PDFRpoert

my_name

2023-08-25

#load libraries

```
library(tidyverse)
library(knitr)
library(corrplot)
#library(kableExtra)
```

load data

```
space<- read_csv("SPACE_wide_2022.csv")
```

```
## Warning: One or more parsing issues, call `problems()` on your data frame for details,
## e.g.:
##   dat <- vroom(...)
##   problems(dat)
```

```
## Rows: 39766 Columns: 224
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr   (2): ID, COUNTRY
## dbl (221): ROUND, MONTH, WEEKDAY, LANG, D1, D6_1, D6_2A, D6_2B, Q1_1, Q1_2, ...
## lgl   (1): QA7AII_8
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
space[space==999998] <- NA
```

Data preparatio

```
df<- space %>%
  select(AGE, D1, EDUCATION, D6_1, D6_2A, D6_2B, HHSIZE, DEPCHILDREN, INCOME,COUNTRY,
         QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D,
         starts_with(c("QA5A_", "QA6A_","QA7A_","QA7AI_", "QA7AII_","QA8A_", "QA8AI_1")))%>%
```

```
  mutate(AGE=case_when(AGE==1~"18-24",
                       AGE==2~"25-29",
                       AGE==3~"30-34",
                       AGE==4~"35-39",
                       AGE==5~"40-44",
                       AGE==6~"45-49",
                       AGE==7~"50-54",
                       AGE==8~"55-59",
                       AGE==9~"60-64",
                       AGE==10~"64-69",
                       AGE==11~"70-74",
                       AGE==12~"75+"),
         D1=case_when(D1==1~'Male',
                      D1==2~"Female",
                      D1==3~"Other, non-binary"),
         EDUCATION= case_when(EDUCATION==1~"Primary/lower secondary education",
                              EDUCATION==2~"Upper/post-secondary education",
                              EDUCATION==3 ~"University/PhD/research",
                              EDUCATION=='=999998'~"Refusal / No answer"),
         D6_1= case_when(D6_1==1~"Self-employed",
                         D6_1==2~"Employee",
                         D6_1==3~"Without a professional activity or student",
                         D6_1=="999998"~"Refusal / No answer"),
         D6_2A= case_when(D6_2A==1~"General management, director or top management",
                          D6_2A==2~"Middle management or other management (e.g. department head)",
                          D6_2A==3~"Employed professional (e.g. doctor, lawyer, accountant, architect)"
                          D6_2A==4~"Employed position, working mainly at a desk",
                          D6_2A==5~"Employed position, not at a desk",
                          D6_2A==6~"Manual worker",
                          D6_2A==7~"Other employee",
                          D6_2A==999998~"Refusal / No answer"),
         D6_2B= case_when(D6_2B==1~ "Responsible for housework (e.g. ordinary shopping, looking after h
                          D6_2B==2~ "Student (full-time)",
                          D6_2B==3~ "Unemployed or temporarily not working",
                          D6_2B==4~ "Retired or unable to work through illness",
                          D6_2B==5~ "Other",
                          D6_2B==999998~    "Refusal / No answer"),
         INCOME= case_when(INCOME==1~   "EUR 750 or less",
                           INCOME==2~   "Between EUR 751 and EUR 1,500",
                           INCOME==3~   "Between EUR 1,501 and EUR 2,500",
                           INCOME==4~"Between EUR 2,501 and EUR 4,000",
                           INCOME==5~   "More than EUR 4,000",
                           INCOME==999998~  "Refusal")

  )
```

Correlation for Demographic

```
### correlation ####
df_cor<- space %>%
  select(AGE, D1, EDUCATION, D6_1, D6_2A, D6_2B, HHSIZE, DEPCHILDREN, INCOME)
```

```
df_cor[df_cor>100]<- NA

cor_mat<-cor(df_cor,use='pairwise.complete.obs')
```

```
## Warning in cor(df_cor, use = "pairwise.complete.obs"): the standard deviation
## is zero
```

```
corrplot(cor_mat, method = 'number',col = COL2('RdYlBu', 2),
         type = 'lower', tl.col='black')
```

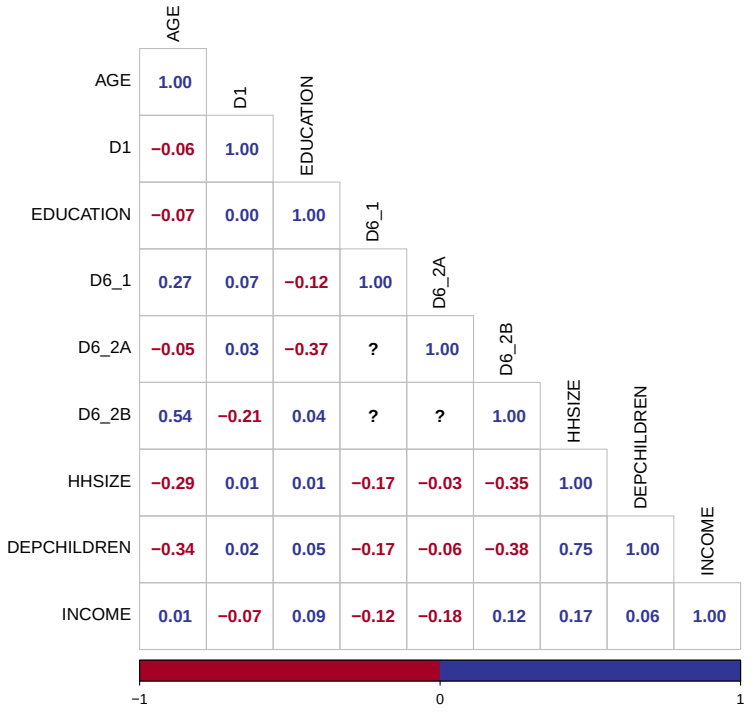


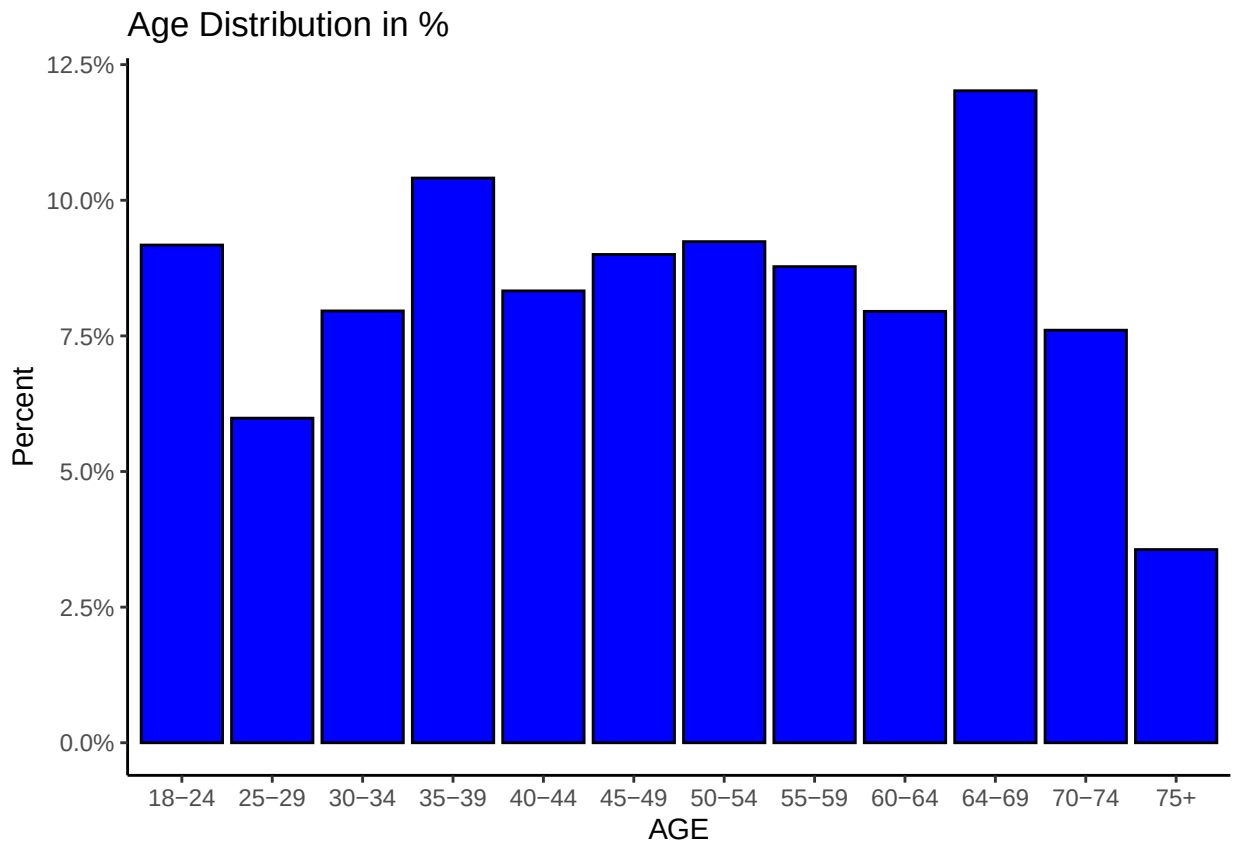
Figure 1: Correlation Matrix

The correlation matrix depicts the relationships between various variables. Notable correlations include a moderate positive relationship between AGE and D6_2B (0.5399) and a strong positive relationship between HHSIZE and DEPCHILDREN (0.7473), suggesting larger households tend to have more dependent children. There's a moderate negative correlation between DEPCHILDREN and both AGE (-0.3418) and HHSIZE (-0.3834), implying that as the number of dependent children increases, household size and the age of respondents tend to decrease. Education shows a strong negative correlation with D6_2A (-0.3705), suggesting that higher education levels are associated with less agreement with a particular statement (D6_2A). Additionally, D1 exhibits a moderate negative correlation with D6_2B (-0.2106), implying that as the level of agreement with D1 increases, agreement with D6_2B tends to decrease. However, some correlations, like D6_1 with D6_2A and D6_2B, have missing values, indicating a lack of correlation data for these pairs.

Visualization of the variables

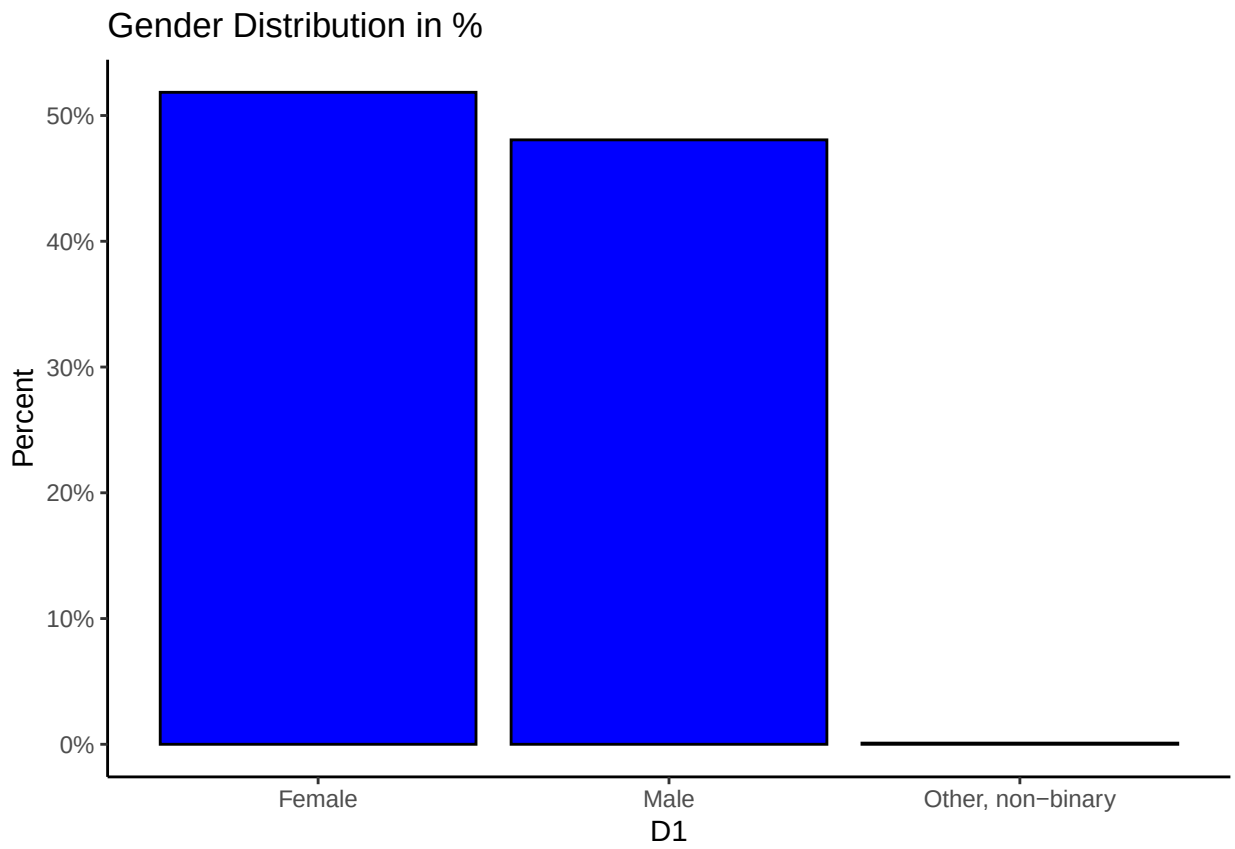
```
ggplot(df, aes(AGE)) +
  geom_bar(aes(y = (..count..)/sum(..count..)), fill="blue", color="black") +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Age Distribution in %")+
  theme_classic()
```

```
## Warning: The dot-dot notation (‘..count..‘) was deprecated in ggplot2 3.4.0.
## i Please use ‘after_stat(count)‘ instead.
## This warning is displayed once every 8 hours.
## Call ‘lifecycle::last_lifecycle_warnings()‘ to see where this warning was
## generated.
```



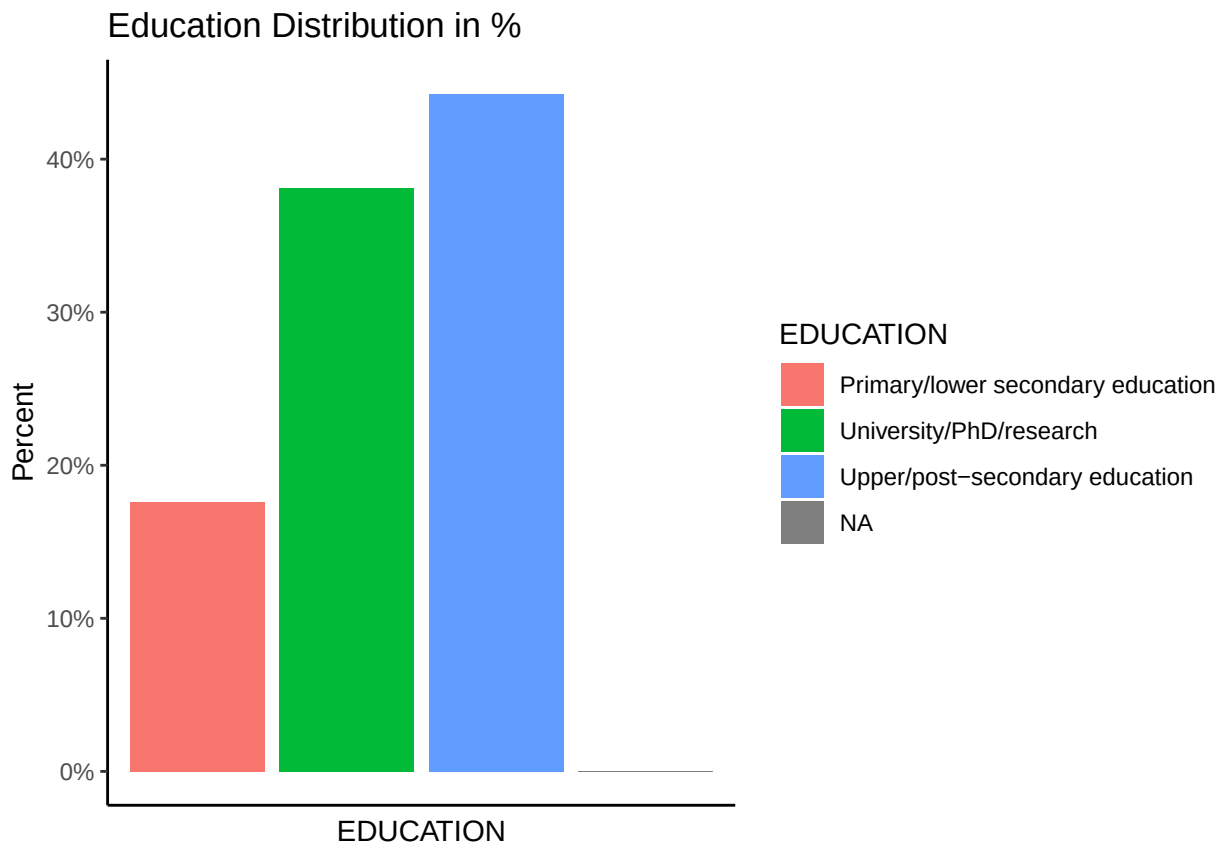

```
#The plot shows that most of the people who took part in the
# survey falls between 64-69 years of age. The group with over 75 years had the least people
```

```
# Gender
ggplot(df, aes(D1)) +
  geom_bar(aes(y = (..count..)/sum(..count..)),fill="blue", color="black") +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", fill="day") +
  labs(y = "Percent", title = "Gender Distribution in %")+
  theme_classic()
```



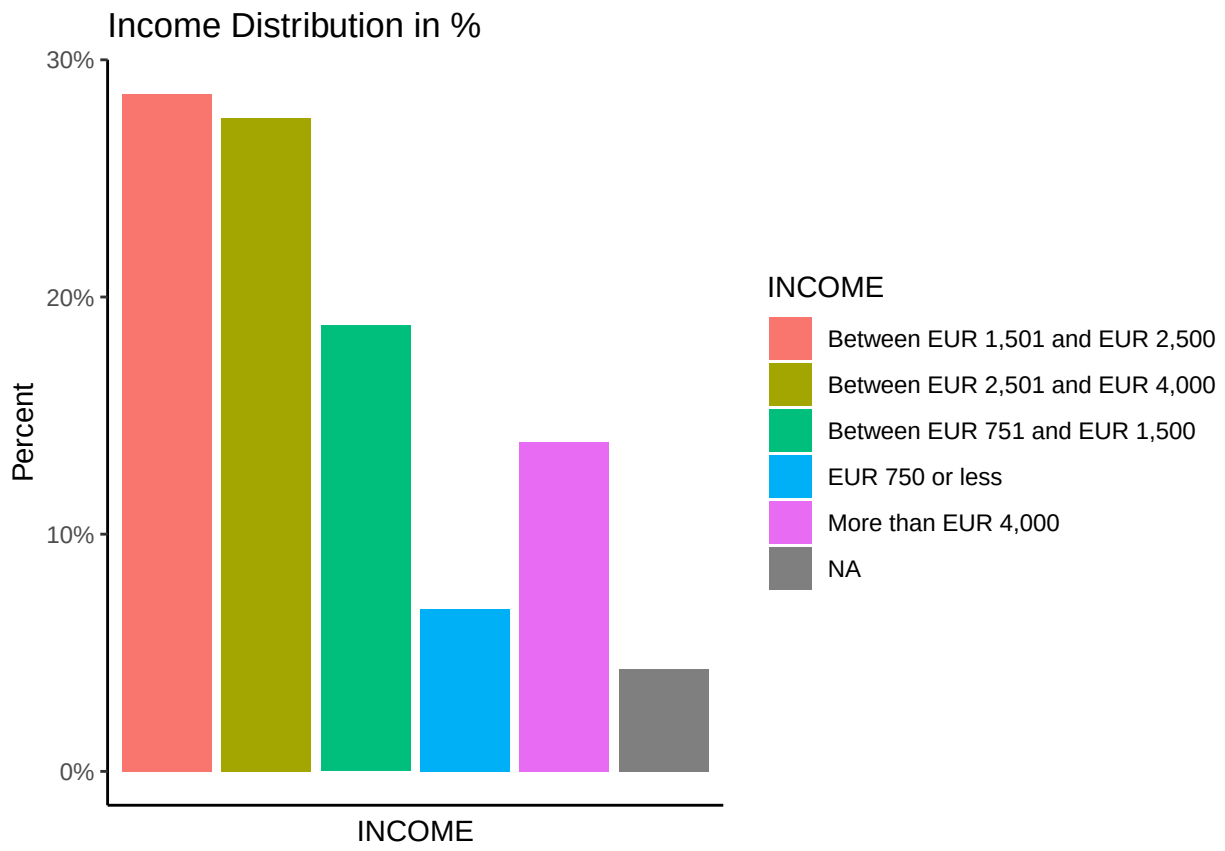

```
#Females are slightly higher than males in the survey.
```

```
# Education
ggplot(df, aes(EDUCATION, fill=EDUCATION)) +
  geom_bar(aes(y = (..count..)/sum(..count..))) +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Education Distribution in %")+
  theme_classic()+
  theme(axis.text.x = element_text(angle = 30, vjust = 0.5, hjust=1))+
  theme(
    # axis.title.x = element_blank(),
    axis.text.x = element_blank(),
    axis.ticks.x = element_blank()
  )
```



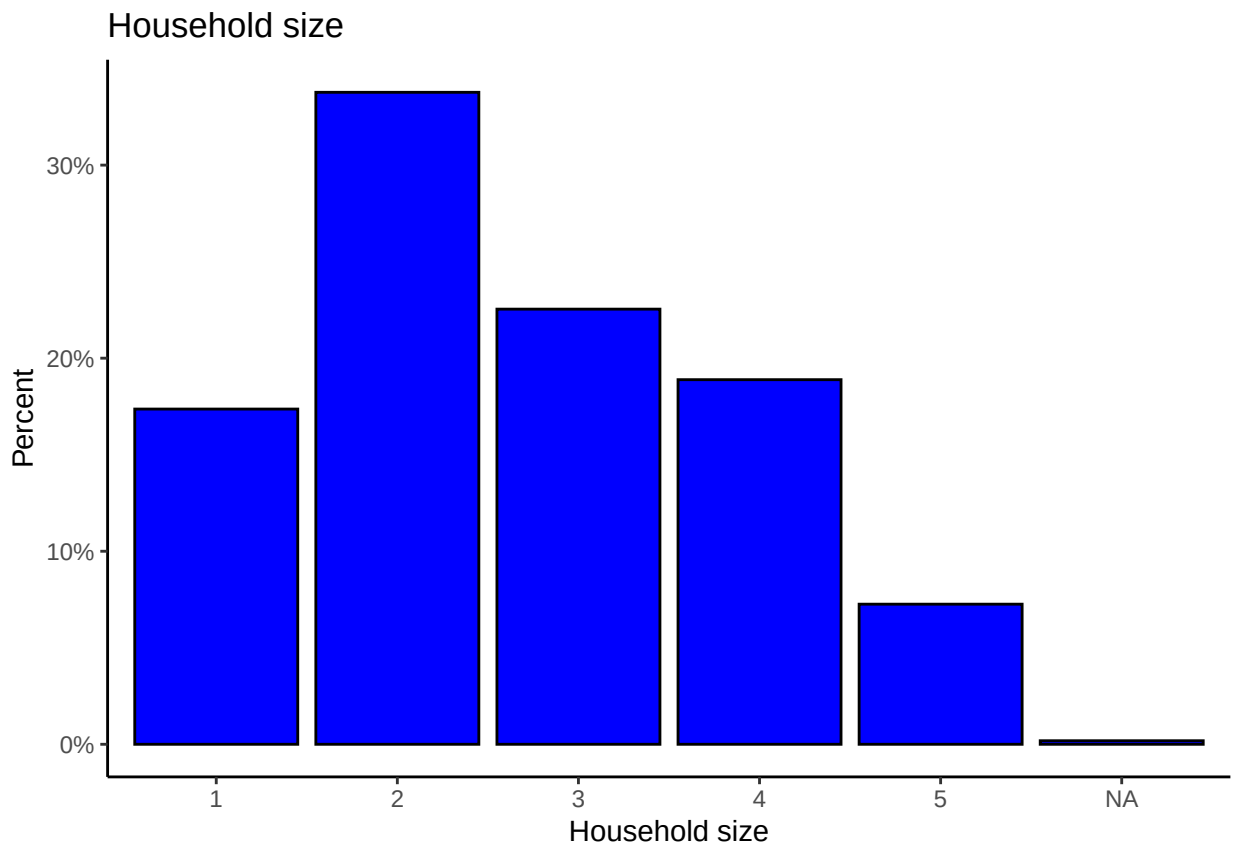

```
# most the people who took part in the survey have attained secondary education.
```

```
#Income
ggplot(df, aes(INCOME, fill= INCOME)) +
  geom_bar(aes(y = (..count..)/sum(..count..))) +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Income Distribution in %")+
  theme_classic()+
  theme(axis.text.x = element_text(angle = 30, vjust = 0.5, hjust=1))+
  theme(
    # axis.title.x = element_blank(),
    axis.text.x = element_blank(),
    axis.ticks.x = element_blank()
  )
```



