UNITED NATIONS

الاسكوا

ESCWA

WELCOME

Session 11

Calibration and Simulation of the model

Simulation with the AUTA Model

Simulations

- We have retained two simulation plans: the first simulation (Sim 1) holds a 10% increase in the volume of labor and the second simulation (Sim 2) analyzes the case of a 10% increase in capital specific to the branch of services

Simulation 1

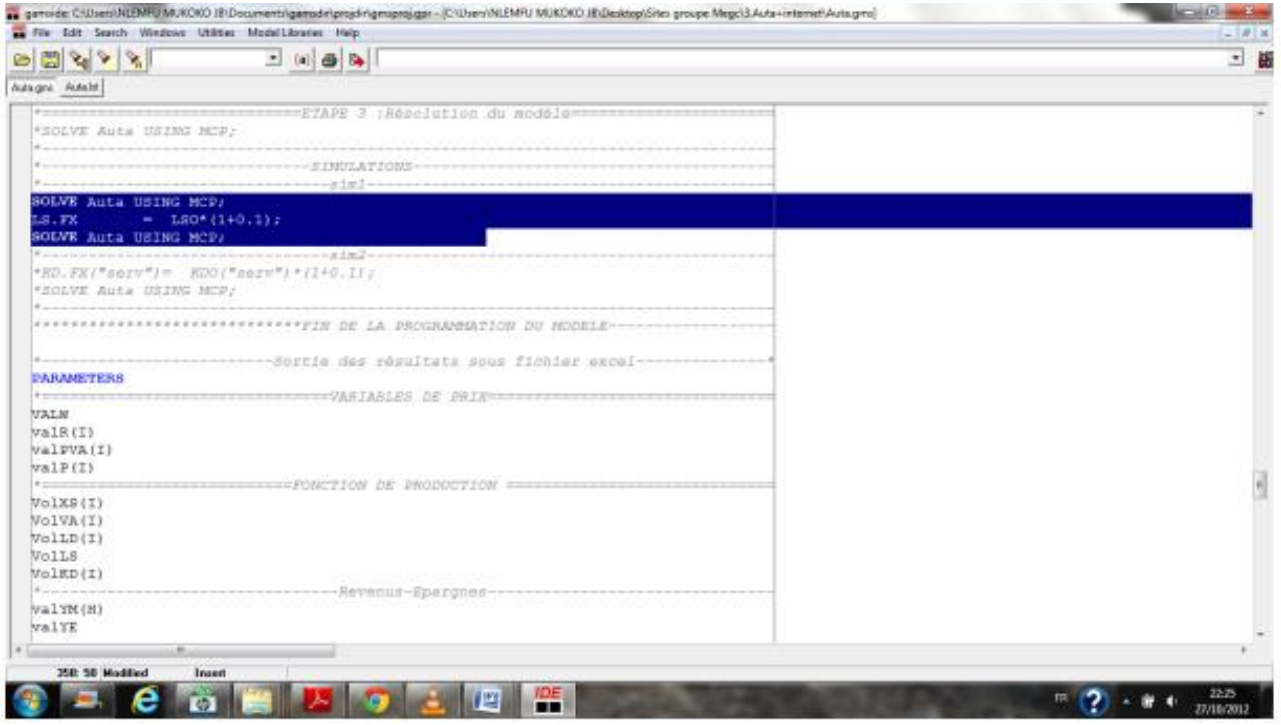
- 10% increase in labor volume.
- The concern at this level, is how to introduce this simulation in our model. As a reminder, the simulations are realized on exogenous variables as highlighted above. In the occurrence, of the case that concerns us, it's the variable labour (LS.FX).

