Determinants of Firm Growth: An Empirical Analysis from Morocco

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Summary: This paper views the economic growth experience in Morocco from the perspective of private firms. Using models of optimal firm size as a theoretical framework, the paper analyzes empirically the factors affecting the growth process of Moroccan private firms. The analysis is based on a field survey of 370 firms carried out under the auspices of the World Bank in 1998. The sample includes firms of different sizes, from more than 100 workers to 5 workers or fewer. It also covers all major economic sectors: manufacturing, construction, services, and commerce. The principal factors promoting firm growth are business strategies that are focused on product diversification and market share expansion; location in large urban centers; legal status as a limited liability company; the presence of price competition; presence in markets with high demand; and certain government policies such as labor regulations, anti-trust and environmental policy. The principal factors impeding firm growth are lack of access to qualified workers and managers; location in smaller population centers; and certain other government policies such as regulation of foreign trade and policies that promote domestic price volatility.

Aggregate economic growth is commonly decomposed into two components: growth due to factor accumulation and growth due to an increase in total factor productivity. At the microeconomic level each of these components requires a further distinction. Aggregate factor accumulation can occur through the entry of new agents (such as firms, farms, banks, and households) or through the expansion of existing ones. Aggregate total factor productivity can rise because the most productive agents expand their activities at the expense of the less productive, or because some agents innovate and their innovations are adopted by other agents. From the perspective of firms there are thus four sources of growth:

- Organic growth (through investment) of existing firms
- Successful formation of new firms operating in existing activities
- Growth through concentration of firms' activities (for instance through mergers and acquisitions), and
- Growth through innovation and diffusion of new products and processes.

This paper examines the growth experience in Morocco from the perspective of private firms. Concentrating primarily on the first microeconomic source of growth, it attempts to identify those factors influencing the growth process of private firms in Morocco either positively or negatively. This should contribute to understanding some of the microeconomic forces driving overall growth performance in Morocco.

The paper is organized in four parts. The first reviews the theoretical and the empirical literature that examines the major factors influencing the growth process of private firms. The second develops an empirical framework for both systematically organizing our thoughts about the major factors influencing the growth process and estimating the quantitative contribution of each. The third part summarizes the econometric results, based on data from Morocco. The final section draws some conclusions for economic policy.

1. Theoretical Background

The enormous literature on the theory of the growth of firms is summarized both in standard textbooks (such as Scherer and Ross, 1990) and in extensive surveys

such as You (1995), Trau (1996), Sutton (1997), Geroski (1999), and Hart (2000). There are also a large number of empirical studies of how firms grow.[1] For several reasons, mainly related to data availability, I will concentrate on models of optimal firm size as the theoretical framework.[2]

Models of optimal firm size postulate that profit-maximizing firms can achieve an optimal size if they behave rationally. That size depends on the market structure in which the firm operates, that is, whether the setting is one of perfect competition or one of imperfect competition (monopoly, oligopoly, or monopolistic competition).

In perfectly competitive markets, firms with a U-shaped average cost curve will grow until they reach the size corresponding to the lowest point on the curve; there is no incentive for them to grow beyond this size. Thus the sizes of perfectly competitive firms will be very narrowly dispersed, with any variation attributable to disequilibrium or managerial error, and this dispersion will diminish over time as firms converge toward the equilibrium size. One major conclusion of this theory is that small firms grow faster than larger ones until they reach what is called minimum efficient scale (MES) of production.

If firms have market power (that is, there is imperfect competition), their optimal size may differ from this optimal cost position. In this situation the limit on a firm's growth is determined by the demand for its unique product rather than by cost considerations. The typical firm faces a downward-sloping demand curve for its products. In practice, this constraint does not limit the growth of a firm because it can always introduce another product line. Product diversification is therefore another determinant of firm growth.

Relaxing the assumptions of this neoclassical theory of the firm permits many other explanations of firms' growth. The two that this paper considers are economies of scale and goals other than profit maximization. Economists distinguish among four different kinds of economies of scale: technical, pecuniary, external, and dynamic. All of these affect the growth process of firms and its determinants.

