SAS/R PROJECT – 03 OCTOBER 2025

DINH Thi Thao Nhung – NGUYEN Linh Chi

2.1 Data Preparation

Figure 1 (Tab1)	Figure 2 (Tab2)
• Removed extra sheets (Tabs 3-5) • Unmerged header cells (row 3-5) and deleted redundant rows (4-5) • Added label “Secteur” for 1st columns • Deleted total/note row (11-13); header rows (1-2);“Industrie manufacturière” line since the rate ofinvestment cannot be properly calculated for “Industrie hors manufacturière” • Added units in columns headers	• Deleted non-data rows (1-2, 9-10) • Added units in columns headers • Deleted total row (“Ensemble”)

2.2 SAS Program

```
libname Project 'C:\Users\nguyli22\Documents\SAS PROJECT';

PROC IMPORT
OUT = Project.Figure1
datafile = 'C:\Users\nguyli22\Documents\SAS PROJECT\
SAS PROJET - DINH - NGUYEN.xlsx'
dbms = xlsx replace;
sheet = 'Figure 1';
getnames = yes;
run;

PROC IMPORT
OUT = Project.Figure2
datafile = 'C:\Users\nguyli22\Documents\SAS PROJECT\
SAS PROJET - DINH - NGUYEN.xlsx'
dbms = xlsx replace;
sheet = 'Figure 2';
getnames = yes;
run;
```

VIEWTABLE: Project.Figure1

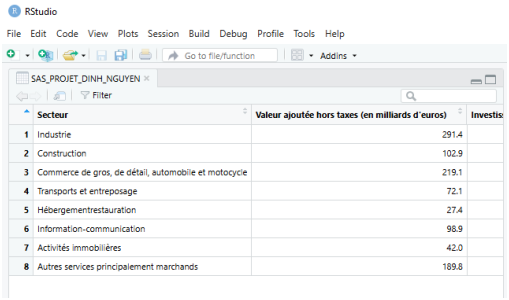
	Secteur	Valeur ajoutée hors taxes (en milliards d'euros)	Investissements corporels bruts hors apports (en milliards d'eu	Taux d'investissement (en %)
1	Industrie	291.4	59.0	20.2
2	Construction	102.9	11.0	10.7
3	Commerce de gros, de détail, automobile et motocycle	219.1	23.5	10.7
4	Transports et entreposage	72.1	26.1	36.2
5	Hébergement restauration	27.4	9.1	33.3
6	Information-communication	98.9	16.5	16.6
7	Activités immobilières	42.0	34.7	82.5
8	Autres services principalement marchands	189.8	32.0	16.8

VIEWTABLE: Project.Figure2

	A	Entreprises ayant investi (en %)	Entreprises n'ayant pas investi (en %)
1	Microentreprises (MIC)	46.0	54.0
2	PME hors MIC	90.1	9.9
3	Entreprises de taille intermédiaire	97.7	2.3
4	Grandes entreprises	99.6	0.4

2.3 R Program

```
> library(readxl)
> SAS_PROJET_DINH_NGUYEN <- read_excel("C:/Users/ dinhth25/Desktop/SAS/SAS PROJET - DINH - NGUYEN.xlsx")
> View(SAS_PROJET_DINH_NGUYEN)
```



3.1 SAS Program

1 + 2. Re-compute the “Taux d’investissement” and Evaluate rounding error

```
/*create new columns ‘col C + col B’*/
data Project.Figure1;
        set Project.Figure1;
        colB = Valeur_ajout_e_hors_taxes__en_mi;
        colC = Investissements_corporels_bruts;
run;
/* re-compute the “Taux d’investissement” as
percentage of ‘col C/ col B’*/
data Project.Figure1;
  set Project.Figure1;
  Taux_investissement = (ColC / ColB) * 100;
run;
/*Evaluate how much rounding error has been made*/
data Project.Figure1;
        set Project.Figure1;
        Erreur_arrondi = (Taux_investissement - VAR4) / VAR4;
run;
```