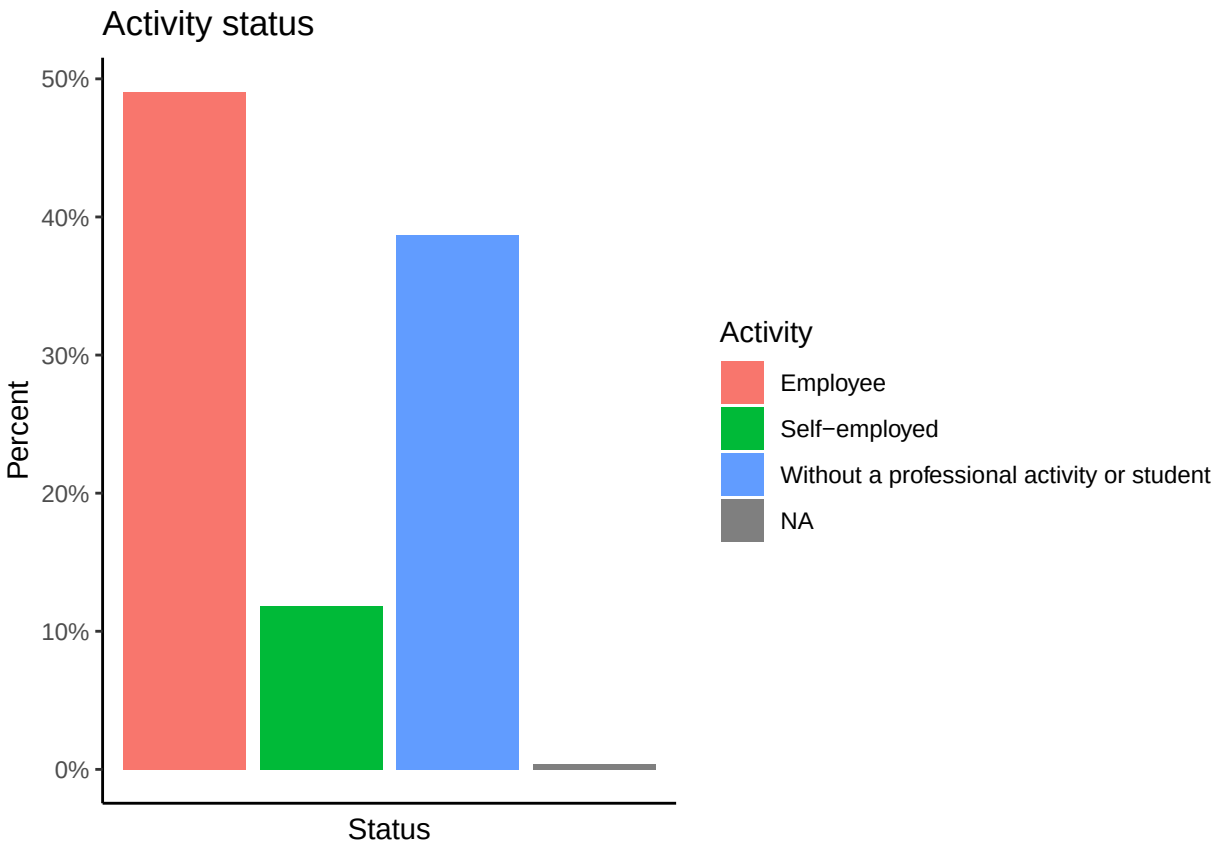

```
#Majority of the people earn between 1510 and 2500 euros
```

```
#HHSIZE
ggplot(df, aes(factor(HHSIZE))) +
  geom_bar(aes(y = (..count..)/sum(..count..)),fill="blue", color="black") +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Household size",
       x="Household size")+
  theme_classic()
```



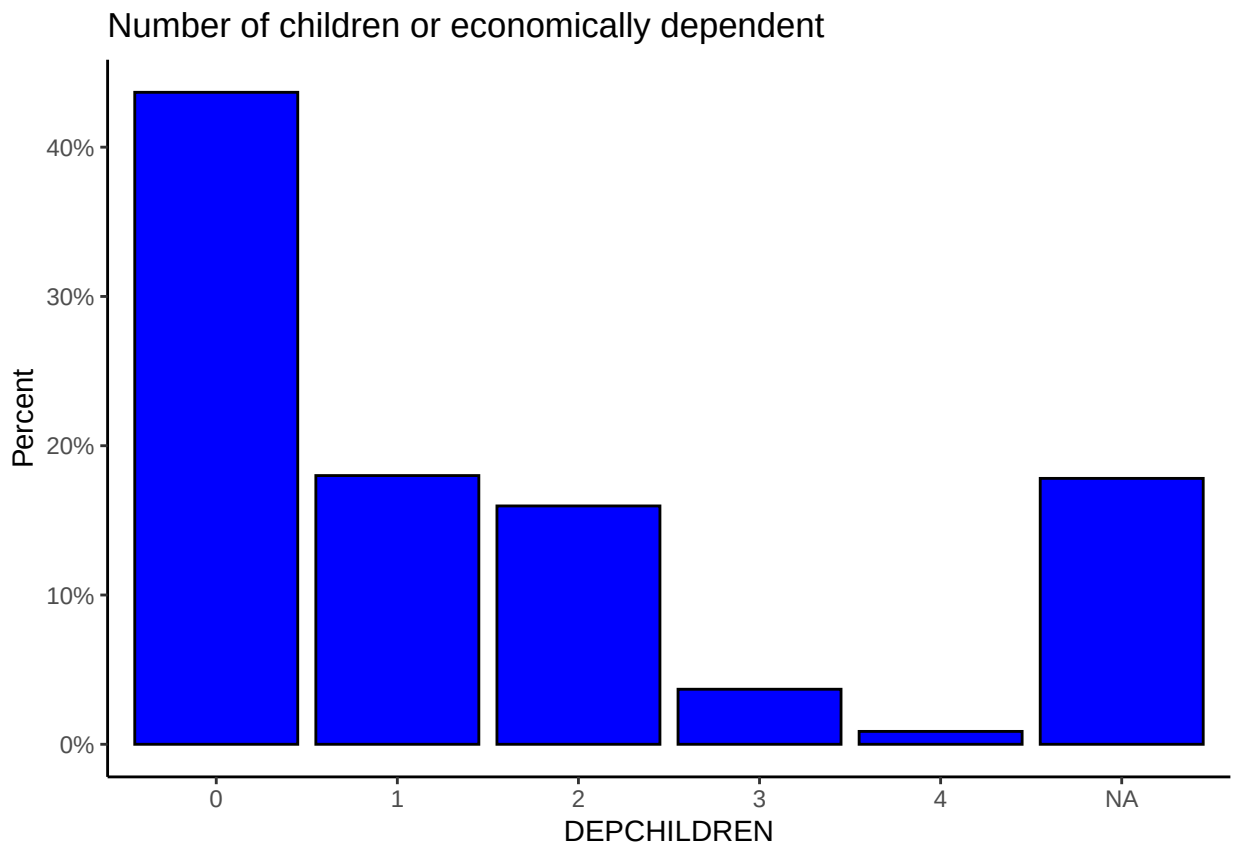

```
#majority of the households have atmost 2 people per household.
```

```
#Activity status
ggplot(df, aes(factor(D6_1), fill=factor(D6_1))) +
  geom_bar(aes(y = (..count..)/sum(..count..))) +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Activity status",
       x="Status",fill="Activity")+
  theme_classic()+
  theme(
    # axis.title.x = element_blank(),
    axis.text.x = element_blank(),
    axis.ticks.x = element_blank()
  )
```



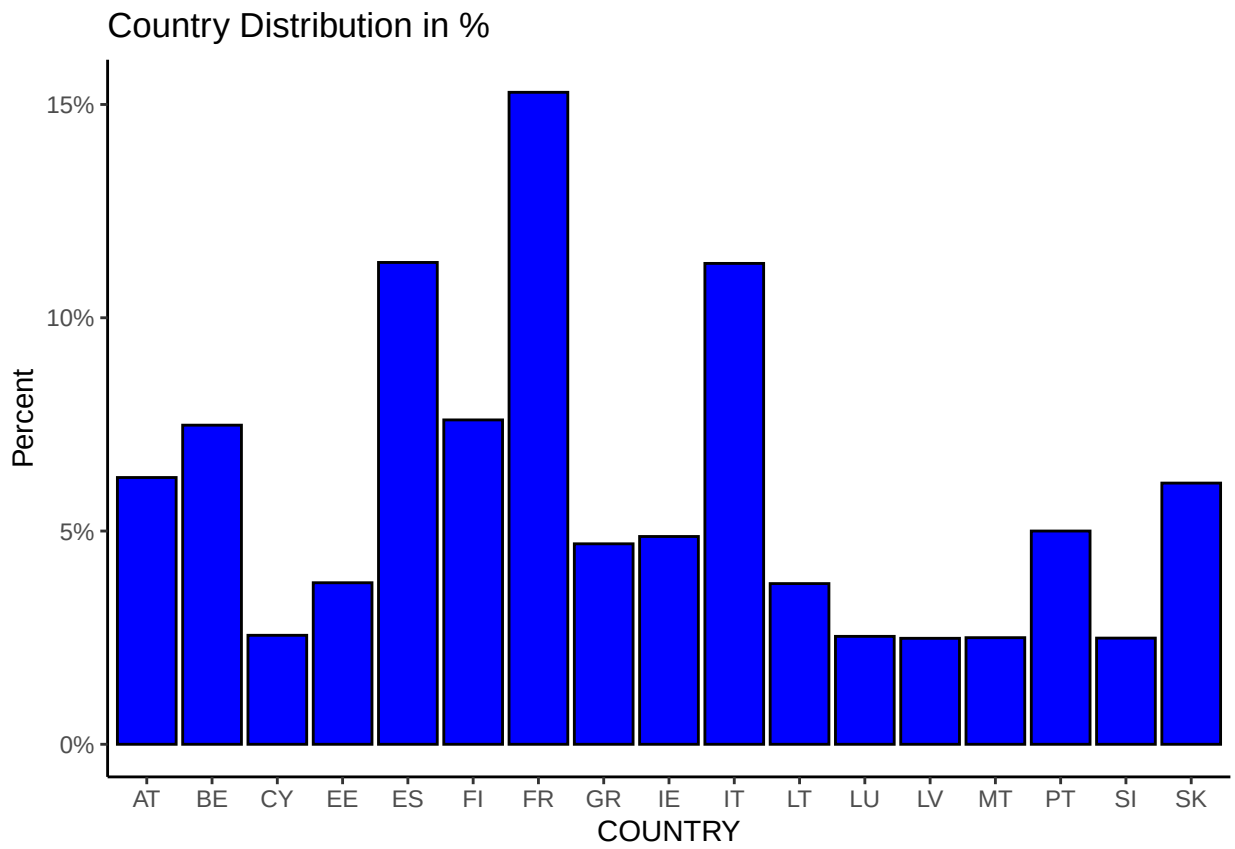

```
#Almost 50% of the people are employees.
```

```
#DEPCHILDREN
ggplot(df, aes(factor(DEPCHILDREN))) +
  geom_bar(aes(y = (..count..)/sum(..count..)),fill="blue", color="black") +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Number of children or economically dependent",
       x="DEPCHILDREN")+
  theme_classic()
```




```
#Over 40% of the participants (majority) do not have dependents.
```

```
#Country
ggplot(df, aes(COUNTRY)) +
  geom_bar(aes(y = (..count..)/sum(..count..)),fill="blue", color="black") +
  scale_y_continuous(labels=scales::percent) +
  labs(y = "Percent", title = "Country Distribution in %")+
  theme_classic()
```




```
#Most of the participants are from france followed by italy and spain comes in at third position
```

Pop holding Bundles of payment instruments in percentage

```
POS<- space%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt",
```

```
                    "Pop")
kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	Pop
1	1	0	Yes, it is available for me	39.36 %
1	1	0	heard aboutservice, not sure if available	14.05 %
1	1	0	No, it is not available for me	13.24 %
1	1	0	I have not heard about this service	11.18 %
0	1	0	Yes, it is available for me	4.22 %
1	0	0	Yes, it is available for me	3.54 %
1	1	1	Yes, it is available for me	2.69 %
0	1	0	No, it is not available for me	2.29 %
0	1	0	heard aboutservice, not sure if available	1.66 %
0	1	0	I have not heard about this service	1.45 %
1	0	0	No, it is not available for me	1.3 %
1	0	0	heard aboutservice, not sure if available	1.07 %
1	0	0	I have not heard about this service	0.99 %
1	1	1	heard aboutservice, not sure if available	0.54 %
1	1	1	I have not heard about this service	0.37 %

The table presents the distribution of people holding specific payment instruments based on their access or awareness of various payment services. The columns represent different conditions: “account” (whether they have an account), “credit/debit” (whether they have a credit/debit card), “crypto” (whether they have access to cryptocurrency), “instant” (whether they have access to instant payment services), and “Pop” (the percentage of respondents falling into each category). For example, 39.36% of respondents have an account, hold a credit/debit card, and have access to instant payment services, while 14.05% have the same but are uncertain if instant payment is available to them. This table provides insights into the intersections of various payment methods and respondents’ access or awareness of these methods, helping to understand the usage patterns and familiarity with different payment instruments among the surveyed population.

The above anlysis haave been broken down by various demographic variables as shwon below.

Pop holding Bundles of payment instruments in percentage by Age

```
#### Age

POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, AGE)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,AGE) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
```

```
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","AGE",
                   "Pop")

kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	AGE	Pop
1	1	0	Yes, it is available for me	35-39	4.37 %
1	1	0	Yes, it is available for me	64-69	4.24 %
1	1	0	Yes, it is available for me	50-54	3.93 %
1	1	0	Yes, it is available for me	45-49	3.87 %
1	1	0	Yes, it is available for me	30-34	3.54 %
1	1	0	Yes, it is available for me	40-44	3.52 %
1	1	0	Yes, it is available for me	55-59	3.49 %
1	1	0	Yes, it is available for me	18-24	3.37 %
1	1	0	Yes, it is available for me	60-64	3.09 %
1	1	0	Yes, it is available for me	25-29	2.55 %
1	1	0	Yes, it is available for me	70-74	2.49 %
1	1	0	No, it is not available for me	64-69	1.99 %
1	1	0	heard aboutservice, not sure if available	64-69	1.96 %
1	1	0	I have not heard about this service	64-69	1.63 %
1	1	0	heard aboutservice, not sure if available	35-39	1.36 %

Pop holding Bundles of payment instruments in percentage by education

```
#Education
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, EDUCATION)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,EDUCATION) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
```

```
                    "crypto", "instnt","EDUCATION",
                    "Pop")
kable(Bundles,align = "l")
```

account	crdit.dbit	crypto	instnt	EDUCATION	Pop
1	1	0	Yes, it is available for me	Upper/post-secondary education	17.06 %
1	1	0	Yes, it is available for me	University/PhD/research	15.99 %
1	1	0	heard aboutservice, not sure if available	Upper/post-secondary education	6.34 %
1	1	0	Yes, it is available for me	Primary/lower secondary education	6.29 %
1	1	0	No, it is not available for me	Upper/post-secondary education	5.61 %
1	1	0	I have not heard about this service	Upper/post-secondary education	5.26 %
1	1	0	heard aboutservice, not sure if available	University/PhD/research	5.25 %
1	1	0	No, it is not available for me	University/PhD/research	4.83 %
1	1	0	I have not heard about this service	University/PhD/research	3.94 %
1	1	0	No, it is not available for me	Primary/lower secondary education	2.8 %
1	1	0	heard aboutservice, not sure if available	Primary/lower secondary education	2.45 %
1	1	0	I have not heard about this service	Primary/lower secondary education	1.97 %
0	1	0	Yes, it is available for me	Upper/post-secondary education	1.85 %
1	0	0	Yes, it is available for me	Upper/post-secondary education	1.64 %
0	1	0	Yes, it is available for me	University/PhD/research	1.62 %

Pop holding Bundles of payment instruments in percentage by Activity status

```
## Activity Status
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, D6_1)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,D6_1) %>% ungroup()%>%
```

```
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","Activity",
                   "Pop")
kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	Activity	Pop
1	1	0	Yes, it is available for me	Employee	21.25 %
1	1	0	Yes, it is available for me	Without a professional activity or student	13.31 %
1	1	0	heard aboutservice, not sure if available	Employee	6.5 %
1	1	0	heard aboutservice, not sure if available	Without a professional activity or student	5.94 %
1	1	0	No, it is not available for me	Without a professional activity or student	5.89 %
1	1	0	No, it is not available for me	Employee	5.72 %
1	1	0	I have not heard about this service	Without a professional activity or student	5.09 %
1	1	0	I have not heard about this service	Employee	4.81 %
1	1	0	Yes, it is available for me	Self-employed	4.67 %
0	1	0	Yes, it is available for me	Employee	2.08 %
1	0	0	Yes, it is available for me	Employee	1.93 %
1	1	1	Yes, it is available for me	Employee	1.74 %
1	1	0	No, it is not available for me	Self-employed	1.56 %
1	1	0	heard aboutservice, not sure if available	Self-employed	1.55 %
0	1	0	Yes, it is available for me	Without a professional activity or student	1.53 %

Pop holding Bundles of payment instruments in percentage by employment status

```
## Employment status
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, D6_2A)%>%
  mutate(QQ1D= case_when(
```

```
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,D6_2A) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","Employment_Status",
                   "Pop")
kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	Employment_Status	Pop
1	1	0	Yes, it is available for me	NA	18.14 %
1	1	0	heard aboutservice, not sure if available	NA	7.54 %
1	1	0	No, it is not available for me	NA	7.53 %
1	1	0	Yes, it is available for me	Employed position, working mainly at a desk	7.08 %
1	1	0	I have not heard about this service	NA	6.38 %
1	1	0	Yes, it is available for me	Middle management or other management (e.g. department head)	3.62 %
1	1	0	Yes, it is available for me	Employed position, not at a desk	3.4 %
1	1	0	Yes, it is available for me	Employed professional (e.g. doctor, lawyer, accountant, architect)	3.01 %
1	1	0	heard aboutservice, not sure if available	Employed position, working mainly at a desk	2.17 %
0	1	0	Yes, it is available for me	NA	2.13 %
1	1	0	Yes, it is available for me	Manual worker	2.08 %
1	1	0	No, it is not available for me	Employed position, working mainly at a desk	1.8 %
1	0	0	Yes, it is available for me	NA	1.61 %
1	1	0	I have not heard about this service	Employed position, working mainly at a desk	1.51 %
0	1	0	No, it is not available for me	NA	1.39 %

Pop holding Bundles of payment instruments in percentage inactivity status

```
###  Inactivity status
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, D6_2B)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,D6_2B) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","Inactivity_Status",
                   "Pop")
kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	Inactivity_Status	Pop
1	1	0	Yes, it is available for me	NA	26.05 %
1	1	0	heard aboutservice, not sure if available	NA	8.11 %
1	1	0	Yes, it is available for me	Retired or unable to work through illness	7.5 %
1	1	0	No, it is not available for me	NA	7.36 %
1	1	0	I have not heard about this service	NA	6.09 %
1	1	0	No, it is not available for me	Retired or unable to work through illness	4.03 %
1	1	0	heard aboutservice, not sure if available	Retired or unable to work through illness	3.69 %
1	1	0	I have not heard about this service	Retired or unable to work through illness	3.43 %
0	1	0	Yes, it is available for me	NA	2.69 %
1	0	0	Yes, it is available for me	NA	2.41 %
1	1	1	Yes, it is available for me	NA	2.17 %
1	1	0	Yes, it is available for me	Student (full-time)	1.98 %

accountcrdit.dbitcrypto instnt				Inactivity_Status	Pop
1	1	0	Yes, it is available for me	Responsible for housework (e.g. ordinary shopping, looking after home and family)	1.97 %
1	1	0	Yes, it is available for me	Unemployed or temporarily not working	1.57 %
0	1	0	No, it is not available for me	NA	1.15 %

Pop holding Bundles of payment instruments in percentage by household size

```
###  Household size
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, HHSIZE)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,HHSIZE) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","HHSIZE",
                   "Pop")
kable(Bundles, align = "l")
```

account	crdit.dbit	crypto	instnt	HHSIZE	Pop
1	1	0	Yes, it is available for me	2	13.2 %
1	1	0	Yes, it is available for me	3	8.95 %
1	1	0	Yes, it is available for me	4	7.7 %
1	1	0	Yes, it is available for me	1	6.58 %
1	1	0	heard aboutservice, not sure if available	2	4.92 %
1	1	0	No, it is not available for me	2	4.85 %
1	1	0	I have not heard about this service	2	4.08 %
1	1	0	heard aboutservice, not sure if available	3	3.22 %
1	1	0	Yes, it is available for me	5	2.86 %
1	1	0	No, it is not available for me	3	2.67 %
1	1	0	No, it is not available for me	1	2.65 %
1	1	0	heard aboutservice, not sure if available	1	2.59 %
1	1	0	heard aboutservice, not sure if available	4	2.39 %

account	crdit.dbit	crypto	instnt	HHSIZE	Pop
1	1	0	I have not heard about this service	3	2.36 %
1	1	0	No, it is not available for me	4	2.23 %

Pop holding Bundles of payment instruments in percentage by income

```
### INCOME
POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, INCOME)%>%
  mutate(QQ1D= case_when(
    QQ1D==1~    "Yes, it is available for me",
    QQ1D==2~    "No, it is not available for me",
    QQ1D==3~    "heard aboutservice, not sure if available",
    QQ1D==4~    "I have not heard about this service",
    QQ1D==999999~   "Don't know"

  ))

Bundles<-count(POS,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,INCOME) %>% ungroup()%>%
  mutate(n= round((n/sum(n))*100,2))%>%
  arrange(desc(n))%>%
  mutate(n= paste0(n," %"))%>%
  head(15)

names(Bundles)<- c("account","crdit.dbit",
                   "crypto", "instnt","INCOME",
                   "Pop")
kable(Bundles, align = 'l')
```

account	crdit.dbit	crypto	instnt	INCOME	Pop
1	1	0	Yes, it is available for me	Between EUR 2,501 and EUR 4,000	11.86 %
1	1	0	Yes, it is available for me	Between EUR 1,501 and EUR 2,500	11.28 %
1	1	0	Yes, it is available for me	More than EUR 4,000	6.73 %
1	1	0	Yes, it is available for me	Between EUR 751 and EUR 1,500	6.34 %
1	1	0	heard aboutservice, not sure if available	Between EUR 1,501 and EUR 2,500	4.23 %
1	1	0	No, it is not available for me	Between EUR 1,501 and EUR 2,500	3.93 %
1	1	0	heard aboutservice, not sure if available	Between EUR 2,501 and EUR 4,000	3.88 %
1	1	0	No, it is not available for me	Between EUR 2,501 and EUR 4,000	3.73 %
1	1	0	I have not heard about this service	Between EUR 1,501 and EUR 2,500	3.27 %

account	crdit.dbit	crypto	instnt	INCOME	Pop
1	1	0	I have not heard about this service	Between EUR 2,501 and EUR 4,000	2.95 %
1	1	0	heard aboutservice, not sure if available	Between EUR 751 and EUR 1,500	2.84 %
1	1	0	I have not heard about this service	Between EUR 751 and EUR 1,500	2.29 %
1	1	0	No, it is not available for me	Between EUR 751 and EUR 1,500	2.21 %
1	1	0	No, it is not available for me	More than EUR 4,000	1.88 %
1	1	0	Yes, it is available for me	EUR 750 or less	1.88 %

Pop holding Bundles of payment instruments in percentage country

```
### country

POS<- df%>%
  select(QQ1A_1,,QQ1A_2,QQ1A_3,QQ1D, COUNTRY)

for(country in unique(POS$COUNTRY)){
  dd<- POS%>%
    filter(COUNTRY %in% country)

  Bundles2<-count(dd,QQ1A_1,QQ1A_2, QQ1A_3,QQ1D ,COUNTRY) %>% ungroup()%>%
    mutate(n= round((n/sum(n))*100,2))%>%
    arrange(desc(n))%>%
    mutate(n= paste0(n," %"))%>%
    head(15)

  names(Bundles2)<- c("account","crdit.dbit",
                      "crypto", "instnt","COUNTRY",
                      "Pop")
  print(kable(Bundles2, align = 'l', caption = paste0(country,"'s Population Holdings of the Top 15 Bund

}
```

```
##
##
## Table: AT's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |AT      |28.43 % |
## |1       |1          |0      |4      |AT      |17.45 % |
## |1       |1          |0      |2      |AT      |15.36 % |
## |1       |1          |0      |3      |AT      |14.76 % |
## |1       |0          |0      |1      |AT      |4.22 %  |
## |1       |1          |1      |1      |AT      |3.38 %  |
## |0       |1          |0      |1      |AT      |2.49 %  |
## |1       |0          |0      |2      |AT      |2.13 %  |
```

```
## |1       |0          |0      |4      |AT      |2.13 %  |
## |0       |1          |0      |2      |AT      |1.65 %  |
## |1       |0          |0      |3      |AT      |1.49 %  |
## |0       |1          |0      |4      |AT      |1.29 %  |
## |1       |1          |1      |3      |AT      |1.29 %  |
## |0       |1          |0      |3      |AT      |0.88 %  |
## |1       |1          |1      |4      |AT      |0.88 %  |
##
##
## Table: BE's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |BE      |39.73 % |
## |1       |1          |0      |3      |BE      |16.44 % |
## |1       |1          |0      |2      |BE      |12.17 % |
## |1       |1          |0      |4      |BE      |10.42 % |
## |1       |0          |0      |1      |BE      |4 %     |
## |0       |1          |0      |1      |BE      |3.63 %  |
## |0       |1          |0      |2      |BE      |2.69 %  |
## |1       |1          |1      |1      |BE      |2.25 %  |
## |0       |1          |0      |3      |BE      |1.58 %  |
## |1       |0          |0      |2      |BE      |1.41 %  |
## |0       |1          |0      |4      |BE      |1.28 %  |
## |1       |0          |0      |3      |BE      |1.18 %  |
## |1       |0          |0      |4      |BE      |1.14 %  |
## |1       |1          |1      |3      |BE      |0.34 %  |
## |0       |0          |0      |4      |BE      |0.3 %   |
##
##
## Table: CY's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |CY      |42.72 % |
## |1       |1          |0      |3      |CY      |12.5 %  |
## |0       |1          |0      |1      |CY      |9.84 %  |
## |1       |1          |0      |2      |CY      |9.65 %  |
## |1       |1          |0      |4      |CY      |5.81 %  |
## |1       |1          |1      |1      |CY      |5.51 %  |
## |0       |1          |0      |2      |CY      |2.66 %  |
## |0       |1          |0      |3      |CY      |2.66 %  |
## |0       |1          |0      |4      |CY      |2.36 %  |
## |1       |0          |0      |1      |CY      |1.48 %  |
## |1       |1          |0      |999999 |CY      |0.79 %  |
## |1       |0          |0      |4      |CY      |0.69 %  |
## |0       |0          |0      |2      |CY      |0.49 %  |
## |0       |1          |1      |1      |CY      |0.49 %  |
## |1       |1          |1      |2      |CY      |0.49 %  |
##
##
## Table: EE's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
```

