EXPLORING FIRM DYNAMICS:
THE CASE OF SMALL-SCALE MANUFACTURING IN AFRICA

By

Joan Chamberlin Parker

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ABSTRACT

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This paper examines the dynamics of small-scale manufacturing enterprises in Africa. In order to understand the evolution of individual firms within the industrialization process, intertemporal firm-level data is necessary.

Several new insights on African enterprise dynamics emerge from the data. The vast majority of new firms are micro enterprises, which, as per capita income grows, appear increasingly in larger localities. Closure rates are highest for micro enterprises, and lowest for the largest firms. Moreover, the likelihood of closure is highest in the initial three to four years of a firm's existence, after which a firm has a substantially higher chance of survival. In terms of firm expansion, relatively few African micro enterprises graduate through the size structure; rather, most remain micro firms. Similarly, the majority of modern small and medium enterprises do not emerge from the large pool of micro enterprises, but originate as larger firms. Future studies of firm dynamics framed by an understanding of the economic and policy environment in which firms evolve.

ACKNOWLEDGEMENTS

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INTRODUCTION

This paper examines the dynamics of small-scale manufacturing enterprises in developing countries, with emphasis on evidence from Africa.[1] It also lays out a context for understanding enterprise dynamics in the broader process of economic development, and proposes a specific agenda for future research.

What is meant by "the study of firm dynamics"? First, it is the study of why and how businesses appear, grow, and disappear. Variations in these patterns may then appear by the location, age, subsector and size of firms, the level of national development, and the policy and project environment.

Studies of **small** enterprise dynamics are important because they provide insights into the feasible and desirable patterns of growth in manufacturing output and employment. Since small firms dominate the industrial scene in most African countries, a deeper understanding of how these firms evolve may make it possible to pursue an

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[1]. In this paper, small-scale enterprises are defined as those businesses with one to fifty employees. They can be divided into two size categories: "micro enterprises" which employ less than 10 workers, and "modern small" enterprises, with 10 to 49 workers. Within the micro size category, one-person firms are separately analyzed in some cases. The establishments examined in this study include those specifically engaged in the production and repair of manufactured goods (ISIC codes 31-39 and 95). Excluded are establishments engaged in mining, construction, trading, transport, financial, social, and personal services.

industrialization path that builds on these enterprises. A small enterprise strategy may lead to industrialization that is potentially both more equitable and efficient than alternatives which stress large-scale firms. Studies of small firm dynamics may also uncover ways that policies and projects can facilitate this evolutionary process.

The vast majority of small enterprise studies in Africa have been undertaken at a single point in time and thus provide only a cross-sectional snapshot of the distribution of firms. Consequently, these studies can only provide a limited perspective of how firms evolve over time and the impact of policy or programs on the evolution process. To uncover the specifics of the evolution of firms, an intertemporal approach is necessary which follows the development of specific firms over time.

Dynamic studies can be sub-divided into those that follow a "macro" approach and those that follow a "micro" approach. On the macro level, researchers focus on changes in business demographics captured by aggregate cross-sectional data in different time periods. These studies reveal patterns of economic growth and industrialization at the national level. However, stymied by a dearth of firm-specific data, macro studies can only infer patterns of firm-level dynamics from the available aggregate data. Using micro-level intertemporal data, however, studies can directly examine the birth and death of individual firms,

as well as the dynamic activities within firms, such as innovation and reinvestment patterns. To date, however, relatively few micro-level intertemporal studies have been undertaken.

Part I of this paper brings together the relevant information from each approach to provide an improved framework for analyzing manufacturing firm dynamics. Section A provides a broader framework of economic development and industrialization, summarizing macro-level evidence of firm dynamics and updating the material covered in previous studies. Section B breaks the aggregate trends down to their firm-level components: firm birth, death, and growth patterns. This section provides new findings and attempts to shed additional light on the evolutionary process of individual firms.

Part II develops a proposal for future research on firm dynamics for the specific case of Kenya, couched within the framework laid out in Part I. Appendix I focuses on specific issues of collecting and analyzing data in studies of firm-level dynamics. Appendix II looks at the analytical problems in working with data collected in borehole questionnaires, while Appendix III provides an example of such a questionnaire.

I. A CONCEPTUAL FRAMEWORK OF SMALL ENTERPRISE DYNAMICS

A. BROAD PATTERNS OF DYNAMISM AND GROWTH

Firms dynamics are imbedded within a broader process of structural change and industrialization. Thus, in order to understand firms and their dynamics, it is important to understand the context in which they function. This section explores global, national and subsectoral economic activity, and the linkages between them. It also lays out the evidence of small enterprise dynamics provided by macro-level data.

1. The Global Setting

Economic activity at any level takes place within a global economic context. It is in this international context that world supply and demand forces are played out, which determine the international prices of commodities and currencies.

These global market conditions set limits on national economies, influencing their comparative advantage for goods and services. Sub-Saharan African countries have long concentrated their exports in agricultural and primary commodities. Studies of African economies have suggested that such an export strategy is sound, arguing that African countries do, in fact, hold comparative advantage in these products (World Bank, 1981). If this is true, African

for agricultural products as a method of increasing domestic production and thereby per capita income.

Other international forces also set limits on national and subnational development patterns. Prices of critical inputs, such as petroleum, have had a large impact on national budgets. Global economic wellbeing also affects the size of the international market. In the early 1980s, for example, global recession dampened demand in many international markets.

2. National Patterns of Development

Individual countries, actors within the global economy, each go through a process of economic development and structural change over time.[2]

This structural change is an evolution from a rural, largely agrarian, low-income economy to a wealthier, industrial, urban economy (Syrquin, 1988). The various stages of the structural transformation can be categorized by level of income, distribution of resources between sectors, and productivity of the factors of production.

The stimulus for an economy to develop from one stage to the next comes from growth points, or leading sectors, within the economy. Empirical work suggests that in the

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[2]. According to Syrquin (1988), "the interrelated processes of structural change that accompany economic development are jointly referred to as the *structural transformation*."

early stages of development, agriculture often serves as a growth point for an economy, generating the bulk of national income, as well as producing goods (particularly food) for which there is the greatest demand. In effect, both demand and supply for the sector's goods are strong, generating a "multiplier effect" which stimulates further rounds of growth. As per capita incomes increase, food needs can be met with a lower proportion of total income, leaving more resources for the purchase of non-food goods. At this stage, growth points may shift toward the industrial sector, first toward light consumer goods and then to intermediate and capital goods (Chenery et.al., 1986). Clearly, the points of dynamism in an economy are directly linked to the structure of demand.

In most African countries, agriculture is the sector most likely to provide sufficient demand around which the economy can develop. In some countries, such as Zimbabwe and Kenya, this has indeed been the case. Many African economies, however, are caught in a cycle of low per capita income and the resulting low domestic demand for all goods, including food. In these countries, domestic demand for agricultural goods may not be strong enough to make agriculture the dynamic engine of growth for the broader economy. Therefore, in much of Africa, little structural transformation has taken place. Most countries remain characterized by rural, largely agrarian, low-income

populations. As shown in Tables 1 and 2, the past 20 years
have shown little income growth in the low-income African
countries. As expected, manufacturing remains a minor
contributor to GDP in those countries.

Despite the lack of transformation, aggregate data
discussed below shows that there are dynamics underway in
even the lowest income African countries. If there is no
growth in the share of manufacturing, where are these
dynamics occurring? Overall, this apparent conflict may be
due to an aggregation problem, where detailed country-level
data would provide evidence of more subtle dynamics. For
example, the statistics on structural transformation cited
above do not include changes in the levels of employment.
In the lowest-income group cited in Tables 1 and 2,
employment in industry has more than doubled despite the
lack of growth in manufacturing output (Mead and Liedholm,
1989).[3] Country-specific data may also show changes in the
size and location structure of firms, patterns not captured
in aggregate manufacturing data. Similarly, within the
broad category of "manufacturing," evolution within and
between subsectors may be occurring. This is the level of
dynamics discussed below.

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[3]. "Industry" includes not only manufacturing, but
also mining and construction, therefore is not directly
comparable to the "manufacturing" covered in Tables 1 and
2. However, if within industry, the relative shares of
employment in manufacturing, mining, and construction are
constant or shifting toward manufacturing, trends in
industry employment are indicative of trends in manufacturing.

TABLE 1

**Annual Real Growth Rates of Manufacturing Output
and Gross Domestic Product (GDP)
(in percent)**

Countries by Level of Per Capita GDP	Annual Growth in Manufacturing Output 1970-85	Annual Growth in Per Capita GDP 1965-86
Low-income African Countries		
$250 or less	0.1	-0.1
$251 - $450	1.6	0.1
Middle-income African Countries		
$451 - $800	4.5	0.7
$801 - $1,600	8.4	5.4

Source: Mead and Liedholm, 1989.

TABLE 2

**Change in Share of Manufacturing Value Added
in Gross Domestic Product
(in percent)**

Countries by Level of Per Capita GDP	1965	1986
Low-income African Countries		
$250 or less	10.7	8.1
$251 - $450	6.1	9.9
Middle-income African Countries		
$451 - $800	12.2	14.0
$801 - $1,600	11.0	6.0

Source: Mead and Liedholm, 1989.

3. Subsectoral Patterns of Change

Regular patterns of change also exist within sectors, or at the subsectoral level. As per capita incomes rise, demand often shifts towards goods with a greater proportion of processing and services. Within the agricultural sector, for example, demand shifts over time from agricultural staples toward processed foods, and similarly from storable to perishable foods, both changes which require a higher proportion of services in the provision of the final good.

Other patterns of subsectoral change involve shifts away from traditional toward more modern goods. This is especially the case within light consumer goods subsectors, but also occurs within other subsectors, such as metal-working and repairs.[4] In light manufacturing, for example, small firm activity typically shifts from weaving to tailoring and from traditional mats to modern furniture manufacturing (Anderson and Khambata, 1981, and Liedholm and Mead, 1987). Such an evolution not only affects the composition of employment in a subsectoral sense, but also results in a general shift away from the types of activities dominated by women.

The ebb and flow of a subsector provide an understanding of both aggregate patterns of evolution and the dynamics of

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[4]. Light manufacturing includes food, beverages, tobacco, textiles, and wood and wood products (ISIC 31-33).

individual firms within that transformation. As such, it provides a bridge between macro-level structural change and micro-level firm dynamics.

4. Evidence of Patterns of Change from Aggregate Data

Aggregate data can identify patterns of structural change and industrialization in an economy without identifying the path followed by individual firms. However, the insights gleaned from aggregate data on the patterns of sectoral and subsectoral dynamism have direct links to firm-level dynamics. The evidence of structural change, pulled from studies of eight African, Asian, and Latin American countries, is explored below.

4.1 Size

First, one can examine the changing structure of manufacturing in terms of size of businesses. Worldwide, the absolute number of micro and small enterprises is increasing. Relative growth in numbers of firms appears to be highest in the 2-9 worker and 10-49 worker firms, and lowest in one-person firms (see Table 3).[5] In some

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[5]. This finding is consistent with theories of industrialization that hypothesize a declining household enterprise sector, first relatively, then absolutely, as an economy develops. For a discussion of the theory and empirical evidence on structural transformation, see Biggs and Oppenheim, 1986, and Anderson, 1982. This subject will be explored further at the end of this section.

TABLE 3

Annual Growth Rate by Numbers of Manufacturing Firms
By Firm Size
(in percent)

| Region/ | | Size of Establishment (# workers) | | | |
| | | Micro | | Small | Medium & Large |
Country	Dates	(1)	(2-9)	(10-49)	(50+)
Africa					
Sierra Leone	1974-80				
Overall		-4.2	3.5	12.7	1.0
Rural		-9.4	2.6	13.0	-
Other					
Colombia	1970-78	1.8	-	13.4[a]	7.9[a]
India	1961-71				
Overall		2.8	4.1	5.9	5.3
Rural		1.9	3.2	7.3	7.7
Philippines	1967-75	0.2	7.0	6.5[b]	3.7[c]
Taiwan	1971-81	-1.1[d]	11.5[e]	11.9[e]	9.1[e]

Sources:
  Colombia - computed from data in Cortes et.al., 1987.
  India - computed from data in Little et.al., 1987.
  Philippines - computed from data in Anderson and Khambata, 1981.
  Sierra Leone - Liedholm and Mead, 1987.
  Taiwan - computed from data in Taiwan Census of Commerce and
      Industry, 1984.

Notes:
a Figures show growth in employment rather than number of firms.
b Firm size 10-99.
c Firm size 100+.
d Data for firms with 1-3 workers (1961-71), from Little et.al.,
   1987.
e For firm size categories 2-19, 20-99, and 100+.

