

CLUSTERING

How to segment our customers?

Sample Data Exploration

Clustering Attributes

Clustering Features

Project Closure

One of the main concerns of financial institutions today is the trade policy that they must apply with their customers about cash withdrawals at ATMs from Royal Decree-Law 11/2015, of 2 October, which regulates fees cash withdrawals at ATMs.

For this reason, we will make a classification of our customers based in 6 attribute:

- * F1 = Amount of cash withdrawals made at ATMs of the own entity (On Us)
- * F2 = Amount of cash withdrawals at ATMs of an entity different than their entity but belong to the same System (Intra-System)
- * F3 = Amount of cash withdrawals at ATMs of an entity outside their System (Inter-System)
- * F4 = number of cash withdrawals made at ATMs of the own entity (On Us)
- * F5 = number of cash withdrawals of an entity different than theirs but belong to the same System (Intra-System)
- * F6 = number of ATM cash withdrawals made in an entity from different System than theirs (Inter-System)

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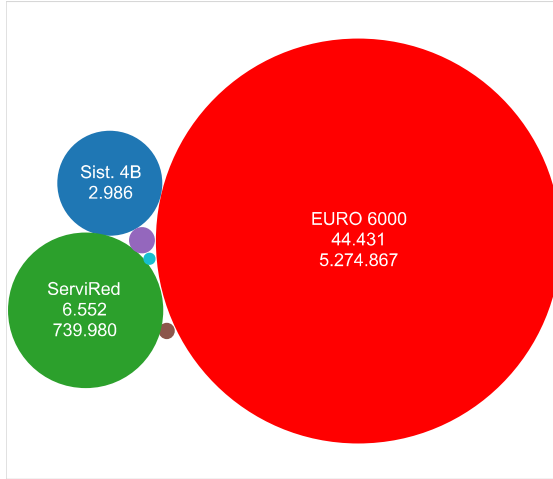
Sample Data Exploration

Clustering Attributes

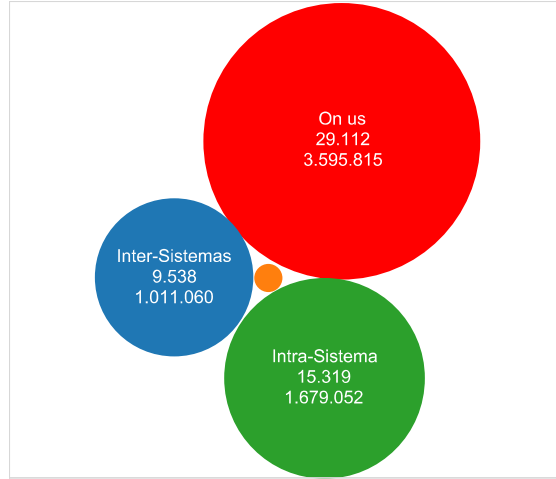
Clustering Features

Project Closure

Withdrawal for Acquirer



Withdrawal for Area



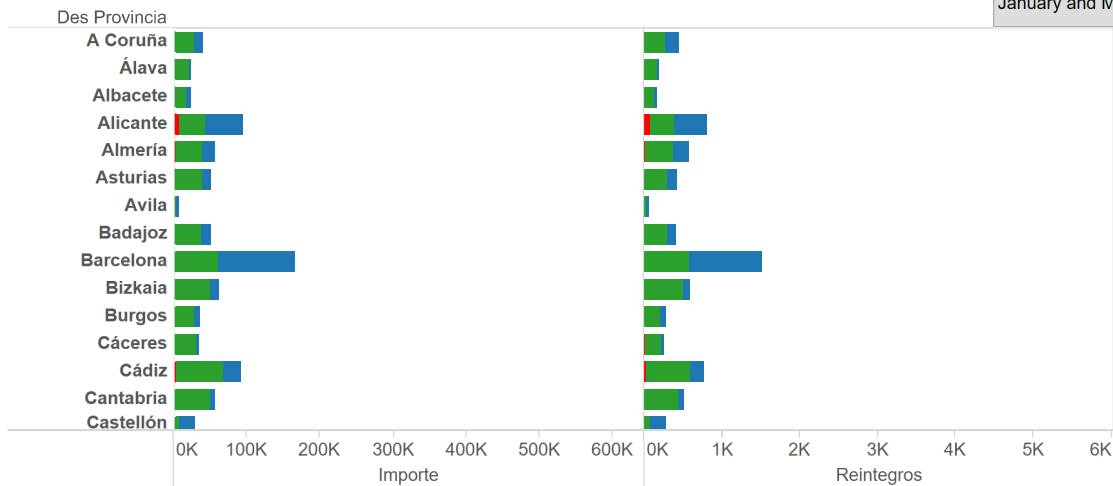
Acquirer Type

Eufiserv
EURO 6000
MC Int.
ServiRed
Sist. 4B
Visa Int.