```
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |EE      |45.09 % |
## |1       |1          |0      |3      |EE      |16.67 % |
## |1       |1          |0      |4      |EE      |13.15 % |
## |1       |1          |0      |2      |EE      |7.24 %  |
## |1       |1          |1      |1      |EE      |3.65 %  |
## |0       |1          |0      |1      |EE      |2.99 %  |
## |1       |0          |0      |1      |EE      |2.86 %  |
## |0       |1          |0      |4      |EE      |1.46 %  |
## |0       |1          |0      |2      |EE      |1.39 %  |
## |1       |0          |0      |3      |EE      |1.2 %   |
## |1       |0          |0      |4      |EE      |1.13 %  |
## |0       |1          |0      |3      |EE      |0.93 %  |
## |1       |1          |0      |999999 |EE      |0.6 %   |
## |1       |1          |1      |4      |EE      |0.4 %   |
## |1       |0          |0      |2      |EE      |0.27 %  |
##
##
## Table: ES's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |ES      |46.48 % |
## |1       |1          |0      |2      |ES      |19.03 % |
## |1       |1          |0      |3      |ES      |8.13 %  |
## |1       |1          |0      |4      |ES      |6.28 %  |
## |0       |1          |0      |1      |ES      |5.1 %   |
## |1       |1          |1      |1      |ES      |3.07 %  |
## |1       |0          |0      |1      |ES      |2.78 %  |
## |0       |1          |0      |2      |ES      |2.43 %  |
## |1       |0          |0      |2      |ES      |1.49 %  |
## |0       |1          |0      |3      |ES      |1.25 %  |
## |0       |1          |0      |4      |ES      |1.16 %  |
## |1       |0          |0      |4      |ES      |0.56 %  |
## |1       |0          |0      |3      |ES      |0.33 %  |
## |1       |1          |1      |2      |ES      |0.31 %  |
## |1       |1          |1      |3      |ES      |0.31 %  |
##
##
## Table: FI's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |FI      |47.92 % |
## |1       |1          |0      |2      |FI      |22.69 % |
## |1       |1          |0      |3      |FI      |9.29 %  |
## |1       |1          |0      |4      |FI      |8.99 %  |
## |1       |1          |1      |1      |FI      |3.67 %  |
## |1       |1          |0      |999999 |FI      |1.22 %  |
## |0       |1          |0      |1      |FI      |0.86 %  |
## |1       |0          |0      |2      |FI      |0.86 %  |
## |1       |0          |0      |1      |FI      |0.79 %  |
## |1       |1          |1      |2      |FI      |0.73 %  |
## |0       |1          |0      |2      |FI      |0.66 %  |
```

```
## |1       |1          |1      |4      |FI      |0.5 %   |
## |1       |1          |1      |3      |FI      |0.46 %  |
## |1       |0          |0      |4      |FI      |0.3 %   |
## |0       |1          |0      |4      |FI      |0.26 %  |
##
##
## Table: FR's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |FR      |39.68 % |
## |1       |1          |0      |2      |FR      |15.53 % |
## |1       |1          |0      |3      |FR      |15.15 % |
## |1       |1          |0      |4      |FR      |9.69 %  |
## |1       |0          |0      |1      |FR      |4.52 %  |
## |0       |1          |0      |1      |FR      |3.57 %  |
## |0       |1          |0      |2      |FR      |2.45 %  |
## |1       |1          |1      |1      |FR      |1.58 %  |
## |0       |1          |0      |3      |FR      |1.43 %  |
## |0       |1          |0      |4      |FR      |1.32 %  |
## |1       |0          |0      |2      |FR      |1.14 %  |
## |1       |0          |0      |4      |FR      |0.92 %  |
## |1       |0          |0      |3      |FR      |0.61 %  |
## |1       |1          |1      |2      |FR      |0.31 %  |
## |0       |0          |0      |4      |FR      |0.23 %  |
##
##
## Table: GR's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |GR      |31.3 %  |
## |1       |1          |0      |2      |GR      |18.73 % |
## |1       |1          |0      |4      |GR      |13.38 % |
## |1       |1          |0      |3      |GR      |12.2 %  |
## |0       |1          |0      |2      |GR      |6.37 %  |
## |0       |1          |0      |1      |GR      |3.85 %  |
## |1       |1          |1      |1      |GR      |2.73 %  |
## |1       |0          |0      |1      |GR      |1.98 %  |
## |0       |1          |0      |3      |GR      |1.93 %  |
## |0       |1          |0      |4      |GR      |1.44 %  |
## |1       |1          |1      |3      |GR      |0.91 %  |
## |1       |1          |0      |999999 |GR      |0.75 %  |
## |1       |0          |0      |4      |GR      |0.7 %   |
## |0       |0          |0      |2      |GR      |0.64 %  |
## |0       |0          |0      |4      |GR      |0.64 %  |
##
##
## Table: IE's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |IE      |30.87 % |
## |1       |1          |0      |4      |IE      |17.91 % |
```

```
## |1       |1          |0      |3      |IE      |14.61 % |
## |1       |1          |0      |2      |IE      |8.31 %  |
## |0       |1          |0      |1      |IE      |7.07 %  |
## |1       |0          |0      |1      |IE      |3.87 %  |
## |1       |1          |1      |1      |IE      |3.36 %  |
## |0       |1          |0      |4      |IE      |2.79 %  |
## |0       |1          |0      |2      |IE      |2.32 %  |
## |0       |1          |0      |3      |IE      |2.01 %  |
## |1       |0          |0      |2      |IE      |1.19 %  |
## |1       |0          |0      |4      |IE      |1.14 %  |
## |1       |0          |0      |3      |IE      |0.83 %  |
## |1       |1          |1      |3      |IE      |0.62 %  |
## |1       |1          |1      |4      |IE      |0.62 %  |
##
##
## Table: IT's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop    |
## |:-------|:----------|:------|:------|:-------|:------|
## |1       |1          |0      |1      |IT      |47.6 % |
## |1       |1          |0      |3      |IT      |15.5 % |
## |1       |1          |0      |4      |IT      |8.68 % |
## |1       |1          |0      |2      |IT      |7 %    |
## |0       |1          |0      |1      |IT      |5.38 % |
## |0       |1          |0      |3      |IT      |3.15 % |
## |1       |0          |0      |1      |IT      |2.83 % |
## |0       |1          |0      |2      |IT      |1.74 % |
## |1       |1          |1      |1      |IT      |1.49 % |
## |0       |1          |0      |4      |IT      |1.36 % |
## |1       |0          |0      |3      |IT      |1.18 % |
## |1       |0          |0      |2      |IT      |1 %    |
## |1       |0          |0      |4      |IT      |0.78 % |
## |0       |0          |0      |4      |IT      |0.54 % |
## |1       |1          |0      |999999 |IT      |0.33 % |
##
##
## Table: LT's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |LT      |28.57 % |
## |1       |1          |0      |3      |LT      |19.96 % |
## |1       |1          |0      |4      |LT      |16.49 % |
## |1       |1          |0      |2      |LT      |8.41 %  |
## |0       |1          |0      |1      |LT      |6.01 %  |
## |1       |0          |0      |1      |LT      |5.34 %  |
## |1       |0          |0      |3      |LT      |2.94 %  |
## |0       |1          |0      |3      |LT      |2.27 %  |
## |0       |1          |0      |4      |LT      |1.74 %  |
## |1       |0          |0      |4      |LT      |1.74 %  |
## |0       |1          |0      |2      |LT      |1.4 %   |
## |1       |0          |0      |2      |LT      |1.4 %   |
## |1       |1          |1      |1      |LT      |1.4 %   |
## |1       |1          |1      |3      |LT      |0.47 %  |
```

```
## |1       |1          |0      |999999 |LT      |0.4 %   |
##
##
## Table: LU's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |LU      |50.7 %  |
## |1       |1          |0      |2      |LU      |12.92 % |
## |1       |1          |0      |3      |LU      |12.13 % |
## |1       |1          |1      |1      |LU      |6.46 %  |
## |1       |1          |0      |4      |LU      |5.37 %  |
## |0       |1          |0      |1      |LU      |3.98 %  |
## |1       |0          |0      |1      |LU      |1.89 %  |
## |0       |1          |0      |2      |LU      |1.49 %  |
## |1       |1          |1      |3      |LU      |0.89 %  |
## |0       |1          |0      |3      |LU      |0.8 %   |
## |0       |1          |0      |4      |LU      |0.8 %   |
## |1       |1          |1      |4      |LU      |0.7 %   |
## |1       |0          |0      |3      |LU      |0.5 %   |
## |1       |1          |1      |2      |LU      |0.5 %   |
## |1       |0          |0      |2      |LU      |0.3 %   |
##
##
## Table: LV's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |LV      |37.25 % |
## |1       |1          |0      |3      |LV      |20.34 % |
## |1       |1          |0      |4      |LV      |15.59 % |
## |1       |1          |0      |2      |LV      |9.41 %  |
## |1       |0          |0      |1      |LV      |3.64 %  |
## |0       |1          |0      |1      |LV      |2.02 %  |
## |1       |1          |1      |1      |LV      |1.82 %  |
## |1       |0          |0      |3      |LV      |1.72 %  |
## |0       |1          |0      |3      |LV      |1.62 %  |
## |1       |0          |0      |2      |LV      |1.21 %  |
## |1       |0          |0      |4      |LV      |1.01 %  |
## |0       |1          |0      |4      |LV      |0.81 %  |
## |1       |1          |1      |3      |LV      |0.81 %  |
## |1       |1          |0      |999999 |LV      |0.61 %  |
## |0       |1          |0      |2      |LV      |0.4 %   |
##
##
## Table: MT's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |MT      |38.13 % |
## |1       |1          |0      |3      |MT      |10.87 % |
## |0       |1          |0      |1      |MT      |9.66 %  |
## |1       |1          |0      |4      |MT      |9.46 %  |
## |1       |1          |0      |2      |MT      |9.36 %  |
```

```
## |1       |0          |0      |1      |MT      |5.33 %  |
## |0       |1          |0      |2      |MT      |3.42 %  |
## |1       |1          |1      |1      |MT      |3.42 %  |
## |0       |1          |0      |4      |MT      |2.11 %  |
## |0       |1          |0      |3      |MT      |2.01 %  |
## |1       |0          |0      |2      |MT      |1.51 %  |
## |0       |0          |0      |4      |MT      |0.6 %   |
## |1       |0          |0      |3      |MT      |0.5 %   |
## |1       |0          |0      |4      |MT      |0.5 %   |
## |1       |1          |1      |3      |MT      |0.5 %   |
##
##
## Table: PT's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |PT      |26.76 % |
## |1       |1          |0      |3      |PT      |11.92 % |
## |1       |1          |0      |2      |PT      |11.62 % |
## |1       |1          |0      |4      |PT      |7.9 %   |
## |1       |0          |0      |1      |PT      |7.14 %  |
## |0       |1          |0      |1      |PT      |5.99 %  |
## |0       |1          |0      |2      |PT      |4.68 %  |
## |1       |0          |0      |2      |PT      |4.02 %  |
## |1       |0          |0      |3      |PT      |3.57 %  |
## |0       |1          |0      |3      |PT      |3.47 %  |
## |1       |1          |1      |1      |PT      |3.32 %  |
## |0       |1          |0      |4      |PT      |3.17 %  |
## |1       |0          |0      |4      |PT      |2.16 %  |
## |1       |1          |1      |3      |PT      |1.01 %  |
## |1       |1          |1      |4      |PT      |0.7 %   |
##
##
## Table: SI's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |SI      |23.43 % |
## |1       |1          |0      |4      |SI      |19.9 %  |
## |1       |1          |0      |3      |SI      |13.43 % |
## |1       |1          |0      |2      |SI      |11.92 % |
## |0       |1          |0      |1      |SI      |5.15 %  |
## |1       |0          |0      |1      |SI      |4.65 %  |
## |1       |1          |1      |1      |SI      |3.54 %  |
## |0       |1          |0      |2      |SI      |2.93 %  |
## |0       |1          |0      |3      |SI      |2.73 %  |
## |0       |1          |0      |4      |SI      |2.63 %  |
## |1       |0          |0      |2      |SI      |2.02 %  |
## |1       |1          |1      |4      |SI      |1.82 %  |
## |1       |0          |0      |3      |SI      |1.72 %  |
## |1       |1          |1      |2      |SI      |1.01 %  |
## |1       |0          |0      |4      |SI      |0.91 %  |
##
##
```

```
## Table: SK's Population Holdings of the Top 15 Bundles of Payment Instruments
##
## |account |crdit.dbit |crypto |instnt |COUNTRY |Pop     |
## |:-------|:----------|:------|:------|:-------|:-------|
## |1       |1          |0      |1      |SK      |38.32 % |
## |1       |1          |0      |3      |SK      |19.67 % |
## |1       |1          |0      |4      |SK      |16.92 % |
## |1       |1          |0      |2      |SK      |8.75 %  |
## |1       |0          |0      |1      |SK      |3.61 %  |
## |1       |1          |1      |1      |SK      |1.72 %  |
## |1       |0          |0      |3      |SK      |1.52 %  |
## |1       |0          |0      |4      |SK      |1.19 %  |
## |0       |1          |0      |4      |SK      |1.07 %  |
## |1       |1          |1      |3      |SK      |1.07 %  |
## |0       |1          |0      |1      |SK      |0.99 %  |
## |0       |1          |0      |2      |SK      |0.99 %  |
## |1       |0          |0      |2      |SK      |0.99 %  |
## |0       |0          |0      |4      |SK      |0.9 %   |
## |0       |1          |0      |3      |SK      |0.53 %  |
```

Average spending on various commodities using different instruments

```
# online payment

online<- space%>%
  select(starts_with(c("QB1_","QB3_", "QB4_")))#,QB3_n,QB4_n)
online[online>100 & !is.na(online)]<- NA

df_1<- online%>%
  select(ends_with("_1"))%>%
  mutate(QB1_1= case_when(
    QB1_1==1~   "Clothes_sportswear",
    QB1_1==2~   "Electronic_goods",
    QB1_1==3~   "Food_daily.supplies",
    QB1_1==4~   "Medicine",
    QB1_1==5~   "entertainment",
    QB1_1==6~   "Donations",
    QB1_1==7~   "Accommodation",
    QB1_1==8~   "Furniture",
    QB1_1==9~   "Tickets",
    QB1_1==10~  "Luxury_goods",
    QB1_1==11~  "Financial_products",
    QB1_1==12~  "Household_related",
    QB1_1==13~  "Other",
    QB1_1==999999~  "Don't know"

  ),
  QB4_1= case_when(
    QB4_1==1~"Card",
    QB4_1==3~"PayPal",
```

```
    QB4_1==4~   "Other.online",
    QB4_1==5~   "Direct",
    QB4_1==6~   "Credit",
    QB4_1==8~   "Loyalty",
    QB4_1==10~  "Crypto-assets",
    QB4_1==11~  "Other",
    QB4_1==999999~  "Don't know"

  ))

df_1.clean<- df_1%>%
  drop_na()

grouped_1<-df_1.clean%>%
  group_by(QB4_1, QB1_1)%>%
  summarise(mean= mean(QB3_1, na.rm = T))
```

```
## `summarise()` has grouped output by 'QB4_1'. You can override using the
## `.groups` argument.
```

```
dd<-pivot_wider(grouped_1, names_from = QB4_1,
            values_from = mean)
kable(dd, digits = 2,  align = "l")
```

QB1_1	Card	Credit	Crypto-assets	Direct	Loyalty	Other	Other.online	PayPal
Accommodation	41.69	37.08	NA	35.03	NA	19.76	22.64	46.59
Clothes_sportswear	37.79	43.42	NA	33.28	33.38	43.36	45.41	36.82
Donations	26.31	26.36	62.50	22.10	30.00	15.03	16.67	28.42
Electronic_goods	38.77	34.23	30.00	40.56	38.52	39.50	33.48	35.32
Financial_products	47.08	42.48	17.90	35.10	NA	73.75	30.25	43.55
Food_daily.supplies	25.87	31.67	14.13	29.23	16.76	21.97	25.61	28.67
Furniture	35.81	52.59	NA	32.56	38.61	32.74	49.17	35.52
Household_related	35.29	47.69	60.80	43.72	23.99	34.72	33.79	34.95
Luxury_goods	53.29	48.63	NA	75.00	NA	13.18	NA	42.96
Medicine	27.50	31.33	5.96	34.51	21.60	23.38	32.33	32.58
Other	26.81	34.34	77.00	32.71	20.68	19.37	24.35	28.54
Tickets	34.36	42.91	NA	52.92	51.50	28.67	30.17	26.01
entertainment	28.09	28.86	NA	22.36	26.61	18.98	28.44	24.90

The table above shows the average spending on various commodities using different instruments. For example the average spending on on donations using credit card is 26.31 This comprison has also be broken down by demographics and country.

Compare average spending on various commodities using different instruments by AGE

```r
#compare by demographic
df_3<- data.frame(df_1, AGE= df$AGE)%>%
  drop_na()

for(age in unique(df_3$AGE)){
  df_3.sub<- df_3%>%
    filter(AGE== age)
  grouped_3<-df_3.sub%>%
    group_by(QB4_1, QB1_1)%>%
    summarise(mean= mean(QB3_1, na.rm = T),)

  dd_3<-pivot_wider(grouped_3, names_from = QB4_1,
                    values_from = mean)
  print(kable(dd_3, digits = 2, align = "l",
              caption=paste0(age, "'s online Payment")))

}
```

```
##
##
## Table: 64-69's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |46.93 |47.47  |9.57   |NA      |1.70  |2.80         |51.45  |
## |Clothes_sportswear  |43.13 |52.97  |NA     |7.20    |30.00 |17.90        |29.52  |
## |Donations           |20.00 |28.75  |12.00  |NA      |6.07  |25.00        |17.00  |
## |Electronic_goods    |44.74 |32.90  |58.50  |53.16   |NA    |40.47        |25.18  |
## |Financial_products  |48.67 |68.72  |40.00  |NA      |NA    |NA           |25.00  |
## |Food_daily.supplies |29.56 |42.27  |32.88  |NA      |23.47 |22.34        |20.11  |
## |Furniture           |31.95 |67.09  |60.00  |NA      |30.00 |61.50        |25.50  |
## |Household_related   |30.92 |47.44  |91.33  |NA      |20.00 |NA           |35.84  |
## |Luxury_goods        |68.08 |NA     |NA     |NA      |NA    |NA           |81.00  |
## |Medicine            |34.50 |24.04  |23.12  |18.50   |14.94 |16.91        |39.77  |
## |Other               |31.53 |28.70  |38.98  |22.60   |13.91 |22.26        |27.76  |
## |Tickets             |26.82 |61.00  |98.00  |NA      |NA    |NA           |NA     |
## |entertainment       |34.26 |26.05  |46.60  |50.00   |27.03 |NA           |34.83  |
##
##
## Table: 30-34's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other  |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:------|:------------|:------|
## |Accommodation       |49.31 |31.05  |NA            |NA     |NA      |52.00  |NA           |60.00  |
## |Clothes_sportswear  |35.20 |34.93  |NA            |31.20  |17.02   |23.73  |47.92        |34.31  |
## |Donations           |17.75 |14.00  |NA            |10.00  |NA      |NA     |5.00         |21.00  |
## |Electronic_goods    |33.20 |21.74  |NA            |21.76  |100.00  |NA     |46.65        |39.09  |
## |Financial_products  |28.69 |23.32  |NA            |30.00  |NA      |87.50  |60.02        |23.38  |
## |Food_daily.supplies |21.33 |31.76  |20            |31.07  |12.54   |14.29  |28.82        |25.89  |
## |Furniture           |27.60 |12.50  |NA            |12.50  |NA      |100.00 |NA           |36.68  |
## |Household_related   |38.91 |30.50  |NA            |29.33  |NA      |17.48  |51.90        |41.55  |
## |Medicine            |24.57 |26.82  |NA            |45.55  |27.50   |16.35  |73.05        |20.30  |
## |Other               |21.83 |32.18  |NA            |25.81  |17.54   |22.42  |14.78        |31.00  |
```

```
## |Tickets             |26.30 |20.00  |NA            |NA     |NA      |NA     |22.67        |26.94  |
## |entertainment       |29.45 |20.90  |NA            |20.34  |23.45   |20.03  |26.95        |20.54  |
## |Luxury_goods        |NA    |NA     |NA            |NA     |NA      |NA     |NA           |70.00  |
##
##
## Table: 35-39's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |38.12 |39.68  |NA            |35.30  |NA      |10.00 |4.00         |51.31  |
## |Clothes_sportswear  |38.11 |40.44  |NA            |40.80  |55.87   |42.51 |94.35        |34.01  |
## |Donations           |56.00 |7.50   |62.50         |13.75  |10.00   |NA    |NA           |47.00  |
## |Electronic_goods    |35.25 |35.12  |NA            |22.00  |NA      |22.00 |30.00        |42.17  |
## |Financial_products  |47.56 |35.00  |20.17         |33.28  |NA      |NA    |40.00        |31.54  |
## |Food_daily.supplies |25.07 |43.21  |2.40          |33.55  |19.07   |23.69 |36.75        |40.04  |
## |Furniture           |31.19 |38.00  |NA            |NA     |100.00  |NA    |NA           |42.83  |
## |Household_related   |36.66 |36.15  |NA            |34.14  |NA      |NA    |23.49        |10.00  |
## |Luxury_goods        |55.96 |11.00  |NA            |NA     |NA      |NA    |NA           |56.50  |
## |Medicine            |29.33 |32.63  |5.96          |42.56  |14.78   |29.19 |48.85        |35.55  |
## |Other               |26.03 |36.75  |NA            |41.10  |32.47   |17.37 |19.78        |31.95  |
## |Tickets             |38.54 |35.51  |NA            |59.00  |NA      |12.00 |12.00        |25.12  |
## |entertainment       |27.70 |30.10  |NA            |28.54  |15.14   |25.25 |32.16        |16.97  |
##
##
## Table: 18-24's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |37.09 |23.70  |NA            |47.33  |NA      |14.88 |7.95         |47.20  |
## |Clothes_sportswear  |33.08 |41.10  |NA            |20.00  |26.85   |43.11 |35.75        |40.20  |
## |Donations           |18.25 |40.00  |NA            |NA     |NA      |NA    |NA           |2.00   |
## |Electronic_goods    |36.91 |36.19  |30.0          |NA     |12.49   |56.50 |24.00        |31.43  |
## |Financial_products  |34.99 |58.26  |NA            |35.00  |NA      |NA    |58.41        |22.40  |
## |Food_daily.supplies |21.76 |27.60  |NA            |29.64  |14.08   |17.59 |18.54        |20.04  |
## |Furniture           |24.64 |100.00 |NA            |NA     |39.48   |5.25  |56.00        |10.45  |
## |Household_related   |25.32 |47.34  |60.8          |NA     |NA      |NA    |24.92        |25.95  |
## |Luxury_goods        |53.33 |NA     |NA            |NA     |NA      |NA    |NA           |21.33  |
## |Medicine            |23.20 |14.25  |NA            |34.62  |NA      |19.80 |14.56        |20.94  |
## |Other               |19.81 |22.65  |NA            |34.68  |10.00   |16.32 |16.14        |20.12  |
## |Tickets             |28.92 |24.67  |NA            |37.50  |NA      |NA    |37.89        |36.15  |
## |entertainment       |24.39 |26.05  |NA            |22.00  |16.26   |4.99  |26.84        |24.81  |
##
##
## Table: 25-29's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |39.41 |20.25  |NA     |NA      |NA    |75.00        |44.67  |
## |Clothes_sportswear  |39.04 |38.98  |43.73  |NA      |35.40 |47.08        |32.31  |
## |Donations           |5.00  |10.00  |80.00  |NA      |NA    |NA           |26.25  |
## |Electronic_goods    |47.90 |NA     |NA     |28.29   |32.00 |26.99        |38.43  |
## |Financial_products  |39.71 |26.38  |32.39  |NA      |NA    |NA           |NA     |
## |Food_daily.supplies |23.58 |25.60  |32.37  |14.73   |21.24 |19.24        |29.38  |
## |Furniture           |39.79 |14.85  |8.00   |40.00   |NA    |30.00        |37.67  |
```

|Household_related |38.71 |NA |16.12 |24.99 |23.02 |30.00 |56.00 |
|Luxury_goods |49.92 |NA |80.00 |NA |NA |NA |20.00 |
|Medicine |28.01 |15.40 |60.54 |30.80 |26.37 |14.14 |27.02 |
|Other |25.61 |30.33 |32.11 |NA |13.47 |25.86 |15.02 |
|Tickets |48.63 |80.00 |61.33 |NA |NA |32.47 |15.00 |
|entertainment |26.00 |31.15 |17.04 |40.50 |33.00 |14.97 |18.97 |
##
##
Table: 60-64's online Payment
##
|QB1_1 |Card |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
|:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
|Accommodation |44.63 |80.00 |NA |95.20 |NA |NA |7.80 |50.00 |
|Clothes_sportswear |38.72 |39.46 |NA |35.00 |22.00 |NA |50.09 |38.00 |
|Donations |16.67 |NA |NA |32.00 |NA |25.00 |NA |5.00 |
|Electronic_goods |28.34 |30.29 |NA |43.94 |NA |NA |25.88 |42.50 |
|Food_daily.supplies |27.60 |26.56 |NA |18.83 |12.58 |24.01 |22.38 |35.31 |
|Furniture |37.37 |NA |NA |NA |32.25 |NA |NA |9.85 |
|Household_related |33.14 |38.20 |NA |46.66 |NA |60.00 |25.88 |45.00 |
|Luxury_goods |83.00 |NA |NA |70.00 |NA |NA |NA |NA |
|Medicine |27.76 |38.29 |NA |29.13 |NA |30.25 |64.68 |34.09 |
|Other |29.61 |42.49 |77 |37.82 |24.53 |19.70 |24.43 |23.12 |
|Tickets |40.29 |48.00 |NA |60.00 |NA |40.00 |NA |40.52 |
|entertainment |27.12 |39.10 |NA |9.50 |18.61 |NA |55.00 |32.08 |
|Financial_products |NA |25.21 |NA |NA |NA |NA |NA |100.00 |
##
##
Table: 55-59's online Payment
##
|QB1_1 |Card |Credit |Direct |Loyalty |Other |Other.online |PayPal |
|:-------------------|:-----|:------|:------|:-------|:------|:------------|:------|
|Accommodation |47.58 |16.08 |NA |NA |2.60 |30.60 |55.00 |
|Clothes_sportswear |35.84 |52.61 |35.88 |NA |39.00 |29.92 |37.59 |
|Donations |28.58 |30.00 |16.75 |NA |NA |NA |42.50 |
|Electronic_goods |41.95 |20.13 |65.94 |29.99 |27.00 |40.00 |44.39 |
|Financial_products |49.84 |26.38 |22.80 |NA |100.00 |20.00 |42.00 |
|Food_daily.supplies |29.99 |27.11 |11.46 |32.50 |23.00 |21.30 |29.09 |
|Furniture |44.88 |43.10 |NA |42.90 |NA |NA |27.56 |
|Household_related |32.93 |54.04 |18.40 |23.50 |46.67 |20.00 |47.50 |
|Luxury_goods |59.00 |NA |NA |NA |NA |NA |NA |
|Medicine |24.76 |46.79 |7.48 |18.94 |25.82 |22.50 |38.38 |
|Other |26.38 |22.77 |19.00 |23.80 |21.28 |30.57 |32.99 |
|Tickets |30.82 |NA |30.00 |NA |NA |45.50 |11.40 |
|entertainment |32.68 |22.60 |21.50 |15.04 |2.00 |15.00 |30.90 |
##
##
Table: 50-54's online Payment
##
|QB1_1 |Card |Credit |Direct |Loyalty |Other |Other.online |PayPal |
|:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
|Accommodation |40.28 |42.96 |20.30 |NA |NA |20.00 |53.27 |
|Clothes_sportswear |44.70 |37.00 |32.08 |39.12 |23.33 |96.00 |37.78 |
|Donations |8.00 |27.50 |NA |NA |NA |NA |15.00 |
|Electronic_goods |46.00 |33.49 |50.00 |24.24 |NA |NA |36.12 |

