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REGIONAL CHARACTERISTICS AFFECTING
SMALL BUSINESS FORMATION

A CROSS-NATIONAL COMPARISON

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1993

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This report has been prepared by Professor Paul D. Reynolds, Coleman Foundation Chairholder in Entrepreneurial Studies, College of Business Administration, Marquette University, Milwaukee, Wisconsin, United States and by David J. Storey, Director, Small and Medium Enterprise Centre, University of Warwick, United Kingdom. It is based on several sources of research conducted by country study teams (listed in Annex C) who also completed the individual analysis and prepared the national summary in Annex A.

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The views expressed are those of the authors and are not necessarily those of the OECD or of the national authorities concerned. The report is made available to the public on the responsibility of the Secretary-General of the OECD.
SUMMARY

An active entrepreneurial/new firm sector is associated with a high proportion of new jobs, intimately involved in innovations and economic change, provides an important career option for many, and is a necessary, though not sufficient, condition for subsequent economic growth. A cross-national analysis considered the processes affecting regional firm birth rates in either all economic sectors or manufacturing only in France, Germany (West), Ireland, Japan, Sweden, United Kingdom, and the United States. Whether measured by annual births of new firms per 100 existing firms or by 10,000 human population, the average and regional diversity of birth rates was broadly comparable across these countries.

Linear models using regional characteristics to explain firm births in the late 1980s were developed for each country. They were able to explain from half to four-fifths of the regional variation in firm birth rates. Three processes were found to have a statistically significant impact in most countries: growth in demand; a population of business organisations dominated by small firms; and a dense, urbanised context. Other processes -- related to unemployment, personal wealth, liberal political climate, or government actions -- had weak or mixed effects. Studies completed for two countries, Japan and the United States, suggested that start-up processes were stable over the 1970s and 1980s.

The major policy implications were: a) that the underlying processes affecting firm births were broadly similar among developed countries and to have a significant influence would required substantial, sustained programmes. Small scale piece-meal programmes were unlikely to have a noticeable effect; b) that reducing the diversity in firm birth rates across regions within countries would be difficult and involve a considerable shift in the allocation of public resources to non-urban areas. The acceptability of cross-region subsidies could only be determined in the political arena; c) the entrepreneurial process was such a pervasive feature of a market economy that the most efficient way to encourage firm births was to enhance the context for all business activity; d) if specific efforts were to be made to enhance firm births, different government actions would be effective for different stages of the entrepreneurial process -- firm conception, firm gestation and birth, firm infancy and growth.
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Chapter 1:
The Entrepreneurial Process and Policy Initiatives

The entrepreneurial process can be considered to have three stages.

a) **Conception:** In a given context -- national milieu, geographical region, industry, work and life course stage -- one or more adults decide to start a new firm. Whether these nascent entrepreneurs are oriented toward self-employment or a business creating jobs for others, a gestation process is initiated. The prevalence of nascent entrepreneurs in any adult population is currently unknown.

b) **Gestation and Birth:** Some nascent entrepreneurs -- an unknown proportion -- complete the gestation process and a new firm is established as a business entity. It engages in exchanges with its immediate environment -- purchasing parts and supplies; renting space; paying interest, wages and taxes -- and, supporting these expenditures, selling goods or services.

c) **Infancy and Growth:** Following the firm founding a large proportion of new firms maintain their initial size. Others, a small proportion, enter a high growth trajectory -- providing a substantial proportion of jobs and sales. Some may discontinue soon after start-up, allowing the resources they utilised (capital, facilities and equipment, labour, managerial talent) to be redeployed to other uses.

Policies and programmes of governments (international, national, and regional) may influence the entrepreneurial process in several ways.

i) **Encourage conception:** Governments may modify the institutions and regulations that affect the capacity to initiate new firms, encouraging individuals to enter into the gestation process.

ii) **Facilitate gestation, indirectly:** Governments may use public resources to improve or modify the infrastructure in such a way that it facilitates the gestation process. This would, indirectly, encourage conception.

iii) **Facilitate gestation, directly:** Special programmes may be developed to identify, inform, and train nascent entrepreneurs interested in establishing new firms -- acting as midwives in the gestation-firm birth stage of the process. These may focus on the three major activities involved in planning a new firm: a marketing strategy, assembling resources, and organising the delivery of the goods or services.
iv) **Facilitate growth/survival**: Specialised efforts may be made to assist new firms following birth, providing post-natal care, as it were. This may take the form of counsel and advice, provision of resources, or sympathy and encouragement.

The entrepreneurial process and these influences are portrayed in Figure 1.

The major focus of the following analysis is a cross national comparison of the major processes underlying firm births. As will be shown, a rather high proportion of the regional variation in firm births can be explained, or predicted, by knowing the regional characteristics. This major result is represented by a dotted line in Figure 1. The implications of these predictions, and their basis, for efforts to use government policy to affect new firm births is the focus of the concluding section.
Figure 1. The Entrepreneurial Process and Policy Intervention
Chapter 2:

Why care about New Firm births?

There are at least four reasons for giving attention to firm foundings. First, and perhaps most significant, new firms are a major source of new jobs. Analyses for Sweden (Davidsson, Lindmark, and Olofsson, 1992a) and the United States (Reynolds and Maki, 1991, p. 142) are shown in Table 1.

Table 1. Sources of Job Creation

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<th>Sweden: 1985-89 (%)</th>
<th>United States: 1976-88 (%)</th>
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<td>Independent firm births</td>
<td>19</td>
<td>25</td>
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<td>Independent firm expansions</td>
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<td>Branch births</td>
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In both countries, careful delineation of autonomous firms from branch establishments indicates that about half of all new jobs are provided by autonomous firms -- virtually all qualify as small and medium enterprises.

Second, new firms are involved in a substantial proportion of innovations in the economy. New firms implementing innovations in product or processes often lead to the creation of entire industries. Further, these new firms may provide a major challenge to established firms and encourage them to improve their products, quality, service, or reduce prices. The fact that innovation based new firms are a small proportion of all new firms does not diminish their significance. Innovation, change, and vitality in an economic system are associated with vigorous new and small firm sectors.

Third, it has become clear that starting a new business is, for many people, an important career option. Societies committed to maximising freedom of economic opportunity may wish to ensure that those wishing to pursue entrepreneurship are not prevented from doing so.

Fourth, within countries some geographic regions appear to have much higher rates of new firm formation than others. In many cases, these high rates of firm births are associated with substantial regional prosperity.
Classic examples include the so-called "third Italy" where firm formation rates are much higher than elsewhere in Italy, as in the south. Other illustrations include the Gnosjo area of Sweden, always used as a Swedish example of an area of exceptional enterprise\(^1\) and wealth. Since the third Italy and the Gnosjo areas have low unemployment, it has encouraged many to believe that the new firm formation has led to prosperity, producing jobs and reducing unemployment.

Analysis of the relationship between firm births and subsequent regional economic growth in the United States has found that while not all regions with high firm birth rates prosper, it is rare for regions that prosper not to have high firm birth rates (Reynolds and Maki, 1990, 1991). High firm birth rates may be, then, necessary but not sufficient conditions for regional economic growth. If such a relationship exists more broadly across other countries, it justifies policies to raise new firm formation rates on the grounds that this will lead ultimately to greater regional prosperity.

While no one would argue that new firms are responsible for all job growth, all innovation, all new career options, or all regional prosperity, their intimate involvement in these four positive features suggest they are a major source of a better economic life for many. They clearly deserve more attention than they have received.

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1. Although they are used frequently as examples of "enterprising" regions, it should not be assumed that low levels of unemployment and high levels of wealth always coincide. For example, while the Gnosjo area has a low level of unemployment it is, by Swedish standards, a low wage economy. In addition, analysis of 382 U.S. labour market areas indicate that correlations between annual growth in jobs and annual growth in labour income are about 0.67 over the 1976-86 period; many labour market areas have labour income growth without job growth and many job growth without labour income growth (Reynolds and Maki, 1990, pg. 24).
Chapter 3:

Entrepreneurial Processes Selected for Attention

Seven processes underlying new firm starts were selected for attention in this cross-national comparison. Their choice reflects both the availability of suitable data and an informed judgement regarding processes likely to have a major impact on new firm births.

i) **Demand:** No process is more fundamental than reactions to increased demand for goods and services. It is reasonable to expect that as demand increases, more new firms will be founded to satisfy this greater demand. Two indicators of such growth were utilised. One was a measure of net population growth or in-migration. (This may also reflect, however, a growth in the supply of potential entrepreneurs.) The second was an indicator of increases in personal or household income or a growth in regional Gross Domestic Product.

ii) **Urbanisation/agglomeration:** There has, for some time, been attention to the relative advantages of urban areas as a context -- or incubator -- for new firms. This is considered to reflect the relative ease of access to customers as well as the inputs required (capital, labour, suppliers) to produce the goods or services. Urbanised contexts are frequently a source of entrepreneurs, educated individuals with business experience in their early and middle adult years. On the other hand, the costs associated with most inputs (physical space, wages, transportation) are somewhat higher in urban areas. This may offset the benefits of ease of access for new firms in some industries. Indicators of urbanisation/agglomeration included population density (transformed to a normal distribution), the percentage of the population 25-44 years old, the percentage of the workforce in managerial positions, the percentage of the population with formal occupational training or post-high school degrees, and -- as an indicator of non-urban settings -- the presence of secondary or vacation housing.

