

Will a Customer Accept the Coupon?

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Preliminary Data Cleaning:

A preliminary data cleaning has been carried out, to correct NaN values present, eliminate useless data (e.g. column Car) and structure the dataset to make the analysis easier.

Part 1: Bars

1. Frequency at Bars:

Acceptance rate of the whole bar-coupon dataset is **41%**. I found that drivers already used to bars (at least 1 time per month) are much more likely to accept coupons: indeed the rate increases considerably.

Acceptance rate of those who went to a bar 3 or fewer times a month: **37.1%**

Acceptance rate of those who went to a bar >3 times a month: **76.9%**

This is also well evident by the plots, where bars "greater than 8" and "4-8" have higher accepted percentages than the others. It is also interesting to observe that said categories (gt8, 4-8) have a lower number of distributed coupons: this makes sense, since these persons are already good customers, so it is better to focus on persons who currently do not come often to bars (≤ 3 times per month).

2. Frequency and Age

Acceptance rate of drivers who go to a bar more than once a month and are over the age of 25: **69.5%**

Acceptance rate of others: **33.5%**

The percentages suggest the first group is more likely to accept a coupon.

Regarding the age, the analysis shows how there is a difference between under and over 25y (48% vs 38%): the population older than 25y has a lower acceptance rate and this could explain the lower percentage compared to point. However, if I compare the acceptance rates reported above with the ones only depending on the frequency (>1 per month, 69% and 29%), they are not quite different. This suggests to me that age and frequency are not very correlated.

3. Considering Other Characteristics:

Acceptance rate of drivers who go to bars more than once a month and had passengers that were not a kid and had occupations other than farming, fishing, or forestry: **71.3%**

Acceptance rate of others: **29.6%**

Acceptance rate of drivers who go to bars more than once a month and are under the age of 30: **72.2%**

Acceptance rate of others: **34.6%**

Acceptance rate of drivers who go to cheap restaurants more than 4 times a month and income is less than 50K: **45.3%**

Acceptance rate of others: **40.1%**

Regarding the combinations "frequency >1 AND passenger NO Kids AND job in farming" vs "frequency >1 AND passenger NO Kids AND marital status Widow" they have the same acceptance rate because the population with "frequency >1" hasn't anyone in farming or widow: this means we are considering the same group twice. Therefore, drivers often at bars are unlikely in farming and widows. Another insight is related to the kids onboard: if drivers with a frequency >1 have an acceptance rate of 69%, the ones without kids onboard have an acceptance rate of 71.3%. This means that no-kids onboard could slightly increase the acceptance rate: this makes sense, since a bar isn't a place for kids... In general drivers alone are ones receiving more coupons for bars, and the ones more responsive are the ones driving with friends.

Regarding the group of drivers going to cheap restaurants AND with an income <50k, the acceptance rate is 45%. Looking at the distribution of coupons as a function of income, the most covered classes are the low incomes (<62.5k) and the high incomes(>100k): therefore the population here is a good insight into a wide portion of drivers. Regarding the frequency at cheap restaurants, this actually affects the number of distributed bar coupons: the biggest targets are drivers going to cheap restaurants 1-8 times per month (1-3 highest group). The population here investigated (>4 per month) is not the biggest one, but it isn't negligible though. Regarding both income and frequency at cheap restaurants, both covered categories (income <50k, frequency >4 per month) show an average acceptance percentage of 40-45% each: the combined one is very close.

Part 2: Coffee Houses

Before deciding which type of coupon I want to investigate, I recovered the initial plot of coupons distributed to the drivers: this allowed me to see how they are distributed. The most common coupon is the one for "Coffee Houses" (nearly 4k coupons distributed). The plot is very clear in reporting an acceptance rate close to **50%**.

As observed in the previous dataset, being already a customer increases the acceptance rate: a frequency of >1 per month provides an acceptance rate of **66%**.

Since I observed that frequency at Coffee Houses highly affects the acceptance rate, I tried to link the following considerations to this feature.

Regarding the "age", as observed in the "Bar" analysis, this doesn't have a huge impact on the analysis: there is a slightly higher acceptance ratio for drivers <30y over older drivers. By looking at the younger group there is an improvement of 3% (from **50%** to **53%**) and the same improvement can be observed limiting the analysis to the group more used to Coffee Houses, >1 per month (from **66%** to **69%**).

"Education" looks related to this analysis. The more targeted drivers are the ones with advanced instruction diplomas: this makes sense to me, since Coffee Houses seem a nice place to study or to meet cohorts. Restricting the analysis to drivers already used to Coffee Houses further highlights the tendency and also increases the accepted ratios (all well above **>50%**).

"Income" provides an insight similar to the one observed for Bars: low incomes and very high incomes (>100k) are the most targeted by coupon distribution. Regarding the acceptance rate, it looks like that low incomes (<62.5k) are more likely to accept coffee coupons: said low incomes indeed have an acceptance rate of **55%** vs 49% of higher incomes. Frequency affects the percentages as a bias, drifting the values to 71% vs 65%.

"Occupation" covers a wide range of jobs. It is interesting to see which ones are very unlikely to either receive a coupon or accept it. There is a general tendency to increase the acceptance ratio by restricting the analysis to the habitual customers (minimum acceptance rate from 40% to 60%). One consideration: one of the most targeted groups is "Students" and this agrees with the considerations done regarding "Education".

Regarding the onboard passengers, there is a clear tendency in distributing coupons to alone drivers: this makes sense to me, because everyone is more willing to stop for a coffee when with others. Involving only habitual customers, the trend of distributed numbers doesn't change much but the acceptance ratios are very pushed: drivers with a frequency of >1 per month with Friend(s) or Partner have an acceptance rate close to **80%**. This seems like a very interesting parameter.

Very few coffee coupons are distributed for places further than 25 minutes.

Coffee coupons are distributed throughout the whole day, with much less frequency at 10PM: this is not a very appealing time for a coffee. Regarding whether and temperature, there is a clear peak in distributed coupons during sunny and warm days.

I tried to relate the destination of the trip to the "passenger(s)" and the "time" of the trip.

a - Destination vs Passenger(s):

- There is a clear tendency to accept coupons with any passenger, if the trip is to a no-urgent place. As already observed, "Friends" and "Partner" in particular increase the acceptance rate.
- "Work" as destination is for solo drivers only (44% acceptance)
- "Home" as destination is for drivers alone (35% accepted) or with the partner (55% accepted)

b - Destination vs Time:

- When traveling to no-urgent place, I wasn't surprised to see that no coupons are distributed early in the morning (7AM). The most popular accepted time is 10AM (64% accepted)
- When traveling to work the only time covered is of course early morning (7AM), 45% accepted.
- When traveling to Home, the only times are late afternoon or evening (6PM, 10PM), they do not look very appealing.

Relating gender and marital status, it is evident that males are more open to accepting coupons, in particular Single and Divorced ones.

Looking at the habits with other shops, i see that there are many accepted coffee coupons among drivers going:

- less 1 per month at good restaurants
- going 1-3 times per month to cheap restaurants
- less 3 times per month to bars
- 1-8 times per month to Carry Aways

To conclude, I try to identify some potential "**TOP**" groups very likely to accept a coffee coupon. For instance, one group with a very high acceptance rate is:

drivers with a coffee house frequency more than 1 per month AND income <50k AND Friends as passengers AND job in Tech → Acceptance rate: **95%** (acceptance rate of drivers not included is 49%).

The analysis revealed that the insights gained could provide valuable indications to maximize the return of the coupons sent.