In the case of *technical economies of scale,* economics textbooks distinguish further among the following three cases:

- *Constant returns to scale.* Here the firm faces constant average costs and thus an L-shaped average cost curve. This means we will see firms of widely varying sizes beyond the minimum efficient scale, all producing at close to the same average cost and thus realizing returns proportionate to their increasing scale. The limits on the growth of firms in this world of constant returns are determined basically by demand.
- *Increasing returns to scale*. Where average costs continue to fall beyond the point of minimum efficient scale, returns to scale are increasing. In the limit there would be only one firm in the industry, whose larger scale allows it to undercut all potential rivals. This case has indeed been observed in practice and is often given great emphasis in explaining firm behavior (see Chandler, 1990).
- *Decreasing returns to scale*. A third possible scenario is one in which average costs increase beyond the point of minimum efficient scale. This case is unlikely to be observed in practice because firms would not increase all inputs unless they expected to achieve a corresponding increase in output.

All these models assume that factor proportions are constant across the range of output, whereas in practice there might be a fixed factor of production that cannot be increased beyond a certain proportion of output. Several such fixed inputs have been observed in the real world: management and entrepreneurship, indivisible capital equipment, and others. Small companies cannot purchase the large, expensive machinery that would allow them to grow and hire more employees. Only large firms can afford such equipment and are able to exploit the cost economies of larger plants. According to the theory of economies of scale, these advantages of large firms should result in their faster growth.

Many examples of *pecuniary economies of scale* can be found in practice. Large companies may be better able than small ones to obtain attractive financial terms

from lenders, or they may be more effective at lobbying for political favors. Conversely, the growth of smaller firms may be constrained by their poorer access to capital and political markets.

External economies of scale are those that relate to an entire industry or market rather than to an individual firm; thus they are not related to firm size. These economies arise when access to inputs, including access to technological opportunities, differs from one industry to another. Firms operating in industries where these inputs to production are more available than in other industries can grow faster. For example, a successful industry might establish a tradition of skilled labor, which can flow between firms. Appropriate training centers and technical schools are created, which overcome the constraints on growth imposed by shortages of skilled labor. Other examples can be found in the area of science and technology.

A good example of *dynamic economies of scale* is the phenomenon of learning by doing.[3] The basic idea is that average costs of production decrease logarithmically with the cumulative output of a firm over time rather than depending on its output in any one period. In such a situation, small firms are at a disadvantage because their cumulative outputs are smaller and grow more slowly than those of large firms.

Most of the theories discussed so far assume that all firms aim to maximize profits. Other assumptions about the goals of firms have different implications for firms' growth. For example, Sargant (1943) suggested that many owner-managed companies adopt "satisficing" rather than maximizing policies;[4] instead of maximizing profits or sales, these firms opt for a quiet life and hence tend to employ fewer people than they could. Satisficing theories were subsequently developed by Simon (1959) and Cyert and March (1963). Baumol (1959) postulated that firms maximize sales subject to the constraint that profits satisfy their shareholders and the company's plowback policy. A firm's goals might also change over its life cycle, in response to conflict between its principals and their agents (Mueller, 1972). Young, dynamic firms have rapid growth and high profitability, and managers and shareholders are happy. But as a company matures

and its investment opportunities decline, a conflict arises: managers may attempt to maximize growth at the expense of profitability.

In summary, there exist several theoretical hypotheses about the determinants of optimal firm size and firm growth. Some of these hypotheses have been tested empirically, as shown in the next section.

2. Empirical Framework

Several economists have tried to translate the numerous theories of optimal firm size presented above into a simple, empirically testable model (see Geroski 1999 and Geroski/Gugler 2001). The model can be stated as follows:

$$\Delta S_i(t) = S_i^* + \beta S_i(t - 1) + \mu_i(t), \qquad (1)$$

where $S_i(t)$ is the actual size of firm i at time t, S_i^* is the long-run steady-state size of firm i, β is the speed with which firm i converges toward S_i^* when $S_i \neq S_i^*$, and $\mu_i(t)$ is a normally distributed *iid*. white noise error process.

