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TO WHAT EXTENT CAN PROFIT MARGIN,
VALUE ADDED GROWTH AND
OWNERSHIP CONCENTRATION PORTRAIT
CORPORATE GOVERNANCE SYSTEMS?

Abid Fathi and Salma Fourati

Working Paper No. 457

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Abstract

This paper examines how product market competition and corporate governance variables affect differently the productivity growth of corporations. Corporate governance systems are expected to have different patterns regarding the relationship determining the impact of corporate governance mechanisms, product market competition and ownership structure. Corporate performance is measured by value added growth as a proxy of the variable indicating productivity, which is generally supposed to be determined by product market competition, capital and labor changes and other variables related to ownership structure, governance style and financial structure.

The performance analysis methodology is based on a Cobb-Douglas production function which allows for an effort function measuring productivity. The data sample used for illustration purposes is composed of 48 non-financial firms with only 20 listed on the Tunisian Stock Exchange, and covers the period from 1996 to 2001 allowing for the construction of a panel dataset of 288 observations. The information used to compute productivity and competition variables is based on published audited accounts of balance sheets and income statements. Ownership structure information includes the identity of all shareholders holding more than the mandatory disclosure threshold of 5% of the shares and the percentage of the capital they own. We find that productivity growth is higher when competition is severe and that low and high levels of ownership have positive effects on productivity growth, especially when they are introduced with competition variable. Coefficient estimates show that competition is not likely to be a substitute for bad governance structures (in particular ownership levels between 20% and 50% of capital).

ملخص

تدرس هذه الورقة كيف يؤثر متغيرا منافسة إنتاج السوق وحوكمة المؤسسة، بشكل مختلف على النمو الإنتاجي للمؤسسات. ويُتوقع أن يكون لأنظمة حوكمة المؤسسة نماذج مختلفة فيما يخص العلاقة المحددة لتأثير آليات حوكمة المؤسسة، ومنافسة إنتاج السوق وهيكل الملكية. ويقاس أداء المؤسسة بنمو القيمة المضافة، كممثل للمتغير الذي يحدد الإنتاجية والتي من المفترض بشكل عام أن يحددها عن طريق كل من منافسة إنتاج السوق، ورأس المال وتغيرات الأيدي العاملة، وكذا متغيرات أخرى ترتبط بهيكل الملكية وأسلوب الحوكمة والهيكل المالي. وتقوم منهجية تحليل الأداء على دالة "كوب دوجلاس Cobb Douglas" للإنتاج والتي تتيح قياس الإنتاجية عن طريق "دالة الجهد".

وتتكون عينة البيانات المستخدمة لأغراض التوضيح والشرح من 48 شركة غير مالية، من بينها 20 شركة فقط مسجلة في بورصة تونس للأوراق المالية، وتغطي البيانات الفترة من 1996 إلى 2001 بما يتيح بناء جدول بيانات مكون من ملاحظات يبلغ عددها 288 ملاحظة. وتقوم المعلومات المستخدمة في حساب متغيرات الإنتاجية والمنافسة على حسابات ميزانيات عامة تمت مراجعتها. كما تشمل معلومات هيكل الملكية على هوية كافة المساهمين المالكين لأكثر من الحد الإلزامي للإفصاح والبالغ 5% من الأسهم والنسبة المئوية لرأس المال الذي يمتلكونه.

ونجد أن نمو الإنتاجية يزداد ارتفاعاً عندما تشتد المنافسة، كما نجد أن انخفاض مستويات الملكية وارتفاعها يؤثران إيجابياً على نمو الإنتاجية، لاسيما عندما يصاحبها متغير المنافسة. ويبين معامل التقديرات أن المنافسة لا يحتمل أن تكون بديلاً لبنية رديئة للحوكمة. أي: مستويات ملكية تتراوح بين 20% إلى 50% من رأس المال).

