Firm Size and Resource Mobility

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Final Report
on Contract # SBA 7153-OA-83

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EXECUTIVE SUMMARY

This study investigates how firm size is related to resource mobility. It analyzes the extent to which small firms are more flexible than larger ones in the engagement and disengagement of economic resources as market conditions change. Since resource mobility is a necessary ingredient for economic efficiency and growth, studying the effect of firm size on mobility can point to an important contribution made by small firms.

The relation between resource mobility and firm size is analyzed by comparing the frequency of entry and exit of establishments owned by small and large firms between 1976 and 1982. Each establishment is viewed as an organized package of resources, capable of entering an industry, exiting and industry or surviving in the same industry in both years. Enterprises whose establishments are more frequently entering or exiting are enterprises with more mobile resources.

The size of enterprise was measured on the basis of the total number of employees in all of the establishments that it owned. Over seven million establishments, in operation at some point between 1976 and 1982, were grouped into one of five size classes based on the total number of employees in the owning enterprise. The size classes were: 0-4 employees, 5-19 employees, 20-99 employees, and 100-499 employees and 500 or more employees. Mobility in each size class was then
compared to mobility in each of the other smaller and each of the other larger size classes.

A number of mobility measures were studied. They include birth rates, death rates, turnover rates (births plus deaths), net births rates (birth minus deaths), inter-industry migrations of surviving establishments and inter-size class mobility. The measures of entry and exit were defined on an establishment basis. Thus the birth of an establishment was counted as an entry of a resource package whether or not there was a surviving or dying establishment in the industry that was owned by the same firm.

The study also considered the effect of establishment type on mobility. Two types of establishments were defined: independent establishments were those owned by a single establishment firm or those which were headquarters of multi-establishment firms. Dependent establishments were those which were branches or subsidiaries of multi-establishment firms.

Major Findings

The results suggest that resource mobility is greater for small firms. In general, the smaller the size of the owning enterprise, the greater the mobility of its establishments. The specific findings are as follows:

(1) For both independent and dependent establishments, mobility as measured by births and deaths was greater for smaller than for larger firms. Among independents, births
in the smallest enterprise size class (0-4 employees) accounted for 33 percent of the average population of establishments in that class, while births in the largest size class (500 or more employees) accounted for only 5 percent of the average population of that class. Deaths in the smallest size class accounted for 25 percent while deaths in the largest size class accounted for only 7 percent. Among dependents, births in the smallest size class were 108 percent of the average population in that class, while in the largest size class births were only 67 percent of the average population. Deaths were 66 percent in the smallest size class as compared to only 47 percent in the largest size class.

(2) In all comparisons between size classes, the larger the size class, the smaller the births and deaths as a percent of the average population in the class.

(3) Among all size classes (i.e. large and small), mobility as measured by births and deaths was greater for dependent than for independent establishments. Among dependent establishments, births were 79 percent of the population. Among independent establishments, births were only 32 percent of the population. Deaths were 51 percent for dependents and 22 percent for independents. Independent establishments probably represent a different kind of package of resources (e.g. greater entrepreneurial elements) than dependent establishments.
(4) When no distinction is made between independents and dependents, establishments of larger firms appear to have higher birth and death rates than those of smaller firms. This is because establishments of larger firms are more often dependent and those of smaller firms more often independent. Since dependents are overall more mobile, with no distinction between establishment types, the greater mobility of dependent establishments makes it appear that larger firms are more mobile. That is, the effect of establishment type is mistaken for the effect of enterprise size. Only by controlling for establishment type can the true effect of enterprise size be measured.

(5) Although the majority of independent establishments are small firms and the majority of dependent establishments belong to large firms, there were large numbers of dependent establishments owned by small firms and large numbers of independent establishments that were large firms. The average population of dependent establishments in the period of this study was 944,218. Of this total 191,827 were owned by enterprises with less than twenty employees. The average population of independent establishments for the period was 4,199,587 and 88,263 of them were enterprises with one hundred or more employees.

(6) Higher industry growth was associated with higher industry birth rates and lower industry death rates. For independents, the association was stronger among establishments owned by smaller firms than among those owned
by larger firms. This suggests that among independents, the greater mobility of smaller firms represented a movement of resources out of declining industries and into expanding industries. An example of this is the movement of small firms into business services (SIC#73) and out of retail dry goods (SIC#53). Among dependents however, the association between growth, births and deaths was stronger for establishments owned by larger firms. This means that for dependents, the greater mobility of small firms was not associated with a movement of resources from declining to expanding industries.

(7) Using turnover rates to analyze mobility showed the same pattern of higher mobility among smaller firms that was shown using births and deaths separately.

(8) The movement of surviving establishments from one industry to another (i.e. migration) was a significant factor among independent establishments but not among dependent establishments. Mobility as measured by migrations of surviving establishments was greater for larger firms than for smaller firms. Among independents, migrations in the smallest size class were 6 percent of the average population in that class while migrations in the largest size class were 29 percent of the average population in that class. Thus among small firms, mobility most often takes the form of births and deaths, while among large firms, mobility most often takes the form of migration from one industry to another. However a migration cannot be counted as equal to a
birth and death in terms of the amount of resources redeployed.

(9) In examining inter-size class mobility (movements of surviving establishments from one firm size class to another), the study found that the tendency of small firms to become large firms was greater than the tendency of large firms to become small firms. High industry growth increased the tendency of small firms to move to a higher size class and reduced the tendency for large firms to move to a lower size class. Thus, high industry growth tends to increase the percentage of surviving establishments in an industry owned by the largest size class of firms and decrease the percentage of surviving establishments owned by the smallest size class of firms. This means that the falling small firm share of output or employment in high growth industries, observed in research using aggregate data results in part because successful small firms become large firms and less successful large firms become small firms.

(10) An analysis of employment generation was carried out in order to provide some measure of the volume of resources mobilized by small firms. In both dependent and independent establishments, the patterns of employment generation with respect to firms size were similar to the pattern observed for establishment net births. This suggests that counting establishments as resource packages is roughly equivalent to counting labor resources.
The effect of net births on employment generation in independent establishments was different for smaller firms than for larger firms. Among larger firms, employment gained through establishment births was less than employment lost through establishment deaths. But among smaller firms, employment gained through establishment births exceeded employment gained through establishment deaths. For dependent establishments, the gain from births exceeded the loss through deaths for both large and small firms. However, the gain in employment through net births in all sizes exceeded the gain in employment due to internal expansion in surviving establishments. Thus, as a source of job generation in dependent establishments, net births are more important than internal growth.

The rate of job generation in firms with less than 100 employees exceeded the rate of job generation in firms with more than 100 employees. Small firms' share of new jobs accounted for more than their share of the average level of employment.
Chapter 1: Introduction

The main part of this study is an empirical analysis comparing mobility of large and small firms. However before proceeding to the empirical analysis, we wish to provide some theoretical reasons why small firms are expected to be more mobile than large firms and why mobility is important. Readers not interested in these topics can skip to the next chapter.

1.1 The Importance of Resource Mobility

Because of technological innovation, shifting cost conditions and changing consumer tastes, there must be a continuous reallocation of resources in the economy. The appearance and growth of new industries and the shrinking or disappearance of old industries is one way by which resources are reallocated. In order for this to happen, there must be a transfer of resources from declining to expanding industries. There is also a movement of resources in and out of industries even if they are not expanding or contracting. When an industry develops new products or new methods of producing an existing product, it will often be necessary for one type of resource to replace another. An example is the replacement of existing steel production facilities by so-called mini-mills. One way in which this replacement of resources takes place is thru the birth of a new firm and the death of an existing firm.

The realignment of resources in response to changing technology and consumer tastes is a critical factor for
economic efficiency and growth. Rapid realignment can improve efficiency and accelerate growth by making production factors available to promising areas. Slow realignment can impede efficiency by denying needed factors to promising new activities. It should also be recognized that the disappearance of firms due to bankruptcy or voluntary dissolution may be part of the reallocation process. These events, though at times viewed as a sign of economic weakness, are a natural part of a healthy economy.

1.2 Mobility and Resource Specialization and Durability

Our theory that small firms are more mobile is based on the notion that they are less intense users of specialized and durable resources. An important factor in determining the ease with which resources can be transferred from declining to expanding areas is the extent of their durability and specialization. Durable resources are plant and equipment that have a long service life. Specialized resources are plant and machinery that are designed for specific tasks in the production of particular products and therefore have little use outside the industry for which they were originally designed. An example of a durable and specialized resource would be a machine that produces the bodies of automobiles. When resources are both durable and specialized, it becomes difficult for firms which use these resources to switch operations from one industry to another.
We explain below why small firms are less likely to be users of durable and specialized resources. But first some further explanation of why these resources are less mobile.

1.21 Exit From Declining Industries

When a firm owns durable and specialized capital assets, the cost of these assets represents a fixed or sunk cost. When sunk costs account for a large fraction of the firm's total cost of production, it is less likely that the firm will quickly exit the industry, when industry prices decline and profits fall below normal. For firms with large fixed costs, prices can fall below the average total cost of production but operations will continue as long as price is above the average variable cost of production because losses are minimized by producing rather than by closing down.

The higher the fixed costs as a portion of total costs, the more price can fall below average total cost of production without causing the firm to cease its operations in the declining industry. Operations can continue until the plant and equipment wear out and must be replaced. The more durable the firm's fixed assets, the longer it takes for equipment to depreciate and the longer it will continue to operate in a declining industry where price has fallen below average total cost. It should be noted that it is durability combined with specialization which delays exit from declining industries. Without specialization, assets could be sold upon exit and the costs of these assets would not be
fixed costs. Without durability, assets would wear out in a short period of time and the firm would be free to exit.

1.22 Entry Into Expanding Industries

Asset specialization and durability can also affect the rate at which firms will enter a new or expanding industry. For plant and machinery specialized to one particular industry, conditions within that industry will determine the price and availability. If the industry is expanding, the cost of purchasing the specialized machines will be increased and order backlogs will develop as well. Even without an order backlog, the design and construction of specialized plant and equipment will take time, and this will limit the rate of entry by firms using such specialized assets. In contrast, the price and availability of non-specialized assets will not be affected by the fact that the industry is expanding. Firms using non-specialized assets will be able to obtain them quickly either as new or as used assets.

1.23 Firm Size and Mobility

A good case can be made for the premise that small firms tend to make less use of specialized and durable assets and are therefore more mobile. One reason is that small businesses generally have less access to capital markets than large businesses. Because of the higher risks of lending to small businesses, small firms are less able to raise funds through stock and bond offerings and are restricted to owners equity (and perhaps bank loans) as a
source of funds for capital assets. This makes it difficult (or costly) to raise long-term capital with which to purchase fixed assets. Consequently, small firms will tend to favor production techniques using less capital and more labor.

Another reason is that the scale of operations of a small firm makes it less likely that it will employ highly specialized machines. Such machines require a large volume of output to keep them fully utilized and this makes them less economical for small firms who by definition have a small output volume. Large firms making use of mass-production methods to obtain economies of scale are more suited to the use of specialized machines.

Another factor which could restrain the entry of large firms is the effect of entry on output market prices. A firm using specialized plant and equipment to gain economies of scale will have to enter an industry with a large output volume. Otherwise the presence of excess capacity can cause the per unit production cost of a large firm to be higher than that of a small firm with the same output level. But a large firm entry at an efficient production level can cause a substantial depression of output market prices, even if the market is expanding. This may deter large firm entrants as they wait for growth in market demand to accommodate the large increase in output which their entry will generate. However, small firm entry will have only a small effect on
market prices. Therefore, small firms will be quicker to enter expanding markets than large firms.

In many industries large and small firms are direct competitors. It is the hypothesis of this study that for the reasons given above, small firms will more likely be the first to enter new and expanding industries and the first to exit declining industries. As a new industry matures and growth slows down, large firms which may ultimately be more efficient producers, will enter and perhaps displace many of the original small firm entrants. However, we would expect to find that in rapidly expanding (declining) industries, the rate of small firm entry (exit) will be greater than the rate of large firm entry (exit).

We also expect that the greater mobility of small firms will be manifested in greater turnover of small firms in all industries regardless of whether the industry is declining or expanding output. This is because new products and new technology which require a replacement of resources can arise even in industries which have zero growth.

1.24 Forms of Resource Mobility

The movement of resources from declining to expanding industries can take place either through death (bankruptcy or voluntary liquidation) of firms in the declining industry and birth of firms in the expanding industry or by a shift of an ongoing firm's operations from a declining industry to an expanding industry. We refer to the latter case as across industry or inter-industry migration. In this case, the firm
simply closes down its operations in the declining industry, lays off its workers and sets up a new plant and hires new workers in the expanding industry. It may retain most of its workers by locating the new plant next to the old, or by helping its workers relocate. Across industry migration can take place very slowly or very rapidly, depending on the durability of the resources involved. Often the firm will, for a time, simultaneously operate in both the declining and expanding industries. In either case, it is necessary that the owner/managers of the firm have knowledge about the increase in demand that is creating a new industry as well as knowledge about the production technology for its new products. Most often this knowledge is absent because the declining and expanding industries are unrelated. Thus for example, when demand declined in the steel and textile industries and increased in the computer and robotics industry, it was not the steel and textile companies who entered the computer and robotics industries. Birth and death may be more common than inter-industry migration.

In the case of redeployment through death, the firm ceases to exist, its assets are liquidated and its workers become unemployed. The resources of the declining industry are then released and made available for firms born into or migrating into the expanding industries. The dying firm's assets are offered for sale in used asset markets and its workers can look for jobs in other industries. It is, of course, unlikely that the identical assets and identical
workers will be directly transferred from a declining to an expanding industry. This is because the plant and equipment and labor skills of the declining industries are not necessarily well suited to the expanding industries. Most often, the resources of a dying firm will be dispersed over a wide range of industries. However, their entry into the pool of available resources creates a net increase in the economy-wide availability of resources, lowers wage rates and capital goods prices and makes it easier for firms in the expanding industries to obtain these resources. For example, if steel (a declining industry) companies were to die, their plant and machinery would not be purchased mainly by firms in the computer industry (an expanding industry) nor would their workers find jobs in the computer industry. However, the availability of former steel workers to some third industry means that the third industry would not hire workers that would be going to the computer industry. The availability of used plant and machinery to some third industry also means that new capital goods are more available for the computer industry.

1.3 Prior Research

To our knowledge, there has been no systematic comparison of birth and death rates of small and large firms in the U.S., apart from the research sponsored by SBA of which this study is a part. There has been one study of establishment births and deaths for Scotland by Beasley and Hamilton.¹ Their study tabulated birth and death rates in
Scotish manufacturing industries for the period 1976-80. It estimated a regression of turnover rates (birth rates plus deaths rates) in each industry with the percentage of industry establishments with less than 25 employees. It found no statistically significant relation. Unfortunately the study did not compare small firm and large firm birth and death rates within industries or within the entire manufacturing sector.

A related study of small firm behavior was conducted by Mills and Schulman. They hypothesized differences between small and large firms production techniques similar to those set forth in this study-namely less capital intensity of small firms and less use of specialized capital by small firms. Rather than looking at birth and death rates, Mills and Schulman compared the variability of sales over time between surviving large and small firms. They hypothesized that small firms, with less durable and specialized capital, would be more flexible in varying their output level in response to variations in industry demand. Their regression of firm sales variability on market share confirmed that smaller firms did indeed have more variation in sales as compared to larger firms within the same industry. The work of Mills and Schulman complements the research in this study in explaining how large and small firms co-exist in the same industry. Large firms may be superior in terms of static efficiency while small firms appear to be more flexible in response to changing market conditions. Mills and Schulman
looked at the response in terms of the behavior of surviving firms while this study will look at the response in terms of exits and entries.

1.4 Plan of the Study

Apart from the present chapter, this study comprises six additional chapters. In Chapter 2, we present the data base which we used and discuss its relevant characteristics as well as certain methodological points on its utilization. In Chapter 3, we analyze the effects of enterprise size on birth and death rates of establishments. The dependence of birth and death rates on firm size is a fundamental indicator of relative resource mobility across size classes. Birth and death rates are measures of entry and exit activity at the industry level. Aside from the main point which is the role of small firms in resource mobility, the study of birth and death rates allows us to also draw some implications on industry structure and the size distribution of firms.

In Chapter 4, we analyze the effects of industry growth upon resource mobility. We examine whether growth mobilizes resources differently among different sized firms. This analysis takes us a step beyond what was accomplished in Chapter 3 because it will pinpoint mobility in response to a specific stimulus - industry growth. It thus provides a direct link between firm size and the shift of resources from declining to expanding industries.
In Chapter 5, we analyze the impact of birth, death and internal growth in the various size classes upon job generation. The importance of this issue is self evident, especially at times when unemployment is a major social and economic concern. In addition, demonstrating the capacity of small firms to generate employment will supplement our previous conclusions about small firm mobility and its contribution to the level of resources utilization.

In Chapter 6, we analyze the pattern and the determinants of cross-industry migration. This phenomenon is an important form of resource mobility and can exist side by side with entry/exit by birth and death of enterprises. Whereas death and birth are processes which involve a scattering and a new "packaging" of resources, cross-industry migration of an enterprise maintains, at least in part, the "package" of resources involved in the movement.

Finally, Chapter 7 brings together the main conclusions of the study.

Notes to Chapter 1


Chapter 2: Data Sources

Readers not interested in the technological details of the data sources can skip this chapter.

The database for this study is the 1976 and 1982 versions of the U.S. Establishment and Enterprise Microdata (USEEM) file. This data, part of the Small Business Data Base maintained by The Office of Advocacy of the U.S. Small Business Administration, is derived from Dun and Bradstreet's DUNS Market Identifier (DMI) files. The combined 1976 and 1982 files contain data on over 7 million establishments that existed in either or both years. The original DMI files were extensively edited and cross checked by the Brookings Institution under contract to the Office of Advocacy of the U.S. Small Business Administration.