Before equation (1) can be used for empirical work, one has to specify S^*. The most common approach is to write

$$S_i^*(t) = c + \alpha \mathbf{X}(t) + \eta_i(t), \qquad (2)$$

where $\eta_i(t)$ is a white noise error process and $\mathbf{X}(t)$ is a set of observable exogenous drivers of $S^*(t)$. Substituting equation (2) into equation (1),

$$\Delta S_i(t) = c + \alpha \mathbf{X}(t) + \beta S_i(t - 1) + \nu_i(t), \qquad (3)$$

where $\nu_i(t) \equiv \mu_i(t) + \eta_i(t)$.

If $\alpha = 0$, equation (2) says that S^* is constant over time and the same for all firms (up to a stochastic term). If $\alpha \neq 0$, S^* also depends on a set of exogenous variables $\mathbf{X}(t)$. Based on our theoretical discussion and on other sources in the literature (cited below), these observable exogenous variables might include, in addition to size, the age of the firm, its legal form, its location, whether it engages in innovative activity, the diversification of its product line, its internal organization, the size of its market, the structure of its market, factors specific to its industry, state regulations and policies, and others.[5]

The major problem with using equation (2) or equation (3) is omitted variables. Most studies, including this one, cannot accurately correct for all of the possible determinants of S_i^*, and, as a consequence, it is often difficult to avoid the suspicion that α is estimated with bias. Despite this limitation I discuss below some of the determinants of firm size just mentioned.

Age. Recent empirical studies suggest a negative correlation between firm age and firm growth. Decreasing returns to learning over time are one major reason. The probability diminishes that an aging firm will achieve additional efficiency gains (Jovanovic, 1982; Ericson and Pakes, 1995; Das, 1995; Farinas and Moreno, 2000). This negative association has also been confirmed for German firms (see Harhoff and others, 1998; Steil and Wolf, 1999).

Legal form. Theoretically, firms legally constituted such that the owners enjoy limited liability have a greater incentive to pursue risky projects and therefore expect higher profits and growth rates than other firms (Stiglitz and Weiss, 1981). This hypothesis has been tested empirically, for instance in Germany by Harhoff and others (1998), and has not been rejected. Those authors argue that the legal liability of a firm, which is determined by the legal form chosen for it, influences its growth rate. They also show that firms with limited liability have above-average growth rates.

Location. Several researchers suggest that agglomeration effects (in the form of both regional concentration of a specific industry and regional concentration of several unrelated economic activities) can produce net positive externalities up to

a threshold. Once this threshold is achieved, however, negative net externalities can be expected: high traffic, high land prices, environmental problems, and others. Geography matters, but its impact on firm growth cannot be determined ex ante.[6]

Innovative activity. Technical innovations can be divided into product and process innovations. The introduction of product innovations normally results in a new demand, and that of process innovations in a reduction of costs. Both elements affect the growth process of the innovating firm positively (for a survey of the literature see Cohen, 1995).

Diversification. As already mentioned, diversification also affects the growth process positively. It helps firms to cope with demand constraints on a specific product line and creates new opportunities for growth.

Internal organization. In her classic study on firm growth, Penrose (1959) advanced the famous "managerial limits to growth" hypothesis. This argument starts from the premise that management is a team effort in which individuals deploy specialized, functional skills as well as highly team-specific skills that enable them to coordinate their many activities in a coherent manner. As a firm expands, it needs to recruit new managers and must divert at least some existing managers from their current operational responsibilities to help manage the expansion of the management team. This places a constraint on the firm's growth process.

Market size. Numerous empirical studies have confirmed the importance of market demand for a firm's innovative activities and growth (see Cohen, 1995; Kleinknecht, 1996). It is assumed here that there is a positive correlation between market size and firm growth.

Market structure. As discussed above, market structure is a major force behind a firm's growth. The growth process of firms in competitive markets is driven by different forces than those that drive the process in firms under imperfect competition.

Industry-specific environment. The variability of firm growth rates may also differ from industry to industry, depending upon the nature of the product, the character of competition, and so on. Dunne and others (1989a, 1989b) show that firms' growth rates vary significantly among the different industries in the manufacturing sector in the United States. Harhoff and others (1998) confirm sectoral differences in growth rates in Germany. Their study also shows that firms in the services sector in particular are characterized by above-average employment growth. Brüderl and others (1998) confirm significant sectoral differences in employment growth rates. Johnson and others (1997) find a close relation between growth dynamics within a sector and firms' growth rates. They argue that growth rates of firms in growing sectors should be higher than those of firms in stagnating or declining sectors. Young and growing markets are, as a rule, characterized by low barriers to entry, and thus by high rates of entry and exit. Individual firms therefore have different growth potentials as determined by their sector's life cycle.