Introduction

The economic and institutional environments of developing countries affect differently the productivity growth of corporations and their corporate governance style. Corporate governance systems of developing countries are expected to have different patterns regarding the relationship determining the impact of corporate governance mechanisms, product market competition, ownership structure and financial pressure on productivity growth. The competitive environment in developing countries faces several constraints. It is constrained by a wide range of weak institutions (tax system, audit, technological knowledge, financial systems, etc.). Product markets tend to be small and therefore suffer from a variety of imperfections (Laffont,1998). Also, financial markets do not usually seem to contribute considerably to the economic growth of these countries.

Firms try to find the adequate corporate strategy that compresses costs and enhances performance. Corporate governance systems are supposed to adjust inappropriate structures by supporting constructive competition and productivity. Bolton (1995) and Stiglitz (1999) suggest that firms apply different reform strategies including a mixture of competition and privatization policies that fail to create adequate corporate governance arrangements and that ownership transformation should be postponed. Furthermore, competition is considered to be more important than ownership and it should be put in the center of the transformation strategy from the beginning. Thereby more attention should be given to managerial incentives and supervision rather than to ownership changes. In particular, mass privatization is often viewed as having important perverse effects. By freely transferring assets to certain groups of the population, it creates vested interests which can block further reforms or bring about a rigid and most often dispersed ownership structure which is unable to provide an efficient monitoring mechanism. In the absence of good corporate governance arrangements, competition could be the alternative because it may provide managers with appropriate disciplinary mechanisms. Demsetz and Lehn (1985) report that competition in the product market causes ownership structure to change endogenously toward enhancing performance. Allen and Gale (1998), report that competition can have positive effects on corporate governance and performance because it affects managerial behavior. Mookherjee (1984) states that reward systems generate sharper incentives the greater the number of players involved and the greater the opportunities for comparison of firms' performance and managers' ability, and that the role of competition is to allow investors to use incentive schemes that lead managers to make greater efforts.

In this work we define and illustrate a general production function framework of corporate governance systems and apply it to explain several responses of product market competition and productivity involved in corporate performance. In the same line Ickes et al. (1995) suggest that in the period of great uncertainty, competition in the product market may not only discipline managers but may also help in generating information on various investment opportunities and managers' quality. Given the huge need for firm restructuring, the transition specific effect of competition is supposed to be stronger in the case of the previously state-owned enterprises than in the newly created firms. This may lead to asking a fundamental question; how product market competition and corporate governance interact when affecting corporation productivity growth? Do corporate governance and competition reinforce each other (are complementary) or is one a substitute for the other. If they are complements, the impact of product market competition would be greater in firms with efficient governance structure.

Aghion and Howitt (1997) and Aghion et al. (1999) propose a model in which competition appears as a substitute to what they call good corporate governance measured by financial pressure. On the contrary, in a multitask-principal-agent framework Holmström and Milgrom (1994) regard initiative and various incentive mechanisms as complementary. Taking a panel

of British firms Nickell et al. (1997) find some evidence that corporate control and financial pressure can substitute for competition. Januszewski et al. (2001) find an ambiguous result on a panel of German firms. Grosfeld and Tressel (2001) suggest that good corporate governance and competition pressures are rather complements than substitutes in a panel of Polish corporations listed on the Warsaw Stock Exchange. In this paper the focus is to empirically examine whether an increase in product market competition, of a sample of Tunisian corporations, has an impact on productivity levels and growth rates, whether it is positive or negative, and whether the increase in competition leads to a change in productivity.

The remainder of the paper is organized as follows. Section 2, gives a brief description of the Tunisian macroeconomic indicators and some descriptive statistics of the corporations' sample used in the empirical analysis. Section 3, gives the research design, data description and methodology. Section 4 presents the result analysis and Section 5 concludes.

