Proceedings of the 3rd International Conference of Economics and Management (CIREG 2016) Volume I

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ECONOMY

ECONOMY

DETERMINANTS OF THE GROWTH OF SME: WHICH ECONOMETRIC MODEL TO APPLY?

IBTISSAM BENERRAMI[1]

Preamble

Although the importance of SMEs for both social status and economic level is undeniable, these types of companies have not received the attention they deserve from econometrics researchers.

Most economic surveys and research emphasize the importance of small and medium-size companies and the fact that they constitute a very important economic growth factor. Indeed, these companies underpin the economies of both industrialized countries and emerging countries.

They are also essential to the development of territories due to the fact that they play a significant role in the economic and social development of employment and division of wealth.

I intend to look at the growth of SMEs in the Moroccan context. The first part is focused on outlining the theory of growth, the second part on a comparative study of SMEs on the national level by releasing the determinants of the growth of SMEs and the third part establishes a model to test the growth of SMEs.

Based on this, and as we know that SMEs today represent 92% of companies in the Moroccan productive fabric, we quickly realize that the biggest part of the challenge lies in the growth of SMEs which must be at the center of any reform concerns.

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Aware of this challenge, the Ministry of Economy and Finance plays an important role because of the intervention instruments it has, in particular customs, budget, tax, and funding, must reflect on this.

I. Thinking of the Theory of Growth

Curiously enough, we find around this theme two currents that any methodology, theoretical propositions, or academic statutes, separate: the theory of regulation and the endogenous theory of growth.

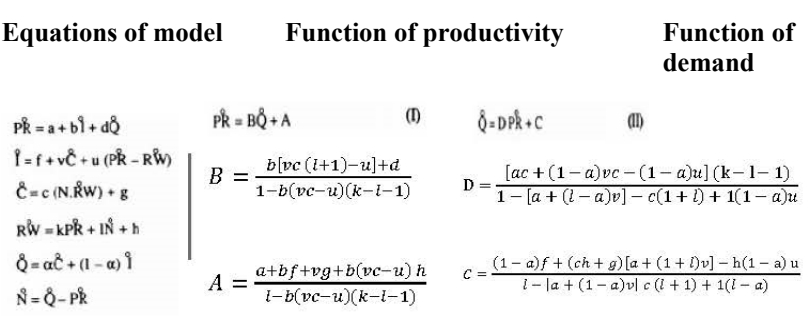
The theory of regulation will cause general problems for becoming a capitalist economy. This latter takes the opposite view of neo-classical theory in its rejection of methodological individualism, its relation to history and its emphasis on the themes of structural change, particularly technological and institutional change. The product growth hypothesis generally appears in these models in the form of Kaldor Verdoorn's laws. The endogenous theory of growth attempts to overcome the shortcomings of the Solow model. The first is to prevent the marginal efficiency of a factor from decreasing as it accumulates. Outflows increase using Marshallian externalities on the stock of capital knowledge.

The second way explains the models and their effects on the research sector in terms of deepening the division of employment and technological innovation. But it goes beyond the tricks of abandoning certain points of the Walrasian orthodoxy to keeping it in the traditional model of growth: the recognition of monopolistic competition and the justified optimality justify the intervention of the State, and a new look at the collective and institutional dimension of the growth process made to take the revolution with neo-classical **macroeconomics.**

1. The regulation theory

A short presentation of the theory of regulation draws its identity from a criticism of the theory dominant—and more particularly neo-classic from which the call to a minimal interbreeding rises immediately from the pure and hard economy with other social sciences in the forefront of history.

Figure 1: Regulation model



With: PR: productivity, I: Investment; Q: Production, C: consummation, RW: real wage, N: employment

2. The endogenous theory of growth

This theory appeared in the 1980s and aims to explain the cumulative character of the growth or, in other words, to explain why certain countries do not manage to start a process of growth and then they remain in a trap door with underdevelopment.

In contrast to the Solow model, endogenous growth models assume that yields increase (due to externalities) and consider that technical progress is endogenous, i.e. it depends on the behavior of the agents. In other words, just like at Solow model, technical progress generates economic growth, but in return, it is also likely to generate technical progress.

3. Canonical model of endogenous growth (ROMER1986)[2]

- **Function of production: external effect**

$$Y_j = f(k_j, K) \qquad K = \sum k_j$$

[2] Romer P. (1986), Increasing Returns and long run Growth, *Journal of political economy*, vol 94, October, n°5, pp.1002-1037.