2.1 Computing Births and Deaths

In computing the birth and death rates using the USEEM, several adjustments had to be made to the raw data. These adjustments were necessary because of (a) imputed or synthetic records (b) improved coverage and (c) lags in updating records. Imputed records are those which were created and added to the file in order to reconcile company employment reported by headquarters of multi-establishment firms with the sum of employment reported in all of its branches and subsidiaries. Improved coverage of the file results because the DMI files, which form the basis of the USEEM, were never a complete census of U.S. businesses. Because of this, companies appearing on the file in 1982 but
not in 1976 often do not represent the birth of a new establishment but rather an old establishment which has been added to the DMI file. Lags in updating the records result because the DMI is less frequently updated for small firms. Therefore, some records on the USEEM are 3 or 4 years old. Two methods of computing birth and death rates were used. The first (hereafter referred to as the method which excludes imputed records) was to count as births all records on the file in 1982 but not in 1976 except (a) records that were imputed and (b) records with a business age of more than seven years. The latter are presumed to represent new coverage of existing establishments. At the same time, deaths were computed as all records on the file in 1976 but not in 1982 except (a) imputed records and (b) records with a very old (more than four years) report age for 1976. The latter were presumed to have gone out of business prior to 1976.

The second method of computing birth and death rates (hereafter referred to as including imputed records) follows the technique used by Armington and Odle. This technique is premised on the fact that since the vast majority of large corporations must register in state and local government offices, it is likely that Dun and Bradstreet was comprehensive in reporting these registrations on the DMI file. It is therefore assumed that all branches of multi-establishment firms are represented on the USEEM file either as reported or as imputed records. If this assumption
is correct, then a portion of the branches that appear on the file for the first time in 1982 were represented by imputed branches in 1976. A second assumption was that the death rate for imputed branches was identical to the death rate of non-imputed branches. These assumptions allowed us to compute the number of births and deaths of branch records. Since number of births and deaths of non-imputed branches was already directly countable on the USEEM file, the total number of births and deaths could be computed by adding the directly counted non-branch births (excluding improved coverage) to the estimated number of branch births and deaths.

2.11 Computing Branch Births, Deaths and Matches

The computations can be described algebraically as follows:

\[ F^T = \text{all branch records appearing for the first time in 1982.} \]

\[ D^N = \text{deaths of non-imputed branch records} \]

\[ T76^I = \text{total imputed branches for 1976} \]

\[ T76^N = \text{total non-imputed branches for 1976} \]

\[ T82^N = \text{total non-imputed branches in 1982} \]

\[ T82^I = \text{total imputed branches in 1982} \]
The values of the above variables are all directly measurable on the USEEM file. The following four variables must be estimated:

- \( D_I \) = imputed deaths of branch
- \( D_T = D_I + D_N \) = total deaths of branches
- \( M_T = \) total number of matches of branches (i.e., those existing in both 1976 and 1982)
- \( B_T = \) total births of branches

To obtain the values of the above four variables we make the following computations:

- \( D_I = T76^I \times (D_N/T76^N) \)
- \( D_T = D_N + D_I \)
- \( M_T = T76^N - D_N + T76^I - D_I \)
- \( B_T = F_T + T82^I - D_I \) = total births

### 2.2 Industry Growth Rates

Industry growth was based on the percentage change in employment. This was computed by taking the change in employment of matches adding the employment in births and subtracting the employment in deaths. Because a large number of records on the USEEM were not suitable for estimating growth, our computations were based on a subset of records in each industry. We employed the same criteria as Odle and Armington used and excluded (a) non-updated records (b) imputed branch records (c) excessive employment growth records which were probably clerical errors (d) old report date records. Because the records in determinant growth samples contained a varying time interval between report
dates, employment growth was first computed on a per time period basis (time periods on the USEEM are designated in four month intervals). The per period employment growth was then multiplied by 18 to get the employment change for 1976-82.

Two measures of industry employment growth were computed using determinate growth records. One measure assumed that the growth rate for the non-determinate records was the same as for the determinate records. Therefore, the employment growth rate for the industry was simply the employment growth rate for the determinate growth records. We refer to this measure as an unweighted growth rate. A second measure was computed using Odle and Armington's technique of dividing the population into cells within which the growth of determinate and indeterminate records was likely to be the same and then computing a weighted aggregate of the employment growth in the cells. We refer to this as a weighted growth rate. The weights for each cell were the ratio of total employment for all records (average of base and current year employment) to total employment in the determinate growth records. Cells were constructed on the basis of firm size, establishment employment and the complex code.

The results of our computations for nine major industries are shown in Table 2-I. We have also computed industry growth rates for 1049 4-SIC industries. However, these are too numerous to display. Table 2-I shows that the
Table 2-I  Weighted and Unweighted Employment Growth for 1976-82 For the USEEM Population By Major Industry Group

<table>
<thead>
<tr>
<th>Industry</th>
<th>Weighted Growth Rate</th>
<th>Unweighted Growth Rate</th>
<th>Rate of Change in Aggregate EMPH</th>
<th>Weighted Employment Change</th>
<th>Average Weighted Population</th>
<th>Average Unweighted Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>.310</td>
<td>.355</td>
<td>.307</td>
<td>436,706</td>
<td>1,408,728</td>
<td>938,452</td>
</tr>
<tr>
<td>Construction</td>
<td>.065</td>
<td>.074</td>
<td>.144</td>
<td>306,453</td>
<td>4,714,665</td>
<td>3,953,863</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>.036</td>
<td>.099</td>
<td>.066</td>
<td>919,265</td>
<td>25,535,152</td>
<td>19,379,932</td>
</tr>
<tr>
<td>TPCU 1)</td>
<td>.069</td>
<td>.114</td>
<td>.141</td>
<td>394,278</td>
<td>5,714,181</td>
<td>3,660,69</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>.156</td>
<td>.158</td>
<td>.166</td>
<td>842,231</td>
<td>5,393,521</td>
<td>4,551,43</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>.058</td>
<td>.058</td>
<td>.176</td>
<td>880,221</td>
<td>15,176,216</td>
<td>10,413,43</td>
</tr>
<tr>
<td>FIRE 2)</td>
<td>.220</td>
<td>.295</td>
<td>.320</td>
<td>1,319,393</td>
<td>25,997,239</td>
<td>3,696,31</td>
</tr>
<tr>
<td>Services</td>
<td>.291</td>
<td>.279</td>
<td>.298</td>
<td>5,814,170</td>
<td>19,979,968</td>
<td>15,080,2</td>
</tr>
</tbody>
</table>

1) Transportation, Communication and Public Utilities
2) Finance Insurance and Real Estate
highest growth has occurred in the service and mining sector and the lowest growth in the manufacturing sector.

Notes to Chapter 2


2. Establishments that were a branch or a subsidiary of a multi-establishment firm did not report a business age. Therefore, all non imputed branches and subsidiaries that were not on the file in 1976 were counted as births.

Chapter 3: Entry, Exit and Enterprise Size

The object of this chapter is an examination of the pattern of enterprise entry and exit across size classes. We interpret "entry" as the birth of a new establishment in a particular sector, and "exit" as the death of an old establishment in a particular sector. An establishment represents a "packages" of resources organized into an operational unit. The birth or death of an establishment is a basic indicator of the formulation or dissolution of organized "packages" of resources, and therefore constitutes a fundamental measure of entry or exit.

Our population consists of establishments which belong to firms of various sizes. The relation of entry and exit to firm size is the basic criteria for evaluating the relative mobility of small and large firms. The conceptual arguments in the previous chapter lead us to expect that establishments owned by small firms will be more mobile than ones owned by large firms. This is the central hypothesis of this chapter.

For this study, we define two different types of establishments: "independent" and "dependent". An establishment is "independent" if it is owned by a firm that owns no other establishments or if it is the headquarters of a multi-establishment firm. An establishment is "dependent" if it is a branch or subsidiary of a multi-establishment firm. The birth or death of an independent establishment is almost always the same as the birth or death of an
enterprise. On the other hand, the birth or death of a dependent establishment usually represents the expansion or contraction of an existing enterprise. Within the existing firm however, establishment births and deaths still signify the deployment or withdrawal of an organized resource "package". Thus, births and deaths of dependent establishments still indicate entry or exit.

In our approach to the question of resource mobility, we separate the two types of establishments into two subpopulations for reasons of methodology and of conceptual clarity. In terms of methodology, we must point out that most dependent establishments belong to larger businesses, whereas most independent establishments represent small business firms. It will also become clear that the mobility of dependent establishments of all enterprise sizes is far greater than the mobility of independent establishments. This suggests that establishment type is one factor, perhaps the primary factor, in determining mobility, while enterprise size is a second factor. By segregating the population, we can analyze the effect of firm size, holding constant the effect of establishment type.

The factors determining mobility may well differ between independent and dependent establishments. There is no reason (a priori) why the factors and the decisions which determine entry/exit actions in one group will be identical to those determining entry/exit actions in the other.
The analysis presented in this chapter is based on two tabulations of our population shown in the Appendix as Tables 3-A and 3-B (these can be found at the end of Chapter 3). Table 3-A shows the number of establishment births and deaths for five enterprise size classes and for the two types of establishments. The Table also includes the average number of existing firms in each size class and for each type of establishment. Thus, birth and death rates can be computed from the data. Finally, Table 3-A provides two alternative compilations of births and deaths. One compilation includes imputed records while the other excludes them. The analysis in this Chapter is based on the more inclusive compilation which accounts for imputed records. However, both compilations are available to the reader so that he can verify that the results which we obtain based on one compilation also hold for the other.

Table 3-B includes data analogous to those of Table 3-A but at a lower level of aggregation. Births, deaths and the average number of existing establishments are given by enterprise class and by one-digit industry grouping.

In the classification of establishments in Table 3-A and 3-B as well as in all our subsequent work we define the two types of establishment respectively as "singles and tops" and "branches and subsidiaries." In the first category we have included all establishments whose appearance or disappearance signify entry or exit of a whole enterprise. Thus, we consider as independent establishments not only
those belonging to single-establishment firms ("singles") but also those which are classified as the head establishment of a multi-establishment firm ("tops"). In the second category we have included all dependent establishments, i.e. branches and subsidiaries of multi-establishment firms. Births and deaths of dependent establishments constitute a form of entry and exit which can be interpreted as a variant of internal enterprise expansion or contraction.

The definition of size classes in the compilations of this Chapter and all our subsequent work is uniform. Size classes are defined on the basis of total enterprise employment. The limits of the five size classes are: 0-4 employees; 5-19 employees; 20-99 employees; 100-499 employees; 500 or more employees. This classification has been chosen as a reasonable empirical device which is both workable and capable of revealing differential patterns of entry and exit for small and large businesses. We have accepted the number of 500 employees as the lower limit of large business following SBA's size standard division. However, some may wish to count as a large business any firm with more than 100 employees. Others may wish to use a lower cutoff. It is difficult to argue that there is one single threshold above which mobility (or any other type of behavior) changes radically. Thus it would be difficult to argue that a firm with 499 employees is vastly different from a firm with 500 employees. Changes in mobility are
likely to occur gradually with gradual changes in size. Therefore to demonstrate a relation between size and mobility, it is best to consider several ranges of firm size. We expect the differences between the very smallest and very largest size class to be greatest and the differences between adjacent size classes (e.g. 5-19 and 20-100) to be modest. In other words, our tests do not classify firms as either large or small and then compare two groups. Instead we compare several size groups and expect that differences in mobility between the groups to be greatest when the groups are farthest apart on the size spectrum.

Birth and death rates are basic tools of analysis in this chapter. They are defined as the ratios of births and deaths over the average number of existing firms over the interval 1976-1982. We also utilize the net birth rate (birth rate minus death rate) and the turnover rate (birth rate plus death rate).

3.0 Dependent and Independent Establishments Compared with All Establishments

Table 3-0 shows the average number of establishments in each of five enterprise size classes for independent, dependent and all establishments. The average was computed by adding the number of establishments existing in 1976 to the number existing in 1982 and dividing the sum by two. The result is labeled "average population" in Table 3-0. Also shown are the birth and death rates in each of the five size
TABLE 3-0  

Average Population, Birth Rates and Death Rates for Independent and Dependent Establishments 1976-82

<table>
<thead>
<tr>
<th>Firm Size in Number of Employees</th>
<th>Independent Establishment</th>
<th>Dependent Establishment</th>
<th>All Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Population</td>
<td>Birth Rate</td>
<td>Death Rate</td>
</tr>
<tr>
<td>0-4 1]</td>
<td>2457939</td>
<td>.36</td>
<td>.25</td>
</tr>
<tr>
<td>5-19</td>
<td>1301025</td>
<td>.29</td>
<td>.20</td>
</tr>
<tr>
<td>20-99</td>
<td>352360</td>
<td>.20</td>
<td>.18</td>
</tr>
<tr>
<td>100-499</td>
<td>64140</td>
<td>.12</td>
<td>.15</td>
</tr>
<tr>
<td>500+</td>
<td>24123</td>
<td>.05</td>
<td>.07</td>
</tr>
<tr>
<td>ALL</td>
<td>4199587</td>
<td>.32</td>
<td>.22</td>
</tr>
</tbody>
</table>

Source: Table 3A and 3B

Notes:
1] Less than 5000 of the establishments in this size class had zero employees.
classes. The birth (death) rate is the number of births (deaths) divided by the average population. The rates are also shown for independents, dependents and all establishments.

Table 3-0 indicates that in both the independent and dependent sub-populations there are large numbers of establishments in each of the five size classes. Although most independent establishments are small firms and most dependent establishments are owned by large firms, a large number of independent establishments are large firms and a large number of dependent establishments are owned by small firms. For example, there are 88,263 independent establishments that are firms with more than 100 employees and 24,123 that are firms with more than 500 employees. There are also 191,987 dependent establishments that are owned by firms with less than 20 employees and 40,049 owned by firms with less than 5 employees. Thus by creating the two sub-populations we are clearly able to examine the impact of firm size holding organization type constant. Table 3-0 indicates further that differences in birth and death rates in the two sub-populations are large. For all size classes, birth and death rates among dependent establishments were more than double those among independents.

The most important pattern in Table 3-0 is that, among both sub-populations, birth rates and death rates fall monotonically as firm size increases, i.e. in each size
class the rate is higher than it is in all other classes that are larger size classes. Among independents, birth rates go from .36 in the smallest size class down to .05 in the largest size class. Death rates go from .25 in the smallest size class down to .05 in the largest class. Among dependents, birth rates go from 1.08 in the smallest size class down to .67 in the largest size class. Death rates go from .66 in the smallest class down to .46 in the largest class.

Table 3-0 also indicates that differences between the two sub-populations in each size class are generally greater than differences between size classes within each sub-population. Within the sub-population of independents, the difference in birth rates between the largest and the smallest size class is a difference between .36 and .05 (a difference of .31). Within the sub-population of dependents, the difference in the birth rates between the smallest and the largest size class is a difference between 1.08 and .67 (a difference of .41). However the difference in the birth rates between all independents and all dependents is a difference between .79 and .32 (a difference of .47). Since .47 is greater than .41 or .31, one can say that the effect of establishment type on births and deaths is greater than the effect of firm size on births and deaths.

These results suggest that failure to separate the two sub-populations, will obscure the relation between firm size and mobility. This is apparent in comparing birth and death
rates in the entire population with those in each sub-population. Where as birth and death rates fall monotonically as firm size increases in each sub-population they tend to rise (almost monotonically) as size increases in the entire population. Because of the differences between the sub-populations and the combined population, the remainder of this study will focus on either the independent or the dependent sub-populations and not on the combined population.

3.1 Birth, Death and Turnover for Independent Establishments

For the population of independent establishments, Table 3-I shows the net birth and turnover rates along with the birth and death rates of Table 3-0. Table 3-I clearly shows that smaller firms have higher net birth and turnover rates as well as higher (gross) birth and death rates. The decline in each of these rates is monotonic as we move from lower to higher size classes and the difference between size classes is substantial. This is also true of turnover rates. The rate of turnover in the smallest size class is more than five times that of the largest size class. Clearly their size is a strong inverse determinant of turnover rates, and this constitutes strong prima facie evidence of higher mobility in smaller firms. Small firms engage much more intensely in entry/exit actions than large firms. It must be remembered that since we are dealing with
**TABLE 3-I**

Birth and Death Rates of Independent Establishments

<table>
<thead>
<tr>
<th>Size</th>
<th>Birth Rate (1)</th>
<th>Death Rate (2)</th>
<th>Net Birth Rate (3) = (1)-(2)</th>
<th>Turnover Rate (4) = (1)+(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>0.357</td>
<td>0.247</td>
<td>0.110</td>
<td>0.604</td>
</tr>
<tr>
<td>5-19</td>
<td>0.286</td>
<td>0.202</td>
<td>0.084</td>
<td>0.488</td>
</tr>
<tr>
<td>20-99</td>
<td>0.201</td>
<td>0.177</td>
<td>0.024</td>
<td>0.378</td>
</tr>
<tr>
<td>100-499</td>
<td>0.122</td>
<td>0.149</td>
<td>-0.027</td>
<td>0.271</td>
</tr>
</tbody>
</table>

**ALL SIZES**

<table>
<thead>
<tr>
<th>Less than 500</th>
<th>Birth Rate (1)</th>
<th>Death Rate (2)</th>
<th>Net Birth Rate (3) = (1)-(2)</th>
<th>Turnover Rate (4) = (1)+(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 or more</td>
<td>0.048</td>
<td>0.067</td>
<td>-0.019</td>
<td>0.115</td>
</tr>
</tbody>
</table>

**Notes:**

Source: Table 3-A
Tabulations include imputed records
independent establishments, births and deaths literally signify the appearance or disappearance of firms.

3.11 Net Birth Rates

The net birth rate is a measure which must be interpreted against the background of general population change. Over the period 1976-1982 covered by the data of Table 3-A, the population of independent establishments grew by 386,302 units. In the context of this expansion we note from column (3) of Table 3-I that small firms exhibit higher net birth rates than larger ones. In fact, for enterprise size of 100 employees or more, slightly negative net birth rates are recorded. This observation is important because it underlines the type of economic change which has been going on over the period 1976-1982: Single establishment firms with less than 100 employees have shown absolute increase whereas those with more than 100 employees exhibit absolute decline. This implies a net shift of resources from large to small firms in the economy. From this finding two points emerge. The first is that the importance of small firms has grown in the economy over the period examined. The second is that small firms have been the main organizational form fostered in the process of change and growth over the 1976-1982 period.

