Panel Analyses Report

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Contents

Chapter 1

Prerequis

Ceci est *une étude* des données de panel avec **Markdown**.

The **bookdown** package can be installed from CRAN or Github:

La structure de ce rapport est que chaque fichier RMD porte un chapitre et un thème bien spécifique de notre analyse

Nous avions utilisé XeLaTeX pour compiler ce document en PDF.

Chapter 2

Introduction

You can label chapter and section titles using `{#label}` after them, e.g., we can reference Chapter 2. If you do not manually label them, there will be automatic labels anyway, e.g., Chapter 5.

Figures and tables with captions will be placed in `figure` and `table` environments, respectively.

```
par(mar = c(4, 4, .1, .1))
plot(pressure, type = 'b', pch = 19)
```

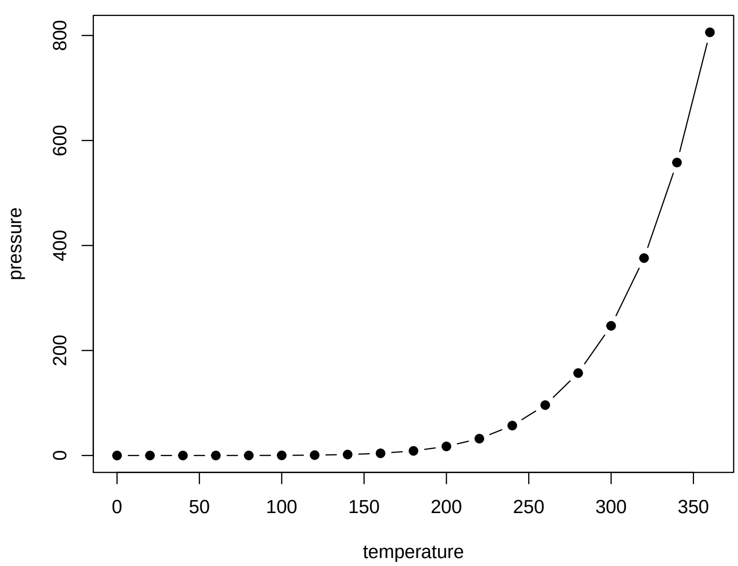

Figure 2.1: Here is a nice figure!

Table 2.1: Here is a nice table!

Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
5.1	3.5	1.4	0.2	setosa
4.9	3.0	1.4	0.2	setosa
4.7	3.2	1.3	0.2	setosa
4.6	3.1	1.5	0.2	setosa
5.0	3.6	1.4	0.2	setosa
5.4	3.9	1.7	0.4	setosa
4.6	3.4	1.4	0.3	setosa
5.0	3.4	1.5	0.2	setosa
4.4	2.9	1.4	0.2	setosa
4.9	3.1	1.5	0.1	setosa
5.4	3.7	1.5	0.2	setosa
4.8	3.4	1.6	0.2	setosa
4.8	3.0	1.4	0.1	setosa
4.3	3.0	1.1	0.1	setosa
5.8	4.0	1.2	0.2	setosa
5.7	4.4	1.5	0.4	setosa
5.4	3.9	1.3	0.4	setosa
5.1	3.5	1.4	0.3	setosa
5.7	3.8	1.7	0.3	setosa
5.1	3.8	1.5	0.3	setosa