- **Function of utility logarithmic:**

$$f(k,K) = k^{\alpha} K^{\eta} \qquad u(c) = \log c$$

- The agents solve the program of maximization of their utility under the constraint of accumulation of the capital knowledge.

$$\begin{cases} \text{Max} \int_0^{\infty} u\left(c(t)\right) e^{Pt} dt \\ K = f(k,K) - c \end{cases}$$

i. The solution of this program gives for the dynamics of the capital.

$k^{\alpha} = N^{\eta} k^{\alpha+\eta} \cdot \frac{1}{\theta}$ With ϖ mulitiplier of the hamittonien.

Three cases must be distinguished:

1) **α+η<1:** The growth rate of the stock of capital tends towards 0 as accumulation.

2) **α+η= 1:** The growth rate of the stock of capital towards a constant.

3) **α+η>1:** The growth rate of the stock of capital is increasing.

4. Confrontation: Models of exogenous / endogenous growth theory

The purpose of this proposal is theoretically to analyze the role of technical progress in economic growth. The theoretical framework chosen is neo-classical theory. The main results published are two. First, this theoretical analysis has evolved more in recent decades. Second, this evolution is achieved by endogenous growth models and compared to the traditional neo-classical growth model (Solow, 1957).

Figure 2: A summary of the positioning of technical progress in the traditional neo-classic model (Solow, 1957)[3]

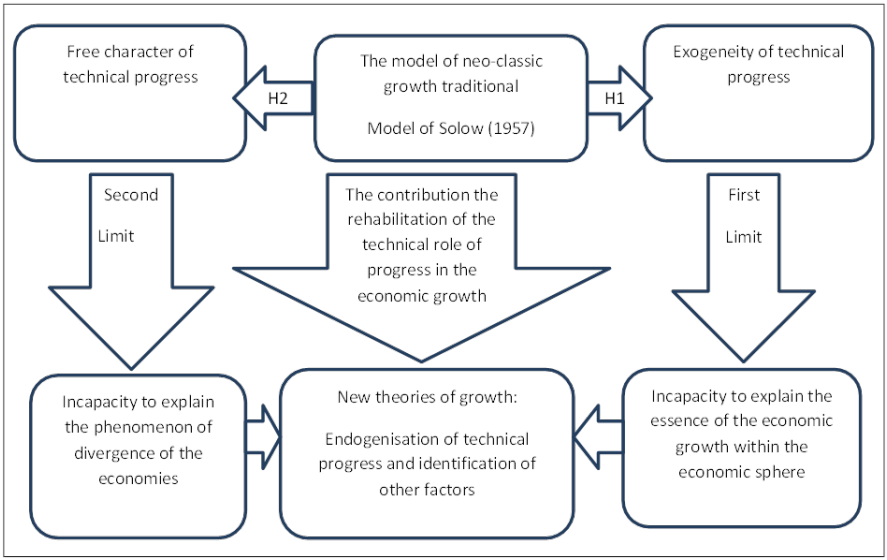


Diagram N°1: Summary of the positioning of technical progress in the traditional neo-classical model by Mohamed Moezhamdi and Mohamed Moezyaiche: neo-classical theoretical analysis of the role of technical progress in economic growth: the contribution of the models of endogenous growth models, URED, University of SFAX. Tunisia 2001.

[3] Solow R.M (1957), 'technical change and the aggregate production function', The Review of Economics and Statistics, vol 3, 9 August.

Figure 3: A summary diagram of the positioning of technical progress in endogenous growth models based on innovation