3.12 Industry Breakdowns

The findings which are reported in Table 3-I are of course quite aggregated since they refer to the entire population of independent establishments in the economy. The
data included in the Appendix Table 3-B breaks down entry/exit activity by one-digit industrial groupings, as well as by size class. In Figure 3-I, we show birth rates by class and industry group for independent establishments. In Figure 3-II we show death rates broken down in the same manner.

Lines (1)-(5) portray the behavior of births or deaths of firm size classes (1)-(5) as we move across the different sectors of the economy. The height of the lines show the magnitude of the birth or death rates of each size class. Inspection of Figures 3-I and 3-II indicates that in the majority of sectors, birth and death rates vary inversely with firm size. Since the lines for each size class rarely cross, size more than sector is the main determinant of mobility. Thus, sectoral disaggregation does not upset the aggregate results which we obtained previously. With respect to the birth rate, the decline with increase in class size is always monotonic with a small exception in mining. The behavior of the death rate is more anomalous since monotonic decline fails to appear in three sectors - agriculture, mining, and finance-insurance-real estate (FIRE). In all cases however, it is significant to note that rates for the largest size class are lower than rates in all other classes.

In terms of net births (births minus deaths) and net birth rates, the data by major industry grouping is similar to the aggregate behavior which was shown in Table 3-I.
FIGURE 3-1
Birth Rates by Size Class and Industry Group
for Independent Establishments

Key = 1 - 0-4 employees
2 - 5-19 employees
3 - 20-99 employees
4 - 100-499 employees
5 - 500 or more employees

* Transportation Communication and Public Utilities
+ Finance, Insurance and Real Estate

SOURCE: Table 3-B
FIGURE 3-II
Death Rates by Size Class and Industry Group for Independent Establishments

Key:
1 - 0-4 employees
2 - 5-19 employees
3 - 20-99 employees
4 - 100-499 employees
5 - 500 or more employees

SOURCE: Table 3-B
Chiefly for purposes of reference, net birth rates by size class and industry grouping are shown in Table 3-II. While births and deaths are measures of gross mobility, the net birth rate is an indication of the outcome of the mobility process, either expansion or contraction. Thus, the net birth rate is more closely related to industry growth than are births and deaths.

The net birth rates shown in Table 3-II do exhibit a general tendency to decline as we move from small to large size classes. Only one of the nine sectors exhibits a serious anomaly. This occurs in the retail trade sector where the birth rate increases with size class from class 1 up to size class 3. One element which must be noted is that for each size class, there is considerable variation of net birth rates among industries. If we use the coefficient of variation (CV) as an indicator of interindustry fluctuations of the net birth rate, we note that this is small for class 1 but increases as we move to classes 2 and 3, peaks for class 4, and drops for class 5 to a very small value again. Thus, we may note that for very small firms (less than 5 employees) and very large firms (more than 500 employees) entry/exit actions are relatively uniform across industries. On the other hand for firm sizes in the middle range, especially those employing 20 to 499 persons, entry/exit actions are quite varied across industries. This is sensible since it is in the subgroup of middle-sized enterprises that


<table>
<thead>
<tr>
<th>Industry Group</th>
<th>(1) 0-4</th>
<th>(2) 5-19</th>
<th>(3) 20-99</th>
<th>(4) 100-499</th>
<th>(5) 500+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.106</td>
<td>0.032</td>
<td>-0.024</td>
<td>-0.043</td>
<td>-0.029</td>
</tr>
<tr>
<td>Mining</td>
<td>0.280</td>
<td>0.324</td>
<td>0.253</td>
<td>0.169</td>
<td>0.013</td>
</tr>
<tr>
<td>Construction</td>
<td>0.104</td>
<td>0.070</td>
<td>0.008</td>
<td>-0.033</td>
<td>0.015</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.122</td>
<td>0.092</td>
<td>-0.025</td>
<td>-0.070</td>
<td>-0.014</td>
</tr>
<tr>
<td>TPCU</td>
<td>0.092</td>
<td>0.080</td>
<td>0.007</td>
<td>-0.032</td>
<td>-0.017</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>0.151</td>
<td>0.083</td>
<td>-0.030</td>
<td>-0.039</td>
<td>0.003</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>0.041</td>
<td>0.020</td>
<td>0.045</td>
<td>-0.071</td>
<td>-0.046</td>
</tr>
<tr>
<td>FIRE 1</td>
<td>0.175</td>
<td>0.122</td>
<td>0.045</td>
<td>-0.071</td>
<td>-0.046</td>
</tr>
<tr>
<td>Services</td>
<td>0.209</td>
<td>0.163</td>
<td>0.061</td>
<td>-0.002</td>
<td>-0.034</td>
</tr>
<tr>
<td>Mean</td>
<td>0.139</td>
<td>0.109</td>
<td>0.038</td>
<td>-0.012</td>
<td>-0.013</td>
</tr>
<tr>
<td>Variance</td>
<td>0.005</td>
<td>0.007</td>
<td>0.007</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>CV</td>
<td>0.038</td>
<td>0.067</td>
<td>0.179</td>
<td>-0.396</td>
<td>-0.030</td>
</tr>
</tbody>
</table>

SOURCE: Table 3-B

1 - Transportation, Communication and Public Utilities
2 - Finance Insurance and Real Estates
we may find most variation in techniques, and in the use of specialized durable resources across industries.

3.13 Births of Very Small Firms

Table 3-III shows the net births in each size class as a percent of the population total. It is clear from Table 3-III that almost 98.5 percent of all net births appear in the size classes 1 and 2, (i.e. in the form of enterprises employing less than 20 persons). It is of some interest to examine the sectoral incidence of these small firms. In Table 3-IV, we show the distribution of class 1 and class 2 net births over the nine major industry groups.

The most important observation to be drawn from Table 3-IV is that over 40 percent of net births of firms employing less than 20 persons make their appearance in a single industry group: Services. Wholesale trade and finance-insurance-real estate contribute another 22-24 percent to all net births of firms employing less than 20 persons. Thus, about 65 percent of net births of very small enterprises are in the service economy. In the case of very small firms employing less than 5 persons, construction participates with almost 16 percent of net births. On the other hand, in the case of small firms employing 5 to 19 persons, manufacturing participates with almost 12 percent. Mining and agriculture each account for only about 2 percent of total net births of small firms.
Table 3-III

Net Births of Independent Establishments by Size Class (Number of Employees)

<table>
<thead>
<tr>
<th>Class</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500+</th>
<th>All Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Births</td>
<td>271,494</td>
<td>108,734</td>
<td>8,270</td>
<td>-1,738</td>
<td>-458</td>
<td>386,302</td>
</tr>
<tr>
<td>Percentage</td>
<td>70.28</td>
<td>28.15</td>
<td>2.14</td>
<td>-0.45</td>
<td>-0.12</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Table 3-A
### TABLE 3-IV

Distribution of Net Births by Major Industry for Firm Size Classes
0-4 Employees and 5-19 Employees

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>0-4 Employees</th>
<th>0-4 Employees</th>
<th>5-19 Employees</th>
<th>5-19 Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Agriculture</td>
<td>8530</td>
<td>3.14</td>
<td>1055</td>
<td>0.97</td>
</tr>
<tr>
<td>Mining</td>
<td>4353</td>
<td>1.60</td>
<td>3691</td>
<td>3.39</td>
</tr>
<tr>
<td>Construction</td>
<td>43224</td>
<td>15.92</td>
<td>9976</td>
<td>9.17</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>17020</td>
<td>6.27</td>
<td>12771</td>
<td>11.75</td>
</tr>
<tr>
<td>TPCU</td>
<td>7019</td>
<td>2.59</td>
<td>4242</td>
<td>3.90</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>33381</td>
<td>12.30</td>
<td>13063</td>
<td>12.01</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>8504</td>
<td>3.13</td>
<td>7795</td>
<td>7.17</td>
</tr>
<tr>
<td>FIRE</td>
<td>32084</td>
<td>11.82</td>
<td>11662</td>
<td>10.73</td>
</tr>
<tr>
<td>Services</td>
<td>117379</td>
<td>43.23</td>
<td>44539</td>
<td>40.96</td>
</tr>
<tr>
<td>TOTAL</td>
<td>271494</td>
<td>100.00</td>
<td>108734</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Notes:** Net Births = Births - Deaths

**SOURCE:** Table 3-B
3.2 Entry and Exit of Dependent Establishments

We now proceed to the analysis of birth and death rates for dependent establishments (i.e. branches and subsidiaries) which are shown in Table 3-V. The basic observation is that like the case of independent establishments, size exerts a strong downward influence on both birth and death rates of dependent establishments. This downward influence of size on mobility is even more clearly depicted in the monotonic decline of the turnover rate as we move from small to large sized enterprises. Thus, again, small enterprise emerges as the user of more mobile resources. It is interesting to note that the turnover rate for dependent establishments exceeds 100 percent of the average population for all size classes. In comparison to the turnover rate of independent establishments, the rate exhibited by dependent establishments is much higher. In Table 3-I (independent establishments) the turnover rate ranged across size classes between 12 and 60 percent. In Table 3-V, it ranges across size classes between 114 and 175 percent. The clear implication of this comparison is that creation and closure of a dependent establishment is much easier and more frequent an action than creation and closure of an independent establishment. This is a sensible finding. An independent establishment represents an autonomous "package" of resources, and constitutes a separate legal, administrative, and technological entity. Its creation or closure necessitates transfer of resources in open markets. On the other hand, a dependent establishment constitutes
## TABLE 3-V

Birth and Death Rates of Dependent Establishments

(Imputed Records Included)

<table>
<thead>
<tr>
<th>Employment Size</th>
<th>Birth Rate (1)</th>
<th>Death Rate (2)</th>
<th>Net Birth Rate (3) = (1) - (2)</th>
<th>Turnover Rate (4) = (1) + (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>1.083</td>
<td>0.664</td>
<td>0.419</td>
<td>1.747</td>
</tr>
<tr>
<td>5-19</td>
<td>0.888</td>
<td>0.660</td>
<td>0.228</td>
<td>1.548</td>
</tr>
<tr>
<td>20-99</td>
<td>0.849</td>
<td>0.526</td>
<td>0.323</td>
<td>1.375</td>
</tr>
<tr>
<td>100-499</td>
<td>0.848</td>
<td>0.431</td>
<td>0.417</td>
<td>1.279</td>
</tr>
<tr>
<td>Less than 500</td>
<td>0.876</td>
<td>0.542</td>
<td>0.334</td>
<td>1.418</td>
</tr>
<tr>
<td>500 or more</td>
<td>0.672</td>
<td>0.466</td>
<td>0.206</td>
<td>1.138</td>
</tr>
</tbody>
</table>

SOURCE: Table 3-A
less of an autonomous entity and its creation of closure may involve simply *intra-firm* transfers or "repackaging" of resources. It is indeed sensible to find that the ease and frequency of creation or closure is greater for dependent compared to independent establishments.

Because large firms account for the vast majority of dependent establishments, combining dependent and independent establishments together would lead us to conclude that large firms are more mobile. In some sense this conclusion is valid. However, as shown in Table 3-0 and in Appendix Table 3-B dependent establishments frequently belong to small firms and when they do, they tend to be more mobile than dependent establishments of large firms. By separating dependent and independent establishments we are emphasizing that what appears to be greater mobility for larger firms is really the influence of organizational type.

### 3.21 Net Birth Rate of Dependent Establishments

The net birth rate of dependent establishments is computed in the third column of Table 3-V. Here the effect of size follows a complicated pattern. The net birth rate is clearly larger for enterprises employing less than 500 persons compared to enterprises employing 500 persons or more. However, among the first four size classes, the lowest and the highest exhibit the highest and almost equal net birth rates of about 42 percent. Thus, in terms of net
intra-firm establishment births, middle sized firms exhibit a very active role.

3.22 Birth and Death Rates by Major Industry for Dependent Establishments

A disaggregated view of birth and death rates can aid us in assessing the internal consistency of the aggregate results of Table 3-V. Using the data of Appendix Table 3-B, we construct Figures 3-III and 3-IV below.

Inspection of Figures 3-III and 3-IV indicates that with respect to birth rates the downward size effect is monotonic in six of the nine industry groups and that the birth rate for size class 5 is smallest for all groups. With respect to death rates the sectoral picture is much less clear. Size classes 1 and 2 appear to interchange their order in a number of cases. Size classes 4 and 5 also exhibit interchanging order across groups. Size class 3 places in the middle position of death rate orderings in 7 out of 9 industry groups. Death rates for size classes 1 and 2 are higher than death rates for size classes 4 and 5 in all 9 industry groups. Thus, the size effect does hold generally despite the internal reversals for firms employing less than 20 or more than 100 employees.

The process of birth and death of dependent establishment has led to positive net births over the interval 1976-82, in that 265,432 additional establishments were on record in the later year. In Table 3-VI we show the net
FIGURE 3-III
Birth Rates by Size Class and Industry Group for Dependent Establishments

Key = 1 - 0-4 employees
2 - 5-19 employees
3 - 20-99 employees
4 - 100-499 employees
5 - 500 or more employees

SOURCE: Table 3-B
FIGURE 3-IV

Death Rates by Size Class and Industry Group for Dependent Establishments

Key = 1 - 0-4 employees
2 - 5-19 employees
3 - 20-99 employees
4 - 100-499 employees
5 - 500 or more employees

SOURCE: Table 3-B
birth rates of dependent establishments by size class and major industry group.

It can be seen from Table 3-VI that the tendency for a decline in the net birth rate as we move to higher size classes is apparent in most sectors. An important exception is the behavior of the net birth rate in Services, where it increases to a peak in the fourth size class (100-499 employees). As we shall see below the sector of Services carries a large weight in net births and thereby exercises significant influence on the aggregate findings reported in Table 3-V. The variation of net birth rates across industry groups (as measured by the coefficient of variation CV) is least in the two smallest size classes (firms employing less than 20 persons). Thus, we may conclude that decisions and conditions which regulate entry/exit activities for dependent establishments are more uniform across industries for small enterprises than for large ones. If we compare the net birth rates for dependent establishments shown in Table 3-VI to the same rates for independent establishments shown in Table 3-II we note two elements of interest. First, net birth rates are much higher for dependent than for independent establishments. This is consistent with the view which we have already stated that entry is much easier as an intra-firm expansion than as an appearance of a firm de novo. The second element is that whereas for independent establishments a negative net birth rate is the dominant case for large size classes, dependent establishments
**TABLE 3-VI**  
Net Birth Rates of Dependent Establishments

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Size Class (Number of Employees)</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td></td>
<td>0.550</td>
<td>0.286</td>
<td>0.070</td>
<td>0.218</td>
<td>0.050</td>
</tr>
<tr>
<td>Mining</td>
<td></td>
<td>0.735</td>
<td>0.587</td>
<td>0.504</td>
<td>0.569</td>
<td>0.308</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>0.358</td>
<td>0.160</td>
<td>0.067</td>
<td>0.104</td>
<td>-0.012</td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td>0.395</td>
<td>0.212</td>
<td>0.130</td>
<td>0.103</td>
<td>0.043</td>
</tr>
<tr>
<td>TPCU</td>
<td></td>
<td>0.309</td>
<td>0.136</td>
<td>0.151</td>
<td>0.192</td>
<td>0.071</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td></td>
<td>0.423</td>
<td>0.250</td>
<td>0.212</td>
<td>0.200</td>
<td>0.055</td>
</tr>
<tr>
<td>Retail Trade</td>
<td></td>
<td>0.278</td>
<td>0.091</td>
<td>0.135</td>
<td>0.334</td>
<td>0.104</td>
</tr>
<tr>
<td>TUE</td>
<td></td>
<td>0.693</td>
<td>0.488</td>
<td>0.680</td>
<td>0.501</td>
<td>0.393</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td>0.524</td>
<td>0.411</td>
<td>0.710</td>
<td>0.833</td>
<td>0.512</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>0.474</td>
<td>0.291</td>
<td>0.295</td>
<td>0.332</td>
<td>0.169</td>
</tr>
<tr>
<td>CV</td>
<td></td>
<td>0.051</td>
<td>0.089</td>
<td>0.207</td>
<td>0.175</td>
<td>0.183</td>
</tr>
</tbody>
</table>

Source: Table 3-B
exhibit positive net birth rates in all sectors and size classes. (The only exception is a small negative net rate for very large firms in Construction). This observation indicates that the creation of dependent establishments by large firms is not determined by the same factors as the creation or closure of large independent establishments.

3.23 Size Class Shares

In Table 3-VII, we show the relative contribution of each size class to total net births of dependent establishments.

Contrary to our finding with respect to net births of independent establishments, larger size classes account for more of a share in the net generation of dependent establishments. The sectoral distribution of net births is also of interest. This is shown in Table 3-VIII.

The computations of Table 3-VIII indicate that across size classes, three industry groups account for a large share of the net generation of dependent establishments. These are Services, FIRE and Retail Trade. Their relative contribution in fact increases as we move to higher size classes. From 62 percent of net births in Size class 1, they contribute 85 to 87 percent respectively in size classes 4 and 5. The participation of other sectors in net generation of dependent establishments is relatively minor with the exception of wholesale Trade which accounts for over a 10 percent share in each of the first three size classes.
## TABLE 3-VII

Net Births of Dependent Establishments by Size Class

<table>
<thead>
<tr>
<th>Size Class (Number of Employees)</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Births</td>
<td>16,791</td>
<td>34,564</td>
<td>60,663</td>
<td>73,908</td>
<td>79,508</td>
<td>265,432</td>
</tr>
<tr>
<td>Percentage</td>
<td>6.33</td>
<td>13.02</td>
<td>22.85</td>
<td>27.84</td>
<td>29.95</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Table 3-A
### TABLE 3-VIII

Sectoral Distribution of Net Births, Dependent Establishments (percent)

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Size Class (Number of Employees)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-4</td>
</tr>
<tr>
<td>Agriculture</td>
<td>4.44</td>
</tr>
<tr>
<td>Mining</td>
<td>2.35</td>
</tr>
<tr>
<td>Construction</td>
<td>7.91</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5.86</td>
</tr>
<tr>
<td>TPCU *</td>
<td>2.81</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>12.26</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>22.07</td>
</tr>
<tr>
<td>FIRE+</td>
<td>16.96</td>
</tr>
<tr>
<td>Services</td>
<td>25.35</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**SOURCE:** TABLE 3-B

* Transportation Communication and Public Utilities
+ Finance, Insurance and Real Estate
3.3 Observations on the Movement of Total Establishment Population

The total population of establishments underwent significant changes over the period 1976-82. The USEEM file indicates that 2,077,475 establishments were "born" and 1,425,741 establishments "died". The net result was an addition of 651,734 units to the establishment population. Of these 386,302 units, or 59 percent, were independent establishments; 265,432 units, or 41 percent, were dependent establishments. Clearly then the entry of new firms accounted for a much higher share of total net establishment generation than the internal reorganization of old firms into new dependent establishments. In Table 3-IX we show the relative contribution of independent and dependent establishment generation by size class, as well as the total contribution of each size class in net establishment generation.

