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Dynamics of  
Microenterprises:

Research Issues  
and Approaches

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# **GEMINI**

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# **Dynamics of Microenterprises: Research Issues and Approaches**

by

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## EXECUTIVE SUMMARY

This paper explores the field of microenterprise growth. Although much has been written in recent years about the nature and structure of small enterprises, the analysis has been static in orientation. This essay seeks to correct that imbalance, concentrating on dynamic issues relating to patterns of change among micro and small producers.

A firmer understanding of patterns of growth among micro- and small-scale enterprises (MSEs) can make a major contribution to the development of improved approaches for the promotion of efficient and equitable growth of MSEs. It can help target such assistance in terms of the balance between different types of interventions (policy and regulatory reform, credit, and other types of direct assistance), as well as target assistance by type of enterprise (size, age, location, and sector of the economy).

The paper examines the question of microenterprise dynamics at four different levels: the individual (with particular attention to the entrepreneur); the enterprise; the subsector; and the economy as a whole, including issues of intersectoral linkages. For each of these four levels, the paper reviews existing theoretical approaches and empirical information, outlines outstanding issues and major themes, suggests specific research questions that should be explored, and outlines analytical approaches to address these questions.

At the first level, the characteristics of the entrepreneur — his or her background and experience, education and age, motivation, and abilities — can have a significant effect on patterns of growth of the enterprise. In addition to these characteristics of the entrepreneur as a person, one must also take account of the interactions between the entrepreneur's activities in the enterprise under examination and other activities in which she or he is engaged. Other questions to be examined concern the movement back and forth between activities as a worker and activities as an entrepreneur. Important issues to be explored concern the ways in which motivations and strategies vary according to the gender of the entrepreneur.

At the level of the firm, variations in the amount of output and employment arise because of several different categories of change: births of new firms, expansion or contraction of existing enterprises, or disappearances (deaths) of existing firms. Theoretical models of the life cycle of firms have focused primarily on random factors and on the role of the entrepreneur. The few empirical studies examining the relationships between growth rates of firms and other variables have most often focused on firm age and size.

The goal of research in this area should be to generate a solid body of data concerning the life cycle of the firm, from birth, through possible net growth, and including possible disappearance. Armed with descriptive data of this type, the primary objective is to ascertain whether there are systematic patterns in the evolution of such firms in developing countries. Explanatory variables to be examined include the size and age of the firm, its location and subsector, and the gender and other characteristics of the entrepreneur.

Information needed to explore these questions can be collected through three types of surveys: cross-section enumerations of enterprises in locations where such studies have previously been done; bore hole surveys, tracing the past evolution of selected firms; and longitudinal or prospective surveys, following patterns of change of particular firms over time. Information generated in such surveys can be analyzed in a variety of ways. The data can be reported in simple tabular form, without any statistical analysis of the underlying relationships. At a more sophisticated level, three types of analyses are possible: grouped data regression analysis, use of selectivity models, and duration and hazard models. Such analyses should make it possible to construct stylized profiles of the life cycle of firms, portraying the expected size and survival probabilities of a typical firm in a certain subsector at various ages of the enterprise.

Moving on to the level of the subsector, this approach involves an examination of patterns of change among a group of firms engaged in the production and distribution of a related set of products. In this approach, the universe under examination includes enterprises of all types and sizes engaged in the production and distribution of a particular group of commodities. The frame of reference includes suppliers of raw materials and intermediate products as well as producers of finished products. Equally important, it includes in its field of analysis the marketing and distribution systems that link the various stages in the production process. Particular attention is paid to these vertical linkage mechanisms.

Key issues to be examined at the level of the subsector include the changing role of different types of enterprises in particular channels, and the determinants of these changes; and the changing competitive position of different channels within the subsector. Important dimensions of the analysis include changing patterns of specialization at different stages in the production and distribution system and the ways in which microenterprises can participate in increasing specialization, along with associated questions of risk; the firm-level counterpart of changes in the subsector; the ways in which competition determines returns to different participants, which in turn influences patterns of change within the subsector; and the gender dimension of subsector development.

In terms of surveys and approaches, it would be desirable to examine the same subsector in different countries, to explore the impact of country-specific factors; to look at different subsectors in the same country, to explore differences between subsectors operating in the same environment; to return to locations where subsector studies have been done previously, to examine changes since the first study was completed; to combine subsector studies with other types of surveys, to take advantage of synergism in learning; and to include some subsectors where microenterprises have played a significant role in rapid growth of a particular channel. For the latter, it would be particularly useful to include some cases where good results have been achieved by women.

The fourth level of analysis is concerned with intersectoral linkages and macro changes. For intersectoral concerns, the central task is to identify actual or potential sources of dynamism in the economy, and then explore the extent to which these "growth engines" create opportunities for multiplied development through reinforcement of positive linkages. At the related macro or comprehensive level, the central interest is in the changing relative importance of enterprises of different sizes and types, including their sectoral and locational dimensions.

An improved understanding of patterns of microenterprise dynamics at these different levels can make a major contribution to the improvement of policies as well as to the design and implementation of project interventions, leading to an enhanced role of microenterprises in the development process.

## **SECTION ONE**

### **INTRODUCTION**

This paper explores the field of microenterprise growth. Although much has been written in recent years about the nature and structure of microenterprises, the analysis has been static in orientation. This essay seeks to correct that imbalance, concentrating on dynamic issues relating to patterns of change among micro and small producers.

The debate as to what constitutes a desirable and feasible pattern of growth for small enterprises has continued over several decades without reaching any consensus. Analysts, donors and practitioners have differed dramatically in their perception of the role of micro- and small-scale enterprises in the development process. The evidence is clear by now that in many poor countries the number of people engaged in such activities is enormous; in many cases, it is growing over time. But is this growth best seen as an auspicious sign, to be facilitated and encouraged, or as an indication of failure on the part of the rest of the economy to provide productive employment for new entrants to the labor force, forcing people to seek work in microenterprises as a last resort? Can micro- and small-scale enterprises act as a leading sector in the development process, or are they merely followers? What patterns of change should be sought, for what types of enterprises?

Closely associated are questions of constraints: what factors are most important in impeding desirable patterns of growth? This in turn provides the background for the action-oriented questions: what types of interventions are most effective in facilitating desirable patterns of development among small producers? At a conceptual level, what units of analysis, categories of producers, and analytical approaches are most appropriate for examining these questions?

Several different perceptions of the broad role of microenterprises in the development process have been advanced over the years. Some have contended that microenterprises can be efficient producers that constitute an important dynamic force in the economy, creating new jobs and contributing significantly to a desirable expansion of output over time. Others have argued that microenterprises are a residual, made up of low-productivity activities that are destined to fade away as national income increases. Proponents of the latter point of view argue that there is a natural progression from microenterprises to larger firms such that most growth occurs when the entrepreneurs and workers in microenterprises are redeployed as workers in larger-scale, more productive activities. For those espousing this point of view, efforts to promote microenterprises can be at best fruitless, and at worst a serious waste of resources.

These differing perceptions concerning broad patterns of growth are reflected in differing approaches to appropriate types of interventions for the encouragement of microenterprises. The current interest in minimalist credit arises from a perception that there are large numbers of very small but very poor producers that can significantly expand their output and associated income if they are provided with access to small amounts of credit, made available at market interest rates. While recognizing the important achievements of such credit programs, others have expressed skepticism about the extent to

which these successes can be generalized and about how far such minimal interventions can carry the beneficiaries, particularly as the producers evolve to a larger size or to more complex activities where they may run into constraints requiring other, complementary types of assistance.

Other issues of assistance design are equally in dispute. Among different types of direct assistance, what is the appropriate balance between nonfinancial assistance such as management training, technology upgrading, and marketing assistance, on the one hand, and credit, on the other? What relative emphasis should be accorded to direct assistance, as opposed to policy change or improvements in the regulatory context aimed at making the overall environment more supportive of enterprise growth? Is it true, as some have argued, that the relaxation of regulatory constraints by itself constitutes the single most important change needed for the encouragement of microenterprises?

For direct assistance, related questions arise concerning the types of enterprises to be targeted for attention. Should assistance be given primarily to newly formed enterprises, or to those that have been in existence for some time? Is assistance best targeted towards the smallest enterprises (those with only one or two workers), or towards those nearer the top end of the small enterprise scale? What is the appropriate balance between manufacturing, commerce, transport, and other services? Between enterprises in the capital city, in secondary towns, and in dispersed rural areas?

Similar uncertainties arise with regard to the analytical approaches that are most appropriate for examining these questions. What definitions and classification schemes are most revealing of differences between categories of firms: small enterprises, microenterprises, or all producers in a particular subsector? How helpful is the informal sector as an analytical concept? Should the reasoning be focused on the entrepreneur, on the household, on the firm, on groups of firms examined together, or on the economy as a whole? Different analysts have followed different approaches to each of these questions, with no apparent recognition of the relationships between the different levels of aggregation or the need to supplement one type of analysis with a different approach.

In the absence of agreement on these basic issues, donors and assistance agencies have adopted a great multiplicity of strategies. Since careful monitoring of the impact of these different approaches is notable by its absence, it is most difficult to say which is most effective, and particularly which is most cost-effective. The lack of clear findings here has left the debate with few clear conclusions or guidelines for action. In such a situation, donors often find themselves forced to make decisions based on the persuasiveness of partisan voices rather than on the basis of reasoned analysis.

For all of these questions, then, there is an urgent need for a more comprehensive understanding of patterns of growth and development of different types of enterprises, their potential for development, and the constraints that they face. Such information should be of immense value to assistance agencies, seeking to direct their promotional activities in ways that will do the most good. The information should be of great interest to donors trying to decide which types of activities to fund. It should also be of considerable importance to Third World governments seeking to determine the feasible and desirable patterns of growth for their country as well as the policies and regulatory changes needed to facilitate such patterns of growth.

This paper reviews the state of current knowledge about patterns of growth and development among microenterprises. It explores this question at a number of different levels of aggregation. In this



regard, it builds on the reasoning of Timmer (1986), Stewart (1989), and others, who have argued that the older separation of economic reasoning into two broad categories (microeconomic and macroeconomic analysis) is inadequate for many issues requiring examination. For the issues of concern in this paper, we have found it useful to develop the reasoning in terms of four different levels of analysis:

- **Individuals:** an analysis of patterns of change from the perspective of individuals in the enterprise, particularly the entrepreneur (sometimes referred to as micro-micro or intra-enterprise analysis);
- **Micro or firm:** the analysis of developments at the level of the individual producing unit (built around the theory of the firm, a central component of standard microeconomic reasoning);
- **Subsector:** an analysis of patterns of development among groups of enterprises within a particular subsector; and
- **Intersectoral and macro:** the analysis of linkages or relationships between sectors or subsectors within an economy, and changes in the overall structure of the economy..

While all four levels are relevant to issues of dynamics of microenterprises and all will be explored in this paper, primary attention will be given to the micro and subsector levels, focusing on patterns of change at the levels of the individual enterprise and the subsector.

In the discussion that follows, we offer, for each of these four levels of analysis, a review of the "state of the art" (the current status of theory and existing empirical evidence), issues outstanding and major themes that need to be addressed at this level, research questions and research hypotheses, and approaches that may be used in examining these questions. The concluding section suggests issues that should be given prominence in subsequent research activities.

## SECTION TWO

### A FOCUS ON INDIVIDUALS

#### THE STATE OF THE ART

Analysis under consideration at this level of reasoning is concerned with the behavior of individuals and how their behavior contributes to the observed patterns of performance of the enterprise. Such reasoning, baptized with the inelegant name of "micro-micro analysis" in the economics literature, thus penetrates inside the firm, the primary unit of analysis in microeconomics, to focus on individual entrepreneurs and workers.

Theories focusing on the behavior of individuals as participants in producing units are still at a rudimentary stage in economics; they are much less developed than the standard neoclassical analysis of the firm itself. Indeed, Leibenstein's plea that "a branch of economics is missing: micro-micro theory" only appeared in 1979. Although Leibenstein focused primarily on intra-firm issues, the analysis could also be extended to the intra-household issues that are central to the "new household economics" and the closely related agricultural household models (see, for example, Singh, Squire, and Strauss, 1986). It is the intra-firm and especially the entrepreneurial aspects, however, that are of most relevance to questions of microenterprise dynamics, the central focus of this essay.

Until recently, theories of entrepreneurship have been primarily the domain of sociologists and psychologists. The recrudescence of the Austrian school of economics, which views competition as a process of dynamic change with the entrepreneur as its prime mover, as well as the emergence of a few neoclassical models that include entrepreneurship explicitly, reflect the resurgence of interest on the part of economists in the study of entrepreneurs.

What are the critical activities that an entrepreneur performs in this dynamic process? According to Schumpeter (1934) and his followers in the Austrian school, the entrepreneur is the innovator, who introduces new products, new technologies, new markets, or new sources of supply. In contrast to this notion, Frank Knight's (1921) conceptualization of the entrepreneur as anyone who has control of the operation of the business and bears the risk fits the views of most neoclassical economists. While Schumpeter would consider management of the firm as simply a routine activity, Knight would place it at the core of the entrepreneur's task.