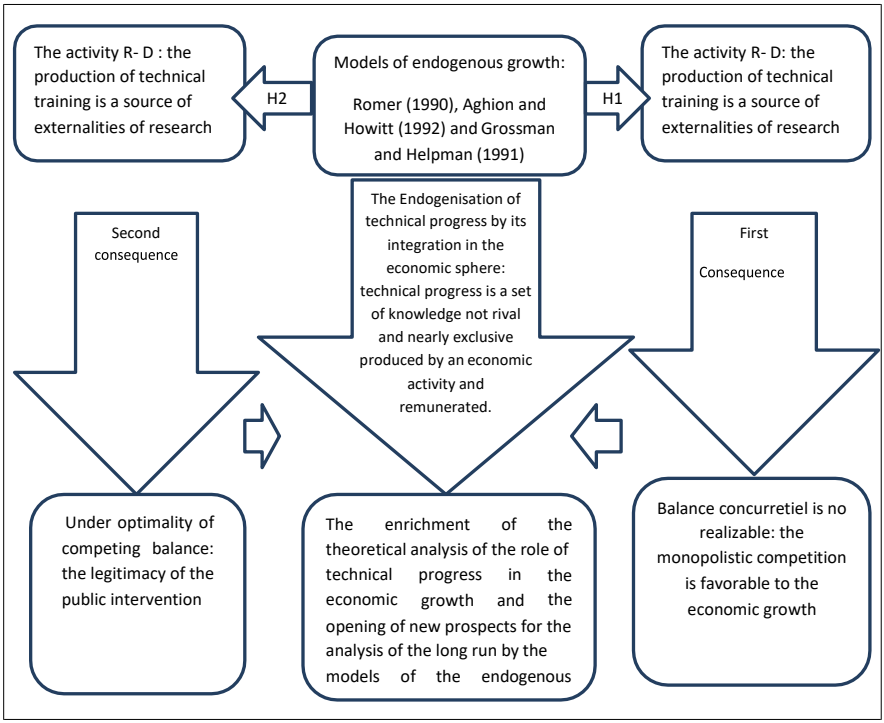


Diagram N°2: Summary of the positioning of technical progress in the traditional neo-classic model by Mohamed Moezhamdi and Mohamed Moezyaiche: neo-classic theoretical analysis of the role of technical progress in the economic growth: the contribution of the models of the endogenous growth, URED, University of SFAX. Tunisia 2001;

II. Comparative study of SMEs at national level

The modeling of growth is related mainly to the behavior of managers and the company's strategy that depend on economic, financial and social transfers. Other models are related to business growth optimization behavior. These developments are presented in many literature reviews.

Given the number of these existing models, we will limit ourselves here to a summary presentation of the basic model to devote to the ideal profile while it can be attributed to the SME TEST.

Modeling gives different growth theories depending on whether one studies the company's strategy or management style. Visibility on the behavior of SMEs in Morocco is today very limited because of the weakness of the current statistical system. Thus, it seems appropriate to constitute a real sample of SMEs at the national level for the establishment of a statistical system of successful SMEs wishing to improve the visibility necessary to monitor the economic behavior related to this category of companies.

1. Choice of the sample: Representative sample (N=30 observations)

The objective of this study is to empirically verify the hypothesis from the theoretical framework that there are two types of growth profiles (according to the theory of growth) to constitute our sample, the following selection criteria were used.

Table 1: Description of the sample

Sector	**Industry**
Address	Casablanca; Agadir; Rabat; Midelt; Tangier; Meknes; Fes; Errachidia; Azrou.
Legal form	Limited company (SA) and Incorporated company (SARL)
Date of creation	Between 1968 and 2012
Accounting years	2012; 2013 and 2014
Variables	Turnover, share capital, debts of financing, payables, social security, debts, nearby state, payroll costs, net result, tax.

Model with data PANEL:

Our ultimate goal is to propose an ideal profile in terms of growth of Moroccan SMEs through the SME TEST at the end of our study. We first test the homogeneity of the sample according to the structure of the Panel obtained. The data Panel is representative of a double dimension: individual and temporal. Our Panel is made up of 30 SMEs (N = 30) and is known for 3 years (T = 3); which is a total of 90 observations at K = 9 explanatory variables.

The model is: **Y=a0+a1X1+ a2X2 +a3X3+ a4X4+ a5X5+ a6X6 +a7X7+ a8X8+ a9X9+ei**

With: (a: Parameters to be estimated/ei: residue).

Table 2: List of endogenous and exogenous variables

Y	**Turnover**	**CA**
X1	Share capital	CS
X2	Debts of financing	DETTESFIN
X3	Payables	DETTESFOUR
X4	Social debts	ORGSOC
X5	Government debts	ETAT
X6	Cost of pay	CHPERSO
X7	Staff	EFFECTIF
X8	Net result	RESUNET
X9	Tax	IMPOETTAX

2. Modeling of the growth of SMEs for sector I at year T.

According to the series of the data: It is about an unbalanced Panel. (Lack of observations for certain SMEs)

1. N: branch of industry with: NR = 30

2. T: Years with: T=3 (2012; 2013 and 2014)
3. n: Full number of observations with: n=N*T = 30*3 = 90 Observations

While answering the following question: Do 30 SMEs (sample) belong to the same population?