The computations of Table 3-IX reveal two important observations. The first is that small firms account for a very large share of all net establishment generation, as seen from the last column of Table 3-IX. Thus, firms employing less than 20 persons account for 66 percent of net establishment births. It is therefore an undisputable fact that small firms play an important - primary we should say - role in the deployment of new resource "packages" of both the independent and dependent type. The second observation is that small firms predominantly generate independent
<table>
<thead>
<tr>
<th>Size Class</th>
<th>Independent</th>
<th>Dependent</th>
<th>Total</th>
<th>Class Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 Net Births</td>
<td>271,494</td>
<td>16,791</td>
<td>288,285</td>
<td>44.2</td>
</tr>
<tr>
<td>% of Total in Class</td>
<td>(94.2)</td>
<td>(5.8)</td>
<td>(100.0)</td>
<td></td>
</tr>
<tr>
<td>5-19 Net Birth</td>
<td>108,734</td>
<td>34,564</td>
<td>143,298</td>
<td>22.0</td>
</tr>
<tr>
<td>% of Total in Class</td>
<td>(75.9)</td>
<td>(24.1)</td>
<td>(100.0)</td>
<td></td>
</tr>
<tr>
<td>20-99 Net Births</td>
<td>8,270</td>
<td>60,663</td>
<td>68,933</td>
<td>10.6</td>
</tr>
<tr>
<td>% of Total in Class</td>
<td>(12.0)</td>
<td>(88.0)</td>
<td>(100.0)</td>
<td></td>
</tr>
<tr>
<td>100-499 Net Births</td>
<td>-1,738</td>
<td>73,908</td>
<td>72,170</td>
<td>11.1</td>
</tr>
<tr>
<td>% of Total in Class</td>
<td>(-2.4)</td>
<td>(102.4)</td>
<td>(100.0)</td>
<td></td>
</tr>
<tr>
<td>500 or more Net Births</td>
<td>-458</td>
<td>79,508</td>
<td>79,050</td>
<td>12.1</td>
</tr>
<tr>
<td>% of Total in Class</td>
<td>(-0.6)</td>
<td>(100.6)</td>
<td>(100.0)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>386,302</td>
<td>265,432</td>
<td>651,734</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>(59.3)</td>
<td>(40.7)</td>
<td>(100.0)</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: TABLE 3-A
establishments whereas larger firms predominantly generate dependent establishments. This is a sensible result and it squares quite well with our basic arguments about resource mobility. In the case of small firms, the engagement of new resources takes the form of a firm being born. In the case of large firms the engagement of new resources takes the form of "branching out" and internal expansion or diversification.

As we have seen in the analyses presented in sections 3.1 and 3.2 above, there is substantial variation in net birth rates among industry groups. This is true for both dependent and independent establishments. This variation reflects different conditions in the various sectors, conditions which may facilitate or hinder the generation of new establishments. Thus, on one hand, demand changes vary from sector to sector and thereby offer stimuli of different strength to expansion of the establishment population. On the other hand, the type of resources which are used in one sector will differ from that used in another in degree of specialization, durability and in factor mix. In this context it is of interest to investigate whether intersectoral variation in net birth rates follows the same pattern for dependent and independent establishments. If the sectoral characteristics which determine dependent and independent establishment generation are the same, the variations of net birth rates should be highly correlated between the two types of establishment generation. We have
used the net birth rates shown in Tables 3-II and 3-VI to compute the correlation of independent and dependent net birth rates for each size class. The results are shown in Table 3-X.

The findings of Table 3-X indicate that for firms employing less than 20 persons net birth rates are highly positively correlated for independent and dependent establishments. This is evidence that the forces and factors leading to mobilization of new resources are the same irrespective of the type of establishment. The correlation declines but remains positive for firms employing 20-499 persons. Clearly for intermediate sizes the forces leading to mobilization of new resources are differentiated but still work in the same direction. In the very large firm category (500 or more employees) the correlation becomes negative. This means that sectors with higher net birth rates of independent establishments tend to show lower net birth rates for dependent establishments and vice versa. This finding implies that in the largest size class, the generation of independent establishments substitutes for the generation of dependent establishments. In the other size classes the generation of independent establishments complements the generation of dependent establishments. In the world of very large firms, to put it simply, where independent new firms appear more frequently, existing firms branch out less; and where independent firms appear less frequently (i.e. disappear) surviving firms branch out more.
## TABLE 3-X

Correlation of Independent and Dependent Net Birth Rates Across Industry Groups

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Mean Net Birth Rate</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Independent</td>
<td>Dependent</td>
</tr>
<tr>
<td>0-4</td>
<td>0.139</td>
<td>0.474</td>
</tr>
<tr>
<td>5-19</td>
<td>0.108</td>
<td>0.291</td>
</tr>
<tr>
<td>20-99</td>
<td>0.038</td>
<td>0.295</td>
</tr>
<tr>
<td>100-499</td>
<td>-0.012</td>
<td>0.332</td>
</tr>
<tr>
<td>500 or more</td>
<td>-0.013</td>
<td>0.169</td>
</tr>
</tbody>
</table>

Source: TABLES 3-II and 3-VI
3.4 Recapitulation of Findings

The fundamental finding of this Chapter is that small firms are more mobile than large ones. This is true both for entry or exit of independent establishments and for entry or exit of branches and subsidiaries.

Over the interval 1976-82 there was a total addition of 651,734 to the population of establishments in the US economy. Two thirds of these were put into operation by enterprises employing less than 20 persons.

Small firms played a relatively pronounced role in the launching of independent establishments. Large firms, on the other hand, had a more pronounced role in organizing new dependent establishments in the form of branches and subsidiaries.

Service sectors contributed a large percentage in the generation of new establishments in the period 1976-82. Small firms played a prominent role in the generation activity of these sectors.

The overall assessment of the evidence indicates that small enterprises can command and organize mobile resources. They thereby contribute decisively to flexibility, economic change and growth.
### Table 3-A: Births, Deaths of Establishments and Birth and Death Rates for Five Enterprise Size Classes for the 1976-82 USEEM Population

**Imputed Records Included in Computations**

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Births</th>
<th>Deaths</th>
<th>Ave. Number Exiting Firms</th>
<th>Birth Rate</th>
<th>Death Rate</th>
<th>Births</th>
<th>Deaths</th>
<th>Ave. Number Exiting Firms</th>
<th>Birth Rate</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>878086</td>
<td>606592</td>
<td>2457939</td>
<td>0.357245</td>
<td>0.246789</td>
<td>43385</td>
<td>26594</td>
<td>1.08329</td>
<td>0.664031</td>
<td></td>
</tr>
<tr>
<td>5-19</td>
<td>372523</td>
<td>262789</td>
<td>1301025</td>
<td>0.285562</td>
<td>0.201986</td>
<td>134747</td>
<td>100183</td>
<td>0.88779</td>
<td>0.660065</td>
<td></td>
</tr>
<tr>
<td>20-99</td>
<td>70808</td>
<td>62538</td>
<td>352360</td>
<td>0.200954</td>
<td>0.177483</td>
<td>159419</td>
<td>98756</td>
<td>0.84940</td>
<td>0.526179</td>
<td></td>
</tr>
<tr>
<td>100-499</td>
<td>7841</td>
<td>9579</td>
<td>64140</td>
<td>0.122248</td>
<td>0.149345</td>
<td>150165</td>
<td>76257</td>
<td>0.84810</td>
<td>0.430682</td>
<td></td>
</tr>
<tr>
<td>500+</td>
<td>1163</td>
<td>1621</td>
<td>24123</td>
<td>0.048211</td>
<td>0.067197</td>
<td>260338</td>
<td>180832</td>
<td>0.67159</td>
<td>0.466486</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1329421</td>
<td>943119</td>
<td>4199587</td>
<td>0.316560</td>
<td>0.224574</td>
<td>748054</td>
<td>482622</td>
<td>0.792247</td>
<td>0.511134</td>
<td></td>
</tr>
</tbody>
</table>

**Imputed Records Excluded from Computations**

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Births</th>
<th>Deaths</th>
<th>Ave. Number Exiting Firms</th>
<th>Birth Rate</th>
<th>Death Rate</th>
<th>Births</th>
<th>Deaths</th>
<th>Ave. Number Exiting Firms</th>
<th>Birth Rate</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>878086</td>
<td>554146</td>
<td>2431716</td>
<td>0.361097</td>
<td>0.227883</td>
<td>9751</td>
<td>8458</td>
<td>10799</td>
<td>0.902996</td>
<td>0.783257</td>
</tr>
<tr>
<td>5-19</td>
<td>372523</td>
<td>252831</td>
<td>1296046</td>
<td>0.286659</td>
<td>0.195079</td>
<td>49319</td>
<td>46271</td>
<td>64883</td>
<td>0.760122</td>
<td>0.713145</td>
</tr>
<tr>
<td>20-99</td>
<td>70808</td>
<td>61132</td>
<td>351657</td>
<td>0.201355</td>
<td>0.173840</td>
<td>79594</td>
<td>51332</td>
<td>99245</td>
<td>0.801995</td>
<td>0.517225</td>
</tr>
<tr>
<td>100-499</td>
<td>7841</td>
<td>9153</td>
<td>63927</td>
<td>0.122656</td>
<td>0.143179</td>
<td>73430</td>
<td>36943</td>
<td>89933</td>
<td>0.816501</td>
<td>0.410786</td>
</tr>
<tr>
<td>500+</td>
<td>1163</td>
<td>1855</td>
<td>24240</td>
<td>0.047979</td>
<td>0.076526</td>
<td>144456</td>
<td>101585</td>
<td>224911</td>
<td>0.642282</td>
<td>0.451669</td>
</tr>
<tr>
<td>Total</td>
<td>1329421</td>
<td>879117</td>
<td>4167586</td>
<td>0.318891</td>
<td>0.210945</td>
<td>356550</td>
<td>244589</td>
<td>489771</td>
<td>0.727993</td>
<td>0.499395</td>
</tr>
</tbody>
</table>
### Table 3-B: Births, Deaths and Rates by Enterprise Size Class By Industry Groups for 1976-82 USEEM (imputed records included in computations)

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Firm Size Class</th>
<th>Singles and Tops</th>
<th>Branches and Subsidiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Births</td>
<td>Deaths</td>
<td>Ave. Number</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1 17923</td>
<td>9393</td>
<td>80691</td>
</tr>
<tr>
<td></td>
<td>2 5622</td>
<td>4567</td>
<td>32476</td>
</tr>
<tr>
<td></td>
<td>3 706</td>
<td>827</td>
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<td>4 68</td>
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<td></td>
<td>2 6266</td>
<td>2575</td>
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<td></td>
<td>3 1881</td>
<td>859</td>
<td>4036</td>
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<td></td>
<td>4 251</td>
<td>123</td>
<td>759</td>
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<td>32564</td>
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</tr>
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<td>3 6743</td>
<td>6513</td>
<td>32023</td>
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<tr>
<td></td>
<td>4 537</td>
<td>670</td>
<td>4016</td>
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<td>72</td>
<td>1195</td>
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<td>36809</td>
<td>139539</td>
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<td></td>
<td>2 43000</td>
<td>30289</td>
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<td>13657</td>
<td>68459</td>
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<tr>
<td></td>
<td>4 1763</td>
<td>2922</td>
<td>16725</td>
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<tr>
<td></td>
<td>5 379</td>
<td>467</td>
<td>6135</td>
</tr>
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<td>TPCU 2]</td>
<td>1 25822</td>
<td>18803</td>
<td>76682</td>
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<tr>
<td></td>
<td>2 15315</td>
<td>11073</td>
<td>52753</td>
</tr>
<tr>
<td></td>
<td>3 3126</td>
<td>3025</td>
<td>15892</td>
</tr>
<tr>
<td></td>
<td>4 331</td>
<td>419</td>
<td>2730</td>
</tr>
<tr>
<td></td>
<td>5 77</td>
<td>102</td>
<td>1448</td>
</tr>
</tbody>
</table>
Appendix

Table 3-B: Births, Deaths and Rates by Enterprise Size Class By Industry Groups for 1976-82 USEEM
(imputed records included in computations)
(Continued)

<table>
<thead>
<tr>
<th>Industry Size Group</th>
<th>Firm 1</th>
<th>Firm 2</th>
<th>Firm 3</th>
<th>Firm 4</th>
<th>Firm 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Births</td>
<td>Deaths</td>
<td>Ave. Number</td>
<td>Birth</td>
<td>Death</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>86352</td>
<td>52971</td>
<td>221083</td>
<td>0.390</td>
<td>0.239</td>
</tr>
<tr>
<td>2</td>
<td>42377</td>
<td>29314</td>
<td>156315</td>
<td>0.271</td>
<td>0.187</td>
</tr>
<tr>
<td>3</td>
<td>63</td>
<td>56</td>
<td>1883</td>
<td>0.033</td>
<td>0.029</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>268702</td>
<td>260198</td>
<td>762376</td>
<td>0.352</td>
<td>0.341</td>
</tr>
<tr>
<td>2</td>
<td>109351</td>
<td>101556</td>
<td>399103</td>
<td>0.273</td>
<td>0.254</td>
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<td>3</td>
<td>22465</td>
<td>18589</td>
<td>85806</td>
<td>0.261</td>
<td>0.216</td>
</tr>
<tr>
<td>4</td>
<td>1513</td>
<td>1412</td>
<td>7908</td>
<td>0.191</td>
<td>0.178</td>
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<td>5</td>
<td>119</td>
<td>149</td>
<td>3555</td>
<td>0.033</td>
<td>0.041</td>
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<tr>
<td>FIRE</td>
<td>57200</td>
<td>25116</td>
<td>183506</td>
<td>0.311</td>
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<tr>
<td>2</td>
<td>23325</td>
<td>11663</td>
<td>95488</td>
<td>0.244</td>
<td>0.122</td>
</tr>
<tr>
<td>3</td>
<td>4545</td>
<td>3387</td>
<td>26044</td>
<td>0.174</td>
<td>0.130</td>
</tr>
<tr>
<td>4</td>
<td>586</td>
<td>937</td>
<td>4967</td>
<td>0.117</td>
<td>0.188</td>
</tr>
<tr>
<td>5</td>
<td>136</td>
<td>234</td>
<td>2120</td>
<td>0.064</td>
<td>0.110</td>
</tr>
<tr>
<td>Services</td>
<td>212261</td>
<td>94882</td>
<td>561537</td>
<td>0.378</td>
<td>0.168</td>
</tr>
<tr>
<td>2</td>
<td>83727</td>
<td>39188</td>
<td>272675</td>
<td>0.307</td>
<td>0.143</td>
</tr>
<tr>
<td>3</td>
<td>14934</td>
<td>10079</td>
<td>79634</td>
<td>0.187</td>
<td>0.126</td>
</tr>
<tr>
<td>4</td>
<td>2412</td>
<td>2458</td>
<td>22230</td>
<td>0.108</td>
<td>0.110</td>
</tr>
<tr>
<td>5</td>
<td>261</td>
<td>500</td>
<td>7164</td>
<td>0.036</td>
<td>0.069</td>
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</table>

Singles and Tops

<table>
<thead>
<tr>
<th>Industry Size Group</th>
<th>Branches and Subsidiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Births</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>5210.5</td>
</tr>
<tr>
<td>2</td>
<td>18314.4</td>
</tr>
<tr>
<td>3</td>
<td>20734.2</td>
</tr>
<tr>
<td>4</td>
<td>13811.3</td>
</tr>
<tr>
<td>5</td>
<td>25124.3</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>13591.3</td>
</tr>
<tr>
<td>2</td>
<td>49646.3</td>
</tr>
<tr>
<td>3</td>
<td>45395.2</td>
</tr>
<tr>
<td>4</td>
<td>38511.9</td>
</tr>
<tr>
<td>5</td>
<td>62237.0</td>
</tr>
<tr>
<td>FIRE</td>
<td>5042.5</td>
</tr>
<tr>
<td>2</td>
<td>10959.2</td>
</tr>
<tr>
<td>3</td>
<td>20513.6</td>
</tr>
<tr>
<td>4</td>
<td>21200.8</td>
</tr>
<tr>
<td>5</td>
<td>45287.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry Size Group</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Births</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>9138.1</td>
</tr>
<tr>
<td>2</td>
<td>28910.6</td>
</tr>
<tr>
<td>3</td>
<td>43180.2</td>
</tr>
<tr>
<td>4</td>
<td>49397.2</td>
</tr>
<tr>
<td>5</td>
<td>65128.5</td>
</tr>
</tbody>
</table>

1] (1) 0-4 (2) 5-19 (3) 20-99 (4) 100-499 (5) ≥ 500
2] Transportation Communication and Public Utilities
3] Finance Insurance and Real Estate
Chapter 4: Entry, Exit and Industry Growth

The object of this chapter is to investigate the effect of industry growth upon establishment birth and death rates. In the previous chapter we showed that holding organizational form constant, small firms have higher birth and death rates than large ones. A major factor determining birth and death rates is industry growth. Therefore, we expect that births will be more intense in an industry experiencing high growth, than in one experiencing low or negative growth, holding everything else constant. Correspondingly we would expect that deaths would be more intense in an industry experiencing low growth than in one experiencing high growth holding everything else constant. Naturally, enterprises of varying size may respond differently to a growth stimulus. Our argument (and previous evidence) that small firms command more mobile resources would lead us to expect that they also respond more readily to the growth stimulus. This can translate into two simple propositions which we would like to put to a test. The first is that given a level of industry growth, small firms exhibit higher birth rates and higher death rates than large firms. The second proposition is that birth and death rates are more responsive to industry growth among small firms than among large firms. This means for example, that if we compare the difference in birth (or death) rates between a high growth and a low growth industry, the difference should be greater when the birth rates (or death rates) are
computed for small firms. It also means that any tendency for net birth rates to be higher in high growth industries ought to be stronger for small firms. These two propositions are important because they can help establish the link between growth and mobility of resources. In particular, the first proposition will ensure, if verified, that our previous results of higher small firm mobility is not simply a sign of aimless or random movement out of or into industries, but rather that it is a movement relates to the overall expansion or contraction of industries.