State regulations and policies. As the framer of the legal environment within which firms operate, and as the largest single domestic customer for goods and services, government affects the ability of firms to grow in a sustainable manner.

Empirical Specification

This section uses the models of optimal firm size presented above to examine empirically the major forces behind the growth process of Moroccan firms. The variables used in this analysis are summarized in Table 1 and described further below. The dependent variable, $\Delta S(t)$ from equation (3), can be measured in different ways: as the average annual growth rate of a firm's sales (this variable is here called SALESG), as the average annual growth rate of employment (EMPLOYG), or as a qualitative variable indicating the expectations of a firm regarding its growth in the near future. Based on the survey questionnaire described below, the variable ESALES indicates a firm's expected growth of sales in 1998-2000. This variable takes the value of 3 if expected sales growth is positive, 2 if it is constant, and 1 if it is negative. On the whole, I estimate three

empirical models using each of the above specifications of the dependent variable. The following explanatory variables are drawn from the theoretical and empirical literature described above.

Firm size. Firm size in the previous period, corresponding to the variable $S_i(t - 1)$ in equation (3), is designated here as FSIZE and measured as the logarithm of firm sales in 1997. Theoretically this variable could have a positive or a negative impact on firm growth, depending on the characteristics of the firm and the market in which it operates. It depends on the speed—that is, on parameter β in equation (3)—with which Moroccan firms converge toward their long-run steady-state size. Table 2 breaks the firms in the sample down by firm size (number of employees) and industry.

The set of observable exogenous variables, $\mathbf{X}(t)$ in equation (3), are the following:

Firm age. The age of a firm (AGE) is defined as the absolute number of years of existence since start-up. Theoretically it is assumed that younger firms grow faster.

Firm location. On the basis of responses to the questionnaire, firms were grouped into three geographical categories: large urban centers (Casablanca or Fés, accounting for 46 percent of all firms interviewed); medium-size urban centers such as Rabat, Tanger, and Salé (33 percent); and all other locations (21 percent). This information was used to construct two dummy variables: FLOCATION1 takes the value of 1 for firms in medium-size centers and 0 otherwise, and FLOCATION2 takes the value of 1 for firms in the third group and 0 otherwise. This leaves firms in large urban centers as the benchmark or omitted variable. From the earlier theoretical discussion, firms in large urban centers should grow faster than firms in the other two location groups.

Legal form. The questionnaire distinguishes among six different legal forms: single proprietorships, partnerships, cooperatives, privately held corporations, limited liability corporations, and public limited companies. Of these, the last accounts for a large majority (66 percent) of the firms interviewed. From this

information a dummy variable FSTATUS1 was constructed that takes the value of 1 if the legal form is that of a limited liability company and 0 otherwise.

Innovative ability. Another major source of firm growth is the ability to innovate. The dummy variable INNOV controls for this important capability. It takes the value of 1 if the firm reports engaging in innovative activity and 0 if it does not.

Product diversification. A further source of a firm's growth is the ability to diversify both its existing products and services and its product mix. The qualitative variables DIVERS1 and DIVERS2 address this ability. The first variable takes the value of 1 if the firm diversifies its existing products and services, and 0 otherwise. The second takes the value of 1 if the firm is able to diversify its product mix, and 0 otherwise.

Access to inputs. The ability of firms to obtain access to major inputs is also of paramount importance for their growth. Such assets would include managerial inputs, reflecting Penrose's "managerial limits to growth" hypothesis. The following five variables were constructed to deal with these issues: LWORK measures a firm's access to qualified workers, LMANAGE its access to qualified managers, LFINANCE its access to financial resources, LINFRAST its access to good infrastructure (power, water, telecommunications, and so forth), and LLAND its access to industrial land. Each of these variables is measured on a 1-to-5 (Likert) scale, where 1 indicates that access to the input is a major obstacle to growth, and 5 that it is no obstacle.