Area

Inter-Sistemas
Intercambio Internac..
Intra-Sistema
On us

Withdrawal for Area and Location



We analyzed a random sample of 50,000 withdrawals at ATMs between January and March 2016

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Attributes

cluster	Avg. F1 (tablea..	Avg. F2 (tablea..	Avg. F3 (tablea..	Avg. F4 (tablea..	Avg. F5 (tablea..	Avg. F6 (tablea..
0	75,1	2,7	3,7	1,9	0,1	0,1
1	46,6	109,4	48,1	0,5	1,7	0,5
2	44,2	15,9	124,9	0,5	0,4	1,6
3	455,7	2,7	7,0	1,9	0,0	0,1

Scaled attributes

cluster	Avg. F1. scaled	Avg. F2. scaled	Avg. F3. scaled	Avg. F4. scaled	Avg. F5. scaled	Avg. F6. scaled
0	-0,208	-0,275	-0,319	0,789	-0,368	-0,462
1	-0,383	1,360	0,129	-0,866	2,321	0,214
2	-0,398	-0,073	0,904	-0,902	-0,016	2,040
3	2,133	-0,274	-0,286	0,730	-0,413	-0,480

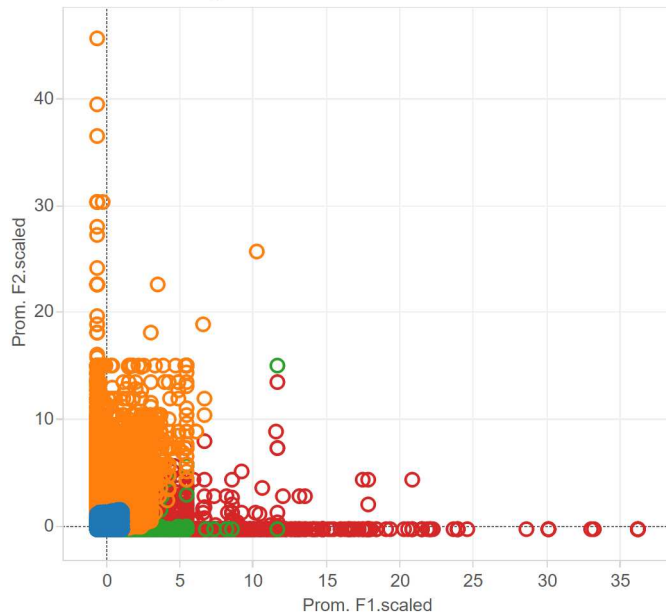
Cluster 0: customers who made withdrawal especially at ATMs of their own entity and not for very high amounts

Cluster 1: customers who withdraw cash mainly at ATMs in entities of the same system, but especially in differents entities than theirs

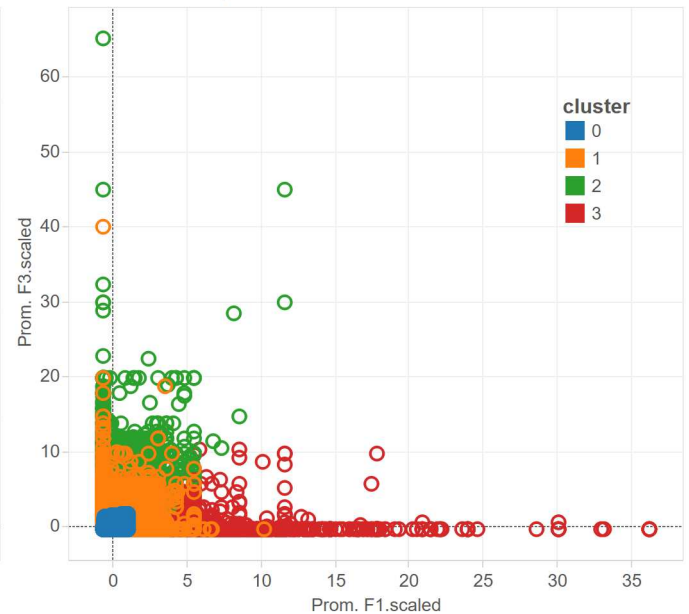
Cluster 2: customers who withdraw cash especially in entities that do not belong to the same system that their System

Cluster 3: customers who made withdrawals especially at ATMs of the same entity but for very high amounts