```
## |Financial_products  |58.32 |41.36  |46.14  |NA      |NA    |10.00         |35.09  |
## |Food_daily.supplies |27.11 |30.07  |42.60  |16.49   |28.63 |17.54         |27.05  |
## |Furniture           |41.67 |59.96  |NA     |NA      |14.22 |NA            |63.20  |
## |Household_related   |34.27 |50.32  |95.25  |NA      |NA    |NA            |27.46  |
## |Medicine            |27.44 |22.79  |23.45  |NA      |22.34 |10.10         |34.73  |
## |Other               |28.99 |31.69  |38.14  |10.00   |24.34 |31.34         |22.77  |
## |Tickets             |44.29 |23.93  |60.00  |80.00   |10.00 |12.00         |33.33  |
## |entertainment       |30.76 |36.20  |NA     |24.66   |5.00  |31.05         |23.19  |
## |Luxury_goods        |NA    |87.89  |NA     |NA      |NA    |NA            |14.00  |
##
##
## Table: 45-49's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |45.35 |50.00  |NA            |NA     |NA      |NA    |NA           |45.57  |
## |Clothes_sportswear  |37.46 |45.42  |NA            |25.11  |30.00   |73.40 |49.45        |43.80  |
## |Donations           |30.92 |NA     |NA            |90.00  |50.00   |2.00  |NA           |32.67  |
## |Electronic_goods    |35.48 |8.89   |NA            |40.14  |NA      |41.49 |17.99        |26.47  |
## |Financial_products  |64.80 |75.00  |14.5          |35.30  |NA      |NA    |19.82        |100.00 |
## |Food_daily.supplies |28.94 |21.95  |NA            |26.68  |20.00   |16.54 |19.36        |30.08  |
## |Furniture           |34.75 |66.63  |NA            |10.00  |52.99   |NA    |NA           |31.34  |
## |Household_related   |34.83 |49.26  |NA            |32.73  |NA      |NA    |18.23        |24.87  |
## |Luxury_goods        |46.00 |NA     |NA            |NA     |NA      |13.18 |NA           |46.70  |
## |Medicine            |23.45 |47.24  |NA            |20.35  |5.00    |16.09 |20.98        |32.25  |
## |Other               |28.70 |37.57  |NA            |21.93  |15.20   |20.77 |24.24        |30.31  |
## |Tickets             |40.32 |40.75  |NA            |NA     |23.00   |NA    |21.60        |20.00  |
## |entertainment       |24.65 |24.95  |NA            |16.87  |54.92   |18.00 |10.00        |20.15  |
##
##
## Table: 75+'s online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |46.48 |40.90  |2.80   |NA      |NA    |NA           |NA     |
## |Clothes_sportswear  |54.20 |NA     |NA     |NA      |NA    |NA           |44.17  |
## |Donations           |40.00 |26.00  |10.00  |NA      |NA    |NA           |90.00  |
## |Electronic_goods    |47.71 |100.00 |42.20  |NA      |NA    |25.65        |15.00  |
## |Food_daily.supplies |28.08 |23.20  |49.00  |8.25    |24.66 |38.00        |29.69  |
## |Furniture           |29.39 |NA     |NA     |NA      |NA    |NA           |NA     |
## |Household_related   |59.75 |42.47  |NA     |NA      |58.00 |NA           |NA     |
## |Luxury_goods        |21.00 |NA     |NA     |NA      |NA    |NA           |NA     |
## |Medicine            |36.32 |91.83  |NA     |NA      |22.48 |15.00        |25.52  |
## |Other               |33.55 |58.85  |21.99  |20.00   |14.74 |NA           |28.94  |
## |Tickets             |36.00 |17.00  |50.00  |NA      |NA    |50.00        |10.00  |
## |entertainment       |37.70 |44.83  |19.50  |NA      |NA    |43.45        |49.12  |
## |Financial_products  |NA    |15.00  |25.00  |NA      |NA    |3.50         |NA     |
##
##
## Table: 70-74's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |28.68 |33.00  |NA            |NA     |NA      |NA    |NA           |59.62  |
```

```
## |Clothes_sportswear  |39.92 |64.99  |NA           |NA     |80.00   |25.00 |NA          |32.54  |
## |Donations           |35.00 |34.00  |NA           |NA     |NA      |30.00 |NA          |35.00  |
## |Electronic_goods    |43.90 |47.50  |NA           |22.83  |50.00   |NA    |NA          |31.81  |
## |Food_daily.supplies |29.94 |40.46  |20           |33.33  |5.32    |27.69 |43.11       |29.29  |
## |Furniture           |46.08 |35.00  |NA           |42.50  |NA      |NA    |NA          |31.63  |
## |Household_related   |47.88 |67.33  |NA           |65.00  |NA      |NA    |50.21       |33.90  |
## |Luxury_goods        |19.00 |47.00  |NA           |NA     |NA      |NA    |NA          |66.00  |
## |Medicine            |28.51 |9.15   |NA           |46.80  |NA      |35.56 |35.88       |53.93  |
## |Other               |27.82 |35.40  |NA           |32.35  |NA      |25.47 |38.25       |46.98  |
## |Tickets             |39.14 |90.00  |NA           |13.00  |NA      |30.00 |NA          |NA     |
## |entertainment       |30.48 |32.47  |NA           |12.99  |32.65   |8.25  |NA          |38.77  |
## |Financial_products  |NA    |80.00  |NA           |36.00  |NA      |20.00 |NA          |NA     |
##
##
## Table: 40-44's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |44.46 |34.27  |NA     |NA      |NA    |25.00        |9.20   |
## |Clothes_sportswear  |35.02 |50.47  |27.79  |12.99   |68.05 |40.59        |37.20  |
## |Electronic_goods    |40.31 |54.00  |NA     |21.04   |47.75 |NA           |39.13  |
## |Financial_products  |62.70 |57.34  |11.30  |NA      |NA    |NA           |50.00  |
## |Food_daily.supplies |24.45 |34.60  |16.29  |25.43   |22.05 |39.69        |26.75  |
## |Furniture           |43.27 |49.97  |24.95  |12.99   |NA    |NA           |24.50  |
## |Household_related   |38.09 |57.82  |48.88  |NA      |30.13 |NA           |33.34  |
## |Medicine            |28.97 |22.62  |41.49  |25.00   |13.07 |20.08        |34.91  |
## |Other               |26.17 |37.02  |33.44  |11.61   |18.49 |31.60        |33.61  |
## |Tickets             |30.72 |67.50  |NA     |NA      |40.00 |NA           |25.75  |
## |entertainment       |26.12 |37.08  |19.63  |38.66   |5.65  |31.66        |26.02  |
## |Donations           |NA    |15.00  |NA     |NA      |NA    |20.00        |NA     |
## |Luxury_goods        |NA    |NA     |NA     |NA      |NA    |NA           |39.00  |
```

compare average spending on various commodities using different instruments by country

```
#compare by country

df_2<- data.frame(df_1, Country= space$COUNTRY)%>%
  drop_na()



for( country in unique(df_2$Country)){
  df_2.sub<- df_2%>%
    filter(Country == country)
  grouped_2<-df_2.sub%>%
    group_by(QB4_1, QB1_1)%>%
    summarise(mean= mean(QB3_1, na.rm = T))

  dd_2<-pivot_wider(grouped_2, names_from = QB4_1,
                    values_from = mean)
```

```
  print(kable(dd_2,digits = 2,
              align = "l",
              caption=paste0(country, "'s online Payment")))
}
```

```
##
##
## Table: AT's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |36.75 |NA     |20.30  |NA      |6.30  |NA           |24.92  |
## |Clothes_sportswear  |37.69 |58.70  |77.00  |29.15   |53.00 |39.44        |46.29  |
## |Donations           |13.00 |50.00  |NA     |NA      |10.00 |NA           |40.34  |
## |Electronic_goods    |35.60 |32.50  |37.51  |NA      |NA    |31.90        |33.00  |
## |Financial_products  |20.00 |56.05  |45.00  |NA      |NA    |3.50         |25.00  |
## |Food_daily.supplies |31.15 |26.70  |15.21  |25.00   |31.12 |27.59        |30.30  |
## |Furniture           |35.09 |100.00 |NA     |12.00   |NA    |NA           |50.50  |
## |Household_related   |26.04 |NA     |90.00  |NA      |35.00 |NA           |3.00   |
## |Luxury_goods        |81.90 |49.44  |NA     |NA      |NA    |NA           |81.00  |
## |Medicine            |28.81 |47.08  |22.11  |NA      |26.70 |32.55        |31.15  |
## |Other               |33.62 |46.61  |27.02  |8.88    |24.23 |44.00        |41.20  |
## |Tickets             |30.75 |29.50  |35.00  |NA      |NA    |NA           |21.23  |
## |entertainment       |31.54 |25.87  |35.38  |21.00   |20.00 |31.40        |24.91  |
##
##
## Table: BE's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |9.70  |NA     |NA            |NA     |NA      |NA    |8.70         |51.93  |
## |Clothes_sportswear  |38.32 |56.59  |NA            |30.00  |7.20    |44.44 |41.00        |38.01  |
## |Donations           |48.17 |18.33  |25            |90.00  |NA      |NA    |NA           |11.75  |
## |Electronic_goods    |41.00 |22.66  |NA            |NA     |51.04   |NA    |30.51        |33.79  |
## |Financial_products  |60.49 |40.73  |NA            |48.40  |NA      |20.00 |60.02        |14.04  |
## |Food_daily.supplies |27.36 |13.69  |NA            |57.20  |NA      |23.97 |13.27        |29.87  |
## |Furniture           |32.85 |100.00 |NA            |NA     |NA      |8.45  |NA           |47.33  |
## |Household_related   |30.85 |NA     |NA            |33.98  |NA      |NA    |41.09        |30.33  |
## |Luxury_goods        |46.97 |NA     |NA            |70.00  |NA      |NA    |NA           |23.00  |
## |Medicine            |31.44 |29.66  |NA            |58.00  |32.39   |12.30 |48.38        |27.96  |
## |Other               |29.53 |39.53  |NA            |48.07  |36.11   |24.70 |36.29        |25.53  |
## |Tickets             |37.70 |29.40  |NA            |60.00  |NA      |NA    |52.47        |28.33  |
## |entertainment       |29.60 |30.31  |NA            |6.50   |35.28   |30.65 |49.82        |31.96  |
##
##
## Table: CY's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-----|:------------|:------|
## |Accommodation       |61.50 |NA     |NA     |NA    |NA           |NA     |
## |Clothes_sportswear  |42.93 |20.00  |33.65  |NA    |25.49        |16.33  |
## |Donations           |32.50 |10.00  |NA     |NA    |NA           |NA     |
## |Electronic_goods    |33.07 |NA     |NA     |16.00 |NA           |NA     |
```

```
## |Financial_products  |45.25 |50.00  |37.80  |NA    |NA           |NA     |
## |Food_daily.supplies |19.64 |20.25  |33.00  |24.38 |NA           |42.50  |
## |Household_related   |36.98 |NA     |12.90  |NA    |NA           |NA     |
## |Luxury_goods        |2.50  |NA     |NA     |NA    |NA           |NA     |
## |Medicine            |27.58 |NA     |NA     |NA    |NA           |13.50  |
## |Other               |19.40 |57.02  |32.50  |23.98 |NA           |13.21  |
## |Tickets             |25.19 |30.00  |NA     |NA    |NA           |20.00  |
## |entertainment       |12.35 |10.00  |6.99   |28.13 |NA           |18.91  |
##
##
## Table: EE's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-----|:------------|:------|
## |Accommodation       |26.20 |29.43  |NA     |6.00  |NA           |NA     |
## |Clothes_sportswear  |40.57 |46.03  |NA     |NA    |NA           |NA     |
## |Donations           |10.00 |18.25  |10.50  |NA    |NA           |NA     |
## |Electronic_goods    |47.10 |12.50  |NA     |NA    |NA           |30.50  |
## |Food_daily.supplies |20.21 |32.14  |NA     |19.50 |20.47        |NA     |
## |Furniture           |40.00 |NA     |NA     |NA    |NA           |NA     |
## |Household_related   |51.48 |56.00  |NA     |50.00 |NA           |NA     |
## |Medicine            |24.06 |19.99  |NA     |NA    |15.00        |12.33  |
## |Other               |18.55 |34.87  |15.00  |17.13 |28.50        |47.43  |
## |Tickets             |43.00 |17.86  |NA     |NA    |34.30        |NA     |
## |entertainment       |26.91 |28.28  |14.55  |3.50  |7.50         |9.95   |
## |Financial_products  |NA    |22.17  |5.30   |NA    |10.00        |NA     |
##
##
## Table: ES's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other  |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:------|:------------|:------|
## |Accommodation       |46.05 |NA     |NA            |NA     |NA      |10.00  |75.00        |44.66  |
## |Clothes_sportswear  |38.27 |50.00  |NA            |32.08  |62.32   |28.43  |36.30        |30.02  |
## |Donations           |42.67 |7.50   |NA            |31.67  |10.00   |5.20   |25.00        |45.00  |
## |Electronic_goods    |29.79 |NA     |NA            |62.45  |29.66   |NA     |NA           |25.93  |
## |Financial_products  |41.10 |26.00  |NA            |18.43  |NA      |NA     |NA           |30.00  |
## |Food_daily.supplies |27.29 |46.27  |20            |27.17  |18.02   |20.91  |10.94        |28.81  |
## |Furniture           |38.16 |NA     |NA            |24.95  |42.90   |100.00 |NA           |28.52  |
## |Household_related   |35.79 |70.00  |NA            |NA     |NA      |NA     |30.00        |34.23  |
## |Luxury_goods        |19.00 |NA     |NA            |NA     |NA      |13.18  |NA           |16.00  |
## |Medicine            |26.83 |NA     |NA            |16.19  |18.76   |37.49  |36.35        |37.00  |
## |Other               |24.73 |50.00  |NA            |25.91  |NA      |11.44  |27.38        |24.99  |
## |Tickets             |35.09 |NA     |NA            |NA     |NA      |NA     |12.00        |38.94  |
## |entertainment       |28.26 |55.54  |NA            |17.00  |29.65   |NA     |50.90        |27.78  |
##
##
## Table: FI's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |33.57 |33.38  |53.53  |NA      |NA    |20.81        |NA     |
## |Clothes_sportswear  |37.90 |46.69  |58.30  |NA      |NA    |57.42        |26.71  |
## |Donations           |20.00 |19.33  |15.00  |NA      |10.00 |20.00        |NA     |
```

```
## |Electronic_goods    |51.30 |41.58  |NA     |NA      |NA    |39.94        |14.26  |
## |Financial_products  |42.11 |44.21  |20.99  |NA      |NA    |NA           |NA     |
## |Food_daily.supplies |22.55 |25.96  |25.66  |21.00   |27.32 |34.43        |36.00  |
## |Furniture           |32.93 |38.65  |NA     |NA      |5.25  |43.00        |NA     |
## |Household_related   |58.30 |53.01  |51.33  |NA      |20.00 |19.17        |65.20  |
## |Medicine            |32.49 |35.41  |35.36  |NA      |20.70 |47.85        |NA     |
## |Other               |27.79 |30.90  |31.93  |NA      |15.99 |33.64        |31.32  |
## |Tickets             |38.50 |83.75  |98.00  |NA      |NA    |1.00         |25.00  |
## |entertainment       |27.03 |36.96  |18.37  |33.88   |7.50  |28.24        |18.16  |
##
##
## Table: FR's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |53.66 |12.16  |NA            |30.00  |NA      |NA    |NA           |82.16  |
## |Clothes_sportswear  |40.43 |97.50  |NA            |38.00  |19.99   |55.90 |50.00        |41.59  |
## |Donations           |45.16 |10.00  |NA            |5.00   |NA      |NA    |5.00         |37.50  |
## |Electronic_goods    |41.22 |NA     |30.00         |45.15  |48.59   |23.50 |23.00        |28.01  |
## |Financial_products  |55.00 |100.00 |10.00         |NA     |NA      |NA    |NA           |53.77  |
## |Food_daily.supplies |30.00 |36.20  |2.40          |26.16  |15.69   |16.83 |35.12        |32.34  |
## |Furniture           |35.37 |75.00  |NA            |43.33  |46.73   |NA    |NA           |30.55  |
## |Household_related   |34.42 |18.10  |NA            |24.99  |29.99   |58.00 |35.00        |39.87  |
## |Luxury_goods        |61.59 |NA     |NA            |NA     |NA      |NA    |NA           |46.70  |
## |Medicine            |30.48 |8.67   |5.96          |22.13  |13.00   |18.96 |6.80         |33.23  |
## |Other               |29.70 |20.47  |NA            |30.00  |22.30   |20.55 |32.33        |29.54  |
## |Tickets             |36.03 |20.00  |NA            |81.00  |NA      |NA    |NA           |27.97  |
## |entertainment       |30.90 |5.00   |NA            |17.86  |26.27   |6.74  |25.49        |23.22  |
##
##
## Table: GR's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |34.57 |NA     |NA            |NA     |NA      |NA    |NA           |NA     |
## |Clothes_sportswear  |36.99 |NA     |NA            |22.30  |NA      |24.50 |61.33        |19.71  |
## |Donations           |1.00  |10.00  |NA            |NA     |NA      |26.00 |NA           |NA     |
## |Electronic_goods    |34.99 |NA     |NA            |100.00 |NA      |34.00 |35.00        |39.85  |
## |Financial_products  |22.60 |NA     |0.5           |28.27  |NA      |NA    |NA           |55.18  |
## |Food_daily.supplies |25.45 |70.22  |NA            |34.85  |2.43    |20.64 |22.90        |22.16  |
## |Furniture           |30.09 |NA     |NA            |NA     |NA      |NA    |NA           |20.00  |
## |Household_related   |32.12 |NA     |60.8          |75.00  |NA      |26.82 |NA           |14.81  |
## |Medicine            |19.81 |24.90  |NA            |NA     |NA      |19.94 |10.10        |18.17  |
## |Other               |21.54 |65.89  |NA            |40.62  |NA      |9.13  |8.67         |23.00  |
## |Tickets             |20.12 |NA     |NA            |NA     |NA      |NA    |42.00        |5.00   |
## |entertainment       |22.64 |20.00  |NA            |10.83  |5.05    |21.00 |20.50        |7.73   |
## |Luxury_goods        |NA    |47.00  |NA            |NA     |NA      |NA    |NA           |100.00 |
##
##
## Table: IE's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |35.20 |45.00  |NA            |56.00  |NA      |NA    |NA           |32.00  |
```

```
## |Clothes_sportswear  |41.36 |45.84  |NA           |46.00  |12.99   |50.00 |NA          |43.93  |
## |Donations           |15.25 |NA     |NA           |NA     |NA      |NA    |NA          |42.00  |
## |Electronic_goods    |44.49 |NA     |NA           |25.49  |NA      |NA    |NA          |39.99  |
## |Financial_products  |33.38 |NA     |NA           |59.09  |NA      |NA    |NA          |62.29  |
## |Food_daily.supplies |27.13 |52.76  |20           |38.83  |50.30   |25.10 |33.52       |37.60  |
## |Furniture           |40.02 |NA     |NA           |12.50  |NA      |NA    |NA          |65.50  |
## |Household_related   |39.43 |58.00  |NA           |40.00  |NA      |25.00 |NA          |25.95  |
## |Luxury_goods        |18.00 |NA     |NA           |NA     |NA      |NA    |NA          |90.00  |
## |Medicine            |32.53 |32.88  |NA           |71.00  |25.00   |15.00 |NA          |38.48  |
## |Other               |31.21 |34.83  |NA           |39.84  |10.00   |30.83 |30.00       |27.01  |
## |Tickets             |46.00 |90.00  |NA           |NA     |NA      |NA    |32.47       |27.50  |
## |entertainment       |23.34 |8.99   |NA           |16.07  |25.00   |65.00 |NA          |24.29  |
##
##
## Table: IT's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other  |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:------|:------------|:------|
## |Accommodation       |47.71 |85.00  |NA     |NA      |3.50   |NA           |37.52  |
## |Clothes_sportswear  |36.65 |39.74  |NA     |28.27   |25.04  |28.00        |35.56  |
## |Donations           |12.50 |54.00  |NA     |50.00   |NA     |NA           |11.75  |
## |Electronic_goods    |41.38 |40.86  |NA     |40.00   |41.49  |NA           |48.25  |
## |Financial_products  |58.04 |87.00  |57.14  |NA      |100.00 |NA           |30.00  |
## |Food_daily.supplies |27.05 |56.00  |NA     |10.63   |28.69  |18.20        |26.37  |
## |Furniture           |31.19 |75.00  |NA     |34.75   |NA     |NA           |70.00  |
## |Household_related   |24.53 |35.00  |NA     |11.99   |2.10   |NA           |20.12  |
## |Luxury_goods        |20.00 |NA     |NA     |NA      |NA     |NA           |39.25  |
## |Medicine            |23.41 |51.42  |NA     |16.75   |20.00  |16.00        |31.85  |
## |Other               |23.96 |37.59  |36.06  |18.71   |19.45  |17.77        |30.39  |
## |Tickets             |35.34 |NA     |NA     |NA      |45.00  |NA           |20.36  |
## |entertainment       |26.69 |30.57  |25.52  |20.87   |31.50  |21.96        |23.45  |
##
##
## Table: LT's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other  |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:------|:------------|:------|
## |Accommodation       |30.10 |NA     |4.75   |NA      |20.85  |7.80         |NA     |
## |Clothes_sportswear  |33.64 |37.30  |8.30   |NA      |80.00  |70.88        |43.25  |
## |Donations           |5.00  |NA     |20.00  |NA      |14.00  |NA           |NA     |
## |Electronic_goods    |29.14 |36.27  |22.62  |NA      |100.00 |NA           |33.38  |
## |Financial_products  |57.00 |69.67  |53.69  |NA      |100.00 |20.00        |54.00  |
## |Food_daily.supplies |22.29 |39.55  |30.99  |NA      |18.44  |34.50        |24.28  |
## |Furniture           |46.78 |38.00  |NA     |NA      |NA     |NA           |51.50  |
## |Household_related   |28.84 |36.61  |34.25  |NA      |NA     |23.49        |56.55  |
## |Medicine            |21.51 |27.68  |46.63  |NA      |11.58  |33.30        |46.77  |
## |Other               |26.00 |27.99  |26.25  |20      |29.56  |NA           |17.28  |
## |Tickets             |48.50 |100.00 |26.00  |80      |10.00  |NA           |30.00  |
## |entertainment       |21.27 |24.67  |25.16  |22      |NA     |19.99        |35.00  |
##
##
## Table: LU's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
```

