

Report 1

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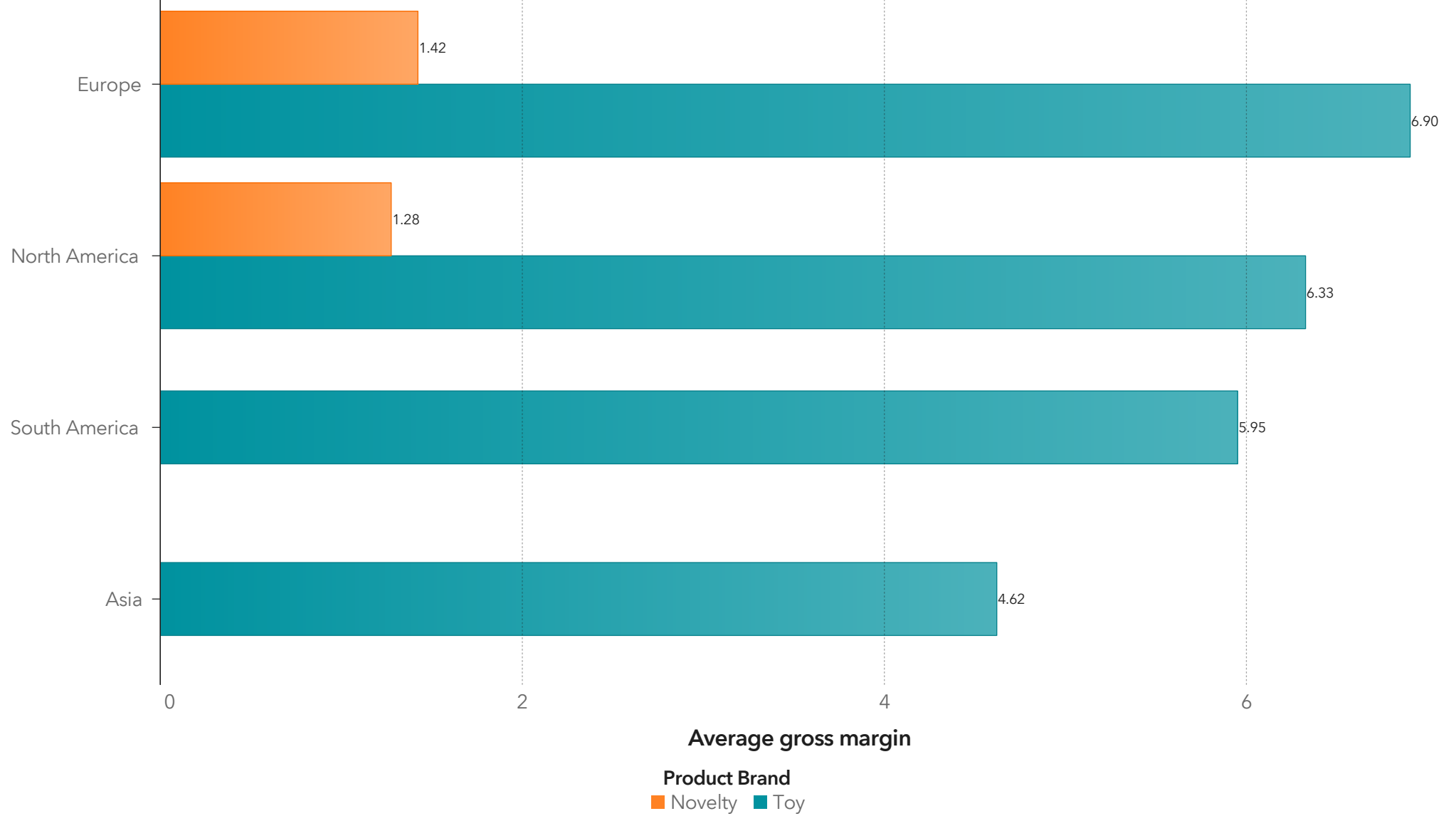
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Task 1