Reference a figure by its code chunk label with the `fig:` prefix, e.g., see Figure 2.1. Similarly, you can reference tables generated from `knitr::kable()`, e.g., see Table 2.1.

```
knitr::kable(
  head(iris, 20), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

You can write citations, too. For example, we are using the **bookdown** package (Xie, 2021) in this sample book, which was built on top of R Markdown and **knitr** (Xie, 2015).

Chapter 3

Literature

Chapter 4

The One-way Error Component Regression Model

4.1 INTRODUCTION

A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables, i.e.

$$y_{it} = \alpha + X'_{it}\beta + u_{it}$$
$$i = 1, ..., N; t = 1, ..., T$$

(2.1)

with $ i $ denoting households, individuals, firms, countries, etc. and t denoting time. The i subscript, therefore, denotes the cross-section dimension whereas t denotes the time-series dimension.

$$\alpha$$

is a scalar,

$$\beta$$

is

$$K \times 1$$

and Xi t is the $ it_{th} $ observation on K explanatory variables. Most of the panel data applications utilize a one-way error component model for the disturbances, with

$$u_{it} = \mu_i + v_{it}$$

(2.2)

where i denotes the unobservable individual-specific effect and i t denotes the remainder disturbance. For example, in an earnings equation in labor economics, yi t will measure earnings of the head of the household, whereas

$$X_{it}$$

may contain a set of variables like experience, education, union membership, sex, race, etc. Note that i is time-invariant and it accounts for any individual-specific effect that is not included in the regression. In this case we could think of it as the individual's unobserved ability. The remainder disturbance

$$v_{it}$$

varies with individuals and time and can be thought of as the usual disturbance in the regression. Alternatively, for a production function utilizing data on firms across time,

$$y_{it}$$

will measure output and

$$X_{it}$$

will measure inputs. The unobservable firm-specific effects will be captured by the

$$\mu_i$$

and we can think of these as the unobservable entrepreneurial or managerial skills of the firm's executives. Early applications of error components in economics include Kuh (1959) on investment, Mundlak (1961) and Hoch (1962) on production functions and Balestra and Nerlove (1966) on demand for natural gas. In vector form (2.1) can be written as

$$y = \alpha i_{NT} + X\beta + u = Z\delta + u$$

(2.3)

$$y = \alpha i_{NT} + X\beta + u = Z\delta + u$$

(2.3)

where $ y $ is $ NT × 1 $, $ X $ is $ NT × K $, $ Z = [_{NT} , X] $, $ ^{'} = ({'}, ') $ and $\iota_N T$ is a vector of ones of dimension NT. Also, (2.2) can be written as

$$u = Z_\mu \mu + v$$

(2.4)

$$y_{it} = \alpha + X'_{it} + U_{it}$$

, $ i=1,...,N ; t=1,...,T $ with i denoting households, individuals, firms, countries, etc. and t denoting time. The i subscript, therefore, denotes the cross-section dimension whereas t denotes the time-series dimension. $ $ is a scalar, $ $ is $ K × 1 $ and $X_{it} $is the $ it^{th} $ observation on K explanatory variables. disturbances, with it

$$u_{it} = u_i + v_{it}$$

where i denotes the unobservable individual-specific effect and νit denotes the remainder disturbance. For example, in an earnings equation in labor economics, y_{it} will measure earnings of the head of the household, whereas Xi t may contain a set of variables like experience, education, union membership, sex, race, etc. Note that i is time-invariant and it accounts for any individual-specific effect that is not included in the regression. In this case we could think of it as the individual's unobserved ability. The remainder disturbance $ {it} $ varies with individuals and time and can be thought of as the usual disturbance in the regression. Alternatively, for a production function utilizing data on firms across time, $ y_{it} $ will measure output and $ X_{it} $ will measure inputs. The unobservable firm-specific effects will be captured by the $ _i $ and we can think of these as the unobservable entrepreneurial or managerial skills of the firm's executives. Early applications of error components in economics include Kuh (1959) on investment, Mundlak (1961) and Hoch (1962) on production functions and Balestra and Nerlove (1966) on demand for natural gas. In vector form (2.1) can be written as

$$y = \alpha i_{NT} + X\beta + u = Z\delta + u$$

where y is $ NT × 1$, X is $NT \times K$, $ Z = [i_{NT} , X] $, $ ^{'}=(^ ', ^{'}) $ and i_{NT} is a vector of ones of dimension NT . Also, (2.2) can be written as

$$u = Z_\mu \mu + v$$

(2.4)