Figure 4: Statistical and economic interpretation of the results

Dependent Variable: CA
Method: Panel Least Squares
Date: 02/20/16 Time: 19:03
Sample: 2012 2014
Cross-sections included: 11
Total panel (unbalanced) observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CS	-2.736113	3.002226	-0.911361	0.3775
DETTESFIN	3.047448	5.039473	0.604716	0.5550
DETTESFOUR	0.667149	0.414703	1.608738	0.1300
ORGSOC	-8.072943	19.86879	-0.406313	0.6907
ETAT	5.287068	1.346330	3.927023	0.0015
CHPERSO	5.877934	2.881544	2.039856	0.0607
EFFECTIF	78.75529	172.5125	0.456519	0.6550
RESUNET	2.238312	1.405636	1.592383	0.1336
IMPOETTAX	-85.72706	56.09515	-1.528244	0.1487
C	153.1419	5751.474	0.026627	0.9791

R-squared	0.929004	Mean dependent var	35991.25
Adjusted R-squared	0.883363	S.D. dependent var	29049.67
S.E. of regression	9921.093	Akaike info criterion	21.53705
Sum squared resid	1.38E+09	Schwarz criterion	22.02791
Log likelihood	-248.4446	F-statistic	20.35476
Durbin-Watson stat	2.348628	Prob(F-statistic)	0.000001

The model is overall significant from a statistical point of view.

Table 3: Statistical and economic interpretation of the results

Variable	Coefficient	Sign	Effect/ CA	T stat	Significance
Share capital	-2.73	-	NEGATIF	-0.91	No
Debts of financing	3.04	+	POSITIF	0.60	No
Payables	0.66	+	POSITIF	1.60	No
Social debts	-8.07	-	NEGATIF	-0.40	No
Government debts	5.28	+	POSITIF	3.92	Yes
The cost of pay	5.87	+	POSITIF	2.03	No
Staff	78.75	+	POSITIF	0.45	No
Net result	2.23	+	POSITIF	1.59	No
Tax	-85.72	-	NEGATIF	-1.52	No

III. Economic statistical interpretation

1. Share capital: From another angle, the capital reduction will result in the company converting the debt and so it can try to rely on the markets and hold the funds for more production.
2. Payables: a logical relationship in that the purchase of the MP implies an increase in production; something that can lead to business growth.
3. Social debts: an increase in social debts may result in staff demotivation explained by late or cumulative remuneration and therefore a reduction in productivity representing a decrease in turnover.
4. Government Debts: (IR / S, Income Tax, VAT) When there is an increase in turnover, there is an increase in the company's profit. These two variables will lead to an increase in taxes paid by the company.
5. The cost of pay: the increase in the labor force will at the same time have a great impact on the productivity rate and therefore on a high productivity of production.
6. Staff: Ditto for staff costs.
7. Net result: The increase in turnover is represented by an increase in revenues and more specifically in operating revenues and therefore an increase in the bottom line.
8. Tax (TP, TSC, DET, TSAVA): from another angle, as is the case of social security contributions, the increase in the tax burden can lead to a reduction to see a total insolvency of the company.

According to the sequential procedure of the homogeneity tests proposed by HSIAO, and the MCO, estimation of the equations relating to each PME is carried out. We note that the model is heterogeneous and that the growth of SMEs differs from one SME to another. For this, we will test the hypothesis that the model to be estimated has individual effects. Models for individual purposes assume that the estimated models differ from an SME only in the value of constancy. Two cases are distinguished: fixed-use models and random-use models.

1. Fixed effects

Figure 5: fixed effects model by Eviews

Dependent Variable: CA
Method: Panel Least Squares
Date: 02/20/16 Time: 19:17
Sample: 2012 2014
Cross-sections included: 11
Total panel (unbalanced) observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CS	-2.243850	3.752141	-0.598019	0.5609
DETTESFIN	2.509942	5.828686	0.430619	0.6744
DETTESFOUR	0.639163	0.485822	1.315631	0.2129
ORGSOC	-4.562759	26.40957	-0.172769	0.8657
ETAT	5.234153	1.477065	3.543618	0.0040
CHPERSO	5.209262	4.044653	1.287938	0.2220
EFFECTIF	69.73083	192.1214	0.362952	0.7230
RESUNET	2.387988	1.648411	1.448661	0.1731
IMPOETTAX	-76.33998	71.10299	-1.073653	0.3041
C	77.64889	6465.165	0.012010	0.9906

Effects Specification

Period fixed (dummy variables)

R-squared	0.929399	Mean dependent var	35991.25
Adjusted R-squared	0.864681	S.D. dependent var	29049.67
S.E. of regression	10686.15	Akaike info criterion	21.69814
Sum squared resid	1.37E+09	Schwarz criterion	22.28716
Log likelihood	-248.3776	F-statistic	14.36075
Durbin-Watson stat	2.404882	Prob(F-statistic)	0.000030