In developing countries, Leff (1979) contends that entrepreneurship, or the lack of it, is not a constraint to growth. He argues that the various functions performed by the entrepreneur are available in such abundant supply that these functions become essentially "slack variables." It is rather, he contends, the demand for entrepreneurship that is the dominant force determining the extent of observed entrepreneurship; any lack of entrepreneurial response is due to market imperfections or defective policies. Kilby (1988) argues, however, that deficiencies in the routine management functions performed by the entrepreneur, a supply side variable, constitute the crucial constraint to the evolution of firms and

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industries in developing countries. This is a form of technical or "X-inefficiency" (Leibenstein, 1978) that prevents firms from realizing their full potential. The daily functions of managerial coordination and production control are thus more central than the innovative, investment, and risk-bearing functions, which, Kilby argues, are in abundant supply and do not constitute a bottleneck in developing countries.

The entrepreneur has finally begun to be incorporated as a key variable in several recent dynamic theories of firm growth. A straightforward model by Lucas (1978) is based on the assumption that individuals have differing endowments of managerial ability (or "business acumen"); persons with more of this attribute become entrepreneurs, while those possessing less become workers. Over time, business formations (births) and disappearances (deaths) occur as those with marginal managerial ability move back and forth between operating as entrepreneurs and as workers.

A similar model developed by Kihlstrom and Laffont (1979) incorporates risk into the analysis. These authors contend that the key attribute of the entrepreneur is a taste for risk; individuals who are relatively less averse to risk become entrepreneurs, while those who are relatively more risk averse become workers.

The empirical literature on the relationship between entrepreneurship and firm dynamics is somewhat limited, but does shed some light on the issue. Beginning in the 1960s, there have been numerous studies in developing countries seeking to identify empirically the determinants of the evolution of entrepreneurial capacities and their effects on firm performance. These studies, which have been usefully reviewed and summarized by Kilby (1971), Leff (1979), Page (1979), and Anderson (1982), typically conclude that there is no shortage of individuals willing to innovate, bear risks, or generate new capital. Education and experience are frequently found to have a positive influence on business performance although, surprisingly, formal education is sometimes negatively correlated with success (Chuta and Liedholm, 1985). In addition, recent studies have indicated that, as a result of differential access to resources and other gender-differentiated constraints, the gender of the entrepreneur has an important effect on firm dynamics, particularly on survival chances, likelihood of growth, and diversification strategy (Downing, 1990). Yet most socioeconomic variables do not seem to be statistically correlated with performance, suggesting that all segments of the population are potentially capable of contributing to the entrepreneurial pool. These results may be somewhat misleading in a dynamic context, because of methodological shortcomings such as the lack of any information on the disappearing (dead) firms and the lack of time series information.

Many of these studies, however, have also found that there are serious and enduring problems with the managerial facets of the entrepreneurial function in many developing countries (Kilby, 1988, and Anderson, 1982). In a dynamic context, the managerial constraint becomes particularly acute when attempts are made to transform the firm from a micro into a modern small-scale enterprise. Indeed, Chuta's (1989) recent Northern Nigeria study revealed that finding a good manager was the most frequently cited constraint facing firms with six or more workers and seeking to expand.

A separate literature has emerged in recent years that focuses on the motivations that underlie the actions of entrepreneurs. Downing (1990) provides a useful summary of a number of important contributions here. Much of this analysis has developed in an attempt to understand the differences in experience between female and male entrepreneurs. Drawing on work of Tinker (1987), Grown and Sebstad (1989), and others, Downing suggests that an important part of this difference may be explainable

in terms of differences in the goals of the entrepreneur. She presents this in terms of an evolution from survival to security to growth as the primary motivation. For an entrepreneur whose principal objective is security, any profits gained may be devoted to diversification in a variety of economic activities, along with other endeavors such as the feeding and educating of children or the strengthening of kinship networks (a form of social security), all aimed at raising the security of the household. Entrepreneurs whose motivations are focused on growth, by contrast, are more likely to reinvest any profits in their principal activity, hoping through increased specialization to obtain the benefits of higher productivity and higher income. Downing has suggested that there may be systematic patterns of change here, as entrepreneurs' motivations evolve along this continuum. Of particular interest would be differences between male and female entrepreneurs in this regard.

In summary, this review of the evidence makes clear that entrepreneurship is a significant factor that needs to be incorporated into any analysis of firm dynamics.

### ISSUES AND MAJOR THEMES

In the analysis of the role of individuals as determinants of patterns of growth among microenterprises, issues of concern focus primarily on the entrepreneur. The characteristics of the entrepreneur — his or her background and experience, education and age, motivation and abilities — can have a significant effect on patterns of growth and development of the enterprise. In addition to these characteristics of the entrepreneur as a person, one must also take account of the interaction between the entrepreneur's activities in the enterprise under examination and other activities in which she or he is engaged. These could involve other economic activities (farming, commerce, other commercial endeavors, and so on); they could also involve family or household responsibilities. Each of these sets of factors can have a significant impact on patterns of growth and development of the microenterprise.

An important dimension of this issue concerns the motivations and strategies of entrepreneurs. It has been suggested that these vary in a systematic way with the evolution of the individual, the household, or the enterprise. A major set of issues to be explored here concerns the ways in which these motivations and strategies vary according to the gender of the entrepreneur. Furthermore, there are many reasons to believe that female entrepreneurs face significantly different constraints from those of their male counterparts. Preliminary research suggests that women may be more easily displaced by increased mechanization and, at least in some subsectors, may find more opportunities as employees rather than as entrepreneurs.

A further set of questions concerns the movement back and forth between activities as a worker and activities as an entrepreneur. An important set of issues here concerns the extent to which, and the circumstances in which, hired workers become entrepreneurs by opening their own business. The converse is also of interest: to what extent do discouraged entrepreneurs take up paid employment as hired workers, either in microenterprises or in larger firms? There is little empirical evidence about patterns of change in either of these directions, as these are influenced by returns to be earned or by variations in general business conditions. Again, these are issues in which the analysis must be disaggregated by gender, since there is reason to believe that men and women have responded differently in the past.

## **RESEARCH QUESTIONS AND HYPOTHESES**

The reasoning set out to this point enables us to specify the particular questions that should be addressed and hypotheses to be tested. The education, experience, gender, and age of the entrepreneur all appear to have important effects on patterns of growth of the enterprise he or she is running. The most significant of these characteristics and their hypothesized relationship to net growth and survival of the enterprise are set forth below.

1. The education of the entrepreneur would be expected to be directly related to firm growth and survival. This variable as well as the next two reflects aspects of the entrepreneur's human capital.
2. The experience of the entrepreneur (number of years of experience as manager of the enterprise, other work experience, apprenticeship, unpaid work in which skills were learned, and so forth) would also be directly related to these variables.
3. Prior business experience of other family members would be expected to follow this same direct set of relationships.
4. Gender: enterprises run by male entrepreneurs would be more likely to survive and grow than their female counterparts; this would be traceable, at least in part, to the hypothesis that female entrepreneurs are more likely to pursue a diversification strategy, leading to higher chances of failure and lower growth rates among surviving enterprises.
5. For female-headed enterprises particularly, the number of children in the household (negatively related to growth), the number of other income-earning activities in which other members are the household are engaged (positively related to growth), and other similar measures of family structure might be significant determinants of growth patterns of microenterprises.
6. The age of the entrepreneur would be indirectly related to growth but directly related to survival, particularly if one is able to control for the education and experience of the entrepreneur.

An important factor influencing the entrepreneur's success in a particular enterprise is the other activities in which he or she is also engaged. These may be other productive activities, or they may be household responsibilities. Although a principal focus of the research is expected to be on patterns of growth in a particular enterprise, it is also important to explore the ways in which the multiple activities or responsibilities of the entrepreneur reinforce or constrain the development potential in the enterprise. Specific hypotheses to be explored here include the following (see Downing, 1990).

7. The number of nonfarm activities in which an individual is engaged is very low for low-income households. This number first increases with increases in family income level, then decreases as family income reaches a certain point, which will differ from country to country. The decrease in diversity of activities is accompanied by increases in specialization and productivity.

8. Women behave differently from men from this point of view. At any given level of household income, they will be engaged in more nonfarm activities than corresponding males. They will move to specialize (in other words, to reduce the number of activities in which they participate) at a higher income level than men.

Some enterprises go out of business in one form and are reconstituted with a different size, location, or activity mix. Entrepreneurs comprise the link between the different embodiments of the enterprise. Such transitions can be particularly important in the evolution of enterprises; they need to be analyzed with special care to see if they can and should be encouraged and, if so, what steps are needed to facilitate them. This leads to the following hypothesis.

9. Transformations of microenterprises — a process whereby an enterprise steps up to new markets or new technologies — frequently happen through a process in which existing enterprises die and are reconstituted in a new form. The entrepreneur is the key link in these transformations.

To be able to explore the movement of individuals between being a worker and being an entrepreneur, it is important to look at the levels of income earned in these two situations. Hypotheses to be tested in this regard include the following.

10. The decision to start one's own business is influenced by relative returns to be earned as a worker or as an entrepreneur. Similarly, the decision of an entrepreneur to allow his business to close, moving into paid employment, depends on opportunities and rates of pay from these different sources.

11. Patterns of expansion or even the continuing existence of enterprises using hired labor will be strongly influenced by the wage rates that these workers could earn elsewhere in the economy.

## ANALYTICAL APPROACHES

Survey methods and analytical approaches must be carefully crafted if they are to capture the important dimensions of intrafirm dynamics. This is particularly true of studies of entrepreneurship, given the methodological shortcomings in the standard approaches to this topic discussed above.

Two survey approaches might be employed to generate information relating to the entrepreneur. The first would be to undertake a repeat, one-shot, cross-section enumeration of micro firms and their entrepreneurs in countries where similar detailed studies have previously been conducted. Although the firm would usually be the basic unit for the enumeration (indeed, it will often be the same as the repeat one-shot firm census surveys described in Section Three below), details on the socioeconomic characteristics of the entrepreneurs would also be obtained, along with information on the firms and entrepreneurs who did not survive.

The second survey approach would be to conduct bore hole interviews — retrospective histories — of selected entrepreneurs (see Section Three for more details of this survey method at the firm level). The survey approach here would probably be less structured than for others discussed in this paper. Included in the survey would be questions that would illuminate how this activity fits in with other

activities of the person or family, how this has changed over time, and the motivation for diversification or specialization. The survey would also generate information on critical transitions or junctures in the evolution of the entrepreneur and the key variables that played a central role in either facilitating or impeding these transitions.

Several types of analysis could make use of the data generated by these surveys to illuminate various facets of intrafirm dynamics in developing countries. Survivor analysis is one approach that could be used to examine the role of the entrepreneur in firm survival over time. The cross-section entrepreneurial characteristics that were used to predict firm success in earlier surveys would now be correlated with the actual long-run (time series) performance of the firms.

A second approach is that of a path analysis to evaluate the crucial transitions or junctures of the entrepreneur and the firm over time. These transitions could involve firm growth spurts and transformations, or even critical household decisions, including changing occupations. The path analysis would seek to determine which, if any, of the entrepreneurial characteristics were correlated with the successful navigation of these critical junctures.

A third approach would be a path analysis of the multiple activities of entrepreneurs involved in microenterprises. It would seek to examine how their participation in the microenterprise, which is the principal focus of study, fits in with other activities of the person or the family, how this has changed over time, and the motivations for diversification or specialization. Gender would be expected to play a major role in this analysis.

A fourth approach at this level might focus on the workers in the microenterprise. This could involve retrospective employment histories, including being entrepreneurs at some point. It would need to include information about "effective wages," examining compensation disaggregated by gender, skill, and experience, at different stages in the life history of the individual.

## **SECTION THREE**

### **FIRM-LEVEL ANALYSIS**

#### **THE STATE OF THE ART**

Studies of microenterprise dynamics at the firm level, both theoretical and empirical, are particularly sparse. This paucity of information is not limited to developing countries; it is a deficiency that plagues the developed countries as well (see, for example, Brock and Evans, 1986).

#### **Theories of the Firm**

The theoretical literature on firm dynamics is limited. Some of the more recent theoretical work on industry and firm evolution, however, has generated a few testable hypotheses about this process. The salient elements of this literature will be briefly highlighted (see Appendix A for more details).

The standard, classical theory of the firm sheds little light on the formation, growth or dissolution of individual firms. It is a static equilibrium theory, with no implications for the rate of entry, exit, or speed of adjustment; moreover, it assumes that the supply of entrepreneurs is perfectly elastic, and that no learning occurs within the firm.

Many of the more recent theories of the firm have emphasized the random or stochastic nature of the process of enterprise growth. The primitive versions are based on Gibrat's Law, which states that firm growth is independent of firm size (Gibrat, 1931). Scherer (1980) provides an illustration of this version, while somewhat more sophisticated variants have been developed by Simon and Bonini (1958) as well as Ijiri and Simon (1977). Such theories, however, assume entrepreneurs are merely passive actors in this mechanistic game of chance and accord them no role.

Several recent formulations of firm dynamics, such as the previously described models by Lucas (1978) and Kihlstrom and Laffont (1979), have accorded a much more central role for the entrepreneur. A model developed by Jovanovic (1982) synthesizes the key elements of these entrepreneurial models with those of the stochastic models and generates a rich set of testable hypotheses about the life cycle patterns of firm growth. Jovanovic assumes that entrepreneurs have different managerial abilities; yet the entrepreneurs are unsure about these abilities when the business is established. Entrepreneurs gradually "learn" about their abilities by engaging in the rough and tumble business world and observing how well they perform. As they learn more about their abilities, entrepreneurs change their behavior over time: those who revise their ability estimates upward expand, while those who revise them downward tend to contract or disappear.