Average gross margin by Facility Continent grouped by Product Brand

Facility Continent



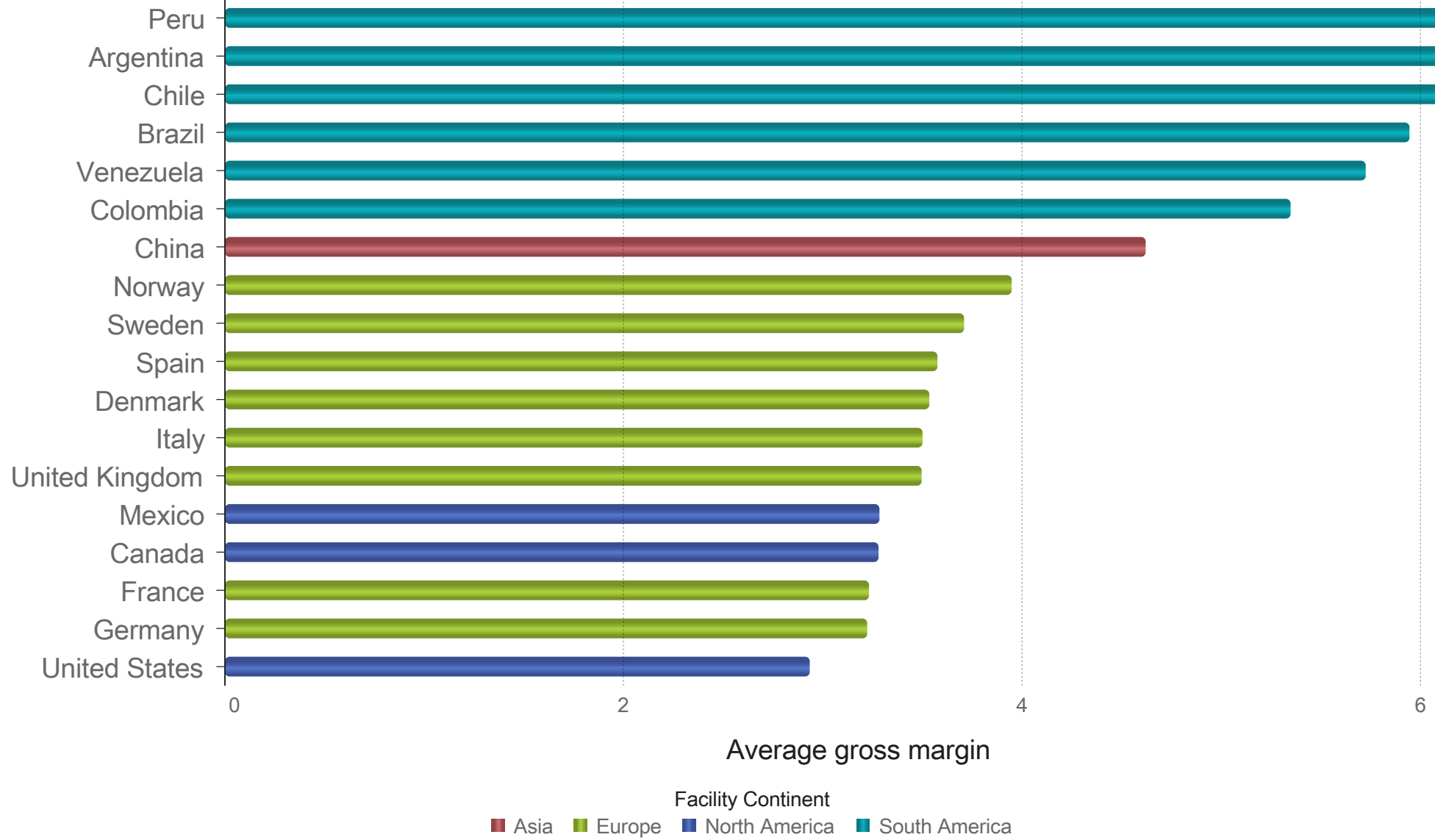
T2.1

Facility Continent ▲	Facility Country map locations ▲	Product Sale	Average gross margin
Asia	China	16645	4.62
Europe	Denmark	234614	3.54
	France	296303	3.23
	Germany	689530	3.22
	Italy	445738	3.50
	Norway	409697	3.95
	Spain	1560412	3.58
	Sweden	607665	3.71
	United Kingdom	1501642	3.50
North America	Canada	969520	3.28
	Mexico	406205	3.29
	United States	22832243	2.94
South America	Argentina	57805	6.19
	Brazil	455194	5.95
	Chile	282672	6.14
	Colombia	200706	5.35
	Peru	376081	6.35
	Venezuela	325704	5.73