iii) **Unemployment/desperation:** When people lose their jobs with existing organisations and become desperate for a role in the economy, they may well turn to self-employment or attempt to start a new firm. This is more likely to occur when they feel committed to a given community, where their family may have been established for generations, and reluctant to move to other regions with job opportunities. On the other hand, higher levels of unemployment may indicate a reduction in disposable income and a reduced demand, decreasing the rate of new firm formation. Two indicators were used to reflect this process, the absolute level of unemployment and changes in the unemployment rate in the previous two years.
iv) **Personal, household wealth:** One of the primary requirements for founding a new firm is start-up capital. This may be provided by the entrepreneurs on the start-up team or borrowed from friends or family. Greater wealth in an area may indicate the availability of start-up capital or a reduction in borrowing costs. For individuals, this wealth is often in the form of home ownership. Land prices would be one alternative to dwelling values. Four measures were used as indicators of wealth controlled by individuals: household income, the presence of owner-occupied housing, housing prices, and land prices.

v) **Small firms/specialisation:** There are a number of examples of regions with a reputation for adaptability and growth that are characterised by a high proportion of small firms and sector concentration. "Flexible specialisation" refers to an organisation of economic activity that is both adaptable and robust while specialising on a narrow range of goods or products. Two indicators were utilised in an attempt to capture the basic elements of this process. The percentage of all firms that would be considered small was a primary measure, although the definition of firm size varied somewhat among the different countries. For most firm size was measured by the number of employees, for others it was the annual sales (turnover). The second measure was an index of sector concentration, based on the percentage of workers in the major economic sectors (from 10 to 15 categories, depending upon the country) covering all areas of activity. If there was complete uniformity with the same proportion of the workforce in all sectors, the index would be zero. If all workers were in the one sector, the index would be one.

vi) **Socialist voters:** The political complexion of the government could also influence business formation rates. For example, it could be argued that left wing or socialist local/regional governments are more likely to spend money and hence create demand in the locality. On the other hand, these expenditures may require higher tax rates which could depress demand. Left-wing (or liberal) governments might also indicate the presence of relatively negative attitudes to self-employment and entrepreneurship, and the absence of a local 'enterprise culture'. It could also be argued that regions dominated by small businesses are more likely to have a conservative government. This liberal-conservative dimension was measured by the extent of socialist (liberal) voting patterns in a recent election.

vii) **Government spending/policies:** There are at least two ways governments may affect the presence of new firms in a locality. One is through local spending which may increase demand and, wisely used, improve the local infrastructure: schools, health care, roads, police and fire services, and the like. The other is through programmes providing direct assistance to new and small firms. Indicators of both were used to reflect the impact of government actions.

It should be mentioned that the technical procedures used to measure the indicators varied among the countries. For example, virtually every country
has a different education system, so the measure of educational attainment (associated with the urban/agglomerative processes) is slightly different for each country.

The major focus of the analysis, then, is to determine if there is evidence that these processes are having an impact on firm births in advanced market economies. If more than one process is found to have an impact, the relative magnitude of the impact is also of some interest.
Chapter 4: Analysis Strategy

The objectives of the overall project, and the analysis within each country, is to determine the relative impact of different processes on firm births (Reynolds, 1991). As an important socio-economic phenomena with major ramifications for the people involved it is not possible to use social experiments. It is, for example, inconceivable that deliberate action would be taken to increase unemployment in a region just to see if that increased the firm birth rate.

The strategy was, therefore, to take advantage of the variation across regions that are considered "natural," at least not deliberately controlled by any human agents or organisations. In order to track the effects of these natural variations, it is necessary to have reliable data, over time, for the different regions within a country. If regions that have -- for whatever reason -- higher unemployment in one period appear, in a following period, to have higher firm birth rates when compared to other regions, it is reasonable to infer that unemployment is somehow related to the processes that lead to firm births.

In order to complete such an analysis within a single country, reliable data reflecting important processes must be gathered for each region at frequent intervals, say every one to five years. While most Western or developed countries have extensive annual data on economic activity and population characteristics at the national level, it is -- surprisingly -- relatively rare for the regions within the countries. This lack of periodic, regional level data placed major constraints on the countries that could be included in this analysis. In fact, the countries that are represented (France, Germany [Western], Italy, Ireland, Japan, Sweden, United Kingdom, United States) are among the very few with appropriate data (Keeble, Potter, and Storey, 1990). Suitable data may be available in some other countries (such as Australia, Canada, the Netherlands, New Zealand, Norway, Switzerland), but teams could not be located nor resources assembled for analyses in time for inclusion for this comparison.

Cross-national comparisons are facilitated by the same procedures used to measure the same variables in all countries. But a more fundamental problem confronted this endeavour. The number of regional characteristics measured across the different countries -- by whatever procedure -- was small. This problem led to two adaptations: harmonization of the conceptual framework and tolerance of procedural diversity. For example, once it was determined that unemployment was an important regional characteristic to be tested in all analyses -- conceptual harmonization -- the differences in the exact procedures used to measure unemployment in each country -- procedural diversity -- is less of an issue. This is because all comparisons are within countries, not between countries.
While exact comparability of measures has its value, there is also an advantage to having conceptual harmonization and a wide variation in measures and procedures. Such diversity provides a more severe test of the basic assumptions underlying the comparisons. If the same relationships are found across different countries despite diversity in technical definitions and procedures, the evidence that these are indeed fundamental, pervasive processes is stronger. The processes are -- in the language of the analyst -- robust. This will increase confidence that the same processes could be expected in countries not included in these comparisons.

One further characteristic enhances the analysis -- substantial variation across the country in terms of regional characteristics. Among the countries represented in this analysis, Ireland and the United States represent the two extremes in terms of range of diversity. Regional diversity in the United States is unique, as it has a far greater range among the 382 labour market areas in basic characteristics than any other country in the study. For example, it is the only country with a large number of sparsely populated regions, most are in the western plains and mountain areas between the Pacific and the Mississippi River -- Alaska is the extreme case of low population density. In addition, most other countries that are included have a small number, less than ten, of major urban areas. The United States, in contrast, has over 80 included in its analysis. The population range among the United States regions varies from 100,000 to 12,000,000. At the other extreme is Ireland, with 27 counties oriented toward the single major metropolitan region of Dublin. Greater regional diversity should make it easier to make predictions for the United States analysis, less regional diversity should make it more difficult to make good predictions for Ireland. As it turns out, the predictive success of the models for Ireland are better than those for the United States.

While there has been conceptual harmonization across countries for the following comparisons, the diversity in measures and range of differences among regions provides a very severe test of the most critical hypothesis: Are the same underlying processes affecting firm births in different countries? If the same processes are found to be important for all countries included in these comparisons, despite diversity in the measurement procedures, it provides strong confidence that the results would have occurred with identical measurement procedures. It is also very likely that the same processes are occurring in other developed countries, those that were not included in the analysis.

2. Along with diversity in regional characteristics, there is substantial diversity in the economic structure of the different labour market areas in the United States. This diversity in economic structure tends to reduce the capacity to create successful predictions with a single multiple regression model. Predictions for the United States are improved when models are developed for regions with similar economic structures, such as all urban areas excluding rural areas.
Chapter 5:

Spatial Variation in Firm Birth Rates

There is substantial variation in the procedures used to determine new firm births across most advanced countries. In fact, no two countries have, strictly speaking, the same procedure. This variation is fully represented in this cross-national comparison in several ways. For example, for the United Kingdom, new registrations for the Value Added Tax (VAT) were used as counts of new businesses. For Sweden and France it was new entries in business registers. German firm births were inferred from social administration files and in Ireland based on comprehensive annual censuses of manufacturing firms. Births in the United States were based on new entries into the files of a commercial credit rating service. The nature of the business entities also varied. Data in Germany, Japan, and the United Kingdom was based on all new businesses, including independent start-ups and branch units. In Ireland, Sweden, and the United States, it was possible to exclude branch births and focus on autonomous start-ups.

Another important source of difference was the definition of a "region." For Ireland and the United Kingdom, the regions were administrative counties. For France and Japan, they were administrative regions and for Germany, planning regions. For Sweden and the United States they were labour market (or travel-to-work) areas.

Despite the differences and with considerable co-ordination among the different country teams, it was possible to develop birth rate indicators that were conceptually similar, even if the technical details differed. The two measures used in the analysis are presented in Table 2.
Table 2. Firm Birth Rates and Variation by Country

Notes: * Population 16-64 used as denominator, rather than size of workforce.
** Manufacturing workers used as denominators.
The four columns on the left in Table 2 are related to annual firm births per 100 firms existing at the beginning of the period. The four columns on the right refer to annual firm births per 10,000 human population. For each firm birth rate measure, the average across regions, the maximum, the minimum, and the ratio of maximum/minimum is given. The top half of the table reflects new firm births in all economic sectors, the bottom new firm births in manufacturing (industry). All birth rates are for the middle to late 1980s.