To view the 10% increase, we will have:

Solve Auta using MCP;

LS.FX=LSO*(1+0.1);

Solve Auta using MCP;

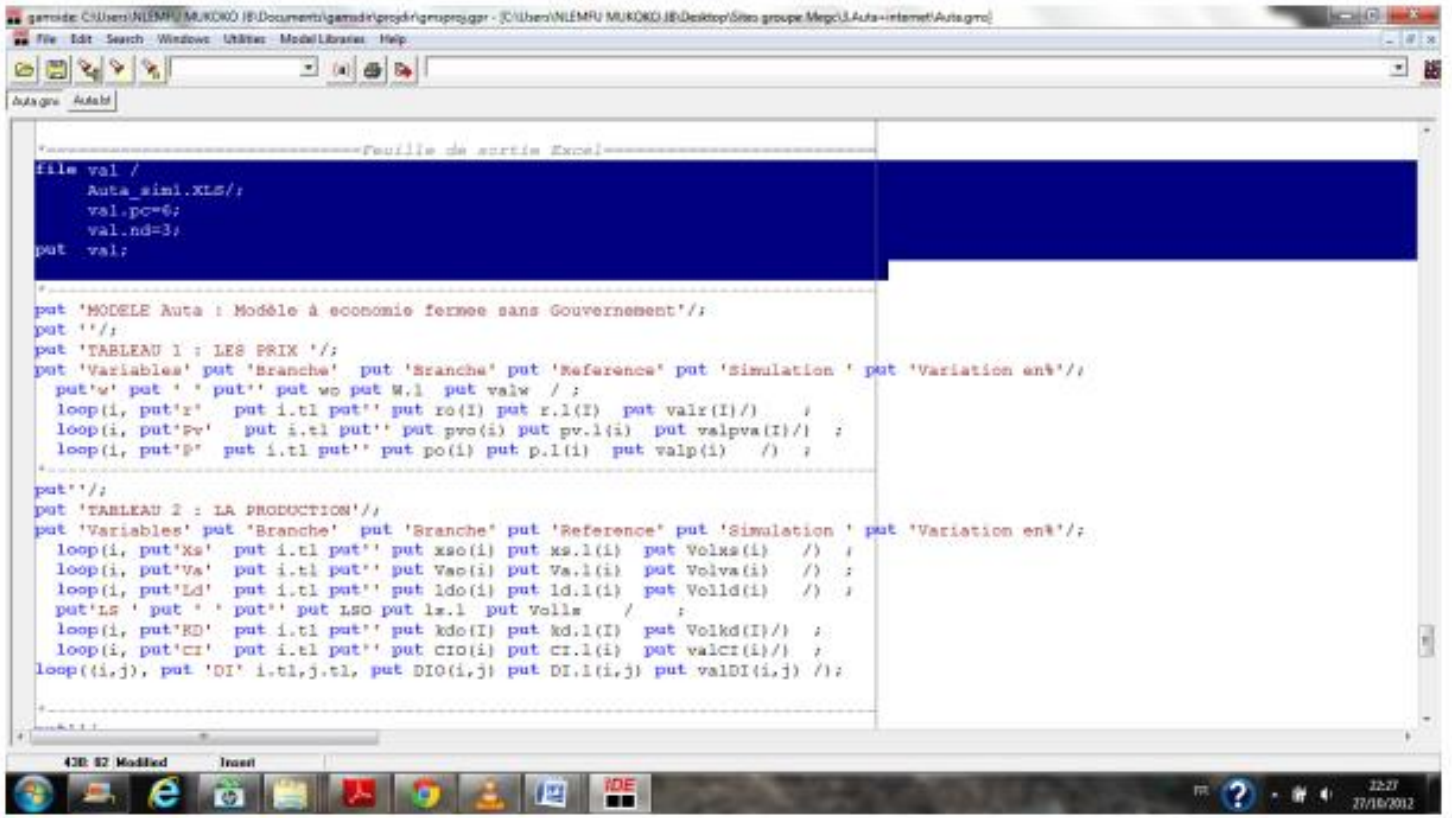


- Change the name of the output sheet on Excel from

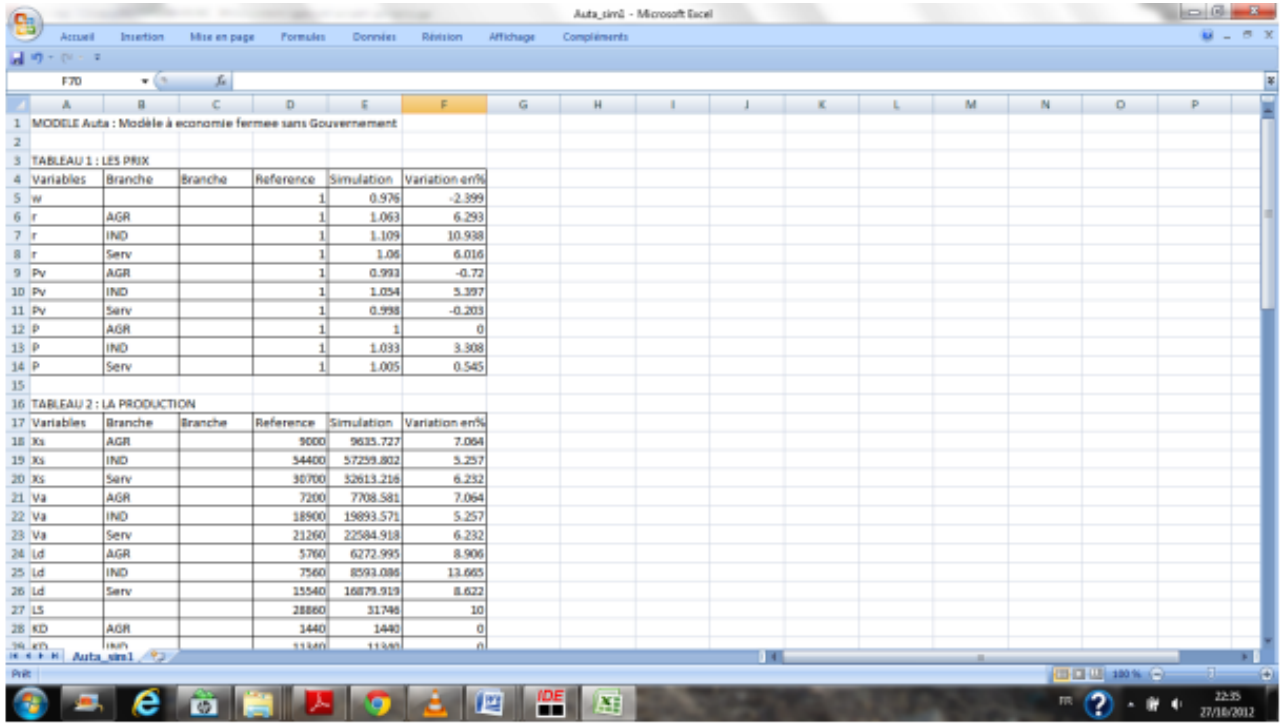
FILE Val/
Auta.xls/;
Val.pc=6
val.nd=4
put val;

To

FILE Val/
Auta_sim1.xls/;
Val.pc=6;
Val.pc=4
put val;



- Next, **File/Run or F9** to solve the model and recover the results sheet <<**Auta_sim1.xls**>> in **Documents/Gamsdir/projdir/**



MODELE Auta : Modèle à economie fermee sans Gouvernement

TABLEAU 1 : LES PRIX

Variables	Branche	Branche	Reference	Simulation	Variation en%
w			1	0.976	-2.399
r	AGR		1	1.063	6.293
r	IND		1	1.109	10.938
r	Serv		1	1.06	6.016
Pv	AGR		1	0.993	-0.72
Pv	IND		1	1.054	5.397
Pv	Serv		1	0.998	-0.203
P	AGR		1	1	0
P	IND		1	1.033	3.308
P	Serv		1	1.005	0.545

TABLEAU 2 : LA PRODUCTION

Variables	Branche	Branche	Reference	Simulation	Variation en%
Xs	AGR		9000	9635.727	7.064
Xs	IND		54400	57259.802	5.257
Xs	Serv		30700	32613.216	6.232
Va	AGR		7200	7708.581	7.064
Va	IND		18900	19893.571	5.257
Va	Serv		21260	22584.918	6.232
Ld	AGR		5760	6272.995	8.906
Ld	IND		7560	8593.086	13.665
Ld	Serv		15540	16879.919	8.622
LS			28860	31746	10
KD	AGR		1440	1440	0