Average gross margin by Facility Country locations

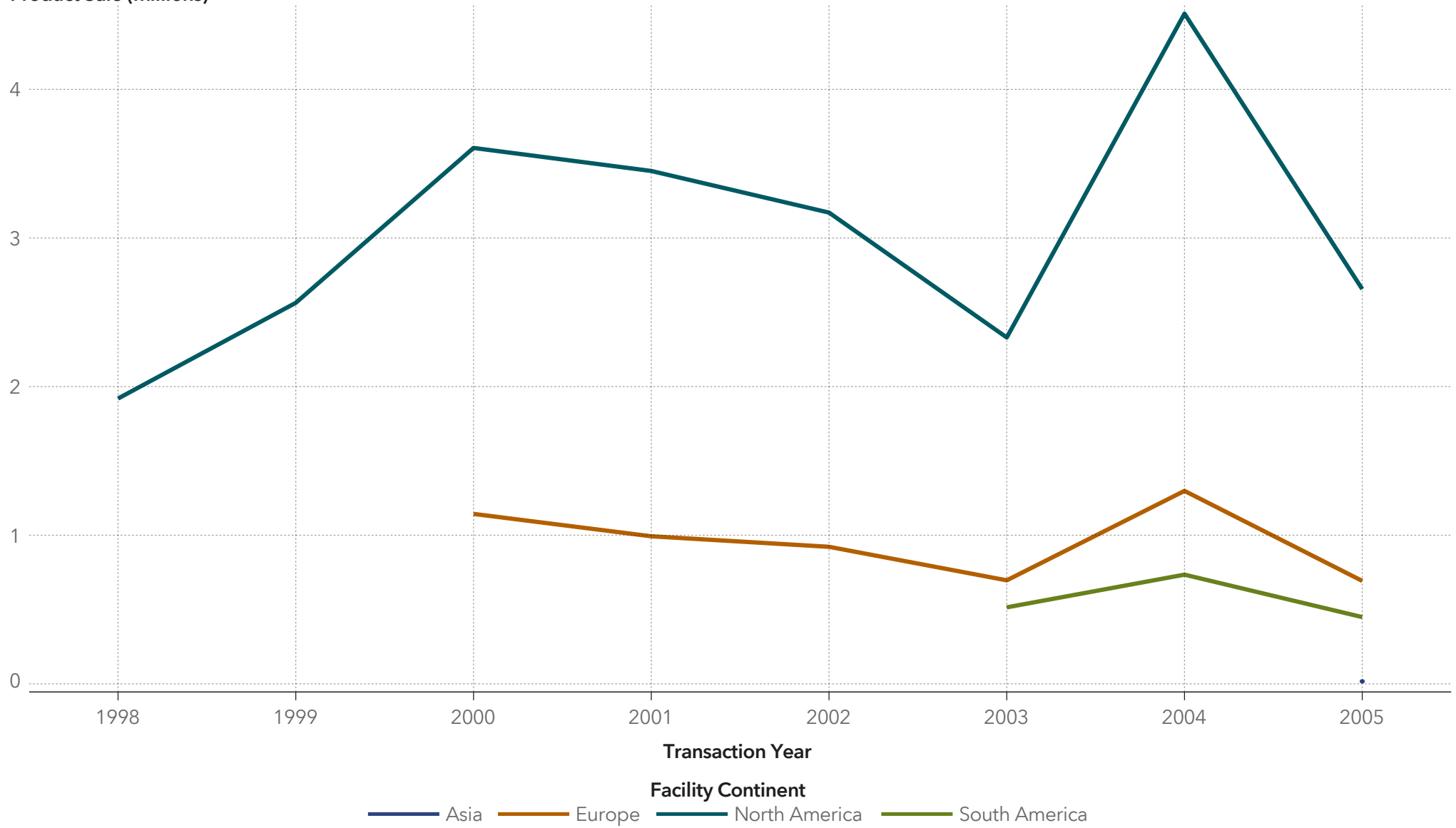
Facility Country map locations





Product Sale by Transaction Year grouped by Facility Continent

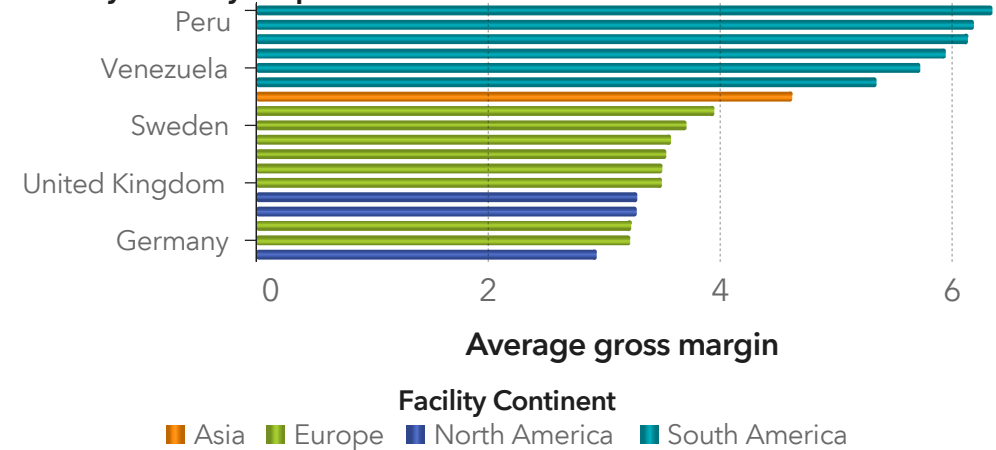
Product Sale (millions)



Facility Country map locations	▲ Facility Continent ▲	Product Sale	
Argentina	South America	57805	
Brazil	South America	455194	
Canada	North America	969520	
Chile	South America	282672	
China	Asia	16645	
Colombia	South America	200706	
Denmark	Europe	234614	
France	Europe	296303	
Germany	Europe	689530	
Italy	Europe	445738	

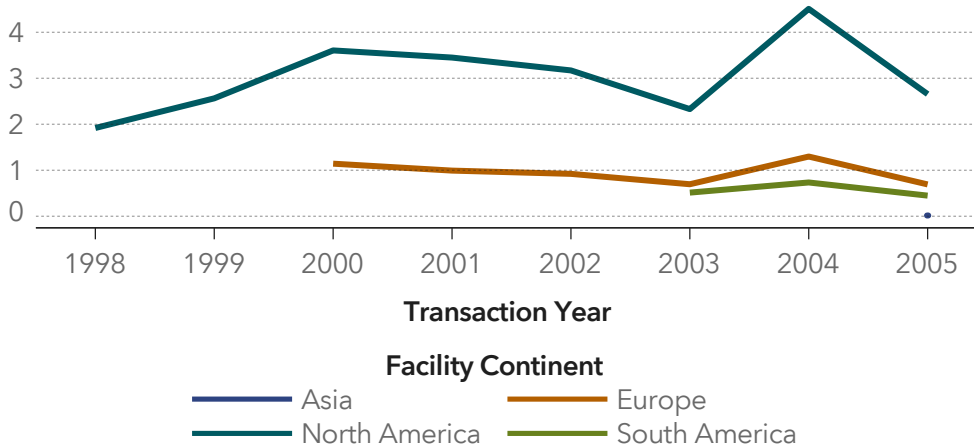
Average gross margin by Facility Country map locations grouped by Facility Continent