In general terms, this model indicates that the age and size of the firm play a crucial role in firm dynamics. More specifically, this particular learning model predicts that both the failure rates and growth



rates of the firm will be inversely related to the age and initial size of the individual firm. Unfortunately, neither the Jovanovic nor the other evolutionary models indicate what the key determinants of this managerial ability might be or how it might be augmented. Consequently, in generating hypotheses about the key determinants of firm birth, expansion, contraction, and dissolution, one must ultimately move beyond those suggested by the existing dynamics literature.

### **Empirical Evidence**

The empirical literature sheds some additional light on the dynamics of micro firms. Crucial insights into this dynamic process can be generated through an examination of the components of the life cycle of these firms. The most central of these elements are firm births, firm disappearances, and net firm growth.

#### **Firm Births**

Empirical evidence on birth rates of micro and small firms is limited. What information does exist indicates that the annual birth rates for such firms are quite high, ranging from 8 percent in Colombia and the United States to over 12 percent in Sierra Leone (Liedholm and Parker, 1989).<sup>1</sup>

Empirical regularities between birth rates of micro- and small-scale firms and other variables have not been systematically examined in any developing country. There is recent evidence from the United States, however, that birth rates are inversely related to firm size; indeed, birth rates of U.S. small firms were found to be three times those of larger firms. Moreover, there is also evidence that the birth rates of small firms in the United States have tended to vary directly with the aggregate level of economic activity and have exhibited more year-to-year variations than have the birth rates of their larger-scale counterparts (Phillips, 1988). Small-firm birth rates also appear to vary by subsector. More specifically, in a recent study of U.S. small firms, Acs and Audretsch (1989) found that the birth rate varied directly with the growth of the subsector and negatively with the four-firm concentration ratio and the level of human capital in the subsector. These empirical relationships found in developed countries may not necessarily hold in developing countries.<sup>2</sup>

#### **Firm Disappearances**

More empirical evidence exists on the disappearance (or death) rates of micro firms in developing countries. Firm mortality studies have been undertaken in Sierra Leone, Nigeria, Colombia, the Philippines, and India. Nevertheless, even this information is rather scanty. A review of the data

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<sup>1</sup> See below for a discussion of issues of measurement for firm birth and death rates.

<sup>2</sup> Micro firm birth rates, for example, might increase during a decline in the level of aggregate economic activities in many developing countries, if establishing a new micro firm provides the only viable option to individuals who would otherwise be unemployed.

generated from these studies reveals that the disappearance rates of micro firms hover between 9 and 10 percent per year (see Liedholm and Parker, 1989).

Several studies have attempted to examine empirically whether systematic patterns exist between disappearance rates of micro firms and other important variables. Location, sector, size, and age of firm are the variables most often related to firm deaths.

The empirical evidence on the relationship between location and disappearance rates is rather meager. Data from Sierra Leone (Chuta and Liedholm, 1982) indicate that the mortality rates of small firms in rural villages (11.1 percent) are somewhat higher than in those firms located in the largest urban areas (9.5 percent). This relationship was rather weak, however.

Somewhat stronger evidence exists that firm mortality rates vary by sector or subsector. Wide variations in firm disappearance rates by sector, for example, were reported in Frishman's study of micro-enterprises in Northern Nigeria (Frishman, 1988). Unfortunately, significance tests on these relationships were not conducted. In a careful empirical study derived from the Longitudinal Employment Database, which matches information on 300,000 U.S. manufacturing firms from five censuses of manufacturing, Dunne, Roberts, and Samuelson (1989) found that industry differences were significant in explaining variations in firm failure rates in the United States.

Several empirical studies have revealed that mortality rates are inversely related to firm size. Studies from Colombia (Berry and Pinnell-Siles, 1979) and the Philippines (Anderson, 1981), for example, reveal that the disappearance rates decline as one moves to larger-size firms. In the United States, studies by the U.S. Small Business Administration based on data provided by Dun and Bradstreet (Phillips and Kirchoff, 1988) indicate that the death rate of large firms (with 500 or more employees) was one-third that of smaller ones. Dunne, Roberts, and Samuelson's (1989) study of U.S. firms found that "within any age category, failure rates decline with increases in firm size," results that were statistically significant. This inverse relation between failure rates and firm size would thus appear to hold in both developing and developed countries.

One of the most powerful empirical relationships exists between firm disappearance and the age of the firm. Virtually all the empirical studies indicate that there is a strong inverse relationship between the age of the firm and the failure rate. Indeed, most disappearances occur during the early years of a firm's existence. Nag's (1980) study of the Indian small firm revealed that almost two-thirds of all firm deaths took place during the firm's first four years. In an analysis of age-specific death rates in Sierra Leone, Liedholm (1990) generated estimates of a typical micro firm's "hazard rate," which is the probability that the firm would fail during the next year given that it has survived until the beginning of that year. At the beginning of the firm's fourth year, for example, the hazard rate was 22 percent, but in year five it declined to 16 percent and in year six it declined to 12 percent.

A similar pattern has been observed in the United States. In Dunne, Roberts, and Samuelson's econometric analysis of U.S. manufacturing firms, they found that "the failure rate declines with a firm's age, holding current size fixed" (1989). Indeed, these empirical findings that a firm's disappearance rate is inversely related to both age and size are consistent with theoretical predictions derived from the Jovanovic model of firm dynamics.

Given age-specific mortality rates, however, it is also possible that firm disappearance rates might also be affected by the aggregate level of economic activity. Unfortunately, this relationship has not been examined in developing countries. Some insights can be gleaned, however, from a few studies in the United States. In analyzing the relationship between the small firm failure rates and the aggregate level of economic activity from 1976 to 1986, Phillips and Kirchoff (1988) found that "death rates exhibited overall stability through time" and were not very sensitive to business cycles. The modest variation that does occur might be attributable to variations in firm birth rates in earlier periods. Given firm life cycles, for example, a higher-than-average firm death rate might be expected three or four years after a surge in birth rates. Support for this notion was provided by Swain and Phillips (1985), who found that firm failure rates in the United States were positively related to firm birth rates in the three previous years, a relationship that held across all firms and in industry-specific analysis. Information of this sort is lacking for micro firms in developing countries.

### **Net Growth of Firms**

The final component to be examined is the net growth (expansion minus contraction) of surviving micro and small firms. Evidence on growth rates of such firms in developing countries is rather sparse. The information from studies that have examined the empirical regularities of these growth rates will be reviewed.

The limited evidence that exists on the net growth rates of surviving micro and small firms in developing countries indicates that these rates have been quite high. Indeed, for the three countries where such information exists — Colombia (Cortes et al., 1985), India (Little et al., 1987) and Northern Nigeria (Chuta, 1989) — the annual mean rates of growth of employment cluster remarkably around 15 percent. Although the mean growth rates are quite high, a sizeable group of surviving firms do not grow at all. In Northern Nigeria, for example, 32 percent of the urban micro firms added no workers, while in Sierra Leone (Chuta and Liedholm, 1985), 58 percent of small firms in all areas failed to grow.

Systematic analyses of the empirical regularities between growth rates of firms and other variables have rarely been studied, particularly in developing countries. The variables most often examined are firm size and age of firm; other possibly important variables such as sector, location, and gender have typically been ignored.

The relationship between size and firm growth has not been extensively examined in developing countries. Studies by Cortes et al. (1987) in Colombia, Chuta (1989) in Northern Nigeria and Liedholm and McPherson (1991) in South Africa are among the rare exceptions. In Colombia, the growth rate of employment for metalworking firms was found to be negatively related to initial firm size. A similar pattern was revealed in two South African townships. For firms that start with one worker, the annual growth rate was 26.1 percent, while for firms with eight workers or more, the annual growth rate was negative. Such results can only be taken as indicative, however, because these relationships were not rigorously tested.

The size and growth relationship has been subjected to somewhat more rigorous scrutiny in several studies conducted in developed countries. Until recently, most could find little or no correlation between growth rates and size. These studies, however, focused primarily on larger firms only (see, for

example, Hart and Prais, 1956). More recent analyses in the United States that have included smaller firms have found firm growth to be inversely related to firm size. Evans (1987), using data in the U.S. Establishment Longitudinal Microdata set compiled from 4 million Dun and Bradstreet files and estimating growth rates econometrically using Heckman's selectivity model, found that firm growth decreases with firm size. This inverse relationship held for 89 percent of the industries he examined in the United States, even after controlling for sample censoring, which arises because of the exit of slow-growing firms from the sample. Dunne, Roberts and Samuelson (1989), using the Longitudinal Employment Data Base and employing a grouped-data econometric approach to control for sample censoring, also found an inverse relationship between firm growth and firm size. These results are consistent with the predictions from Jovanovic's dynamic model and cast doubt on the validity of Gibrat's Law, particularly in developing countries, in which small enterprises account for the vast majority of firms in most industries.

There is also evidence that the constraints faced by microenterprises and the implied project assistance needs also vary with the size of the firm. In Northern Nigeria (Chuta, 1989), for example, working capital was the most frequently cited difficulty facing firms expanding with one or two workers, but finding a good manager became the most frequently cited constraint for those firms expanding with six or more workers. The nature of the financial constraint also appears to vary by firm size (Liedholm, 1989). Finally, there is evidence that the number of perceived constraints facing expanding firms tends to increase with firm size (Liedholm, 1990).

Do the growth rates of micro and small firms vary by the firm's age? The important life-cycle aspects of firm growth have rarely been studied in developing countries; yet the age of the firm would appear to be a crucial determinant of firm dynamics. The only studies that have examined this relationship have been conducted in India (Little et al., 1987), Colombia (Cortes et al., 1987), and Northern Nigeria (Chuta, 1989). In all three countries, an inverse relationship was found to exist between the age of the firm and its growth rate. This result held for all of the subsectors examined in these countries. Unfortunately, no statistical tests of significance were conducted in these studies, so the results can only be treated as indicative.

Several studies of small enterprise dynamics in the United States have rigorously examined the relationship between age and firm growth, including the previously mentioned works of Evans (1987) and Dunne et al. (1989). Both of these studies found that the growth rates of firms declined as the firms aged. In Evans' study, the negative relationship between growth and age held for 76 percent of the U.S. industrial sectors examined. The empirical findings as well as those from developing countries are again consistent with deductions from Jovanovic's theory and point to the importance of incorporating life cycle components into any analysis of firm dynamics.

The speed and duration of the growth that occurs in these micro firms has also begun to be scrutinized in several developing countries. Much of the growth of surviving firms does not occur gradually, but takes place rapidly over a limited period of time. In Northern Nigeria (Chuta, 1989), for example, over two-thirds of the interviewed firms had experienced limited periods of "very fast growth." These occurred most frequently among the smallest firms (1-2 workers), when they were between five and 10 years old. Similar results have been found in Niger (Fisseha, 1990), Jamaica (Fisseha, 1982), and the United States (Phillips and Kirchoff, 1988).

Another strand of recent empirical investigations of firm growth in developing countries has focused on the transformation of microenterprises into modern small and medium enterprises. This transformation is typically more complex and risky for the firm than simply expanding within the ranks of microenterprises (Boomgard, 1989). A recent study by Liedholm and Parker (1989) has begun to shed some light on this process. On the basis of a reanalysis of firm histories in four African countries (Botswana, Rwanda, Nigeria, and Sierra Leone), two Asian countries (Philippines and India), and one Latin American country (Colombia), they found that relatively few microenterprises graduate or are transformed into modern small or medium enterprises; most remained micro firms. Approached from the other side, the majority of modern small and medium enterprises did not graduate from the micro seedbed, but originated as larger firms in six of the seven countries. The percentage of small and medium firms that were transformed from micro firms was higher in Asia and Latin America than in Africa. Preliminary analyses indicate that graduation or transformation rates varied by sector or subsector and by initial size of firm. There is also empirical evidence that graduation rates are significantly affected by the magnitude of the policy and managerial constraints (Kilby, 1987; Chuta, 1989; and Liedholm, 1990).

Other analysts have explored these issues in terms of transactions costs (Acheson and Wilson, 1990). Small firms cannot easily grow, it is argued, because of high internal transactions costs and high organizing costs; they cannot easily raise their productivity in ways that involve market transactions with other firms to obtain goods and services, because of high external transactions costs. The result is a continuing prevalence of small firms, all operating at low levels of productivity. To date, empirical estimates of the magnitudes of these different categories of transactions costs are lacking.

A final element of net firm growth that must be considered is the contraction or decline in the level of activity in surviving enterprises. Information on firm contraction is scanty in developing countries. Recent evidence from Northern Nigeria (Chuta, 1989), however, indicates that the majority (55 percent) had experienced a contraction at some point in their evolution. The percentage of firms experiencing declines was inversely related to both size and firm age. This result is counter to the direct relationship between contraction rates and the age and size predicted by Jovanovic's theory as well as Birch's empirical findings on U.S. firms.