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countries, in fact, the number of one-person firms is declining in absolute terms.

Related to changes in the size structure of firms are changes in the employment generated by firms of different size groups. As shown in Table 4, employment is rising in the combined micro and small as well as the medium/large size categories. In two-thirds of the countries, however, micro and small firm employment is growing more slowly than medium/large firm employment, shifting the relative balance of employment toward large enterprises.

In absolute terms, however, micro and small firms still generate more new jobs than their larger scale counterparts. Given the larger number of small firms, more jobs can be created even at a slower growth rate. As demonstrated in Table 5, the number of new jobs created in micro and small firms outweighs the number created in larger firms in every country examined.[6]

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[6]. By simple algebra, small firms will generate more jobs than large firms as long as the ratio of the number of small to large firms is greater than the inverse of their relative growth rates. For example, in Ghana, small firms outnumber large firms nine to one. To create as many new jobs in large as small firms, large firm employment would need to grow at nine times the rate found in small firms. The annual employment creation rates necessary for large firms to match small firms' employment creation rates are presented here for six countries (actual growth rates in parentheses): Sierra Leone: 99.9% (2.4%); Ghana: 62.7% (12.1%); Colombia: 10.5% (7.9%); Philippines: 5.7% (5.0%); Turkey: 7.6% (7.1%). It appears that the absolute employment gap is shrinking most quickly in the countries with highest per capita incomes. (Figures are calculated from Table 5.)

TABLE 4

Annual Growth of Manufacturing Employment
By Firm Size
(in percent)

| Region Country | Dates | Growth in Employment (%) | |
		Micro/[a] Small	Medium/[b] Large
Africa			
Ghana	1960-70	7.1	12.1
Sierra Leone	1974-80	4.6	2.4
Kenya	1978-85	8.2	2.9
Other			
India	1961-71	15.3	9.2
Philippines	1967-75	1.6[c]	5.0[c]
Turkey	1970-77	3.6	7.1
Colombia	1970-75	7.1	8.2

Sources:
   Colombia - computed from data in Cortes et.al., 1987.
   Ghana - computed from data in Steel, 1981.
   Kenya - computed from data in Kilby, 1987.
   Philippines, Turkey, India - Anderson, 1982.
   Sierra Leone - Liedholm and Mead, 1987.

Notes:
a   "Micro/Small" refers to firms with fewer than 50
     employees.
b   "Medium/Large" refers to firms with 50 or more
     employees.
c   For the Philippines, "small" refers to firms with
     fewer than 100 employees, "large" to firms with 100
     or more employees.

TABLE 5

Absolute and Relative Changes in Manufacturing Employment
By Firm Size

Region/ Country	Start Date Small[a] Large[b] (000 workers)		End Date Small Large (000 workers)		# Change Small Large (000 workers)		Annual Change Small Large (%)	
Africa								
Ghana (1960-70)	212	24	362	53	150	29	7.1	12.1
Sierra Leone (1974-80)	89	4	113	5	24	1	4.6	2.4
Other								
Philippines[c] (1967-75)	1084	306	1222	429	138	123	1.6	5.0
India[c] (1961-71)	571	201	1446	385	875	184	15.3	9.2
Colombia (1970-78)	597	257	812	420	215	163	4.5	7.9
Turkey (1970-77)	843	397	1057	595	214	198	3.6	7.1

Sources:
  Colombia - computed from data in Cortes et.al., 1987.
  Ghana - computed from data in Steel, 1981.
  Philippines, India, Turkey - computed from data in Anderson, 1982.
  Sierra Leone - computed from data in Liedholm and Mead, 1987,
  and Chuta and Liedholm, 1985.

Notes:
a "Small" refers to firms with fewer than 50 employees.
b "Large" refers to firms with 50 or more employees.
c For India and the Philippines, "small" refers to firms with
   fewer than 100 employees; "large" refers to firms with 100
   or more employees.

4.2 Location

The location of small firms may also change as the
economy evolves.   A reasonable hypothesis is that as
population, income and urbanization grow, greater scale
economies can be achieved in production, resulting in the
development of larger firms in urban areas.[7] Has there
indeed been a concurrent growth in urban densities and firm
size?

For most countries, the majority of small industries are
located in rural areas, and rural manufacturing employment
generally exceeds urban manufacturing employment.[8] How has
this profile changed over time?   Chuta and Liedholm
analyzed employment change by locality size in Sierra Leone
for the period 1974 to 1980. Overall they found higher
growth in manufacturing employment in the largest
localities (population over 20,000).[9]   Evidence from the
Philippines also suggests that manufacturing employment
growth is substantially higher in metropolitan Manila than

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[7]. For a more complete discussion of the locational
aspects of firm growth, see Anderson (1982).

[8]. Liedholm and Mead (1987).

[9]. Chuta and Liedholm (1985). It should be noted
that Chuta and Liedholm's Sierra Leone study focused
solely on micro enterprises, so relative rural-urban
employment may change somewhat when firms of all sizes are
enumerated. Given that larger firms were generally based
in larger population centers, however, adding larger firms
should only strengthen the results found with micro
enterprises only.

in the provinces.[10]

4.3 Subsector

The subsectoral shifts described above are accompanied by changes in firm size. Typically, firm size increases with the movement from traditional light manufacturing to capital good manufacturing. Indeed, the size distribution of firms is closely linked to the country's industrial composition. In exploring the determinants of firm size, Biggs and Oppenheim (1986) found that the composition of output was a more powerful determinant of the size distribution of firms than was the intra-industry size structure of firms.

Subsectoral shifts also have a locational dimension. In Sierra Leone, food processing and repair work showed the highest overall growth in localities of all sizes, while traditional activities (such as weaving), the slowest growing subsector overall, showed negative absolute growth in the smallest localities.[11]

5. A "Standard" Pattern

Given the evidence outlined above, what picture emerges of the "standard" evolution of firm size and structure as the level of economic development increases? Although

[10]. Anderson and Khambata (1981).

[11]. Chuta and Liedholm (1985).

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experiences vary widely between countries, some general patterns do appear to hold. At low levels of per capita income, the "representative firm" is likely to be a one-person, household-based firm producing traditional goods in a rural area. As per capita income rises, the firm is likely to be somewhat larger -- either a non-household enterprise or a small to medium-scale factory -- engaged in manufacturing modern consumer or intermediate goods in a small urban locality. Finally, at the highest levels of per capita income, the representative firm is an even larger-scale entity operating in larger urban localities.[12]

These evolutionary patterns are consistent with results emerging from recent studies that have examined how static economic efficiency tends to be higher for those firms that are: (1) somewhat larger; indeed there appears to be a direct relationship between efficiency and firm size for the micro and small enterprise size categories (1-49 workers); (2) operating in workshops away from the home; (3) located in larger localities; and (4) involved in more modern product lines, such as baking, tailoring, carpentry, metal-working, and repair (Liedholm and Mead, 1987, and Cortes et.al., 1987).[13] It is precisely these types of

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[12]. See Staley and Morse (1965) and Anderson (1982).

[13]. Although these studies are, unfortunately, static in nature, most do employ comprehensive measures of economic efficiency, such as total factor productivity, or economic rate of return.

firms that appear more frequently as per capita income rises.

The industrial evolutionary process is an extremely complex one. Attempts to explain it must, of necessity, incorporate both static and dynamic supply and demand factors and how they interact. Demand factors, for example, would include secular changes in the size of markets and demand shifts towards products where scale economies are more important. On the supply side, technological and input supply factors, among others, would play a role. Short-run variations in the aggregate level of economic activity (sometimes called "business cycles") may make it difficult to delineate these longer-term patterns.[14] Government policies, affecting both demand and supply factors, would also have a crucial influence on this process.

A few attempts have been made recently to explain these evolutionary patterns of firm size, and have generated important new insights into this process.[15] Of necessity,

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[14]. These short-run fluctuations particularly affect the components of growth: firm birth, death and expansion. Lack of time-series data on annual births, death and expansion of firms in developing countries confounds attempts to relate these variables to the levels of economic activity. Were data available, two questions could be asked: First, do birth, death, and expansion rates of small firms vary depending on the level of economic activity? Second, what is the relative effect of changes in the level of economic activity on small versus large firms?

[15]. See, for example, Biggs and Oppenheim (1986).

however, these studies have been based on aggregate firm data and have thus been able to provide only a partial picture of this process. Important questions cannot be answered by aggregate data, such as: Do smaller firms generally tend to disappear, to be replaced by new larger firms, or do the smaller firms simply grow? What is the process by which existing firms grow? Are policy or other constraints restraining an inherent tendency for existing firms to grow over time? Answering these questions and developing a more complete picture of firm dynamics requires micro-level data on the births, deaths, and growth of individual firms. Such data are scarce, since most studies of individual firms are static in nature. The limited micro evidence must be examined in an attempt to shed more light on firm dynamics. This is the task undertaken in the next section.

B. BIRTHS, DEATHS AND GROWTH: THE MICRO EVIDENCE

The net growth of micro and small enterprises cannot be properly analyzed without examining its three components: births of new firms, deaths of firms, and expansion in existing firms.[16] Each will be considered in turn below.

1. Firm Births

Data on micro and small firm births in developing countries are sparse. Table 6 shows evidence from one African country, Sierra Leone, along with figures from Colombia. The data show firm birth rates in Sierra Leone to be quite high, at 12.8 percent annually. Birth rates for Colombia are somewhat lower, but still exceed eight percent annually.

For Sierra Leone, firm birth rates have also been calculated by size of locality. Birth rates were highest in the largest localities at 14.9 percent, and lowest in the most rural localities at 10 percent, as shown in Table 6. These results, when combined with the "death" figures discussed below, confirm the aggregate findings that, over time, the number of firms in urban areas is increasing relative to the number of firms in rural areas.

No evidence has yet been uncovered of how birth rates

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[16]. For definitions and methods for measuring firm birth, death, and expansion, see Appendix I.

TABLE 6

Annual Manufacturing Firm Birth Rates
By Size of Locality
(in percent)

Region/Country	Dates	Under 2,000	2,000-20,000	Over 20,000	Urban Average
Africa					
Sierra Leone[a]	1979-80	10.0	10.8	14.9	12.8
Other					
Colombia[b]	1970-75	–	–	8.1	8.1

Sources:
   Sierra Leone – computed from Chuta and Liedholm's 1980 survey data.
   Colombia – reported in Cortes et.al., 1987.

Notes:
a   Data on Sierra Leone cover a one-year time period only to avoid the downward bias inherent in using a longer time period (see Appendix 1). While a longer time period would improve the accuracy of this figure, annual lists of new firms were not available for Sierra Leone.
b   The Colombia figure covers Bogota and Cali for the time period specified. The specific method of generating this figure is not given. The figure is based on a data set with incomplete coverage of small firms, thus is expected to be biased downward.

vary by firm size in developing countries.[17] However, in a given population of new firms, it is possible to define how many of the new firms will fall into each size category. Evidence from India and the Philippines suggests that 70 to 83 percent of new firms are micro-enterprises (one to nine workers), while the bulk of the remainder falls into the 10-49 worker size category.[18]

What determines birth rates? Excess demand for the goods of firms and excess supply of labor, capital, or other inputs stimulate firm birth. Some of the smallest firms may act as "sponges" for labor in times when demand

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[17]. Recent work in the United States (Phillips, 1988) shows that small firms (fewer than 500 employees) have much higher birth rates than large firms (over 500 employees). Furthermore, variations in birth rates appear to be greater for small than large firms. Small firm birth rates range from 8.9 to 12.1 percent, while large firm birth rates range from 2.4 to 4.9 percent. Results also show that variations in birth rates are greater than in death rates, suggesting that oscillations in the net number of firms (as seen in business cycles) are driven more by changes in firm birth rates than changes in firm death rates.

[18]. **PERCENT OF NEW FIRMS BY SIZE OF FIRM**

Country	1-9	10-19	20-49	50-99	100+	Total
Philippines	81	7	7	5	<1	100
India	72	15	4	3[a]	--	94[b]

Sources:
   Philippines – Anderson and Khambata, 1981
   India – Little et.al., 1987

Notes:
a Includes all firms with 50 or more workers.
b Does not add to 100 percent due to missing data.

for labor and other activities is low. With few productive uses for their labor, people may form small establishments which they then leave when their labor can be used more productively elsewhere. Such firms may appear counter-cyclically to larger firms.

Another issue is the relative importance of supply and demand conditions in the formation of new firms. This distinction is important in cases where a goal is to stimulate new business formation. If constraints to new business formation are primarily on the supply side, then births may be stimulated by program or project interventions. Demand-side constraints, however, call for policies which stimulate growth in per capita incomes.