There is some variation among the different countries in the average values. This reflects differences in the technical procedures used to measure firm births in the different countries. Because of these technical differences, cross-national comparisons of the average values are not appropriate.

There are, however, two major sources of similarity. First, the average values have the same order of magnitude. Annual births per 100 firms ranges from 7 to 16 per year for all industries; 6 to 17 for manufacturing. Annual births per 10,000 persons ranges from 33 to 88 for all industries and 7 to 28 for manufacturing. This is strong evidence that the same phenomena underlies data collection in all countries.

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3. Rather than review the spirited debate regarding which is the "right" measure of birth rates (Audretsch and Fritsch, 1992a), both measures are included in this analysis. If one assumes that new firms related to the presence of businesses. If one assumes that businesses are created by individuals, some of which may not have jobs, then the focus is on the pool of potential entrepreneurs, the human population. For the analysis that follows, the exact measure has little impact on the major conclusions.

4. There has been considerable discussion among the various country teams regarding the difference in birth rates, particularly the lower birth rates for the United States and the rather high birth rates for Sweden, both of which have been able to separate independent businesses from all establishments for their analysis, eliminating branch establishments. There are a number of possible reasons for the lower birth rates for the United States, related to the original source of data, new entries in the files of a commercial credit-rating service. Such a service would under-represent self-employment, included in the registries upon which the Swedish data was based. Furthermore, the figures represent the simple averages for all 382 U.S. labour market areas which was not weighted to represent the population in each labour market area. One half of the U.S. population resides in 81 of the 382 labour market areas to have a substantial effect on the average. The high rates for the United Kingdom probably reflect the use of new Value Added Tax entrants to measure business births, which includes self-employment (if annual turnover or sales exceed a certain level), independent businesses, and branch businesses. As long as there is no reason to suspect a systematic bias accross the regions within a given country, the analysis justifies confidence.
Second, the ratios of the maximum to minimum values are quite consistent. For all industries these range from two to three for annual firm births per 100 firms or two to four for annual firm births per 10,000 persons. Setting aside the United States, the same pattern is found for manufacturing firms, with maximum/minimum ratios of two to three for births per 100 firms and three to six for births per 10,000 humans. The greater range in the United States regarding manufacturing birth rates reflects the diversity across 382 labour market areas. Some rural labour market areas have virtually no manufacturing activity, other labour market areas, again mostly in rural areas, are distinctive for the absence of non-manufacturing economic activity.
Chapter 6: Analysis across space: Cross-national comparisons

It is clear there is variation in new firm birth rates across the regions of all countries included in the analysis. The basic purpose is to determine if the indicators, reflecting the various start-up processes, can be used to predict, or explain, variation in firm birth rates. If indicators of the same process are found to be useful in linear models of new firm birth rates across all the countries included in this analysis, there is high confidence it would be important in the same countries in other time periods, say the 1970s or the 1990s, or in countries not included in this analysis.

Because of the diversity in procedures and measures used among these countries, the simplest comparison is to identify those measures that have a statistically significant impact in the linear models and examine the direction of influence. The result of such an analysis is presented in Table 3 for firm birth rates for all industries and Table 4 for firm birth rates for manufacturing. For each specific indicator, there are four possible outcomes: statistically significant (0.05 level) and positive [+], statistically significant (0.05 level) and negative [-], included but not statistically significant [O], and not included [NI]. Marginal statistical significance, the 0.10 level, is indicated by parentheses.

Both Tables 3 and 4 are organised around two sets of columns. Those on the left represent predictions of birth rates per 100 firms and those on the right birth rates per 10,000 persons. Note that there are only four indicators that could be included in every model for every country: in-migration/population growth, population density, change in unemployment, and the proportion of small firms. Several other indicators were available for almost all the analyses, including growth in regional gross domestic product, unemployment level, owner occupied housing, and the sector specialisation index. Some of the more interesting indicators, such as the presence of government assistance programmes, are available for only one or two countries.

5. For this comparison, all teams completed a simple ordinary least squares regression model forcing all variables into the analysis. The level of statistical significance for each independent variable was then assessed. Acceptable statistical significance was considered to be the 0.05 level, factors acceptable only at the 0.10 level are so indicated. This tolerance is justified by the small number of regions in many analyses, and the number of regions has a major impact upon the level of statistical significance. More stringent criteria would have placed countries with a small number of regions at a disadvantage. The distribution of firm birth rates, as dependent variables, tends to have a normal distribution, as does the residuals from such regression models.
The first important feature of these analysis is the relative high level of explained variance, averaging about 70 per cent for the models of firm birth rates in all industries and 40-50 per cent for firm birth rates in manufacturing. This is, in itself, a major finding. For it suggests that the processes reflected by these indicators are having a substantial impact on the birth of new firms.
Table 3. Region Characteristics and Firm Births: All Economic Sectors
Table 4. Region Characteristics and Firm Births: Manufacturing Only
Informed judgements regarding the relative impact of the different processes, based on an inspection of Tables 3 and 4, are presented in Table 5. This indicates the relative significance of the seven different processes, each represented by one or more variables. Indicators of the different processes are available for from three to seven different countries.

For linear models predicting firm births in all economic sectors, the most significant process is growth in demand. Three processes have a consistent positive effect: urbanisation/agglomeration; unemployment/desperation; and the presence of small firms and economic specialisation. There is a weak positive effect from measures of household wealth. The presence of a liberal political climate has a mixed effect and there is no statistically significant impact from government actions (local spending or programmes of assistance).

Table 5. **Overview of Major Results**

* Indicates the number of countries where one or more indicators of the process could be included.
The pattern is slightly different for predictions of manufacturing firm births. A strong positive effect is found from the presence of small firms (presumably reflecting some specialisation) and there is consistent positive effect from growth in demand. Weak positive impacts are found from processes associated with urbanisation/agglomeration, a liberal political climate, and government actions. There is a mixed pattern associated with unemployment/desperation and no impact from variation in household wealth.

There are, therefore, two differences between the models developed to predict firm births in all sectors and in manufacturing. First, the all sector models are more successful and explain a higher proportion of the variance in birth rates. Second, the processes considered important vary somewhat between the two models. Note, however, that no processes have the opposite impact for the two predictions -- a positive impact for one and negative for the other.

Several things account for these differences. First, manufacturing (firms, jobs or births) represents less than a fifth of economic activity in most regions and countries. When all sectors are considered, over half of all firms, jobs, and firm births are in sectors oriented toward the local market -- retail (including catering), construction, consumer services, health care services -- where an ordinary citizen is the customer. As a result, models of the processes affecting firm births in all industries are dominated by the processes associated with consumer oriented commerce -- population growth, urban context, or availability of small amounts of capital.

In contrast, the major customer for manufacturing firms are other businesses, often other manufacturing firms, and ease of access to large populations may be less significant than other factors, such as input costs. For example, the largest birth rates in manufacturing in the United States occur in rural regions adjacent to the major urban regions. Similar patterns seem to be found in Germany and the United Kingdom, as well. The lower costs of land and labour and efficient transportation to other regions (by rail or road), and the movement to these rural areas of potential entrepreneurs for environmental and quality of life reasons (Keeble, Tyler, Broom and Lewis, 1992), may all play a part in this pattern. These rural regions, then, where the economic structure is dominated by a range of smaller firms, have higher rates of manufacturing firm births. As a result, measures of personal wealth -- related to housing and land values -- or urbanisation/agglomeration have little value in predicting manufacturing firm births.

Variations associated with different industries and distinctive geographical characteristics will be critical elements in more detailed analyses. For example, in the United Kingdom analysis a distinctive "Welsh effect" was found, a higher level of firm births in Wales over and above that associated with the differences found among the other regions in the analysis (Keeble, Walker, Robson, 1992). The success of this first effort, focusing upon an all sector analysis, suggests that more detailed sector specific analyses are justified.
Chapter 7:

Analyses Across Time: Japan and the United States

The previous analysis has suggested substantial stability across a number of countries at the same time, the late 1980s. It is possible, of course, that there is something unique about this period and that different patterns may be found in the past or be expected in the future. While it is not possible to track the future until it arrives, some analyses are available that relate to the past.

Identical analyses for multiple time periods were conducted for both Japan and the United States. This was possible only because comparable data was available for more than one time period. The analysis for Japan (LaPlant, 1992) involved predictions of manufacturing birth rates across 47 prefectures for four periods covering ten years: 1976-79, 1980-82; 1983-84; and 1985-86. Indicators of various start-up processes were developed for prior periods. It was found that no significant difference was present across the time periods and data for all four periods were combined into a single data set for more detailed analysis.