### **Components of Net Change in Employment**

What have been the relative contributions of firm births, firm disappearances, and net growth of surviving firms to the overall net change in employment that occurs over time? This can be determined by recognizing that the net change in employment ( $\Delta N$ ) between two periods would be equal to the employment in new firms ( $\Delta B_N$ ), plus additional employment in expanding firms ( $\Delta G_N$ ), minus the employment loss in firms that contract ( $\Delta C_N$ ) and those that disappear ( $\Delta D_N$ ). If each of these gross flow components is expressed as a proportion of the employment in the initial period, the net overall growth rate of employment can be expressed as the sum of the four individual gross component growth rates:  $\% \Delta N = \% \Delta B_N + \% \Delta G_N - \% \Delta C_N - \% \Delta D_N$ . This identity focuses attention on the key sources of net growth or contraction over time that must be analyzed.

Empirical evidence on the relative importance of these four components of net change for manufacturing employment are currently only available for a few developed countries. These data are summarized in Appendix B, Table 1.

The most striking finding is the sheer magnitude of the changes in employment generated by each of these four components. Although the overall net annual change in employment is generally small (less than 1 percent), the four gross flows of employment creation and destruction are individually quite large, ranging from 2.5 to 3.5 percent, for example, in the United States. There is thus a great deal of churning among firms. Moreover, in the United States, the annual gross changes in employment due to birth and deaths exceed those from the growth and contraction of existing firms.

The relationship between the size of firm and the gross flow of jobs is also an important element in this analysis. Are small firms the major source of new jobs in the economy? Empirical studies of this topic are only available for the United States from 1981 to 1985 (Birch, 1987). An examination of data derived from Birch's study, which are summarized in Appendix B, Table 2, reveals that most of the net expansion of new jobs resulted from the birth of small firms. Employment growth rates from the birth or expansion of existing small firms are higher than those from larger firms. Moreover, employment contraction rates for small firms are less than those for larger firms. Finally, although employment declines from death rates are higher for the small than for the larger firms, they are not high enough to offset the positive contributions from growth and births. Consequently, in the United States, the overall net employment growth generated by small firms exceeds that generated by larger firms. These data also reveal that this net employment growth for small firms comes more from the net employment changes in existing firms ( $\% \Delta G_N - \% \Delta C_N$ ) than from net employment changes in the number of such firms ( $\% \Delta B_N - \% \Delta D_N$ ). For firms of all sizes, the gross employment turnover process arises primarily from the birth of small firms, the expansion or death of small firms, and the contraction of larger firms. Unfortunately, similar data are not available from developing countries, but would be crucial in assessing the contribution of small firms to employment creation and the relative contributions of birth, disappearances, and net firm growth in this process.

The discussion of this section has focused on firm growth measured in terms of employment. Less attention has been paid in the literature to an examination of patterns of growth using other measures such as capital stock or output. In the absence of such analyses, it is impossible to know whether increases in employment were accompanied by increasing or decreasing productivity, nor what happened to levels of income earned by different inputs as employment levels have changed.

## ISSUES AND MAJOR THEMES

The major issues to be addressed at this level of analysis revolve around the dynamics of the individual firm. The analyses must transcend the standard, static approach to the theory of the firm and place the firm in an evolutionary context. Consequently, it is important to examine the firm over its entire life cycle, from birth, through possible net growth, and possible disappearance. Given the paucity of information on this subject, one of the key early objectives of this activity would be the generation of a solid body of data on this process. Armed with these data, the primary overall goal would then be to

analyze them to ascertain if there are systematic patterns in the evolution of such firms in developing countries.

In examining the factors influencing the birth of microenterprises, for example, attention must be directed at isolating, if possible, the key determinants of this process. Some of these stem from the demand side, such as changes in the aggregate level of economic activity or in the demand at the subsector level. Others arise more from the supply side, such as changes in relative microenterprise efficiency or in the experience and education of the entrepreneur. Many of these variables would not be generated at the firm level, but would be derived from other levels of the analysis.

The net growth of an existing firm is also influenced by a wide array of other variables. Both theory and empirical work have identified several such variables. Paramount among them are the size and age of the firm; indeed, recent studies have reinforced the importance of incorporating these life cycle aspects of a firm. In addition, however, there are other variables, such as location and subsector, that have tended to be neglected but must be included in any firm-level dynamic analysis. Moreover, many analyses of the changing attributes of the entrepreneur would be relevant to this issue and must be incorporated into the analysis. Finally, it would be important to examine how the nature and extent of the constraints facing firms, including those arising from policies, vary as these firms evolve.

The disappearance of firms is influenced by many of these same variables. Age, size, location, and subsector as well as entrepreneurial variables will play key roles. One of the expected outputs of this work on disappearances as well as net growth would be stylized firm profiles, which would portray the firm's likelihood of surviving and growing to various sizes as the firm ages, given its initial size and subsector. It will also be important to determine if there are significant differences in the characteristics of those firms that survive and those that disappear.

The speed and character of the growth of firms should also be examined. Particular attention should be focused on examining the nature of the limited periods of rapid growth — growth spurts — which frequently can be critical junctures in the evolution of the firm. Attention should also be directed to the transformation of microenterprises into modern small and medium enterprises and the identification of the factors that induce or constrain this process.

## **RESEARCH QUESTIONS AND HYPOTHESES**

The hypotheses to be examined at the level of the firm would seek to explain and predict the behavior of the key components of the life cycle of individual firms in developing countries. Specifically, these components, which are the dependent variables in the analysis, are the birth, net growth, and disappearance (or its inverse, survival) of these individual firms. The central issues that must be addressed relate to identifying the key determinants — the independent variables — and the way they might be hypothesized to affect these components of the firm's life cycle.

What are the determinants of the birth rate of a micro or small firm in a developing country? The primary explanatory variables for firm birth rates do not arise at the firm level, but rather are external to the firm. Paramount among these external variables are those that stem from the macro and

subsector level. From the macro level, it would be hypothesized that changes in the aggregate level of economic activity would be expected to influence firm birth rates. Although this relationship is typically found to be positively related in developed countries, it is not at all certain that this should be expected to hold in developing countries. From the subsector level, it would be hypothesized that the firm birth rates would vary importantly by subsector. Birth rates of microenterprises would be expected to be highest in those subsectors that are growing rapidly, and particularly in cases where the microenterprises are concentrated in dominant or growing channels of the subsector.

The growth and survival (the inverse of disappearance) of firms, on the other hand, could be viewed as outcomes of a single economic process. Consequently, the explanatory variables and the hypotheses formulated for growth and survival might usefully be treated together. Some of these explanatory variables will arise at the firm level while others arise either inside the firm (micro-micro) or outside of it. Indeed, the hypothesized relationships between key entrepreneurial characteristics, such as gender, education, and experience, and growth and survival have already been set forth in the previous section.

Both the growth and survival of small and micro firms would be expected to be influenced by several key firm-level variables. Paramount among them would be the age, initial size, and location of the firm. These would be hypothesized to be related to these dependent variables as follows:

- Firm age, reflecting the importance of the life cycle, would be expected to be inversely related to growth and survival;
- Initial size would also be expected to be inversely related to these variables; and
- Locality size would be expected to be directly related to net growth and survival.

Finally, firm growth and survival would also be expected to be influenced by factors external to the firm, including variables at the subsector and macro levels. Growth and survival would be hypothesized to vary by subsector. Subsectors that are growing rapidly and that are not highly concentrated, for example, would be more likely to have stronger firm survival and growth rates than those in which the opposite conditions hold. Beyond the subsector, it is hypothesized that changes in the aggregate level of economic activity would have a direct effect on small-firm growth and survival in developing countries. The external constraints, including policy, facing these firms are also hypothesized to have an influence on their growth and survival. It is hypothesized that the number of constraints, including the negative effects of policies, is directly related to the size of the firm; the types of constraints are also expected to vary systematically with the evolution of the enterprise.

In summary, a wide array of variables, ranging from those emanating from within the firm (micro-micro) to those external to the firm, must be included in any analysis of firm dynamics in developing countries. If the various hypotheses relating these variables are found to be statistically validated, progress will have been made in determining whether systematic patterns exist in the life cycle of these firms.



## ANALYTICAL APPROACHES

New approaches must be used when undertaking studies of firm dynamics in developing countries. This applies to the survey methods needed as well as the analytical procedures chosen.

The information needed for firm dynamics studies in developing countries, for example, are rarely available. Particularly scarce are data on microenterprises, which typically are not captured in government statistics. Even when special surveys of microenterprises are conducted, they tend to focus on the current status of the firm and rarely shed light on its evolution over time.

Moreover, even when dynamic data are collected, they frequently are incorrectly specified. Firm birth rates, for example, are frequently measured in terms of the change in the number of firms in a given period (see Acs and Audretsch, 1989). This measure fails to account for the firms that disappeared during the period, yielding a measure of net births rather than the desired gross birth measure. Ideally, the firm birth rate should be calculated by dividing all the new firms appearing in a given time period by the total number of firms in existence at the beginning of the period. One year is the usual time period, so complete counts of the numbers of firms at the beginning and end of the year would be required; the number of firms one year old or less at the end of the year would be considered to be the births. Yet even this procedure misses the firms that appeared and then disappeared within the year. This is one manifestation of the sample censoring problem; in this case, the longer the period covered, the greater is the downward bias in birth rates.

Similar difficulties arise in measurements of firm death rates. Firm disappearance rates are usually calculated by dividing all firms that can no longer be located at the end of a given time period, typically one year, by the total number of firms in existence at the beginning of that time period. If disappearances are to be measured, however, even the baseline data at the beginning of the period must be firm-specific, a condition not required for birth rate calculations. Furthermore, this procedure once again misses those firms that both are born and die within the period of analysis.

Another important measurement issue centers on the need to generate more precise information on the nature of the disappearances. In most surveys, a dead firm is one no longer operating in its listed activity at its previous location (Liedholm and Parker, 1989). Consequently, a dead firm does not necessarily constitute a business failure; it may simply have changed location or shifted into a somewhat different line of activity. Indeed, in some instances, a firm disappearance will be linked to a new firm birth or firm transformation, all elements of the dynamic processes that can be illuminated only by a careful analysis of firm disappearances.

### Survey Methods

What types of survey methods must be employed to generate the needed dynamic information on micro- and small-scale enterprises in developing countries? Given the weaknesses in the existing data sources and in the conventional survey procedures used to generate them, an array of innovative data collection approaches must be developed. These would include retrospective censuses and selective bore hole surveys as well as longitudinal (prospective) surveys of such firms.

### **One-Shot Method**

One survey approach would be to carry out repeat, one-shot, cross-section census enumerations of micro firms in countries where similar census enumerations have been conducted. Lists are available in several countries of all the individual firms, along with basic information on their size, nature, and composition. A one-shot resurvey in some of these countries would enable one to determine not only the birth and growth of firms, but would also provide a list of the firms that had disappeared. These nonsurviving firms could then be hunted in a companion tracer study to ascertain the reasons for their disappearance. Earlier attempts to trace dead firms have met with mixed results; 75 percent of the disappeared firms were successfully traced in Ecuador (Middleton, 1989), but that percentage declined to one-third in Sierra Leone (Chuta and Liedholm, 1985) and Nigeria (Frischman, 1988). Such information would permit a more complete analysis of firm survival and growth as well as testing the validity of previous predictions of firm success based on surviving firms only.

One-shot census enumerations could also usefully be carried out in countries where none had previously existed. This information would provide the baseline needed for calculating firm birth and death rates as well as for launching other studies of firm dynamics. Since these surveys typically generate only a limited amount of information, all of which only concerns the current status of the firm, the survey might be modified slightly to provide some dynamic insights. Specifically, this could be accomplished by adding a few additional questions, such as on firm age, initial size, and even the growth in the number of similar firms in the area. Moreover, in the same survey exercise, it may be possible to inquire whether or not the enumerated individual had in the past ever run a small-scale enterprise that was no longer in existence. If so, information could then be obtained about this disappeared enterprise, such as its beginning and ending dates, size, and reasons for disappearance. Such a survey approach has been used in Kenya (Parker, 1991).

### **Bore Hole Survey**

Another survey approach would be to conduct bore hole interviews — retrospective histories — of selected entrepreneurs as well as their firms. These surveys can be undertaken even in those countries where no previous one-shot censuses have been conducted. The in-depth, retrospective histories of the entrepreneur and firm can provide important insights into the pattern of change in existing firms and the constraints, both internal and external, they have faced at different stages in their life cycle. The detailed information can also generate a path analysis of the critical junctures in the development of the firm and entrepreneur. Not only microenterprises but also some small and medium enterprises could be interviewed to provide insights into how many firms graduated from the microenterprise seedbed and the constraints and problems they faced in doing so.

### **Longitudinal Method**

A final survey approach involves conducting longitudinal surveys of existing firms over a period of time into the future. A sample of firms would be surveyed at least quarterly over a several-year period

to generate a rich array of flow data, such as sales, employment, and selective costs. These flow data can then be analyzed to generate efficiency and other parameters that could be analyzed in relation to the life cycle of the firm. Such information could provide crucial illumination of the issues of efficient firm evolution as well as the constraints faced in this process. Frequent interviews will also provide insights on firm disappearances, particularly on what happens to the entrepreneur and workers, and on the severity of the sample censoring problem. This process can be integrated with the regular monitoring of enterprises receiving assistance. When combined with the collection of comparable data from a control group, the approach makes it possible to evaluate the impact of the assistance.

### **Individual Firm Time-Series Data**

In addition to these survey approaches, individual firm time-series data can also frequently be obtained from organizations engaged in providing assistance to microenterprises. Several assistance organizations, such as ADEMI in the Dominican Republic, have generated a wealth of information on their microenterprise clients over a period of several years.