```
## |:-------------------|:-----|:------|:-------------|:------|:-------|:-----|:-----------|:------|
## |Accommodation       |30.00 |80.00  |NA            |NA     |NA      |NA    |NA          |50.00  |
## |Clothes_sportswear  |39.60 |42.67  |NA            |NA     |58      |NA    |NA          |54.53  |
## |Electronic_goods    |50.18 |51.00  |NA            |14.27  |NA      |NA    |NA          |53.14  |
## |Food_daily.supplies |26.66 |39.61  |NA            |10.30  |NA      |8.53  |34.66       |28.82  |
## |Furniture           |80.21 |78.91  |NA            |NA     |40      |NA    |NA          |NA     |
## |Household_related   |23.66 |65.41  |NA            |NA     |NA      |NA    |NA          |77.25  |
## |Luxury_goods        |76.28 |NA     |NA            |NA     |NA      |NA    |NA          |22.67  |
## |Medicine            |27.40 |25.00  |NA            |NA     |NA      |NA    |NA          |38.89  |
## |Other               |35.03 |49.09  |77            |53.78  |NA      |35.69 |14.30       |66.77  |
## |Tickets             |6.06  |32.00  |NA            |19.00  |NA      |NA    |50.00       |8.00   |
## |entertainment       |39.14 |30.48  |NA            |79.90  |NA      |22.00 |NA          |35.12  |
## |Donations           |NA    |50.00  |100           |NA     |NA      |NA    |NA          |52.00  |
## |Financial_products  |NA    |2.05   |NA            |NA     |NA      |NA    |NA          |NA     |
##
##
## Table: LV's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-----|:------------|:------|
## |Accommodation       |14.85 |32.30  |1.89   |NA    |14.50        |NA     |
## |Clothes_sportswear  |21.79 |35.49  |21.89  |5.93  |NA           |33.63  |
## |Donations           |11.00 |NA     |10.00  |NA    |NA           |NA     |
## |Electronic_goods    |56.33 |38.40  |28.99  |NA    |25.00        |NA     |
## |Financial_products  |36.95 |19.55  |4.00   |NA    |NA           |NA     |
## |Food_daily.supplies |19.66 |28.76  |44.33  |10.25 |28.91        |15.60  |
## |Furniture           |40.50 |35.75  |NA     |NA    |NA           |NA     |
## |Household_related   |38.97 |40.00  |25.00  |25.00 |NA           |8.01   |
## |Medicine            |15.73 |35.45  |55.72  |6.20  |NA           |72.95  |
## |Other               |30.78 |27.35  |11.64  |12.07 |3.41         |3.00   |
## |entertainment       |41.84 |15.54  |14.17  |NA    |50.00        |NA     |
## |Tickets             |NA    |15.04  |56.00  |30.00 |NA           |NA     |
##
##
## Table: MT's online Payment
##
## |QB1_1               |Card   |Credit |Crypto-assets |Direct |Other |Other.online |PayPal |
## |:-------------------|:------|:------|:-------------|:------|:-----|:------------|:------|
## |Accommodation       |100.00 |NA     |NA            |NA     |NA    |NA           |NA     |
## |Clothes_sportswear  |38.00  |NA     |NA            |NA     |65.00 |NA           |36.07  |
## |Electronic_goods    |32.71  |NA     |NA            |NA     |NA    |25.00        |42.15  |
## |Financial_products  |20.00  |NA     |24            |NA     |NA    |NA           |NA     |
## |Food_daily.supplies |30.63  |4.5    |NA            |NA     |12.45 |5.10         |14.72  |
## |Furniture           |13.55  |NA     |NA            |NA     |NA    |NA           |10.00  |
## |Household_related   |26.00  |NA     |NA            |25     |15.00 |25.88        |40.52  |
## |Medicine            |42.17  |NA     |NA            |65     |NA    |6.50         |29.33  |
## |Other               |33.27  |9.0    |NA            |NA     |22.65 |14.54        |14.40  |
## |Tickets             |70.00  |NA     |NA            |NA     |NA    |NA           |NA     |
## |entertainment       |46.25  |NA     |NA            |NA     |26.98 |NA           |26.39  |
##
##
## Table: PT's online Payment
##
## |QB1_1               |Card  |Credit |Crypto-assets |Direct |Loyalty |Other |Other.online |PayPal |
```

```
## |:-------------------|:-----|:------|:------------|:------|:-------|:-----|:-----------|:------|
## |Accommodation       |60.60 |20.00  |NA           |NA     |NA      |69.00 |NA          |47.33  |
## |Clothes_sportswear  |31.43 |40.49  |NA           |13.78  |29.99   |70.00 |27.80       |25.16  |
## |Electronic_goods    |27.24 |25.45  |NA           |58.50  |NA      |NA    |NA          |31.40  |
## |Financial_products  |73.33 |25.00  |27.5         |25.00  |NA      |75.00 |NA          |100.00 |
## |Food_daily.supplies |21.94 |22.50  |NA           |7.88   |40.00   |14.25 |23.82       |21.51  |
## |Furniture           |40.90 |NA     |NA           |40.00  |NA      |NA    |61.50       |7.29   |
## |Household_related   |42.88 |54.52  |NA           |57.75  |NA      |NA    |20.00       |NA     |
## |Luxury_goods        |74.00 |NA     |NA           |80.00  |NA      |NA    |NA          |NA     |
## |Medicine            |32.68 |78.66  |NA           |NA     |35.00   |11.17 |34.99       |37.33  |
## |Other               |25.25 |27.34  |NA           |30.21  |NA      |14.46 |19.92       |18.49  |
## |Tickets             |46.33 |35.00  |NA           |NA     |NA      |NA    |18.63       |10.00  |
## |entertainment       |17.54 |21.25  |NA           |NA     |8.50    |NA    |10.00       |19.58  |
## |Donations           |NA    |NA     |NA           |16.67  |NA      |NA    |NA          |NA     |
##
##
## Table: SI's online Payment
##
## |QB1_1               |Card   |Credit |Direct |Loyalty |Other  |Other.online |PayPal |
## |:-------------------|:------|:------|:------|:-------|:------|:------------|:------|
## |Accommodation       |15.10  |NA     |NA     |NA      |NA     |NA           |NA     |
## |Clothes_sportswear  |33.34  |NA     |NA     |NA      |NA     |NA           |56.20  |
## |Electronic_goods    |58.30  |NA     |NA     |35.00   |NA     |NA           |9.05   |
## |Financial_products  |2.94   |NA     |45.00  |NA      |NA     |NA           |23.38  |
## |Food_daily.supplies |21.64  |24.12  |22.48  |NA      |25.98  |NA           |18.81  |
## |Furniture           |56.00  |NA     |26.50  |NA      |NA     |NA           |NA     |
## |Household_related   |22.15  |NA     |100.00 |NA      |100.00 |NA           |NA     |
## |Luxury_goods        |100.00 |NA     |NA     |NA      |NA     |NA           |NA     |
## |Medicine            |40.34  |3.75   |16.55  |NA      |NA     |NA           |14.30  |
## |Other               |27.58  |21.04  |14.58  |NA      |19.36  |20.55        |25.00  |
## |entertainment       |45.67  |NA     |NA     |97.76   |NA     |36.00        |50.00  |
##
##
## Table: SK's online Payment
##
## |QB1_1               |Card  |Credit |Direct |Loyalty |Other |Other.online |PayPal |
## |:-------------------|:-----|:------|:------|:-------|:-----|:------------|:------|
## |Accommodation       |33.74 |43.00  |NA     |NA      |35.00 |NA           |NA     |
## |Clothes_sportswear  |34.32 |25.69  |NA     |NA      |44.74 |36.84        |28.04  |
## |Donations           |27.50 |NA     |5.00   |NA      |NA    |NA           |10.00  |
## |Electronic_goods    |30.96 |26.70  |NA     |NA      |40.83 |41.00        |22.50  |
## |Financial_products  |32.75 |34.76  |33.57  |NA      |NA    |39.41        |NA     |
## |Food_daily.supplies |20.15 |22.62  |25.00  |16.29   |21.06 |28.38        |32.07  |
## |Furniture           |24.70 |32.49  |NA     |NA      |25.00 |NA           |28.38  |
## |Household_related   |36.44 |19.07  |25.00  |NA      |39.97 |47.42        |NA     |
## |Luxury_goods        |80.00 |NA     |NA     |NA      |NA    |NA           |NA     |
## |Medicine            |26.89 |20.09  |35.78  |5.00    |26.22 |29.18        |23.83  |
## |Other               |21.42 |27.70  |22.50  |NA      |23.68 |17.47        |25.93  |
## |Tickets             |16.80 |23.50  |30.00  |23.00   |21.00 |NA           |20.00  |
## |entertainment       |22.54 |16.15  |5.99   |NA      |5.20  |28.75        |24.37  |
```

Adoption Rate

```
#One chart for adoption Rate

adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
names(adoption)<- c("Cash", "Credit.debit","Crypto","None","Not.Sure")

ratios <- apply(data.matrix(adoption)[,], 2, function(x) length(which(x == 1)) / nrow(adoption))

ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
                Adoption.Rate= ratios)
kable(ff, align = "l", caption = "Adoption Rate")
```

Table 10: Adoption Rate

	Adoption.Rate
Cash	0.8926721
Credit.debit	0.9201328
Crypto	0.0443092
None	0.0097319
Not.Sure	0.0005029

The table above shows how people have adopted various instruments. over 89 % of the population have a payment account. The comparison have also been broken down by demographics as shown below.

comapare adoption by country

```
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5, COUNTRY)

for( country in unique(adoption$COUNTRY)){
  dat<- adoption%>%
    filter(COUNTRY== country)%>%
    select(-COUNTRY)
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
    Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(country, "'s Adoption Rate")))

}
```

```
##
##
## Table: AT's Adoption Rate
```

```
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9284278     |
## |Credit.debit    |0.8898271     |
## |Crypto          |0.0695617     |
## |None            |0.0064335     |
## |Not.Sure        |0.0004021     |
##
##
## Table: BE's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8988235     |
## |Credit.debit    |0.9149580     |
## |Crypto          |0.0366387     |
## |None            |0.0067227     |
## |Not.Sure        |0.0000000     |
##
##
## Table: CY's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8110236     |
## |Credit.debit    |0.9616142     |
## |Crypto          |0.0718504     |
## |None            |0.0068898     |
## |Not.Sure        |0.0000000     |
##
##
## Table: EE's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9276228     |
## |Credit.debit    |0.9442231     |
## |Crypto          |0.0484728     |
## |None            |0.0006640     |
## |Not.Sure        |0.0000000     |
##
##
## Table: ES's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8911398     |
## |Credit.debit    |0.9387801     |
## |Crypto          |0.0414069     |
## |None            |0.0073464     |
## |Not.Sure        |0.0011131     |
##
##
```

```
## Table: FI's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9781746     |
## |Credit.debit    |0.9751984     |
## |Crypto          |0.0548942     |
## |None            |0.0029762     |
## |Not.Sure        |0.0000000     |
##
##
## Table: FR's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8998026     |
## |Credit.debit    |0.9157618     |
## |Crypto          |0.0294505     |
## |None            |0.0097071     |
## |Not.Sure        |0.0018098     |
##
##
## Table: GR's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8437667     |
## |Credit.debit    |0.9464955     |
## |Crypto          |0.0481541     |
## |None            |0.0171215     |
## |Not.Sure        |0.0000000     |
##
##
## Table: IE's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8409912     |
## |Credit.debit    |0.9143005     |
## |Crypto          |0.0562726     |
## |None            |0.0129066     |
## |Not.Sure        |0.0000000     |
##
##
## Table: IT's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8710685     |
## |Credit.debit    |0.9290654     |
## |Crypto          |0.0229757     |
## |None            |0.0140531     |
## |Not.Sure        |0.0004461     |
##
```

```
##
## Table: LT's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8778371     |
## |Credit.debit    |0.8791722     |
## |Crypto          |0.0280374     |
## |None            |0.0046729     |
## |Not.Sure        |0.0000000     |
##
##
## Table: LU's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9274354     |
## |Credit.debit    |0.9691849     |
## |Crypto          |0.0874751     |
## |None            |0.0009940     |
## |Not.Sure        |0.0000000     |
##
##
## Table: LV's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9433198     |
## |Credit.debit    |0.9159919     |
## |Crypto          |0.0374494     |
## |None            |0.0050607     |
## |Not.Sure        |0.0010121     |
##
##
## Table: MT's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8088531     |
## |Credit.debit    |0.9064386     |
## |Crypto          |0.0553320     |
## |None            |0.0160966     |
## |Not.Sure        |0.0000000     |
##
##
## Table: PT's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8118712     |
## |Credit.debit    |0.8148893     |
## |Crypto          |0.0588531     |
## |None            |0.0211268     |
## |Not.Sure        |0.0000000     |
```

```
##
##
## Table: SI's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8626263     |
## |Credit.debit    |0.9050505     |
## |Crypto          |0.0767677     |
## |None            |0.0000000     |
## |Not.Sure        |0.0000000     |
##
##
## Table: SK's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9449692     |
## |Credit.debit    |0.9055441     |
## |Crypto          |0.0353183     |
## |None            |0.0209446     |
## |Not.Sure        |0.0000000     |
```

comapare adoption by AGE

```
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$AGE<- df$AGE

for(age in unique(adoption$AGE)){
  dat<- adoption%>%
    filter(AGE== age)%>%
    select(-AGE)
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
    Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(age, "'s Adoption Rate")))

}
```

```
##
##
## Table: 64-69's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9008161     |
## |Credit.debit    |0.9255074     |
```

```
## |Crypto          |0.0169492     |
## |None            |0.0087884     |
## |Not.Sure        |0.0004185     |
##
##
## Table: 55-59's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9140401     |
## |Credit.debit    |0.9177650     |
## |Crypto          |0.0223496     |
## |None            |0.0120344     |
## |Not.Sure        |0.0002865     |
##
##
## Table: 35-39's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8927277     |
## |Credit.debit    |0.9318676     |
## |Crypto          |0.0681324     |
## |None            |0.0082145     |
## |Not.Sure        |0.0004832     |
##
##
## Table: 30-34's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8998420     |
## |Credit.debit    |0.9178515     |
## |Crypto          |0.0875197     |
## |None            |0.0113744     |
## |Not.Sure        |0.0003160     |
##
##
## Table: 60-64's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9171410     |
## |Credit.debit    |0.9237824     |
## |Crypto          |0.0173941     |
## |None            |0.0094877     |
## |Not.Sure        |0.0000000     |
##
##
## Table: 50-54's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9057991     |
```

```
## |Credit.debit    |0.9273074     |
## |Crypto          |0.0296760     |
## |None            |0.0078955     |
## |Not.Sure        |0.0000000     |
##
##
## Table: 18-24's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8018092     |
## |Credit.debit    |0.9026864     |
## |Crypto          |0.0756579     |
## |None            |0.0150768     |
## |Not.Sure        |0.0027412     |
##
##
## Table: 45-49's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9175747     |
## |Credit.debit    |0.9240011     |
## |Crypto          |0.0413523     |
## |None            |0.0078234     |
## |Not.Sure        |0.0000000     |
##
##
## Table: 40-44's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9033816     |
## |Credit.debit    |0.9112319     |
## |Crypto          |0.0570652     |
## |None            |0.0093599     |
## |Not.Sure        |0.0003019     |
##
##
## Table: 75+'s Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8884181     |
## |Credit.debit    |0.9173729     |
## |Crypto          |0.0134181     |
## |None            |0.0098870     |
## |Not.Sure        |0.0007062     |
##
##
## Table: 25-29's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
```

```
## |Payment.account |0.8722152     |
## |Credit.debit    |0.9041614     |
## |Crypto          |0.0899538     |
## |None            |0.0088272     |
## |Not.Sure        |0.0000000     |
##
##
## Table: 70-74's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8925265     |
## |Credit.debit    |0.9282407     |
## |Crypto          |0.0112434     |
## |None            |0.0082672     |
## |Not.Sure        |0.0006614     |
```

comapare adoption by Gender

```
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$D1<- df$D1

for(d1 in unique(adoption$D1)){
  dat<- adoption%>%
    filter(D1== d1)%>%
    select(-D1)%>%
    drop_na()
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(d1, "'s Adoption Rate")))

}
```

```
##
##
## Table: Female's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8872720     |
## |Credit.debit    |0.9180248     |
## |Crypto          |0.0292976     |
## |None            |0.0109139     |
## |Not.Sure        |0.0005336     |
##
##
## Table: Male's Adoption Rate
```

```
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8988123     |
## |Credit.debit    |0.9225135     |
## |Crypto          |0.0604824     |
## |None            |0.0084236     |
## |Not.Sure        |0.0004709     |
##
##
## Table: Other, non-binary's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.7297297     |
## |Credit.debit    |0.8648649     |
## |Crypto          |0.0540541     |
## |None            |0.0270270     |
## |Not.Sure        |0.0000000     |
```

comapare adoption by Activity

```r
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$D6_1<- df$D6_1

for(d6_1 in unique(adoption$D6_1)){
  dat<- adoption%>%
    filter(D6_1== d6_1)%>%
    select(-D6_1)%>%
    drop_na()
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(d6_1, "'s Adoption Rate")))

}
```

```
##
##
## Table: Without a professional activity or student's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8760717     |
## |Credit.debit    |0.9167966     |
## |Crypto          |0.0250714     |
## |None            |0.0140296     |
## |Not.Sure        |0.0006495     |
```

```
##
##
## Table: Employee's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9047399     |
## |Credit.debit    |0.9245196     |
## |Crypto          |0.0567256     |
## |None            |0.0064053     |
## |Not.Sure        |0.0005124     |
##
##
## Table: Self-employed's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8966397     |
## |Credit.debit    |0.9147171     |
## |Crypto          |0.0561463     |
## |None            |0.0089324     |
## |Not.Sure        |0.0000000     |
##
##
## Table: NA's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |NaN           |
## |Credit.debit    |NaN           |
## |Crypto          |NaN           |
## |None            |NaN           |
## |Not.Sure        |NaN           |
```

comapare adoption by EDUCutation

```
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$EDUCATION<- df$EDUCATION

for(edu in unique(adoption$EDUCATION)){
  dat<- adoption%>%
    filter(EDUCATION== edu)%>%
    select(-EDUCATION)
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
    Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(edu, "'s Adoption Rate")))
```

```
}
```

```
##
##
## Table: Upper/post-secondary education's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8897723     |
## |Credit.debit    |0.9152138     |
## |Crypto          |0.0417400     |
## |None            |0.0110739     |
## |Not.Sure        |0.0006247     |
##
##
## Table: University/PhD/research's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9052680     |
## |Credit.debit    |0.9325984     |
## |Crypto          |0.0560470     |
## |None            |0.0066015     |
## |Not.Sure        |0.0002641     |
##
##
## Table: Primary/lower secondary education's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8727325     |
## |Credit.debit    |0.9054421     |
## |Crypto          |0.0254249     |
## |None            |0.0131410     |
## |Not.Sure        |0.0007142     |
##
##
## Table: NA's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |NaN           |
## |Credit.debit    |NaN           |
## |Crypto          |NaN           |
## |None            |NaN           |
## |Not.Sure        |NaN           |
```

comapare adoption by INCOME

```r
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$INCOME<- df$INCOME

for(income in unique(adoption$INCOME)){
  dat<- adoption%>%
    filter(INCOME== income)%>%
    select(-INCOME)
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
    Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(income, "'s Adoption Rate")))

}
```

```
##
##
## Table: NA's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |NaN           |
## |Credit.debit    |NaN           |
## |Crypto          |NaN           |
## |None            |NaN           |
## |Not.Sure        |NaN           |
##
##
## Table: Between EUR 2,501 and EUR 4,000's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9138765     |
## |Credit.debit    |0.9417936     |
## |Crypto          |0.0453426     |
## |None            |0.0036493     |
## |Not.Sure        |0.0002737     |
##
##
## Table: More than EUR 4,000's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9355072     |
## |Credit.debit    |0.9605072     |
## |Crypto          |0.0717391     |
## |None            |0.0028986     |
## |Not.Sure        |0.0001812     |
##
##
```

```
## Table: Between EUR 751 and EUR 1,500's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8555377     |
## |Credit.debit    |0.8900482     |
## |Crypto          |0.0330391     |
## |None            |0.0164526     |
## |Not.Sure        |0.0000000     |
##
##
## Table: Between EUR 1,501 and EUR 2,500's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9015225     |
## |Credit.debit    |0.9257238     |
## |Crypto          |0.0390742     |
## |None            |0.0061603     |
## |Not.Sure        |0.0003520     |
##
##
## Table: EUR 750 or less's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8024194     |
## |Credit.debit    |0.8185484     |
## |Crypto          |0.0447214     |
## |None            |0.0366569     |
## |Not.Sure        |0.0003666     |
```

comapare adoption by HHSIZE

```
# by country
adoption<- space%>%
  select(QQ1A_1,QQ1A_2, QQ1A_3, QQ1A_4, QQ1A_5)
adoption$HHSIZE<- df$HHSIZE

for(hhsize in unique(adoption$HHSIZE)){
  dat<- adoption%>%
    filter(HHSIZE== hhsize)%>%
    select(-HHSIZE)
  names(dat)<- c("Payment.account", "Credit.debit","Crypto","None","Not.Sure")
  ratios <- apply(data.matrix(dat)[,], 2, function(x) length(which(x == 1)) / nrow(dat))

  ff<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
    Adoption.Rate= ratios)
  print(kable(ff, align = "l", caption=paste0(hhsize, "'s Adoption Rate")))

}
```

```
##
##
## Table: 2's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9025989     |
## |Credit.debit    |0.9266513     |
## |Crypto          |0.0356691     |
## |None            |0.0093082     |
## |Not.Sure        |0.0002234     |
##
##
## Table: 4's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8797603     |
## |Credit.debit    |0.9106525     |
## |Crypto          |0.0519308     |
## |None            |0.0091877     |
## |Not.Sure        |0.0005326     |
##
##
## Table: 1's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.9091962     |
## |Credit.debit    |0.9259957     |
## |Crypto          |0.0385228     |
## |None            |0.0095583     |
## |Not.Sure        |0.0005793     |
##
##
## Table: 5's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8631324     |
## |Credit.debit    |0.9095634     |
## |Crypto          |0.0564796     |
## |None            |0.0128205     |
## |Not.Sure        |0.0006930     |
##
##
## Table: 3's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |0.8858641     |
## |Credit.debit    |0.9176615     |
## |Crypto          |0.0513221     |
## |None            |0.0098181     |
```

```
## |Not.Sure        |0.0004463     |
##
##
## Table: NA's Adoption Rate
##
## |                |Adoption.Rate |
## |:---------------|:-------------|
## |Payment.account |NaN           |
## |Credit.debit    |NaN           |
## |Crypto          |NaN           |
## |None            |NaN           |
## |Not.Sure        |NaN           |
```

Cash advantage

```
#cash advantage
cash.advg<- space%>%
  select(QQ13A_1,QQ13A_2,QQ13A_3,QQ13A_4,QQ13A_5,
         QQ13A_6, QQ13A_7, QQ13A_8,QQ13A_9,QQ13A_10,QQ13A_11)
names(cash.advg)<- c("cash.acceptance", "cash.faster","cash.privacy","cash.easier",
                     "cash.safer","immediately_settled","aware_spending",
                     "other_advantage","do_not_use_cash","no_advantage",
                     "dont_know")
ratios <- apply(data.matrix(cash.advg)[,], 2, function(x) length(which(x == 1)) / nrow(cash.advg))

cash.advg.rate<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
  Advantage.Rating= ratios)
kable(cash.advg.rate, align = "l", caption = "Cash advatange ratio")
```

Table 11: Cash advatange ratio

	Advantage.Rating
cash.acceptance	0.2912790
cash.faster	0.1699190
cash.privacy	0.3754464
cash.easier	0.1849319
cash.safer	0.1677312
immediately_settled	0.2921340
aware_spending	0.3664437
other_advantage	0.0343007
do_not_use_cash	0.0410401
no_advantage	0.0497410
dont_know	0.0120203

The table above the ration of people who believe that cash has advantage for given reason. e.g. 29.12% of the population believe that cash is advantageous since it is easily accepted.

We will break down the same comparison suing different demographics.

Age Comaprios for Cash Advantage

```
cash.advg.age<- data.frame(cash.advg, AGE= df$AGE)

for(age in unique(cash.advg.age$AGE)){
  dd<- cash.advg.age%>%
    filter(AGE==age)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(age, "'s Cash advatange
}
```

```
##
##
## Table: 64-69's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2815452        |
## |cash.faster         |0.1633424        |
## |cash.privacy        |0.3529288        |
## |cash.easier         |0.1822381        |
## |cash.safer          |0.1631325        |
## |immediately_settled |0.2922528        |
## |aware_spending      |0.3407516        |
## |other_advantage     |0.0377913        |
## |do_not_use_cash     |0.0529078        |
## |no_advantage        |0.0629855        |
## |dont_know           |0.0146966        |
## |AGE                 |1.0000000        |
##
##
## Table: 55-59's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2852214        |
## |cash.faster         |0.1687752        |
## |cash.privacy        |0.4008051        |
## |cash.easier         |0.1868890        |
## |cash.safer          |0.1650374        |
## |immediately_settled |0.3266245        |
## |aware_spending      |0.4010926        |
## |other_advantage     |0.0345026        |
## |do_not_use_cash     |0.0342151        |
## |no_advantage        |0.0485911        |
## |dont_know           |0.0094882        |
## |AGE                 |1.0000000        |
##
##
```