A more complex analysis was completed for the United States (Reynolds and Maki, 1991). Data on firm births for all economic sectors was available across 382 labour market areas for six time periods covering twelve years: 1976-78; 1978-80; 1980-82; 1982-84; 1984-86; and 1986-88. Multi-item indicators for fifteen start-up processes were developed for five time periods: 1970, 1978; 1980, 1982, and 1984. A variety of analysis were completed with comparisons based on similar time lags for different periods. For example, linear models for four two-year times lags could be analysed, using 1978 data to predict 1980-82 firm birth rates, 1980 data to predict 1982-84 firm birth rates, 1982 data to predict 1984-86 firm birth rates, and 1984 data to predict 1986-88 firm birth rates. Specific historical time, even periods with different stages of the business cycle, had no impact on the models. In fact, rather successful models -- explaining over 60 per cent of the variance in firm birth rates -- could be developed using 1970 data to predict birth rates 12, 14, 16 years in the future.

The stability in both Japan and the United States analysis appears to reflect temporal stability in the relative status of regions within each country. For example, those regions within the United States with the greatest relative population growth, greatest relative economic diversity, greatest relative personal wealth, and greatest relative proportion of volatile industries change very little over the 1970s and 1980s.

These findings indicating considerable temporal stability complement the findings indicating stability across different countries. It is unlikely that without dramatic changes in the relative status of the regions, such as a doubling of the population in one year, there will much of a change in the relative standing in terms of firm birth rates.
The underlying processes affecting new firm births at the regional level appear uniform across countries and over time. They are a fundamental feature of market economies. They may be very difficult to modify with public policies in democratic societies.
Chapter 8:

Policy Implications Related to the Entrepreneurial Process

There are at least four issues for policy consideration:

i) Should efforts be made to create uniform firm birth rates across all regions of a country?

ii) Can government actions make a difference in firm birth rates?

iii) What government activities are most likely to have the most impact on firm births?

iv) Should small firm policies move away from stimulating births towards promoting "high potential for growth" firms?

v) Will enhancing firm births improve overall economic well-being?

Findings from these cross national analyses are relevant to these questions. They will be discussed in turn.

A. Should efforts be made to create uniform firm birth rates across all regions of a country?

The most pervasive finding across all countries, and all time periods, is the substantial diversity in birth rates within the countries, usually by a factor of two or three. Other research suggests this is associated with changes in the economic well-being of the regions. Often this disparity is associated with economic decline in rural areas and economic growth in major national and regional economic centers.

This study indicates that regional disparity reflects shifts in population and resources that are -- by almost any comparison -- massive. Reducing the regional disparity in birth rates may require policies than constrain (or discourage) migration across regions, compensate for differences in demand across regions, or develop programmes for rural areas that compensate for the natural advantages found in urban areas. The costs, political and financial, of achieving equality across regions in firm birth rates and economic well-being may be substantial.

Only the political processes can resolve the value of subsidising declining regions to achieve parity in firm birth rates and economic well-being. Nothing in this research can provide an answer to this question. One of the major features of political discussion in all advanced countries is the diversity in regional economic conditions. The political arena is where decisions about allocation of national resources properly belongs.
**B. Can government actions make a difference in firm birth rates?**

Governments can, given their powers, have considerable influence over the entrepreneurial process by stifling the efforts of those attempting to start a new business. This may be done by provide onerous requirements, complex regulations, or merely a slow reaction to requests for decisions required to implement the new business.

Can, however, governments encourage entrepreneurship and firm births? Efforts to stimulate entrepreneurship may be divided into two categories, general efforts to enhance the capacity for all businesses to function effectively and specific efforts related to the entrepreneurial process.

The former, efforts to facilitate the capacity of all business to operate, may be the most cost-effective strategy. Fundamental would be providing an efficient, effective infrastructure: transportation, health care, education, criminal and civil justice, and the like. In those requirements or programmes that affect businesses directly, it may help to reduce the transaction costs for businesses as much as possible. This implies an effort to minimising bureaucratic complications, reducing delays in decisions that slow business adaptation, and generally treating the business community as an equal partner in providing a satisfactory work and economic life for all. Such general measures would do much to encourage firms -- new and old, large and small -- to expand business activity.

Perhaps critical in any government action to enhance entrepreneurship is an understanding of the scope of the phenomena associated with firm births. Two elements of this research reflect the massive nature of the entrepreneurial process. First, the success of the linear models that use regional characteristics to predict new firm births. Measures of government actions had very modest impacts in these models. The most important processes were not those easily affected by government action.

Second, entrepreneurial activity is an common feature of the life of the adult population in these countries, presumably absorbing time and personal resources. Table 6 presents the annual new firm births rates, taken from Table 2, in relation to other important life events: births and marriages. The analysis assumes that an average of two adults is associated with each new firm birth, a consistent finding in studies of new firm start-ups.

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6. Though it should be noted that in the United Kingdom study, which also analysed local variations in net changes in numbers of small businesses, found evidence of greater government policy impacts in reducing business death rates and, hence, increasing net growth of small businesses.
Table 6. New Firms, Start-up Teams, Birth Rates, and Marriage Rates

<table>
<thead>
<tr>
<th></th>
<th>Per 10,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New Firms</td>
</tr>
<tr>
<td>Germany (Western)</td>
<td>55</td>
</tr>
<tr>
<td>Sweden</td>
<td>88</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>72</td>
</tr>
<tr>
<td>United States</td>
<td>33</td>
</tr>
</tbody>
</table>

** Assumes two persons per new firm start-up.

Regardless of whether or not the number of firms or the number of adults on the start-up teams is considered, the major point is clear. Entrepreneurship and new firm births are as pervasive as other important life events.

What is not known, at this time, is the prevalence of nascent entrepreneurs -- those attempting to implement new firms. If only half of nascent entrepreneurs are successful in putting new firms in place, then the rate, per 10,000 population, of nascent entrepreneurs will be twice that of the start-up teams (the rates in the second column of Table 6 could all be doubled) and substantially greater than other major life events -- marriages and births. It is reasonable to assume it is true for other developed countries.

The prevalence of nascent entrepreneurs -- those entering the first stage of the entrepreneurial process -- is currently unknown. There has been a suspicion that different countries, even in Europe, give different degrees of emphasis (social respect and encouragement from peers) to the pursuit of entrepreneurship. Differences in cultural emphasis may be reflected in differences in the prevalence of nascent entrepreneurs. This is an important topic for additional research on the entrepreneurial process.

A deliberate government policy to enhance entrepreneurial activity and new firm births should take into account the scope of the phenomena. It is clearly a major activity involving a significant proportion of the adult population; people willing to commitment substantial time and resources to pursuing this career option. Governments that wish to have a major impact on the prevalence and success of entrepreneurial initiatives should be prepared to invest substantial resources to the endeavour. Small scale programmes, such as the occasional twenty-firm incubator or token venture capital fund, may help a few firms, but compared to the overall scope of the phenomena the net impact will be small. (This is probably why there was little impact on firm birth rates associated with the presence of government assistance programmes -- they failed to reach most new firms.)
Just as determined governments have been able to affect human birth rates, determined governments may be able to affect firm birth rates. But it would be naive to suggest that it would be easy or could be accomplished quickly. One way to reduce the overall cost is to restrict assistance to certain regions -- seen as having unusually high or low potential -- or to new firms in certain industries -- those seen as having the highest potential. Differential allocation of public resources, however, is always controversial and can only be resolved by the political process.

C. What government activities are most likely to have the most impact on firm births?

Analysis of the processes associated with new firm births across eight advanced market economies in the late 1980s (France, Germany, Italy, Ireland, Japan, Sweden, United Kingdom and the United States) and two market economies over the 1970s and 1980s (Japan and the United States) indicates three processes having a positive impact on firm birth rates:

* Growth in demand, indicated by population growth and growth in income.
* A population of business organisations dominated by small firms.
* A dense, urbanised context, reflecting the advantages of agglomeration, presumably including the benefits of access to customers, sources of supply, and capital, as well as awareness of competitors’ actions.

Other processes -- related to unemployment, personal wealth, liberal political climate, or government actions -- had weak or mixed impact. The activities of the Shannon Free Airport Development Company (SFADCo) in stimulating new business starts in the rural west of Ireland would be an important exception to this overall conclusion.

Many governments attempt to enhance demand and affect population growth as a basic feature of their political agenda. It is unlikely that these policies would be developed only to enhance firm birth rates.

Governments might, however, adjust or review their current posture toward business organisations to ensure that small firms are not disadvantaged in relation to large firms. If there are administrative advantages for firms to be larger, rather than advantages on economic grounds -- effectiveness or lower costs -- then government policies or regulations may be reconsidered.

Most dense, urbanised areas with the advantages of agglomeration have emerged over long periods of time as the result of natural processes. They are quite difficult to create and it is unlikely that governments can do so. Governments may, however, try to offset the disadvantages to those in the entrepreneurial process outside urban areas by subsidising information and transportation services or technical training or provision of research and development to non-urban areas. Whether or not such subsidies are justified is a matter for the political process to resolve. There are, however, probably limits to the extent to which such programmes can offset the advantages of
agglomeration. The benefits of immersion in frequent, low effort contact with a wide range of firms, people, and institutions may be difficult-to-document, but they could be substantial. This ease of contact with diversity (a critical feature of dense, urbanised, agglomerative regions) seems to be particularly influential in promoting innovation (Jacobs, 1984).