### **Data Analysis Approaches**

The information generated by these various surveys can be analyzed in a variety of ways to illuminate firm-level dynamics in developing countries. These approaches can range in complexity from simple tabular presentations of the key relationships to more sophisticated statistical analyses of these relationships.

The most basic approach would be simply to report the values of the key dependent and independent variables in tabular form without any statistical analysis of the underlying relationship. Such tables, however, only provide a crude indication of whether a significant relationship exists between these variables. To truly verify these relationships, more sophisticated statistical analyses are required.

Several statistical issues must be addressed by these analyses. Among these are sample censoring, which is particularly important in dynamic analyses due to possible unrecorded births and deaths of firms, omitted variables, the functional form of the relationships, and significance levels (see Evans, 1987). Several straightforward tests for significance, such as Analysis of Variance and Chi Square tests, can be applied to the tabular data previously described. More refined econometric approaches are required, however, if these other difficulties are to be overcome.

Three such approaches have recently been developed that may be usefully applied to studies of firm growth and survival in developing countries. The first is the grouped data regression model recently devised by Dunne, Roberts, and Samuelson (1989) and applied to dynamic issues of the firm in the United States. In this approach, observations on firms are grouped into cells, based on size, age, subsector, and ownership. For each cell, separate statistics are constructed for the failure rate, the mean growth rate for all firms, the mean growth rate for nonfailing firms, and the variance of the growth rates. A simple linear regression model, using ordinary least squares estimation techniques, is then used to examine the across-cell pattern for each of these variables. The estimated coefficients provide statistical evidence of the various contributions of the major determinants of firm survival and growth. Sample

censoring is addressed and no assumptions about the distribution of the error term are required. A disadvantage of the approach is that much information is lost when firms are grouped, thus making the estimation procedure relatively inefficient.

A second approach is the Heckman selectivity model, which both Evans (1987) and Hall (1987) have used to study firm growth patterns in the United States. In this approach, the two dependent variables — the firm growth rate and the firm survival probability — are jointly estimated using maximum likelihood estimation techniques.<sup>3</sup> Both dependent variables are related to age and size of the firm. The coefficients estimated in these growth and survival equations provide statistical evidence of the role of the independent variables in this process and also on the severity of the sample selection problem. Although this particular approach is more efficient than the grouped data model, it is based on some rather restrictive assumptions about the distribution of the error terms. Other independent variables besides age and size might also usefully be included in the analysis.

A third approach would involve the use of duration and hazard models. Although these models have been applied in economics primarily to duration of unemployment issues, they could fruitfully be applied to issues of firm dynamics (see Kiefer, 1988, and Rhyne, 1988). In such an application, the dependent variable would be either the length of the firm's life (duration analysis) or the conditional probability of firm failure (hazard analysis). In hazard analysis, for example, the independent variables might include such parameters as the firm's age, size, subsector, location, and experience of the entrepreneur. Perceived constraints (including policy) might also be added. Regression analysis would be used to ascertain the contribution of these variables to the probability of a firm surviving one more year.<sup>4</sup>

On the basis of these various analyses, it may be possible to construct stylized firm profiles. The regression results will reveal which of the independent variables are most important and the way they affect various dependent variables of interest. If, for example, initial size, age, and subsector were found to be the most significant, they would be included in the construction of the stylized firm profiles. Given initial firm size and subsector, the expected or stylized size and survival probabilities of the typical firm in that subsector at various ages could then be portrayed in tabular form.

Finally, for growth spurts and graduation rates, no statistical analyses of these topics have yet been conducted. These issues, however, could be analyzed productively by means of regression models (including logit and probit models) as well as by more basic tests, such as Chi Square and Analysis of Variance.

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<sup>3</sup> The growth rate is estimated by a regression equation of a second order expansion of  $\ln(\text{growth})$  on age and size  $\{(i.e.) \ln \text{growth} = b + c \ln \text{size} + d \ln \text{age} + e \ln (\text{age})^2 + f (\ln \text{size})^2 + g (\ln \text{size})(\ln \text{age}) + u\}$ ; the survival probability is estimated by a probit equation for survival in which age and size are the independent variables and if the firm survives the dependent variable is one (see Evans, 1987).

<sup>4</sup> Several distributional assumptions are possible in the hazard framework and it is not necessary to assume a normal distribution. For some distributions, however, it is difficult to interpret the estimated regression coefficients (see Kiefer, 1988). The sample censoring problem is taken care of in these models.

## SECTION FOUR

### SUBSECTOR ANALYSIS

#### THE STATE OF THE ART

Subsector reasoning offers an analytical approach that has found widespread acceptance. Practitioners and analysts with a wide range of backgrounds have adopted approaches that have much in common, particularly in the way they partition the economy for analysis, isolating a segment of the world for examination. Among the central, defining characteristics of this common approach are the following features:

- The universe under examination is not limited to micro, small or informal producers, but includes enterprises of all types and sizes engaged in the production of a particular group of commodities; and
- The frame of reference of the analysis includes suppliers of raw materials and intermediate products as well as producers of finished products. Equally important, it includes in its field of analysis the marketing and distribution systems and contracting arrangements that link the various stages in the production process. Particular attention is paid to these vertical linkage mechanisms.

#### Subsector Analysis and Agricultural Economics

The most thoroughly articulated presentation of this approach has been in the field of agricultural economics. It was here that the analysis was first elaborated, the terminology was first developed, and the first applications undertaken (Shaffer, 1973; Marion, 1976).<sup>5</sup> In the field of agricultural economics in the United States, the approach continues to be used as a framework for analysis, particularly among those engaged in extension work, informing extension agents and through them the participants in the industry about the structure of the subsector and opportunities for improved performance. The concept of verticality, along with the associated approach that views input suppliers, farmers, processors, and traders in a systems perspective, has come to be widely used throughout the profession.

An important set of applications of subsector analysis in agricultural economics has been done in the Third World, in the context of the Latin American Market Planning (LAMP) Center at Michigan State University. This series of studies, involving at least 11 Doctoral dissertations and three Master's theses, involved the use of a subsector approach for the analysis of production and marketing systems for agricultural products in countries of Latin America and the Caribbean (see Harrison et al., 1987, for a summary of this work). Subsequent work developing this approach was undertaken in the context of a

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<sup>5</sup> A good review of the historical antecedents of this approach, tracing it back to earlier work in the field of industrial organization, is presented in McLaughlin, 1983.

series of rapid rural appraisal studies (see Holtzman, 1986). These simplified subsector studies have focused on particular agricultural crops or product groups, looking at production and distribution systems, with particular attention to marketing patterns. Ten such studies have been completed or are under way.<sup>6</sup>

A parallel set of studies has been under way for a number of years among agricultural economists in France. Originally developed to provide an analytical context for French policies aimed at the regulation of domestic food systems, this approach has subsequently been applied to systems of agricultural production and marketing in the Third World, particularly (but not exclusively) in francophone Africa. A summary of a number of these recent studies is provided in Griffon (1990).

### **Subsector Analysis and Small Enterprises**

The subsector analytic approach, with roots in agricultural economics, has found a further application in the analysis of small enterprises in the Third World. The historical evolution of these subsector-based studies of small enterprises has been explored in some detail in Haggblade (1984) and Boomgard et al. (1986). A recent paper (Boomgard et al., 1990) reviews the coverage, approach and findings of eight studies undertaken using this subsector approach to examine the situation of small enterprises in five different countries. Since that report was completed, six other briefer studies have been undertaken in two other countries, making use of some aspects of the subsector approach (O'Regan et al., 1989, for Malawi; Mead et al., 1990, for Niger). Studies are also planned in Lesotho, Mali, and several other countries.

Efforts were made in each of these small-enterprise subsector studies to address issues of change in the subsector: by collecting historical data about patterns of development in the subsector, asking participants about past evolution in their own enterprise and their interpretation of the causes for such changes, and collecting data about current returns to the entrepreneur (a key indicator of incentives for change among producers) and costs to consumers (a key indicator of the competitiveness of alternative sources of supply). But no comprehensive bore hole studies of firms have been done in conjunction with these subsector studies, nor have there been opportunities to follow the evolution of subsectors over time. Furthermore, virtually no work has been done looking across subsectors or across countries.

### **Other Methodologies Similar to the Subsector Approach**

Researchers and practitioners in other fields with different institutional or professional backgrounds have adopted methodologies that have characteristics similar to this approach.

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<sup>6</sup> In Senegal, course grains; in Niger, cow peas, hides and skins, and onions; in Tunisia, grains; in Madagascar, rice; in Chad, fruits and vegetables; in Bolivia, alternative crops to coca; in Nepal, vegetable seeds; and in Burundi, a broader study looking at rural marketing systems in general. All of these studies were done by Abt Associates.

## **Industrial Organization**

A significant body of analysis, involving research that overlaps in many ways with the reasoning discussed here, emerges from the field of industrial organization in business schools and graduate programs in economics. An important contribution of this vein of reasoning has been the analysis of issues of vertical coordination between different stages in production and distribution systems. Building on the work of Coase (1937), Williamson (1975), Porter (1980), and Nelson and Winter (1982), this body of analysis has explored issues of industrial organization and firm structure with particular attention to alternative mechanisms for linking different stages in production and distribution systems. The polar cases of coordination through market-based contracts versus integration within firms are widely recognized. There are also many types of intermediate cases, some of which are of particular significance for small enterprises in developing countries (for example, types of subcontracting arrangements; see Mead, 1984, and Davies, 1988).

Porter's recent book (1990) carries this reasoning in a somewhat different direction, exploring the interactions between the national policy environment and enterprise strategy, in an effort to understand why some firms based in certain countries have been particularly successful in global competition. Porter's analysis pays attention to the importance of efficiency in supplier industries; it also includes a discussion of the nature of the competition in the markets in which the enterprise sells. But the focus of the analysis is on enterprises, seen in the context of an industry traditionally defined. The author gives little or no attention in his discussion to such issues as vertical coordination, the importance of the distribution system in facilitating growth in the channel, competition between channels, or alternative degrees of vertical integration within a channel.

Other analysts in the area of industrial organization have focused on important new developments in production technologies and management information and control systems. These developments have substantially increased the flexibility with which large and highly mechanized firms can adapt their output to changes in demand (see Milgrom and Roberts, 1990, for a review and summary of several recent studies in this area). The implications of these recent developments for microenterprises, particularly those in the Third World, have nowhere been explored.

## **Branch-Specific Studies**

Schmitz's 1982 work on branch-specific studies originated in a series of case studies of employment among small enterprises in Brazil, done for the United Nations Development Programme/International Labor Organization (UNDP/ILO). Schmitz then went beyond these case studies to undertake a broader review of "what the literature in general has to say on growth constraints in urban small-scale manufacturing in developing countries" (Schmitz, 1982a).

Schmitz concluded that while cross-section surveys of small enterprises such as those undertaken through the world employment program of the ILO "provided a good deal of descriptive information [on small or informal sector enterprises, they] fell down badly on the question of growth potential or constraints" (Schmitz, 1982a, p. 442). For the latter goal, he suggests an approach built around an analysis of particular "branches" of economic activity.

Schmitz defines a branch as "the collection of productive units that undertake an activity in accordance with the ISIC at three or more digits, depending on the specificity required. However . . . additional information is desirable from linkage units such as suppliers of raw materials, credit, technology or buyers of products. Hence, for the purpose of the research in debate, a branch should be understood as the collection of productive units and its relevant linkage units" (Schmitz, 1982a, p. 443). While less thoroughly articulated, this is entirely consistent with the subsector approach.

### **Commodity Systems Perspective**

Regional planners and geographers, such as those associated with the SARSA (Settlement and Natural Resource Systems Analysis) project, have adopted a commodity systems perspective that is similar in many ways to the subsector approach (Bendavid-Val et al., 1988). They have found this commodity-focused perspective to be the most effective means of giving precision to the analysis of linkages between rural and urban development in a regional perspective.

SARSA's commodity systems approach differs somewhat from subsector analysis. Commodities are selected for examination on the basis of their representativeness of the range of commodities produced in a particular region rather than their potential for development. The analysis only examines in depth those activities that take place in rural areas; in this sense, the scope of their analysis is narrower. On the other hand, they include in their framework all of the re-spending of income earned within a commodity system, a change that pushes them to examine factors somewhat broader than those covered in subsector analysis. The emphasis is on regional income multiplication effects and opportunities for enhancing these effects within the region. With this strong regional emphasis, the focus of the analysis is somewhat different from that of subsector reasoning.

In summarizing the major insights they have gained from the application of their Rural-Urban Exchange analysis, two of their principal insights are particularly relevant to subsector analysis:

The key commodity systems approach is a useful tool for minimizing research while documenting critical aspects of rural-urban exchange and associated income generation and multiplication in rural regions.

Deriving economic indicators at transactions points in key commodity systems, and examining factors in the conditioning environment that heavily influence them, is essential for understanding the relevant factors in rural-urban exchange and income generation processes (Bendavid-Val et al., 1988, pp. 41, 43).

Their transactions points are similar to the nodes we have identified; their emphasis on data collection focusing on these points in the system is entirely consistent with ours.