Facility Country map locations



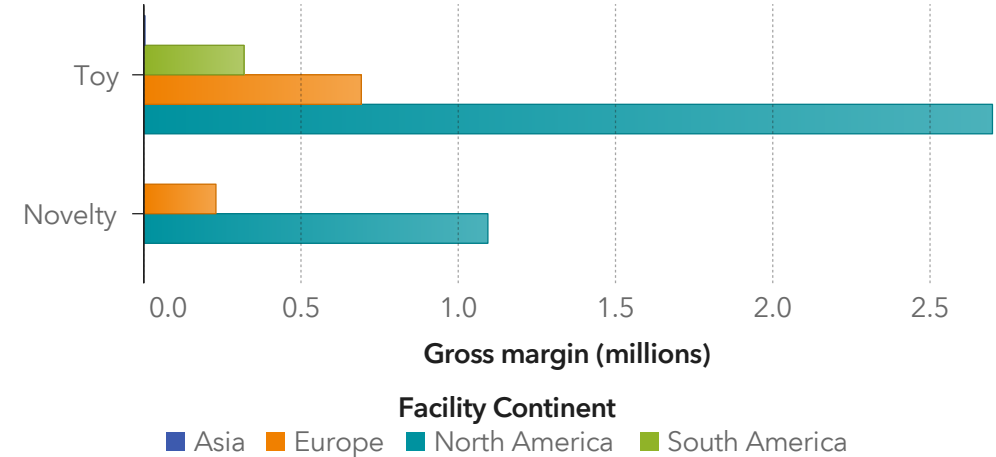
Product Sale by Transaction Year grouped by Facility Continent

Product Sale (millions)

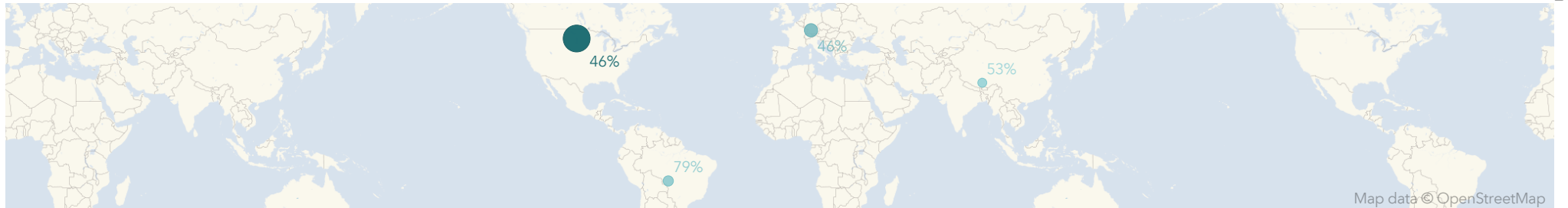


Gross margin by Product Brand grouped by Facility Continent

Product Brand



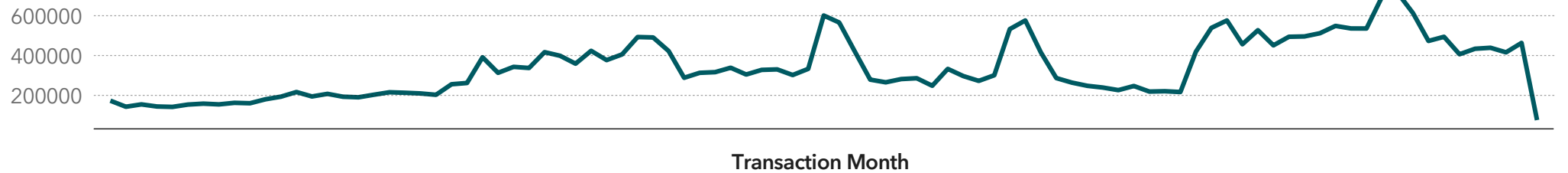
Task 3



Customer Satisfaction Product Sale (millions)