The conception of the entrepreneurial process outlined in the introduction, and Figure 1, was considered to have three stages:

a) **Conception**, where individuals decide to enter the gestation process and found a new firm.

b) **Gestation and birth**, where individuals -- usually in teams -- take the steps necessary to found a new firm, culminating in a new firm birth or abandonment of the initiative.

c) **Infancy and growth**, where the development pattern of the new business is defined and it pursues a stable or growth trajectory with some proportion discontinuing business soon after startup.

These stages delineate activities that reflect proaction by the entrepreneurs. Indeed, it is the energy, optimism, and aspirations -- more than anything else -- that are the mark of entrepreneurial activity. Those pursuing entrepreneurial career options universally seem to think that creating a new business entity will, compared to their alternatives, provide them with a chance to do something that is more interesting, more productive, more innovative, or more rewarding.

Policies initiatives oriented at increasing the conception of new firms -- encouraging adults to enter the gestation process -- could emphasise the availability of support and assistance programmes. Programmes could provide a realistic assessment of the nascent entrepreneurs capacity and potential to complete the gestation process and launch a new firm. There is no question that not every adult is a good candidate for entrepreneurship. Many adults in all countries have neither the stamina or basic skills (at reading, writing, and arithmetic) necessary to found a new firm. While low-skill self-employment may be a alternative to a job for many unemployed; a large proportion of the unemployed are not good candidates for starting a high-growth new firm.

The actual programmes could assist nascent entrepreneurs as they complete the gestation process. They could help nascent entrepreneurs complete the three critical features of the planning process: i) developing a marketing strategy, ii) an operational plan for delivering the goods and services, and iii) a plan for assembling the resources required to implement the new firms.

These counseling programmes could assist nascent entrepreneurs as they assess their business plans and, for those business plans have promise, help them gain access to the resources (facilities, employees, capital) needed to implement the plan. Of special importance at this stage would be a realistic assessment of the market potential for the new business, particularly if it to be located in a region with a stable or declining demand (or population).
A different set of policy initiatives could focus on new firms in their infancy. These firms-in-place represent the culmination of the gestation process -- nascent entrepreneurs that have become start-up entrepreneurs. The fact that these firms have at least some type of official status suggests that they will be easier to locate than nascent entrepreneurs -- a major advantage. Assistance at this stage could be more focused and detailed, as the basic elements of the new firm have been established. Effectiveness and efficiency of assistance may be enhanced by having industry specialists provide the assistance.

D. Should small firm policies move away from stimulating births towards promoting "high potential for growth" firms?

From a policy viewpoint it is possible to argue that the key results from this study suggests that public policies to improve the birth rates of new firms are likely to be ineffective. It has shown that, at least for the US and Japan, regional variation in birth rates do not vary over time. The second key result is the same broad factors influence regional variation in birth rates in most countries -- demand, size structure of enterprises, and an urban context. None of these are clearly amenable to public policy influences.

The implication is that policies to promote births may be misguided for two reasons. The first is that they may be ineffective as suggested by this research. The second, not demonstrated in this research but argued by one of the authors elsewhere (Storey, 1991) is that actions to simulate births may be less effective in terms of job creation than to devote resources to facilitating the growth and development of "high potential for growth" small firms. This is consistent with the more positive result found in the UK study for a policy effect on increasing the total numbers of small businesses by reducing firm deaths.

An important policy issue is the extent to which assistance -- supported by public funds -- will be universally available or targeted to those firms expected to follow a high growth trajectory. These are the firms that provide the majority of the jobs, sales, and exports associated with new firms. This is a politically controversial plan, for it amounts to excluding some firms from assistance that is provided to others -- perhaps even the competitors of "modest potential" new firms.

E. Will enhancing firm births improve overall economic wellbeing?

The research reported has not addressed the question of the effect of enhanced firm birth rates on improved on overall economic well-being. High-firm birth rates are, however, indicators of a vigorous economic system where there is innovation, adaptation, development of new industries, and opportunities for individuals to pursue entrepreneurship as a personal career option.

As competition in the global economy increases, it seems clear that a region or a country without a vigorous entrepreneurial sector is unlikely to have a promising future. Given the evidence that is accumulating, it would take a great deal of courage for any government to ignore the need for a healthy level of entrepreneurship.
Overall

The research reported here suggests that broadly the same factors explain regional variations in birth rates of new firms across a number of developed countries. None of these factors are clearly responsive to public policy measures.

The central policy question which remains is whether to devote public resources into facilitating firm births (easing the hurdles which nascent entrepreneurs need to jump) or whether to accept the number of firms in the economy as given and focus attention (and public resources) upon facilitating growth among the most promising firms.
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ANNEX A.1

National Summary: France

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Interest in the creation and development of firms emerged in France by the end of the 1970s. At this time, the rate of firm birth was particularly low and clearly below other industrialised countries. Concern was reflected in the establishment of the National Agency for the Creation of Firms.

The decade of the 1980s was characterised by a rapid increase in the rate of firm births. This clearly justifies research on understanding and measuring the mechanisms involved. If a high rate of firm births is considered a major source of new jobs and, in turn, regional prosperity, the case for additional research is even stronger. Recent developments in the population of business firms confirms this importance. In France, the total number of business firms increased from 2,003,600 in 1981 to 2,166,900 in 1991. But this reflects the result of 1,943,000 firm births over this ten year period; 704,000 were still active in 1991. As of 1991, one firm in three was less than ten years old. Obviously, a lot of firms -- new and old -- failed to survive during this period. Accompanying this turnover within the population of firms from 1981 to 1991 was an increase of one million paid jobs in manufacturing and the services, outside the public sector.

There is considerable variation across the regions of France in firm creation measured in both absolute counts or birth rates, adjusted for a common base. First, more than 60 per cent of firm births are located in only five of twenty-two regions: Ile de France (Paris area); Rhone-Alpes; Provence-Alpes-Cote d’Azur; Languedoc-Roussillon; and Midi-Pyrénées. These five regions also generated 60 per cent of all newly created paid jobs for France in 1990. Second, there is substantial variation across regions in the firm birth rate. The average for all regions is 11.1 new firms per 100 existing firms, but the highest birth rate (13) is found in Ile de France (Paris area) with the lowest (7.8) in Limousin. Limousin represents only 1.2 per cent of all the firms in France and has a very low level of job creation.

These observations suggest an important relationship between the economic growth, the creation of firms, and the creation of paid jobs. A relationship that justifies careful research.

A comparative European study can make important contributions to the design of government policies to enhance firm births. Further, for France there has been a drop in firm births since 1990 and a reduction in the number of paid jobs since 1991. This increases the importance of understanding the underlying mechanisms that enhance regional economic development.
Two measures of firm births were developed for this study; firm births per stock of firms (at the beginning of the period) and firm births per active population (workforce). For France, they could be calculated for firm births for all economic sectors for the 96 departments (administrative districts within the regions). For measures of manufacturing firm birth rates, it was possible to use a more detailed geographic level, 384 job zones. Each job zone represents a distinctive urban region with a high proportion of completed journey-to-work commutes.

Suitable indicators for the French regions were available for most, but not all, of the independent variables chosen for the comparisons developed for the OECD workshop. Nonetheless, the results were very encouraging and worthy of interpretation.

The regressions based on linear models for firm births in all economic sectors and using the two measures of birth rates (firm stock and active population) explained over 80 per cent of the variation across the 96 departments. The fit or predictive success of the linear models for manufacturing are not as strong, but the same reduction is found in analyses for other countries. The general pattern suggests that other factors are affecting manufacturing birth rates and additional research on this economic sector is justified.

Three types of explanatory factors play a major role in explaining the variation in firm births in the French case.

On the demand side, the independent variables measured by urban growth and population density play an important influence on firm creation across all economic sectors. Population density, however, appears to have no effect on manufacturing firm birth rates.

On the supply side, the importance of small firms appears in three linear regressions: the presence and the proximity of numerous suppliers and customers are dynamic factors enhancing firm births. Without doubt, there also exists a cumulative inertia effect of the firm creation process. The development of infrastructure elements required for firm creation facilitates further firm creation. This, in turn, enhances regional economic development.

The rate of unemployment, but not the variation in the rate of unemployment, appears to provide some additional explanation. This suggests that unemployment reflects a feature of the economic structure. The absence of an impact from variation in the rate of unemployment suggests that firm births are not reflections of the behaviour of the newly unemployed.

The presence of second (vacation) residences appears to play a role in the linear models predicting firm creation for all sectors in relation to the active population. The all sector analysis is heavily affected by new firms in retail (including restaurants and bars), consumer services, and construction which make up the majority of activities. New firms in these economic sectors may develop in a response to more tourist activity, represented by a higher proportion of second (vacation) residences. This is particularly evident in attractive districts near the sea.
Thus, it seems that the principal factors affecting firm births, given the research completed thus far, are very specific features that would be difficult to control with any government intervention. Nonetheless, the competition between cities and regions of France has given rise to a variety of initiatives and local programmes designed to make some regions more attractive. These actions may have an effect on firm birth rates, but their diversity makes it difficult to determine their impact. Additional research is needed to determine what makes some regions more successful in promoting firm births.
The analysis for Germany is based on data on new establishments that have been generated from social insurance statistics. These data cover the time period 1986-89. East Germany is excluded because the comparable data were not available for the same time period. The regions are the 75 planning regions (Raumordnungsregionen) of West Germany. Other data used in the analysis are from social insurance statistics or are taken from publications of the Federal Statistics Office.