The Colombian study carried out by Cortes et.al., (1987) gives seven supply-side arguments for the dramatic increase in the number of micro and small firms in the 1970s, including:

1. a general improvement in academic achievement,
2. an increased pool of skilled workers,
3. declining real wages,
4. a strong extra-bank credit market,
5. the absence of balance of payments problems,
6. an improved second-hand equipment market, and
7. improved equipment repair capacity.

However, no mention is made of the changing structure of demand on new firm creation in the same time period.

A study examining firm birth in Nigeria (Frischman 1988) points to two factors which may have affected both the supply and demand sides of firm birth:

1. lump-sum payments of wage arrears to formal-sector
    workers, and
2. large increases in incomes due to oil money.

These factors increased the money available to start new

businesses, as well as increasing the general level of

income, thus the demand for the goods and services of small

businesses. While the lists of influences presented in the

Nigerian and Colombian cases are illustrative, they are far

from complete.   Moreover,   the   Nigerian   case makes

particularly clear how difficult it is to separate and

measure supply and demand determinants of firm birth.

2. Firm Deaths

The second element determining the net growth rate of

firms is firm mortality, or the disappearance of firms.

Data on firm mortality in Africa are available for Sierra

Leone and Nigeria, where surveys were carried out in the

period 1974-1980.   Firm mortality studies have also been

carried out in Colombia, the Philippines, India, and the

United States.[19]

Mortality rates range from 1.3 percent to 12.5 percent

annually, as shown in Table 7. Four hypotheses can be put

forward regarding firm mortality:

1. Smaller firms have a higher mortality rate than

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[19].   Cortes _et.al._, 1987 (Colombia);   Chuta and
Liedholm, 1982 (Sierra Leone); Frischman, 1988 (Nigeria);
Anderson and Khambata, 1981 (Philippines); Nag, 1980
(India); Phillips and Kirchhoff, 1988 (United States).

TABLE 7

Annual Manufacturing Firm Mortality Rates
By Firm Size
(in percent)

Region/ Country	Dates	Micro (1-9)	Small (10-49)	Medium (50-199)	Total
Africa					
Sierra Leone	1974-80	10.3	-	-	-
Nigeria	1974-80	10.4	-	-	-
Other					
Colombia[a]	1965-71	-	7.7[b]	3.1[b]	5.0
Philippines[a]	1975	-	5.1[c]	-	-
	1972	-	3.5[d]	1.3[d]	-
United States	1976-82	12.5[e]	-	8.3	10.0

Sources:
> Colombia - computed from data in Berry and Pinell-Siles, 1979.
> Nigeria - computed from data in Frischman, 1988.
> Philippines - computed from data in Itao, 1980, and Anderson, 1981.
> Sierra Leone - computed from data in Chuta and Liedholm, 1982.
> United States - computed from data in The State of Small Business, 1983, and Phillips and Kirchhoff, 1988.

Notes:
a Data from Colombia and the Philippines uses crude rather than age-specific death rates, due to their reliance on aggregate rather than firm-specific data. This leads to an underestimation of mortality rates.
b "Small modern" refers to firms with 10-24 workers, "medium" to firms with 25-49 workers.
c "Small modern" refers to firms with 5-99 workers.
d "Small modern" refers to firms with 5-19 workers, "medium" to firms with 20 or more workers.
e "Micro" refers to firms with 1-19 workers.

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larger firms.

2. Rural firms have a higher mortality rate than
    urban firms.

3. Mortality rates vary by subsector.

4. Firms have a higher mortality rate in their first
    few years of existence.

Evidence on these hypotheses is examined in detail below.

2.1 Mortality and Firm Size

As shown in Table 7, mortality rates are negatively related to firm size, with mortality rates highest in micro enterprises, then declining as firm size increases. Data from Nigeria and Sierra Leone micro-enterprises show annual mortality rates around 10 percent, a rate not substantially different from that of U.S. firms in the same size category, at 12.5 percent.[20] For modern small and medium firms, mortality rates are lower, ranging from 1.3 to 8.3 percent annually.

The Sierra Leone and Nigeria studies cover micro enterprises only, so comparisons between size groups are not possible. The Nigerian study (Frischman, 1988),

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[20]. African micro enterprise mortality rates may include several offsetting effects. First, micro firms acting as "sponges" for low opportunity cost labor may remain open even in lean times in the face of few and dwindling alternative uses of labor. On the other hand, the smallest businesses may be the most fungible. Repair work, for example, could easily be picked up or dropped depending on demand for services, while larger scale plants would be more difficult to open or close.

however, uses another measure of size -- initial investment -- to distinguish between firms within the 1-9 worker size group. Results show that surviving Nigerian firms have initial investments over twice the size of disappearing firms.

Mortality rates for different firm size categories are available in Colombia, the Philippines, and the United States. In each country, the larger the firm size category, the lower the disappearance rate.

2.2 **Mortality and Location**

The data show no clear pattern in the relationship between firm location and firm death. Evidence from Sierra Leone (Chuta and Liedholm, 1982) supports the hypothesis that rural firms have a higher mortality rate than urban firms. Firms in Freetown show a mortality rate of 9.5 percent, lower than the 11.1 percent mortality rate of rural firms.

Evidence from the Philippines is inconsistent. A study by Fajardo (Anderson and Khambata, 1981) indicates that mortality rates are higher in Manila than in the rural areas, with a 3.3 percent annual mortality rate in Manila and a 0.5 percent mortality rate in the provinces. On the other hand, a study by Itao (1980) finds that Philippine small and medium mortality rates are highest in the highly developed regions of the country, and lowest in the least

developed regions.

2.3 Mortality and Subsector

Firm mortality may also vary by subsector. Unfortunately, analysis of the industry-specific nature of firm mortality is complicated by size characteristics of the samples. For example, in Nigeria, micro enterprise mortality rates are highest in car repair, barbering, shoe repair, calabash bowls and weaving (Frischman, 1988). Because the study only examines micro-enterprises, however, these results may reflect a growth of firms out of the micro enterprise size category rather than shifts in numbers of firms between subsectors. To overcome this problem in future studies, subsectoral mortality rates should be derived for a sample of firms in all size categories.

2.4 Mortality and Age

There is an important relationship between firm age and firm mortality. Data from Sierra Leone, India and the United States all indicate that most deaths occur during the early years of a firm's existence.

Although detailed African data are lacking, some evidence of age-specific deaths of micro firms do exist for India (Nag, 1980) and the United States (Phillips and Kirchhoff, 1988). These are portrayed in Table 8. Indian

TABLE 8

Distribution of Dead Small Firms by Two-Year Age Intervals:
India and the United States[a]
(in percent closed)

Age at Death (in years)	India	United States
1-2	21.0	40.7[b]
3-4	43.7	45.5
5-6	18.1	13.8
7-8	9.0	-
9-10	5.1	-
11+	3.1	-
Total	100.0	100.0

Sources:
India - Nag, 1980.
United States - Phillips and Kirchhoff, 1988.

Notes:
a The figures in this table show the distribution of
   actual establishment deaths over an eleven-year
   period in India, and a six-year period in the United
   States. The figures cover dead firms only, thus
   indicate nothing about the likelihood of firm survival
   in either country. The U.S. data cover firms that both
   appeared and died in the period from 1976-1986, as
   recorded in the 1976-86 U.S. Establishment Longitudinal
   Microdata files of the U.S. Small Business
   Administration. The Indian study examined dead firms of
   all ages over the period 1961-1974.
b Includes only non-growth firms.

data, in particular, reveal that almost two-thirds of all firm deaths take place during a firm's initial three to four years. A similar pattern emerges from the more limited U.S. data.

What are the survival changes of an African micro enterprise during the early years of its existence? Unfortunately, age-specific death figures do not exist for any African country. The 1980 Sierra Leone study revealed that 37 percent of the new firms previously enumerated in 1974 were still in existence after six years, but it could not ascertain the specific years in which the non-surviving firms disappeared (Chuta and Liedholm, 1982).

Given age-specific mortality rates, a higher-than-average death rate in a particular time period may, in part, be explainable by a higher-than-average birth rate approximately three years previously. This hypothesis was tested for small business failures in the United States. Swain and Phillips (1988) found that firm failure rates were positively related to the firm birth rates in the three previous years, a relationship which held across all firms and in industry-specific analyses. They concluded that high firm mortality rates are a sign of a surge in the economy in an earlier period: given firm life cycles, a higher death rate will appear shortly after a period of high firm creation. One would expect similar findings in Africa, but lack of data precludes such calculations.

2.5 Mortality and Firm Growth

Are the survival probabilities of new small firms enhanced if they grow? Evidence in Africa and other developing countries is virtually non-existent on this issue. Recent evidence in the United States, however, offers evidence that the survival probability of small firms increases with growth. Phillips and Kirchhoff (1988), using the 1976-86 U.S. Establishment Longitudinal Microdata files, discovered that the six-year survival rate of micro (1-4 employee) firms experiencing some growth was almost three times that of firms with zero growth.[21]

Evidence from Sierra Leone indicates, however, that relatively few of the surviving manufacturing micro enterprises grew even slightly, particularly in rural areas. An analysis of the responses from the 128 manufacturing firms in the 1980 survey that had been previously enumerated in 1974 reveals that none of the enterprises in the smallest rural areas (up to 2,000 inhabitants) expanded at all; in localities with 2,000 to 20,000 inhabitants, 13 percent of the surviving firms had added workers; and in localities with over 20,000 inhabitants, 31 percent of surviving firms had added

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[21]. While this relationship between mortality and growth may be useful, there is an unresolved issue of causality. Do firms grow because they are still alive, or are they still alive because they grow? Given a possible tautology, future research on this issue should be undertaken only with great care.

workers. This preliminary finding would indicate that growth within the micro enterprise size category has a minimal impact on survival rates. However, growth appears to be a relatively more significant determinant the larger the locality. It would be instructive to learn if these results hold elsewhere in Africa, and if they hold for small enterprises as well as micro enterprises.

3. Firm Expansion and Graduation

What proportion of the increase in the numbers of modern small and medium enterprises in Africa is due to the expansion of once-micro enterprises through the size structure? What does the process of firm expansion entail?

The process of firm expansion includes two types of growth. First, firms may grow larger without a fundamental change in how they are organized and operate. This growth can be called a "simple expansion" of the firm. Second, as firms grow larger they may undergo a fundamental transformation in terms of their organizational structure, management and production methods, product mix, and market niche. This transformation is a "graduation" of the firm from one stage to another. Whether firms undergo the first or second type of expansion may depend on their initial size and the extent of their expansion. Expansion from a one-person to a two-person firm, for example, may involve a simple expansion in size. An expansion from a three-

person firm to an 11-person firm, however, may require the firm to "graduate" to a more sophisticated firm structure, which may include greater specialization of labor, a change in production technology, more complex managerial tasks, and greater marketing activities. One of the basic tasks in the study of firm dynamics is to differentiate between firms undergoing a simple expansion and those undertaking the more difficult task of "graduation". As will be discussed below, this distinction is especially important in designing policies and projects that can help firms overcome the various difficulties and constraints faced in the process of expansion.

There is no single firm size at which firms begin a graduation rather than a simple expansion. However, there is some evidence to indicate that the nature of organization and production becomes increasingly complex as firms reach the ten-worker size. Therefore, in the discussions below, graduation rates will be measured by the number of firms successfully growing out of the one to nine worker category into the ten or more workers size category.

One of the arguments frequently espoused for encouraging micro enterprises is that they serve as a "breeding ground" or "seedbed" from which larger enterprises emerge (see Marshall, 1920, or Bolton Committee, 1971). It is often argued, in fact, that virtually all larger private enterprises started originally as very small entities

(Anderson, 1982). Yet others contend that this pattern of firm graduation from one size category to another is not ubiquitous, and that entrepreneurial and policy bottlenecks often severely restrict this process (see, for example, Kilby, 1988, and Biggs et.al., 1987).

Empirical evidence on the graduation of enterprises in developing countries has to date been rather sparse and not systematically compiled. Nevertheless, some initial information can now be gleaned from a reanalysis of firm-specific retrospective studies, or "bore-hole" studies, of modern small and medium industry conducted in four African countries (Rwanda, Botswana, Sierra Leone, and Nigeria), two Asian countries (India and the Philippines), and one Latin American country (Colombia).[22] In each of these surveys, information was obtained from the entrepreneurs on their firms' origins and growth, including employment data currently and at start-up. By calculating the percentage of these firms that started with fewer than 10 employees, "graduation" rates are determined. The results are summarized in Table 9.