2. Random effects

Figure 6: random effects model by Eviews

Dependent Variable: CA
Method: Panel EGLS (Cross-section random effects)
Date: 02/20/16 Time: 19:20
Sample: 2012 2014
Cross-sections included: 11
Total panel (unbalanced) observations: 24
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CS	-2.736113	0.722868	-3.785081	0.0020
DETTESFIN	3.047448	1.213390	2.511515	0.0249
DETTESFOUR	0.667149	0.099851	6.681438	0.0000
ORGSOC	-8.072943	4.783951	-1.687505	0.1136
ETAT	5.287068	0.324165	16.30978	0.0000
CHPERSO	5.877934	0.693810	8.471964	0.0000
EFFECTIF	78.75529	41.53709	1.896023	0.0788
RESUNET	2.238312	0.338445	6.613513	0.0000
IMPOETTAX	-85.72706	13.50643	-6.347128	0.0000
C	153.1419	1384.824	0.110586	0.9135

Effects Specification

Cross-section random S.D. / Rho	0.000000	0.0000
Idiosyncratic random S.D. / Rho	2388.773	1.0000

Weighted Statistics

R-squared	0.929004	Mean dependent var	35991.25
Adjusted R-squared	0.883363	S.D. dependent var	29049.67
S.E. of regression	9921.093	Sum squared resid	1.38E+09
F-statistic	20.35476	Durbin-Watson stat	2.348628
Prob(F-statistic)	0.000001		

Unweighted Statistics

R-squared	0.929004	Mean dependent var	35991.25
Sum squared resid	1.38E+09	Durbin-Watson stat	2.348628

Table 4: Fixed effects and Random effects by Eviews

	Fixed effect	Random effect
Coefficient of determination: R^2	0,92	0,92
Test of Fisher: F	14,36	20,35
Durbin Watson DW	2,40	2,34
Result	Effect of SMES is constant in the course of time	Constant term is an unpredictable variable

3. Model with multiple regression

The multiple model of regression to model a so-called endogenous variable according to more than one variable is called exogenous. In our study, the endogenous variable that we will model according to the arithmetic significance of the turnover (turnover) relating to 30 SMEs over 3 years according to the economic indicators (authorized capital, staff costs, financing debts, suppliers' debts, labor, debts near STATE, debts close to welfare, taxes and bottom line).

Figure 7: Multiple regression by Eviews

Dependent Variable: CA
Method: Least Squares
Date: 02/20/16 Time: 17:26
Sample: 1 30
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CS	0.912987	0.637938	1.431153	0.1678
CHPERS	3.619493	0.563470	6.423581	0.0000
DETTESFIN	0.224941	3.046783	0.073829	0.9419
DETTESFOUR	0.584036	0.185779	3.143709	0.0051
EFFECTIF	-48.77941	10.08116	-4.838670	0.0001
ETAT	2.994714	0.433673	6.905466	0.0000
IMPETTAX	-103.3373	28.37915	-3.641310	0.0016
ORGSOC	3.494566	8.577484	0.407412	0.6880
RESUNET	3.080005	0.798945	3.855089	0.0010
C	4245.581	1276.173	3.326807	0.0034

R-squared	0.985252	Mean dependent var	27388.13
Adjusted R-squared	0.978616	S.D. dependent var	29663.97
S.E. of regression	4337.836	Akaike info criterion	19.84934
Sum squared resid	3.76E+08	Schwarz criterion	20.31641
Log likelihood	-287.7401	F-statistic	148.4620
Durbin-Watson stat	1.977510	Prob(F-statistic)	0.000000

4. Statistical interpretation

Table 5: Statistics of the regression by Excel

Coefficient of determination multiple	0.992623403
Coefficient of determination R2	0.98530122
Error-type	4330.671588
Observations	30

Multiple regression reveals a coefficient of determination of 0.98, which means that the exogenous variables account for 98% of the variables to be explained (CA).

Test of Fisher:

The analysis of the variance shows that the model is overall significant.

Table 6: Analysis of the variance by Excel

Type	Degree of liberty	Sum of the squares	Average of the squares	F-stat	Probability
Regression	9	25143644613	2793738290	148.961905	2.45713E-16
Residus	20	375094328.1	18754716.41		
Total	29	25518738941			

- **Test of student:**

The student test makes it possible to know the meaning of each factor (explanatory variable) with respect to the model as a whole and the coefficients make it possible to interpret the effect of each factor on the variable to be explained (CA). According to the law of the corresponding student with a risk of 5% and a degree of freedom of 20 there will be a theoretical T of: 2.086.