```
## Table: 35-39's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2950740        |
## |cash.faster         |0.1681631        |
## |cash.privacy        |0.3901966        |
## |cash.easier         |0.1943703        |
## |cash.safer          |0.1732589        |
## |immediately_settled |0.2841543        |
## |aware_spending      |0.3620480        |
## |other_advantage     |0.0296045        |
## |do_not_use_cash     |0.0351856        |
## |no_advantage        |0.0487746        |
## |dont_know           |0.0075224        |
## |AGE                 |1.0000000        |
##
##
## Table: 30-34's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3113716        |
## |cash.faster         |0.1735825        |
## |cash.privacy        |0.3842255        |
## |cash.easier         |0.1808679        |
## |cash.safer          |0.1716820        |
## |immediately_settled |0.2850808        |
## |aware_spending      |0.3791574        |
## |other_advantage     |0.0291416        |
## |do_not_use_cash     |0.0370605        |
## |no_advantage        |0.0370605        |
## |dont_know           |0.0088692        |
## |AGE                 |1.0000000        |
##
##
## Table: 60-64's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2753024        |
## |cash.faster         |0.1747295        |
## |cash.privacy        |0.3822406        |
## |cash.easier         |0.1804583        |
## |cash.safer          |0.1521324        |
## |immediately_settled |0.3045831        |
## |aware_spending      |0.3835137        |
## |other_advantage     |0.0327817        |
## |do_not_use_cash     |0.0388288        |
## |no_advantage        |0.0585614        |
## |dont_know           |0.0149586        |
## |AGE                 |1.0000000        |
##
##
```

```
## Table: 50-54's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2884458        |
## |cash.faster         |0.1578804        |
## |cash.privacy        |0.3783119        |
## |cash.easier         |0.1756351        |
## |cash.safer          |0.1576072        |
## |immediately_settled |0.2952745        |
## |aware_spending      |0.3813166        |
## |other_advantage     |0.0346900        |
## |do_not_use_cash     |0.0357826        |
## |no_advantage        |0.0527178        |
## |dont_know           |0.0125649        |
## |AGE                 |1.0000000        |
##
##
## Table: 18-24's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3196924        |
## |cash.faster         |0.1691843        |
## |cash.privacy        |0.3858830        |
## |cash.easier         |0.1867619        |
## |cash.safer          |0.1919802        |
## |immediately_settled |0.2930514        |
## |aware_spending      |0.3737984        |
## |other_advantage     |0.0269157        |
## |do_not_use_cash     |0.0288382        |
## |no_advantage        |0.0373524        |
## |dont_know           |0.0093381        |
## |AGE                 |1.0000000        |
##
##
## Table: 45-49's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2996633        |
## |cash.faster         |0.1705948        |
## |cash.privacy        |0.4043210        |
## |cash.easier         |0.1860269        |
## |cash.safer          |0.1705948        |
## |immediately_settled |0.2988215        |
## |aware_spending      |0.3905724        |
## |other_advantage     |0.0297419        |
## |do_not_use_cash     |0.0356341        |
## |no_advantage        |0.0448934        |
## |dont_know           |0.0120651        |
## |AGE                 |1.0000000        |
##
##
```

```
## Table: 40-44's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2982456        |
## |cash.faster         |0.1805808        |
## |cash.privacy        |0.3871748        |
## |cash.easier         |0.1730188        |
## |cash.safer          |0.1760436        |
## |immediately_settled |0.2828191        |
## |aware_spending      |0.3826376        |
## |other_advantage     |0.0329704        |
## |do_not_use_cash     |0.0402299        |
## |no_advantage        |0.0483969        |
## |dont_know           |0.0111918        |
## |AGE                 |1.0000000        |
##
##
## Table: 75+'s Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2611781        |
## |cash.faster         |0.1745919        |
## |cash.privacy        |0.2924060        |
## |cash.easier         |0.2129170        |
## |cash.safer          |0.1504613        |
## |immediately_settled |0.2810504        |
## |aware_spending      |0.3073101        |
## |other_advantage     |0.0610362        |
## |do_not_use_cash     |0.0731015        |
## |no_advantage        |0.0610362        |
## |dont_know           |0.0276792        |
## |AGE                 |1.0000000        |
##
##
## Table: 25-29's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3102867        |
## |cash.faster         |0.1838111        |
## |cash.privacy        |0.3798482        |
## |cash.easier         |0.1956155        |
## |cash.safer          |0.1800169        |
## |immediately_settled |0.2833052        |
## |aware_spending      |0.3655143        |
## |other_advantage     |0.0345700        |
## |do_not_use_cash     |0.0408938        |
## |no_advantage        |0.0387858        |
## |dont_know           |0.0080101        |
## |AGE                 |1.0000000        |
##
##
```

```
## Table: 70-74's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2686170        |
## |cash.faster         |0.1732048        |
## |cash.privacy        |0.3354388        |
## |cash.easier         |0.1911569        |
## |cash.safer          |0.1595745        |
## |immediately_settled |0.2809176        |
## |aware_spending      |0.3144947        |
## |other_advantage     |0.0462101        |
## |do_not_use_cash     |0.0601729        |
## |no_advantage        |0.0598404        |
## |dont_know           |0.0169548        |
## |AGE                 |1.0000000        |
```

#Gender comariosn for cash advantage

```
cash.advg.D1<- data.frame(cash.advg, D1= df$D1)%>%
  drop_na()

for(d1 in unique(cash.advg.D1$D1)){
  dd<- cash.advg.D1%>%
    filter(D1==d1)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(d1, "'s Cash advatange

}
```

```
##
##
## Table: Female's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2851928        |
## |cash.faster         |0.1647196        |
## |cash.privacy        |0.3718847        |
## |cash.easier         |0.1791764        |
## |cash.safer          |0.1645736        |
## |immediately_settled |0.2921534        |
## |aware_spending      |0.3886293        |
## |other_advantage     |0.0347547        |
## |do_not_use_cash     |0.0405471        |
## |no_advantage        |0.0480919        |
## |dont_know           |0.0121690        |
## |D1                  |1.0000000        |
##
##
```

```
## Table: Male's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2998267        |
## |cash.faster         |0.1769340        |
## |cash.privacy        |0.3820703        |
## |cash.easier         |0.1926369        |
## |cash.safer          |0.1724174        |
## |immediately_settled |0.2942072        |
## |aware_spending      |0.3452025        |
## |other_advantage     |0.0339793        |
## |do_not_use_cash     |0.0419096        |
## |no_advantage        |0.0518880        |
## |dont_know           |0.0119742        |
## |D1                  |1.0000000        |
##
##
## Table: Other, non-binary's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.4054054        |
## |cash.faster         |0.1081081        |
## |cash.privacy        |0.4054054        |
## |cash.easier         |0.1351351        |
## |cash.safer          |0.1621622        |
## |immediately_settled |0.3513514        |
## |aware_spending      |0.4054054        |
## |other_advantage     |0.0810811        |
## |do_not_use_cash     |0.0270270        |
## |no_advantage        |0.0540541        |
## |dont_know           |0.0000000        |
## |D1                  |1.0000000        |
```

Activity Status comariosn for cash advantage

```
cash.advg.D6_1<- data.frame(cash.advg, D6_1= df$D6_1)%>%
  drop_na()

for(d6_1 in unique(cash.advg.D6_1$D6_1)){
  dd<- cash.advg.D6_1%>%
    filter(D6_1==d6_1)%>%
    select(-D6_1)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(d6_1, "'s Cash advatang

}
```

```
##
##
## Table: Without a professional activity or student's Cash advatange ratio
##
## |                     |Advantage.Rating |
## |:--------------------|:----------------|
## |cash.acceptance      |0.2844282        |
## |cash.faster          |0.1697436        |
## |cash.privacy         |0.3512949        |
## |cash.easier          |0.1908800        |
## |cash.safer           |0.1683737        |
## |immediately_settled  |0.2910170        |
## |aware_spending       |0.3661035        |
## |other_advantage      |0.0378368        |
## |do_not_use_cash      |0.0447518        |
## |no_advantage         |0.0534934        |
## |dont_know            |0.0136995        |
##
##
## Table: Employee's Cash advatange ratio
##
## |                     |Advantage.Rating |
## |:--------------------|:----------------|
## |cash.acceptance      |0.2962278        |
## |cash.faster          |0.1681057        |
## |cash.privacy         |0.3908418        |
## |cash.easier          |0.1795149        |
## |cash.safer           |0.1664097        |
## |immediately_settled  |0.2976668        |
## |aware_spending       |0.3747045        |
## |other_advantage      |0.0328914        |
## |do_not_use_cash      |0.0422448        |
## |no_advantage         |0.0476925        |
## |dont_know            |0.0111522        |
##
##
## Table: Self-employed's Cash advatange ratio
##
## |                     |Advantage.Rating |
## |:--------------------|:----------------|
## |cash.acceptance      |0.3017941        |
## |cash.faster          |0.1834686        |
## |cash.privacy         |0.4017514        |
## |cash.easier          |0.1943614        |
## |cash.safer           |0.1781290        |
## |immediately_settled  |0.2808629        |
## |aware_spending       |0.3481418        |
## |other_advantage      |0.0301153        |
## |do_not_use_cash      |0.0228535        |
## |no_advantage         |0.0472021        |
## |dont_know            |0.0098249        |
```

Education comaprion for cash advantange

```
cash.advg.edu<- data.frame(cash.advg, EDU= df$EDUCATION)

for(edu in unique(cash.advg.edu$EDU)){
  dd<- cash.advg.edu%>%
    filter(EDU==edu)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(edu, "'s Cash advatange
}
```

```
##
##
## Table: Upper/post-secondary education's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2923577        |
## |cash.faster         |0.1787770        |
## |cash.privacy        |0.3702627        |
## |cash.easier         |0.1918277        |
## |cash.safer          |0.1776942        |
## |immediately_settled |0.2991395        |
## |aware_spending      |0.3814327        |
## |other_advantage     |0.0311734        |
## |do_not_use_cash     |0.0395509        |
## |no_advantage        |0.0506069        |
## |dont_know           |0.0125378        |
## |EDU                 |1.0000000        |
##
##
## Table: University/PhD/research's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3052980        |
## |cash.faster         |0.1573510        |
## |cash.privacy        |0.3935762        |
## |cash.easier         |0.1689404        |
## |cash.safer          |0.1572185        |
## |immediately_settled |0.2939735        |
## |aware_spending      |0.3627815        |
## |other_advantage     |0.0401987        |
## |do_not_use_cash     |0.0509934        |
## |no_advantage        |0.0544371        |
## |dont_know           |0.0127152        |
## |EDU                 |1.0000000        |
##
##
```

```
## Table: Primary/lower secondary education's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2643893        |
## |cash.faster         |0.1785560        |
## |cash.privacy        |0.3571121        |
## |cash.easier         |0.2058275        |
## |cash.safer          |0.1689393        |
## |immediately_settled |0.2763026        |
## |aware_spending      |0.3444811        |
## |other_advantage     |0.0301421        |
## |do_not_use_cash     |0.0238266        |
## |no_advantage        |0.0384671        |
## |dont_know           |0.0094732        |
## |EDU                 |1.0000000        |
##
##
## Table: NA's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |NaN              |
## |cash.faster         |NaN              |
## |cash.privacy        |NaN              |
## |cash.easier         |NaN              |
## |cash.safer          |NaN              |
## |immediately_settled |NaN              |
## |aware_spending      |NaN              |
## |other_advantage     |NaN              |
## |do_not_use_cash     |NaN              |
## |no_advantage        |NaN              |
## |dont_know           |NaN              |
## |EDU                 |NaN              |
```

Income comaprison for cash advantage

```
cash.advg.income<- data.frame(cash.advg, INCOME= df$INCOME)%>%
  drop_na()

for(income in unique(cash.advg.income$INCOME)){
  dd<- cash.advg.income%>%
    filter(INCOME==income)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(income, "'s Cash advata

}
```

```
##
```

```
##
## Table: Between EUR 2,501 and EUR 4,000's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3020165        |
## |cash.faster         |0.1639780        |
## |cash.privacy        |0.4021998        |
## |cash.easier         |0.1775435        |
## |cash.safer          |0.1555454        |
## |immediately_settled |0.3141155        |
## |aware_spending      |0.3582951        |
## |other_advantage     |0.0296059        |
## |do_not_use_cash     |0.0362053        |
## |no_advantage        |0.0456462        |
## |dont_know           |0.0107241        |
## |INCOME              |1.0000000        |
##
##
## Table: More than EUR 4,000's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2707313        |
## |cash.faster         |0.1460715        |
## |cash.privacy        |0.4102704        |
## |cash.easier         |0.1529668        |
## |cash.safer          |0.1415351        |
## |immediately_settled |0.3235347        |
## |aware_spending      |0.3215387        |
## |other_advantage     |0.0480856        |
## |do_not_use_cash     |0.0709490        |
## |no_advantage        |0.0586101        |
## |dont_know           |0.0127019        |
## |INCOME              |1.0000000        |
##
##
## Table: Between EUR 751 and EUR 1,500's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3012614        |
## |cash.faster         |0.1847826        |
## |cash.privacy        |0.3442029        |
## |cash.easier         |0.2069243        |
## |cash.safer          |0.1909554        |
## |immediately_settled |0.2709340        |
## |aware_spending      |0.4002952        |
## |other_advantage     |0.0365003        |
## |do_not_use_cash     |0.0367687        |
## |no_advantage        |0.0493827        |
## |dont_know           |0.0114063        |
## |INCOME              |1.0000000        |
##
```

```
##
## Table: Between EUR 1,501 and EUR 2,500's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2989399        |
## |cash.faster         |0.1751767        |
## |cash.privacy        |0.3742049        |
## |cash.easier         |0.1860424        |
## |cash.safer          |0.1705830        |
## |immediately_settled |0.2958481        |
## |aware_spending      |0.3780035        |
## |other_advantage     |0.0258834        |
## |do_not_use_cash     |0.0351590        |
## |no_advantage        |0.0477915        |
## |dont_know           |0.0129859        |
## |INCOME              |1.0000000        |
##
##
## Table: EUR 750 or less's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2858193        |
## |cash.faster         |0.1976488        |
## |cash.privacy        |0.3310066        |
## |cash.easier         |0.2215283        |
## |cash.safer          |0.2086701        |
## |immediately_settled |0.2575312        |
## |aware_spending      |0.3783982        |
## |other_advantage     |0.0400441        |
## |do_not_use_cash     |0.0378398        |
## |no_advantage        |0.0484938        |
## |dont_know           |0.0084497        |
## |INCOME              |1.0000000        |
```

HHsize cash advantage comparison

```
cash.advg.hhsize<- data.frame(cash.advg, HHSIZE= df$HHSIZE)

for(hhsize in unique(cash.advg.hhsize$HHSIZE)){
  dd<- cash.advg.hhsize%>%
    filter(HHSIZE==hhsize)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(hhsize, "'s Cash advata

}
```

```
##
```

```
##
## Table: 2's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2878289        |
## |cash.faster         |0.1655203        |
## |cash.privacy        |0.3797847        |
## |cash.easier         |0.1763606        |
## |cash.safer          |0.1600628        |
## |immediately_settled |0.2945574        |
## |aware_spending      |0.3539922        |
## |other_advantage     |0.0393989        |
## |do_not_use_cash     |0.0475478        |
## |no_advantage        |0.0543511        |
## |dont_know           |0.0139803        |
## |HHSIZE              |0.0000000        |
##
##
## Table: 4's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.3091929        |
## |cash.faster         |0.1811865        |
## |cash.privacy        |0.3701229        |
## |cash.easier         |0.1928113        |
## |cash.safer          |0.1707643        |
## |immediately_settled |0.2847408        |
## |aware_spending      |0.3752004        |
## |other_advantage     |0.0312667        |
## |do_not_use_cash     |0.0307322        |
## |no_advantage        |0.0423570        |
## |dont_know           |0.0109567        |
## |HHSIZE              |0.0000000        |
##
##
## Table: 1's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2830957        |
## |cash.faster         |0.1606052        |
## |cash.privacy        |0.3818737        |
## |cash.easier         |0.1803899        |
## |cash.safer          |0.1668606        |
## |immediately_settled |0.3149549        |
## |aware_spending      |0.3565610        |
## |other_advantage     |0.0372418        |
## |do_not_use_cash     |0.0549898        |
## |no_advantage        |0.0548443        |
## |dont_know           |0.0116381        |
## |HHSIZE              |1.0000000        |
##
```

```
##
## Table: 5's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2885417        |
## |cash.faster         |0.1670139        |
## |cash.privacy        |0.3715278        |
## |cash.easier         |0.1906250        |
## |cash.safer          |0.1777778        |
## |immediately_settled |0.2815972        |
## |aware_spending      |0.3989583        |
## |other_advantage     |0.0357639        |
## |do_not_use_cash     |0.0385417        |
## |no_advantage        |0.0427083        |
## |dont_know           |0.0111111        |
## |HHSIZE              |0.0000000        |
##
##
## Table: 3's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |0.2936766        |
## |cash.faster         |0.1780638        |
## |cash.privacy        |0.3754896        |
## |cash.easier         |0.1963067        |
## |cash.safer          |0.1767208        |
## |immediately_settled |0.2858422        |
## |aware_spending      |0.3814214        |
## |other_advantage     |0.0267487        |
## |do_not_use_cash     |0.0305540        |
## |no_advantage        |0.0481253        |
## |dont_know           |0.0106323        |
## |HHSIZE              |0.0000000        |
##
##
## Table: NA's Cash advatange ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |cash.acceptance     |NaN              |
## |cash.faster         |NaN              |
## |cash.privacy        |NaN              |
## |cash.easier         |NaN              |
## |cash.safer          |NaN              |
## |immediately_settled |NaN              |
## |aware_spending      |NaN              |
## |other_advantage     |NaN              |
## |do_not_use_cash     |NaN              |
## |no_advantage        |NaN              |
## |dont_know           |NaN              |
## |HHSIZE              |NaN              |
```

Card Advantage comparison

```
#card advantages

card.advg<- space%>%
select(QQ13B_1,QQ13B_2,QQ13B_3,QQ13B_4,QQ13B_5,
       QQ13B_6, QQ13B_7, QQ13B_8,QQ13B_9,QQ13B_10)
names(card.advg)<- c("card.acceptance", "card.faster","card.easier",
                "card.safer","no_worry_carrying_cash","aware_spending",
                "other_advantage","no_advantage","do_not_use_card",
                "dont_know")

ratios <- apply(data.matrix(card.advg)[,], 2, function(x) length(which(x == 1)) / nrow(card.advg))

card.advg.rate<- data.frame(#instruments=c("Cash", "Credit.debit","Crypto","None","Not.Sure"),
  Advantage.Rating= ratios)

kable(card.advg.rate, align = "l", caption = "Card advatange ratio")
```

Table 12: Card advatange ratio

	Advantage.Rating
card.acceptance	0.2162400
card.faster	0.4297390
card.easier	0.4142232
card.safer	0.2946487
no_worry_carrying_cash	0.5827843
aware_spending	0.1862395
other_advantage	0.0197405
no_advantage	0.0223055
do_not_use_card	0.0238646
dont_know	0.0153900

Similar to the cash advantage table, the table displays the % of population who think card has advantages for various reasons. inthis case, 42.97% of the people suggested that card has advantages since it is faster to use. We will do a similar compariosn by breaking it down suing demographics.

Age Comaprios for Card Advantage

```
card.advg.age<- data.frame(card.advg, AGE= df$AGE)

for(age in unique(card.advg.age$AGE)){
  dd<- card.advg.age%>%
    filter(AGE==age)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))
```

```
  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(age, "'s Card advatang
}
```

```
##
##
## Table: 64-69's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2347260        |
## |card.faster            |0.3923997        |
## |card.easier            |0.3816922        |
## |card.safer             |0.3151375        |
## |no_worry_carrying_cash |0.6057107        |
## |aware_spending         |0.1744699        |
## |other_advantage        |0.0191056        |
## |no_advantage           |0.0239345        |
## |do_not_use_card        |0.0266639        |
## |dont_know              |0.0151165        |
## |AGE                    |1.0000000        |
##
##
## Table: 55-59's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2412306        |
## |card.faster            |0.4045428        |
## |card.easier            |0.3898792        |
## |card.safer             |0.2964347        |
## |no_worry_carrying_cash |0.6138585        |
## |aware_spending         |0.1584244        |
## |other_advantage        |0.0235768        |
## |no_advantage           |0.0296147        |
## |do_not_use_card        |0.0247269        |
## |dont_know              |0.0161012        |
## |AGE                    |1.0000000        |
##
##
## Table: 35-39's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2050473        |
## |card.faster            |0.4673623        |
## |card.easier            |0.4231983        |
## |card.safer             |0.2911915        |
## |no_worry_carrying_cash |0.5738898        |
## |aware_spending         |0.2016501        |
## |other_advantage        |0.0167435        |
## |no_advantage           |0.0165008        |
## |do_not_use_card        |0.0211114        |
## |dont_know              |0.0194128        |
```

```
## |AGE                    |1.0000000        |
##
##
## Table: 30-34's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1973392        |
## |card.faster            |0.4802027        |
## |card.easier            |0.4459930        |
## |card.safer             |0.2869813        |
## |no_worry_carrying_cash |0.5749129        |
## |aware_spending         |0.2150776        |
## |other_advantage        |0.0193221        |
## |no_advantage           |0.0183719        |
## |do_not_use_card        |0.0186886        |
## |dont_know              |0.0126703        |
## |AGE                    |1.0000000        |
##
##
## Table: 60-64's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2374284        |
## |card.faster            |0.3936983        |
## |card.easier            |0.4042011        |
## |card.safer             |0.3042648        |
## |no_worry_carrying_cash |0.5926162        |
## |aware_spending         |0.1543603        |
## |other_advantage        |0.0241884        |
## |no_advantage           |0.0311903        |
## |do_not_use_card        |0.0283259        |
## |dont_know              |0.0152769        |
## |AGE                    |1.0000000        |
##
##
## Table: 50-54's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2141491        |
## |card.faster            |0.3968861        |
## |card.easier            |0.3889648        |
## |card.safer             |0.3018301        |
## |no_worry_carrying_cash |0.5946463        |
## |aware_spending         |0.1660748        |
## |other_advantage        |0.0215788        |
## |no_advantage           |0.0251297        |
## |do_not_use_card        |0.0240371        |
## |dont_know              |0.0191205        |
## |AGE                    |1.0000000        |
##
##
```

```
## Table: 18-24's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1917056        |
## |card.faster            |0.4886020        |
## |card.easier            |0.4358693        |
## |card.safer             |0.2746498        |
## |no_worry_carrying_cash |0.5347432        |
## |aware_spending         |0.2383960        |
## |other_advantage        |0.0192255        |
## |no_advantage           |0.0140071        |
## |do_not_use_card        |0.0214227        |
## |dont_know              |0.0112606        |
## |AGE                    |1.0000000        |
##
##
## Table: 45-49's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2247475        |
## |card.faster            |0.4332211        |
## |card.easier            |0.4175084        |
## |card.safer             |0.2904040        |
## |no_worry_carrying_cash |0.5934343        |
## |aware_spending         |0.1826599        |
## |other_advantage        |0.0179574        |
## |no_advantage           |0.0179574        |
## |do_not_use_card        |0.0230079        |
## |dont_know              |0.0143098        |
## |AGE                    |1.0000000        |
##
##
## Table: 40-44's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2105263        |
## |card.faster            |0.4633999        |
## |card.easier            |0.4452511        |
## |card.safer             |0.2785844        |
## |no_worry_carrying_cash |0.5946763        |
## |aware_spending         |0.1808832        |
## |other_advantage        |0.0205687        |
## |no_advantage           |0.0187538        |
## |do_not_use_card        |0.0184513        |
## |dont_know              |0.0157290        |
## |AGE                    |1.0000000        |
##
##
## Table: 75+'s Card advatange ratio
##
## |                       |Advantage.Rating |
```

```
## |:----------------------|:----------------|
## |card.acceptance        |0.2122072        |
## |card.faster            |0.3406671        |
## |card.easier            |0.4002839        |
## |card.safer             |0.3136977        |
## |no_worry_carrying_cash |0.5777147        |
## |aware_spending         |0.1611072        |
## |other_advantage        |0.0248403        |
## |no_advantage           |0.0468417        |
## |do_not_use_card        |0.0347764        |
## |dont_know              |0.0184528        |
## |AGE                    |1.0000000        |
##
##
## Table: 25-29's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1947723        |
## |card.faster            |0.5223440        |
## |card.easier            |0.4704890        |
## |card.safer             |0.2731872        |
## |no_worry_carrying_cash |0.5623946        |
## |aware_spending         |0.2242833        |
## |other_advantage        |0.0160202        |
## |no_advantage           |0.0130691        |
## |do_not_use_card        |0.0223440        |
## |dont_know              |0.0109612        |
## |AGE                    |1.0000000        |
##
##
## Table: 70-74's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2287234        |
## |card.faster            |0.3680186        |
## |card.easier            |0.4072473        |
## |card.safer             |0.3231383        |
## |no_worry_carrying_cash |0.5851064        |
## |aware_spending         |0.1811835        |
## |other_advantage        |0.0172872        |
## |no_advantage           |0.0265957        |
## |do_not_use_card        |0.0299202        |
## |dont_know              |0.0166223        |
## |AGE                    |1.0000000        |
```

#Gender compariosn for card advantage

```
card.advg.D1<- data.frame(card.advg, D1= df$D1)%>%
  drop_na()

for(d1 in unique(card.advg.D1$D1)){
  dd<- card.advg.D1%>%
```

```
    filter(D1==d1)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(d1, "'s Card advatange