One important finding that emerges from these particular

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[22]. Specifically, the required data were obtained from studies of 28 private firms with 30 to 850 employees in Rwanda; 25 private firms from 11 to 200 employees in Botswana; 42 firms with 1 to 200 employees in Sierra Leone; 300 firms with one or more employees in Nigeria; 47 firms with 11 to 200 employees in the Philippines; and 244 firms with over 11 employees in six subsectors in India. The Colombian figures include only metal working firms.

TABLE 9

Origins of Modern Small and Medium Manufacturing Firms
(with 11 employees or more)

Region/ Country	Year	# of Firms	Firm Size (# of Workers)	% with Micro Origin -- "Graduated"[a]	% without Micro Origin[b]
Africa					
Nigeria	1965	64	11-200	43.7	56.3
	1989	58	11-200	42.0	58.0
Sierra Leone	1975	42	11-200	30.1	69.9
Rwanda	1987	28	30-850	10.7	89.3
Botswana	1982	20	11-200	20.0	80.0
Asia					
India	1979	244	11-200	65.6	34.4
Philippines	1978	47	11-200	48.9	51.1
Latin America					
Colombia[c]	1978	76	11-200	50.0	50.0

Sources:

    Botswana - computed from data compiled by the Government of
    Botswana, 1984.
    Colombia - computed from data generated by Cortes et.al., 1987.
    Nigeria (1965) - computed from data gathered by Harris, 1967.
    Nigeria (1989) - computed from data gathered by Chuta, 1989.
    Rwanda - computed from data compiled by Ngirabatware, Murembya,
    and Mead, 1988.
    Sierra Leone - computed from data compiled by Chuta and Liedholm,
    1982.
    India - computed from data in Little et.al., 1987.
    Philippines - computed from data in Anderson and Khambata, 1981.

Notes:
a   Started with fewer than 11 employees.
b   Started with 11 employees or more.
c   Includes metal-working establishments only.

studies is that modern small and medium manufacturing firms did <u>not</u> primarily originate as micro enterprises. Indeed, in six of the seven countries, the majority of modern small and medium enterprises did not graduate from the micro seedbed, but rather started with ten or more employees.[23]   The percentage of such firms with micro origins varied widely, however, ranging from 10.7 percent in Rwanda to 65.6 percent in India.

One can also calculate graduation rates <u>out of</u> the micro enterprise size category.   These rates will be substantially lower than graduation rates <u>into</u> the small and medium size category, given the much larger base population in the micro enterprise size category. Evidence shows that the overwhelming majority of micro enterprises remain within that size category, and very few grow into small (let alone medium or large) firms.   In Nigeria, Frischman (1988) reports that only four of the 214 sampled micro firms jumped to the small and medium size category over an eight-year period, implying that only 0.2 percent of the micro firms did so annually.   Similarly low rates also appear to hold for Kenya on the basis of somewhat more indirect evidence. In 1974, Kenya had 9,760 manufacturing firms employing less than ten persons; between 1974 and

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[23].   The graduation rate may be somewhat understated, however, because the figures do not reflect those who might have origins in non-manufacturing micro-enterprise, such as in trading or in agriculture. This relationship needs further study.

1984, an average of only 20 new firms with between 10 and 100 workers appeared each year (Kilby, 1987). Even under the heroic assumption that all firms appearing with 10 to 100 workers emerged from the micro category, this would imply that less than 0.2 percent of the micro enterprises did so each year. In the Philippines, if one is to make similar computations, the annual rate of micro manufacturing firms growing into small or medium firms is 0.7 percent. Although the Philippine rate is still minuscule, it is two and a half times larger than the African rates.[24]

3.1 Graduation Rates by Region

Does the likelihood of graduation in Africa differ significantly from that found in other parts of the world? The graduation rates in the African countries are substantially lower than those found in Asia and Latin America. In Asia and Latin America roughly one half to two-thirds of the modern small and medium firms expanded through the size structure, while in no African country did even half graduate. There does appear to be, however, a significant difference in these rates between East/Central and West Africa. In both Sierra Leone and Nigeria, the

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[24]. Between 1967 and 1975, the number of establishments with from 10 to 200 workers increased by 316; in 1967 there were 41,000 micro establishments (Anderson and Khambata, 1981).

graduation rate exceeded 30 percent, while in Rwanda and Botswana, 20 percent or fewer of the firms graduated from the micro ranks.

What accounts for these differences between Latin America, Asia and Africa, and even within Africa? Policy and entrepreneurial bottlenecks are among the possible causes for these variances in graduation performance. The role of the policy bottleneck will be discussed in more detail below. The entrepreneurial bottleneck, as persuasively argued by Kilby (1988), refers to a crucial deficiency in indigenous entrepreneurial performance as firms grow beyond ten employees. It is a deficiency not in the innovative aspects of entrepreneurship, but rather in the managerial functions of the entrepreneur-- coordination and control of the firms operations -- which is more of a problem in Africa, and particularly in East/Central Africa than elsewhere. A recent study of graduation in Nigerian firms (Chuta, 1989) found that firms graduating out of the six to nine worker size category cited management as a critical constraint to growth. Firms expanding within the one to five worker size group did not face a similar constraint.

3.2 Graduation Rates by Subsector

Graduation rates also vary by subsector. The Indian data are sufficiently detailed to provide some insights on

this issue, and are presented in Table 10. In the machine tools, printing, and shoe industries, over 70 percent of the modern small and medium firms emerged from the micro seedbed, while in the power loom, iron casting and soap industries, the balance between graduating and already existing larger firms was approximately equal. Chuta's 1989 study of Nigerian light manufacturing firms also finds substantial differences in graduation rates between subsectors, although small sample sizes eschew the strength of results shown in the Indian data. However, the data do show that clothing has the highest graduation rate at 75 percent, and food processing and baking the lowest at 30.8 percent. One interesting result of Chuta's study is that subsectoral graduation rates may vary dramatically by location. For example, carpentry/furniture firms showed an 80 percent graduation rate in Yola (a slower-growth area), and a zero percent graduation rate in Maiduguri (a fast-growth area). These results point to the need for future location-sensitive subsector-specific research to define which growth patterns are subsectorally determined and to identify the characteristics of specific subsectors that stimulate or stifle growth.

3.3 Graduation Rates and Firm Size and Age

There is also evidence to indicate that firms starting at the upper end of the micro size range are more likely to

TABLE 10

India: Origins of Modern Small and Medium Firms
By Manufacturing Subsector

Subsector	# of Firms	% with Micro Origin -- "Graduated"[a]	% without Micro Origin[b]
Shoes	32	75.0	25.0
Printing	47	74.5	25.5
Machine Tools	74	73.0	27.0
Soap	19	57.9	42.1
Power Looms	29	55.2	44.8
Iron Casting	43	46.5	53.5
Average		65.6	34.4

Sources:
  Computed from Little et.al., 1987, from data collected
  in 1979.

Notes:
a   Started with fewer than 11 employees.
b   Started with 11 employees or more.

graduate than those that are initially smaller. In India (Little et.al., 1987) for example, the proportion of firms with an initial size of six to nine workers that graduated was higher than those in the one to five initial worker size group. This result held when age of firm was held constant across size groups. Indeed, both in India and Colombia (Cortes et.al., 1987), an inverse relationship was found between the age of firm and the firm's rate of growth, such that the youngest firms experienced the highest growth rates.[25]

3.4 The Speed of Growth

Just as there is a distinction in the complexity of growth between "simple expansion" and "graduation", there is also a distinction between a steady pace of growth and periods of sudden growth. As in the difference between graduation and simple expansion, sudden growth may generate more difficulties for a firm than gradual growth. For example, while growth that occurs gradually may allow time for making and correcting mistakes, change that occurs abruptly or unexpectedly may not. In that sense, stages of

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[25]. These results are consistent with recent research on small businesses in the United States that has found that firm growth decreases with age as well as with firm size (Evans, 1988). This research, which controls for the exit of slow growth firms, and tests for the age and size effects on growth separately, thus also casts some doubt on the empirical relevance of Gibrat's Law (i.e., that firm growth is independent of firm size), particularly when a complete size distribution of firms is examined.

fast growth may be times when the firm is most vulnerable, even if the firm is not going through a complex "graduation" process. Growth spurts are also likely to occur when the firm is most aggressively exploiting its perceived opportunities. Thus, growth spurts may encompass periods of both greater danger and greater opportunity for firms than other periods in the firm's life.

Until recently, no research has been undertaken to study growth spurts of firms, despite the fact that they may be critical junctures for firms. Recent evidence from Nigeria (Chuta, 1989) suggests that the majority of firms do experience periods of very fast growth.

According to the Nigerian data, growth spurts occur most frequently in firms over the age of five. Evidence from Jamaica (Fisseha, 1979), Niger, (Fisseha, 1989), and the United States confirms these results. In their study of U.S. firm dynamics, Phillips and Kirchhoff (1988) found that a "typical" firm life cycle is characterized by four years of low or no growth, followed by a sudden growth spurt which lasts for at least two years.

In terms of firm size, the Nigerian data shows that spurts are more likely to occur in the smallest (one to two workers) or largest (ten or more workers) firms. Similarly, certain subsectors seem more likely to experience periods of fast growth, including carpentry and furniture, food processing and baking, and clothing.

Clearly, more research is needed to explore periods of fast growth in developing country manufacturing firms.

3.5 Firm Contraction

To fully understand firm life cycles, it is also important to explore periods in which firms contract. All firms eventually face some kind of contraction, at least in the period of firm death. Unfortunately, firm contraction cannot be studied in firms that have died, due to problems in identifying and contacting those firms. Information on firm contraction can, however, be gathered from existing firms that have faced set-backs that do not result in firm closure. Until very recently, no information was collected on firm contraction. Evidence from Nigeria (Chuta, 1989), however, suggests that the majority of on-going firms do face periods of contraction at some time. According to the data, declines are most likely to affect the youngest, smallest firms, a finding which coincides with the higher likelihood of firm mortality for young, small firms as discussed above. Nearly two-thirds of all declines were experienced by firms with one to five workers, with the bulk occurring in firms with one to two workers (41.5 percent). Among micro enterprises only, 55 percent experienced declines. Sixty percent of declines were experienced by firms under the age of four. These results indicate that more research is needed on both the

causes of periods of decline and how firms have dealt with

them.

C. POLICY AND PROJECT ISSUES

The preceding discussion of firm dynamics highlighted several findings that have important implications for micro and small enterprise policy and projects. These policy and project issues are examined below.

1. Policy Issues

One key policy issue is what effect government policies have on growth of dynamically efficient micro and small enterprises in Africa. Are they responsible for the meager graduation rate? It is frequently argued (see, for example, Little et.al., 1988, and Biggs and Oppenheim, 1986) that most government taxes and regulations, such as those governing minimum wages, working conditions, registration and zoning, fail to reach the micro firm in most developing countries. As firms increase in size, however, they become more visible and fall subject to these various government policies, many of which fall proportionally heavily upon them. Consequently there is a disincentive to evolve organically into modern small and medium-sized firms. Empirical support for this view is provided by an Indian survey that discovered an unusually large number of firms just below the size required for registration as a factory (Timberg, 1978).

Comparable evidence unfortunately does not exist for Africa. One key issue to be illuminated is how regulations

and taxes affect firms by size, both <u>de jure</u> and <u>de facto</u>. Often those that formally apply (<u>de jure</u>) are not enforced, or if so, are applied unevenly, subjecting the firm to harassment or pressures for side payments. A second key issue is how policies "beneficial" to smaller enterprises (such as access to government finance, import quotas, training assistance, or foreign exchange) differentially affect firms of different sizes, both <u>de jure</u> and <u>de facto</u>. Do these positive policies outweigh the negative ones at varying size levels? Finally, it is important to ascertain whether these governmental policies, both negative and positive, arise all at once when a firm reaches a certain size or whether they phase in gradually or in discrete steps, as a firm expands and evolves.

Preliminary evidence indicates that the effects of governmental policy do change as the firm grows, even within the micro size category. In Chuta's Nigeria survey, for example, 90 percent of firms stated that various government policies began to affect their firms at different stages in the firm's life. Evidence from other African countries, most of it anecdotal and episodic, also shows that policies do not all appear to affect the firm at the same time as, for example, when the firm reaches the "visible" size. Even the smallest micro firm cannot avoid the effects of import duties, quotas, or an overvalued currency. In Nigeria (Chuta, 1989), firms of all size

complained of foreign exchange restrictions and licensing excessive requirements.

As firms grow, however, they may become subject to additional taxes, rules, and regulations. Many of these are in the nature of lump sum levies, such as the "patente" tax in Rwanda (see Ngirabatware et.al., 1988) or licensing and registration fees in Sierra Leone, all of which per unit of output fall heavily on the micro or small firm when applied. There is thus a strong discontinuity when a firm reaches this size (or becomes "visible") as its marginal tax rate jumps precipitously.