Market structure. A major outcome of an industry's market structure is whether firms can compete in product markets or not. A concrete expression of this market competition is the ability of a firm to adapt its price policy to internal or external changes and to increase or decrease its market share. The variable PCOMPETE takes the value of 1 if a firm facing competition reports that it can adapt its prices, and 0 if it cannot. In addition, the variable DCOMPETE is measured on a scale from 1 to 5, where 1 means that the firm has decreased its market share significantly and 5 that it has increased that share significantly. This variable

measures the firm's power to vary its market share and therefore its relative position (weight) in the market.

Market demand. Demand in a firm's product market enters the equation through the variable MDEMAND, measured on a Likert scale from 1 (the firm reports that current lack of demand is a major obstacle to growth) to 5 (lack of current demand is no obstacle). Theoretically, it is expected that greater market demand will enhance firm growth.

State regulations and policies. In the survey, firms were asked whether each of the following types of regulations and policies (or consequences of poor policies) were a major obstacle (value of 1) or no obstacle (value of 5):

- Regulation of foreign trade (imports and exports)
- Tax regulation
- High taxes
- Regulation of the labor force
- Other regulation (antitrust, environmental policy, and so on)
- Political instability and instability of reforms
- Inflation and price volatility.

Table 3 summarizes the average responses to each of these seven questions. On the whole, state regulations and policies are considered obstacles to doing business in Morocco. Principal-component analysis was used to reduce the seven policy instruments into three subgroups (Table 4). Following their different factor loadings, they are labeled STATE1, STATE2, and STATE3 and introduced as variables in the regression analysis. Their signs cannot be predicted ex ante, since their impact on corporate growth depends on the specific situation of the firm and the industry it belongs to.

Interindustry differences. Theoretical and empirical studies suggest substantial interindustry differences with respect to firm growth (see the discussion above). To control for these differences, industry dummies have been included in the regression analysis. According to the survey data, the manufacturing sector was

the most frequently cited branch of activity. This sector is therefore used here as a benchmark. For the remaining sectors--construction, services, and commerce--dummy variables were constructed, taking the value of 1 when the firm's principal activity is in that sector, and 0 otherwise.

Data

Ideally, the empirical model of firm growth should be tested on the basis of panel data, to more fully reveal the growth dynamics of Moroccan firms. Unfortunately, panel data for all the variables described above do not yet exist. What is available is a cross-sectional data set, based on a field survey of 370 firms, carried out under the auspices of the World Bank in 1998.[7] The survey sample covers firms of different sizes: large (more than 100 workers), medium-size (50 to 100 workers), and micro (5 workers or fewer).[8] It also covers all of the major economic sectors in Morocco: manufacturing, construction, services, and commerce (Table 2).

The sample of firms under consideration is, for various reasons, not statistically representative of the universe of Moroccan firms. One reason is that the universe of firms is itself not really known but varies, according to the source, between 270,888 (from the 1995 patent registry) and 900,687 firms (from the official statistical yearbook for 1996). In addition, the sampling method and the number of units drawn are not statistically adequate. Despite these shortfalls, the sample allows an explorative analysis of firm behavior in Morocco.[9]

Econometric Problems

A significant problem relates to the noise in the data. This is mostly due to the fact that almost all of the variables have the measurement properties of categorical data. To be useful in the econometric analysis, these responses have to be converted into dummy variables.

A second problem is that there are missing values for firms in the data set that cannot be included in our estimate of equation (3). Since the remaining observations with no missing values were not selected randomly, this gives rise to

sample selection bias in the data. In the presence of this specification error, the ordinary least squares procedure cannot be used to estimate equation (3). An alternative procedure is the full information maximum likelihood (FIML) method developed by Heckman (1976).[10] This method corrects for the specification error due to sample selection bias.

Because one of the dependent variables, ESALES, takes the value of 3 when positive, 2 when constant, and 1 when negative, a multinomial logit procedure must be used as a basis for estimating this parameter. The method used here is the maximum likelihood method (for more details, see Green 2000)

3. Results

Originally, three regression equations, using different specifications of the dependent variable (SALESG, EMPLOYG, or ESALES), were estimated. The first two equations produced implausible results, and therefore I present here the results of the third equation only (Table 5):

- Firm size in 1997 (FSIZE) seems to have a negative impact on expected firm growth in subsequent years (1998-2000): the larger a firm was in 1997, the smaller the probability of it being expected to grow in the next three years. A deceleration of the convergence process toward a long-term steady-state size takes place. In other words, smaller firms grow faster than larger ones. This result is consistent with several theoretical models and previous empirical findings, as discussed above[11].