where $ u^{'} = (u_{11}, . . . , u_{1T} , u_{21}, . . . , u_{2T}, . . . , u_{N1}, . . . , u_{NT}) $ with the observations stacked such that the slower index is over individuals and the faster index is over time.$ Z_ = IN   T $ where IN is an identity matrix of dimension N, T is a vector of ones of dimension T and $ $ denotes Kronecker product. $ Z_ $ is a selector matrix of ones and zeros, or simply the matrix of individual dummies that one may include in the regression to estimate the i if they are assumed to be fixed parameters. $ ^{'} = (_1, . . . , _N)$ and $\nu' = (\nu 11, ..., \nu_{1T}, ..., \nu_{N1}, ..., \nu_{NT})$. Note that $Z_ Z^{'} = I_N J_T $ where J_T is a matrix of ones of dimension T and $

P = Z (Z$^{\{'\}}$ Z){−1} Z^{'} $, the projectionmatrix on $ Z_ $, reduces to $ IN J_T $ where $J _T= JT /T $. P is a matrix which averages the observation across time for each individual, and Q = INT − P is a matrix which obtains the deviations from individual means. For example, regressing y on the matrix of dummy variables Z_μ gets the predicted values $ P_y $ which has a typical element

$$\bar{y}_i = \sum_{t=1}^{T} \frac{y_{it}}{T}$$

repeated T times for each individual. The residuals of this regression are given by Qy which has a typical element

$$(y_{it} - \bar{y}_{i.})$$

P and Q are (i) symmetric idempotent matrices, i.e.

$P^{'} = P$ and $ P^2 = P $. This means that $rank(P) = tr(P) = N$ and $rank(Q) = tr(Q) = N(T-1)$. This uses the result that the rank of an idempotent matrix is equal to its trace (see Graybill, 1961,theorem 1.63). Also, (ii) P and Q are orthogonal, i.e. $PQ=0 $ and (iii) they sum to the identity matrix $P + Q = I_{NT}$. In fact, any two of these properties imply the third (see Graybill, 1961, theorem 1.68).

4.2 THE FIXED EFFECTS MODEL

In this case, the i are assumed to be fixed parameters to be estimated and the remainder disturbances stochastic with v_{it} independent and identically distributed $IID(0, \sigma_v^2)$. The X_{it} are assumed independent of the v_{it} for all i and t. The fixed effects model is an appropriate specification if we are focusing on a specific set of N firms, say, IBM, GE,Westinghouse, etc. and our inference is restricted to the behavior of these sets of firms. Alternatively, it could be a set of N OECD countries, or N American states. Inference in this case is conditional on the particular N firms, countries or states that are observed. One can substitute the disturbances given by (2.4) into (2.3) to get

$ y= i_{IT} + X + Z_ +v = Z + Z_ +v $ (2.5)

and then perform ordinary least squares (OLS) on (2.5) to get estimates of $, and µ $

Note that Z is $ NT ×(K+1)$ and Z , the matrix of individual dummies, is$NT ×N $ NT × N. If N is large, (2.5) will include too many individual dummies, and the matrix to be inverted by OLS is large and of dimension $(N + K)$. In fact, since and are the parameters of interest, one can obtain the LSDV (least squares dummy variables) estimator from (2.5), by premultiplying the model by Q and performing OLS on the resulting transformed model:

$ Qy=QX + Qv$ (2.6)

This uses the fact that $QZ_\mu = Qi_{NT} = 0$, since $PZ_\mu = Z_\mu$ the Q matrix wipes out the individual effects. This is a regression of $\tilde{y} = QY$ with element $(y_{it} - \bar{y}_{i.})$ on $\check{X} = QX$ with typical element

Chapter 5

Methods

We describe our methods in this chapter.

Les données de panel, ou données longitudinales possèdent les deux dimensions précédentes (individuelle et temporelle). En effet, il est souvent intéressant d'identifier l'effet associé à chaque individu (un effet qui ne varie pas dans le temps, mais qui varie d'un individu à un autre). Cet effet peut être fixe ou aléatoire.

Par conséquent, le modèle en données de panel s'écrit comme un modèle à double indice qui prend la forme suivante :

$$Y_{it} = \alpha_i \sum_k \beta_{ki} x_{ki} + \epsilon_{it}$$

avec

$$i : 1 \rightarrow N$$

et

$$t : 1 \rightarrow T$$

La double dimension qu'offrent les données de panel est un atout majeur. En effet, si les données en séries temporelles permettent d'étudier l'évolution des relations dans le temps, elles ne permettent pas de contrôler l'hétérogénéité entre les individus. A l'inverse, les données en coupes transversales permettent d'analyser l'hétérogénéité entre les individus mais elles ne peuvent pas tenir compte des comportements dynamiques, puisque la dimension temporelle est exclue du champ d'analyse.

Ainsi, en utilisant des données de panel, on pourra exploiter les deux sources de variation de l'information statistique : - Temporelle où variabilité intra-individuelle (within) - et individuelle ou variabilité inter-individuelle (Between).

Chapter 6

Analyses

Nous faisons *application* des méthodes présentées dans le chapitre précédant pour l'analyse des données de pannel

Avant de passefr à la modélisation, nous ferons une description de nos variables d'interet d'une manière statique : nos prédicteurs et la variables réponses

6.1 Netoyage de la base des données

Apperçue globale des données

Voici la structure de la base des données