Table 7: Results of the multiple regression by Excel

Variable	**Coefficients**	**Error-type**	**Statistic t**	**Probability**
Share capital	0,921388747	0,637624257	1,445034027	0,16393504
Debts of financing	0,185121524	3,042113758	0,060852926	0,95208034
Payables	0,583464582	0,185459387	3,146055272	0,00508426
Government debts	2,993570285	0,432488934	6,92172689	1,011E-06
The cost of pay	3,623932241	0,562760858	6,439559878	2,7938E-06
Staff	-48,91160203	10,07586098	-4,854334744	9,6141E-05
Net result	3,078200008	0,797196286	3,861282426	0,0009729
Tax	-103,7299371	28,36520572	-3,656942881	0,0015661

5. Economic Interpretation

The student test allows one to distinguish the variables as follows:

- Variables that act positively on CA: Authorized Capital; financing debts; debt providers; debts close to social welfare; debts to the state; staff costs; bottom line.
- Variables that negatively affect CA: Workforce and taxes.

Table 8: Impact study

Variable	Coefficient	Sign	Effect / CA	Significance
Share capital	0,91	+	POSITIF	No
Debts of financing	3.61	+	POSITIF	No
Payables	0.22	+	POSITIF	Yes
Social debts	0.58	+	POSITIF	No
Government debts	-48.77	-	NEGATIF	Yes
The cost of pay	2.99	+	POSITIF	No
Staff	-103.33	-	NEGATIF	Yes
Net result	3.49	+	POSITIF	Yes
Tax	3.08	+	POSITIF	No

6. Correlation Matrix

According to the matrix of the correlation between the explanatory variables, we notice that there is a strong correlation between turnover (turnover) and debt financing (end-end debt); debts close to the state (state) and social capital (CS) with:

- r CA / end debt= 0 ,81 = 81%;
- r CA /Etat= 0,78 =78;
- r CA/ CS= 0,77 = 77%;

Considering that the set of correlation coefficients (R) is less than the coefficient of determination R^2, and hence there is no multi-collinearity between the explanatory variables.

Figure 8: Correlation matrix by Eviews

Correlation Matrix

	CA	CS	CHPERS	DETTESFIN	DETTESF...	EFFECTIF	ETAT	IMPETTAX	ORGSOC	RESUNET
CA	1.000000	0.771058	0.713173	0.347764	0.817887	0.409306	0.782771	0.647517	0.553481	0.578201
CS	0.771058	1.000000	0.747971	0.740989	0.477442	0.402740	0.503153	0.864956	0.766564	0.327834
CHPERS	0.713173	0.747971	1.000000	0.330953	0.305394	0.880796	0.490660	0.439085	0.842729	0.289223
DETTESFIN	0.347764	0.740989	0.330953	1.000000	0.220933	-0.040893	-0.043623	0.802583	0.596878	0.227540
DETTESF...	0.817887	0.477442	0.305394	0.220933	1.000000	0.009929	0.601934	0.505644	0.246993	0.642444
EFFECTIF	0.409306	0.402740	0.880796	-0.040893	0.009929	1.000000	0.366759	0.002375	0.674574	0.057354
ETAT	0.782771	0.503153	0.490660	-0.043623	0.601934	0.366759	1.000000	0.376710	0.218010	0.183827
IMPETTAX	0.647517	0.864956	0.439085	0.802583	0.505644	0.002375	0.376710	1.000000	0.549197	0.411227
ORGSOC	0.553481	0.766564	0.842729	0.596878	0.246993	0.674574	0.218010	0.549197	1.000000	0.306226
RESUNET	0.578201	0.327834	0.289223	0.227540	0.642444	0.057354	0.183827	0.411227	0.306226	1.000000

IV. Model with binary variable: PROBIT

Binary (dichotomous) choice models are used in very different sectors since the variables to be explained can only take two methods: 0 or 1; in this case we try to model an alternative (growth or failure of the SME) and therefore consider the probability pi associated with the event (Growth = 1). Then, when the variable to be explained is a binary variable, models with binary choices are used (Probit or logit). It is assumed that the error term follows a normal centered and reduced NR (0, 1) and we model the suggested model from: PROBIT is spent.