On Us VS Intra-System



On Us VS Inter-System



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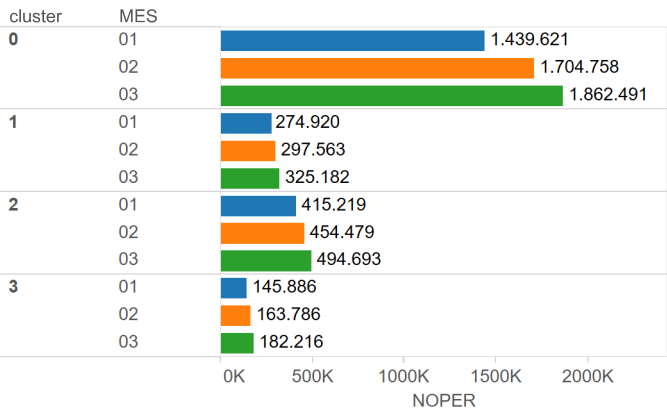
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Clustering Attributes

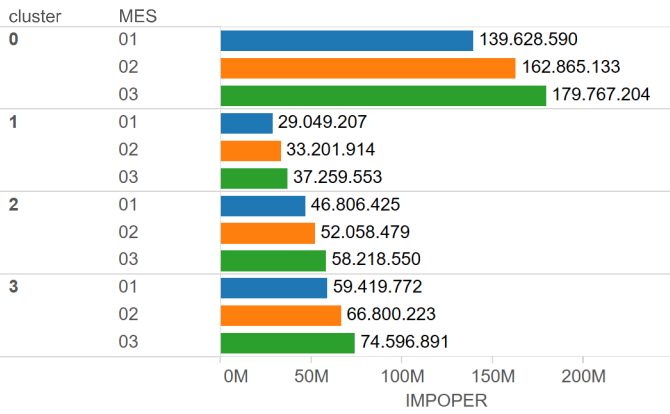
Clustering Features

Project Closure

Withdrawal for Cluster and Month



Amount for Cluster and Month

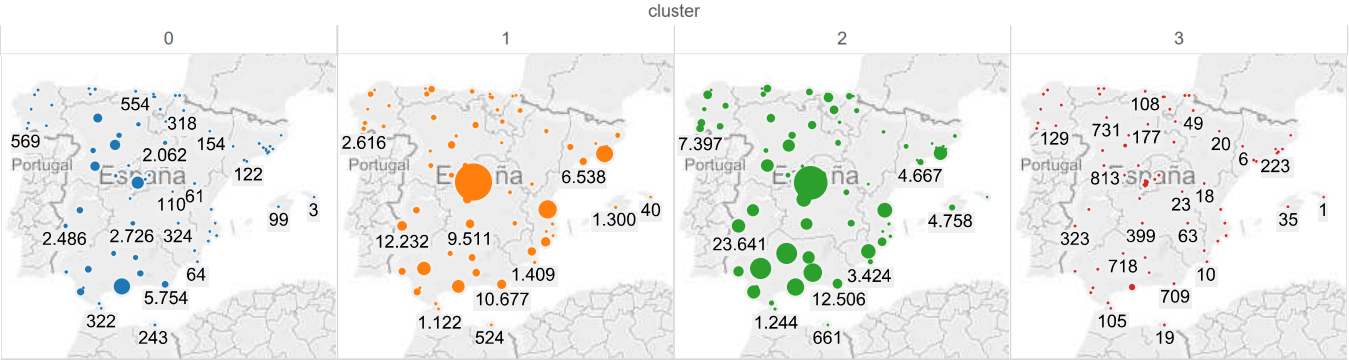


Customers

cluster	N° customers	Average withdraw..	Average Amount
0	541.509	1	100
1	150.468	1	117
2	189.295	1	128
3	109.124	1	427

Most of our customers belong to the group 0. If you look at the map you can see that this cluster has more presence in Andalusia which coincides with the location of one of our major institutions.

Clusters for City



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With the data that we have, maybe we should reduce clusters to 3, so that we join the clusters 0 and 3 because both groups are made up of customers who mainly withdraw money at ATMs of its own entity (the difference between them is based on the amount of such transactions).

In this way, maybe we have to simplify our clustering and classify our customers as follows:

- * Cluster 0 + 3: customers who made withdrawal especially at ATMs of their own entity.
- * Cluster 1: customers who withdraw cash mainly at ATMs in entities of the same system, but especially in different entities than theirs
- * Cluster 2: customers who withdraw cash especially in entities that do not belong to the same system than their System