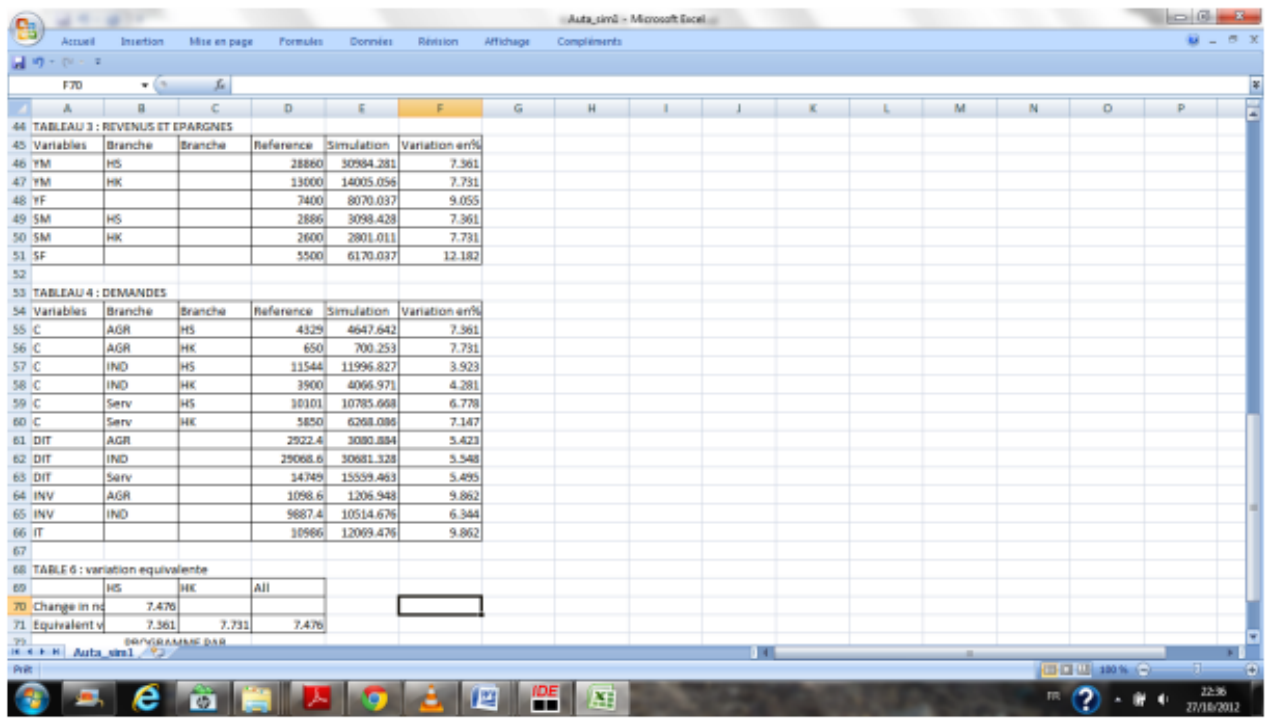


TABLEAU 3 : REVENUS ET EPARGNES

Variables	Branche	Branche	Reference	Simulation	Variation en%
YM	HS		28860	30984.281	7.361
YM	HK		13000	14005.056	7.731
YF			7400	8070.037	9.055
SM	HS		2886	3098.428	7.361
SM	HK		2600	2801.011	7.731
SF			5500	6170.037	12.182

TABLEAU 4 : DEMANDES

Variables	Branche	Branche	Reference	Simulation	Variation en%
C	AGR	HS	4329	4647.642	7.361
C	AGR	HK	650	700.253	7.731
C	IND	HS	11544	11996.827	3.923
C	IND	HK	3900	4066.971	4.281
C	Serv	HS	10101	10785.668	6.778
C	Serv	HK	5850	6268.086	7.147
DIT	AGR		2922.4	3080.884	5.423
DIT	IND		29068.6	30681.328	5.548
DIT	Serv		14749	15559.463	5.495
INV	AGR		1098.6	1206.948	9.862
INV	IND		9887.4	10514.676	6.344
IT			10986	12069.476	9.862

TABLE 6 : variation equivalente

	HS	HK	All
Change in ns	7.476		
Equivalent v	7.361	7.731	7.476

As you can see at the level of the last column, the simulation had an impact on the studied economy. All that is left is to interpret the different variations that were noted

Simulation 2

- 10% increase in capital specific to the services branch.