### **Sector/Systems Approach**

A fourth current of reasoning with many similarities to subsector analysis emerges from the work of microenterprise promotion agencies. A prime example here is Technoserve, which has adopted a



sector/systems approach to their enterprise development activities. As reported in Bowman and Reiling (1989), this approach has much that is similar to subsector analysis, although it has some differences as well. First as to similarities, the inclusion in the analysis of inputs and markets (that is, forward and backward linkages) as well as direct and indirect competition is entirely consistent with the subsector approach. It is stated that the approach incorporates the economic, political and social (cultural) environment. While this sounds ambitious, its implementation is probably similar to that followed in subsector studies.<sup>7</sup> The description of the approach used in the Technoserve project working with the palm oil sector in Ghana makes this appear to be a classic subsector approach.

Questions arise when it is claimed that the same approach is used in other "sectors," described in one case as "agricultural credit," in another as "savings and credit." These are not subsectors; it is hard to see how the concept of verticality, which both Technoserve and others have found to be central to the approach, can be applied to credit activities such as these.

In sum, when applied as they have done to commodity groups (livestock, edible oils, water, and so on), their approach is not significantly different from subsector reasoning. Trying to use the same tools of analysis to look at other activities such as credit programs is much less plausible.

These diverse studies and approaches have generally been undertaken in isolation, with little awareness that others are pursuing similar lines of reasoning. The terminology is inconsistent from one approach to another, and the degree of sophistication of the analysis is uneven. While much has been learned from these studies, the learning has been specific to the particular country and subsector under examination. For small enterprises in the Third World, some generalizations with regard to approach and findings were presented in Boomgard et al. (1990); but the challenge of drawing conclusions concerning subsector dynamics based on a coordinated set of related studies in individual countries supplemented by cross-country analysis looking across subsectors and across countries still lies ahead.

## ISSUES AND MAJOR THEMES

An understanding of patterns of growth and development of particular microenterprises requires an examination of two sets of factors: those that are specific or internal to the individual enterprise, examined in the first two levels of analysis discussed above (that is, the individual, and the firm); and those that are external to the enterprise — the context in which the enterprises operate. The principal contributions of subsector analysis focus on an analysis of important aspects of this context. The analysis includes contextual factors operating on both the supply side and the demand side. On the supply side, it focuses on developments upstream and downstream in the channel, including the marketing systems that link the enterprise in both these directions. On the demand side, contextual questions involve an examination of the linkages between a particular subsector and other parts of the economy, including a disaggregation of the subsector into its components, exploring the competitive position of the different

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<sup>7</sup> Bowman and Reiling state that "the needed background information is broadened to include all of the prices, markets, processes, ministries, and regulations which affect" the enterprise (p. 3).

channels within the subsector and the demand situation facing producers in different channels.<sup>8</sup> The analysis focuses attention on:

- The position of a microenterprise in its channel: the extent to which it performs multiple functions or specializes in a more limited range of activities; its own efficiency, the efficiency of other producers in its channel, and the effectiveness of the linkage mechanisms that join together the different participants in the channel;
- Competition between whole channels, rather than concentrating solely on the performance of particular functions in a channel;
- The patterns of change in the subsector, examined in terms of the changing strengths of different channels in the subsector and the changing positions of microenterprises within their channel; and
- Closely related to and arising from this descriptive and analytical work — the prescriptive dimension, aimed at identifying cost-effective interventions that could facilitate an expansion of efficient enterprises.

To date, subsector work dealing with small enterprises in the Third World has been done in one country and one subsector at a time, with little effort to draw lessons looking across countries or across subsectors. By now, enough studies have been completed so it is possible to begin asking questions about systematic patterns of change at the level of subsectors.

### **Five Dimensions Required to Analyze Subsector Change**

A review of existing studies suggests that there is a need for new ways of conceptualizing the process of change at the subsector level: what aspects of change do we need first to document, then to explain in terms of causation? In addition to issues examined in such studies to date, five different dimensions need to be added to the conceptualization of the process of change at a subsector level.

The first of these concerns the question of specialization. Increasing specialization is a central feature of the process of economic development, characteristic of both production activities and distribution systems. It means that, as development takes place, the transformation of raw materials into finished products involves increasing numbers of steps as well as increasing numbers of people, each specializing in a smaller part of the total process. In this sense, the production/distribution system becomes more complex. Increasing specialization is at the root of rising productivity (that is, increases in output per unit of input), which in turn is fundamental to growth in income per capita.

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<sup>8</sup> While the issues under discussion here are closely related to questions to be addressed at the fourth level of analysis discussed below, which concentrates on intersectoral and macro linkages, these broader linkage issues can best be explored in ways that make use of subsector reasoning, hence their discussion here.

The role of microenterprises in that evolution towards increasing complexity and increasing specialization depends on the extent to which the evolution occurs in vertically integrated firms that manage all of those steps internally, or through an alternative pattern whereby the different steps take place in separate enterprises linked through the market. For microenterprises to play a continuing and positive role in this process, two things are necessary:

- The microenterprises must adopt patterns of increasing specialization in their own activities, perhaps narrowing the range of functions that they perform while raising the quality and lowering the cost of those that they do undertake; and
- They must rely increasingly on other participants in their channel: for inputs (whether raw materials or intermediate products) as well as for marketing (buying inputs and selling their products).

The development of low-cost and reliable linkage mechanisms between successive steps in the production and distribution system is a precondition for this type of evolution to take place in ways that involve a continuing and expanding role for microenterprises. When such linkage mechanisms exist, specialization can take place in different stages of manufacturing and in marketing systems in ways that make it possible for microenterprises to participate in dynamic and efficient development.

Two examples may help illustrate this process. The first is from the beer subsector in Botswana (Hagglade, 1984). Brewers in that country have traditionally produced their own malt, which they use in making millet brew. Hagglade's subsector study found that both the traditional producers and the country would be substantially better off if they purchased trade malt made in larger, specialized malt houses, restricting their activities to brewing and retailing functions.

The second example is from the garment industry in Egypt (Davies, 1988). Small rural tailors and dressmakers traditionally sell directly to final consumers, constraining their production to the rhythm of highly localized and slowly growing rural markets. Changing this system to sell through a middle-man to urban retailers enables them to gain access to a much larger and more dynamic market; but that change requires that they make other alterations, including changes in the quality and style of the products they make and in their financing patterns.

In both of these cases, development has meant that microenterprises have been able to raise their productivity by restricting the range of functions they undertake, relying on other, more specialized firms to perform tasks they formerly did themselves. This need not always be the case; but if development means increasing productivity through increased specialization, then we would expect microenterprises participating in that process either to restrict the range of their activities in the ways described above, or to get larger, enabling them to achieve increasing specialization with a constant degree of vertical integration. These alternative paths have substantially different requirements in managerial skills and environmental prerequisites (legal systems, regulatory environment, infrastructure, and so forth).<sup>9</sup>

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<sup>9</sup> Acheson and Wilson (1990) explore some of these same issues in terms of internal and external transactions costs.

An important counterpart of this process of increasing specialization is the question of risk. For the individual producer, the gains to be derived from increasing productivity associated with specialization need to be balanced against the increasing risk associated with "putting all one's eggs in one basket," as well as in being dependant on others in the channel — people over whom one may have little or no direct control. A better understanding of these risk-return trade-offs can help facilitate a move towards greater specialization which is central to rising productivity.

A second dimension of the needed new conceptualization concerns the firm-level counterpart of subsector-level change. When a particular channel in a subsector grows, does that happen through an expansion in the number of firms, all of a standard size, or through an expansion in size of existing enterprises, or through transformations whereby existing enterprises in other channels modify their activities to move into the more rapidly growing channel? What is the size mix of the firms participating in the growth process? To tie this back to the previous point, what changes are taking place in the number of functions performed (that is, in the degree of vertical integration) among the firms in expanding channels? These questions are particularly significant when one looks for policy or project-level interventions based on one's understanding of the process of change.

A third issue to be incorporated in the analysis looks at linkages between the subsector and the broader context in which it operates. Questions at issue here concern the impact on the evolution of the subsector of patterns of growth in the rest of the economy, at a national level as well as in particular related sectors or regions of the country.

A fourth issue to be examined here concerns the distributional effects of increases in productivity. Economic theory suggests that such changes can result in increases in income for those engaged in the activity, or decreases in the price of the product for its users, or (most frequently) some combination of the two. An significant determinant of the outcome here is the nature of the competition, within the channel and between channels. The differences between these outcomes are particularly important in determining the incentives for microenterprises to modernize and grow in particular subsector niches.

A fifth theme that needs to be incorporated into subsector research concerns the gender issue. Studies done to date indicate that there is often considerable specialization by gender, either at certain stages in a particular channel or sometimes through whole channels in a subsector. Important research issues here concern why this is the case, the nature of the channels or niches within channels in which women predominate, the identification of channels or niches where women have favorable growth prospects, the particular ways in which the risk element affects women, and the specification of needed interventions to bring about patterns of development involving improved opportunities for women.

With these five additions to the agenda of issues covered in subsector studies, the challenge is to determine whether there are systematic patterns of change at a subsector level, then to undertake analyses aimed at explaining the causes of these changes.

## **RESEARCH QUESTIONS AND HYPOTHESES**

Research hypotheses to be explored at the level of the subsector include the following propositions.

1. Low capital and skill requirements in a certain function or group of functions mean low barriers to entry. The resulting competition means low returns to participants in those activities.
2. Microenterprises that are fully integrated vertically, performing all tasks from input procurement through sales to the final consumer, face serious problems of competition either from other larger, fully integrated producers or from other channels involving separate, more specialized enterprises linked through the market. This competition will also generally mean low returns to participants in the small, vertically integrated activities.
3. Whether employment declines or expands in channels with declining returns to microenterprises, arising from forces such as those set out in points 1 and 2 above, depends on the availability of alternative income-earning opportunities elsewhere in the economy.
4. In growing channels in which microenterprises play a significant role and incomes are rising, the microenterprises generally either purchase a major share of their inputs or sell their products through intermediaries. In such cases, a large share of the expansion in output will come from enterprises engaged in this type of functional specialization, whether as producers or as traders.
5. Growing channels in which microenterprises play a significant role are more likely to be found in countries where a favorable environment exists — where:
  - A well-developed legal system exists that leads to efficient enforcement of contracts;
  - Government licenses and regulations do not hinder entrepreneurial initiative;
  - The literacy rate and/or the supply of secondary school graduates are relatively high;
  - The system of roads is well developed; and
  - The tax system and foreign exchange allocation procedures do not discriminate against small producers.

In countries meeting these conditions, prospects are favorable that the response to growth in demand can be met by channels that are not fully integrated vertically, in which microenterprises play a significant role.

6. There is considerable specialization by gender. Sometimes this occurs for whole channels, and in other cases for particular stages in the transformation process of a particular channel. If women play a significant role at key points in a channel, they will be disproportionately represented at other points in the channel as well.

## **ANALYTICAL APPROACHES**

Three different survey methods will be used to generate data needed for the analysis of these subsector-based research issues.

- Surveys in countries and subsectors that have not previously been examined. These can be done with differing degrees of intensity in terms of extent of coverage of the country, amount of detail, time devoted to the study, and numbers and types of people involved. Experimentation with differing degrees of intensity can help clarify the advantages and limitations of each;
- Repeat surveys of subsectors previously studied. Repeat surveys (for example, of the furniture subsector in Thailand or the garment subsector in Egypt) should be approached in a different way from new subsector studies, since the repeat surveys provide opportunities for analyses not possible for new studies. For example, repeat surveys can search out producers previously interviewed to explore with them changes in their own situation as well as in that of the subsector in which they operate; and
- In some cases, it will be possible to follow subsectors over time, monitoring changes longitudinally through prospective surveys.

Various approaches will be used in the selection of subsectors for study and in the analysis of data collected from these studies. These approaches will be guided by a number of guiding principles.

1. It is useful to undertake studies of the same subsector in several different countries, to explore the impact of country-specific factors on patterns of growth in the subsector.
2. It is useful to undertake studies of several different subsectors in the same country, to explore the differences between subsectors, all operating in the same environment.
3. It is useful to incorporate a regional dimension into the analysis, using a subsector context to compare patterns of enterprise development in two regions of one country with, for example, high and low agricultural growth, to explore the impact on the dynamics of the subsector of such differences in the context in which it operates.
4. When possible, it is useful to return to locations where subsector studies were done previously, to explore changes that have taken place and see how well the analysis of the original study has stood the test of time.
5. There are important synergistic forces at work when several different types of studies are undertaken in the same location. Studies of the characteristics of individual entrepreneurs and of patterns of birth, growth, decline, and death of individual firms can benefit from an understanding of the subsector context in which these changes take place, and can contribute in turn to an understanding of the subsector

dynamics. All of this means that it is important where possible to undertake these different types of studies in the same locations and same industries, so they can be mutually reinforcing along these lines.

6. In the selection of subsectors for examination as well as in the choice of countries, it is useful to include some success stories: cases in which there has been a significant expansion in output and employment in subsectors and channels involving microenterprises. This may involve collection and analysis of information about such countries as Italy and Japan, to determine how they have succeeded in this regard. In the same vein, it is important to include some subsectors in the analysis where there are good prospects for participation by women.

7. It is important to look for ways of involving interested parties in subsector research, developing national constituencies of potential users of the analysis, both to increase its validity and to add to its potential impact.

## SECTION FIVE

### INTERSECTORAL LINKAGES AND MACRO ANALYSIS

#### THE STATE OF THE ART

There have been relatively few intersectoral or macro analyses of microenterprises in developing countries. These studies focus on how changes in the size, type, or location of enterprises are affected either by changes in the aggregate level of economic activity or by changes in other major sectors of the economy.