4.0 Examples of Expanding and Contracting Industries

The two propositions can be illustrated by comparing the business services industry (SIC #73) and the retail dry goods industry (SIC #53). The business services industry is an example of an expanding industry with employment increasing by 37.7% during the period of study, 1976-82. The retail dry goods industry is an example of a contracting industry where employment fell by 9.5%. Tables 4-I and 4-II show the number of births (line 1), number of deaths (line 2) and the average number of establishments populating the industry over the period (line 3). The turnover rate (births plus deaths divided by average population) is also shown (line 4). In addition, the net number of births (number of births minus number of deaths) and the net birth rate (net birth divided by average population) are shown in lines 5 and 6 respectively.
Table 4-1: Births and Deaths of Independent Establishments in Two Industries

<table>
<thead>
<tr>
<th>Business Service SIC #73</th>
<th>Firm Size Class (number of employees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Growth = 37.7%</td>
<td>1-4</td>
</tr>
<tr>
<td>(1) Number of Births</td>
<td>65,538</td>
</tr>
<tr>
<td>(2) Number of Deaths</td>
<td>24,363</td>
</tr>
<tr>
<td>(3) Average Population</td>
<td>129,195</td>
</tr>
<tr>
<td>(4) Turnover Rate</td>
<td>.696</td>
</tr>
<tr>
<td>(5) Net Births (1)-2)</td>
<td>41,175</td>
</tr>
<tr>
<td>(6) Net Birth Rate (5)/(3)</td>
<td>.319</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Retail Dry Goods SIC #53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Growth = -9.5%</td>
</tr>
<tr>
<td>(1) Number of Births</td>
</tr>
<tr>
<td>(2) Number of Deaths</td>
</tr>
<tr>
<td>(3) Average Population</td>
</tr>
<tr>
<td>(4) Turnover Rate</td>
</tr>
<tr>
<td>(5) Net Births (1)-2)</td>
</tr>
<tr>
<td>(6) Net Birth Rate (5)/(3)</td>
</tr>
</tbody>
</table>

Notes:
1 - Average Population = (Number Birth + Number of Deaths)/2 + Number of Surviving Establishments
Table 4-II: Births and Deaths of Dependable Establishments in Two Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Firm Size Class (number of employees)</th>
<th>1-4</th>
<th>5-20</th>
<th>21-99</th>
<th>100-499</th>
<th>500+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Service SIC #73</strong></td>
<td>Industry Growth = 37.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Number of Births</td>
<td>2,212</td>
<td>6,790</td>
<td>7,554</td>
<td>7,529</td>
<td>14,524</td>
<td></td>
</tr>
<tr>
<td>(2) Number of Deaths</td>
<td>1,173</td>
<td>4,010</td>
<td>4,350</td>
<td>3,953</td>
<td>9,314</td>
<td></td>
</tr>
<tr>
<td>(3) Average Population</td>
<td>1,881</td>
<td>7,341</td>
<td>9,590</td>
<td>10,189</td>
<td>24,352</td>
<td></td>
</tr>
<tr>
<td>(4) Turnover Rate</td>
<td>1.79</td>
<td>1.47</td>
<td>1.24</td>
<td>1.12</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>(5) Net Births (1) - (2)</td>
<td>1,039</td>
<td>2,780</td>
<td>3,204</td>
<td>3,576</td>
<td>5,210</td>
<td></td>
</tr>
<tr>
<td>(6) Net Birth Rate (5)/(3)</td>
<td>0.552</td>
<td>0.379</td>
<td>0.334</td>
<td>0.351</td>
<td>0.214</td>
<td></td>
</tr>
<tr>
<td><strong>Retail Dry Goods SIC #53</strong></td>
<td>Industry Growth = -9.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Number of Births</td>
<td>279</td>
<td>943</td>
<td>1,121</td>
<td>1,331</td>
<td>7,403</td>
<td></td>
</tr>
<tr>
<td>(2) Number of Deaths</td>
<td>278</td>
<td>1,450</td>
<td>1,652</td>
<td>1,805</td>
<td>9,088</td>
<td></td>
</tr>
<tr>
<td>(3) Average Population</td>
<td>370</td>
<td>1,980</td>
<td>2,883</td>
<td>3,856</td>
<td>21,395</td>
<td></td>
</tr>
<tr>
<td>(4) Turnover Rate</td>
<td>1.50</td>
<td>1.20</td>
<td>0.96</td>
<td>0.81</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>(5) Net Births (1) - (2)</td>
<td>0.1</td>
<td>-0.507</td>
<td>-0.531</td>
<td>-0.474</td>
<td>-1.685</td>
<td></td>
</tr>
<tr>
<td>(6) Net Birth Rate (5)/(3)</td>
<td>0.003</td>
<td>-0.256</td>
<td>-0.184</td>
<td>0.123</td>
<td>-0.079</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1. Average Population = (Number Birth + Number of Deaths)/2 + Number of Surviving Establishments
Consider first the independent establishments which are analyzed in Table 4-I. Note that in both industries, as we move from the smallest to the largest size class, the number of births and deaths in the class decreases. This is not surprising given that small firms are more numerous than large firms. However if we look at the turnover rates, which standardizes for differences in average population, we find that they also decrease as we move from the smallest to the largest size class. Since this happens in both industries, it illustrates the first proposition that holding industry growth constant, mobility of establishments is greater for smaller firms.

The second proposition is illustrated by looking at the net births. The number of net births in each class is positive in the business service industry and negative in the retailing industry. This is expected since the former is an expanding industry while the latter is a declining industry. The more important fact if that, for business services, the number of net births is greater, the smaller the size class, while in retailing the number of net births is lower (i.e. more negative) the smaller the size class. This shows that smaller firms are injecting more resource packaged into business services and withdrawing more resource packages from retailing. However again, the number of resource packages is influenced by the fact that establishments of small firms are more numerous overall than establishments of large firms. Therefore the critical
measure is the net birth rate. We see that the net birth rate decreases with firm size in business services and it increases (i.e. becomes less negative) with firm size in retailing. Thus small firms are being born faster in the expanding industry and they are dying faster in the contracting industry.

If we look at the dependent establishments in Table 4-II we see a pattern that is mostly the same as the one for independent establishments. The turnover rates in both industries are higher the smaller the firm size class.

In business services, the net birth rate decreases with firm size. In retailing, the net birth rate does not follow a smooth pattern. It is lowest (i.e. most negative) in the 5-19 employee size class and it is highest in the 100-499 size class. However if we combine the three smallest size classes and the two largest classes we can compare the net birth rate of establishments in firms with under 100 employees with that of firms with 100 or more employees. The net birth rate for firms with under 100 employees is -.198 while the net birth rate for firms with 100 or more is only -.086. Thus again, establishments of small firms are being born faster than those of large firms in the expanding industry and they are dying faster than those of large firms in the declining industry.

These industries are just examples. The examples do not demonstrate that the trend holds for all industries, since
counter examples can also be found. In the next selection we test the two propositions using all industries.

In order to put our two propositions to a test we have estimated rates of growth in employment for every 4-digit SIC industry. We then divide all industry sectors into eight growth groups. For each growth group and each size class, we estimate birth and death rates exactly as they were derived in the previous Chapter. This is done both for independent and dependent establishments, separately.

4.1 Mobility of Independent Establishments and Industry Growth

In Table 4-III we show birth and death rates of independent establishments by size class and industry growth group.

In the first part of Table 4-III (Table 4-IIIA) we observe birth rates. We can check the validity of our first proposition on birth rates by moving down each column of the Table. In every case and for every growth level, birth rates decline as we move to higher size classes, and the decline is monotonic everywhere. The same observation holds true for the death rates exhibited in part B of the Table. Thus, our first proposition that given the level of the growth rate, small firms exhibit higher mobility is fully verified. This is an important finding. Were we to stop at the findings of the previous Chapter, one could always argue that the size effect on mobility proxies for a growth effect underlying size distributions. That would mean that small
TABLE 4-III - PART A

Average 4-SIC Industry Birth Rates for Independent Establishments
1976-82 (imputed records included) by Industry Growth by
Enterprise Size Class

<table>
<thead>
<tr>
<th>Enterprise Employment Size Class</th>
<th>4-SIC Industry Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.15</td>
</tr>
<tr>
<td>below -0.15</td>
<td>0.316</td>
</tr>
<tr>
<td>0 - 4</td>
<td>0.264</td>
</tr>
<tr>
<td>5 - 19</td>
<td>0.167</td>
</tr>
<tr>
<td>20 - 99</td>
<td>0.105</td>
</tr>
<tr>
<td>100 - 499</td>
<td>0.049</td>
</tr>
<tr>
<td>500 and above</td>
<td>0.186</td>
</tr>
<tr>
<td>All Classes</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 4-III - PART B

**Average 4-SIC Industry Death Rates for Independent Establishments**
1976-82 (imputed records included) by Industry Growth by Enterprise Size Class

<table>
<thead>
<tr>
<th>Enterprise Employment Size Class</th>
<th>4-SIC Industry Growth Rates</th>
<th>below</th>
<th>to</th>
<th>to</th>
<th>to</th>
<th>to</th>
<th>to</th>
<th>to</th>
<th>Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td></td>
<td>0.394</td>
<td>0.264</td>
<td>0.251</td>
<td>0.245</td>
<td>0.235</td>
<td>0.222</td>
<td>0.205</td>
<td>0.198</td>
</tr>
<tr>
<td>5 - 19</td>
<td></td>
<td>0.369</td>
<td>0.226</td>
<td>0.545</td>
<td>0.217</td>
<td>0.236</td>
<td>0.189</td>
<td>0.196</td>
<td>0.191</td>
</tr>
<tr>
<td>20 - 99</td>
<td></td>
<td>0.304</td>
<td>0.209</td>
<td>0.402</td>
<td>0.178</td>
<td>0.172</td>
<td>0.195</td>
<td>0.191</td>
<td>0.171</td>
</tr>
<tr>
<td>100 - 499</td>
<td></td>
<td>0.239</td>
<td>0.153</td>
<td>0.363</td>
<td>0.165</td>
<td>0.152</td>
<td>0.141</td>
<td>0.158</td>
<td>0.144</td>
</tr>
<tr>
<td>500 and above</td>
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<td>0.143</td>
<td>0.045</td>
<td>0.289</td>
<td>0.048</td>
<td>0.048</td>
<td>0.065</td>
<td>0.052</td>
<td>0.043</td>
</tr>
<tr>
<td>All Classes</td>
<td></td>
<td>0.295</td>
<td>0.181</td>
<td>0.377</td>
<td>0.173</td>
<td>0.169</td>
<td>0.164</td>
<td>0.161</td>
<td>0.150</td>
</tr>
</tbody>
</table>
firms predominate in high growth industries, and large firms in low growth industries and that what we thought of as the effect of size was in fact the effect of differential growth. Our present finding dispels that doubt completely. For each growth group separately small firm mobility is found to be superior.

In order to test the validity of our second proposition, we must observe the change in birth and death rates along each row of Table 4-III. Looking first at birth rates, we note that there is a tendency for them to increase for each class as we move from low to high growth groups. If we compare the birth rate of each growth group to birth rates of every other growth group, given eight growth groups, we can make a total of 28 possible comparisons for any size class. If the response to growth is greater for small firms, we expect the higher growth group to have a higher birth rate (and a lower death rate) more frequently when we compare small firms than when we compare large firms. Out of 28 comparisons in each row of Table 4-III (Part A), the number of times the birth rates of a given group exceed those of lower growth groups is 25, 26, 23, 22 and 17 for size classes 0-4, 5-19, 20-99, 100-499, and 500+ respectively. If we compare the death rate of each growth group in Table 4-III (Part B) to death rates of every lower growth group, we find that out of 28 possible comparisons for each size class, the number of times the death rates of a given group are less than those of lower growth groups is
28, 22, 22, 21 and 18 for size classes 0-4, 5-19, 20-99, 100-499, and 500+ respectively. The implication of this finding is that small firms' births and deaths are much more responsive to industry growth than large firms' births and deaths. In order to visualize this conclusion, we present in Figures 4-I and 4-II plots of birth and death rates for the smallest and largest size classes.

The trend line in each figure is a least squares line fitted by using the midpoints of the growth class intervals. The slope of the trend line is the average increase in the birth rate or decrease in the death rate per unit of growth. The greater the slope, the more responsive are births or deaths to growth. The two figures clearly depict that small firms are more responsive than large firms.

4.11 High Birth Rates in Very Rapidly Declining Industries

Although we have depicted the relationship between births and deaths as a linear one, there is some non-linearity in the data. In the tabulation of birth rates in Table 4-III Part A, birth rates are consistently higher in the two groups with negative growth (i.e. the < -.15 and the -.15 to -.05 groups) than in the zero growth group (i.e. -.05 to +.05). This shows that as industry growth falls below zero, birth rates tend to increase rather than decrease. It happens in all classes but the effect is smallest in the 500+ size class. While this pattern appears to contradict our second proposition, it has a simple explanation. The explanation is that high death rates have a tendency to
FIGURE 4-1
Birth Rates of Independent Establishments with 0-4 Employees and 500+ Employees by Industry Growth

Birth Rate (Percent)

Industry Growth

Size Class 1

Size Class 5

Birth Rate: 0.15, 0.25, 0.35, 0.45

Industry Growth: 0.15, 0.25, 0.35, 0.45
Death Rates of Independent Establishments with 0-4 Employees and 500+ Employees by Industry Growth
Independent Establishments

Death Rate (Percent)

---

below 0.15 to 0.05 to 0.05 to 0.15 to 0.25 to 0.35 to 0.45 over Industry Growth
produce high birth rates. In a declining industry with many dying firms, workers and managers (and even perhaps owners) lose their jobs and as a result seek to form new firms. In other words, when industries decline, there is a reorganization of resources which manifests itself in the creation of new firms. This implies that a good portion of the deaths of firms in declining industries do not represent a departure of resources from the industry, but rather a reorganization within the industry. Since the increase in the birth rate that accompanied negative growth was smallest for the largest firms, it means that many dying large firms were replaced by one or more new smaller firms.

The high birth rate in negative growth industries also means that in measuring the departure of resources from the industry the net births (i.e. births minus deaths) would be a better measure than (gross) deaths.

4.12 Net Births Rates

Net birth rates can be computed by taking the difference between birth and death rates. The conclusion of higher mobility in response to growth for small firms can also be tested with net birth rates. In Figure 4-III, we exhibit the relation of net birth rates to growth for the smallest and largest size classes.

It is clear from Figure 4-III that small firms are more readily and more extensively mobilized by industry growth than large firms are.
FIGURE 4-III

Net Birth Rates of Independent Establishments with 0-5 Employees and 500+ Employees by Industry Growth for Independent Establishments

Net Birth Rate (Percent)

below -0.15 -0.05 0.05 0.15 0.25 0.35 over Industry Growth
-0.15 to to to to to to 0.45
-0.05 0.05 0.15 0.25 0.35 0.45

o - Size Class 1
+ - Size Class 5

Size Class 1
(0-5 Employees)

Size Class 5
(500+ Employees)
4.2 Mobility of Dependent Establishments and Industry Growth

Birth and death rates of dependent establishments can also be examined with respect to the proposition of (1) higher birth and death rates for smaller firms holding growth constant and (2) greater response of birth and death rates to industry growth for smaller firms. In Table 4-IV we show birth and death rates of dependent establishments by size class and by industry growth group.

The validity of the first proposition is verified both in the case of birth and in the case of death rates. Moving down every column, the dominant tendency of birth and death rates to decline as we move to higher size classes is prominent. Thus, what we found about independent establishments also holds for dependent establishments. Given the level of the industry growth rate small firms exhibit higher mobility than large ones.

The validity of our second proposition for dependent establishment entry and exit requires us, once more, to check how birth and death rates relate to industry growth. First, there is an apparent tendency for births and deaths to increase for each size class as we move to higher growth groups. If we compare the birth rate of each growth group to birth rates of lower growth groups in the same size class we find the following: out of 28 comparisons, the birth rates of each group exceed those of lower growth groups 23, 22, 25, 26 and 26 times for employment size classes 0-4, 5-19, 20-99, 100-499 and 500+ respectively. Looking at death rates we find that the rates of a given growth group
### TABLE 4- IV- PART A

Average 4-SIC Industry Birth Rates for Dependent Establishments
1976-82 (imputed included) by Industry Growth by Enterprise Size Class

<table>
<thead>
<tr>
<th>Enterprise Employment Size Class</th>
<th>Industry Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>below -.15 to -.05 to .05 to .15 to .25 to .35 to .45 Above</td>
</tr>
<tr>
<td>0 - 4</td>
<td>1.104 0.924 1.053 1.159 1.075 1.167 1.257 1.224</td>
</tr>
<tr>
<td>5 - 19</td>
<td>0.746 0.726 0.790 0.786 0.859 0.928 0.784 1.081</td>
</tr>
<tr>
<td>20 - 99</td>
<td>0.546 0.578 0.554 0.646 0.620 0.695 0.688 0.853</td>
</tr>
<tr>
<td>100 - 499</td>
<td>0.430 0.468 0.514 0.546 0.559 0.595 0.551 0.745</td>
</tr>
<tr>
<td>500 and above</td>
<td>0.260 0.308 0.423 0.420 0.423 0.492 0.508 0.720</td>
</tr>
<tr>
<td>All Classes</td>
<td>0.566 0.577 0.642 0.687 0.689 0.747 0.723 0.900</td>
</tr>
</tbody>
</table>
TABLE 4-IV- PART B

Average 4-SIC Industry Death Rates for Dependent Establishments
1976-82 (imputed included) by Industry Growth by
Enterprise Size Class

<table>
<thead>
<tr>
<th>Enterprise Employment Size Class</th>
<th>Industry Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>below -.15</td>
</tr>
<tr>
<td>0 - 4</td>
<td>0.647</td>
</tr>
<tr>
<td>5 - 19</td>
<td>0.758</td>
</tr>
<tr>
<td>20 - 99</td>
<td>0.610</td>
</tr>
<tr>
<td>100 - 499</td>
<td>0.575</td>
</tr>
<tr>
<td>500 and above</td>
<td>0.545</td>
</tr>
<tr>
<td>All Classes</td>
<td>0.621</td>
</tr>
</tbody>
</table>
are less than those of lower growth groups 25, 27, 25, 25 and 28 times in the five size classes. Here the tendency for birth rates to increase and death rates to decline appears stronger for large firms than for small ones. This implies in turn that net birth rates will respond more intensely to industry growth in the case of large firms compared to small firms response. The visual representation of this differential response can be seen in Figure 4-IV, where we show plots of net birth rates against growth for the smallest and largest size classes.