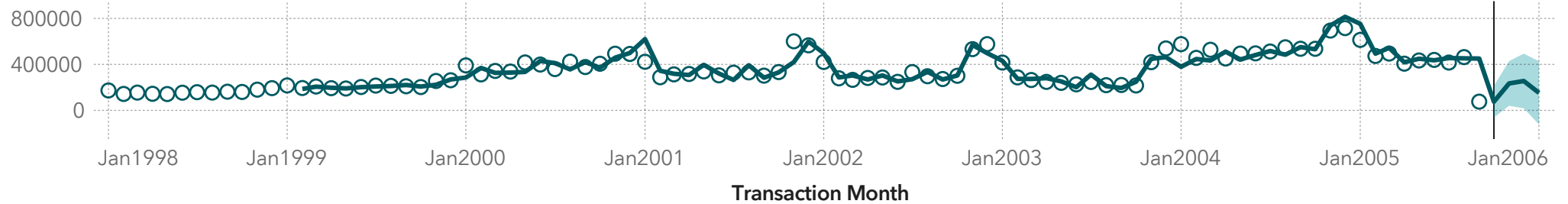
Product Sale by Transaction Month

Product Sale



Product Sale forecast by month

Product Sale



Product Sale (Model) Product Sale (Actual)

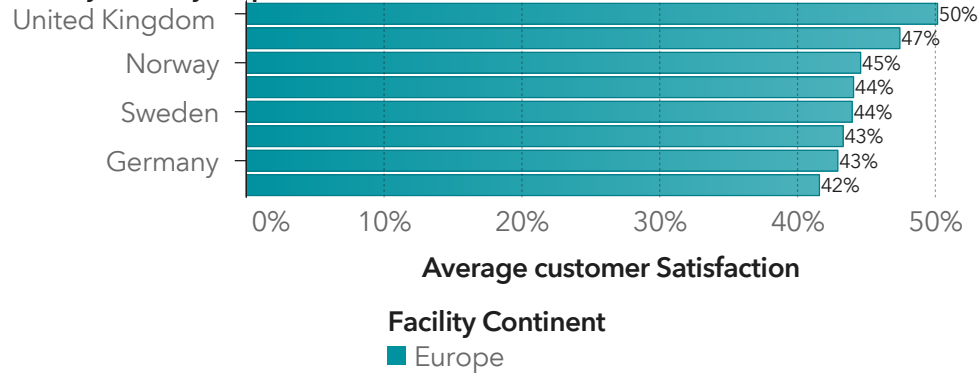
95% forecast confidence.

Task 4



Average customer Satisfaction by Facility Country map locations grouped by Facility Continent

Facility Country map locations



A1.1

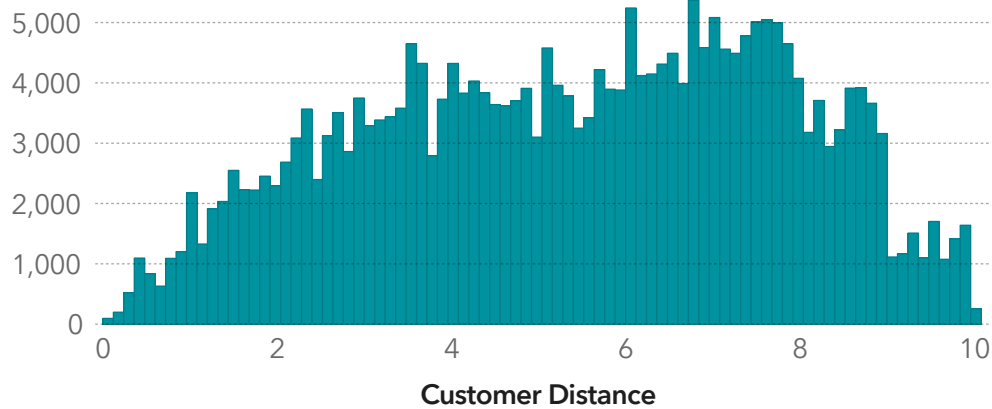
Correlation of Selected Measures



A1.2

Frequency of Customer Distance

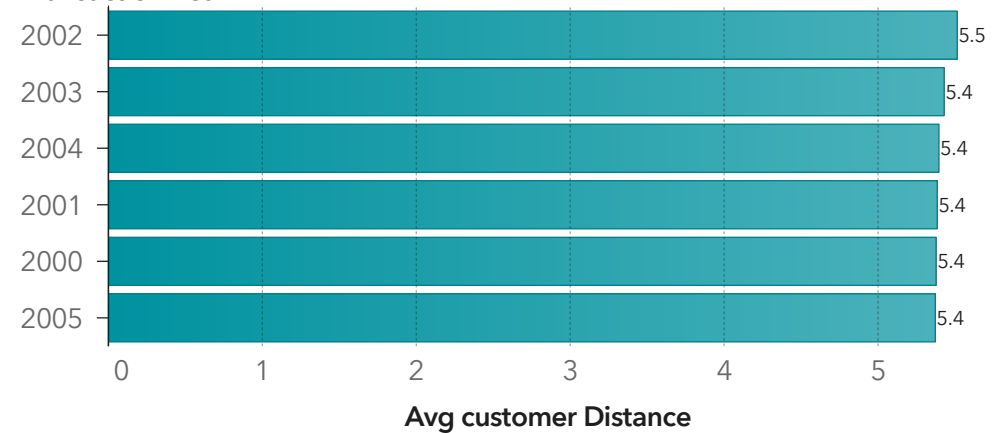
Frequency



A1.3

Avg customer Distance by Transaction Year

Transaction Year



A1.4

Task 5.1 report

This entire report consists of 4 tasks in total. All the tasks in this report/case study deal with different aspects of the data insights from Insight Toy demo data set which is also an inbuilt set of SAS viya. A brief description of the contained tasks is as follows.