The theoretical literature is remarkably silent on how broad categories of microenterprises would be influenced by changes in the aggregate level of economic activity. One exception is Dennis Anderson (1982), who has used a form of stage theory to explain changes in the size structure of enterprises over time. In the early stage (Phase I), household enterprises — the smallest units — predominate; in Phase II, modern small and medium enterprises emerge and increase at a rapid rate, displacing some of the household activities; in Phase III, large-scale enterprises predominate.

The extensive literature that has developed around the examination of the standard patterns of structural change that accompany economic growth, on the other hand, has paid little attention to issues of firm size (see, for example, Syrquin, 1989, and Chenery, Robinson, and Syrquin, 1986). Only Biggs and Oppenheim (1986) have made even an initial attempt to investigate firm size in a patterns framework. In these various formulations, demand factors, such as systematic changes in the pattern of final demand as per capita income rises, as well as supply factors, such as changes in human and physical capital and technology, all play a role (see, for example, Chenery, 1986).

Demand factors are central to the theories that focus on intersectoral linkages. Many of these theories center on the role of the agricultural sector as a "growth engine" and the nature and strength of the linkages from this sector to others. Mellor's (1976) model of a rurally led strategy of growth, Johnston and Kilby's (1975) agricultural and structural transformation model, and Adelman's (1989) agriculture-led industrialization model all have intersectoral linkages as their foundation. Each model provides insight on the way firm size might be affected by alternative patterns of agricultural growth. Consumption as well as backward and forward production linkages play key roles in these formulations. One important hypothesis that emerges is that increases in output from small-scale farms generates more increase in microenterprise employment than corresponding increases from large-scale farms (Johnston and Kilby, 1975).

The empirical evidence at the intersectoral and macro level, though still limited, is richer than the corresponding theoretical literature. Several macro level studies have begun to identify systematic patterns of structural change in micro- and small-scale enterprises, while recent studies of intersectoral linkages have begun to generate estimates of their magnitudes.

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One of the macro patterns that emerges from the empirical studies is that the average size of MSEs tends to rise with increases in per capita income. Such a pattern has been revealed in the studies of Banerji (1978) as well as Biggs and Oppenheim (1986). In a recent review of the empirical evidence on firm growth, Liedholm and Parker (1989) found that the absolute number of MSEs is growing in virtually all the reviewed countries, but it is the one person size category that is growing the least rapidly. Employment in MSEs is also increasing in these countries, but in the majority of them it is growing less rapidly than in the larger firms, thus tending to shift the relative balance of employment towards somewhat larger enterprises.

There is also some limited empirical evidence that the location of MSEs tends to shift as the economy evolves. In Sierra Leone, Chuta and Liedholm (1985) found that microenterprise growth rates were directly related to the size of the locality. In cross-section comparisons, Haggblade, Hazell, and Brown (1989) document the increasing importance of nonfarm activities as one moves from the smallest rural village to the largest urban areas of Africa. A recent study in Niger supports this finding, but only if one restricts the analysis to primary sources of employment; if one includes part-time and secondary activities, employment densities were found to fall as one moves towards the larger locations in the regions studied (Mead et al., 1990). With this caveat, cross-section studies suggest that the locus of MSE activity shifts gradually towards larger localities, at least in Africa.

Finally, the sectoral composition of MSEs also appears to shift with increases in per capita income. The movement from light manufacturing to intermediate and then to capital goods as income increases has been well documented (Chenery et al., 1986). Yet, even within sectors, there are shifts from more traditional to more modern goods as the economy evolves, a trend that results in a shift away from the types of activities dominated by women (Liedholm and Parker, 1989). These sectoral shifts are also accompanied by changes in firm size. Biggs and Oppenheim (1986) found that the sectoral composition of output was a more powerful determinant of the size distribution of firms than was intraindustry competition between firms. In summary, the macro-level empirical evidence indicates that as aggregate per capita income increases, there is a systematic pattern of MSE evolution toward larger firms, based in larger localities, producing more modern products.

Recent empirical evidence has also been emerging on the nature and magnitude of the key intersectoral linkages with micro and small firms. In most low income countries, the primary growth dynamic comes from agriculture, and therefore the evidence on linkages with this sector is of particular importance (Liedholm and Kilby, 1989). Several studies have investigated the magnitude of the consumption linkages between rural households and MSE goods and services (King and Byerlee, 1978; Hazell and Roell, 1983; Deb and Hossain, 1984). All indicate that a strong, positive relationship exists between income and the demand for these products. The consumption linkages account for two-thirds or more of the total agricultural growth multipliers, while the backward and forward production linkages with agriculture account for the remainder. There is some evidence that these backward and forward linkages are weaker in Africa than in Asia, due to the lower levels of irrigation and mechanization (Haggblade, Hazell and Brown, 1989). Recent studies also indicate that the overall linkages from medium scale farms are greater than those from small farms; that farms using high-yield varieties have higher multipliers than those using traditional varieties; and that farms using oxen have higher multipliers than those using hoe cultivation (Haggblade and Hazell, 1989).

Evidence on linkages with other sectors of the economy, on the other hand, is limited. The literature on subcontracting systems is substantial, often linking small producers with large enterprises (see, for example, Mead, 1984 and 1985, and Meller and Marfan, 1981). A review of this evidence suggests that subcontracting systems may be more prevalent in Asia than in Africa (Liedholm and Mead, 1987). In most cases, though, these subcontracting arrangements involve linkages between enterprises within the same subsector rather than linkages between different sectors of the economy, the question under discussion here. Empirical studies on linkages with the export sector, another potential growth engine, are also limited. One study by Huddle and Ho (1972) of the international demand for culturally oriented products, however, found that the overall income elasticity of demand exceeded one for many of these items. In general, exports do not yet provide a major source of demand for MSEs.

### ISSUES AND MAJOR THEMES

One of the principal questions at issue for this level of analysis concerns the nature and strength of the linkages between the different sectors. For many Third World countries, particularly those with very low levels of income, the central problem facing most microenterprises is one of small and stagnant markets. In such countries, the most important growth dynamic comes from primary production: from agriculture or occasionally from mining. In rarer cases, the main driving force may have come from purchases by the government. The nature and strength of the linkages to these growth engines can be a central determinant of rates and patterns of growth in related subsectors. It is thus of great significance that researchers identify the actual or potential sources of dynamism in the economy, and explore the extent to which these growth engines create opportunities for multiplied development through reinforcement of positive linkages.

Two examples can be given of cases in which this type of reasoning is important. In Malawi, there is currently considerable interest in policies and other interventions aimed at the promotion of smallholder estates. In Kenya, high priority is being given to the promotion of export production, with particular attention to Export Processing Zones. In both cases, major questions arise as to the extent to which success with the primary target will have multiplied effects through linkages with other sectors of the economy. Beyond this, it is important to know about complementary policies or projects that might increase the strength of such linkages, thereby reinforcing the impact of success with the primary target through an induced expansion of microenterprises.

It is also important to recognize the locational dimensions of these demand issues. Markets are not only small; they are also often fragmented by lack of information, poorly developed commercial links, and high transportation costs. This fact is significant for microenterprise producers who may find that the markets in which they sell are isolated from other more dynamic parts of the economy. Such a situation may also provide important opportunities for microenterprise traders and transporters, who can find productive activities that not only provide them with a good income but also open up new possibilities for others engaged in production activities.

At the related macro or comprehensive level, the main question of interest is whether or not there are systematic patterns of change in the structure of enterprises over time. Of central interest is the change in relative importance of enterprises of different sizes and types, including their sectoral and

locational dimensions. The growth of individual subsectors also needs to be understood in the context of these larger patterns of structural change in the economy.

Much of the research on this topic to date has been done in a comparative statics context, examining the relationship between levels of income and the structure of production. Less attention has been paid to the significance of rates of growth of income. World Bank statistics indicate, for example, that GDP/capita in Jamaica is nearly 30 percent higher than that in the Dominican Republic; yet over the past 22 years, GDP/capita in Jamaica is reported to have declined by 1.5 percent per year, while that in the Dominican Republic is reported to have risen by 2.3 percent per year. The effect of these different aggregate levels and growth rates on patterns of development of microenterprises is an important topic that has received little attention. Its importance is magnified by the fact that, in many economies in Africa, not only are incomes low but little or no growth has been taking place, so the process of structural transformation that usually underlies reasoning in this area is lacking.

A related issue concerns the ways in which the magnitude and structure of microenterprises change over time as a result of changes in policy or in the regulatory environment. A number of countries have adopted policies or projects aimed at improving the business environment to make it more supportive of the growth of small enterprises. The extent to which observed changes are attributable to particular policy or project-level interventions could best be examined either at the level of individual firms or subsectors.

## **RESEARCH QUESTIONS AND HYPOTHESES**

The central research hypotheses to be addressed at this level of analysis should seek to illuminate the way enterprises and subsectors are influenced by changes in the rest of the economy, both in the aggregate and in other related sectors. These hypotheses can usefully be grouped into those that relate to intersectoral linkages and those that are concerned with patterns of growth in the aggregate economy.

The important hypotheses relating to intersectoral linkages include the following.

1. Expenditure elasticities for many products of microenterprises are positive. By examining these elasticities, it should be possible to identify new and growing markets that will arise with increases in income.
2. Expenditure or consumption linkages are larger than backward and forward production linkages with other sectors.
3. The consumption and production linkages from small farmers to microenterprises are larger than those from larger farmers. Verification of this hypothesis would strengthen the argument for agricultural policies and programs that emphasize small farmers in developing countries.
4. In most low income countries, the growth engines, the potential sources of dynamism in an economy, are most likely to be found in primary production (agriculture and mining). Once again, the

importance of stimulating agricultural production and the close links between it and microenterprise growth are reflected in this hypothesis.

The following research hypotheses emerge from considerations of the patterns of growth in the aggregate economy.

5. The relative importance of microenterprises declines with increases in the aggregate level of economic activity.
6. Enterprise and employment density (the number of enterprises or employment per 1,000 people) in microenterprises increases with the size of the locality.
7. The sectoral composition of output is a more significant determinant of the size distribution of enterprises than is interindustry competition among firms of different sizes.
8. The policy environment or rates of growth in the aggregate level of economic activity explain deviations from these expected patterns.

### ANALYTICAL APPROACHES

Innovative survey methods must be employed to generate the required information on intersectoral linkages. Since households, especially those in rural areas of many countries, are the primary source of demand for microenterprises, household expenditure surveys would be important. Yet to be of maximum use, they must elicit information on the location and size of the firm from which purchases were made; unfortunately, such information is rarely obtained. Additional insights on the growth and location of demand can also be obtained, however, from bore hole studies of firms and from subsector surveys.

Various analytical techniques can be used to examine the intersectoral linkages. Approaches for undertaking the expenditure studies are well developed. The options available for modeling and estimating expenditure elasticities for microenterprise products, for example, are described in King and Byerlee (1978). More comprehensive approaches that incorporate the backward and forward linkages have also been developed. These include general equilibrium as well regional models, such as the semi-input-output models used by Haggblade and Hazell (1989).

More eclectic approaches are needed to analyze the growth engines and new sources of demand. The structure of income and its past growth would be based on the analysis of existing data: GDP statistics combined with information on population and employment. The analysis would cover the breakdown of income by sector, class and social group, and location. The examination of other potential new sources of demand — through exports or through replacement of other sources of supply, whether from imports or from other, higher-cost domestic suppliers — would be based on more detailed, product-level work in selected subsectors.

Information needed for the more general macro analyses, on the other hand, would be derived primarily from the one-shot censuses of MSEs, the component of the enterprise size spectrum that is

severely underrepresented in official counts. Ideally, such a census could be conducted in a country in which one had previously been undertaken. If not, perhaps another census could be conducted four or five years later, to provide a dynamic perspective.

One of most basic types of analysis to be undertaken with these macro data would be a modified version of the standard patterns of structural change study. The importance of structure and composition in explaining the pattern of small enterprises in various subsectors can be discerned using the approach of Biggs and Oppenheim (1986). Single equation reduced-form estimates of the relative importance of micro- and small-scale firms are derived using linear regression analysis.

## **SECTION SIX**

### **CONCLUSIONS: RESEARCH PRIORITIES**

This review has made clear that the field of microenterprise dynamics is vast. To provide some order to this extensive array, the research issues and approaches examined in this paper were grouped into four different levels of analysis, focusing on individuals, enterprises, subsectors, and intersectoral and macro analyses. Our review of the research issues arising from these different perspectives suggests that attention should be focused primarily but not exclusively on patterns of change at the level of the individual firm (micro) and at the level of the subsector.

The following are the issues and approaches that appear to deserve top priority. They are presented following the same four levels of analysis developed in the first part of this paper; this means that the order here does not necessarily reflect any priority ordering.

1. At the level of the individual, the priority issues to be examined center around an analysis of the entrepreneur. The priority research topics would involve path analyses of the entrepreneur focusing particularly on:

- Movements back and forth for an individual between being a worker and being an entrepreneur, and the causes of these changes;
- Changes in the patterns of diversification of the individual: the number and character of the activities in which the individual is engaged;
- The motivations of individual entrepreneurs, at different levels of development; and
- Changes in the character of the principal nonfarm activity in which the individual is engaged, particularly in terms of crucial transitions or junctures.

All these types of changes should be approached in ways that clarify the differences in development patterns for women and men, looking especially at differential gender-specific constraints and opportunities and how these might be changed.