2. Research Design, Data Description and Methodology

We consider a firm run by a manager whose role is to allocate different input, organize the production and make investment decisions which are summarized in a vector of efforts e . We assume that this effort affects the overall productivity; more precisely it enters the production function as a multiplicative factor. We assume that the production function can be written as follows:

$$Y = A(e).F(KL) \quad (1)$$

Where $F(K,L)$ is supposed to be a Cobb-Douglas production function with no restriction on returns to scale. We estimate directly the production function, which allows for identifying the factors explaining the performance of the corporation measured by value added growth. The ownership concentration and the degree of competition on the product market measured by the profit margin ratio are supposed to affect the value added growth as a proxy of the firm's productivity. When managers do not have a profit-maximizing behavior, enforcement of these mechanisms pushes them to work harder and to better manage the corporation. As a result, the manager chooses his effort under the constraints and the incitation mechanisms provided by ownership arrangements and the competitive environment. The equilibrium effort level e^* depends on the ownership concentration SP , the degree of competition on product market C , and the interaction of the two terms:

$$e^* = e^*(SP, C SP^* C) \quad (2)$$

The interaction term between ownership concentration and competitiveness allows us to address the question of substitutability between corporate governance and product market competition. The starting point of our analysis is a Cobb-Douglas production function with two factor inputs:

$$Y_{it} = A(e_{it}).L_{it}^{\beta_L}.K_{it}^{\beta_K} \quad (3)$$

Where Y_{it} is value added, L_{it} is labor, K_{it} is capital and A_{it} is a measure of total factor productivity for firm i in year t , β_L and β_K are the marginal proportions of factors. We interpret the level of total factor productivity A_{it} as the compound effect of past variables that shape a firm's productivity. After differencing, we can parameterize these determinants of productivity by level measures of product market competition and corporate governance. We transform equation (3) in several steps to reach an equation that estimates productivity growth. As argued by Januszewski et al. (2001), there are two reasons for estimating growth equations. First, measurement problems are much more severe for level equations than for growth equations. Second, measures of industry competition might well be endogenous with

respect to the productivity level. However, this problem is less severe if productivity growth is the dependent variable.

In order to get the growth version, we first take logs and include lagged output (lagged value added variable) as an explanatory variable to allow for endogenous persistence, using a weight λ . We also allow for unobserved firm heterogeneity α_i and include an error term, ε_i , which is assumed to be serially uncorrelated over time ($E(\varepsilon_t, \varepsilon_t') = 0$, for $t \neq t'$). This yields the basic log-linear empirical production function:

$$\begin{aligned} \log Y_{it} &= \lambda \log Y_{it-1} + (1-\lambda) \log e_{it} + (1-\lambda) \beta_L \log L_{it} \\ &+ (1-\lambda) \beta_K \log K_{it} + \alpha_i + \varepsilon_{it} \end{aligned} \quad (4)$$

Second, we take first differences which eliminate the fixed firm effect α_i . We obtain the differenced growth version of the Cobb-Douglas production function in equation (5) with small letters denoting logs:

$$\begin{aligned} \Delta y_{it} &= \lambda \Delta y_{it-1} + (1-\lambda) \beta_L \Delta l_{it} + (1-\lambda) \beta_K \Delta k_{it} \\ &+ (1-\lambda) \Delta e_{it} + \Delta \varepsilon_{it} \end{aligned} \quad (5)$$

Finally, we parameterize productivity growth (i.e. the first difference of total factor productivity, Δe_{it}) as a linear function of the lagged firm-specific measure of competition (RENT) and a set of lagged corporate governance variables (ownership concentration). In some specifications we also include interactions of RENT and corporate governance variables. We model productivity growth as:

$$\begin{aligned} \Delta e_{it} &= \beta_1 \text{RENT}_{it-1} + \beta_2 (\text{control})_{it-1} \\ &+ \beta_3 [\text{RENT}_{it-1} * (\text{control, type})_{it-1}] \end{aligned} \quad (6)$$

The empirical model of productivity growth is given by equations (5) and (6). The structure of this model corresponds to the differenced panel model with lagged endogenous variables considered by Arellano and Bond (1991). They propose a generalized method of moments (GMM) estimator that allows exploiting lags of the lagged dependent variable as well as lags of the explanatory variables as instruments. Using this approach addresses the potential endogeneity problem related to the competition and corporate governance variables that enter the right side of equation (5).