VIEWTABLE: Project.Figure1

	Investissements corporels bruts hors apports (en milliards d'eu	Taux d'investissement (en %)	E	F	G	H	colB	colC	Taux_investissement	Erreur_arrondi
1	59.0	20.2					291.4	59	20.247083047	0.0005615209
2	11.0	10.7					102.9	11	10.689990282	-0.000935488
3	23.5	10.7					219.1	23.5	10.725696029	0.0024014981
4	26.1	36.2					72.1	26.1	36.199722607	-7.662777E-6
5	9.1	33.3					27.4	9.1	33.211678832	-0.002652287
6	16.5	16.6					98.9	16.5	16.683518706	0.0050312473
7	34.7	82.5					42	34.7	82.619047619	0.0014430014
8	32.0	16.8					189.8	32	16.859852476	0.0035626474

3. Estimate the proportion of MIC

Explantion of an average of 48.7 (%) : The "Entreprises ayant investi" has an average of of 48,7%, which is closed to the MIC rate. It means that MICs dominate the weight : we can clearly see that even all the other groups almost all invest, they are too few to lift the overall average much. In other words, most of the firm is MIC and have a low investing rate, which pull the total down. The other groups invest a lot but they're too few to move the overall average. In order to do that, we need either more MICs investing, or a much larger share of non-MIC firms that invest more.

```
%let T       = 0.487;  /* Overall investment rate*/
%let r_MIC   = 0.460;  /* Investment rate of MIC*/
%let r_nonMIC = 0.93;   /* Assumed investment rate among non-MIC*/
data Project.Figure2_Calcul;
 T       = &T.;
 r_MIC   = &r_MIC.;
 r_nonMIC = &r_nonMIC.;
 p_MIC   = (r_nonMIC - T) / (r_nonMIC - r_MIC);
 p_nonMIC = 1 - p_MIC;
run;
```

VIEWTABLE: Project.Figure2_calcul

	T	r_MIC	r_nonMIC	p_MIC	p_nonMIC
1	0.487	0.46	0.93	0.9426	0.0574468085

3.2 R Program

1 + 2. Re-compute the "Taux d'investissement" and Evaluate rounding error

```
> library(readxl)
> SAS_PROJET_DINH_NGUYEN <- read_excel("C:/Users/dinhth25/Desktop/SAS/SAS PROJET - DINH - NGUYEN.xlsx")
> # Recompute Taux d'investissement
> SAS_PROJET_DINH_NGUYEN$Taux_computed <-
+   (SAS_PROJET_DINH_NGUYEN$`Investissements corporels bruts hors apports  (en milliards d'euros)` /
+     SAS_PROJET_DINH_NGUYEN$`Valeur ajoutée hors taxes (en milliards d'euros)`) * 100
> # Calculate rounding error
> SAS_PROJET_DINH_NGUYEN$Rounding_error <-
+   (SAS_PROJET_DINH_NGUYEN$`Taux d'investissement (en %)` - SAS_PROJET_DINH_NGUYEN$Taux_computed) /
+   SAS_PROJET_DINH_NGUYEN$`Taux d'investissement (en %)`
> # View the results
> View(SAS_PROJET_DINH_NGUYEN)
```

SAS_PROJET_DINH_NGUYEN | Untitled1* | Untitled2*

Filter

	Valeur ajoutée hors taxes (en milliards d'euros)	Investissements corporels bruts hors apports (en milliards d'euros)	Taux d'investissement (en %)	Taux_computed	Rounding_error
	291.4	59.0	20.23572	20.24708	-5.615209e-04
	102.9	11.0	10.70000	10.68999	9.354877e-04
mobile et motocycle	219.1	23.5	10.70000	10.72570	-2.401498e-03
	72.1	26.1	36.20000	36.19972	7.662777e-06
	27.4	9.1	33.30000	33.21168	2.652287e-03
	98.9	16.5	16.60000	16.68352	-5.031247e-03
	42.0	34.7	82.50000	82.61905	-1.443001e-03
rchands	189.8	32.0	16.80000	16.85985	-3.562647e-03

3. Estimate the proportion of MIC

```
> r_MIC <- 46.0
> r_PME_hors_MIC <- 90.1
> r_ETI <- 97.7
> r_GE <- 99.6
> # Estimate non-MIC average investment rate (assuming equal weight)
> r_nonMIC <- mean(c(r_PME_hors_MIC, r_ETI, r_GE))
> p_MIC <- (48.7 - r_nonMIC) / (r_MIC - r_nonMIC)
> # Print result
> cat("Estimated proportion of Microentreprises (MIC):", round(p_MIC * 100, 1), "%\n")
Estimated proportion of Microentreprises (MIC): 94.6 %
```