2. At the micro level, one of the most important research priorities is to develop new insights on the dynamics of the individual microenterprise. Given the paucity of information on this subject, a key early objective will be the generation of a solid body of descriptive evidence on the components (birth, net growth, disappearance) of this process. Armed with these data, the primary goal will then be to determine whether or not there are systematic patterns in the evolution of such firms.

The primary focus of the analyses at this level should center on the disappearance and net growth components of this process. A study of firm disappearances should seek to identify the key variables, including the attributes of the entrepreneur as well as external constraints, that are the prime determinants of firm attrition. A companion study of the net growth of surviving firms would include many of the

same variables and use a similar analytical framework. One of the expected outputs of these analyses would be stylized firm profiles, which portray the firm's likelihood of surviving and growing to various sizes. Another set of priority studies would examine the factors inducing or constraining the ability of microenterprises to navigate successfully two critical junctures in the evolution of microenterprises: growth spurts and firm transformations.

3. At a subsector level, the first goal must be to describe the patterns of change in selected subsectors. The examination needs to include the degree of vertical integration and specialization of enterprises in the different channels of the subsector as well as the coordinating mechanisms between different functions in the channel. The role of the distribution system in linking producers in particular channels with expanding sources of demand needs to be explored. Interactions between subsector change and enterprise-level change must be examined. Building on studies done in individual countries, cross-country and cross-subsector analyses are needed to examine the impact on the structure of growth in selected subsectors of differences in levels and patterns of national development.

4. The priority research issue at the macro level of analysis concerns the extent to which growth in microenterprises is explainable in terms of growth in markets because of the expansion of income in identifiable primary sectors beyond the subsector.

A research program along these lines can provide important insights into patterns of growth and dynamics of microenterprises. Such information can make a major contribution to the improvement of policies and to the design and implementation of project interventions, enhancing the contribution of microenterprises to the development process.

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## APPENDIX A

### REVIEW OF THEORIES OF FIRM DYNAMICS

The theoretical literature on firm dynamics is rather sparse. This appendix reviews the contributions, focusing on the recent work in the area.

#### CLASSICAL ECONOMIC THEORY

Classical economic theory sheds relatively little light on the formation, growth, and dissolution of firms. According to the textbook version of this economic theory, under conditions of perfect competition, firms enter an industry until economic rents are reduced to zero, and leave when average variable cost exceeds price.<sup>1</sup> Firms have identical cost curves in the simplest version, so one cannot identify which firms will enter or depart. A somewhat more sophisticated variant assumes enterprises have different cost curves, where the most efficient firms (i.e. those with lower average variable and total costs) enter an expanding industry and the least efficient depart a contracting industry.

This theory is deficient on several grounds. First, it is a static equilibrium theory with no implication for the rate of exit, entry and growth or for the speed of adjustment. Second, this theory does not specify what determines the supply of entrepreneurs; it simply assumes that the supply of entrepreneurs is perfectly elastic.<sup>2</sup> Third, the theory ignores the role of expectations and learning in decisions to form or expand a firm. Consequently, a richer theory than that given by the standard classical version is required.

#### STOCHASTIC THEORIES OF GROWTH

Many of the more recent theories of firm and industry growth emphasize the stochastic or random nature of the process. In such formulations, the role of luck or pure chance looms large in explaining the evolution of businesses over time.

The primitive versions of the stochastic theories are based on Gibrat's Law, which states that the firm growth is independent of firm size (Gibrat, 1931). Firms of all sizes face the same probability

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<sup>1</sup> See, for example, Alfred Marshall (1920).

<sup>2</sup> The entrepreneur plays a central role, for example, in the Austrian economic theory, which reviews competition as a process of dynamic change. They view the entrepreneur as a spotter of opportunities who upsets economic equilibrium and sets the forces of change in motion.

distribution of growth rates; some firms are luckier than others and these grow more rapidly and become larger than the rest. Scherer (1980) provides an illustration of this version, while somewhat more sophisticated variants have been developed by Simon and Bonini (1958) Ijiri and Simon (1977).

Stochastic growth processes adhering to Gibrat's Law generate a log-normal firm size distribution (that is, a bell-shaped curve skewed to the right when the percent of all sales made by firms is plotted against firm size). A few large firms make an unusually large share of sales, while a plethora of small firms make a disproportionately small share of sales.

Although the random or stochastic nature of the growth process may be a useful ingredient in any dynamic theory, the assumption and implications of the purely stochastic theories are at variance with reality. These initial studies from developing countries, along with the recent small firm research in the United States, indicate that firm growth is inversely related to firm size. Gibrat's Law would thus not appear to be a reasonable assumption, particularly in developing countries where small firms account for the vast majority of firms in most industries. If small firms do indeed grow more rapidly on the average than their larger-scale counterparts, the tendency towards increasing inequality of firm size over time implied by Gibrat's Law would tend to be moderated and in certain cases could be checked entirely.

Another limitation of pure stochastic theories is they accord no role to the entrepreneur. Entrepreneurs are merely passive actors in this mechanistic game of chance. A dynamic growth theory that overlooks the differing preferences and abilities of the entrepreneurs themselves would appear to be deficient.

### **DYNAMIC ENTREPRENEURIAL THEORIES**

The entrepreneur, however, is accorded a central role in several of the more recent formulations of firm and industry growth. The recrudescence of the Austrian school, which views competition as a process of dynamic change with the entrepreneur as the prime mover in this process, as well as the emergence of a few neoclassical models that include entrepreneurship explicitly, reflect the increased interest of economists in the study of entrepreneurs. This area until recently has been primarily the domain of sociologists and psychologists.

#### **Lucas Model**

The entrepreneur has been explicitly incorporated as a key variable in several recent dynamic theories of firm and industry growth. A straightforward model by Lucas (1978) is based on the assumption that individuals have differing endowments of managerial ability (or business acumen) and that these differences are major determinants of business formations, growth, and dissolution. Those entrepreneurs with more of this managerial ability are more efficient and operate firms with lower



average costs and higher output than firms operated by their less able counterparts.<sup>3</sup> Indeed, those with the lowest endowments of managerial ability become workers. Over time, business formations and disappearances (deaths) occur as those with marginal managerial ability move between being entrepreneurs or being workers.

Given the assumptions incorporated into the basic Lucas model, the average firm size in an industry will grow as the economy becomes wealthier.<sup>4</sup> This occurs because in this formulation increases in capital decrease the returns from managing and increase the returns from working (that is, wages), so marginal managers close their firms to become workers; average firm size increases, as fewer firms employ more workers. Using U.S. data, Lucas found that a statistically significant relationship existed between average firm size and capital stock.

Yet, this model is still unduly abstract and depends on too many tenuous assumptions. It is still rather static and says relatively little about how the firms evolve over time. There is also no uncertainty or risk.

### **Kihlstrom and Laffont Model**

A similar growth model developed by Kihlstrom and Laffont (1979) incorporates risk into the analysis. They argue that the key attribute of the entrepreneur is a "taste for risk". Entrepreneurs are assumed to bear more risks than workers. Consequently, individuals who are less risk averse become entrepreneurs while those who are more risk averse become workers. Differing tastes for risks rather than managerial abilities become the major determinant of business formations, growth, and disappearances. Yet, this model suffers many of the same disabilities as that of Lucas.

### **Jovanovic Model**

A more realistic model developed by Jovanovic (1982) synthesizes the key elements of the stochastic, Lucas, and Kihlstrom/Laffont models. Like Lucas's model, Jovanovic assumes that the entrepreneurs' managerial abilities differ, and like Kihlstrom/Laffont he assumes that the entrepreneurial activity is risky. This risk arises not only from the inherently risky nature of business activity, but also because individuals are unsure of their management abilities. Jovanovic's model also assumes, however, that those who enter self-employment gradually learn about their managerial abilities over time by engaging in the rough and tumble business world and observing how well they perform. As they gradually learn more about their actual abilities, entrepreneurs change their behavior over time, a fact that gives this model a unique dynamic element lacking in other models.

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<sup>3</sup> These entrepreneurs cannot become a monopolist because Lucas assumes production is subject to decreasing returns to scale.

<sup>4</sup> The key assumptions are that Gibrat's Law holds and that the elasticity of substitution between capital and labor is less than one.

When the industry begins, Jovanovic assumes it is perfectly competitive and all firms are the same small size because they all are assumed to have the same estimate of their managerial abilities. Entrepreneurs then observe their profits after the first year and from this update their estimate of their management ability. Since the profit reflects not only management ability but also chance or random elements, the entrepreneur only partly adjusts to this new information. Those firms that revise their ability estimates upward expand output, while those with downward estimates contract or even exit (die). Firms exit if their estimated managerial ability falls below a cut-off point — a failure boundary — where net expected profits become negative. The surviving entrepreneurs over time gain through experience a more precise estimate of their managerial abilities and eventually the estimated and true managerial abilities will converge. Surviving firms have withstood the market screening process and will tend to be those with the greatest managerial ability, which will be the most efficient and have the lowest costs.

Although the Jovanovic model is an important step towards a truly dynamic theory of the firm, it still somewhat limited. In particular the entrepreneurial "learning" that occurs is rather passive — the entrepreneur simply learns more about his or her exogenously given level of managerial ability. There is no provision for the entrepreneur to enhance this managerial ability by actively investing in more education or simply by gaining more business experience. Indeed, these models are all silent on what the key determinants of this managerial ability are. Is it education (formal, informal, on-the-job experience), occupation of parents, ethnic background, or some other socio-political attribute of the entrepreneur? Are there key indicators such as the organizational configuration of delegation and control within the firm? Also, these growth models do not include other variables that may be crucial in explaining patterns of firm evolution such as location, subsector, and gender of the entrepreneur and workers. In generating hypotheses about the key determinants of firm births, expansion, contraction, and dissolution one must move beyond those suggested by the existing growth model literature.

A rich set of testable hypotheses relating to the life cycle patterns of firms can be derived from Jovanovic's model, which incorporates many of the features of the other models. In general terms, it predicts that both age and size will affect both the mean and variance of the failure and growth rates of firms.

First, the variability of firm growth of non-failing firms should decline with firm age, holding firm size constant. This follows because young firms have less precise estimates of their true managerial ability than do older firms.

Second, the growth of non-failing firms should be a decreasing function of firm age, when firm size is held constant. This follows from a general version of Jovanovic's model under certain assumptions that are plausible on theoretical and empirical grounds<sup>5</sup> (Evans, 1987).

Third, failure (death) rates of firms should be a decreasing function of firm age, again holding size constant. This occurs because older firms have a better estimate of their managerial abilities, which,

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<sup>5</sup> This version assumes that output is a decreasing convex function of managerial inefficiency (the inverse of managerial ability); this occurs for commonly used cost functions, such as the Cobb-Douglass (with decreasing returns to scale, Evans 1987).

because they have withstood the market screening process, must be favorable; this reduces the likelihood that the firm would erroneously close because of some unusually bad luck in one particular year.

Fourth, failure rates also should be a decreasing function of firm size. A larger firm is one that has received favorable information on managerial ability, and later information is less likely to be unfavorable enough to cause it to disappear.

Fifth, growth rates of surviving firms should be a decreasing function of firm size for firms of the same vintage. This result holds because the possible firm sizes in the Jovanovic model have an upper-bound limit; consequently, as a firm increases in size there is less room for further increases (Dunne et al., 1989).<sup>6</sup>

Sixth, as a corollary, contraction rates of surviving firms should be an increasing function of age or size. This follows because older and larger firms, which have withstood the market screening and thus have relatively lower costs, will reduce output rather than close (die) when bad luck occurs in one particular year.

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<sup>6</sup> In another version of the Jovanovic model, the relationship between size and growth depends on the distribution of managerial ability in the population and the shape of the cost function (Evans, 1987).

## APPENDIX B

Table 1

Summary of Studies of Components of Firm Net  
Employment Growth in Manufacturing

Annual Rate of Employment Growth Due to:

<u>Country</u>	<u>Date</u>	<u>Births</u>	<u>+ Expansion</u>	<u>- Contraction</u>	<u>- Death =</u>	<u>Net Employm. Growth</u>
U.S.	1963-82	3.5%	2.9%	2.5%	3.3%	0.6%
Canada	1970-81	1.8%	1.9%	1.2%	2.1%	0.4%
France	1978-84	5.6%	5.7%	6.2%	5.7%	- 0.6%

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Sources: U.S. - Dunne et al. (1989)  
Canada - Baldwin-Gorecki (1988)  
France - OECD (1987)

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**Table 2**

**Components of Net Employment  
Growth by Initial Firm Size  
in the United States**

1981-1985

Annual Rate of Employment Growth Due to:

<u>Enterprise Size</u> (Employment)	<u>Births</u>	<u>+Growth</u>	<u>-Contraction</u>	<u>-Death</u>	=	<u>Net Employment Growth</u>
1-19	7.9%	4.1%	1.2%	6.7%		4.1%
20-99	6.1	3.8	2.6	5.9		1.6
100-499	3.6	2.9	2.8	5.0		-1.3
500-4999	4.2	2.3	2.3	4.3		0.0
5000+	<u>5.2</u>	<u>2.0</u>	<u>2.6</u>	<u>4.3</u>		<u>0.3</u>
All	5.6%	3.1%	2.2%	5.3%		1.2%

Source: Computed from data in Birch, 1987, p 15.

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