To view the 10% increase, we will:

Solve Auta using MCP
KD.FX('serv')= KDO ('serv')*(1+0.1);
Solve Auta using MCP

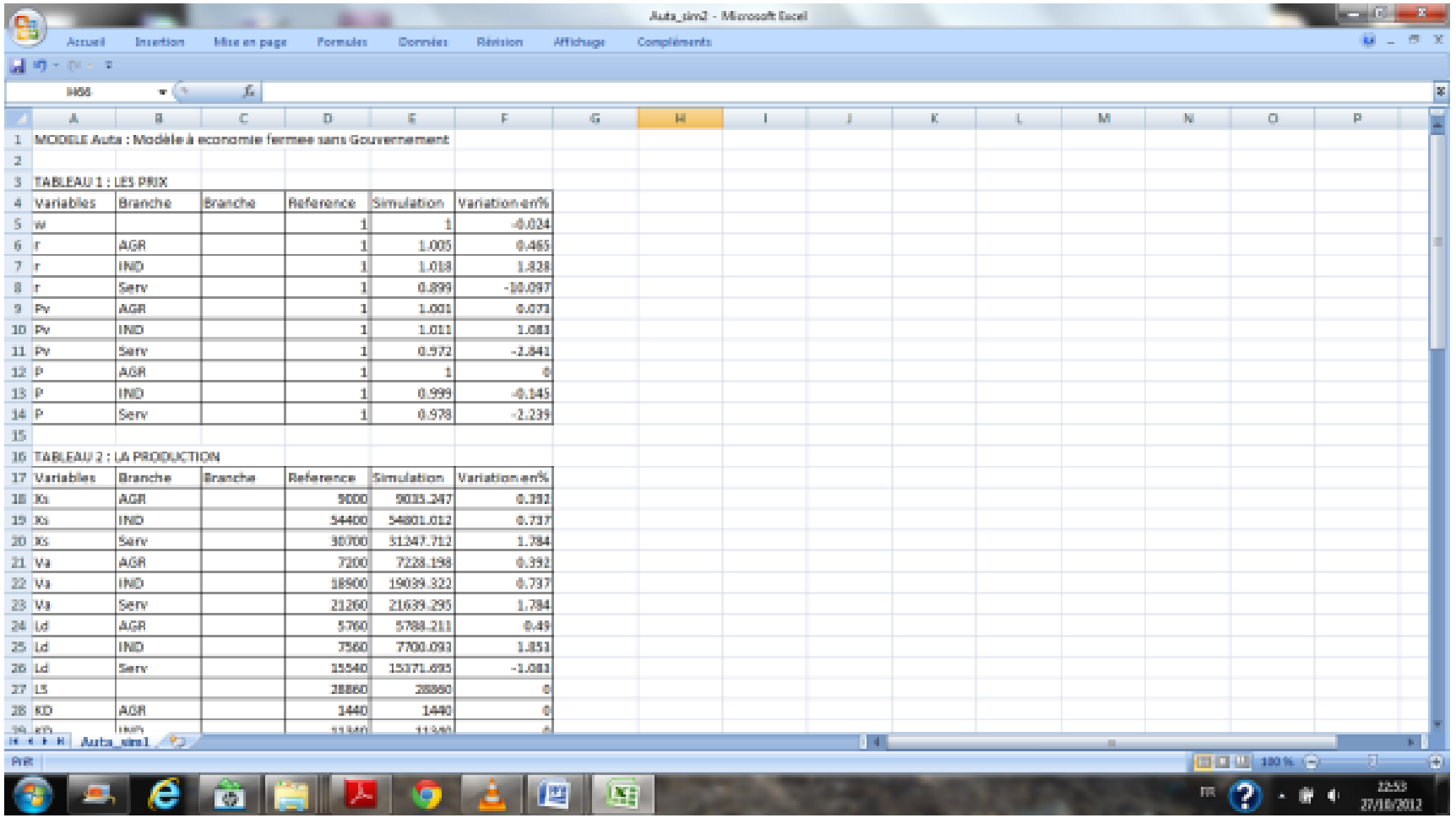
- Change the name of the Excel output sheet file from:

```
FILE Val/
Auta.xls.xls/;
Val.pc=6;
Val.nd=4;
put val;
```