```
## Rows: 3,310
## Columns: 6
## $ `N°`                  <dbl> 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 1~
## $ `Country/destination` <chr> "AFRIQUE DU SUD", "AFRIQUE DU SUD", "AFRIQUE DU ~
## $ Year                  <dbl> 2011, 2011, 2011, 2013, 2013, 2013, 2013, 2013, ~
## $ Goods                 <fct> "GRUES SUR PNEUMATIQUE", "CAMION FAMIL", "CAMION~
## $ Weight                <dbl> 13500, 12000, 24000, 183, 19520, 19520, 19520, 1~
## $ Taxe                  <dbl> 0, 0, 0, 0, 264771, 272817, 283220, 264142, 0, 0~
```

Voici les modalités de la variabme `Goods` qui signifie `Marchandises`

La variables **Goods** a 740 modalités

Faison la cactérisation des niveaux des marchandises dont l'encodage fait défaut

```
class(taxe_df$Goods)
```

```
## [1] "character"
```

Usage de tm et Stringr

Table 6.1: Echantillon de la base des données

N°	Country/destination	Year	Goods	Weight	Taxe
1	AFRIQUE DU SUD	2011	GRUES SUR PNEUMATIQUE	13500	0
2	AFRIQUE DU SUD	2011	CAMION FAMIL	12000	0
3	AFRIQUE DU SUD	2011	CAMION SOMUL	24000	0
4	AFRIQUE DU SUD	2013	Café vert arabica k4	183	0
5	AFRIQUE DU SUD	2013	Café vert arabica k4	19520	264771
6	AFRIQUE DU SUD	2013	Café vert arabica k4	19520	272817
7	AFRIQUE DU SUD	2013	Café vert arabica k4	19520	283220
8	AFRIQUE DU SUD	2013	Café vert arabica k4	19520	264142
9	AFRIQUE DU SUD	2013	CAMION	24000	0
10	AFRIQUE DU SUD	2017	Instruments et appareils du n°90.15	654	0