For the cross-national comparisons presented in this report (see Tables 3 and 4 in the main report) the independent variables were, as much as possible, standardised across all the countries. This resulted in a partial representation of the factors significant in predicting regional firm births in West Germany. By far the most significant impact on the birth rate is due to the share of employees in the region in establishments with less than 50 employees. All other factors are of minor importance compared to the presence of small firms.

The level of unemployment was statistically significant only in some linear models and the direction of effect varied from positive to negative. In such cases, no strong conclusions are justified. The percentage increase in unemployment in the preceding period, however, had a more significant impact. This suggests that a considerable share of new firms are started by people who have just become unemployed. In these cases the founding of a new business can be seen as a reaction for losing a job.

Other factors that had an effect on the new firm birth rate included the skill level of the regional workforce and the population density (or related factors such as land prices).

The disadvantage of using a large number of variables with a relatively small number of regions is the potential for disturbances in the linear models due to intercorrelation of the independent variables. If variables that are obviously unimportant (at least for West Germany) are dropped from the analysis, then the indicators of work-force skill level becomes much more significant. The result is a high positive correlation between qualifications of the regional workforce and the firm birth rate. This indicates that in most cases it is the more qualified individuals that are starting the new firms. Furthermore, it can be shown that the positive impact of the qualification
level is obviously due to the share of employees with the same qualifications working in small firms. This strongly suggests that many of the new entrepreneurs had skills specific to their occupation and gained work, and perhaps administrative, experience in small firms before starting their own business.

The German data show no strong impact of the birth rate on regional employment growth but there is a significant positive correlation between the rate of net entry (firm births less firm deaths) and the provision of jobs. These relationships are tentative and caution is advised in the interpretation. Further research is necessary to understand the processes behind such correlations.
ANNEX A.3

National Summary: Ireland

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Between 1980-90 there were 4,408 new openings of indigenous manufacturing firms in the Republic of Ireland of which 2,731 were still in operation in 1990. These companies employed 28,677 persons in 1990 (an average of 10.5 employees per firm), and constituted approximately 10 per cent of manufacturing employment in 1990. These figures clearly underline the importance of new indigenous openings to the growth of both national and regional economies in Ireland.

The vast majority of new firms remain small, with approximately three-quarters of all new firms employing under 11 people in 1990. However, even these companies accounted for over 7,000 jobs or one-quarter of the total employment in all new firms. The evidence from Ireland also supports the view that medium-sized new firms, employing between 11 and 49 people, are the most important source of new jobs, creating 13,000 new jobs or 45 per cent of the total number in 1990. The relatively few fast growth new firms, employing over 50 employees in 1990, generated 8,000 jobs (28 per cent of the total). Although each of these companies was individually highly successful, the small numbers involved limited the total impact on employment.

New indigenous firms in the Republic of Ireland are widely distributed across most industrial sectors. In common with most other countries they are to be found principally in sectors which include many activities which have low capital requirements for entry. These include metals and engineering, food, timber and furniture, and miscellaneous goods. One-third of new firms are found in the metals and engineering sector and in 1990 they employed just under one-third of total employment (9,270 jobs).

The pattern of gross new firm formation across the 27 counties in the Republic of Ireland is very diverse. The highest rates occur in the West, Mid-West, and North-West regions. Generally, the counties of the North-East, South-West, and South-East possess low formation rates, although an exception to this pattern is the relatively high formation rates in Wicklow and Wexford. Dublin possessed one of the lowest formation rates of all the counties. The highest rates, therefore, are in the most rural and least industrialised regions of the country.

To extract those independent or explanatory variables that provide the best explanation for inter-county differences in new firm formation, various combinations of variables were tested in ordinary least square regressions. These variables were selected on the basis of theory or previous research and an attempt was made to standardise with other country analyses in this study.
The dependent variables for gross new firm formation was specified using the number of firms as well as the population of manufacturing employees in the base year (1980). However, the preferred measure in this analysis was to use the latter normalisation procedure on the grounds that it reflects more accurately the pool of potential new firm founders.

The best-fitting equation has an R-squared of 0.76, indicating that the included variables account for three-quarters of the inter-country variation in the dependent variable.

From this equation the proportion of small manufacturing establishments in an area; growth in local industrial demand; the proportion of professional and managerial occupations in the population and the dummy variable for government policy (defined as the Shannon Free Airport Development Company -- SFADCo -- centered on the counties of Limerick and Clare in the West) are all positive and statistically significant influences on the gross formation rate of new firms across the counties of the Republic of Ireland.

A negative, and statistically significant, influence was the proportion of the county population residing in settlements greater than 5,000 persons. Two further negative influences were the proportion of the county population gaining access to higher education and the measure of net population migration (not statistically significant). Relative few people with higher education qualifications then proceed to found new manufacturing firms.

With respect to the wider debate on local economic development this analysis has indicated that the characteristics of local areas does play a significant role in the ability of an area to create new forms of economic activity, and thus have the potential for future economic prosperity. However, to translate these conclusions into policies to stimulate the process of new firm formation through the encouragement of a more positive attitude to enterprise among selected groups would be oversimplistic. Such an aim would ignore the importance of the survival and growth of new and existing small firms to medium and long-term economic development. Furthermore, it fails to recognise the fact that for many local economies their future economic well-being is intrinsically caught up with the performance of the large firm sector, some of which may be controlled from outside the local or national economy. Research into the process of new firm formation and its economic significance is not helped by the tendency to translate the results into more frequent calls for policies to increase the levels of new firm formation as the sole means of generating economic growth.
National Summary: Italy

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The Italian analysis is based on comparisons among 84 provinces. New firm births are based on registrations filed with the local Chamber of Commerce. New firm formation rates in Italy may be significantly higher than those for the other countries in the study, but technical differences make this difficult to determine. In common with the other countries, Italy also exhibits considerable regional variations in birth rates, with these being highest in the central areas and lowest in Southern Italy.

Of the two measures of new firm formation which can be used, annual birth rate per 10,000 adults active in the labour force leads to more successful models than annual birth rate per 100 establishments. (Use of a third birth rate measure, annual new firms per 10,000 total population, leads to even greater predictive success, to be discussed below.) The linear models for Italian provincial variation are not very successful when attempting to predict births per establishment, this may reflect the lack of variation when this measure is used. In contrast, linear models developed to predict births per human population are quite successful, explaining as much of the variation as the models for the other countries.

An examination of the linear models for predictions of All Sector, population based, birth rates suggest the following factors are important in Italy.

First is in-migration, with provinces experiencing more in-migration having higher rates of new firm formation. It is also notable that it is the more densely populated urban areas which seem to have higher firm birth rates.

Italy differs from other countries included in this comparison in that those with higher levels of unemployment have lower levels of firm formation.

The Italian data also suggest that provinces with a high proportion of workers with managerial experience, a larger proportion with higher educational attainment, and higher levels of self-employment are provinces with higher rates of new firm births. Perhaps surprisingly, provinces which have a high concentration of employment in a narrow range of economic sectors -- most notably the Italian industrial districts -- have a lower rate of new firm formation than might be expected. The specialisation index coefficient appears statistically significant at only the 0.10 level, rather than the more widely accepted 0.05 level. Furthermore, unlike almost all other countries in the analysis, there is no evidence in Italy that provinces dominated by small firms have higher rates of new firm formation.
Italy presents one of the cases where the success of the models and factors incorporated as significant is very sensitive to the measure of firm births. For example, if the annual rate of All Sector new firm births is computed per 10,000 total population (rather than those active in the labour force), both the index of specialisation and the presence of small firms have a statistically significant role in the linear model. A linear model with a better fit, as reflected in higher explained variance.

Turning now to an analysis of the factors influencing manufacturing new firm births, the Italian results are more consistent with those of other countries. There is strong support for the industrial district hypothesis, with higher rates of new firm births in provinces dominated by small firms with a higher proportion of employment in a narrow range of economic sectors; this relationship is enhanced if the birth rate is based on annual firms founded per 10,000 total population.

A further interesting point regarding the Italian variation in formation rates is that, in the All Sector model, the proportion of socialist voters in a province appears to be positively associated with higher firm birth rates. This does not appear as a statistically significant factor in models of manufacturing firm birth rates.
ANNEX A.5

National Summary: Japan

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Japan has been organised into 47 prefectures for administrative purposes. A large amount of diverse data is assembled and published by prefecture by the national government on a regular basis. Almost all tables are published with Arabic numerals and headings in English and Japanese. Descriptions of the data and how it was collected is also provided in English. These printed Japanese government reports are, however, spread across a number of libraries in the United States. This analysis is based on manufacturing establishment (all independent firms and branches) births for the 1985-88 period.