The evidence of Table 4-IV indicates that among dependent establishments, large firms are more responsive to industry growth than small firms. This appears to counter the notion of higher mobility as a feature of small firms. Yet, we must remember that we are dealing here with the generation of new dependent establishments, i.e., the creation of new branches and subsidiaries of already existing firms. For small firms, size can act as a limiting factor to how much "branching out" they can engage in even under the strong stimulus of high industry growth. Large firms on the other hand face no such size limitations and "branching out" is an easy and almost natural response to industry growth, when their establishments surpass optimal size.

One final note is necessary about the Figure 4-IV. The slopes of the lines depicting the best fitting regression to the scatter diagrams are a measure of net birth rate
FIGURE 4-IV

Net Birth Rates of Dependent Establishments with 0-4 Employees and 500+ Employees by Industry Growth for Dependent Establishments

Net Birth Rate (percent)

-30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

Size Class 0-4 employees

Size Class 500+ employees

below -0.15 to -0.05 to 0.05 to 0.15 to 0.25 to 0.35 to 0.45 over Industry Growth
response to growth. Both for size class 0-5 employees and for size class 500+ employees, the slopes of the regression line for dependent establishments (0.652 and 0.877, respectively) are much higher than the slopes of equivalent regression lines for independent establishments. (These were 0.386 and 0.108, respectively). Thus, it is correct to state that dependent entry is much more responsive to growth than independent entry.

4.3 Interclass Migration and Growth for Independent Establishments

Growth of an industry spurs on the entry of both independent and dependent establishments into the industry. It also implies the internal expansion of existing firms, or their contraction, as the case may be. This means in turn that firms "exit" from one size class and "enter" into another. The process of interclass migration is an important element in the development of the structure of establishment and firm population. From the viewpoint of this study, the examination of interclass migration can furnish useful answers to two questions: The first question is whether small firms exhibit more (upward or downward) mobility in size class than large firms. This question seeks to establish whether in addition to more flexible entry/exit actions, small firms are also more flexible in adjusting the size of their resource "package" as surviving firms. The second question is whether industry growth affects the upward size class mobility of small firms and downward size
class mobility of large firms. That is, to what extent does positive industry growth cause small firms to become large firms? To what extent does negative growth cause large firms to become small firms? In this section we take up those two questions for independent establishments. Dependent establishments will be examined in the next section.

In the Appendix to this Chapter the reader will find Table 4-A. This table show the transition of independent establishments from their 1976 class to their 1982 class, including births and deaths. From the data shown in the Table there are 1,609,469 independent establishments which survive between 1976 and 1982. In Table 4-V we have computed the interclass mobility of these survivors, based on the data of Appendix Table 4-A.

The basic observation about surviving firms is that their upward mobility is a function of their starting size. The smallest firms go to a higher size class with a frequency of 22.7 percent. This frequency declines monotonically to 7.2 percent for upward moves of firm in the size class of 100-499 employees. On the other hand, downward mobility is more frequent for intermediate size classes of firms employing 20-499 persons. The resulting class shares for surviving firms are shown in Table 4-IV.

As we would expect, among surviving independent establishments the class shares of the smallest firms decline and all other shares increase between 1976 and 1982. This is the outcome of the higher frequency of upward moves
### TABLE 4-V

Inter-class Mobility of Surviving Independent Establishments by Firm Size

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>Total of Firms in (1976)</th>
<th>(1982) Outcomes (percent)</th>
<th>(\text{Moved to Lower Class})</th>
<th>(\text{No Move})</th>
<th>(\text{Moved to Higher Class})</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>703,822</td>
<td></td>
<td>0.0</td>
<td>77.3</td>
<td>22.7</td>
</tr>
<tr>
<td>5-19</td>
<td>641,336</td>
<td></td>
<td>15.7</td>
<td>73.2</td>
<td>11.8</td>
</tr>
<tr>
<td>20-99</td>
<td>211,992</td>
<td></td>
<td>17.9</td>
<td>74.5</td>
<td>7.6</td>
</tr>
<tr>
<td>100-499</td>
<td>37,882</td>
<td></td>
<td>19.3</td>
<td>73.5</td>
<td>7.2</td>
</tr>
<tr>
<td>500 or more</td>
<td>9,437</td>
<td></td>
<td>15.7</td>
<td>84.3</td>
<td>0.0</td>
</tr>
<tr>
<td>All</td>
<td>1,609,469</td>
<td></td>
<td>9.2</td>
<td>75.0</td>
<td>15.8</td>
</tr>
</tbody>
</table>

**SOURCE:** CHAPTER 4 - APPENDIX A

### TABLE 4-VI

Class Shares of Surviving Independent Establishments by Firm Size

<table>
<thead>
<tr>
<th>Size Class</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976 Share</td>
<td>43.7</td>
<td>39.8</td>
<td>13.2</td>
<td>2.4</td>
<td>0.6</td>
</tr>
<tr>
<td>1982 Share</td>
<td>40.5</td>
<td>40.6</td>
<td>15.2</td>
<td>3.0</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**SOURCE:** CHAPTER 4 - APPENDIX A
by small firms and the fact that among surviving firms, movements below the smallest class are impossible.

We can now pursue the answer to our second question about the effects of growth on mobility of surviving firms. In order to assess the growth effect we have computed a transition table (Appendix Table 4-B) like Appendix Table 4-A for two subgroups of establishments. The subgroups are those whose 4-SIC industry experienced employment growth above 35 percent (high growth) and those whose 4-SIC industry experienced employment growth below -15 percent (low growth). In the high growth group there are 212,698 survivors. In the low growth group there are 148,114 survivors. In Table 4-VII we show the mobility frequencies for these two subgroups.

The computations of Table 4-VII show that industry growth exercises a strong effect on the interclass mobility of firms. It increases upward mobility and restrains downward mobility. The upward mobility of firms in the smallest size class which was 22.7 percent for the whole population, is 34.2 percent for high-growth and 18.9 percent for low-growth industries. A corresponding large difference between high and low-growth industries is found for the other size classes as well. The downward mobility of firms is visible for every size class but becomes most dramatic the largest firms in 1976 moved to a lower size class in 1982. In the high-growth group only 7.6 percent moved to a
### Table 4-VII

Interclass Mobility for High and Low Industry Growth Groups of Surviving Firms, 1476, 1982 (Independent Establishments)

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>High Growth Group</th>
<th>Low Growth Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Firms</td>
<td>Moved to Lower Class</td>
</tr>
<tr>
<td>0-4</td>
<td>76,927</td>
<td>0.0</td>
</tr>
<tr>
<td>5-19</td>
<td>86,620</td>
<td>12.6</td>
</tr>
<tr>
<td>20-99</td>
<td>35,625</td>
<td>14.7</td>
</tr>
<tr>
<td>100-499</td>
<td>10,294</td>
<td>11.6</td>
</tr>
<tr>
<td>500 or more</td>
<td>3,232</td>
<td>7.6</td>
</tr>
<tr>
<td>All</td>
<td>212,699</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Source: Chapter 4 Appendix B
lower size class. The resulting class shares for the two subgroups of surviving firms are shown in Table 4-III.

In the high-growth group, the class shares of all but the smallest size class increase visibly, at the expense of the share of the smallest class which declined. In the low-growth group class share remain practically unchanged.

The conclusion of this analysis of surviving independent establishments is that small firms exhibit higher upward mobility and that industry growth substantially intensifies upward mobility of small firms, the small firm share of the number of establishments (and of output and employment as well) can decline in rapidly growing industries. It may then appear that the small firms are performing poorly in the most promising sectors of the economy. However in this case, the decline in the small firm share results from the effect of industry growth causing small firms to become large firms. It reflects good performance rather than poor performance.

4.4 Interclass Migration and Growth for Dependent Establishments

The transition of dependent establishments form one size class to another between 1976 and 1982 is shown in the Appendix Table 4-C. From the data shown in that Table, there are 215,820 dependent establishments which survive between 1976 and 1982. In Table 4-IX we present the mobility analysis of these establishments.
<table>
<thead>
<tr>
<th>Growth Group</th>
<th>Year</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>High:</td>
<td>1976</td>
<td>36.2</td>
<td>40.7</td>
<td>16.7</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>29.5</td>
<td>41.2</td>
<td>20.8</td>
<td>6.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Change</td>
<td>-6.7</td>
<td>+0.5</td>
<td>+4.1</td>
<td>+1.7</td>
<td>+0.6</td>
<td></td>
</tr>
<tr>
<td>Low:</td>
<td>1976</td>
<td>47.4</td>
<td>38.7</td>
<td>10.8</td>
<td>2.5</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>46.1</td>
<td>38.8</td>
<td>11.7</td>
<td>2.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Change</td>
<td>-1.3</td>
<td>+0.1</td>
<td>+0.9</td>
<td>+0.3</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: CHAPTER 4 APPENDIX B
The results shown in Table 4-IX reveal much about the mobility of firms of different sizes among size classes. Since we are dealing here with dependent establishments, the computations of Table 4-IX testify to the mobility of multiestablishment firms. The upward mobility of small multiestablishment firms is indeed very significant; 82 percent of surviving dependent establishments which belonged to firms employing 0-4 persons in 1976, ended up belonging to larger sized firms in 1982. Upward mobility declines substantially as we go to higher size classes. The result of this interclass mobility upon class shares is shown in Table 4-X.

Table 4-X shows that interclass mobility reduces the share of establishments in intermediate size classes and increases the shares in low and high size classes. This apparently counterintuitive effect is due to the relatively large number of establishments in intermediate classes compared to the lowest size class. This causes the number of establishments moving downward from the classes of 5-99 employees to overshoot the number of establishments moving upward for the class of 0-4 employees. It must always be remembered, as is clear from this instance, that it is not only mobility frequencies but also the starting class distribution which determines the overall outcome of changes in class shares.

In order to establish the effect of industry growth we have again produced transition data for two subgroups of
<table>
<thead>
<tr>
<th>1976 Firm Size Class</th>
<th>No. of Establishments in Size Class, 1976</th>
<th>1982 Outcomes (percent)</th>
<th>Moved to Lower Class</th>
<th>No Move</th>
<th>Moved to Higher Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>6,766</td>
<td></td>
<td>0.0</td>
<td>18.0</td>
<td>82.0</td>
</tr>
<tr>
<td>5-19</td>
<td>25,549</td>
<td></td>
<td>8.3</td>
<td>48.1</td>
<td>43.6</td>
</tr>
<tr>
<td>20-99</td>
<td>41,583</td>
<td></td>
<td>14.1</td>
<td>56.3</td>
<td>29.6</td>
</tr>
<tr>
<td>100-499</td>
<td>37,840</td>
<td></td>
<td>16.4</td>
<td>60.2</td>
<td>23.4</td>
</tr>
<tr>
<td>500 or more</td>
<td>104,082</td>
<td></td>
<td>14.5</td>
<td>85.5</td>
<td>0.0</td>
</tr>
<tr>
<td>All</td>
<td>215,820</td>
<td></td>
<td>13.6</td>
<td>68.9</td>
<td>17.5</td>
</tr>
</tbody>
</table>

**SOURCE:** CHAPTER 4 APPENDIX C
<table>
<thead>
<tr>
<th>Enterprise Size Class (number of Employees)</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976 Share</td>
<td>3.1</td>
<td>11.8</td>
<td>19.3</td>
<td>17.5</td>
<td>48.2</td>
</tr>
<tr>
<td>1982 Share</td>
<td>4.5</td>
<td>10.7</td>
<td>17.6</td>
<td>18.1</td>
<td>49.2</td>
</tr>
<tr>
<td>Change</td>
<td>+1.4</td>
<td>-1.1</td>
<td>-1.7</td>
<td>+0.6</td>
<td>+1.0</td>
</tr>
</tbody>
</table>

**TABLE 4-X**

Enterprise Size Class Shares of Surviving Dependent Establishments

**SOURCE:** CHAPTER 4 APPENDIX C
industries: one subgroup consists of industries which experienced growth in employment exceeding 35 percent (high growth); the other consists of industries which experienced growth in employment below -15 percent. Transition data are included in Table 4-D of the Appendix to this Chapter. In the high growth group there are 37,681 surviving establishments. In the low growth group there are 19,783 surviving establishments. In the Table 4-XI we show the mobility frequencies for these two subgroups.

The comparison of mobility profiles for the two subgroups of high and low growth reveals several points of interest: For both subgroups upward mobility frequencies decline monotonically as we move to higher size classes. Upward mobility however is much higher in the high growth group than in the low growth group. In the lowest size class the frequency of upward moves is 91 percent in the high growth group, but only 69 percent in the low growth group. A sizable differential persists in upward mobility frequencies across all four size classes employing 0-499 employees. It is therefore clear that industry growth has a substantial impact on upward mobility of firms. Observing downward mobility, on the other hand, we note that the frequency of downward moves is practically the same in the high and low growth subgroups. In the highest size class which (by construction) has no upward mobility, the mobility profile is almost identical between the two groups. This finding is different from what we found in the analysis of independent
TABLE 4-XI

Interclass Mobility of Surviving Dependent Establishments for High and Low Growth Groups by Firm Size Class

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>High Growth Group</th>
<th>Low Growth Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Estab.</td>
<td>Percent Moved to Lower Class</td>
</tr>
<tr>
<td></td>
<td>1976 Size Class</td>
<td>Percent Moved to Lower Class</td>
</tr>
<tr>
<td>0-4</td>
<td>1,331</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>5-19</td>
<td>3,869</td>
</tr>
<tr>
<td></td>
<td>20-99</td>
<td>6,384</td>
</tr>
<tr>
<td></td>
<td>100-499</td>
<td>6,527</td>
</tr>
<tr>
<td></td>
<td>500 or more</td>
<td>19,570</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>37,681</td>
</tr>
<tr>
<td></td>
<td>0-4</td>
<td>599</td>
</tr>
<tr>
<td></td>
<td>5-19</td>
<td>2,832</td>
</tr>
<tr>
<td></td>
<td>20-99</td>
<td>3,561</td>
</tr>
<tr>
<td></td>
<td>100-499</td>
<td>3,435</td>
</tr>
<tr>
<td></td>
<td>500 or more</td>
<td>9,356</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>19,783</td>
</tr>
</tbody>
</table>

SOURCE: APPENDIX D, Chapter 4
establishments where high growth clearly restrained the downward mobility of firms to low levels. The finding in the present sample suggests that multiestablishment firms owning surviving dependent establishments do not exhibit more frequent size reductions as the rate of industry expansion declines. But they do exhibit more frequent size increases as the rate of industry expansion increases. Thus, whereas multiestablishment firms appear to share in the upward movement of their industry is employment, they do not share the downward movement.

One possible explanation for this may be that dependent establishments in declining industries are generally part of more diversified enterprises than those in growing industries. Diversification may be a function of the firm's age and age may also be related to growth. An alternative explanation would be that for dependent establishments, negative industry growth leads to establishment deaths.

We can lastly observe the effects of mobility in the two growth groups upon class shares of surviving dependent establishments. These are shown in Table 4-XII.

In the high growth group, class shares for the lowest and highest size classes increase. The gain in the highest size class is more substantial. The gain in the lowest size class occurs because of the small number of establishments which initially belong to that class compared to the large number of establishments belonging to the two adjacent classes. The downward moves of firms in the adjacent classes
<table>
<thead>
<tr>
<th>Growth Group</th>
<th>Year</th>
<th>0-4</th>
<th>5-19</th>
<th>20-99</th>
<th>100-499</th>
<th>500 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>High:</td>
<td>1976</td>
<td>3.5</td>
<td>10.3</td>
<td>16.9</td>
<td>17.3</td>
<td>51.9</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>4.4</td>
<td>8.0</td>
<td>14.8</td>
<td>17.2</td>
<td>55.7</td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>+0.9</td>
<td>-2.3</td>
<td>-2.1</td>
<td>-0.1</td>
<td>+3.8</td>
</tr>
<tr>
<td>Low:</td>
<td>1976</td>
<td>3.0</td>
<td>14.3</td>
<td>18.0</td>
<td>17.4</td>
<td>47.3</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>4.6</td>
<td>13.4</td>
<td>16.9</td>
<td>18.3</td>
<td>46.9</td>
</tr>
<tr>
<td></td>
<td>Change</td>
<td>+1.6</td>
<td>-0.9</td>
<td>-1.1</td>
<td>+0.9</td>
<td>-0.4</td>
</tr>
</tbody>
</table>

**SOURCE:** CHAPTER 4 APPENDIX D
overwhelm numerically the upward moves form the lowest size class.

In the low growth group shares change little. The largest gainer of shares is the lowest size class and this is expected since it is the recipient of downward movers from other classes. High growth is thus shown to bring about several rearrangements in shares whereas low growth produces little change in them.

4.5 Recapitulation of Findings

In this Chapter we have examined the relationship between industry growth and mobility. Two propositions were considered, (1) that at all growth levels, births and deaths are higher among establishments owned by smaller firms and (2) that industry growth has a greater impact on birth and death rates of smaller firms than on those of larger firms.

Our findings confirm the first proposition for both independent and dependent establishments. The second proposition was confirmed for independent establishments but not for dependent establishments. The failure to confirm the second proposition for dependent establishments is due in our view to the fact that small firms are less able to "branch out" compared to large firms.