```
## Warning: Unknown levels in `f`: equipements protection
```

```
##  [1] "Autres Marchandises"
##  [2] "Bois"
##  [3] "Machines et appareils domestique"
##  [4] "Médicaments et plantes médécinales"
##  [5] "Poissaons, viande et oeufs"
##  [6] "Matériels de construction"
##  [7] "Materiel Informatique et Electroniques"
##  [8] "Véhicules,camions,Motos et acc"
##  [9] "Vetements,tissus et acc et chaussure"
## [10] "boissons, bières et limonades"
## [11] "Machine us Ingsutriel"
## [12] "Article Menange et Campement"
## [13] "sacs, sachetsn emballages"
## [14] "Papiers et fournitures de bureaux"
## [15] "Produits alimentaires,prep et huiles"
## [16] "caféarabica"
## [17] "Minérais et dérivés"
## [18] "engins et tracteurs"
## [19] "Cigarette et papier cigarettes et tabac"
## [20] "constructionprefabriquees"
## [21] "cadreset conteneurs"
## [22] "Pièces de Réchange appareils"
## [23] "Générateurs,baterie et piles"
## [24] "etuis en plastique ou textile"
## [25] "Pétrole et dérivées et huile de graissage"
## [26] "boissons, bières,liqueurs et limonades"
## [27] "produits beaute"
## [28] "peauxdes betes"
```

Table 6.2: Modalités de la variable Goods à l'importation des donnees

x
0
3Café vert arabica, en feve K3
Abats comestibles,congeles,de chevaux,anes,mulets,ovins ou caprins
ABATS COMESTIBLES;CONGELES;DE CHEVAUX;ANES;MULETS;OVINS
Accessoires de radio diffusion
Accessoires de vehicules
Accumulateurs electriques
Acide acetique
ages de 5 ans ou moins
ages de plus de 5 ans
Agés de plus de 5 ans ou moins
Alcaloides du quinquina et leurs derives;
ALCOOL ETYLIQUE NON DENATURE
ambulance d'une cylindree excedant 2500 cm3
Antennes
Antennes et reflecteurs d'antennes
antennes et refleteurs
Appareils d'eclairage electriques
Appareils d'eclairage non electriques
Appareils d'eclairages electriques
Appareils du n°84.14
Appareils electrothermiques pour la
appareils pour la reception,la conversion et la transmission
Art et materiel d'athletisme
Articles confectionnes en textiles
Articles d'economie domestique,en
Articles de bureau
ARTICLES DE BUREAU
Articles de bureau ou de la papeterie
Articles de friperie
ARTICLES DE FRIPERIE
Articles et materiel d'athletisme
Ashok Layland
ASPIRATEUR ET ACCESSOIRES
Autes bois sciés
AUTRE MACHINE ET APPAREIL A IMPRIMER
AUTRE MINERAIS DE TITANE (Coltant)
AUTRE PARTIE DE PLANTE
AUTRE PEAUX
AUTRE PREP ALIMENTAIRE
Autre vehicules automobiles a usages speciaux
Autres
AUTRES
Autres bois scies
Autres abats comestibles frais ou refrigérés de chevaux,anes,mulets,ovins,caprins
Autres abats comestibles,congeles,de chevaux,anes,mulets,ovins ou caprins
Autres accessoires de tuyauterie en fonte
Autres accumulateurs electriques
Autres appareils elevateurs, a action continue pour marchandises
Autres armes
Autres art de bureau ou de papeterie en papier