As suggested above, as firms grow they also gain greater access to beneficial government policies. In Nigeria, Chuta (1989) found that while small and large firms all feel the effects of negative business policies, large firms are much more likely to benefit from government support programs of technical training, marketing assistance, and access to government estates than smaller firms. Unfortunately, the absolute and relative ratio of policy benefits and costs in large and small firms cannot be measured. Clearly, future work on policy must pay careful attention to identifying and avoiding sharply net negative policy discontinuities that would act as a disincentive to firm expansion.

2. Project Issues

Myriad projects have been designed and carried out to facilitate the creation, support, and expansion of small enterprises. A key issue in the outcome of these projects is the economic environment in which they are implemented. Projects based in dynamic sectors of the economy are more likely to lead to a net increase in the number of viable firms. However, projects targeting regions or subsectors with declining or stagnant economies may not cause a net increase in the number of firms; instead, benefits to some firms may come at the expense of others that were not assisted (Boomgard, 1989a). Therefore, when projects are carried out in stagnant or declining regions, the task becomes finding a market which shows some untapped demand for goods or services, then supporting firms supplying those markets.

Several additional issues arise from the firm-level findings. First, do the types of direct assistance needed vary as a firm grows? Initially, working capital may be the crucial need for micro firms, but as firms evolve, managerial, technical and marketing assistance may become more central. Evidence from Nigeria (Chuta, 1989) shows a similar pattern. For the smallest firms (one to two workers), working capital is the greatest constraint. As firms grow into six or more workers, managerial constraints are increasingly cited as major difficulties. This finding

lends evidence to Kilby's hypothesized "entrepreneurial bottleneck" discussed above.

Moreover, an initial "single" missing component in smaller firms may become "multiple" in larger firms. Evidence from Nigeria (Chuta, 1989) showed that the number of constraints facing growing firms tripled as firms grew from five or less workers into six to nine workers. This suggests that project or policy interventions targeting the needs of larger firms will be more difficult to design than projects targeting smaller firms.

Second, the evidence on the age and location profile of business survival provides an interesting question of which firms to target for assistance. Since the risks of failure are greatest during the first three years of a firm's existence, a four year old firm is more likely to be economically viable than a new firm. Similarly, given relatively lower death rates in larger localities, projects targeting firms in urban areas may generate more viable firms than those carried out in areas with very dispersed populations. Consequently, project managers may have a higher long-term "success rate" from supporting existing firms rather than setting up new firms, or from supporting firms in more densely populated areas.

In deciding which firms to target for assistance, project designers may be forced to choose between projects that target those with greatest need and projects that have

the highest payoff. This choice cannot be made without reference to a specific situation, therefore, project recommendations must be made on a case by case basis. How to make these decisions is not the topic of this paper. To make such decisions, however, more information is needed on how firms evolve within a given project and policy environment. Methods for gathering this information is the subject of Part II of this paper.

II.   STUDYING FIRM DYNAMICS IN THE KENYAN CONTEXT

When examined in the broader context of global, national
and subsectoral economic patterns, the study of firm-level
dynamics becomes a detailed look at how economies develop.
In fact, firm births, growth, and death are the basis of
transformations which are observed at a subsectoral and
national level.   Policy makers cannot   understand   or
facilitate an industrialization process without a detailed
understanding of how to generate firms, keep them going,
and help them grow.   However, to understand firm level
dynamics one needs to bring in knowledge of the global,
sectoral and subsectoral dynamics. Thus, understanding the
dynamics of industrialization becomes an iterative process
-- insight on macro trends illuminates micro processes, and
knowledge of micro processes clarifies macro trends.

So where should research start?   It starts with
developing an understanding of the global, national and
subsectoral context in which firms operate.   The core of
the research, however, is an in-depth analysis of firm-
level dynamics, which allows the investigator to search
both for peculiarities of the case and for similarities
across cases. Below is a specific research agenda which
provides a first attempt at researching these issues in the
context of Kenya.

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A. SETTING A RESEARCH AGENDA

Ideally, detailed firm-level data would be collected for a sample which covers different firm sizes, locations, subsectors, and countries. This data would allow an analysis of firms by size, age, location, entrepreneurial characteristics, subsector, and nationality. It would also allow the study of the subsectoral and national development patterns. However, such an agenda would require an enormous investment of financial and human resources, and is optimistic even for the long-run. A more manageable short-run agenda can be set in a single country, within a single subsector. If the country and subsector are chosen carefully, insights gained in one setting may provide glimpses into broader cross-national or cross-sectoral trends. This is the agenda described below.

First, a manageable agenda requires narrowing the field of inquiry to a single country in which in-depth research can be conducted. Kenya is one country in which the study of firm dynamics may be especially fruitful.

Kenya's population is largely rural, and the majority of gross domestic product (GDP) comes from agriculture. As such, one would expect the bulk of household income to come from agricultural output. Even in rural areas, however, only 58.7 percent of households receive the majority of their income from farm enterprise earnings, while 16.9 percent of rural household income comes directly from non-

farm enterprises (Boomgard, 1989b). Naturally, the proportion of non-farm income is even higher in urban areas. While the bulk of non-farm employment comes from trading activities, manufacturing activities provide an important and increasing proportion of non-farm employment for both the formal and informal sectors (Kilby, 1986).

Within manufacturing, certain subsectors may be more dynamic than others. From 1976 to 1983, production in the formal sector increased most rapidly in transport equipment, clothing, petroleum and other chemical products, and most slowly in meat and dairy products, leather and footwear, and furniture (Grosh, 1988). Without explicitly including informal sector manufacturing, however, production data is likely to dramatically underestimate the growing importance of light consumer good and agriculture-related manufacturing. Even when looking at formal sector data only, however, it is clear that one subsector is central to the economy, both in a static and dynamic sense: agricultural processing (see Tables 11 and 12).

The importance of agricultural processing in Kenya is understandable on several grounds. First, agricultural processing is closely tied to the largest overall contributor to GDP, agriculture. As such, it is linked to the "growth engine" of the economy. Second, it produces goods that are known to have a significant and growing domestic market. Even in the lowest income households, 10

TABLE 11

Employment and Value Added by Manufacturing Subsector
in Kenya, 1984
(in percent)

Subsector	Persons Engaged	Value Added
Food processing	26.0	28.3
Beverages and tobacco	4.8	12.9
Textiles incl. cotton ginning	13.0	5.5
Clothing, footwear, other textile & leather products	7.8	4.4
Wood and furniture	8.2	3.7
Paper and packaging	5.8	6.2
Chemicals	9.2	17.1
Non-metallic minerals	4.2	5.3
Metal and metal products	8.3	5.8
Elect. & transport equipment, misc. manufactures	12.8	10.8
All manufacturing	100.0	100.0

Source:
   Grosh, 1988, calculated from preliminary unpublished
   estimates, Kenya Central Bureau of Statistics.

TABLE 12

Annual Growth in Formal Sector Agricultural
Processing Output in Kenya, 1976-1984
(in percent)

Agricultural Industry	Annual Change in Production
Meat and dairy products	-3.6
Grain mill products	7.1
Sugar and confectionery	9.9
Miscellaneous foods	3.0
Beverages	3.1
Tobacco	6.9

Source: Grosh, 1988.

to 15 percent of incomes are spent on processed foods (Boomgard, 1989b).[26] Third, Kenya has a long history of success in selling its agricultural goods in international markets. Coffee and tea have traditionally been the most important exports. More recently, attention has been given to developing non-traditional agricultural exports. In the past four years, for example, exports of horticultural crops have risen by 25 percent annually (Industrial Review. 1989).

Recently, agricultural processing has received significant support from the public sector in terms of credit, technical support, and research.[27] While benefiting from such support, however, the subsector is

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[26]. While studies show Kenyan expenditure elasticity of demand for food to be less than one on average, this figure does not disaggregate elasticities by types of food products (Boomgard, 1989b). Ideally, one would estimate expenditure elasticities of demand for various classes of foods to see if processed foods constitute a growing or declining proportion of expenditures as incomes rise. Experience from other developing countries suggests, however, that the elasticity of demand for processed foods remains high as per capita income rises, while the elasticity of demand for basic foodstuffs falls.

[27]. Public sector investments in agricultural processing constitute between 8 and 23 percent of the budgets for the following organizations: the Development Finance Company of Kenya (DFCK), the Industrial and Commercial Development Corporation (ICDC), the Kenyan Industrial Estates (KIE), and the Kenya Industrial Research and Development Institute (KIRDI). KIRDI, for example, develops new food technologies. The focus of research is currently on processing and uses of millet, sorghum, oil seeds, and fibers; uses of agro-industrial wastes for manufacturing energy and chemicals; and general development and improvement of agro-industrial technologies and products from domestic raw materials (Ikiara, 1988).

relatively open to market forces. Grosh (1988) estimates that private food processing firms enjoy nominal protection of four percent, and face an effective rate of protection of negative two percent, which suggests that the domestic market is closely aligned with international market conditions.[28] Thus, food processing may provide a glimpse of how firms and subsectors evolve within real supply and demand conditions.

Within the agricultural processing subsector, industries can be differentiated into food and non-food processing. They include meat processing, fruit and vegetable processing, dairy products, baking, grain milling, sugar and chocolate processing, beverages, edible oil production, coffee, tea, and tobacco processing, jute and sisal processing, and horticulture. These industries differ by some basic characteristics, such as by location and availability of raw materials, scale economies in production, product and raw material perishability, and the location of the final output markets. Differentiating the

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[28]. The nominal protection coefficient (NPC) is the ratio between the domestic price of a good and the world price for the same good. An NPC equal to one suggests that domestic firms are completely aligned with world supply and demand conditions. The effective rate of protection (ERP) is a measure of whether local firms their incentive to produce enhanced or decreased by the tariff structure. An ERP equal to zero suggests that domestic firms are neither protected nor disadvantaged with respect to world producers by a tariff system, while a positive ERP suggests that firms enjoy protection from international markets.

analysis of agricultural processing along these lines may provide interesting insights into dynamics of both subsectors and firms.

Given the above discussion, a manageable agenda which provides useful insights into patterns of growth and change can be framed in the context of Kenya's agricultural processing subsector. What is now needed is a theoretical and methodological approach for studying dynamics in this context.

B. DEVELOPING A THEORETICAL FRAMEWORK

Building a theoretical framework in which to study firm dynamics is a necessary task, which can lend direction to the empirical inquiry. Much academic energy has already been devoted to building theories of firm growth. Despite these efforts, few theories have emerged which can provide guidance for research of developing country firms, as is required here. However, it is useful to make a brief review of two theoretical constructs now available.

Clearly, the overarching theory of supply and demand give the context of firm birth, growth, and death. At the macro level, supply and demand theory is important in exploring aggregate trends, as was done in the work of Syrquin (1988). At the firm level, a supply and demand framework is also relevant. Neoclassical theory provides one variant of a microeconomic supply/demand framework, which analyzes a firm in the context of a given industry. As demand for an industry's products increases, existing firms expand to capture short-term profit, and new firms may enter the industry, depending on barriers to entry. Once demand and supply stabilize, and in periods of little technological change, there is little incentive for firms to expand or enter the industry. At this point, it is hypothesized, "equilibrium" can be reached. Neoclassical theory also suggests that firms will grow up to an "optimal

size" where economies of scale are realized, and that the market will force inefficient firms out of the industry.

This neoclassical view of firm birth, growth, and death is based on the assumptions of full information, zero transactions costs, and perfect mobility of resources. Most importantly, perhaps, it is based on a rigid view of a firm as an organization which produces a given commodity across time, regardless of changing supply and demand forces. As such, it is an inappropriate model for analyzing the typical developing country firm, which evolves with market conditions and with the abilities of the entrepreneur.

Penrose (1959) provides an alternative framework which is also based on the theory of supply and demand. Penrose's concept of a firm is fundamentally different from that used in neoclassical analysis. She sees the firm as an organism which grows, innovates, and changes products in response to changing market conditions and changes in its internal managerial and entrepreneurial capabilities. For Penrose, optimal size is not a useful concept. In fact, a healthy firm will always grow under favorable economic conditions. Therefore, market "equilibrium" is not a meaningful concept, since growth is a dynamic process of continuous disequilibrium. Penrose's view of firm evolution allows for firm integration into other stages of production, and even into completely different lines of

business, two processes which are typical of firm evolution in developing countries.

Penrose's work and the conceptual framework of structural change laid out in Part I provide a good framework on which to build more explicit theoretical hypotheses of firm-level dynamics. Within this framework, specific theories can be developed on the role of various factors in determining firm evolution. The large literature on entrepreneurship is a case in point.