We also found evidence among, independent establishments that the birth rate is higher in industries having negative growth than it is industries with zero growth. This pattern, which was more prevalent among firms
with less than 500 employees, is explained by the tendency of a high industry death rate to cause a high birth rate. Employees and owners in dying firms who have lost their jobs tend to form new firms.

The study of interclass mobility among surviving establishments has also led to interesting results: Small firms are much more upward mobile than large firms. Industry growth affects upward mobility which becomes more frequent in high than in low growth industries.

Finally, the study of class shares of surviving establishments has shown that the effect of growth on changing class shares is complex. Whereas low growth does not seem to materially affect class shares, high growth does but its effects clearly depend on the starting class distribution.

In sum, small firms are a source of dynamism in the face of industry growth. They partake into such growth both by entering more intensively and by growing themselves more frequently.
Chapter 4: Appendix A

Transition Matrix for Independent Establishments: Percent of Establishments Moving Between Size Classes 1976-82

- top panel = number of firms
- bottom panel = % of total

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>1982 Size Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>878066</td>
</tr>
<tr>
<td>20</td>
<td>371523</td>
</tr>
<tr>
<td>100</td>
<td>70608</td>
</tr>
<tr>
<td>500+</td>
<td>7841</td>
</tr>
<tr>
<td>All</td>
<td>1163</td>
</tr>
<tr>
<td>1</td>
<td>1329421</td>
</tr>
<tr>
<td>2</td>
<td>1143993</td>
</tr>
<tr>
<td>0-4</td>
<td>543872</td>
</tr>
<tr>
<td>5-19</td>
<td>151116</td>
</tr>
<tr>
<td>20-99</td>
<td>12552</td>
</tr>
<tr>
<td>100-499</td>
<td>1153</td>
</tr>
<tr>
<td>500+</td>
<td>129</td>
</tr>
<tr>
<td>All</td>
<td>1652815</td>
</tr>
<tr>
<td>50+</td>
<td>397036</td>
</tr>
<tr>
<td>0-4</td>
<td>100530</td>
</tr>
<tr>
<td>5-19</td>
<td>469738</td>
</tr>
<tr>
<td>20-99</td>
<td>68376</td>
</tr>
<tr>
<td>100-499</td>
<td>2473</td>
</tr>
<tr>
<td>500+</td>
<td>219</td>
</tr>
<tr>
<td>All</td>
<td>1038366</td>
</tr>
<tr>
<td>All</td>
<td>1293</td>
</tr>
<tr>
<td>1</td>
<td>10959</td>
</tr>
<tr>
<td>2</td>
<td>10429</td>
</tr>
<tr>
<td>3</td>
<td>566</td>
</tr>
<tr>
<td>0-4</td>
<td>906</td>
</tr>
<tr>
<td>5-19</td>
<td>5850</td>
</tr>
<tr>
<td>20-99</td>
<td>27857</td>
</tr>
<tr>
<td>100-499</td>
<td>2703</td>
</tr>
<tr>
<td>500+</td>
<td>46311</td>
</tr>
<tr>
<td>All</td>
<td>10959</td>
</tr>
<tr>
<td>1</td>
<td>48311</td>
</tr>
<tr>
<td>2</td>
<td>1630675</td>
</tr>
<tr>
<td>0-4</td>
<td>1529632</td>
</tr>
<tr>
<td>5-19</td>
<td>1024903</td>
</tr>
<tr>
<td>20-99</td>
<td>315717</td>
</tr>
<tr>
<td>100-499</td>
<td>56059</td>
</tr>
<tr>
<td>500+</td>
<td>12579</td>
</tr>
<tr>
<td>All</td>
<td>4569565</td>
</tr>
<tr>
<td>1</td>
<td>Surviving 1609469</td>
</tr>
</tbody>
</table>

Notes:
1 - NE = not existing. Establishments not existing in 1976 are births and those not existing in 1982 are deaths.
### Transition Matrix for Independent Establishments

#### High Growth Industries

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>1982 Size Class</th>
<th>NE</th>
<th>0</th>
<th>5</th>
<th>20</th>
<th>100</th>
<th>500+</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE 1]</td>
<td></td>
<td>0</td>
<td>145043</td>
<td>83415</td>
<td>16887</td>
<td>2454</td>
<td>373</td>
<td>248172</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>52377</td>
<td>21970</td>
<td>3913</td>
<td>545</td>
<td>120</td>
<td>78925</td>
</tr>
<tr>
<td>0-4</td>
<td></td>
<td>129658</td>
<td>50581</td>
<td>22885</td>
<td>3032</td>
<td>384</td>
<td>45</td>
<td>206585</td>
</tr>
<tr>
<td></td>
<td></td>
<td>144621</td>
<td>56906</td>
<td>12365</td>
<td>827</td>
<td>74</td>
<td>13</td>
<td>204860</td>
</tr>
<tr>
<td>5-19</td>
<td></td>
<td>59647</td>
<td>10917</td>
<td>60400</td>
<td>14432</td>
<td>776</td>
<td>95</td>
<td>146267</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10744</td>
<td>22233</td>
<td>4183</td>
<td>183</td>
<td>13</td>
<td>103939</td>
<td></td>
</tr>
<tr>
<td>20-99</td>
<td></td>
<td>12682</td>
<td>1114</td>
<td>4115</td>
<td>25765</td>
<td>4490</td>
<td>141</td>
<td>48307</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7768</td>
<td>546</td>
<td>2846</td>
<td>11582</td>
<td>1046</td>
<td>24</td>
<td>23812</td>
</tr>
<tr>
<td>100-499</td>
<td></td>
<td>2378</td>
<td>113</td>
<td>172</td>
<td>905</td>
<td>7991</td>
<td>1113</td>
<td>12672</td>
</tr>
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<td></td>
<td></td>
<td>1610</td>
<td>43</td>
<td>81</td>
<td>686</td>
<td>2686</td>
<td>166</td>
<td>5272</td>
</tr>
<tr>
<td>500+</td>
<td></td>
<td>376</td>
<td>18</td>
<td>27</td>
<td>23</td>
<td>177</td>
<td>2987</td>
<td>3608</td>
</tr>
<tr>
<td></td>
<td></td>
<td>285</td>
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<td>14</td>
<td>19</td>
<td>163</td>
<td>671</td>
<td>1158</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td>204741</td>
<td>207786</td>
<td>171014</td>
<td>61044</td>
<td>16272</td>
<td>4754</td>
<td>665611</td>
</tr>
<tr>
<td></td>
<td></td>
<td>190867</td>
<td>120616</td>
<td>79504</td>
<td>21216</td>
<td>4697</td>
<td>1007</td>
<td>417906</td>
</tr>
</tbody>
</table>

**Notes:**

1 - NE = not existing. NE for 1976 are births and NE for 1982 are deaths.
Chapter 4: Appendix C

Transition Matrix: Movement between Firm Size Classes for the 1976-82 USEEM Population of Dependent Establishments

Number of Establishments

<table>
<thead>
<tr>
<th>1976 Firm Size Class</th>
<th>1982 Firm Size Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>NE 1)</td>
<td>0</td>
</tr>
<tr>
<td>0-4</td>
<td>8,611</td>
</tr>
<tr>
<td>5-19</td>
<td>47,020</td>
</tr>
<tr>
<td>20-99</td>
<td>52,450</td>
</tr>
<tr>
<td>100-499</td>
<td>37,821</td>
</tr>
<tr>
<td>500+</td>
<td>104,866</td>
</tr>
<tr>
<td>All</td>
<td>250,768</td>
</tr>
</tbody>
</table>

Notes:
NE = not existing. NE for 1976 are births and NE for 1982 are deaths.
Chapter 4: Appendix D

Transition Matrix: Movement between Firm Size Classes
for two Subgroups of 1976-82 USEEM Population
of Dependent Establishments

Number of Establishments
High Growth Subgroup

<table>
<thead>
<tr>
<th>1976 Size Class</th>
<th>1982 Size Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>NE 1)</td>
<td>0</td>
</tr>
<tr>
<td>0-4</td>
<td>869</td>
</tr>
<tr>
<td>5-19</td>
<td>5,126</td>
</tr>
<tr>
<td>20-99</td>
<td>7,036</td>
</tr>
<tr>
<td>100-499</td>
<td>6,143</td>
</tr>
<tr>
<td>500 or more</td>
<td>16,996</td>
</tr>
<tr>
<td>All</td>
<td>36,170</td>
</tr>
</tbody>
</table>

Low Growth Subgroup

<table>
<thead>
<tr>
<th>Size Class</th>
<th>1982 Size Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>NE</td>
<td>0</td>
</tr>
<tr>
<td>0-4</td>
<td>1,048</td>
</tr>
<tr>
<td>5-19</td>
<td>6,620</td>
</tr>
<tr>
<td>20-99</td>
<td>6,011</td>
</tr>
<tr>
<td>100-499</td>
<td>4,275</td>
</tr>
<tr>
<td>500 or more</td>
<td>11,940</td>
</tr>
<tr>
<td>All</td>
<td>29,894</td>
</tr>
</tbody>
</table>

Notes:
1 - NE = not existing. For 1976 NE refers to births, while for 1982 NE refers to deaths.
CHAPTER 5: The Employment Impact of Firm Mobility

Births, deaths and growth of firms are events which affect aggregate employment in the private sector of the economy. In this Chapter we seek to study how births and deaths of different size firms affect aggregate employment. As we have seen in previous Chapters, small firms exhibit higher mobility in the form of birth and death as well as in the form of internal expansion and interclass migration. The question posed in this Chapter is then whether this higher mobility leads also to a substantial impact of small firms in the generation of new employment. The importance of this question is evident in an economy suffering from high rates of unemployment. The answer to this question can illuminate the degree to which small firms have operated as an effective vehicle of new job generation and of unemployment reduction.

At a more general level, we have stated that the mobility of firms in the form of entry and exit represents the movement of organized "resource packages" into and out of specific industry sectors. Small firms have been shown to be very active in such entry/exit movements. What we do not know yet is what volume of resources those movements represent. Finding out about the employment impact of these movements will provide us with a more accurate notion about the volume of all resources involved.

In examining the effect of mobility on employment generation, we have utilized the database which excludes
imputed records. This choice was predicated by the fact that imputed records have been created in the files after observation of firm employment changes and they are therefore not independent of aggregate growth considerations. Our primary interest in this Chapter is precisely to see how mobility of establishments in variously sized firms contribute to aggregate employment change. Inclusion of imputed records would distort this analysis because imputations were made precisely on the basis of aggregate change. Aside from exclusion of imputed records, we have also excluded a) births of single establishments firms with a business age above 7 years and b) deaths having a 1976 report age above 4 years which must by and large represent prior period deaths.

In this part of the report then, we take up the important question: What is the impact of birth, death and internal growth activity in the various size classes upon the generation of employment? The tabulation of employment generation by type of establishment, by form of expansion and by size class is shown in Table 5-I. It shows all necessary data for the analysis which follows:

The data in Table 5-I are the source of all subsequent analysis in this Chapter.


### TABLE 5-1

New Employment Generation by Firm Size Class and Source (000 persons)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Independent Establishments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 4</td>
<td>647.4</td>
<td>1185.1</td>
<td>1832.5</td>
<td>5426.0</td>
</tr>
<tr>
<td>5 - 19</td>
<td>799.5</td>
<td>1144.5</td>
<td>1944.0</td>
<td>9533.2</td>
</tr>
<tr>
<td>20 - 99</td>
<td>181.6</td>
<td>600.7</td>
<td>782.2</td>
<td>9824.3</td>
</tr>
<tr>
<td>100 - 499</td>
<td>-294.4</td>
<td>-19.3</td>
<td>-313.7</td>
<td>6430.5</td>
</tr>
<tr>
<td>= or &gt; 500</td>
<td>-439.8</td>
<td>-1209.3</td>
<td>-1649.1</td>
<td>9241.4</td>
</tr>
<tr>
<td>TOTALS</td>
<td>849.2</td>
<td>1746.7</td>
<td>2595.9</td>
<td>40455.4</td>
</tr>
<tr>
<td>B. Dependent Establishments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 4</td>
<td>3.6</td>
<td>3.0</td>
<td>6.6</td>
<td>18.4</td>
</tr>
<tr>
<td>5 - 19</td>
<td>25.6</td>
<td>32.9</td>
<td>58.5</td>
<td>281.5</td>
</tr>
<tr>
<td>20 - 99</td>
<td>411.6</td>
<td>107.5</td>
<td>519.1</td>
<td>1119.7</td>
</tr>
<tr>
<td>100 - 499</td>
<td>913.3</td>
<td>185.2</td>
<td>1098.5</td>
<td>2280.0</td>
</tr>
<tr>
<td>= or &gt; 500</td>
<td>2592.2</td>
<td>1278.3</td>
<td>3870.5</td>
<td>20736.4</td>
</tr>
<tr>
<td>TOTALS</td>
<td>3946.3</td>
<td>1606.9</td>
<td>5553.2</td>
<td>24435.9</td>
</tr>
</tbody>
</table>

Notes:

EB = employment in establishment births
ED = employment in establishment deaths
ES₀ = 1976 employment in surviving establishments
ES₁ = 1982 employment in surviving establishments
5.1 The Rate of New Employment Generation

The most basic measure is the rate at which new employment is generated in each class, measured by growth in employment relative to average employment in each class.

New employment (i.e. employment growth) has two components. One is attributable to the net births and is computed by subtracting the employment in establishment births from the employment in establishment deaths. The second component is attributable to internal expansion in surviving establishments and is computed by subtracting each establishment's 1976 employment from its 1982 employment.

The computations can be described with the following notation:

\[ \begin{align*}
\text{ES}_0 &= 1976 \text{ employment in surviving establishments} \\
\text{ES}_1 &= 1982 \text{ employment in surviving establishments} \\
\text{EB} &= \text{employment in establishment births} \\
\text{ED} &= \text{employment in establishment deaths} \\
\text{NE} &= (\text{ES}_1 - \text{ES}_0 + \text{EB} - \text{ED}) = \text{new employment} \\
\text{AE} &= (\text{ES}_0 + \text{ED} + \text{ES}_1 + \text{EB})/2 = \text{average employment} \\
\text{RNE} &= \text{NE}/\text{AE} = (\text{new employment}/\text{average employment})
\end{align*} \]
Furthermore we can define the two components of RNE as follows:

\[
RNE_1 = \frac{(EB - ED)}{AE} = \text{rate of new employment due to net births}
\]

\[
RNE_2 = \frac{(ES_1 - ES_0)}{AE} = \text{rate of new employment due to internal expansion}
\]

where clearly, \( RNE = RNE_1 + RNE_2 \). The computation of these ratios will enable us to see the relative new employment contribution of each size class for each subpopulation and to assess the partition of this contribution into net births or internal expansion of firms. Table 5-II shows the values of \( RNE, RNE_1, RNE_2 \) in percent.

The computations of rates of new employment generation lead us to observations similar to those we made about net birth rates. In the case of the independent establishment population, both RNE and its two components are highest in the lowest size class and decline monotonically over the remaining size classes. Rates become negative in the two largest size classes. This implies that there occurred a redistribution of employment in favor of smaller firms over the period of this study. It is noteworthy that in those classes where there was expanded employment, internal expansion plays a more significant role than net
Table 5-II
Rates of New Employment Generation (in percent)

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Independent Establishments</th>
<th>Dependent Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RNE</td>
<td>RNE1</td>
</tr>
<tr>
<td>0 - 4</td>
<td>33.7</td>
<td>11.9</td>
</tr>
<tr>
<td>5 - 19</td>
<td>20.4</td>
<td>8.4</td>
</tr>
<tr>
<td>20 - 99</td>
<td>7.9</td>
<td>1.8</td>
</tr>
<tr>
<td>100 - 499</td>
<td>-4.8</td>
<td>-4.6</td>
</tr>
<tr>
<td>= or &gt; 500</td>
<td>-17.9</td>
<td>-4.8</td>
</tr>
<tr>
<td>All</td>
<td>6.4</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Notes:

RNE = rate of total employment growth
RNE1 = rate of employment growth due to net births
RNE2 = rate of employment growth due to internal expansion
RNE = RNE1 + RNE2
establishment births. Nevertheless, these births account for a considerable share of new employment generation. In the two classes where there was shrinkage in employment, this shrinkage was accounted for almost completely by deaths in one class but mostly from internal contraction in the other class.

In the case of the dependent establishment population, the patterns of change in RNE, RNE₁ and RNE₂ across classes are less simple. Intermediate size classes exhibit the highest generation rates. This is due strictly to the change in RNE₁. So far as internal expansion is concerned, rates of employment generation decline monotonically across classes, similarly to the behavior of the independent establishment population.

In sum, the computations of rates of employment generation lead to two main conclusions: First, smaller firms generally exhibit higher rates of employment generation than large firms. In all cases the largest size class has the lowest employment generation rates. Generation of employment through internal expansion of firms is relatively largest for smaller firms. Generation of employment through generation of independent establishments is also strongest for small firms. Second, the patterns which we observe for employment generation are very similar to the patterns which we observed for establishment generation. This establishes a reasonable assurance that there is equivalence in our two measures of resource
"packages" of resources, and employment changes as quantitative indices of the volume of resources.

5.2 Class Contributions to New Employment Generation

The analysis based on Table 5-II retains the division of the population into dependent and independent establishments. It is useful at this juncture however to estimate some class effects for the population as a whole. This will make possible an assessment of the overall weight and influence of small firms in the generation of new employment of whatever form. There are, as can be seen from Table 5-I three distinct forms of employment generation: internal expansion, net births of independent firms, net births of dependent establishments. It is important to see the role of each of these forms in the overall population. Table 5-III shows the combined data from both subpopulations.