```
##                                               n    % val%
## Autres Marchandises                         160  4.8  4.8
## Bois                                        140  4.2  4.2
## Machines et appareils domestique             30  0.9  0.9
## Médicaments et plantes médécinales           34  1.0  1.0
## Poissaons, viande et oeufs                   12  0.4  0.4
## Matériels de construction                    27  0.8  0.8
## Materiel Informatique et Electroniques       32  1.0  1.0
## Véhicules,camions,Motos et acc              113  3.4  3.4
## Vetements,tissus et acc et chaussure        100  3.0  3.0
## boissons, bières et limonades                15  0.5  0.5
## Machine us Ingsutriel                        54  1.6  1.6
## Article Menange et Campement                 37  1.1  1.1
## sacs, sachetsn emballages                     6  0.2  0.2
## Papiers et fournitures de bureaux            24  0.7  0.7
## Produits alimentaires,prep et huiles         68  2.1  2.1
## caféarabica                                1303 39.4 39.5
## Minérais et dérivés                        1053 31.8 31.9
## engins et tracteurs                          18  0.5  0.5
## Cigarette et papier cigarettes et tabac      14  0.4  0.4
## constructionprefabriquees                     7  0.2  0.2
## cadreset conteneurs                           1  0.0  0.0
## Pièces de Réchange appareils                  6  0.2  0.2
## Générateurs,baterie et piles                 15  0.5  0.5
## etuis en plastique ou textile                 1  0.0  0.0
## Pétrole et dérivées et huile de graissage     4  0.1  0.1
## boissons, bières,liqueurs et limonades        2  0.1  0.1
## produits beaute                              10  0.3  0.3
## peauxdes betes                               14  0.4  0.4
## NA                                           10  0.3   NA
```

netoyyage de la variable country_desti qui est un facteur dans le quel nous retrouvons les niveaux rédondants (sur l'identifiant des pays)

```
##  [1] "AFRIQUE DU SUD"
##  [2] "ALGERIE"
##  [3] "ALLEMAGNE"
##  [4] "AMERIQUE LATINE"
##  [5] "ANGLETERRE"
##  [6] "ANGOLA"
##  [7] "ARABIE"
##  [8] "ASIE"
##  [9] "AUSTRALIE"
## [10] "BELGIQUE"
## [11] "BURUNDI"
## [12] "CANADA"
## [13] "CHINE"
```

```
## [14] "CHYPRE"
## [15] "CONGO BRAZA"
## [16] "CZECH REP"
## [17] "DOMBASI SIMBA"
## [18] "EMIRATES ARABES UNIES"
## [19] "ESPAGNE"
## [20] "FRANCE"
## [21] "GABON"
## [22] "GRANDE BRATAGNE"
## [23] "GRECE"
## [24] "HONG KONG"
## [25] "ILE MAURICE"
## [26] "INDE"
## [27] "ITALIE"
## [28] "J WOLFF"
## [29] "JAPON"
## [30] "KENYA"
## [31] "KP - Corée, République Populaire démocra"
## [32] "LIBAN"
## [33] "LUXEMBOURG"
## [34] "MADRID"
## [35] "MALAISIE"
## [36] "MAROC"
## [37] "NERLAND"
## [38] "NERTHERLAND"
## [39] "NIGERIA"
## [40] "NOUVELLE ZELANDE"
## [41] "OUGANDA"
## [42] "PANAMA"
## [43] "PAYS BAS"
## [44] "PHILLIPINE"
## [45] "POLOGNE"
## [46] "PORTUGAL"
## [47] "R-U"
## [48] "RDC"
## [49] "RDC/BELGIQUE"
## [50] "RDC/BUNIA"
## [51] "RDC/CHINE"
## [52] "RDC/ETATS UNIS"
## [53] "RDC/FRANCE"
## [54] "RDC/MALAISIE"
## [55] "RDC/OUGANDA"
## [56] "RDC/R-U"
## [57] "RDC/RWANDA"
## [58] "RDC/SINGAPOUR"
## [59] "RDC/SUISSE"
```

```
## [60] "REP TCHEQUE"
## [61] "ROYAUME UNI"
## [62] "RWANDA"
## [63] "SENEGAL"
## [64] "SINGAPOUR"
## [65] "SKN"
## [66] "SOMALIE"
## [67] "SOUDAN"
## [68] "SUCAFINA"
## [69] "SUD SOUDAN"
## [70] "SUEDE"
## [71] "SUISSE"
## [72] "SUITZERLAND"
## [73] "Swaziland"
## [74] "SWEDEN"
## [75] "SWITZERLAND"
## [76] "TANZANIE"
## [77] "TCHAD"
## [78] "THAILANDE"
## [79] "TWIN TRADING"
## [80] "TZ"
## [81] "UAE"
## [82] "UNION EUROPEENNE"
## [83] "USA"
## [84] "WALTER MATTER"
## [85] "ZAMBIE"
```