Figure 9: Modeling of the growth of SMEs with the Binary model by Eviews

Dependent Variable: CHA
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 02/21/16 Time: 11:26
Sample: 1 30
Included observations: 30
Convergence achieved after 9 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
CS	0.000512	0.000463	1.107096	0.2683
CHPERS	-0.000684	0.000738	-0.926710	0.3541
DETTESFOUR	-5.04E-05	0.000108	-0.465295	0.6417
DETTESFIN	-0.002209	0.001338	-1.651341	0.0987
EFFECTIF	-0.006229	0.008126	-0.766597	0.4433
ETAT	2.74E-05	0.000240	0.113866	0.9093
IMPETTAX	0.015390	0.016769	0.917789	0.3587
ORGSOC	0.003400	0.006458	0.526463	0.5986
RESUNET	0.000375	0.000452	0.828832	0.4072

Mean dependent var	0.500000	S.D. dependent var	0.508548
S.E. of regression	0.486659	Akaike info criterion	1.547467
Sum squared resid	4.973580	Schwarz criterion	1.967826
Log likelihood	-14.21200	Hannan-Quinn criter.	1.681943
Avg. log likelihood	-0.473733		
Obs with Dep=0	15	Total obs	30
Obs with Dep=1	15		

1. Economic Interpretation

When it comes to a qualitative model with a binary choice; only the signs are interpretable.

Table 9: Impact study

Variable	**Sign**	**Effect/ CA**
Share capital	+	POSITIF
Debts of financing	-	NEGATIF
Payables	-	NEGATIF
Social debts	+	POSITIF
Government debts	+	POSITIF
The cost of pay	-	NEGATIF
Staff	-	NEGATIF
Net result	+	POSITIF
Tax	+	POSITIF

Reading the results, we noted that:

- The variables that have a positive effect on turnover (CA) are: social capital (Cs); the debts of the State (State); tax (impettax); social security (orgsoc) and (net result).
- The variables that negatively act with turnover are: the cost of the payroll (chpers); financing debts (dettesfin) and net result.

2. Statistical Interpretation

To know the degree of the effect of each variable on the turnover, we use the criterion relating to statistics indicating Z-specific statistics for the qualitative model with binary choice to measure the impact of each variable on the sales turnover.

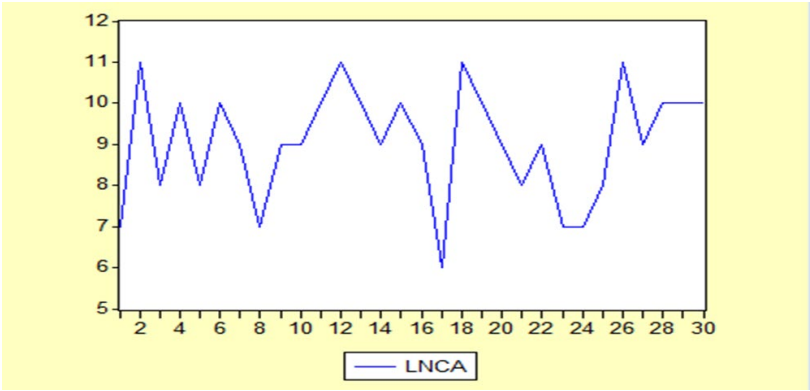
Table 10: Statistical interpretation of the explanatory variables

Variable	Z **statistic**	**Effect/ CA**
Share capital	1,10	POSITIF
Debts of financing	-0,92	NEGATIF
Payables	-0,46	NEGATIF
Social debts	-1,65	NEGATIF
Government debts	-0,76	NEGATIF
The cost of pay	0,11	POSITIF
Staff	0,91	POSITIF
Net result	0,52	POSITIF
Tax	0,82	POSITIF

3. Proposal of SME TEST

The graph represents the evolution of SME growth. The growth of SMEs was quantified by the Naperian logarithm of the arithmetic average of turnover for 30 SMEs over 3 years out of 9 cities at national level:

Figure 10: Evolution of the growth of SME TEST by Eviews



The graph shows us that the series is seasonal.

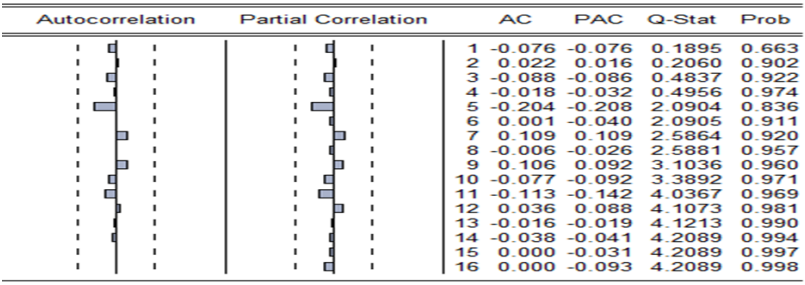
Correlogram of LNCA:

The simple and partial autocorrelation function for statistical Q is: 4.2089 with a delay of h = 16 obtained by the correlogram below: Ljung-box Q statistics: Q-stat: 4.2089 and chi-2 with a risk of 5%: 26, 29 (according to the table of law chi-2 with a risk of 5% and 16 degrees of freedom).