Task 1 It consists of three subtasks.

1.1 In this task we have created a calculated field by using built in option of SAS create calculated field from add new data object option in tool bar on the left and then used the two columns namely Product sales and product cost of sales and subtracted them using the x-y function of SAS to get the gross margin on products.

1.2 Here I have created a product hierarchy using SAS feature 'Hierarchy' and used given values Brand line, make and product to get the desired hierarchy.

1.3 In this task I have created a Geo hierarchy for continent, country, region and city by changing the classification of each first to geo and then put in the values of corresponding latitudes and longitudes with the help of given relevant data in the dataset.

In the end I have created a drillable visualization to get the average gross margin at each level of geography.

Task 2 This task is aimed to create a visualization to get the gross margin and it has got three sub tasks.

2.1 From data objects I selected cross tab type and put in the values of continents, country etc.

2.2 I used the bar chart option from the objects to get the data of different countries in descending order of avg. gross margin with Peru having highest and US having the lowest avg. gross margin.

2.3 To do this task I used line chart with four colored lines depicting for different continents and the X axis has got value of year of sales.

Task 3 In this task I have created an interactive report to compare the product sales and customer satisfaction across different facility geographies using built in map and also forecasted four months sales using the predictive analytics feature of SAS which is forecast.

3.1 Here the size of dots represent the product sales bigger the size higher is the product sale.

3.2 Below in the second visualisation varying blue shade represent the customer satisfaction across different facility geographies.

3.3 It contains a forecast of product sales in the next four months done using forecast feature from data objects and introducing the given values of product sales as the data to help the forecast.

Task-4 Identifying the correlation between facility attributes like distance, age etc and the customer satisfaction based on those factors.

Appendix

A1.1 Average customer Satisfaction by Facility Country map locations grouped by Facility Continent

Filters: Facility Continent = 'Europe'

A1.2 Correlation of Selected Measures

Filters: Facility Continent = 'Europe'

A1.3 Frequency of Customer Distance

Filters: Facility Continent = 'Europe'

A1.4 Avg customer Distance by Transaction Year

Filters: Facility Continent = 'Europe'

Facility Continent ▲	Average gross margin ▼	Product Brand ✕
Europe	6.90	Toy
North America	6.33	Toy
South America	5.95	Toy
Asia	4.62	Toy
Europe	1.42	Novelty
North America	1.28	Novelty

Facility Country map locations ▲	Average gross margin ▼	Facility Continent ☒
Peru	6.35	South America
Argentina	6.19	South America
Chile	6.14	South America
Brazil	5.95	South America
Venezuela	5.73	South America
Colombia	5.35	South America
China	4.62	Asia
Norway	3.95	Europe
Sweden	3.71	Europe
Spain	3.58	Europe
Denmark	3.54	Europe
Italy	3.50	Europe
United Kingdom	3.50	Europe
Mexico	3.29	North America
Canada	3.28	North America
France	3.23	Europe
Germany	3.22	Europe
United States	2.94	North America

Transaction Year▲	Product Sale	Facility Continent✕
1998	1919776	North America
1999	2563739	North America
2000	1143414	Europe
2000	3606000	North America
2001	992804	Europe
2001	3451002	North America
2002	922036	Europe
2002	3171014	North America
2003	696474	Europe
2003	2330522	North America
2003	514524	South America
2004	1298342	Europe
2004	4509764	North America
2004	734550	South America
2005	16645	Asia
2005	692530	Europe
2005	2656152	North America
2005	449088	South America

Facility Country map locations ▲	Average gross margin ▼	Facility Continent ☒
Peru	6.35	South America
Argentina	6.19	South America
Chile	6.14	South America
Brazil	5.95	South America
Venezuela	5.73	South America
Colombia	5.35	South America
China	4.62	Asia
Norway	3.95	Europe
Sweden	3.71	Europe
Spain	3.58	Europe
Denmark	3.54	Europe
Italy	3.50	Europe
United Kingdom	3.50	Europe
Mexico	3.29	North America
Canada	3.28	North America
France	3.23	Europe
Germany	3.22	Europe
United States	2.94	North America

Transaction Year▲	Product Sale	Facility Continent	✕
1998	1919776	North America	
1999	2563739	North America	
2000	1143414	Europe	
2000	3606000	North America	
2001	992804	Europe	
2001	3451002	North America	
2002	922036	Europe	
2002	3171014	North America	
2003	696474	Europe	
2003	2330522	North America	
2003	514524	South America	
2004	1298342	Europe	
2004	4509764	North America	
2004	734550	South America	
2005	16645	Asia	
2005	692530	Europe	
2005	2656152	North America	
2005	449088	South America	

Bar - Product Brand 2 Supplement 1

Product Brand ▲	Gross margin ▼	Facility Continent ✕✕
Toy	2,698,502.12	North America
Novelty	1,094,379.21	North America
Toy	691,796.78	Europe
Toy	318,929.10	South America
Novelty	229,680.03	Europe
Toy	2,449.23	Asia