- Firm age (AGE) also has a negative impact on firm growth. Younger firms grow faster. Other research has shown that they are also the ones that are more likely to export than older firms (Fafchamps, El Hamine, and Zeufack, 2002).[12]

- Firm location (FLOCATION) also matters. Compared with firms located in the large urban centers, those in medium-size urban centers and

especially those in smaller centers expect less growth. The regional dimension of firm growth is also important in Morocco, as one would expect.

- The legal form of the enterprise (FSTATUS) also affects the growth process. Being a limited liability company is positively correlated with the firm's growth prospects.

- There is some evidence indicating that the ability of a firm to innovate (as measured by the INNOV variable) is positively correlated with expected growth of sales, but the variable is not statistically significant.

- A further positive source of growth is a firm's ability to diversify its existing products and services: the variable DIVERS1 is statistically significant. On the other hand, firms that try to diversify their product mix are less successful: the sign on DIVERS2 is negative.

- Access to at least some major inputs also has an impact. Lack of access to qualified workers (LWORK) and to qualified managers (LMANAGE) seems to be detrimental to the growth process of Moroccan firms. Less severe impediments are lack of access to financial resources (LFINANCE), industrial land (LLAND), and infrastructure (LINFRAST).

- The ability of firms to adapt their pricing policy to competitive pressures is positively associated with expected sales growth, as is the ability of firms to increase or decrease their market share in response to such pressures: the variables PCOMPETE and DCOMPETE both have positive coefficients.

- Market demand seems to exert an important impact on firm growth: the MDEMAND variable shows a positive and statistically significant coefficient.

- State regulations and policies appear to have mixed effects. Although tax regulations, the level of taxes, and labor regulations do not seem to affect expected firm growth negatively (the signs of the synthetic variables STATE1 and STATE2 are positive; the latter is even statistically significant at the 10 percent level), state regulations on foreign trade together with domestic price volatility seem to have a negative impact on firm growth: the synthetic variable STATE3 has a negative sign.

- Firms operating in the services and construction sectors have experienced a less favorable growth environment than those in the manufacturing sector.

4. Summary and Conclusions

The principal factors positively affecting firm growth in Morocco were found to be the following:

- Business strategies that focus on product diversification and market share expansion
- Location (in large urban centers
- Legal status as a limited liability company
- The presence of price competition
- Strong demand for the firm's products, and
- Certain government policies, such as labor regulations, anti-trust and environmental policy.

The principal factors that affect firm growth negatively are the following:

- Lack of access to qualified workers and managers
- Location in small population centers, and

- Certain other government policies, such as state regulations on foreign trade and tolerance of domestic price volatility.

If confirmed by further analysis, these results have important policy implications for both business leaders and policymakers in Morocco. For business leaders, is it important to emphasize that an explicit and sound growth strategy matters. Important points of such a strategy include the choice of the right location and legal form, and the choice of markets with sufficiently strong and expanding demand. A promising way for firms to grow in Morocco is to diversify the products or services offered. For policymakers, the analysis suggests several policy areas where improvements may be needed. First, the regulatory and administrative framework has to be adjusted, to become more responsive to the needs of firms willing and able to grow. In this respect, competition policy has an important role in achieving fair play among competing firms. Second, policies regarding education and professional training have to be targeted to the needs of firms. It is striking that, in a country where thousands of college and university graduates are unemployed, lack of access to qualified workers and managers constitutes a major hindrance to firm growth. The mismatch between the skills supplied by the labor force and the skills demanded by employers has to be fixed. Third, regional disparities with regard to infrastructure (roads and utilities, among others), manpower, life, and work quality have to be addressed, because these disparities present major obstacles for firms seeking to grow in certain parts of the country such as Kenetra, Oujda, Marrakech, Khemisset, Larache, and Skhirat.