```
##  [1] "AFRIQUE DU SUD"        "ALGERIE"               "ALLEMAGNE"
##  [4] "AMERIQUE LATINE"       "GRANDE BRATAGNE"       "ANGOLA"
##  [7] "ARABIE"                "ASIE"                  "AUSTRALIE"
## [10] "BELGIQUE"              "BURUNDI"               "CANADA"
## [13] "CHINE"                 "CHYPRE"                "CONGO BRAZA"
## [16] "REP TCHEQUE"           "NA"                    "EMIRATES ARABES UNIES"
## [19] "ESPAGNE"               "FRANCE"                "GABON"
## [22] "GRECE"                 "HONG KONG"             "ILE MAURICE"
## [25] "INDE"                  "ITALIE"                "JAPON"
## [28] "KENYA"                 "KP - Corée"            "LIBAN"
## [31] "LUXEMBOURG"            "MALAISIE"              "MAROC"
## [34] "NERLAND"               "PAYS BAS"              "NIGERIA"
## [37] "NOUVELLE ZELANDE"      "OUGANDA"               "PANAMA"
## [40] "PHILLIPINE"            "POLOGNE"               "PORTUGAL"
## [43] "ROYAUME UNI"           "RDC"                   "USA"
## [46] "RWANDA"                "SINGAPOUR"             "SUISSE"
## [49] "SENEGAL"               "SOMALIE"               "SOUDAN"
## [52] "SUD SOUDAN"            "SUEDE"                 "Swaziland"
## [55] "TANZANIE"              "TCHAD"                 "THAILANDE"
```

Table 6.3: Table de corrélation entre les variables quantitatives

var1	var2	coef_corr
Weight	Year	-0.1727414
Taxe	Year	-0.1965648
Year	Weight	-0.1727414
Taxe	Weight	0.6699457
Year	Taxe	-0.1965648
Weight	Taxe	0.6699457

```
## [58] "UNION EUROPEENNE"      "ZAMBIE"
```

Dans la base des données il y a des entreprises que l'on a enregistré à la place des pays. ces genre des cas ont été traité par remplacement avec le *NA* pour **Not Available** et ces dernier on été élargués de la base des données, car nous avions jugé qu' aucune méthode d'imputation n'est applicable pour ce genre de situation. Nous avions fait la même chose pour les variables tels que **Les marchandises**.

6.1.1 Nouvelle base de données pour les analyses

Regroupement des variables pour la synthèse pour rendre la base des données simple à exploiter, éliminer les NA dans les observations telsque les pays et les valeurs pour les marchandises et les taxes.

```
DBase <- taxe_df  %>%
  select(Year,Country_dest,Goods,Weight,Taxe) %>%
  group_by(Year,Country_dest,Goods) %>%
  summarise(Weight=sum(Weight),Taxe=sum(Taxe),.groups = "drop") %>% drop_na()

correlate(DBase) %>% kable(caption = "Table de corrélation entre les variables quantitatives")
```

```
#plot_correlate(DBase)
```

```
df <- pdata.frame(DBase,index = c("Year","Country_dest"))
```

```
## Warning in pdata.frame(DBase, index = c("Year", "Country_dest")): duplicate couples (id-time)
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

```
DF <- df %>% pivot_wider(names_from = Goods,values_from = c(Taxe,Weight))
```

```
DB <- pdata.frame(DBase,index=c("Year","Goods"))
```

```
## Warning in pdata.frame(DBase, index = c("Year", "Goods")): duplicate couples (id-time) in resu
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

6.2 Analyse descriptive des Varariales

Conversion des données en modèle des panels des données

Chapter 7

Final Words

We have finished a nice book.

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