We note that Qstat0.05 <chi-2 = ""> so the LNCA process is a white vibration the correlogram of the LNCA series filtered by the differences first is characteristic of a white vibration. The series is therefore a process DS (evolutionary process) without drift.

Is it a white Gaussian vibration?

Figure 11: Correlogram of LNCA by Eviews



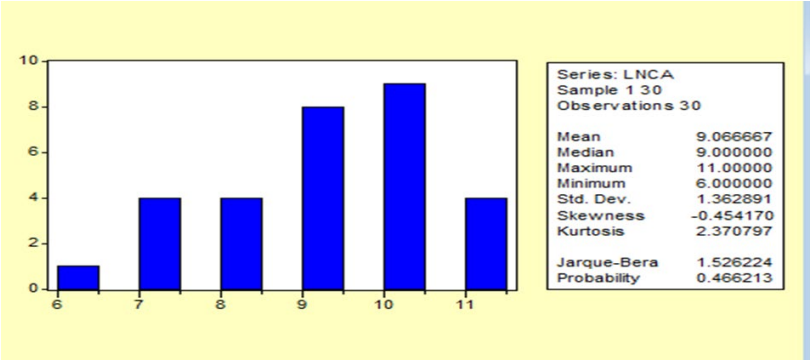
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.076	-0.076	0.1895	0.663
		2	0.022	0.016	0.2060	0.902
		3	-0.088	-0.086	0.4837	0.922
		4	-0.018	-0.032	0.4956	0.974
		5	-0.204	-0.208	2.0904	0.836
		6	0.001	-0.040	2.0905	0.911
		7	0.109	0.109	2.5864	0.920
		8	-0.006	-0.026	2.5881	0.957
		9	0.106	0.092	3.1036	0.960
		10	-0.077	-0.092	3.3892	0.971
		11	-0.113	-0.142	4.0367	0.969
		12	0.036	0.088	4.1073	0.981
		13	-0.016	-0.019	4.1213	0.990
		14	-0.038	-0.041	4.2089	0.994
		15	0.000	-0.031	4.2089	0.997
		16	0.000	-0.093	4.2089	0.998

Histogram and stat:

The histogram of the distribution and the empirical values of Skewness, Kurtosis and Jarque-Bera statistics are presented underneath:

V1 = 1,015 and V2 = 0,707, we find that V1 and V2> 1,96, then we reject the hypothesis of normality with respect to the symmetry and the flatness of the distribution; which is confirmed by Jarque-Bera statistics namely: JB = 1.526 with (problem = 0.46> 0.05). An LNCA process difference is therefore a non-Gaussian white vibration.

Figure 12: Histogram and statistics by Eviews



Results:

A number of key determinants have been identified for the level of growth of SMEs due to influence of opportunities offered to entrepreneurs, as well as the company's ability to exploit these opportunities. The independent growth factors identified are:

Share capital; debts to the state; tax; social security and net income.

According to the results produced for the SME TEST, it turned out that the ideal profile, to be followed by a Moroccan SME to reach a certain level of growth, is an SME which has large capital, and achieves a beneficial result which generates income from taxes with the profit of the State. They pay taxes (EMS own) although it generates social debts to social security (CNSS, CIMR) for example through the integration of new income or because of the salary increase for existing employees as motivational measures to increase productivity.

One can say that there are no bad factors which really impact the growth of an SME namely: style of management, human capital, innovation; research, development, technology and way of financing.

Considering the heterogeneity of the sample; the empirical study reveals that SME growth differs according to the opportunities and capacities available to SMEs. Note that these results cannot be generalized because of the limitation of the selected sector that concerns our examples. A larger study (a larger sample) will certainly validate these parameters.

Contribution of the study

While this study deals specifically with the growth of SMEs, there is no rule that growth is always the most desirable outcome or that SME growth continues in most private sector development projects.

The SME sector is large and heterogeneous. Development policies and programs that include the growth of SMEs in their explicit or implicit objectives may find in this analysis a decision aid. Initiators and implementers of programs need to develop a clear model of causality showing how intent can impact SME growth. For this, it is essential to understand how the intervention will influence the productivity and growth of SMEs.

Initiators of development programs may wish to segment the SME sector according to certain variables, in order to target the companies most likely to grow or adapt certain interventions or services to different population groups.

If the growth or competitiveness of SMEs is one of the project's objectives, designers will pay attention to the nature of existing links within the industry. Beneficial links can at the same time increase the relevance of SMEs and their internal capabilities. Operators of development programs need to look at ways to strengthen business linkages and local capacity so that SMEs and their partners are armed to solve the sector's future problems.

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