In this paper, key hypotheses revolve around the relationship between firm birth, growth, and death and the central firm characteristics of firm size, age, and location, all couched within the framework of supply and demand factors. Some of these hypotheses are:

Birth = f(Location, size, subsector, familial and entrepreneurial characteristics, global and national economic conditions)

Survival = g(Location, age, size, subsector, firm and entrepreneurial characteristics, global and national economic conditions)

Growth = h(Location, age, size, subsector, firm and entrepreneurial characteristics, global and national economic conditions)

where:

Age of the firm is related to death rates (-), rates of growth (+), and variability of growth (-).

Size of the firm is related to birth rates (-), death rates (-), and growth rates (-).

Size of Locality in which the firm operates is related to death rates (-), birth rates (+), and growth rates (+).

The types and numbers of constraints faced by firms vary by firm size, age, and location.

Clearly, a new theory of firm dynamics is needed which can incorporate such relationships. One of the goals of future research is to test such theoretical hypotheses, and let the empirical results inform future theoretical endeavors. Equally important is developing a conceptual framework of what constitutes firm "birth" or "death", and how we define the process of firm evolution in general.

Preliminary methods of carrying out an empirical investigation of these issues is the topic of the next section.

C. DEVELOPING A METHODOLOGY

A discussion on methodology can be divided into three parts corresponding to the three levels of inquiry laid out in Part I: the national, subsectoral, and firm levels. First, ways of exploring the broader context of the national environment are laid out. Second, a methodology for studying the subsector is outlined and discussed. Finally, methods for carrying out the actual studies of firm-level dynamics are explored.

1. Studying the National Economy

To be useful for the purposes of studying economic dynamics, the study of Kenya's national economy needs to be carried out on two levels. First, the current status of the economy and the historical patterns of development are relevant areas of inquiry. Second, one must explore the current dynamics of the economy -- the areas and direction of growth in the economy, and the speed of growth.

A broad review of the historical foundations of Kenya's economy is a first step in understanding the current economic environment. Such an historical perspective includes an understanding of the policies of the colonial government, and of the Kenyan government from independence to the present day. Elements of this perspective include infrastructure development, training of nationals as skilled workers and managers, development of an economic

elite, and types and directions of linkages created with international corporations. It also includes a study of the development of state-owned industry and policies of import substitution industrialization, and their outcomes.

The second step involves a thorough study of the current state of the Kenyan economy. This includes an understanding of the levels of national income and resources, and how they are distributed and used; sources and rates of population growth; types and levels of national education and training; the health and growth of various sectors such as agriculture, services, commerce and industry; economic institutions and their functions and memberships; and the national policy structure.

Equally important for an understanding of the process of structural change is the search for current points of dynamism in the Kenyan economy. Which sectors are most rapidly expanding, providing an "engine of growth" for the broader economy? These sectors can be identified by tracking the proportion of GDP contributed by each sector over time, where rising shares of GDP may signify a dynamic sector, constant GDP a stagnant sector, and declining GDP a declining sector. Studying economic dynamism also involves exploring the dynamics of specific regions and localities to identify levels of market activity

A review of the national economy lays the framework within which subsectors, and firms within subsectors,

evolve. It does not require a large investment of time or money, and can be carried out within the confines of a library.

2. Subsector Studies

Subsector analysis (SSA) traces the movement of a product from the beginning of the production process until the delivery of that product to its final consumer. In this process, small-scale manufacturers are joined by raw material producers and suppliers, transporters, wholesalers, and retailers to meet the demands of the market for goods and services.

Specifically, SSA studies four key attributes of a subsector. First, it outlines each transformation through which a product goes, from raw material to the final product. Second, it studies the mechanisms that link the various stages of the transformation, including methods of coordination of supply and demand, as well as flows of information. Third, it identifies who is involved at each stage of the transformation. This step also includes identifying the competitive structure of each stage, and the amount of integration between stages. Finally, SSA identifies the different paths, or "channels", through which a product flows. Any single channel will include a grouping of firms that are connected through forward or backward linkages (Boomgard et.al., 1986). As described

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thus far, SSA appears to be a static view of a subsector. However, SSA can be made more dynamic by exploring how these patterns evolve over time, and the causes of this evolution.

What do the techniques of SSA provide for the study of small enterprise dynamics? First, they can shed light on some of the following questions which affect firm dynamics:

- What technologies exist for products of the subsector? If multiple technologies exist, are some more labor intensive than others? At what firm size are economies of scale achieved for each technology?

- How much product differentiation exists within the subsector? Are both inferior and normal goods produced within the subsector? To what extent are they substitutes for each other? What other substitutes exist?

- What are the major constraints faced by firms in the subsector? What input, information, or policy constraints exist? Are they the same for firms of all sizes and locations?

- What institutional framework exists for the subsector, such as cooperatives or manufacturers' associations? What mechanisms exist to facilitate information flow and reduce risk?

- What is the structure of demand for the goods and services of the subsector? Is it changing over time? Is it location- or season-specific?

In addition to answering the above questions, SSA may prove useful in illuminating the following distinctions which may be particularly important in studying firm-level dynamics.

a. **Large v. Small Firms:** Mapping the vertical and horizontal structure of firms allows a view of the relationship between firms of different sizes. One might

hypothesize that the presence of large firms in a subsector may drive out smaller firms, or that multinational corporations would drive out Kenyan firms. However, a good subsector study will go beyond identifying the apparent competitors at each stage, and provide information on the following as well: Do small and large firms produce an identical product? Do they produce for the same geographic market? How are their markets changing? Do small firms work on a subcontract basis for large firms? Do large firms act as market leaders for small firms, providing information or other benefits to small firms?

b. **Formal Sector v. Informal Sector Firms:** The discussion in Part I of this paper suggests that formal sector firms are subject to more official hindrances, as well as more benefits, than firms operating in the informal sector. SSA allows a closer look at the types and magnitudes of costs and benefits of operating in the formal and informal sectors. Moreover, it shows to what extent formal and informal sector firms compete or cooperate within and between stages.

c. **Manufacturing v. Service/Commerce Firms:** SSA does not allow the examination of manufacturing firms in the absence of other types of enterprises, as was attempted in Part I of this paper. Instead, it emphasizes the interdependence of performance between the agricultural, manufacturing, service, and trade sectors, where the

dynamics of manufacturing firms are intimately connected to the health of agricultural, service, and trade firms operating in the same subsector.

d. **Rural v. Urban Firms:** By defining the various channels through which products flow, SSA identifies locational patterns in a subsector. Thus, it can help to identify the relationships between rural and urban firms and markets, and changes in those relationships over time. Such an analysis may be especially important, for example, in exploring the long-term employment potential of a particular subsector for remote rural regions.

Clearly, SSA can provide a great deal of information on the environment in which individual firms operate. Unfortunately, a complete SSA requires a great deal of time and resources. Therefore, to uncover the most salient features of the subsector while leaving time for in-depth firm-level research, shortcut methods are needed. The most useful methods may be those often incorporated in rapid appraisal studies, such as informant interviewing. This method does not rely on random sampling techniques, but rather hinges on identifying and interviewing individuals with a great deal of knowledge about the subsector. Such informants may be participants in various stages and channels of the subsector, policy makers, or researchers. Also, information on the subsector can be obtained through firm-specific bore-hole interviews (discussed in the next

section), with questions on the level and type of competition, market share, changes in demand, and forward and backward linkages.

3. Firm-Level Analysis

Once a general understanding of national and sectoral context is reached, the focus of the research agenda shifts to in-depth research on the life-cycles of those firms that make up both the subsectoral and national patterns. The bedrock of this research is the "borehole" questionnaire, an instrument designed to uncover the following:

- Conditions under which a firm appears.

- Original and current firm size.

- The background of the entrepreneur and the entrepreneur's family.

- Basic characteristics of the firm, both at the time of start-up and currently, including source and use of inputs, management methods, and choice of technology.

- Periods of growth that the firm has undergone, and the pattern of growth, including age of firm at time of growth, speed of growth, type of growth, and problems incurred in periods of growth.

- Periods of decline that the firm has undergone, and the pattern of decline, including age of firm at time of decline, nature of decline, and reasons for the decline.

- Characteristics of the subsector in which the firm operates -- including institutions, the structure of competition, market demand, and forward and backward linkages -- and how these have changed over time.

- Characteristics of the policy environment, and how different policies have affected the firm both in its initial years and currently.

A sample "borehole" questionnaire is attached in Appendix

III. In order to understand how firm dynamics differ for firms of different sizes and locations, such a questionnaire should be administered to a sample of firms stratified by size of firm and location.

The borehole study allows the following avenues for analysis:

- **Entrepreneurial characteristics:** Which of the attributes of an entrepreneur appear to be most important in ensuring the success of a firm? Education, training, previous work experience, managerial techniques, or other elements?

- **Familial characteristics:** Does family background influence the success of an entrepreneur? If parents were in the same business, is the entrepreneur more likely to succeed?

- **Firm characteristics:** What firm attributes have a bearing on the success of a firm? Type of ownership, choice of technique, level of labor and management specialization, recordkeeping methods, reinvestment strategies, or other?

- **Subsectoral characteristics:** What impact do specific characteristics of the subsector have on a firm's likelihood for success?

- **Policy characteristics:** What impact do specific policies have on a firm's ability to succeed, either positive or negative?

- **The nature of Expansion/Graduation:** At what point in a firm's life is an expansion or graduation likely? How does a firm pass from one stage into another stage? At what point does a simple expansion turn into a graduation?

In terms of the firm dynamic statistics discussed in Section B of Part I, bore-hole questionnaires are particularly useful for attaining graduation rates. However, in order to measure the probability of firm graduation from a micro enterprise to a modern small or

medium enterprises, a substantial number of firms in the larger firm size category must be sampled.

Bore-hole questionnaires do <u>not</u> provide an indepth analysis of firm deaths, either for pinpointing the cause of death, or tracing the post-closure activities of entrepreneurs. They can, however, provide an historical picture of entrepreneurial and firm development, which can shed light on the reasons for and patterns of firm creation, growth, and transformation.

III. CONCLUSION

The process of industrialization is propelled by two fundamental forces -- growth and change in the overall demand for goods, and the intricate interactions of individual firms working to supply the market with goods. No study of the dynamics of industrialization can uncover the pattern of how economies develop without looking at both macro-level patterns of supply and demand and the process by which individual firms participate in the market. To date, however, the macro perspective has received the bulk of attention, perhaps due to the difficulty of collecting and generating information out of firm-level data. Thus, the study of industrialization has remained generally uninformed by an understanding of firm births, evolution, and deaths.

When studying the broad patterns of industrialization, it may seem insignificant whether any single firm appears, survives, or disappears. However, when many firms follow similar patterns, the fate of individual firms may be very instructive in discerning patterns of change in the entire economy.

The initial evidence of firm dynamics presented in this paper suggest that there may indeed be some regular patterns of firm life-cycles which cut across industries, time periods, and national boundaries. It also suggests,

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however, that these patterns may depend on the policy and project environments of a specific area. Thus, it may be possible to encourage certain patterns of industrialization through careful policies and projects, well informed by an understanding of how they affect individual firms.

Clearly, this paper is only a first attempt at laying out the conceptual framework of firm dynamics. The empirical work presented is also a preliminary attempt to uncover firm dynamics from surveys not specifically designed to test such hypotheses. More work is needed on both the theoretical and empirical fronts. Theoretically, a new approach is needed to direct the inquiry of firm development in developing countries. Empirically, future research should be designed explicitly to examine the patterns of firm evolution, and the environmental influences on this process.

APPENDIX I

DATA REQUIREMENTS FOR STUDYING FIRM DYNAMICS

APPENDIX I

DATA REQUIREMENTS FOR STUDYING FIRM DYNAMICS

Gathering data on each element of firm dynamics-- birth, death, and growth of firms -- requires unique types of data and methods of analysis. Unfortunately, the requisite data seldom exist in developing countries and the methods for collecting data are often expensive. Below is a discussion of acceptable methods for carrying out firm dynamics analysis, and the difficulties often encountered.

A. BIRTH RATES

Firm birth rates are calculated by dividing all new firms appearing in a given time period by the total number of firms already in existence at the beginning of the time period. On an annual basis, for example, this is accomplished by taking a snapshot of the number of firms at the end of a year that are one year old or less, which misses firms which appear in that year then die before the snapshot is taken. The longer the time period, the greater the downward bias in birth rates, as more firms can both appear and disappear within the time period, thereby avoid being counted as new firms.