Geo coordinate - Facility Geographic hierarchy 1 Supplement 1

Facility Continent	Product Sale	Customer Satisfaction	Average customer Satisfaction✱✱
Asia	16645	27,982%	53%
South America	1698161	4,208,428%	79%
Europe	5745601	12,102,395%	46%
North America	24207969	59,576,475%	46%

Transaction Month▲	Product Sales📄📄📄
Jan1998	173197
Feb1998	142799
Mar1998	154668
Apr1998	144096
May1998	142060
Jun1998	153747
Jul1998	158293
Aug1998	154668
Sep1998	162443
Oct1998	160225
Nov1998	180236
Dec1998	193342
Jan1999	216736
Feb1999	194364
Mar1999	207487
Apr1999	193120
May1999	190215
Jun1999	203187
Jul1999	215502
Aug1999	212933
Sep1999	209614
Oct1999	202763
Nov1999	255735
Dec1999	262083
Jan2000	391275
Feb2000	312985
Mar2000	343091
Apr2000	337435
May2000	416953
Jun2000	398755
Jul2000	358997
Aug2000	423597
Sep2000	377039
Oct2000	405606
Nov2000	492892
Dec2000	490789
Jan2001	422659
Feb2001	288179
Mar2001	313142
Apr2001	316492
May2001	338734
Jun2001	304608
Jul2001	327917
Aug2001	330329
Sep2001	302036
Oct2001	333031
Nov2001	600960
Dec2001	565720
Jan2002	420964
Feb2002	278850
Mar2002	265437
Apr2002	281731
May2002	285935
Jun2002	248091
Jul2002	332929
Aug2002	296845
Sep2002	272637
Oct2002	300948
Nov2002	532612
Dec2002	576070
Jan2003	416039
Feb2003	286775
Mar2003	264058
Apr2003	247784
May2003	239240
Jun2003	226231
Jul2003	247021
Aug2003	218969
Sep2003	220716
Oct2003	216626
Nov2003	419220
Dec2003	538842
Jan2004	576088
Feb2004	456570
Mar2004	527201
Apr2004	451035
May2004	494180
Jun2004	495807
Jul2004	511956
Aug2004	548665
Sep2004	535873
Oct2004	535572
Nov2004	694198
Dec2004	715511
Jan2005	612913
Feb2005	473155
Mar2005	494082
Apr2005	406271
May2005	434048
Jun2005	438933
Jul2005	415907
Aug2005	463306
Sep2005	75801

Transaction Month	Product Sale (Model)	Product Sale (Actual)	Lower Confidence Interval	Upper Confidence Interval
Jan1998	.	173197	.	.
Feb1998	.	142799	.	.
Mar1998	.	154668	.	.
Apr1998	.	144096	.	.
May1998	.	142060	.	.
Jun1998	.	153747	.	.
Jul1998	.	158293	.	.
Aug1998	.	154668	.	.
Sep1998	.	162443	.	.
Oct1998	.	160225	.	.
Nov1998	.	180236	.	.
Dec1998	.	193342	.	.
Jan1999	.	216736	.	.
Feb1999	186338	194364	.	.
Mar1999	206233	207487	.	.
Apr1999	196915	193120	.	.
May1999	191085	190215	.	.
Jun1999	201902	203187	.	.
Jul1999	207732	215502	.	.
Aug1999	211877	212933	.	.
Sep1999	220708	209614	.	.
Oct1999	207396	202763	.	.
Nov1999	222775	255735	.	.
Dec1999	268840	262083	.	.
Jan2000	285477	391275	.	.
Feb2000	368902	312985	.	.
Mar2000	326109	343091	.	.
Apr2000	328724	337435	.	.
May2000	334529	416953	.	.
Jun2000	429925	398755	.	.
Jul2000	411070	358997	.	.
Aug2000	356428	423597	.	.
Sep2000	420278	377039	.	.
Oct2000	370188	405606	.	.
Nov2000	458578	492892	.	.
Dec2000	499240	490789	.	.
Jan2001	619981	422659	.	.
Feb2001	344370	288179	.	.
Mar2001	318286	313142	.	.
Apr2001	307485	316492	.	.
May2001	396011	338734	.	.
Jun2001	320536	304608	.	.
Jul2001	264849	327917	.	.
Aug2001	392517	330329	.	.
Sep2001	283771	302036	.	.
Oct2001	330603	333031	.	.
Nov2001	420317	600960	.	.
Dec2001	598856	565720	.	.
Jan2002	497590	420964	.	.
Feb2002	286484	278850	.	.
Mar2002	303812	265437	.	.
Apr2002	268788	281731	.	.
May2002	303973	285935	.	.
Jun2002	251808	248091	.	.
Jul2002	271401	332929	.	.
Aug2002	335340	296845	.	.
Sep2002	268552	272637	.	.
Oct2002	303632	300948	.	.
Nov2002	568877	532612	.	.
Dec2002	497372	576070	.	.
Jan2003	431315	416039	.	.
Feb2003	273925	286775	.	.
Mar2003	273363	264058	.	.
Apr2003	280351	247784	.	.
May2003	251988	239240	.	.
Jun2003	201396	226231	.	.
Jul2003	311068	247021	.	.
Aug2003	210937	218969	.	.
Sep2003	194761	220716	.	.
Oct2003	249027	216626	.	.
Nov2003	448290	419220	.	.
Dec2003	462678	538842	.	.
Jan2004	378811	576088	.	.
Feb2004	446824	456570	.	.
Mar2004	433852	527201	.	.
Apr2004	510927	451035	.	.
May2004	442491	494180	.	.
Jun2004	481171	495807	.	.
Jul2004	516597	511956	.	.
Aug2004	483904	548665	.	.
Sep2004	550412	535873	.	.
Oct2004	531783	535572	.	.
Nov2004	738166	694198	.	.
Dec2004	813820	715511	.	.
Jan2005	752757	612913	.	.
Feb2005	493395	473155	.	.
Mar2005	543786	494082	.	.
Apr2005	417916	406271	.	.
May2005	449415	434048	.	.
Jun2005	435675	438933	.	.
Jul2005	455082	415907	.	.
Aug2005	452616	463306	.	.
Sep2005	450514	75801	.	.
Oct2005	75499	.	-62014	213012
Nov2005	234125	.	39653	428598
Dec2005	255438	.	17259	493617
Jan2006	152841	.	-122185	427866