TO

```
FILE VAL/
Auta_sim2.xls/;
Val.pc=6;
Val.pc=4
put  val;
```

- Following the same procedures as we did with simulation 1, we will obtain the results as displayed below



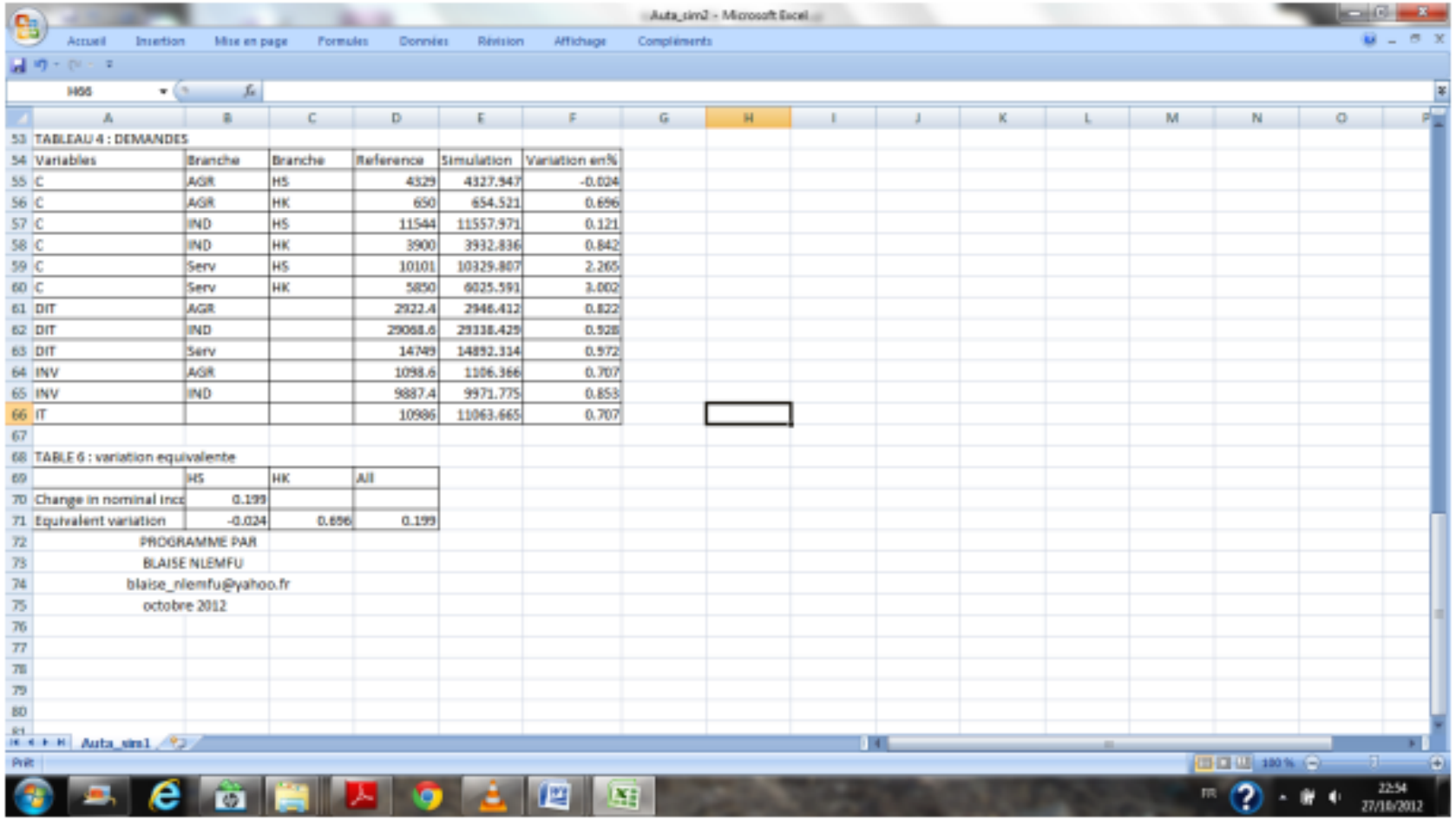
MODELE Auta : Modèle à economie fermee sans Gouvernement