The data sample used for illustration purposes is composed of 62 non-financial firms with only 20 firms listed on the Tunisian Stock Exchange at that date and covers the period from 1996 to 2001. Data is available for only 48 firms allowing for the construction of a panel of 288 observations. Panels are unbalanced because for some periods information is not available. The information used to compute the productivity and competition variables is based on 5 published audited accounts of balance sheets and income statements. Ownership structure information includes the identity of all shareholders holding more than the mandatory disclosure threshold of 5% of the shares and the percentage of the capital they own.

3. Result Analysis

This section starts with result analysis of coefficient estimates for models linking productivity growth (measured by value added growth) with product market competition (RENT) (measured by the profit margin) and with corporate governance variables measured by different levels of ownership concentration. Then we examine whether governance and the product market are substitutes or complements for productivity growth.

Table 2 shows coefficient estimates of regression models between value added changes, lagged value added, salaries and capital changes and profit margin on the one hand and between all these variables except profit margin which is replaced by the cross product of profit margin and listing and profit margin and manufacturing variables to test for the simultaneous effect of the indicated variables on the other hand. Results fail to reject the hypothesis that the profit margin has a positive effect on value added growth. The coefficient estimate of the variable profit margin indicates that the profit margin which is generally supposed to be inversely related to product market competition is negatively and significantly correlated to the value added growth, which in its turn is supposed to give a huge idea about the productivity. Consequently, the negative coefficient of about -0.0741 implies that the more intense competition is, the weaker is the productivity measured by the value added growth. Grosfeld and Tressel (2001) report that the more profitable firms have a higher productivity growth, and not the other way around. In the same table, the cross product between profit margin and not listed and/or not manufacturing characteristics have significant and negative coefficient estimates indicating the absence of a substitution effect between product market competition and financial markets, especially for the not listed and not manufacturing companies.

Table 3 shows the coefficient estimates of the regression models as reported in Table 2 except that the profit margin variable is replaced by the variable representing the fact that firms are not controlled by the first shareholder or that firms have a dispersed ownership. Results illustrate that the dispersed ownership variable (less than 20 percent of the capital) coefficient estimate is positive (0.036) and significant at the 5 percent level. Thus limited ownership concentration may have a positive effect on performance measured by value added growth as a proxy of productivity growth. This finding is in accordance with that of Grosfeld and Tressel (2001) especially when managerial initiative and competence are important. Ownership concentration between 20 and 50 percent variable exhibits a negative and significant coefficient (-0.018); this range of ownership concentration is favorable to value added destruction and hence productivity decreasing. The same conclusion can be drawn when we use the variable of the first shareholder voting power (more than 50 percent), the sensitivity coefficient is significant and negative (-0.015). The ownership concentration has a positive and significant effect (0.045 at 1 percent level) on value added growth for firms that have less than 20 percent or more than 50 percent of their capital detained by the first shareholder. Our findings agree with those of Morck, Shleifer and Vischny (1988) in saying that ownership concentration's effect on performance is not monotonous. Low as well as high levels of ownership are associated with performance increase while medium ownership levels are associated with performance decrease.

Table 4 reports results of the models' estimates as in tables 2 and 3 except that we consider the cross product variables in order to test for the complementary or substitution effect on firm performance. The two competitive variables are profit margin and ownership concentration level. Coefficient estimates in all regression models are significant, implying that profit margin as a proxy to product market competition and ownership concentration level as a proxy to financial market governance system are substitutes in explaining the value added growth as a proxy to productivity or performance. Used separately, profit margin and the ownership concentration of less than 20 percent variables are significant at 1% level signifying that higher competition pressure and relatively low levels. Our results support the idea that firms with a dominant owner tend to experience higher productivity/performance growth, in particular when competition in product markets is strong. This finding corroborates that of Nickell et al. (1997) saying that strong ownership and product market competition are substitutes in improving productivity.