In order to measure birth rates, a complete count of the number of existing firms is needed at regular intervals. As noted above, the shorter the time period the better, particularly in light of evidence that death rates are

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particularly high in firms under four years old. Thus, counts made on an annual or biannual basis will provide much more accurate birth rates than counts made every five or ten years. If existing and new firms are all enumerated in terms of size, location, and sector, then calculations can be made of birth rates by these firm characteristic.

Many African countries rely on occasional censuses or industrial surveys to identify new firms. However, even most national surveys do not uncover the true number of firms in existence. In Kenya, for example, while regular data are collected on new firms, only formal sector firms-- a relatively small portion of the total business population -- are caught in the official data net. For instance, calculations of firm births made from the Kenyan Directory of Industries, 1974-1977, showed a gross annual formal sector birth rate of 2.1 percent, much lower than the 5.25 percent <u>net</u> birth rate uncovered by Kilby for both formal and informal manufacturing firms.[29] Formal sector biases tend to drastically understate the presence and role of the smallest, most rural firms, and particularly household-based activities involving women and children, all populations of interest in encouraging new firm

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[29]. It should be recalled that net birth rates are inherently lower than gross birth rates since each firm disappearance reduces the firm appearance count by one. Therefore, the 5.25 percent increase in numbers of firms cited by Kilby (1986) for the period 1981-1984 underestimates the true birth rate for that period.

creation.

Compounding coverage problems, data on even formal sector firms are gathered or published only sporadically. Moreover, census data often only provide the total number of firms in existence, without identifying which firms have appeared, remained, or disappeared. These problems lead to an enormous gap between the net birth rates measured for a given time period and gross birth rates, the statistic of interest.

In lieu of census or industrial survey data, some researchers have conducted location-specific enumerations of firms, usually by going door-to-door in search of businesses of all sizes and varieties. When these surveys are carried out in the same areas in two time periods, a birth rate for that area can be derived. This was the method used by Chuta and Liedholm to collect the Sierra Leone data cited in Table 6. However, these methods are extremely expensive and time consuming, thus can only be carried out in tandem with other research goals.

Countries with more sophisticated private and public informational systems may have methods for identifying new firms more rapidly, but these methods are also not without problems. In the United States, for example, the number of firms filing business taxes annually gives a yearly account of the total number of firms. However, simple subtraction of the figures of two years gives the net change in numbers

of firms, where a firm birth will be cancelled out by a firm death in the aggregate figure. An alternative series which identifies "business starts" is collected by Dun and Bradstreet as firms apply for credit or insurance for the first time. However, while this may be indicative of the level of new firm activity, it is not a true measure of firm births. It captures firms that are slightly older (about two years old), operating on a full-time basis, and with at least one hired employee (Burke and Phillips, 1988). Thus it underestimates the number of new or part-time establishments, and those staffed by a self-employed, self-financed entrepreneur.

B. DEATH RATES

Firm death rates are calculated by dividing all firms that can no longer be located at the end of a given time period by the total number of firms in existence at the beginning of the time period. Death rates can be calculated in either simple or compound (logarithmic) rates. Simple rates are lower than compound rates since they do not account for an annual decay factor in the total number of firms.

As with birth rates, calculating death rates requires a complete count of the number of existing firms to act as a baseline to which numbers of dead firms can be compared. Contrary to data needs for birth rates, however, this

baseline should include firm-specific data, such as the date of origin, size, location, and sector of each firm. It also requires periodic surveys of the same firms, to identify which firms disappear, and when the disappearance occurs. If these data are available, death rates can be calculated by location, age, size, and sector of firm. Relative to birth rates, death rates are more difficult to calculate, since they require firm-level data from at least two time periods.

The greatest difficulty in measuring firm death rates is a lack of information on why firms disappear. There is a fundamental difference between firms that disappear because of business failures, and firms that disappear for other reasons. In most surveys, a "dead" or closed firm is one no longer operating in its listed activity at its previous location.[30] Consequently, a dead firm does not necessarily constitute a business failure, since it may, for example, have voluntarily changed locations or shifted to other lines of activity. Exact figures on what percentage of deaths are closures of viable firms -- such as due to the retirement or death of the proprietor, or change of location or activity -- and what percentage can

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[30]. In India, it refers to firms non-existent or firms not traceable (Nil or Not-to-be-punched) on the census forms, while in the United States it refers to a firm no longer listed on the U.S. Establishment Longitudinal Microdata file of the SBA (Phillips and Kirchhoff, 1988).

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be attributed to business failures are unfortunately rather
scanty.   Closure of viable firms, however, may be a
significant proportion of total deaths.   In Sierra Leone,
for example, Chuta and Liedholm (1985) reported that 20
percent of the dead firms simply changed locations.   In
Quito, Ecuador (Middleton, 1989), 65 percent of firms
closed for reasons other than firm failure.[31]

This definitional problem points to a   need for methods
of tracking dead firms to discover the reasons for firm
closure.   In Sierra Leone (Chuta and Liedholm, 1981), Kano,
Nigeria (Frischman, 1988), and Quito, Ecuador (Middleton,
1989), attempts were made to find the owners of dead firms
and ask why they had closed their business. All three
efforts pointed to the difficulty and poor results of such
attempts.   In urban Quito, 75 percent of the closed firms
were eventually tracked down. In Sierra Leone and Nigeria,
however, information could be found on only one third of
the closed firms.

Misunderstandings of why firms disappear also cloud the
distinctions between firm death on one hand, and firm
births and transformations on the other hand.   First, if a
firm is closed in order that an entrepreneur can begin a
new line of work that he or she finds more profitable, then
a firm death is the first half of the dynamic of a firm

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[31]. In the United States, it is alleged that 75
percent of business terminations are voluntary.

birth. Similarly, if a firm disappears because it has changed location or evolved into a new product line, a firm death may in fact be a "graduation" or transformation. Both of these possibilities show that they dynamics of birth, growth and death are intimately interrelated, and that methods to ferret out one part of the dynamic story should build in ways to discover how it is linked to another part of the story.

C. GRADUATION RATES

The "graduation" or transformation of a firm can occur at any size of firm, with or without growth in the number of workers. Most frequently, however, fundamental transformations of firms from simple into complex organizations occur as firms grow, and particularly as they evolve from "traditional" into "modern" enterprises. Therefore, this paper has used the number of firms growing from micro enterprises (one to nine workers) into modern small or medium enterprises (10-50 workers) as an indicator of graduation.

Data needs for graduation rates, like those for death rates, include both aggregate and firm-level figures. First, a count is needed of the total number of firms in the relevant size category; in this case, the number in the 10 or more workers size category. Second, the original size of each firm in terms of employment is needed to

indicate whether that firm started in that size category or grew up from another size group. The graduation rate is the percentage of firms which grow into a certain size category from the one to nine worker size category. Given the lack of data on firm growth in most African countries, data to calculate graduation rates are most likely to be collected for a sample of firms, and can be stratified by location and sector as well.

A complication in estimating graduation rates is holding the sample examined constant in terms of age. Clearly, if firms have less likelihood of growth in their first four years, and young firms have a shorter lifetime in which to grow, a sample with a higher proportion of young firms will have a lower graduation rate than one with older firms.

APPENDIX II

METHODOLOGICAL DIFFICULTIES IN USING BORE-HOLE STUDIES FOR ANALYSIS OF FIRM DYNAMICS

METHODOLOGICAL DIFFICULTIES IN USING BORE-HOLE STUDIES

FOR ANALYSIS OF FIRM DYNAMICS

Once a researcher develops a detailed borehole questionnaire and manages to obtain high-quality responses in the field, using the responses for analysis presents two fundamental difficulties. First is the absence of a counterfactual. All of the firms in the sample are still alive, therefore all are relatively successful, even if stagnant. In effect, all samples of firms are truncated, with dead firms not appearing. Without a control group of firms that are explicitly unsuccessful, it is difficult to uncover the key attributes that lead to success or failure.

How can this problem be solved? Given a truncated sample containing live firms only, econometric methods such as Probit or Tobit analysis may be appropriate. A good example of Probit analysis for such research on U.S. firms is found in Evans (1988), where the probability of a firm surviving from one time period to the next depends on the age, size, and number of plants the firm has. This method is particularly useful for cross-sectional data. Were panel data available, however, a more direct link could be made with dead firms. Characteristics of those firms that disappear between interview periods would then be compared

to those firms that survived from one period to the next. Given a binary dependent variable (dead/not dead), Logit or Probit analysis might then be appropriate methods. Overall, in deciding how to cope with the truncated sample, scarcity of resources should be kept in mind, as panel data requires a longer-term, more costly investment than does a one-time survey.

The second problem is definitional, and is related to the first problem; namely, how do we define "success"? To quantify success, it must be reduced to an indicator. In terms of the types of analysis discussed above, success would be indicated by the firm being alive. However, this definition eschews subtleties of performance between existing firms, and results in a tautology: a firm is alive because it is successful, and is successful because it is alive. As an alternative, success could be measured by a firm's ability to graduate, but that would disadvantage firms which began as large, complex organizations. Third, success could be measured as the extent of growth or innovation, of which there are infinite permutations. Ranking these permutations would be a difficult, if not impossible, task. Another measure of success often employed is profit level. However, this measure would be particularly misleading in a study of firm dynamics, where a firm may forego current profits for future returns. In the end, this definitional problem may

be   solved   by   using   multiple   measures   of   growth   and

success.

APPENDIX III

A "BOREHOLE" QUESTIONNAIRE

FIRM DYNAMICS QUESTIONNAIRE

Locality _____

Name of
Enterprise _____

Establishment Number _____

Name of Respondent _____

Name of Enumerator _____

Date of Visit _____

Ethnic Origin _____

Respondent is (check those appropriate):

A. Owner _____

Manager _____

Other _____

B. Male _____

Female _____

Name of Proprietors (1) _____

(2) _____

(3) _____

Name of Manager _____

Major Products _____

_____

_____

PART I: FIRM CHARACTERISTICS

1. In what year was this business established?_____

2. Tell me about how your business has developed since it began.

_____

_____

_____

_____

_____

_____

3. How many people (including the founder) worked in the business a) THIS YEAR, b) IN THE FIRST YEAR?

This Year: _____   In the First Year: _____

4. If possible, can you divide these workers into the following categories a) <u>THIS YEAR</u>, b) <u>IN THE FIRST YEAR</u>?

	<u>THIS YEAR</u>	<u>IN FIRST YEAR</u>
Owners (or) proprietors	_____	_____
Other family labor	_____	_____
Non-family paid labor	_____	_____
Apprentices (trainee's)	_____	_____

5. What type of ownership did this business have, a) <u>THIS YEAR</u>, b) <u>IN THE FIRST YEAR</u>?

	<u>THIS YEAR</u>	<u>FIRST YEAR</u>
Individual	_____	_____
Partnership	_____	_____
Cooperative	_____	_____
Private Corporation	_____	_____
Family	_____	_____
Other_____	_____	_____

6. What are the major activities and products of this business?

_____

_____

_____

7. How much does each activity/product contribute to overall sales?

<u>Activity/Product</u>	<u>Sales</u>
_____	_____
_____	_____
_____	_____
_____	_____
Total Sales:	_____

8. In which of the following markets did the business sell its products, a) <u>THIS YEAR,</u> b) <u>IN FIRST YEAR?</u>

	<u>THIS YEAR</u>	<u>IN FIRST YEAR</u>
Local market	yes ___ no ___	yes ___ no ___
Regional market	yes ___ no ___	yes ___ no ___
National market	yes ___ no ___	yes ___ no ___
Export market	yes ___ no ___	yes ___ no ___
Subcontracting work for other firms	yes ___ no ___	yes ___ no ___

9. Which of the following activities did you carry out in your business, a) <u>THIS YEAR,</u> b) <u>IN FIRST YEAR?</u>

	<u>THIS YEAR</u>	<u>IN FIRST YEAR</u>
Keep records of sales	yes ___ no ___	yes ___ no ___
Keep records of operating or production costs	yes ___ no ___	yes ___ no ___
Set aside money for replacing equipment	yes ___ no ___	yes ___ no ___
Keep separate business and personal financial records	yes ___ no ___	yes ___ no ___
Have a banking account with a formal financial institution	yes ___ no ___	yes ___ no ___

10. How much initial capital was used to start this business? _____

11. What were the sources of this initial capital?

How much?