The stock measure of firm birth rates was based on an annual rate of manufacturing firm births per 100 firms present in 1985; the annual average for the 47 prefectures was 5.97. The population measure of firm births was based on the annual rate of manufacturing firm births per 10 000 manufacturing employees in 1985; the annual average for the 47 prefectures was 6.70. Because the frequency distribution of the latter measure was very skewed (most prefectures located at the low birth rate) a logarithmic transform was required to create a normal (more symmetrical) distribution, required for the regression analysis.

Consistent with the effort to provide standardised comparisons with the other countries in the analysis, twelve characteristics of the prefectures, measured prior to or concurrent with 1985, were utilised in the linear models. These included: population per square mile; percentage change in total population: 1980-85; percentage change in household income: 1982-84; manufacturing establishments per 100 manufacturing employees (a reflection of firm size): 1985; economic sector specialisation based on employment by sector: 1985; change in unemployment: 1982-84; percentage of population between 15 and 69 years old seeking work: 1984; percentage of population over 15 with college degrees: 1984; percentage of the population between 25 and 39 years old; percentage of the labour force in managerial and professional occupations; local government expenditures per capita; and land prices per square meter.

Using the forced entry of all variables in an ordinary least squares regression analysis, the percentage of the population between 25 and 39 was the only statistically significant factors predicting manufacturing births per 100 establishments. About 22 per cent of the variance was explained (or predicted) with the linear model. Using the same analysis procedure, two variables were
statistically significant in predictions of manufacturing firm births per 10 000 manufacturing employees: the indicator of manufacturing firm size (firms per 100 employees) and the percentage of population between 25 and 39 years old. About 41 per cent of the variance was explained (or predicted) with this model.

When a stepwise regression analysis was completed, which selects only those independent variables making a unique and distinctive contribution to predictions of variance, the results are slightly different. For predictions of firm births per 100 existing firms, the explained variance increases to 28 per cent and two variables have a statistically significant impact: the percentage of college graduates and the absence of managers and professional in the labour force. For predictions of manufacturing firm births per 10 000 manufacturing employees, only one variable -- reflecting the presence of smaller firms -- remains in the equation as statistically significant and 28 per cent of the variance can be explained with the model.

The lack of inclusion of other variables in these linear models reflects several factors. First, the small number of cases, 47 prefectures, available for analysis. Statistical significance is greatly affected by the number of cases. (The temporal analysis, reported below in Annex B.1 adjusts for this.) Second, this is a somewhat reduced set of independent variables selected to be consistent with the other country studies. Third, as only data on manufacturing births was available, the only analysis is related to predictions of one of the economic sectors that is more difficult to predict. This is because manufacturing activity appears to concentrate in a small proportion of prefectures and has a low prevalence in the majority of prefectures (reflected in the lopsided distribution of birth rates based on the population measure).

Nonetheless, the results are consistent with many patterns found in other predictions of manufacturing birth rates (presented in Table 4). In particular, the presence of small firms, the presence of people at the right age (between 25 and 39) for starting a new firm, and non-urbanised prefectures (with an lower proportion of managers and professionals) are all consistent with analysis in other countries.
National Summary: Sweden

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Christer Olofsson, Institute of Management of Innovation and Technology, Linkoping University

The analysis of regional characteristics and birth of new autonomous business firms in Sweden are based on data for 80 labour market areas and cover firm births for all sectors as well as different economic sectors: manufacturing, professional services, and other sectors (including consumer services). The period studied is 1985-1989 and cover all commercial business establishments, excluding establishments in agriculture and public services.

The analyses show that there are four main explanations for variations in all sector births rates:

a) There is a positive effect on firm births from favourable economic development as reflected in regional population growth and a negative effect of increased unemployment.

b) There is a positive effect on the firm births from population density and other variables representing agglomeration.

c) The existence of role models and experiences in small businesses are indicated by the proportion of employment in existing small businesses; this tends to increase the firm birth rate.

d) There is also a desperation effect, reflected in the positive influence of higher levels of unemployment on new firm births.

There are, however, less clear differences between sectors. The economic development variables (population growth) and the role model variable (proportion of smaller firms) seem to be important for predictions of all sector new firm birth rates. For the service sector, and particularly business services, the agglomeration variables (population density) appear to have a larger impact. This is also a reflection of the concentration of professional services in the larger metropolitan areas.

The low impact of agglomeration variables (population density) on manufacturing firm births may reflect the lower dependence of manufacturing firms on close geographical proximity to their customers.
The desperation effect explains variations in the "other" sector, and within that sector consumer services, which has low entry barriers. Thus, high unemployment levels only seem to lead to the founding of service firms using, in relative terms, unqualified labour.

There are also indications that industry support has had some impact on the level of firm birth in the manufacturing sector. Such support is mainly distributed to the least developed areas and it also turns out that the birth level of manufacturing firms is relative high in such regions. (It should be noted that only 10 per cent of all births are in the manufacturing sector.

From the analysis we can conclude that there are some important differences between regions in terms of firm birth rates. Larger metropolitan areas and educational centers seem to be the winners in terms of high birth rates. The difference between the large cities and the less populated and more peripheral areas are even more accentuated when looking at the net figures of firm births. The larger cities not only have higher gross birth rates, they also seem to be better equipped to keep the new establishments alive.

As indicated above, compared to the peripheral areas, new firms in the larger metropolitan areas are more likely to be in professional services, including technology intensive areas like computer services and software development.

The births of independent firms generate about twenty per cent of new gross employment for the period. If that is added to the employment effect of growth in small firms (independent businesses with less than 200 employees) more than 50 per cent of new jobs come from the small business sector in Sweden. In terms of net figures, new independent firms and other small firms are responsible for seven out of ten new jobs for the time period covered.
ANNEX A.7

National Comparisons: United Kingdom

David Keeble and Sheila Walker; Department of Geography and Small Business Research Centre, University of Cambridge, United Kingdom
Martin Robson; Department of Economics, Newcastle University

The research represents the first major integrated study of the nature and determinants of variation over both space and time in enterprise creation and small business growth in the United Kingdom. These are measured by county-level, and quarterly national-level, Employment Department VAT (Value Added Tax) business registration, deregistration and net change statistics for the 11-year period 1980-1990. The latter arguably provide the most comprehensive, up-to-date and spatially and temporally desegregated picture of new enterprise formation and changing numbers of small business currently available.

The study shows that there was substantial growth in number of new and small businesses in the UK economy during the 1980s, together with marked spatial variation in rates of local enterprise creation. To understand these patterns, separate multivariate regression models were developed and applied to trends over space and time in the VAT registration and deregistration data. The spatial analysis investigated over 30 different supply-side, demand-side, and policy variables suggested by previous theoretical and survey work as possible determinants of local rates of business creation and survival. These include the impact of local unemployment, market growth, demographic change, urban agglomeration advantages, professional and managerial skills, capital availability in the form of house values, small firm size structures, and even local ‘enterprise cultures’ and Enterprise Agency activities. Separate analyses were also carried out for manufacturing, financial and business services, and consumer services.

The spatial models successfully identify logical relationships and achieve good statistical results. For new enterprise creation, key influences identified include preceding population growth, the existence of large urban markets, capital availability in terms of house values, professional and managerial skills, and small firm size structures. There is also some evidence of possible local ‘enterprise culture’ effects. The role unemployment is, however, surprisingly limited, and though stimulating financial and business service firm formation, actually depresses local manufacturing firm creation.

7. The full report is entitled "New Firm Foundation and Small Business Growth in the United Kingdom: Spatial and Temporal Variation and Determinants", Department of Geography, Cambridge University, Cambridge, UK,
rates. For growth in numbers of small businesses, key spatial variables are again previous population growth, house values, and professional and managerial skills. But there is also evidence here of a negative effect of location in big cities, and of a weak positive regional policy effect, especially in Wales. The manufacturing case also, and most interestingly, yields a significant relationship with local Enterprise Agency activity. This is repeated in the analysis of business death rates, which appear to be reduced both by Enterprise Agencies and high local government expenditure.

The results of the national time series analysis are equally successful and illuminating. New enterprise formation is shown to have been stimulated during the 1980s by rising demand (GDP—Gross Domestic Product), personal financial assets, and housing wealth, and by falling interest rates and levels of income tax, but depressed by high inflation rates and rising unemployment. These also powerfully influence changes in the total stock of small businesses, as well as in death rates, the latter also being affected by rising unit labour costs. These results differ in significant respects from other recent studies, which argue for example that unemployment stimulates new business creation and have important policy implications.

The results of this major and integrated study of both spatial and temporal variations in new enterprise formation in the UK thus provide valuable and original insights into structural and policy influences affecting small firm formation and survival in the United Kingdom, significantly enhancing existing knowledge of this important phenomena.
New Firm Registrations per 1 000 Civilian Labour Force
United Kingdom; Total Economy: 1980-1990
Data on establishment births were based on new entries into a comprehensive commercial credit rating service files (Dun and Bradstreet). Editing procedures developed by the U.S. Small Business Administration separated all establishments into stand-alone, autonomous firms and branches of multi-establishment firms. About 80 per cent of all establishments are autonomous and they account for approximately one-half of all business jobs. The following analysis focuses only on autonomous firm birth rates. All data was assembled for the 3,124 counties of the United States and aggregated into one of 382 labor market or journey-to-work areas. One-third of all labor market areas include counties from two or more states.