The computations in Table 5-III can be best described by expanding the notation and using a superscript(i) to denote independent establishments and superscript(d) to denote dependent establishments. Thus:

$$ES_0^i (ES_0^d) = 1976 \text{ employment in surviving independent (dependent) establishments}$$

$$ES_1^i (ES_1^d) = 1982 \text{ employment in surviving independent (dependent) establishments}$$
### Table 5-III

Sources of Total New Employment (000 persons)

<table>
<thead>
<tr>
<th>Size Class</th>
<th>(1) Total New Employment</th>
<th>(2) Internal Expansion</th>
<th>(3) Independent New Births</th>
<th>(4) Dependent New Births</th>
<th>(5) Average Total Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>1839.0</td>
<td>1188.1</td>
<td>647.4</td>
<td>3.6</td>
<td>5444.4</td>
</tr>
<tr>
<td>5 - 19</td>
<td>2002.5</td>
<td>1177.4</td>
<td>799.5</td>
<td>25.6</td>
<td>9814.7</td>
</tr>
<tr>
<td>20 - 99</td>
<td>1301.4</td>
<td>708.1</td>
<td>181.6</td>
<td>411.6</td>
<td>10944.0</td>
</tr>
<tr>
<td>100 - 499</td>
<td>784.8</td>
<td>165.9</td>
<td>-294.4</td>
<td>913.3</td>
<td>8710.4</td>
</tr>
<tr>
<td>= or 500</td>
<td>2221.4</td>
<td>69.0</td>
<td>-439.8</td>
<td>2592.2</td>
<td>29977.8</td>
</tr>
<tr>
<td>All Classes</td>
<td>8149.1</td>
<td>3308.5</td>
<td>894.2</td>
<td>3946.3</td>
<td>64891.3</td>
</tr>
</tbody>
</table>

Notes:

1. Total New Employment: \( \text{EXP} + \text{EN}^i + \text{EN}^d \) (see notes (3) and (4) for \( \text{EN} \))
2. Internal Expansion (\( \text{EXP} \)) = \( \text{ES}_i - \text{ES}_0^i + (\text{ES}_1^i - \text{ES}_0^d) \) (see note 6 for \( \text{ES} \))
3. Independent Net Births (\( \text{EN}^i \)) = \( \text{EB}^i - \text{ED}^i \)
4. Dependent Net Births (\( \text{EN}^d \)) = \( \text{EB}^d - \text{ED}^d \)
5. Average Total Employment (\( \text{ATE} \)) = \( \text{AE}^i + \text{AE}^d \) (see note 7 for \( \text{AE} \))
6. \( \text{ES}_i \) (\( \text{ES}_d \)) = employment in surviving independent (dependent) establishments
7. \( \text{AE}_i \) (\( \text{AE}_d \)) = average employment in independent (dependent) establishments
\[ EB^i (EB^d) = \text{employment in births of independent (dependent) establishments} \]

\[ ED^i (ED^d) = \text{employment in deaths of independent (dependent) establishments} \]

\[ AE^i (AE^d) = \text{average employment in independent (dependent) establishments} \]

Further we note that:

\[ ES_0 = ES_0 + ES_0 \]
\[ ES_1 = ES_1 + ES_1 \]
\[ EB = EB^i + EB^d \]
\[ ED = ED^i + ED^d \]

The notes to Table 5-III describe the computations of internal expansion, independent net births and dependent net births using the above notation.

From the data in Table 5-III we can compute for the whole population three subsidiary sets of estimates: (A) Total rates of new employment generation by class and how these rates decompose into the three forms of employment generation (internal expansion, independent net births and dependent net births); (B) The share of each of the three forms of new employment generation in (A) and (C). The
percentage contributions of each in size class in A. These computations are shown in Table 5-IV.

There are three panels in Table 5-IV each with computations on three forms of employment change: 1. internal expansion, 2. independent entry, 3. dependent entry and also on 4. total new employment (1+2+3). The panels are:

A: Rates of New Employment Generation

1. internal expansion \( (X) = (ES_{1i} - ES_{0i}) + (ES_{1d} - ES_{0d}) / (AE_i + AE_d) \)
2. independent net births \( (Y) = (EB_i - ED_i) / AE_i \)
3. dependent net births \( (Z) = (EB_d - ED_d) / AE_d \)
4. total = \( X + Y + Z \)

B: Sources of New Employment

1. internal expansion = \( X / (X + Y + Z) \)
2. independent net births = \( Y / (X + Y + Z) \)
3. dependent net births = \( Z / (X + Y + Z) \)
4. total = 100 percent

C: Class Contributions to New Employment

1. internal expansion = \( X / \text{sum of } X \text{ over all size classes} \)
2. independent net births = \( Y / \text{sum of } Y \text{ over all size classes} \)
### Table 5-IV

Rates, Composition, and Class Contributions to New Employment 1976-1982

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. RATES OF NEW EMPLOYMENT GENERATION in %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 4</td>
<td>33.8</td>
<td>21.8</td>
<td>11.9</td>
<td>0.07</td>
</tr>
<tr>
<td>5 - 19</td>
<td>20.4</td>
<td>12.8</td>
<td>8.1</td>
<td>0.3</td>
</tr>
<tr>
<td>20 - 99</td>
<td>11.9</td>
<td>6.5</td>
<td>1.7</td>
<td>3.8</td>
</tr>
<tr>
<td>100 - 499</td>
<td>9.0</td>
<td>1.9</td>
<td>-3.4</td>
<td>10.5</td>
</tr>
<tr>
<td>= or &gt; 500</td>
<td>7.4</td>
<td>0.2</td>
<td>-1.5</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>ALL</strong></td>
<td>12.6</td>
<td>5.1</td>
<td>1.4</td>
<td>6.1</td>
</tr>
</tbody>
</table>

| **B. SOURCES OF NEW EMPLOYMENT BY CLASS in %** |       |                |                           |              |
| 0 - 4      | 100.0 | 64.6           | 35.2                      | 0.2          |
| 5 - 19     | 100.0 | 58.8           | 39.9                      | 1.3          |
| 20 - 99    | 100.0 | 54.4           | 14.0                      | 31.6         |
| 100 - 499  | 100.0 | 21.1           | -37.5                     | 116.4        |
| = or > 500 | 100.0 | 3.1            | -19.8                     | 116.7        |
| **ALL**    | 100.0 | 40.6           | 11.0                      | 48.4         |

| **C. CLASS CONTRIBUTIONS TO NEW EMPLOYMENT in %** |       |                |                           |              |
| 0 - 4      | 22.6  | 35.9           | 72.4                      | 0.1          |
| 5 - 19     | 24.6  | 35.6           | 89.4                      | 0.6          |
| 20 - 99    | 16.0  | 21.4           | 20.3                      | 10.4         |
| 100 - 499  | 9.6   | 5.0            | -32.9                     | 23.1         |
| = or > 500 | 27.3  | 2.1            | -49.2                     | 65.7         |
| **ALL**    | 100.0 | 100.0          | 100.0                     | 100.0        |

1) includes independent plus dependent establishments
The computations performed in Table 5-IV reveal several important results. In terms of rates of new employment generation, it is undisputed that firm size is a primary determinant. As can be seen in Panel A of Table 5-IV, the overall rate declines from 33.8 percent in the smallest class to 7.4 percent in the largest class and the decline is strictly monotonic. In terms of the various components of new employment generation, internal expansion and independent net births exhibit exactly the same pattern. In fact in the case of independent net births, the largest classes exhibit negative employment generation rates. Only in the case of dependent net births do the two largest classes show higher generation rates than small ones, but this is an expected result, given that a certain firm size is required before branching develops. In sum, the most important and solid finding here is that small firms are much more active generators of new employment than large firms.

In the Panel B of Table 5-IV we can see the composition of employment generation by the various forms of expansion. In the two smallest size classes (0-4 and 5-19 employees) internal expansion and independent entry account for more
than 98 percent of all expansion. The role of independent net births is very significant in those classes. This implies that the growth potential of small firms and their increased capacity to enter or leave an industry make significant contributions to employment creation. As we move up the size scale, internal expansion and independent entry shrink in importance; the creation of dependent establishments becomes the dominant form of new employment generation in class sizes above 100.

Finally in Panel C of Table 5-IV we note the class contributions (shares) in new employment generation. The most important point can be extracted from the very first column of the Table. The share of firms with less than 20 employees is 47.2 percent of the total, and that of firms with less than 100 employees is 63.2 percent of the total. These are sturdy and important findings. The role of small firms in employment generation is very substantial.

It is of interest to compare the share of various classes in new employment generation with their share in total average employment. This is shown in Table 5-V below.
### TABLE 5-V

New Employment Generation and Average Employment by Firm Size Class

<table>
<thead>
<tr>
<th>Employment Size Class</th>
<th>New Employment Generation</th>
<th>Average Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Amount (000's)</td>
<td>(3) Amount (000's)</td>
</tr>
<tr>
<td></td>
<td>(2) Share of total in %</td>
<td>(4) Share of total in %</td>
</tr>
<tr>
<td>0 - 4</td>
<td>1839.0</td>
<td>5444.4</td>
</tr>
<tr>
<td></td>
<td>22.6</td>
<td>8.4</td>
</tr>
<tr>
<td>5 - 19</td>
<td>2002.5</td>
<td>9814.7</td>
</tr>
<tr>
<td></td>
<td>24.6</td>
<td>15.1</td>
</tr>
<tr>
<td>20 - 99</td>
<td>1301.4</td>
<td>10944.0</td>
</tr>
<tr>
<td></td>
<td>16.0</td>
<td>16.9</td>
</tr>
<tr>
<td>100 - 499</td>
<td>784.8</td>
<td>8710.4</td>
</tr>
<tr>
<td></td>
<td>9.6</td>
<td>13.4</td>
</tr>
<tr>
<td>500 +</td>
<td>2221.4</td>
<td>29977.8</td>
</tr>
<tr>
<td></td>
<td>27.3</td>
<td>46.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>8149.1</td>
<td>64891.3</td>
</tr>
</tbody>
</table>

**Notes:**
1. \((EB - ED) + (ES_1 - ES_0)\)
2. \((ES_0 + ED + ES_1 + EB)/2\)
The comparison of shares from Table 5-V shows that the contribution of firms employing less than 20 persons is more than proportional to their share in total employment. The contribution of firms employing between 20 and 99 persons is almost proportional, and the contribution of larger firms to new employment generation is less than proportional to their total employment share. This provides one more solid indication as to the primary role of small firms in new employment generation.
Chapter 6: Migrations across Industries

The object of this Chapter is to examine the movement of firms from one industry sector to another. In previous Chapters we examined mobility in two dimensions: Birth/Death of enterprises or establishments and movement across size classes. Interindustry migration constitutes still another form of mobility. Thus, in this Chapter we expand our analysis of mobility to include establishments that have switched from one 4-SIC industry to another between 1976 and 1982. In our previous analyses of births and deaths we counted these establishments as "matches," i.e., simply as survivors. However, they are clearly different from strict "matches" in which the surviving establishment is found in the same 4-SIC industry in both years. Surviving establishments which have switched 4-SIC industries can be regarded as "in-migrants" to their 1982 4-SIC industry and as "out-migrants" from their 1976 4-SIC industry.

Interindustry migration is a form of mobility which maintains to some extent the features of an organized resource "package" through a change in economic activity. It is a movement which, above all, requires entrepreneurial versatility and technological flexibility. The forces causing such a movement can be complex. Yet it must be fundamentally a perception of superior opportunities for profit and growth which motivates interindustry migration. The capacity of a firm to engage in interindustry migration will depend on two sets of factors. On one hand, it requires
the ownership of flexible resources, that is of resources which can be applied to multiple uses. On the other hand, it requires intimate knowledge of market conditions, techniques and possible outcomes in both the industry of origin and the industry of destination, on the part of the entrepreneurs. It also requires a financial "margin of maneuver" since practically always migration involves certain time spans during which resources are tied up but revenues are not forthcoming.

In this chapter we carry out two tasks. First, we compute rates of in- and out-migration for each industry to derive total entry and exit rates by size class. Secondly, we analyze some characteristics of industries which are the origin and industries which are the destination of migrations in order to understand some of the factors which determine and enhance migration.

6.1 Migration Rates and Total Entry and Exit

Interindustry migration has been computed and analyzed in a manner analogous to the treatment of birth and death rates. Thus, we have computed the average industry in-migration and out-migration rates for the five firm size classes segregating independent and dependent establishments. To estimate the rates we took the number of in-migrations (or out:migrations) in a 4-SIC industry and divided by the average number of establishments in that 4-SIC industry for 1976 and 1982. It is clear that in this computation, migration rates have the same denominator as
birth and death rates and they are therefore comparable. Thus, summing the birth and in-migration rate we obtain a total entry rate for the industry.

In comparing in-migrants and out-migrants with births and deaths one should keep in mind that the latter represent a more accurate measure of mobility. This is because the designation of an establishment as having switched from one industry to another requires an amount of subjective judgment. Establishments usually produce several different types of output and often the output spans more than one 4-SIC industry. In defining an industry switch we have counted all cases where an establishment's primary 4-SIC industry changed between 1976 and 1982, except those where the 1982 primary 4-SIC is the same as the 1976 secondary 4-SIC. Thus we have tried to confine our count of migrations to cases where a substantial change in the establishment output has taken place. However since an establishment's primary and secondary 4-SIC are designated on the basis of which industry accounts for the largest and second largest share of its output, a relatively small change in the composition of output could lead to a change in industry classification. In Table 6-I we show birth and in-migration rates by size class.

On the left hand panel of Table 6-I are shown birth and in-migration rates for independent establishments, as well as their sum - the total entry rate. Birth rates decline across size classes, as we have noted earlier. In-migration
<table>
<thead>
<tr>
<th>Employment Size</th>
<th>Independent Establishments</th>
<th>Dependent Establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Births</td>
<td>In-migration</td>
</tr>
<tr>
<td>0 - 4</td>
<td>0.36</td>
<td>0.06</td>
</tr>
<tr>
<td>5 - 19</td>
<td>0.29</td>
<td>0.08</td>
</tr>
<tr>
<td>20 - 99</td>
<td>0.20</td>
<td>0.11</td>
</tr>
<tr>
<td>100 - 499</td>
<td>0.12</td>
<td>0.14</td>
</tr>
<tr>
<td>500 and above</td>
<td>0.05</td>
<td>0.29</td>
</tr>
<tr>
<td>All</td>
<td>0.32</td>
<td>0.07</td>
</tr>
</tbody>
</table>

1) In-migrants are establishments whose primary SIC changed between 1976 and 1982 and whose primary SIC in 1982 was different from its secondary SIC in 1976. These are in-migrants into the 1982 SIC.

2. Independent establishment = establishments that belong to firms owning only one establishment or establishments that are corporate headquarters of multi-establishment firms.

3. Dependent establishment = branches or subsidiaries of multi-establishment firms

4. Imputed records included
rates however behave in the exact opposite pattern: They increase monotonically and substantially as we move to higher size classes. As a result of these two opposing tendencies, total entry rates still decline as size increases but the decline is small compared to the decline exhibited by birth rates.

In the case of dependent establishments, for which the computations are shown in the right hand panel of the Table, we also observe that the in-migration rate increases with class size. However, these rates are so small as to be negligible compared to birth rates. Thus, the total entry rate is dominated by the size and pattern of birth rates, exhibiting a decisive decline with increasing size.

In Table 6-II, we compute death and out-migration rates by size class.

The results here are similar to those of Table 6-I. For independent establishments out-migration rates are substantial and increase monotonically with size class. The total exit rates show a slight increasing tendency with increasing class size, as a result. On the other hand, for dependent establishments out-migration rates are negligible compared to death rates. Thus, although they do exhibit an increasing tendency with class size, total exit rates still decline as class size increases.

Migration appears to be substantial in the case of independent establishments but negligible in the population of dependent establishments. At the same time, as we have
Table 6-II: Rates of Death, Out-migration and Total Exit 1976-82
by Enterprise Size Class

<table>
<thead>
<tr>
<th>Employment Size</th>
<th>Independent Establishments</th>
<th>Dependent Establishments</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Death</td>
<td>Out-migration</td>
<td>Total Exit</td>
</tr>
<tr>
<td>0 - 4</td>
<td>0.26</td>
<td>0.06</td>
<td>0.32</td>
</tr>
<tr>
<td>5 - 19</td>
<td>0.30</td>
<td>0.08</td>
<td>0.38</td>
</tr>
<tr>
<td>20 - 99</td>
<td>0.25</td>
<td>0.11</td>
<td>0.36</td>
</tr>
<tr>
<td>100 - 499</td>
<td>0.21</td>
<td>0.14</td>
<td>0.35</td>
</tr>
<tr>
<td>500 and above</td>
<td>0.11</td>
<td>0.29</td>
<td>0.40</td>
</tr>
<tr>
<td>All</td>
<td>0.23</td>
<td>0.07</td>
<td>0.30</td>
</tr>
</tbody>
</table>

1. out-migrants are establishments whose primary SIC changed between 1976 and 1982 and whose primary SIC in 1982 is different from its secondary SIC in 1976. These are counted migrants out of that 1976 SIC.

2. independent establishment = establishments of firms with only one establishment or establishments that are corporate headquarters of multi-establishment firms.

3. dependent establishments = branches or subsidiaries of multi-establishment firms.

4. Imputed records included
noted before, birth and death rates are much higher for dependent than they are for independent establishments. These comparisons imply that relative to single-establishment firms, multi-establishment firms find it much easier to create (through birth) or terminate (through death) a dependent establishment and much more difficult to move a dependent establishment from one sector to another. This implies that in the intra-firm allocation of resources dependent establishments are specialized and cannot easily be moved as a package to other activities. Rather, multi-establishment firms tend to "unpackage" and "repackage" resources (activities which appear as deaths and births of dependent establishments) when they desire to shift resources.

The behavior of migration rates across size classes merits attention and comment. Prima facie, the patterns of birth and death rates implies higher mobility of smaller firms. It appears that there is a contradiction. It is worth thinking about this a little further. In our view the prerequisites for mobility in the form of birth or death are different from the prerequisites for mobility in the form of migration. The finding that small firms exhibit high birth and death rates certainly implies that they use mobile and flexible resources. Size itself is a factor here since the actions of managing a birth or a death of a small establishment are less complex and more manageable than those of putting together or of dissolving a large firm. On
the other hand, migration requires technological flexibility, variegated information and financial endurance. Given the state of managerial capabilities and financial capacities of small firms, migration may be a more complex and more costly action than simple withdrawal. On the other hand, it is probably the reverse for large firms: migration is a less costly alternative than dissolution and death. Thus, what we are probably observing is an effect of differential costs and complexity of alternative courses of action. Given the higher flexibility of small firms, a flexibility which has been established in previous chapters of this study, it is possible to speculate that if they also had better access to information and to financing they would engage intensively in migration too. As things stand, they do not.