(a) <u>Personal Assets</u> _____

(b) <u>Loans from</u>:

    (i)   Commerical Banks _____

    (ii)   Government Development Bank _____

    (iii) Money Lenders _____

    (iv) Friends _____

    (v)   Family _____

    (vi) Cooperatives _____

    (vii) Other _____ _____

(c) <u>Gifts</u> _____

(d) <u>Partnership</u> _____

(e) <u>Other</u> _____ _____

PART II: ENTREPRENEUR CHARACTERISTICS

12. In what year did you begin in this business? _____

13. How did you acquire the business?

Founded it	yes ____	no ____
Bought it	yes ____	no ____
Took it over from parents	yes ____	no ____
Other _____	yes ____	no ____

14. What is your age? _____

15. What region are you from? _____

16. What type of education have you had? (Number of years)

None   _____
Primary School   _____
Secondary School Type: _____   _____
College Education   _____
Koranic School   _____
Vocational School   _____
Technical School   _____
Other of Type Education   _____
   (Please Specify):_____

[Omit questions 17 and 18 if respondent has secondary or college education]

17. Can you read?

     Yes _____   No _____

18. Can you do arithmatic?

     Yes _____   No _____

19. Please list your apprentice and work experience in chronological order.

Date	Activity	Firm Size (Sm/Lg/Fam)	Position (Proprietor/worker/apprentice)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

20. What other economic activities were you involved in when you began in this business?

Date	Activity	Position
_____	_____	_____
_____	_____	_____
_____	_____	_____

21. What other economic activities are you involved in now?

Date	Activity	Position
_____	_____	_____
_____	_____	_____
_____	_____	_____

PART III: FAMILY CHARACTERISTICS

22. How much education did your father and mother have? (Please check the spaces that apply.)

	Father	Mother
None	_____	_____
Primary School	_____	_____
Secondary School	_____	_____
College Education	_____	_____
Koranic School	_____	_____
Vocational	_____	_____
Technical School	_____	_____
Other Type of Education	_____	_____
(Please Specify): _____		

23. Describe your father's primary occupation?

Activity: _____

Nature of position: _____

_____

24. What was your mother's primary occupation?

Activity: _____

Nature of position: _____

_____

25. What other economic activities were your family involved in when you began in this business?

Activity (manu/trade/serv)	Product	Run by:
_____	_____	_____
_____	_____	_____
_____	_____	_____

26. What other economic activities are your family involved in now?

Activity (manu/trade/serv)	Product	Run by:
_____	_____	_____
_____	_____	_____
_____	_____	_____

PART IV: PERIODS OF GROWTH AND DECLINE

General Change

27. Which of the following changes have taken place since you began in this firm?

    Changed size/location of business:

Expanded existing business	yes ____ no ____
Established other branches	yes ____ no ____
Changed business location	yes ____ no ____
Opened retail outlet/salesroom	yes ____ no ____
Other _____	yes ____ no ____

    Changed techniques:

Bought better machines or changed the production process	yes ____ no ____
Improved workshop design or rebuilt the establishment	yes ____ no ____
Increased worker specialization	yes ____ no ____
Increased production for inventory	yes ____ no ____
Other _____	yes ____ no ____

    Changed products:

Introduced new products or activities	yes ____ no ____
Stopped certain products or activities	yes ____ no ____
Other _____	yes ____ no ____

    Explain: _____

28. What was the greatest difficulty you faced in running this business, a) THIS YEAR; b) IN FIRST YEAR?

    This year:_____

    In First Year:_____

29. What other difficulties did you face in running this business, a) THIS YEAR, b) IN FIRST YEAR? (NOTE: Check space once if you asked, twice if respondent thought of it without prompting.)

Shortage of:	THIS YEAR	IN FIRST YEAR
Consumer demand	yes _____ no _____	yes _____ no _____
Technical advice	yes _____ no _____	yes _____ no _____
Skilled labor	yes _____ no _____	yes _____ no _____
Investment Capital for buildings and equipment	yes _____ no _____	yes _____ no _____
Working Capital for materials	yes _____ no _____	yes _____ no _____
Equipment	yes _____ no _____	yes _____ no _____
Materials	yes _____ no _____	yes _____ no _____
Spare parts	yes _____ no _____	yes _____ no _____
Electricity	yes _____ no _____	yes _____ no _____
Water	yes _____ no _____	yes _____ no _____
Space	yes _____ no _____	yes _____ no _____
Transport facilities	yes _____ no _____	yes _____ no _____
Other _____	yes _____ no _____	yes _____ no _____

High cost of:		
Capital	yes _____ no _____	yes _____ no _____
Skilled labor	yes _____ no _____	yes _____ no _____
Equipment	yes _____ no _____	yes _____ no _____
Materials	yes _____ no _____	yes _____ no _____
Other _____	yes _____ no _____	yes _____ no _____

Other difficulties:		
_____	yes _____ no _____	yes _____ no _____

Growth Periods

30. Did your business have any periods of very fast growth?

Yes _____   No _____   Don't Know _____

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31. If yes, in what year did the biggest growth:

Begin _____   End _____

32. How many workers did you have:

    1) At the <u>beginning</u> of that time?   _____

    2) At the <u>end</u> of that time?   _____

33. What do you think was the cause of this fast growth?_____

_____

_____

34. What changes did you make in your business in order to expand output?

_____

_____

_____

35. Did you encounter difficulties with any of the following during this transitional period?

Choosing the correct production process	yes ___	no ___
Choosing the right amount of labor	yes ___	no ___
Finding adequate working capital	yes ___	no ___
Accounting for your costs	yes ___	no ___
Find good managers and foremen	yes ___	no ___
Managing firm activities and workers	yes ___	no ___
Estimating demand for products	yes ___	no ___
Government policies and regulations	yes ___	no ___
Other _____	yes ___	no ___
_____		
No difficulties	yes ___	no ___

36. If so, what did you do to overcome these difficulties? _____

_____

_____

_____

37. (Ask entrepreneur only) Why was it important for you to expand your business?

_____

_____

_____

Decline Periods

38. Has your business experienced any periods when output declined?

       Yes _____   No _____   Don't know _____

39. If yes, in what year did the biggest decline:

       Begin _____   End _____

40. How many workers did you have:

       At the beginning of that time?   _____

       At the end of that time?   _____

41. What do you think was the cause of this decline? _____

_____

_____

42. What did you do to deal with these difficulties? _____

_____

_____

PART V: THE SUBSECTOR

43. Has the number of firms in your industry in this locality increased, decreased, or remained the same a) <u>IN THE LAST ONE YEAR</u>; b) <u>IN THE LAST FIVE YEARS</u>?

	<u>LAST 1 YEAR</u>			<u>LAST 5 YEARS</u>	
Increased	yes ____	no ____	yes ____	no ____	
Decreased	yes ____	no ____	yes ____	no ____	
Remained the same	yes ____	no ____	yes ____	no ____	

44. Has the demand for the products of your business increased, decreased, or remained the same a) <u>IN THE LAST ONE YEAR</u>, b) <u>IN THE LAST FIVE YEARS</u>?

	<u>LAST 1 YEAR</u>			<u>LAST 5 YEARS</u>	
Increased	yes ____	no ____	yes ____	no ____	
Decreased	yes ____	no ____	yes ____	no ____	
Remained the same	yes ____	no ____	yes ____	no ____	

45. What kind of firms did you compete with for markets a) <u>THIS YEAR</u>, b) <u>IN THE FIRST YEAR</u>?

	<u>THIS YEAR</u>		THE FIRST YEAR	
Household-based firms	yes ____	no ____	yes ____	no ____
Small/medium-sized indigenous firms	yes ____	no ____	yes ____	no ____
Small/medium-sized non-indigenous firms	yes ____	no ____	yes ____	no ____
Large indigenous firms	yes ____	no ____	yes ____	no ____
International firms	yes ____	no ____	yes ____	no ____
Other _____	yes ____	no ____	yes ____	no ____

46. Have you sold any of your products through an agent a) <u>THIS YEAR</u>, b) <u>IN THE FIRST YEAR</u>?

THIS YEAR: Yes ____ No ____   THE FIRST YEAR: Yes ____ No ____

47. If yes to 46a or 46b, why did you decide to do so? _____

_____

_____

48. Do you contract with other firms to make parts or provide services for your business, a) THIS YEAR; b) IN FIRST YEAR?

    THIS YEAR: yes ____ no ____   THE FIRST YEAR: yes ____ no ____

49. If yes to 48a or 48 b, why did you decide to do so? _____

_____

_____

PART VI: GOVERNMENT POLICY

50. What governmental policies and regulations caused problems for your business, a) THIS YEAR, b) IN THE FIRST YEAR OF BUSINESS?

   a)   THIS YEAR:

_____

_____

_____

_____

   b)   IN THE FIRST YEAR:

_____

_____

_____

_____

51. (TICKLER) Did any of the following cause problems for your business,
a) <u>THIS YEAR</u>, b) <u>IN THE FIRST YEAR</u>? (NOTE: Check space once if you asked,
twice if respondent thought of it without prompting.)

<u>Labor</u>	THIS YEAR	IN FIRST YEAR
Minimum wage	yes ____ no ____	yes ____ no ____
Social Security	yes ____ no ____	yes ____ no ____
Working conditions (eg apprenticeship rules, hours, health)	yes ____ no ____	yes ____ no ____

<u>Taxes</u>
<u>National</u>

Income tax (corporate/personal)	yes ____ no ____	yes ____ no ____
Sales tax	yes ____ no ____	yes ____ no ____
Excise or value added tax	yes ____ no ____	yes ____ no ____
Other: _____	yes ____ no ____	yes ____ no ____

<u>Municipal</u>

Application Fees	yes ____ no ____	yes ____ no ____
License Fees	yes ____ no ____	yes ____ no ____
Poll Fees	yes ____ no ____	yes ____ no ____

<u>Regulations</u>

Licensing and registration	yes ____ no ____	yes ____ no ____
Zoning	yes ____ no ____	yes ____ no ____
Health	yes ____ no ____	yes ____ no ____
Price Control	yes ____ no ____	yes ____ no ____

<u>International</u>

Foreign Exchange restrictions	yes ____ no ____	yes ____ no ____
Import quotas	yes ____ no ____	yes ____ no ____
Import duties	yes ____ no ____	yes ____ no ____
<u>None</u>	yes ____ no ____	yes ____ no ____

52. What governmental policies and regulations helped your business, a THIS YEAR, b) IN THE FIRST YEAR OF BUSINESS?

   a) THIS YEAR:

   _____

   _____

   _____

   _____

   b) IN THE FIRST YEAR:

   _____

   _____

   _____

   _____

53. (TICKLER) Did any of the following have a positive effect on your business, a) THIS YEAR, b) IN THE FIRST YEAR? (NOTE: Check space once if you asked, twice if respondent thought of it without prompting.)

Financial	This year		In Year 1	
Access to government finance	yes ____	no ____	yes ____	no ____
Subsidized finance	yes ____	no ____	yes ____	no ____
Nonfinancial				
a) Government Purchases	yes ____	no ____	yes ____	no ____
b) Investment Incentive - import duty rebate or relief	yes ____	no ____	yes ____	no ____
- tax (holiday) or exemption	yes ____	no ____	yes ____	no ____
c) access to import quotas	yes ____	no ____	yes ____	no ____
d) government technical assistance	yes ____	no ____	yes ____	no ____
e) government marketing assistance	yes ____	no ____	yes ____	no ____
f) traning assistance	yes ____	no ____	yes ____	no ____
g) access to industrial estate	yes ____	no ____	yes ____	no ____
None	yes ____	no ____	yes ____	no ____

54. In periods when you were _expanding_ the firm, what government policies and regulations affected this expansion?

_____

_____

_____

_____

55. (TICKLER) Which of those polices/regulations had the _greatest negative_ impact on _your expansion_? (NOTE: Check space once if you asked, twice if respondent thought of it without prompting.)

	Greatest (mark one)	Other (mark no more than 3)
minimum wage	_____	_____
social security	_____	_____
working conditions	_____	_____
income tax	_____	_____
sales tax	_____	_____
excise or value added tax	_____	_____
application fee	_____	_____
license fee	_____	_____
poll fee	_____	_____
licensing and registration	_____	_____
zoning regulations	_____	_____
health regulation	_____	_____
price control	_____	_____
foreign exchange restrictions	_____	_____
import quotas	_____	_____
import duties	_____	_____

56. (TICKLER) Which of these policies had the greatest positive impact on your expansion? (NOTE: Check space once if you asked, twice if respondent thought of it without prompting.)

	Greatest (mark one)	Other (mark no more than 3)
access to government finance	_____	_____
subsidized finance	_____	_____
government purchases	_____	_____
import duty rebate	_____	_____
tax holiday or exemption	_____	_____
access to import duties or license	_____	_____
government technical assistance	_____	_____
government market assistance	_____	_____
government training assistance	_____	_____
access to industrial estate	_____	_____

(Ask 57 and 58 if more than one policy/regulation is listed in 57 and 58.)

57. Did all of these policies begin to affect your business at the same time?

Yes _____   No _____

Explain: _____

_____

_____

_____

58. If yes, how many employees did you have at that time?_____

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