}
```

```
##
##
## Table: Female's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2178738        |
## |card.faster            |0.4377434        |
## |card.easier            |0.4094139        |
## |card.safer             |0.2826129        |
## |no_worry_carrying_cash |0.6034852        |
## |aware_spending         |0.1881815        |
## |other_advantage        |0.0185456        |
## |no_advantage           |0.0215148        |
## |do_not_use_card        |0.0230238        |
## |dont_know              |0.0144568        |
## |D1                     |1.0000000        |
##
##
## Table: Male's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2162702        |
## |card.faster            |0.4244000        |
## |card.easier            |0.4222467        |
## |card.safer             |0.3099102        |
## |no_worry_carrying_cash |0.5648338        |
## |aware_spending         |0.1855995        |
## |other_advantage        |0.0211123        |
## |no_advantage           |0.0233181        |
## |do_not_use_card        |0.0249987        |
## |dont_know              |0.0165432        |
## |D1                     |1.0000000        |
##
##
## Table: Other, non-binary's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1351351        |
## |card.faster            |0.4054054        |
## |card.easier            |0.5675676        |
## |card.safer             |0.2702703        |
```

```
## |no_worry_carrying_cash |0.5945946        |
## |aware_spending         |0.1621622        |
## |other_advantage        |0.0540541        |
## |no_advantage           |0.0270270        |
## |do_not_use_card        |0.0000000        |
## |dont_know              |0.0000000        |
## |D1                     |1.0000000        |
```

Activity Status compariosn for card advantage

```
card.advg.D6_1<- data.frame(card.advg, D6_1= df$D6_1)%>%
  drop_na()

for(d6_1 in unique(card.advg.D6_1$D6_1)){
  dd<- card.advg.D6_1%>%
    filter(D6_1==d6_1)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(d6_1, "'s Card advatang

}
```

```
##
##
## Table: Without a professional activity or student's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2206928        |
## |card.faster            |0.4092243        |
## |card.easier            |0.3974167        |
## |card.safer             |0.2956488        |
## |no_worry_carrying_cash |0.5747929        |
## |aware_spending         |0.1816818        |
## |other_advantage        |0.0217235        |
## |no_advantage           |0.0291604        |
## |do_not_use_card        |0.0279209        |
## |dont_know              |0.0155914        |
## |D6_1                   |1.0000000        |
##
##
## Table: Employee's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2176997        |
## |card.faster            |0.4604790        |
## |card.easier            |0.4361702        |
## |card.safer             |0.2965361        |
```

```
## |no_worry_carrying_cash |0.5963100        |
## |aware_spending         |0.1891767        |
## |other_advantage        |0.0178333        |
## |no_advantage           |0.0172166        |
## |do_not_use_card        |0.0199918        |
## |dont_know              |0.0145955        |
## |D6_1                   |1.0000000        |
##
##
## Table: Self-employed's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2011961        |
## |card.faster            |0.3844511        |
## |card.easier            |0.3889364        |
## |card.safer             |0.2909013        |
## |no_worry_carrying_cash |0.5692012        |
## |aware_spending         |0.1954293        |
## |other_advantage        |0.0219991        |
## |no_advantage           |0.0215720        |
## |do_not_use_card        |0.0271252        |
## |dont_know              |0.0183682        |
## |D6_1                   |1.0000000        |
```

Education comaprion for card advantange

```
card.advg.edu<- data.frame(card.advg, EDU= df$EDUCATION)

for(edu in unique(card.advg.edu$EDU)){
  dd<- card.advg.edu%>%
    filter(EDU==edu)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(edu, "'s Card advatang
}
```

```
##
##
## Table: Upper/post-secondary education's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2252237        |
## |card.faster            |0.4355160        |
## |card.easier            |0.4164814        |
## |card.safer             |0.2845501        |
## |no_worry_carrying_cash |0.5793583        |
## |aware_spending         |0.1734769        |
```

```
## |other_advantage        |0.0195475        |
## |no_advantage           |0.0268992        |
## |do_not_use_card        |0.0240497        |
## |dont_know              |0.0133356        |
## |EDU                    |1.0000000        |
##
##
## Table: University/PhD/research's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2015894        |
## |card.faster            |0.4538411        |
## |card.easier            |0.4505298        |
## |card.safer             |0.3015894        |
## |no_worry_carrying_cash |0.6221854        |
## |aware_spending         |0.1998675        |
## |other_advantage        |0.0208609        |
## |no_advantage           |0.0176821        |
## |do_not_use_card        |0.0201325        |
## |dont_know              |0.0143046        |
## |EDU                    |1.0000000        |
##
##
## Table: Primary/lower secondary education's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2297976        |
## |card.faster            |0.3720396        |
## |card.easier            |0.3380221        |
## |card.safer             |0.3111813        |
## |no_worry_carrying_cash |0.5180135        |
## |aware_spending         |0.1926224        |
## |other_advantage        |0.0182288        |
## |no_advantage           |0.0212430        |
## |do_not_use_card        |0.0320080        |
## |dont_know              |0.0232525        |
## |EDU                    |1.0000000        |
##
##
## Table: NA's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |NaN              |
## |card.faster            |NaN              |
## |card.easier            |NaN              |
## |card.safer             |NaN              |
## |no_worry_carrying_cash |NaN              |
## |aware_spending         |NaN              |
## |other_advantage        |NaN              |
## |no_advantage           |NaN              |
## |do_not_use_card        |NaN              |
```

```
## |dont_know               |NaN              |
## |EDU                     |NaN              |
```

Income comaprison for card advantage

```
card.advg.income<- data.frame(card.advg, INCOME= df$INCOME)%>%
  drop_na()

for(income in unique(card.advg.income$INCOME)){
  dd<- card.advg.income%>%
    filter(INCOME==income)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(income, "'s Card advata

}
```

```
##
##
## Table: Between EUR 2,501 and EUR 4,000's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2340055        |
## |card.faster            |0.4265811        |
## |card.easier            |0.4155820        |
## |card.safer             |0.3088909        |
## |no_worry_carrying_cash |0.5946838        |
## |aware_spending         |0.1879010        |
## |other_advantage        |0.0157654        |
## |no_advantage           |0.0157654        |
## |do_not_use_card        |0.0237397        |
## |dont_know              |0.0179652        |
## |INCOME                 |1.0000000        |
##
##
## Table: More than EUR 4,000's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2427872        |
## |card.faster            |0.4545455        |
## |card.easier            |0.4795863        |
## |card.safer             |0.3130103        |
## |no_worry_carrying_cash |0.6276538        |
## |aware_spending         |0.1932499        |
## |other_advantage        |0.0188713        |
## |no_advantage           |0.0148793        |
## |do_not_use_card        |0.0157866        |
```

```
## |dont_know              |0.0128833        |
## |INCOME                 |1.0000000        |
##
##
## Table: Between EUR 751 and EUR 1,500's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1977992        |
## |card.faster            |0.4276704        |
## |card.easier            |0.4002952        |
## |card.safer             |0.2758991        |
## |no_worry_carrying_cash |0.5720612        |
## |aware_spending         |0.1755233        |
## |other_advantage        |0.0224101        |
## |no_advantage           |0.0304616        |
## |do_not_use_card        |0.0258991        |
## |dont_know              |0.0127483        |
## |INCOME                 |1.0000000        |
##
##
## Table: Between EUR 1,501 and EUR 2,500's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2196113        |
## |card.faster            |0.4421378        |
## |card.easier            |0.4102473        |
## |card.safer             |0.2972615        |
## |no_worry_carrying_cash |0.5894876        |
## |aware_spending         |0.1918728        |
## |other_advantage        |0.0162544        |
## |no_advantage           |0.0178445        |
## |do_not_use_card        |0.0242049        |
## |dont_know              |0.0148410        |
## |INCOME                 |1.0000000        |
##
##
## Table: EUR 750 or less's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.1715650        |
## |card.faster            |0.4125643        |
## |card.easier            |0.3901543        |
## |card.safer             |0.2560617        |
## |no_worry_carrying_cash |0.5003674        |
## |aware_spending         |0.1855253        |
## |other_advantage        |0.0334313        |
## |no_advantage           |0.0488611        |
## |do_not_use_card        |0.0315944        |
## |dont_know              |0.0135929        |
## |INCOME                 |1.0000000        |
```

HHsize card advantage comparison

```
card.advg.hhsize<- data.frame(card.advg, HHSIZE= df$HHSIZE)

for(hhsize in unique(card.advg.hhsize$HHSIZE)){
  dd<- card.advg.hhsize%>%
    filter(HHSIZE==hhsize)%>%
    drop_na()

  ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

  print(kable(data.frame(Advantage.Rating= ratios), align = "l", caption =paste0(hhsize, "'s Card advata

}
```

```
##
##
## Table: 2's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2213666        |
## |card.faster            |0.4196322        |
## |card.easier            |0.4182117        |
## |card.safer             |0.3003888        |
## |no_worry_carrying_cash |0.5962171        |
## |aware_spending         |0.1840610        |
## |other_advantage        |0.0193630        |
## |no_advantage           |0.0248953        |
## |do_not_use_card        |0.0231011        |
## |dont_know              |0.0165969        |
## |HHSIZE                 |0.0000000        |
##
##
## Table: 4's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2069749        |
## |card.faster            |0.4486905        |
## |card.easier            |0.4107429        |
## |card.safer             |0.2975681        |
## |no_worry_carrying_cash |0.5795029        |
## |aware_spending         |0.1941475        |
## |other_advantage        |0.0176376        |
## |no_advantage           |0.0148316        |
## |do_not_use_card        |0.0255211        |
## |dont_know              |0.0136291        |
## |HHSIZE                 |0.0000000        |
##
##
## Table: 1's Card advatange ratio
```

```
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2326157        |
## |card.faster            |0.4189700        |
## |card.easier            |0.4330812        |
## |card.safer             |0.2768403        |
## |no_worry_carrying_cash |0.5904859        |
## |aware_spending         |0.1873727        |
## |other_advantage        |0.0242944        |
## |no_advantage           |0.0261856        |
## |do_not_use_card        |0.0226942        |
## |dont_know              |0.0152749        |
## |HHSIZE                 |1.0000000        |
##
##
## Table: 5's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2125000        |
## |card.faster            |0.4503472        |
## |card.easier            |0.4118056        |
## |card.safer             |0.2927083        |
## |no_worry_carrying_cash |0.5680556        |
## |aware_spending         |0.1913194        |
## |other_advantage        |0.0187500        |
## |no_advantage           |0.0256944        |
## |do_not_use_card        |0.0194444        |
## |dont_know              |0.0114583        |
## |HHSIZE                 |0.0000000        |
##
##
## Table: 3's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
## |card.acceptance        |0.2085059        |
## |card.faster            |0.4380526        |
## |card.easier            |0.4038053        |
## |card.safer             |0.3024063        |
## |no_worry_carrying_cash |0.5739228        |
## |aware_spending         |0.1835478        |
## |other_advantage        |0.0191382        |
## |no_advantage           |0.0209289        |
## |do_not_use_card        |0.0263011        |
## |dont_know              |0.0166760        |
## |HHSIZE                 |0.0000000        |
##
##
## Table: NA's Card advatange ratio
##
## |                       |Advantage.Rating |
## |:----------------------|:----------------|
```

```
## |card.acceptance        |NaN              |
## |card.faster            |NaN              |
## |card.easier            |NaN              |
## |card.safer             |NaN              |
## |no_worry_carrying_cash |NaN              |
## |aware_spending         |NaN              |
## |other_advantage        |NaN              |
## |no_advantage           |NaN              |
## |do_not_use_card        |NaN              |
## |dont_know              |NaN              |
## |HHSIZE                 |NaN              |
```

Covid19 comaprison

```
Covid<- space%>%
  select(QQ19A)%>%
  mutate(QQ19A=case_when(
    QQ19A==1~   "Much more often",
    QQ19A==2~   "Somewhat more often",
    QQ19A==3~   "The same as before",
    QQ19A==4~   "Somewhat less often",
    QQ19A==5~   "Much less often",
    QQ19A==999999~  "Don't know",

  ))

pp<-prop.table(table(Covid$QQ19A))

covid_dist<- data.frame( Use.of.cash= pp)

kable(covid_dist, align = 'l', caption = "are you using cash instead of non-cash payment methods more")
```

Table 13: are you using cash instead of non-cash payment methods more

Use.of.cash.Var1	Use.of.cash.Freq
Don't know	0.0021627
Much less often	0.1429110
Much more often	0.0696826
Somewhat less often	0.1563647
Somewhat more often	0.1021979
The same as before	0.5266811

The table shows a representation of how use of cash has changed before and during covid 19. Over 52.66% of the population continued to use cash in the same frequecy as they did before covid 19. The same analysis above has been broken down by demographic

Comapare cash frequecy use during and before covid 19 by demographics

Age Comaprios for Caash frequecy use during and before covid 19

```
Covid.age<- data.frame(Covid, AGE= df$AGE)

for(age in unique(Covid.age$AGE)){
  dd<- Covid.age%>%
    filter(AGE==age)%>%
    select(-AGE)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(age, "'s cash freq ratio")))
}
```

```
##
##
## Table: 64-69's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0020925        |
## |Much less often     |0.1537979        |
## |Much more often     |0.0537769        |
## |Somewhat less often |0.1468927        |
## |Somewhat more often |0.0947897        |
## |The same as before  |0.5486503        |
##
##
## Table: 55-59's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0014327        |
## |Much less often     |0.1489971        |
## |Much more often     |0.0659026        |
## |Somewhat less often |0.1664756        |
## |Somewhat more often |0.0896848        |
## |The same as before  |0.5275072        |
##
##
## Table: 35-39's cash freq ratio
##
```

```
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0016912        |
## |Much less often     |0.1365064        |
## |Much more often     |0.0804542        |
## |Somewhat less often |0.1613916        |
## |Somewhat more often |0.1152452        |
## |The same as before  |0.5047113        |
##
##
## Table: 30-34's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0012638        |
## |Much less often     |0.1330174        |
## |Much more often     |0.0913112        |
## |Somewhat less often |0.1573460        |
## |Somewhat more often |0.1143760        |
## |The same as before  |0.5026856        |
##
##
## Table: 60-64's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0025300        |
## |Much less often     |0.1584440        |
## |Much more often     |0.0594560        |
## |Somewhat less often |0.1514864        |
## |Somewhat more often |0.0882353        |
## |The same as before  |0.5398482        |
##
##
## Table: 50-54's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0021781        |
## |Much less often     |0.1393956        |
## |Much more often     |0.0620746        |
## |Somewhat less often |0.1668935        |
## |Somewhat more often |0.0898448        |
## |The same as before  |0.5396134        |
##
##
## Table: 18-24's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0016447        |
## |Much less often     |0.1244518        |
## |Much more often     |0.0940241        |
## |Somewhat less often |0.1694079        |
```

```
## |Somewhat more often |0.1293860        |
## |The same as before  |0.4810855        |
##
##
## Table: 45-49's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0008382        |
## |Much less often     |0.1411009        |
## |Much more often     |0.0676167        |
## |Somewhat less often |0.1514389        |
## |Somewhat more often |0.1036602        |
## |The same as before  |0.5353451        |
##
##
## Table: 40-44's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0024155        |
## |Much less often     |0.1440217        |
## |Much more often     |0.0745773        |
## |Somewhat less often |0.1654589        |
## |Somewhat more often |0.1008454        |
## |The same as before  |0.5126812        |
##
##
## Table: 75+'s cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0070621        |
## |Much less often     |0.1525424        |
## |Much more often     |0.0459040        |
## |Somewhat less often |0.1341808        |
## |Somewhat more often |0.0819209        |
## |The same as before  |0.5783898        |
##
##
## Table: 25-29's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0029424        |
## |Much less often     |0.1311475        |
## |Much more often     |0.0748214        |
## |Somewhat less often |0.1555275        |
## |Somewhat more often |0.1361917        |
## |The same as before  |0.4993695        |
##
##
## Table: 70-74's cash freq ratio
##
```

```
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0033069        |
## |Much less often     |0.1537698        |
## |Much more often     |0.0565476        |
## |Somewhat less often |0.1352513        |
## |Somewhat more often |0.0770503        |
## |The same as before  |0.5740741        |
```

Gender Comaprios for Caash frequecy use during and before covid 19

```
Covid.d1<- data.frame(Covid, D1= df$D1)

for(d1 in unique(Covid.d1$D1)){
  dd<- Covid.d1%>%
    filter(D1==d1)%>%
    select(-D1)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(d1, "'s cash freq ratio")))
}
```

```
##
##
## Table: Female's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0015037        |
## |Much less often     |0.1438203        |
## |Much more often     |0.0730016        |
## |Somewhat less often |0.1568685        |
## |Somewhat more often |0.1031238        |
## |The same as before  |0.5216822        |
##
##
## Table: Male's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0028776        |
## |Much less often     |0.1422069        |
## |Much more often     |0.0661853        |
## |Somewhat less often |0.1557055        |
## |Somewhat more often |0.1011877        |
## |The same as before  |0.5318370        |
```

```
##
##
## Table: Other, non-binary's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Much more often     |0.0270270        |
## |Somewhat less often |0.2162162        |
## |Somewhat more often |0.1081081        |
## |The same as before  |0.6486486        |
```

Activity Status Comaprios for Caash frequecy use during and before covid 19

```
Covid.D6_1<- data.frame(Covid, D6_1= df$D6_1)

for(d6_1 in unique(Covid.D6_1$D6_1)){
  dd<- Covid.D6_1%>%
    filter(D6_1==d6_1)%>%
    select(-D6_1)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(d6_1, "'s cash freq ratio")))
}
```

```
##
##
## Table: Without a professional activity or student's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0027929        |
## |Much less often     |0.1431541        |
## |Much more often     |0.0616394        |
## |Somewhat less often |0.1525721        |
## |Somewhat more often |0.0934658        |
## |The same as before  |0.5463757        |
##
##
## Table: Employee's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0016910        |
## |Much less often     |0.1466052        |
## |Much more often     |0.0722009        |
## |Somewhat less often |0.1607481        |
```

```
## |Somewhat more often |0.1065847        |
## |The same as before  |0.5121701        |
##
##
## Table: Self-employed's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0021268        |
## |Much less often     |0.1263292        |
## |Much more often     |0.0865589        |
## |Somewhat less often |0.1507869        |
## |Somewhat more often |0.1135687        |
## |The same as before  |0.5206295        |
##
##
## Table: NA's cash freq ratio
##
## |Use.of.cash |
## |:-----------|
```

EDUCATION Comaprios for Caash frequecy use during and before covid 19

```
Covid.edu<- data.frame(Covid, EDUCATION= df$EDUCATION)

for(edu in unique(Covid.edu$EDUCATION)){
  dd<- Covid.edu%>%
    filter(EDUCATION==edu)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(edu, "'s cash freq ratio")))
}
```

```
##
##
## Table: Upper/post-secondary education's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0019308        |
## |Much less often     |0.1379408        |
## |Much more often     |0.0693395        |
## |Somewhat less often |0.1515134        |
## |Somewhat more often |0.0977341        |
## |The same as before  |0.5415413        |
##
```

```
##
## Table: University/PhD/research's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0019805        |
## |Much less often     |0.1604832        |
## |Much more often     |0.0696462        |
## |Somewhat less often |0.1698574        |
## |Somewhat more often |0.1008054        |
## |The same as before  |0.4972274        |
##
##
## Table: Primary/lower secondary education's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0031424        |
## |Much less often     |0.1175546        |
## |Much more often     |0.0707042        |
## |Somewhat less often |0.1395515        |
## |Somewhat more often |0.1164119        |
## |The same as before  |0.5526353        |
##
##
## Table: NA's cash freq ratio
##
## |Use.of.cash |
## |:-----------|
```

HHSIZE Comaprios for Caash frequecy use during and before covid 19

```
Covid.hhsize<- data.frame(Covid, HHSIZE= df$HHSIZE)

for(hhsize in unique(Covid.hhsize$HHSIZE)){
  dd<- Covid.hhsize%>%
    filter(HHSIZE==hhsize)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(hhsize, "'s cash freq ratio")))
}
```

```
##
##
## Table: 2's cash freq ratio
##
```

```
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0025318        |
## |Much less often     |0.1511654        |
## |Much more often     |0.0598704        |
## |Somewhat less often |0.1525802        |
## |Somewhat more often |0.0953161        |
## |The same as before  |0.5385360        |
##
##
## Table: 4's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0019973        |
## |Much less often     |0.1411451        |
## |Much more often     |0.0777630        |
## |Somewhat less often |0.1648469        |
## |Somewhat more often |0.1098535        |
## |The same as before  |0.5043941        |
##
##
## Table: 1's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0026068        |
## |Much less often     |0.1501810        |
## |Much more often     |0.0590876        |
## |Somewhat less often |0.1459812        |
## |Somewhat more often |0.0887762        |
## |The same as before  |0.5533671        |
##
##
## Table: 5's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0024255        |
## |Much less often     |0.1243936        |
## |Much more often     |0.0928621        |
## |Somewhat less often |0.1604297        |
## |Somewhat more often |0.1115731        |
## |The same as before  |0.5083160        |
##
##
## Table: 3's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0012273        |
## |Much less often     |0.1323218        |
## |Much more often     |0.0785451        |
## |Somewhat less often |0.1619993        |
```

```
## |Somewhat more often |0.1135780        |
## |The same as before  |0.5123285        |
##
##
## Table: NA's cash freq ratio
##
## |Use.of.cash |
## |:-----------|
```

INCOME Comaprios for Caash frequecy use during and before covid 19

```
Covid.income<- data.frame(Covid, INCOME= df$INCOME)

for(income in unique(Covid.income$INCOME)){
  dd<- Covid.income%>%
    filter(INCOME==income)%>%
    drop_na()

  pp<-prop.table(table(dd$QQ19A))

  covid_dist<- data.frame( Use.of.cash= pp)

  print(kable(covid_dist, align = "l", caption =paste0(income, "'s cash freq ratio")))
}
```

```
##
##
## Table: NA's cash freq ratio
##
## |Use.of.cash |
## |:-----------|
##
##
## Table: Between EUR 2,501 and EUR 4,000's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0016422        |
## |Much less often     |0.1447861        |
## |Much more often     |0.0675121        |
## |Somewhat less often |0.1713347        |
## |Somewhat more often |0.0989873        |
## |The same as before  |0.5157376        |
##
##
## Table: More than EUR 4,000's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0018116        |
```

```
## |Much less often     |0.1820652        |
## |Much more often     |0.0648551        |
## |Somewhat less often |0.1769928        |
## |Somewhat more often |0.0795290        |
## |The same as before  |0.4947464        |
##
##
## Table: Between EUR 751 and EUR 1,500's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0009363        |
## |Much less often     |0.1288122        |
## |Much more often     |0.0793205        |
## |Somewhat less often |0.1405832        |
## |Somewhat more often |0.1143660        |
## |The same as before  |0.5359818        |
##
##
## Table: Between EUR 1,501 and EUR 2,500's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0022001        |
## |Much less often     |0.1377277        |
## |Much more often     |0.0635396        |
## |Somewhat less often |0.1523365        |
## |Somewhat more often |0.1097421        |
## |The same as before  |0.5344539        |
##
##
## Table: EUR 750 or less's cash freq ratio
##
## |Use.of.cash.Var1    |Use.of.cash.Freq |
## |:-------------------|:----------------|
## |Don't know          |0.0029326        |
## |Much less often     |0.1198680        |
## |Much more often     |0.0986070        |
## |Somewhat less often |0.1180352        |
## |Somewhat more often |0.1147361        |
## |The same as before  |0.5458211        |
```

Less cash table

```
#Less cash
less.cash<- space%>%
  select(starts_with("Q19C_"))
names(less.cash)<- c('difficult.withdraw','fear.virus',
                     'cash.not.accepted','advice.not.use.cash',
                     'gover.recomm', 'electronic.better',
                     'new.means','other.reason',
```

```
                    'dont.know')
less.cash2<- less.cash
less.cash<- na.omit(less.cash)
ratios <- apply(data.matrix(less.cash)[,], 2, function(x) length(which(x == 1)) / nrow(less.cash))

df.less<- data.frame( Advantage.Rating= ratios)
kable(df.less, align = "l", caption =paste0("Less Cash", ""))
```

Table 14: Less Cash

	Advantage.Rating
difficult.withdraw	0.0892362
fear.virus	0.2836736
cash.not.accepted	0.1078901
advice.not.use.cash	0.2965297
gover.recomm	0.2507352
electronic.better	0.5851609
new.means	0.1159566
other.reason	0.0864633
dont.know	0.0013444

The table shows the percentage in each caterory as to why people used less cash during covid 19. .eg 58.51% of people used less cash since electronic method was much better. Now lets break the analysis by demographic

#AGE Comaprios for Caash frequecy use during and before covid 19

```
Covid.age<- data.frame(less.cash2, AGE= df$AGE)

for(age in unique(Covid.age$AGE)){
  dd<- Covid.age%>%
    filter(AGE==age)%>%
    select(-AGE)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(age, "'s less cash freq ratio")))
}
```

```
##
##
## Table: 64-69's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0807237        |
## |fear.virus          |0.3020181        |
## |cash.not.accepted   |0.1016006        |
## |advice.not.use.cash |0.3354210        |
## |gover.recomm        |0.2769659        |
```