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Table 1. Description of	**Variables**
Variable	Description
Dependent variable	
SALESG	Logarithm of the average annual rate of growth of sales since firm was established, in percent
EMPLOYG	Logarithm of the average annual rate of growth of employment since firm was established, in percent
ESALES	Expected growth of sales in 1998-2000, scored as 3 if positive, 2 if no change, 1 if negative
Independent variables: firm-specific	
FSIZE	Logarithm of firm sales (or of number of employees)
FLOCATION1	Dummy variable with value of 1 if firm is headquartered in a medium-size urban area, otherwise 0
FLOCATION2	Dummy variable with value of 1 if firm is headquartered in other than a large or medium-size urban area, otherwise 0
AGE	Years since establishment of the firm
FSTATUS1	Dummy variable with value of 1 if firm is established as a limited-liability corporation, otherwise 0
INNOV	Dummy variable with value of 1 if firm reports that it engages in innovative activity, otherwise 0
DIVERSE1	Dummy variable with value of 1 if firm reports that it diversifies its existing products and services, otherwise 0
DIVERSE2	Dummy variable with value of 1 if firm reports that it diversifies its product mix, otherwise 0
Independent variables: access to inputs	
LWORK	Access of the firm to qualified workers, measured on a 1-5 scale[a]
LMANAGE	Access of the firm to qualified managers, measured on a 1-5 scale
LFINANCE	Access of the firm to outside financing, measured on a 1-5 scale
LINFRAST	Access of the firm to needed infrastructure, measured on a 1-5 scale
LLAND	Access of the firm to industrial land, measured on a 1-5 scale
Independent variables: market structure	
DCOMPETE	Ability of the firm to vary its market share in response to market competition, measured on a 1-5 scale, where 1 indicates that market share decreases significantly, 3 that it stays constant, and 5 that it increases significantly
PCOMPETE	Dummy variable with value of 1 if firm reports that it can adapt its prices to market competition, otherwise 0
MDEMAND	Sufficiency of market demand, measured on a 1-5 scale, where 1 indicates that market demand is reported to be a

	major obstacle, and 5 that it is no obstacle
STATE1, STATE 2, STATE3	Impact of selected state regulations and policies as determined by principal-components analysis reported in Tables 3 and 4
CONSTRUC	Dummy variable with value of 1 if firm reports that its primary activity is construction
SERVICES	Dummy variable with value of 1 if firm reports that its primary activity is services
COMMERCE	Dummy variable with value of 1 if firm reports that its primary activity is commerce

Source: Author's model specifications

a. For all the access variables, a score of 1 indicates that access is a major obstacle and 5 that it is not an obstacle**.**

Table 2. Firms in the Survey by Firm Size and by Sector

No. of Employees	Sector of Principal Activity				
	Manufacturing	Construction	Services	Commerce	All firms
1-5	32	32	60	52	176
6-20	19	8	27	11	65
20-100	31	5	13	9	58
More than 100	48	9	11	3	71
All firms	130	54	111	75	370

Source: World Bank Survey 1998 and Author's calculations.

Table 3. Reported Impact of State Regulations and Policies on Firms in the Sample

Type of Regulation or Policy	Average Response (1 = Major Obstacle, 5 = No Obstacle)
Regulations on foreign trade	1.67
Tax regulations	2.87
Level of taxes	3.63
Regulations on labor force	2.60
Other regulations[a]	1.78
Political instability and instability of reforms	1.81
Inflation and price volatility	2.21

Source: World Bank Survey 1998 and Author's calculations**.**

a. Examples include antitrust policy and environmental policy.

Table 4. Factor Analysis of the Impact of State Regulations and Policies

	Rotated Factor Loadings		
Type of Regulation or Policy	Factor 1: STATE1	Factor 2: STATE2	Factor 3: STATE3
Regulations on foreign trade	-0.02759	0.10270	0.66755
Tax regulations	0.84614	0.13021	0.20001
Level of taxes	0.89735	0.11850	0.02480
Regulations on labor force	0.20575	0.82728	-0.03744
Other regulations [a]	0.01646	0.80860	0.24555
Political instability and instability of reforms	0.17471	0.44267	0.51504
Inflation and price volatility	0.20704	0.01549	0.79126
Cumulative variance explained (percent)	35	69	100

Source: World Bank Survey 1998 and Author's calculations

a. Examples include antitrust policy and environmental policy.

