	1	1	Pers. (w), Balt. (z)
	Harmony of the Seas	1	0	0	Car.
	Koningsdam	1	0	0	Car., Americas
	Ovation of the Seas	1	0	0	Pac., Alaska
2017	AIDAperla	34	20	12	Car. (w), N. and Fj. (z)
2018	Seabourn Ovation	1	2	1	Ind., Mid., N., Balt.
2019	AIDAnova	-	0	0	Call canceled; Can., Med.
	Costa Smeralda	-	0	0	Call canceled; Med.
	MSC Grandiosa	-	1	0	Med.
	Scenic Eclipse	-	1	0	Many seas
	World Explorer	-	1	0	Many seas
2020	Iona	-	-	2	Fj. (z), Can. (w)
	Carnival Mardi Gras	-	-	1	Car.

Note: Source sailing area in 2020 Cruise Mapper, consulted March 15 2020. Abbreviations: Balt. = Baltic Sea, Can. = Canary Islands, Car. = Caribbean, Fj. = Norwegian Fjords, Ind.= Indian Ocean, Med. = Mediterranean, N. = North Sea, W. Eur. = Northwestern Europe, Pers. = Persian Gulf and Gulf of Oman, Pac. = Pacific Ocean, UK = British Isles and W. = world cruise. w = winter, s = summer

TABLE 4. Cruise ships in Rotterdam and the Environmental Ship Index

Year	No ESI	ESI < 31	ESI > 31
2016	21	0	36
2017	23	0	49
2018	26	35	4
2019	64	23	14
2020	77	14	17

3.3. **Environmental Ship Index.** Cruise ships are large and heavy ships that require substantial amounts of fuel, both for propulsion and for generating electricity for the many systems they have on board and that may be operative in hoteling function.

The Rotterdam Port Authority, together with other port authorities, has developed the Environmental Ship Index. According to the ESI website, the ESI is "a perfect indicator of the environmental performance of ocean going vessels." Ships, including cruise ships, that berth in the port of Rotterdam can apply for a reduction in port fees if they have an ESI score larger than 31, see Algemene voorwaarden inclusief haventarieven 2020, Port of Rotterdam. Ship owners thus have every reason to obtain an ESI score if they believe the discount would apply.

Table 4 indicates, for every year in the period 2016-2020, the number of calls by ships without an ESI, with an ESI lower than 31 and with an ESI larger than 31. The table shows that over the past five years the number of calls by ships that can apply for the discount because of the ship's environmental performance has dropped from 36 in 2016 to 17 in 2020. This is a large absolute decline; it is an even larger drop in percentage points, given the larger number of calls in 2020. In 2016, 63% of calls was by ships with a sufficiently high ESI score to merit a discount; in 2020 this percentage was only 16%. The replacement of the AIDAprima by the AIDAperla in 2018 explains the large drop in high-ESI calls from 2017 to 2018. The AIDAperla does not reach the 31 threshold. The growing number of old ships explains the large increase in ships without an ESI.