Table 5 reports coefficient estimates of regression models relating value added growth, salaries, capital and profit margin, to a series of cross products between the profit margin and dummy variables indicating the ownership control and the type of the first shareholder (whether is it a bank or a non bank, financial institution or a state owned firm or physical person or a non financial firm). All coefficient estimates are significant except when the type of the first shareholder is a bank. And among all significant coefficients, only those when firms are controlled by a shareholder who detains more than 50 percent of the capital and when they are individual firms are negative. Results show that the profit margin variable as a proxy to product market competition and ownership control type seems to be a substitute of governance systems.

4. Conclusion

This paper concludes that the product market competition and good governance structures tend to be substitutes rather than complements (reinforce each other) and that competition has no significant effect on the performance of the firms with poor governance. Productivity growth makes sense only if firms are sufficiently competitive. Coefficient estimates show that productivity growth is higher when competition is intense and that low and high levels of ownership concentration have a positive effect on productivity growth.

Results confirm that ownership concentration and product market competition are substitutes rather than complements and that ownership concentration has significant effects on productivity growth but relatively low levels of ownership concentration (less than 20% of capital) or high levels (equal or more than 50%) involve higher productivity growth. Competitiveness pressure leads, in general, to an increase in productivity growth and, impacts much more non-listed and non-industrial firms.

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Table 1: Variables Description

Ratio	Definition	Symbol	Reference
$\frac{[total\ sales - consumed\ purchasing + (final\ stock\ of\ finished\ products - initial\ stock\ of\ finished\ products) - salaries - depreciation\ of\ the\ year]}{total\ sales}$	<p>It represents a profit margin and it is inversely influenced by price elasticity to the demand of the firm products.</p> <p>The higher the competitiveness in product markets, the smaller the rent that firms can appropriate. The main drawback of this type of measure of ex-post monopoly power is that it is clearly strongly correlated not only with market power but also with profitability</p>	RENT	Carlin and Seabright (2001) Grosfeld and Tressel (2001)
$\frac{[(sales - purchases + stocks\ variation\ of\ raw\ materials\ (St2\ MP - St1\ MP) + stocks\ variation\ of\ final\ products\ (St2\ PF - St1\ PF))]}{[(interest\ payments) / (profits\ before\ tax + depreciations + interest\ payments)]}$	<p>This variable "value added" is used as a measure of performance. It is an indicator of the firm's productivity.</p> <p>Competitiveness in product market directly affects the value added</p>	VA	
	<p>This variable measures the financial pressure of debt.</p> <p>When the denominator takes on a negative value, which is for firms facing losses before the payment of interest and the deduction of depreciation, FP is set equal to 1. The FP variable is a measure of the effect of debt.</p> <p>The higher the level of debt service payments relative to the average levels of earnings, the greater the probability that the firm will be declared bankrupt in any given period, or alternatively the less the amount of free cash flow at the disposal of the managers. Either way, relatively high debt service payments raise the pressure on managers to perform well</p>	FP	Nickell et al. (1997) Jensen (1986) and Aghion et al. (1995)
<i>Governance Variables</i>			
A1inf20%	A dummy variable, which takes 1 if the participation in capital of the first shareholder is strictly smaller than 20% and 0 otherwise		
A120%50%	A dummy variable which takes 1 if the participation of the first shareholder in capital equals or is higher than 20% but strictly smaller than 50%, and 0 otherwise		
Control50% (property right)	It is a dummy variable that takes 1 if the participation of the first shareholder in capital is higher or equaling 20% but strictly smaller than 50% and 0 otherwise.		
A1inf20%+Con50%	A1inf20%+Con50%: A dummy variable, which takes 1 if the first shareholder participation in capital is strictly smaller than 20% or is higher or equaling 50% and 0 otherwise.		
Control50% (voting right)	It is a dummy variable that takes 1 if the power of the first shareholder is higher or equal to 50% and 0 otherwise. The power of the first shareholder is measured by dividing the number of shares that he holds by the number of shares held by shareholders having 5% or more of the capital.		
Type	<p>This variable describes a series of dummy variables which indicate the type of the first shareholder:</p> <p>B: bank. IfnB: financial institution other than bank. EouEp: state or state corporation, PPh: individual EseNF: non financial firm</p>		