Table 5. Maximum Likelihood Estimates of Mutinomial Logit Model

Parameter	Coefficient	Standard Error	Chi-Square	Pr > Chi-Square
Intercept	-1.7991	2.0384	0.7790	0.3774
Intercept2	-0.1224	2.0257	0.0037	0.9518
FSIZE	-0.0253	0.1746	0.0209	0.8849
AGE	-0.0178	0.0222	0.6386	0.4242
FLOCATION1	-0.8239	0.7906	1.0861	0.2973
FLOCATION2	-1.5679	0.9928	2.4940	0.1143
FSTATUS	1.1634	0.8015	2.1068	0.1467
INNOV	0.6784	0.8127	0.6967	0.4039
DIVERS1	1.7257	0.8850	3.8024	0.0512
DIVERS2	-0.9070	0.9621	0.8886	0.3459
PCOMPETE	0.2543	0.6538	0.1513	0.6973
DCOMPETE	0.5935	0.2981	3.9634	0.0465
MDEMAND	0.4697	0.2686	3.0577	0.0804
LINFRAST	0.0582	0.2401	0.0588	0.8083
LFINANCE	0.2290	0.2531	0.8181	0.3657
LMANAGE	-0.5750	0.2657	4.6833	0.0305
LWORK	-0.0520	0.2363	0.0484	0.8258
LLAND	0.3379	0.2362	2.0465	0.1526
STATE1	0.1388	0.4033	0.1184	0.7307
STATE2	0.6091	0.3571	2.9091	0.0881
STATE3	-0.3797	0.4036	0.8852	0.3468
CONSTRUC	-1.2044	1.1422	1.1118	0.2917
SERVICES	-0.2602	0.7003	0.1380	0.7103
COMMERCE	14.6946	547.8	0.0007	0.9786

Source: Author's regressions

I would like to thank Mr. Andre Stone of the World Bank for authorizing me to use the 1998 World Bank data set of firms.

[1] On the United States see Evans (1987a, 1987b) and Hall (1987); on the United Kingdom see Hart and Oulton (1995, 1996, 1998), Dunne and Hughes (1996) and Geroski (1998); on Germany see Wagner (1994), Brüderl and others (1998), Brixy and Kohaut (1999), Steil and Wolf (1999) and Almus (2000); on Switzerland see Harabi (2002).

[2] There are, of course, other theoretical perspectives on firm growth. The most important are evolutionary models of firm growth (see Neslon and Winter, 1982) and stochastic growth models; for a survey of these models, see Sutton (1997).

[3] This concept dates from Wright's (1936) paper on the costs of building aircraft.

[4] The word "satisficing" was invented by Herbert Simon (1959) as a hybrid of the words "satisfy" and "suffice."

[5] For work on the effects of age, see Evans (1987), Dunne and Hughes (1994), and Das (1995); on that of R&D expenditures see Hall (1987) and Liu, Tsou, and Hammit (1999); on that of mergers and acquisitions see Ijiri and Simon (1974); on that of the internal organization of firms see Dunne, Roberts, and Samuelson (1989) and Variyan and Kraybill (1992). For recent overviews of the literature see Sutton (1997) and Hart (2000).

[6] Authors who have studied the relationship between location and firm growth include North and Smallbone (1994), Storey (1994), and Henderson (1994).
[7] Since then the World Bank has conducted another, more comprehensive survey of Moroccan firms, (World Bank, 2000). Unfortunately, despite numerous requests I have not been able to use this data set.
[8] The definition of firm size used in the survey is ad hoc and does not comply with the definition of international institutions like the one of the OECD.
[9] Belghazi (1998) has provided a first descriptive analysis of the data set, results of which have been reproduced in World Bank (1999).
[10] See also the exposition in Greene (2000, pp. 693-96)
[11] The result that firm size is negatively correlated with growth in Morocco has also been found in many other developing countries. It has been established both through cross-country analysis (Leidholm and Mead 1987; Banarji 1987), and through analysis across time within countries (Little, Mazumdar, and Page 1987; Steel 1993)
[12] The same source finds that old firms are unlikely to switch to exporting, even in response to changes in macroeconomic incentives to export.