```
## |electronic.better   |0.5775922        |
## |new.means           |0.0828114        |
## |other.reason        |0.0946416        |
## |dont.know           |0.0006959        |
##
##
## Table: 55-59's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.1099001        |
## |fear.virus          |0.2779292        |
## |cash.not.accepted   |0.0962761        |
## |advice.not.use.cash |0.2888283        |
## |gover.recomm        |0.2370572        |
## |electronic.better   |0.5903724        |
## |new.means           |0.1226158        |
## |other.reason        |0.0881017        |
## |dont.know           |0.0009083        |
##
##
## Table: 35-39's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0916464        |
## |fear.virus          |0.2887267        |
## |cash.not.accepted   |0.1111111        |
## |advice.not.use.cash |0.2627737        |
## |gover.recomm        |0.2311436        |
## |electronic.better   |0.5920519        |
## |new.means           |0.1362530        |
## |other.reason        |0.0867802        |
## |dont.know           |0.0016221        |
##
##
## Table: 30-34's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0837867        |
## |fear.virus          |0.2872688        |
## |cash.not.accepted   |0.1142546        |
## |advice.not.use.cash |0.2927095        |
## |gover.recomm        |0.2437432        |
## |electronic.better   |0.5560392        |
## |new.means           |0.1229597        |
## |other.reason        |0.0881393        |
## |dont.know           |0.0000000        |
##
##
## Table: 60-64's less cash freq ratio
##
## |                    |Advantage.Rating |
```

```
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0816327        |
## |fear.virus          |0.2979592        |
## |cash.not.accepted   |0.1010204        |
## |advice.not.use.cash |0.3163265        |
## |gover.recomm        |0.2612245        |
## |electronic.better   |0.6020408        |
## |new.means           |0.0969388        |
## |other.reason        |0.0816327        |
## |dont.know           |0.0010204        |
##
##
## Table: 50-54's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.1022222        |
## |fear.virus          |0.2915556        |
## |cash.not.accepted   |0.1013333        |
## |advice.not.use.cash |0.2640000        |
## |gover.recomm        |0.2515556        |
## |electronic.better   |0.5600000        |
## |new.means           |0.1226667        |
## |other.reason        |0.0933333        |
## |dont.know           |0.0026667        |
##
##
## Table: 18-24's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0736940        |
## |fear.virus          |0.2462687        |
## |cash.not.accepted   |0.1380597        |
## |advice.not.use.cash |0.3227612        |
## |gover.recomm        |0.2397388        |
## |electronic.better   |0.5746269        |
## |new.means           |0.1473881        |
## |other.reason        |0.0951493        |
## |dont.know           |0.0009328        |
##
##
## Table: 45-49's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0888252        |
## |fear.virus          |0.2683859        |
## |cash.not.accepted   |0.1079274        |
## |advice.not.use.cash |0.2846227        |
## |gover.recomm        |0.2483286        |
## |electronic.better   |0.5807068        |
## |new.means           |0.1337154        |
## |other.reason        |0.0773639        |
```

```
## |dont.know           |0.0009551        |
##
##
## Table: 40-44's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0936585        |
## |fear.virus          |0.2634146        |
## |cash.not.accepted   |0.1170732        |
## |advice.not.use.cash |0.2682927        |
## |gover.recomm        |0.2214634        |
## |electronic.better   |0.6156098        |
## |new.means           |0.1102439        |
## |other.reason        |0.0800000        |
## |dont.know           |0.0000000        |
##
##
## Table: 75+'s less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0960591        |
## |fear.virus          |0.3325123        |
## |cash.not.accepted   |0.0714286        |
## |advice.not.use.cash |0.2733990        |
## |gover.recomm        |0.2980296        |
## |electronic.better   |0.5640394        |
## |new.means           |0.0985222        |
## |other.reason        |0.0886700        |
## |dont.know           |0.0049261        |
##
##
## Table: 25-29's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0835777        |
## |fear.virus          |0.2551320        |
## |cash.not.accepted   |0.1260997        |
## |advice.not.use.cash |0.3416422        |
## |gover.recomm        |0.2214076        |
## |electronic.better   |0.6026393        |
## |new.means           |0.1158358        |
## |other.reason        |0.0674487        |
## |dont.know           |0.0000000        |
##
##
## Table: 70-74's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0869565        |
## |fear.virus          |0.3112128        |
```

```
## |cash.not.accepted   |0.0926773        |
## |advice.not.use.cash |0.3043478        |
## |gover.recomm        |0.2986270        |
## |electronic.better   |0.6041190        |
## |new.means           |0.0938215        |
## |other.reason        |0.0869565        |
## |dont.know           |0.0045767        |
```

income Comaprios for Caash frequecy use during and before covid 19

```
Covid.income<- data.frame(less.cash2, INCOME= df$INCOME)

for(income in unique(Covid.income$INCOME)){
  dd<- Covid.income%>%
    filter(INCOME==income)%>%
    select(-INCOME)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(income, "'s less cash freq ratio")))
}
```

```
##
##
## Table: NA's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |NaN              |
## |fear.virus          |NaN              |
## |cash.not.accepted   |NaN              |
## |advice.not.use.cash |NaN              |
## |gover.recomm        |NaN              |
## |electronic.better   |NaN              |
## |new.means           |NaN              |
## |other.reason        |NaN              |
## |dont.know           |NaN              |
##
##
## Table: Between EUR 2,501 and EUR 4,000's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0911977        |
## |fear.virus          |0.2972583        |
## |cash.not.accepted   |0.1088023        |
## |advice.not.use.cash |0.3125541        |
## |gover.recomm        |0.2704185        |
```

```
## |electronic.better   |0.5800866        |
## |new.means           |0.1229437        |
## |other.reason        |0.0868687        |
## |dont.know           |0.0005772        |
##
##
## Table: More than EUR 4,000's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0857719        |
## |fear.virus          |0.2719475        |
## |cash.not.accepted   |0.1412714        |
## |advice.not.use.cash |0.3567104        |
## |gover.recomm        |0.2643794        |
## |electronic.better   |0.6473259        |
## |new.means           |0.1271443        |
## |other.reason        |0.0852674        |
## |dont.know           |0.0015136        |
##
##
## Table: Between EUR 751 and EUR 1,500's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0928500        |
## |fear.virus          |0.2785501        |
## |cash.not.accepted   |0.0824230        |
## |advice.not.use.cash |0.2462761        |
## |gover.recomm        |0.2199603        |
## |electronic.better   |0.5799404        |
## |new.means           |0.0933466        |
## |other.reason        |0.0858987        |
## |dont.know           |0.0024826        |
##
##
## Table: Between EUR 1,501 and EUR 2,500's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0849515        |
## |fear.virus          |0.2773058        |
## |cash.not.accepted   |0.1080097        |
## |advice.not.use.cash |0.3064320        |
## |gover.recomm        |0.2554612        |
## |electronic.better   |0.5661408        |
## |new.means           |0.1201456        |
## |other.reason        |0.0776699        |
## |dont.know           |0.0006068        |
##
##
## Table: EUR 750 or less's less cash freq ratio
##
## |                    |Advantage.Rating |
```

```
## |:-------------------|:----------------|
## |difficult.withdraw  |0.1001541        |
## |fear.virus          |0.2604006        |
## |cash.not.accepted   |0.0893683        |
## |advice.not.use.cash |0.1972265        |
## |gover.recomm        |0.1972265        |
## |electronic.better   |0.5269646        |
## |new.means           |0.0755008        |
## |other.reason        |0.1278891        |
## |dont.know           |0.0015408        |
```

Gender Comaprios for Caash frequecy use during and before covid 19

```
Covid.d1<- data.frame(less.cash2, D1= df$D1)

for(d1 in unique(Covid.d1$D1)){
  dd<- Covid.d1%>%
    filter(D1==d1)%>%
    select(-D1)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(d1, "'s less cash freq ratio")))
}
```

```
##
##
## Table: Female's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0921116        |
## |fear.virus          |0.2950476        |
## |cash.not.accepted   |0.1167930        |
## |advice.not.use.cash |0.3100500        |
## |gover.recomm        |0.2500403        |
## |electronic.better   |0.5755767        |
## |new.means           |0.1095338        |
## |other.reason        |0.0814648        |
## |dont.know           |0.0014518        |
##
##
## Table: Male's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0858799        |
## |fear.virus          |0.2711626        |
```

```
## |cash.not.accepted   |0.0981735        |
## |advice.not.use.cash |0.2817000        |
## |gover.recomm        |0.2514928        |
## |electronic.better   |0.5953635        |
## |new.means           |0.1231120        |
## |other.reason        |0.0920267        |
## |dont.know           |0.0012294        |
##
##
## Table: Other, non-binary's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.250            |
## |fear.virus          |0.375            |
## |cash.not.accepted   |0.125            |
## |advice.not.use.cash |0.375            |
## |gover.recomm        |0.250            |
## |electronic.better   |0.750            |
## |new.means           |0.000            |
## |other.reason        |0.000            |
## |dont.know           |0.000            |
```

Education Comaprios for Caash frequecy use during and before covid 19

```
Covid.edu<- data.frame(less.cash2, EDUCATION= df$EDUCATION)

for(edu in unique(Covid.edu$EDUCATION)){
  dd<- Covid.edu%>%
    filter(EDUCATION==edu)%>%
    select(-EDUCATION)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(edu, "'s less cash freq ratio")))
}
```

```
##
##
## Table: Upper/post-secondary education's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0835786        |
## |fear.virus          |0.2768295        |
## |cash.not.accepted   |0.1059447        |
## |advice.not.use.cash |0.3015499        |
## |gover.recomm        |0.2458309        |
```

```
## |electronic.better   |0.5773985        |
## |new.means           |0.1094762        |
## |other.reason        |0.0833824        |
## |dont.know           |0.0019619        |
##
##
## Table: University/PhD/research's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0889289        |
## |fear.virus          |0.2811751        |
## |cash.not.accepted   |0.0965228        |
## |advice.not.use.cash |0.2907674        |
## |gover.recomm        |0.2398082        |
## |electronic.better   |0.6155076        |
## |new.means           |0.1139089        |
## |other.reason        |0.0835332        |
## |dont.know           |0.0007994        |
##
##
## Table: Primary/lower secondary education's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.1061111        |
## |fear.virus          |0.3100000        |
## |cash.not.accepted   |0.1450000        |
## |advice.not.use.cash |0.2983333        |
## |gover.recomm        |0.2950000        |
## |electronic.better   |0.5227778        |
## |new.means           |0.1400000        |
## |other.reason        |0.1033333        |
## |dont.know           |0.0011111        |
##
##
## Table: NA's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |NaN              |
## |fear.virus          |NaN              |
## |cash.not.accepted   |NaN              |
## |advice.not.use.cash |NaN              |
## |gover.recomm        |NaN              |
## |electronic.better   |NaN              |
## |new.means           |NaN              |
## |other.reason        |NaN              |
## |dont.know           |NaN              |
```

Activity status Comaprios for Caash frequecy use during and before covid 19

```
Covid.d6_1<- data.frame(less.cash2, D6_1= df$D6_1)

for(d6_1 in unique(Covid.edu$EDUCATION)){
  dd<- Covid.d6_1%>%
    filter(D6_1==d6_1)%>%
    select(-D6_1)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(d6_1, "'s less cash freq ratio")))
}
```

```
##
##
## Table: Upper/post-secondary education's less cash freq ratio
##
## |                     |Advantage.Rating |
## |:--------------------|:----------------|
## |difficult.withdraw   |NaN              |
## |fear.virus           |NaN              |
## |cash.not.accepted    |NaN              |
## |advice.not.use.cash  |NaN              |
## |gover.recomm         |NaN              |
## |electronic.better    |NaN              |
## |new.means            |NaN              |
## |other.reason         |NaN              |
## |dont.know            |NaN              |
##
##
## Table: University/PhD/research's less cash freq ratio
##
## |                     |Advantage.Rating |
## |:--------------------|:----------------|
## |difficult.withdraw   |NaN              |
## |fear.virus           |NaN              |
## |cash.not.accepted    |NaN              |
## |advice.not.use.cash  |NaN              |
## |gover.recomm         |NaN              |
## |electronic.better    |NaN              |
## |new.means            |NaN              |
## |other.reason         |NaN              |
## |dont.know            |NaN              |
##
##
## Table: Primary/lower secondary education's less cash freq ratio
##
## |                     |Advantage.Rating |
```

```
## |:-------------------|:----------------|
## |difficult.withdraw  |NaN              |
## |fear.virus          |NaN              |
## |cash.not.accepted   |NaN              |
## |advice.not.use.cash |NaN              |
## |gover.recomm        |NaN              |
## |electronic.better   |NaN              |
## |new.means           |NaN              |
## |other.reason        |NaN              |
## |dont.know           |NaN              |
##
##
## Table: NA's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |NaN              |
## |fear.virus          |NaN              |
## |cash.not.accepted   |NaN              |
## |advice.not.use.cash |NaN              |
## |gover.recomm        |NaN              |
## |electronic.better   |NaN              |
## |new.means           |NaN              |
## |other.reason        |NaN              |
## |dont.know           |NaN              |
```

HHSIZE Comaprios for Caash frequecy use during and before covid 19

```
Covid.hhsize<- data.frame(less.cash2, HHSIZE= df$HHSIZE)

for(hhsize in unique(Covid.hhsize$HHSIZE)){
  dd<- Covid.hhsize%>%
    filter(HHSIZE== hhsize)%>%
    select(-HHSIZE)%>%
    drop_na()

ratios <- apply(data.matrix(dd)[,], 2, function(x) length(which(x == 1)) / nrow(dd))

df.less<- data.frame( Advantage.Rating= ratios)
print(kable(df.less, align = "l", caption =paste0(hhsize, "'s less cash freq ratio")))
}
```

```
##
##
## Table: 2's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0858053        |
## |fear.virus          |0.2853641        |
```

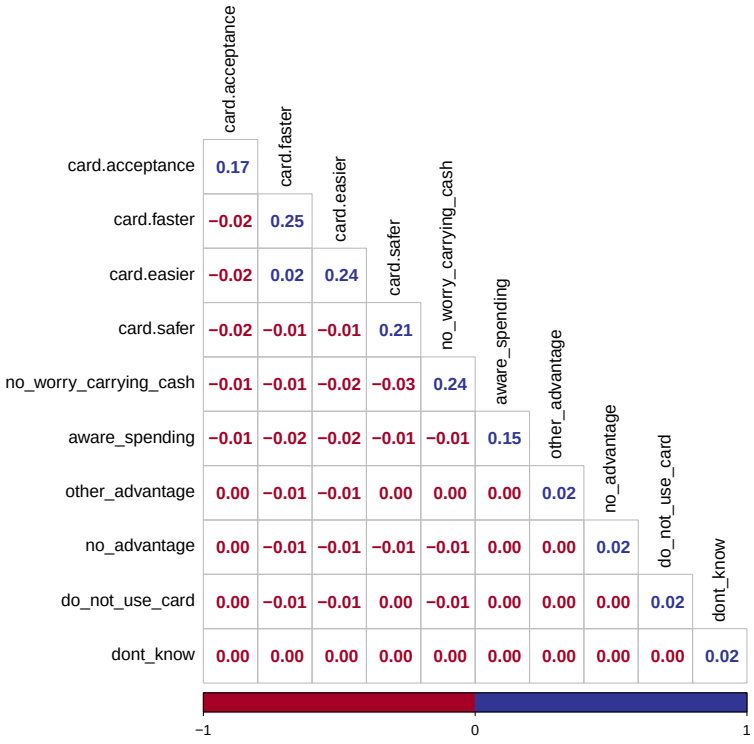
```
## |cash.not.accepted   |0.1073793        |
## |advice.not.use.cash |0.3064477        |
## |gover.recomm        |0.2520226        |
## |electronic.better   |0.6006374        |
## |new.means           |0.1086051        |
## |other.reason        |0.0835989        |
## |dont.know           |0.0012258        |
##
##
## Table: 4's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0931245        |
## |fear.virus          |0.2798085        |
## |cash.not.accepted   |0.1022628        |
## |advice.not.use.cash |0.2654482        |
## |gover.recomm        |0.2354221        |
## |electronic.better   |0.5935596        |
## |new.means           |0.1279373        |
## |other.reason        |0.0805048        |
## |dont.know           |0.0004352        |
##
##
## Table: 1's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0772616        |
## |fear.virus          |0.2929095        |
## |cash.not.accepted   |0.1207824        |
## |advice.not.use.cash |0.3256724        |
## |gover.recomm        |0.2674817        |
## |electronic.better   |0.5887531        |
## |new.means           |0.1100244        |
## |other.reason        |0.0855746        |
## |dont.know           |0.0014670        |
##
##
## Table: 5's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.1046229        |
## |fear.virus          |0.2579075        |
## |cash.not.accepted   |0.1046229        |
## |advice.not.use.cash |0.2700730        |
## |gover.recomm        |0.2165450        |
## |electronic.better   |0.5754258        |
## |new.means           |0.1350365        |
## |other.reason        |0.0985401        |
## |dont.know           |0.0036496        |
##
##
```

```
## Table: 3's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |0.0959060        |
## |fear.virus          |0.2854435        |
## |cash.not.accepted   |0.1050038        |
## |advice.not.use.cash |0.2945413        |
## |gover.recomm        |0.2596664        |
## |electronic.better   |0.5549659        |
## |new.means           |0.1141016        |
## |other.reason        |0.0921152        |
## |dont.know           |0.0015163        |
##
##
## Table: NA's less cash freq ratio
##
## |                    |Advantage.Rating |
## |:-------------------|:----------------|
## |difficult.withdraw  |NaN              |
## |fear.virus          |NaN              |
## |cash.not.accepted   |NaN              |
## |advice.not.use.cash |NaN              |
## |gover.recomm        |NaN              |
## |electronic.better   |NaN              |
## |new.means           |NaN              |
## |other.reason        |NaN              |
## |dont.know           |NaN              |
```

Table 5

```
card.advg<- space%>%
select(QQ13B_1,QQ13B_2,QQ13B_3,QQ13B_4,QQ13B_5,
       QQ13B_6, QQ13B_7, QQ13B_8,QQ13B_9,QQ13B_10)
names(card.advg)<- c("card.acceptance", "card.faster","card.easier",
                "card.safer","no_worry_carrying_cash","aware_spending",
                "other_advantage","no_advantage","do_not_use_card",
                "dont_know")
#Covariance matrix
card.advg2<- na.omit(card.advg)
```

```
corrplot(cov(card.advg2), method = 'number',col = COL2('RdYlBu', 2),
         type = 'lower', tl.col='black')
```



Covariance measures the degree to which two variables change together; a positive covariance indicates that when one variable increases, the other tends to increase as well, while a negative covariance suggests that when one variable increases, the other tends to decrease. Here, for instance, the covariance between "card.acceptance" and "card.faster" is 0.1699, implying a positive relationship where higher acceptance of cards is associated with a faster card transaction experience. Conversely, the negative covariance between "card.acceptance" and "no_worry_carrying_cash" (-0.0124) suggests that as card acceptance increases, the tendency to worry about carrying cash decreases. This table provides insights into how these variables move in relation to each other, but it doesn't standardize for the scales of the variables, making it difficult to compare the strengths of these relationships directly.

```
#by months
paymethod<- space%>%
  select(QA7A_1, QA7AI_1, QA7AII_1)%>%
  mutate(QA7A_1= case_when(QA7A_1==1~   "Cash",
                           QA7A_1==2~   "Card",
                           QA7A_1==3~   "Mobile phone app",
                           QA7A_1==4~   "Bank cheque",
                           QA7A_1==5~   "Credit transfer",
                          QA7A_1==6~    "Loyalty points",
                          QA7A_1==7~    "Other",
                        # QA7A_1==999999~  "Don't know",
),
QA7AI_1= case_when(
  QA7AI_1==1~"By inserting the card into a terminal",
  QA7AI_1==2~   "Using contactless technology",
  #QA7AI_1==999999  ~"Don't know"

),
```

```
QA7AII_1=case_when(
  QA7AII_1== 1~ "Using my bank's mobile application",
QA7AII_1==2~    "Using ApplePay",
QA7AII_1==3~    "Using GooglePay",
QA7AII_1==4~    "Other",
QA7AII_1==5~    "Payconiq by Bancontact",
QA7AII_1==6~    "mTasku",
QA7AII_1==8 ~"Jiffy",
QA7AII_1==9~    "Swedbank mobila lietotne",
QA7AII_1==10~   "MoQ",
QA7AII_1==11~   "Digicash",
QA7AII_1==12~   "Bank of Valletta",
QA7AII_1==13~   "Bankomatkarte mobil",
QA7AII_1==14~   "MBway",
QA7AII_1==15~   "NLB pay",
QA7AII_1==16~   "MobilePay TB",
QA7AII_1==17~   "MobilePay",
QA7AII_1==18~   "Swedbanki mobiilipank",
QA7AII_1==19~   "Viva",
QA7AII_1==20~   "Samsung Pay",
QA7AII_1==22~   "Satispay",
QA7AII_1==23~   "Citadele mobila aplikacija",
QA7AII_1==24~   "Revolut",
QA7AII_1==25~   "Bluecode",
QA7AII_1==26~   "mDenarnic@",
QA7AII_1==27~   "mBank SK",
QA7AII_1==28~   "Siirto",
QA7AII_1==29~   "Paypal",
QA7AII_1==30~   "Android pay",
QA7AII_1==31~   "SEB mobila lietotne",
QA7AII_1==32~   "kWallet",
QA7AII_1==33~   "Wave2Pay",
QA7AII_1==34~   "VÚB Mobil Banking",
QA7AII_1==35~   "my Alpha wallet",
QA7AII_1==36~   "Lydia",
QA7AII_1==37~   "Mobilly (parking, train tickets)",
QA7AII_1==38~   "ZOIN",
QA7AII_1==39~   "mBills",
QA7AII_1==40~   "i-bank Pay",
QA7AII_1==41~   "Pumpkin",
QA7AII_1==42~   "Paylib",
QA7AII_1==43~   "Pivo",
#QA7AII_1==999999~" Don't know",

))

paymethod1<- paymethod%>%
  drop_na(QA7A_1)
prop.table(table(paymethod1$QA7A_1))%>%
  data.frame()%>%
  arrange(desc(Freq))%>%
  kable(align = "l", col.names = c("Instrument of POS payment","Population"),
        caption = "Instrument of POS payment by population")
```

Table 15: Instrument of POS payment by population

Instrument of POS payment	Population
Cash	0.5918299
Card	0.3478498
Mobile phone app	0.0329047
Credit transfer	0.0130103
Other	0.0084612
Loyalty points	0.0031540
Bank cheque	0.0027901

The table presents the distribution of the population using various methods of point-of-sale (POS) payments. It outlines the proportions of individuals or users utilizing different payment instruments, including cash, cards, mobile phone apps, credit transfers, other methods, loyalty points, and bank cheques. For instance, approximately 59.18% of the population prefers cash as their POS payment method, while 34.79% opt for cards, and a smaller percentage, 3.29%, rely on mobile phone apps. Credit transfers, other methods, loyalty points, and bank cheques are used by 1.30%, 0.85%, 0.32%, and 0.28% of the population, respectively. This table provides valuable insights into the payment preferences within the population, which can be instrumental for businesses and policymakers in tailoring their financial services and strategies to meet the diverse needs of their customer base.

```
paymethod2<- paymethod%>%
  drop_na(QA7AI_1)
prop.table(table(paymethod2$QA7AI_1))%>%
  data.frame()%>%
  arrange(desc(Freq))%>%
  kable(align = "l", col.names = c("Card payment","Population"),
        caption = "Card payment by population")
```

Table 16: Card payment by population

Card payment	Population
Using contactless technology	0.6406756
By inserting the card into a terminal	0.3593244

The table illustrates the distribution of card payment methods within a population. It showcases the proportions of individuals utilizing two distinct ways of making payments with their cards. Approximately 64.07% of the population prefers the convenience of contactless technology for their card payments, allowing for quick and secure transactions by tapping the card on a terminal. In contrast, a smaller portion, accounting for 35.93% of the population, opts for the traditional method of card payment by inserting the card into a terminal. This table highlights the growing popularity of contactless payments, which offer speed and ease of use, reflecting a shift in consumer preferences and technology adoption trends within the payment landscape.

```
paymethod3<- paymethod%>%
  drop_na(QA7AII_1)
prop.table(table(paymethod3$QA7AII_1))%>%
  data.frame()%>%
  arrange(desc(Freq))%>%
  kable(align = "l", col.names = c("Mobile payment","Population"),
        caption = "Mobile payment  by population")
```

Table 17: Mobile payment by population

Mobile payment	Population
Using ApplePay	0.2730627
Using my bank's mobile application	0.2601476
Using GooglePay	0.1771218
Other	0.0950185
MobilePay	0.0396679
MBway	0.0359779
Samsung Pay	0.0193727
Satispay	0.0138376
Payconiq by Bancontact	0.0129151
Revolut	0.0129151
Digicash	0.0119926
Swedbank mobila lietotne	0.0083026
Swedbanki mobiilipank	0.0073801
Paypal	0.0046125
Android pay	0.0036900
Bank of Valletta	0.0027675
Bankomatkarte mobil	0.0027675
i-bank Pay	0.0027675
Bluecode	0.0018450
mTasku	0.0018450
Paylib	0.0018450
Pivo	0.0018450
Viva	0.0018450
Citadele mobila aplikacija	0.0009225
Lydia	0.0009225
mBank SK	0.0009225
Mobilly (parking, train tickets)	0.0009225
NLB pay	0.0009225
SEB mobila lietotne	0.0009225
Siirto	0.0009225

The table presents the distribution of mobile payment methods within a population, highlighting the preferences of individuals when it comes to making payments using mobile technology. Among the various options, ApplePay stands out as the most popular choice, with approximately 27.31% of the population opting for this mobile payment solution. Following closely is the use of the bank's mobile application, accounting for 26.01%. GooglePay is also a commonly used method, chosen by 17.71% of users. Other mobile payment options, such as MobilePay, MBway, and Samsung Pay, are selected by smaller proportions of the population, ranging from 3.60% to 1.93%. This table reveals the diverse landscape of mobile payment preferences, reflecting the influence of both platform-specific and region-specific solutions, which can provide valuable insights for businesses and financial institutions seeking to cater to their customers' varied needs in the mobile payment sector.