Dependent Variable	Algorithm
Product Sale	ARIMA: Product Sale ~ D = (1,12) NOINT



Forecast Summary



The forecasting object uses statistical trends in your data to predict future values. It automatically tests multiple forecasting models against the specified data items and then selects the best model for each one.

The selected model for Product Sale is ARIMA: Product Sale ~ D = (1,12) NOINT, displayed with a 95% confidence interval. A 95% confidence interval is the predicted data range that will contain future values of Product Sale with 95% confidence.

Historical values of Product Sale are displayed as markers only, without a line. The chart displays predicted values (hindcast) as part of the forecast line. Some forecasting models include delayed effects, in which case the hindcast will not begin at the start of the MONTH axis.

Facility Country map locations ▲	Average customer Satisfaction ▼	Facility Continent ✕
United Kingdom	50%	Europe
Spain	47%	Europe
Norway	45%	Europe
Italy	44%	Europe
Sweden	44%	Europe
Denmark	43%	Europe
Germany	43%	Europe
France	42%	Europe

Correlation - Customer Satisfaction 1 Supplement 1

X Axis	Y Axis	Correlation
Customer Satisfaction	Customer Distance	-0.1316

Customer Distance (lower)	Customer Distance (upper)	Frequency
0.0	0.1	95
0.1	0.2	198
0.2	0.4	519
0.4	0.5	1,095
0.5	0.6	836
0.6	0.7	630
0.7	0.8	1,090
0.8	1.0	1,201
1.0	1.1	2,175
1.1	1.2	1,328
1.2	1.3	1,910
1.3	1.4	2,033
1.4	1.6	2,549
1.6	1.7	2,226
1.7	1.8	2,223
1.8	1.9	2,453
1.9	2.0	2,294
2.0	2.2	2,685
2.2	2.3	3,085
2.3	2.4	3,566
2.4	2.5	2,397
2.5	2.6	3,125
2.6	2.8	3,507
2.8	2.9	2,861
2.9	3.0	3,748
3.0	3.1	3,291
3.1	3.2	3,384
3.2	3.4	3,437
3.4	3.5	3,580
3.5	3.6	4,646
3.6	3.7	4,323
3.7	3.8	2,791
3.8	4.0	3,729
4.0	4.1	4,322
4.1	4.2	3,830
4.2	4.3	4,030
4.3	4.4	3,836
4.4	4.6	3,640
4.6	4.7	3,619
4.7	4.8	3,703
4.8	4.9	3,909
4.9	5.0	3,100
5.0	5.2	4,578
5.2	5.3	3,959
5.3	5.4	3,783
5.4	5.5	3,249
5.5	5.6	3,422
5.6	5.8	4,219
5.8	5.9	3,895
5.9	6.0	3,881
6.0	6.1	5,241
6.1	6.2	4,121
6.2	6.4	4,147
6.4	6.5	4,311
6.5	6.6	4,490
6.6	6.7	3,989
6.7	6.8	5,370
6.8	7.0	4,585
7.0	7.1	5,083
7.1	7.2	4,559
7.2	7.3	4,490
7.3	7.4	4,778
7.4	7.6	5,009
7.6	7.7	5,046
7.7	7.8	4,993
7.8	7.9	4,647
7.9	8.0	4,075
8.0	8.2	3,179
8.2	8.3	3,708
8.3	8.4	2,945
8.4	8.5	3,220
8.5	8.6	3,912
8.6	8.8	3,918
8.8	8.9	3,662
8.9	9.0	3,160
9.0	9.1	1,113
9.1	9.2	1,168
9.2	9.4	1,509
9.4	9.5	1,097
9.5	9.6	1,702
9.6	9.7	1,075
9.7	9.8	1,413
9.8	10.0	1,639
10.0	10.1	251

Bar - Transaction Year 1 Supplement 1

Transaction Year ▲	Avg customer Distance ✖✖
2002	5.5
2003	5.4
2004	5.4
2001	5.4
2000	5.4
2005	5.4