TABLEAU 1 : LES PRIX

Variables	Branche	Branche	Reference	Simulation	Variation en%
w			1	1	-0.024
r	AGR		1	1.005	0.465
r	IND		1	1.018	1.828
r	Serv		1	0.899	-10.097
Pv	AGR		1	1.001	0.071
Pv	IND		1	1.011	1.083
Pv	Serv		1	0.972	-2.841
P	AGR		1	1	0
P	IND		1	0.999	-0.145
P	Serv		1	0.978	-2.239

TABLEAU 2 : LA PRODUCTION

Variables	Branche	Branche	Reference	Simulation	Variation en%
Xs	AGR		9000	9035.247	0.392
Xs	IND		54400	54801.012	0.737
Xs	Serv		50700	51247.712	1.784
Va	AGR		7200	7228.198	0.392
Va	IND		18900	19039.322	0.737
Va	Serv		21260	21639.295	1.784
Ld	AGR		5760	5788.211	0.49
Ld	IND		7560	7700.093	1.853
Ld	Serv		15540	15371.695	-1.083
LS			28860	28860	0
KD	AGR		1440	1440	0



	A	B	C	D	E	F
53	TABLEAU 4 : DEMANDES					
54	Variables	Branche	Branche	Reference	Simulation	Variation en%
55	C	AGR	HS	4329	4327.947	-0.024
56	C	AGR	HK	650	654.521	0.696
57	C	IND	HS	11544	11557.971	0.121
58	C	IND	HK	3900	3932.836	0.842
59	C	Serv	HS	10101	10329.807	2.265
60	C	Serv	HK	5850	6025.591	3.002
61	DIT	AGR		2922.4	2946.412	0.822
62	DIT	IND		29068.6	29338.425	0.928
63	DIT	Serv		14749	14892.314	0.972
64	INV	AGR		1098.6	1106.366	0.707
65	INV	IND		9887.4	9971.775	0.853
66	IT			10986	11063.665	0.707
67						
68	TABLE 6 : variation equivalente					
69		HS	HK	All		
70	Change in nominal Incc	0.199				
71	Equivalent variation	-0.024	0.696	0.199		
72	PROGRAMME PAR					
73	BLAISE NLEMFU					
74	blaise_nlemfu@yahoo.fr					
75	octobre 2012					

We have the results of both our simulations, the only thing left to do is interpret them.

Interpretations

- To interpret the results of our simulations, a theoretical analysis of the probable direct and indirect (or induced) effects caused by the choc is needed. The analysis should put into evidence the dominant effects and the propagation mechanism (pinpoint the training effect) of the simulation in the model. Next, compare the results of this theoretical analysis by those found with the model, thereby drawing the consequences on the points of agreement and divergence.
- Analyze the effects of supply and demand, the mechanisms of the price formation and the origin of the differences between sector.
- Interpret the variation of price in relation to cash and other prices.

Scenario 1: 10% increase in the labor volume

- As an example, for the first simulation, we have:

The decrease in salary is considered as the indirect effect

The indirect effects (or induced) are a result of:

the decrease in salary, which would have an impact on the relative price of capital that increased (r/s); labor intensive sectors being favored because their price decreased (sectorial effect); which would induce different implications on the production sectors (**supply effect**) and household income. The latter (by combing the effects of price, of revenue even substitution), would have an impact on the demand of goods & services

Scenario 2: 10% increase in specific capital in services

- The same analysis can be done for the second simulation:

The direct effect is the decrease in return on capital in the branch of services with as a consequence the substitution of labor by capital (indirect effect) in this branch, which favors sectors like agriculture and labor intensive sectors (benefiting from the freed up labor).

Incidentally, the increase in specific capital in services has an impact on those in the two other branches (agriculture and industry), which becomes relatively rare and therefore return increases.

The combination of all these elements has implications on the formation of price, household income, as well as consumption and savings relative to investments.

Thank You
Very Much