Table 2

Lagged productivity growth (Δy_{t-1})	Labor growth (Δl_t)	Capital growth (Δk_t)	Rent ($RENT_{t-1}$)	($RENT_{t-1}$).listing t	($RENT_{t-1}$). (1-listing t)	($RENT_{t-1}$). manufacturing t	($RENT_{t-1}$). (1-manufacturing t)
0.073*** (10.963)	0.540*** (27.153)	0.299*** (11.081)	-0.0741*** (-3.832)	-0.001 (-0.156)	-0.110*** (-7.014)	0.025 (0.679)	-0.127*** (-8.479)

Number of observations: 175. Degree of freedom:68. Instrument validity:105.193 (P= 0.003)

Table 3

Lagged productivity growth (Δy_{t-1})	Labor growth (Δl_t)	Capital growth (Δk_t)	A1 inf20% (t-1)	A1 20%50% (t-1)	Control50% (ownership right) (t-1)	A1 inf20% +Con50%(t-1)	Control50% (voting right) (t-1)	Financial pressure (t-1)
0.068*** (10.019)	0.512*** (22.722)	0.232*** (8.775)	0.036** (2.455)	-0.018** (-2.100)	0.020 (1.161)	0.045*** (4.325)	-0.015* (-1.660)	0.006*** (10.234)

Number of observations:151. Degree of freedom:68. Instrument validity:75.985(P= 0.0237)

Table 4

Lagged productivity growth (Δy_{t-1})	0.060*** (9.583)	0.070*** (9.597)
Labor growth (Δl_t)	0.640*** (49.985)	0.630*** (39.862)
Capital growth (Δk_t)	0.229*** (11.868)	0.222*** (10.727)
RENTt-1	-0.163*** (-13.118)	-0.063** (-2.446)
A1 inf20% (t-1)	0.037*** (3.271)	0.096*** (8.517)
(RENT.A1 inf20%) (t-1)		-0.505*** (-6.587)
A1 20%50% (t-1)	-0.002 (-0.270)	-0.041*** (-4.737)
(RENT.A120%50%) (t-1)		0.526*** (10.215)
(Control50%(ownership right)(t-1)	0.057*** (4.054)	0.663*** (10.777)
(RENT.Control50% (ownership right) (t-1)		-3.301*** (-9.487)
A1 inf20%+Con50%(t-1)	0.055*** (7.770)	0.178*** (14.392)
(RENT. A1 inf20%+Con50%(t-1))		-1.114*** (-13.162)

Number of observations:151. Degree of freedom:85. Instrument validity: 104.695 (P= 0.0072)

Number of observations:151. Degree of freedom:84. Instrument validity:101.679(P= 0.092)

Table 5

Lagged productivity growth (Δy_{t-1})	0.080*** (16.384)	
Labor growth (Δl_t)	0.664*** (46.645)	
Capital growth (Δk_t)	0.285*** (29.996)	
RENT _{t-1}	-1.386*** (-6.838)	
(Control50%(ownership Right) (t-1)RENT (t-1)	0.284*** (9.683)	-0.977*** (-6.065)
(Type t-1=B)RENT(t-1)	0.027 (1.15)	-0.212 (-1.522)
(Type t-1=IFNB)RENT(t-1)	-0.208** (-2.253)	2.230*** (3.328)
(Type t-1=E ou EP)RENT(t-1)	0.012** (2.038)	1.139*** (5.973)
(Type t-1=PPH)RENT(t-1)	0.412*** (18.436)	-1.430*** (-6.726)
(Type t-1=ESENF) RE NT(t-1)	-0.010 (-1.164)	1.540*** (7.717)

Number of observations:151. Degree of freedom:132. Instrument validity: 130.157(P= 0.529)