Counts of new autonomous firms were available for all private business activity (except agricultural production) and for manufacturing (durable and non-durable) for 1986-88. Two births rate measures were calculated, one based on the number of new autonomous firms per 100 establishments (autonomous and branch) existing at the start of the period in the same industries. The average for all industries was 6.9 per 100 year and for manufacturing it was 5.95 per 100 per year. Birth rates per human population was based on counts of jobs in the same industries, job counts generally are about 10 per cent higher than counts of employed persons. The average for all industries was 31.36 new firms per 10,000 jobs per year and for manufacturing it was 16.76 per 10,000 manufacturing jobs per year. A logarithmic transform was used to create a symmetrical (normal) distribution for the regression analysis related to annual firm births per 10,000 jobs.

To provide a comparison with the other countries included in this cross-national comparison, thirteen independent variables, measured before the 1986-88 period, were included in both analyses. Regression analysis was used to estimate the fit of linear models with two procedures, one (forced entry) utilised all thirteen independent variables and the second (stepwise) selected only those independent variables with an independent and statistically significant contribution to the fit of the model. The results are presented in the table on the next page and indicate considerable consistency across the two measures of firm births.

Five variables were included in the models related to firm births in all economic sectors. Measures of demand and wealth -- population growth, dwelling values, and per capita income change -- are all related to higher firm birth rates. Greater unemployment and lower per capita government expenditures also tends to increase firm births. Three measures are consistently included when firm births are measured in terms of the existing stock of firms: percentage of white collar employees, industry specialisation, and an absence of adults with
college education. One variable, the proportion of small establishments, has a major impact when the firm births are measured in terms of jobs. Three variables have no impact in either analysis: population density, change in unemployment, or per cent owner/occupied dwellings. The predictive power of these models is acceptable, ranging from 53-58 per cent of the variance explained.

The pattern is somewhat different for predictions related to manufacturing. Six variables are included in all analyses as statistically significant with the same sign. Higher manufacturing firm births are associated with lower population density, population growth, a higher proportion of small establishments, reduction in unemployment, greater proportion of a white collar work force, and greater median dwelling value. Models predicting firm births per 100 establishments include three additional variables: industry job specialisation, unemployment rate, and lower local government expenditures per capita. Models predicting births per 10 000 jobs include three different variables associated with higher firm births: reduction in per capita income; absence of population 25-44 years old; and, for the stepwise only, and absence of college educated adults. No analysis incorporated the per cent owner occupied dwellings as significant. The models developed to predict manufacturing births based on the stock of business are able to account for 48 per cent of the variance; those for firm births per 10 000 jobs 65 per cent of the variance.

The models for all industries and manufacturing are clearly different, reflecting different "birth processes". Most striking is the difference that appears when different measures of firm births are used. For example, measures of industry specialisation tend to be incorporated only in models predicting firm births per 100 existing firms. The difference between the linear models probably reflects the impact of different processes on the firm birth process.

But several factors tend to reduce the capacity for straightforward analysis of these patterns. First, the United States has much greater diversity among regions than other countries included in the analysis, particularly in terms of the economic structure of various regions. Second, the single item measures are subject to errors of measurement, which can be compensated for by creating multi-item measures to indicate each separate process. Third, a more complete set of items can be constructed to represent a wider diversity of startup processes. Greater consistency in analysis of the U.S. patterns is reported in Annex B.2.
Data was available for each prefecture in Japan on to allow the calculation of manufacturing establishment birth rates per 10,000 manufacturing employees for four time periods: 1976-79; 1980-82; 1983-84; and 1985-88. A wide range of independent variables, 24, were assembled to reflect different processes that may affect manufacturing establishment births.

A critical substantive issue is the extent to which the patterns vary over time, that is, will the predictive equations be affected by -- for example -- different stages in the business cycle. Procedures are available to determine if there is a statistically significant difference in the models for different time periods. When applied to the data on Japan for these four time periods, largely one of sustained national growth, it was found that there was no statistically significant differences. This suggests that the underlying phenomena was stable over time, at least for these 10 years in Japan.

In addition, it justified combining the four different data sets -- each containing independent variables representing prefectures prior to the periods for which manufacturing birth rates were available -- into one data set. With a much larger number of observations, 1879 rather than 47, more precise analysis of the relative impact of different factors on firm births was possible.

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9. Data was missing for once prefecture for one time period.
The resulting linear model is quite successful, in a technical sense, for 89 per cent of the variation in the manufacturing birth rate is explained (predicted) by the independent variables. Only nine of twenty-four independent variables have a statistically significant impact in the analysis. Birth rates appear to be enhanced by greater occupational diversity, a higher proportion of manufacturing jobs, adult population with junior high (but not college) educations, and higher per capita government expenditures on education. These birth rates are also somewhat higher in regions with more rain and less humidity. Manufacturing birth rates are lower in prefectures closer to the major urban areas (Tokyo, Osaka, or Nagoya); closer to major seaports; or where there are higher government expenditures per capita for activities other than education, police, or fire protection.

The most appropriate interpretation of this pattern is related to the nature of the measure of manufacturing firm births. Based on population and the registry of firms assembled by the government, it would include a large number of small scale handicraft and artisan production as well as the more complex and modern facilities, such as a new automobile assembly plant. The counts are probably dominated by the smaller scale operations. These are, in turn, found outside the urban areas where governments have few expenditures not related to education, police and fire services; it is some distance from major urban areas or seaports, manufacturing is prevalent among the population, the population is unlikely to have college degrees, and being away from the coasts, humidity tends to be low.

If firm birth counts are dominated by small scale production, more sophisticated analyses must await more details on the new manufacturing firms.

10. Variables not statistically significant in the combined model included: population growth in previous 15 years; manufacturing establishments per square mile; distance from Tokyo as seaport; index of industry diversity; percentage of 15-69 year olds seeking work; personal income per capita; average annual wages in manufacturing; variation in temperature over the past 30 years; annual hours of sunshine over the past 30 years; percentage of land in hill and mountain configuration; per capita expenditures on police and fire services; per capita local taxes; percentage of population aged 25-39 years old; percentage of managers and professionals in labour force; and percentage of the population over 15 with college degrees.
A wide range of data is available on the 3,124 counties in the U.S. on a regular basis (every one, two, or five years). This provided an opportunity to explore the nature of the linear models that would be developed over a twelve-year period (1976-1988) and for a wide range of time lags (0-16 years).

This United States analysis had several major elements. First, labour market or travel-to-work areas, created on the basis of 1980 population census reports on commuting to work patterns, were the units of analysis. One-third of the 382 labour market areas include counties from two or more states.

Second, in order to minimise variation related to unreliable measurement, multi-item indicators were developed to represent fifteen processes expected to have an impact on firm births for 1970, 1978, 1980, 1982, and 1984. The measures and the fifteen processes are summarised in Table B.2.1a-b, following. For each the estimated reliability (Chronbach's alpha) is provided. Higher reliabilities indicate a reduction in errors related to the measurement procedure; reliabilities vary from about 0.6 to "perfect" (0.99).

Third, births were calculated on the basis of new entries into a commercial credit rating record (Dun and Bradstreet files). Firm births are indicated by the annual birth rates of autonomous firms (all economic sectors except agricultural production) per 10,000 population.

The general strategy was to create linear models for different time lags. For example, it was possible to set up four models, each for different time periods, predicting variation in autonomous firm birth rates with no time lag. Once the best possible models developed, a second analysis was employed to determine if the models varied for different time periods or were basically similar and could be combined. In all cases, it was found the models could be combined for each time lag: 0, 2, 4 or 6 years.

The final results, for predictions of autonomous firm birth rates, is presented in Table B.2.2. The entries in the table represent coefficients that were statistically significant in the linear models. The fifteen specific processes have been grouped into seven general categories. The amount of variance in birth rates explained by the models is at a satisfactory level, from 57 per cent to 70 per cent. Table B.2.2 presents the results of twenty different efforts to fit linear models, all giving the same results. With one

small exception, the signs associated with the coefficients are the same and the magnitude of the coefficients are similar. Predictive success and variables included in the models are unrelated to the time lag, indicating substantial stability over time in the underlying processes.

Four processes seem to dominate in predictions of firm births. First, measures associated with population growth and turbulence in the region, including measures of the presence of educated mid-career adults, poised to pursue entrepreneurial options. Second, indications of economic diversity -- heterogeneity in industry and occupational structures as well as a higher proportion of small firms. Third, indicators of greater personal wealth, as indicated by measures of individual and household income. Finally, and perhaps unique to the United States, are measures related to capacity to have flexibility in the employment relations (e.g. an absence of unionisation in the workforce).

A number of processes consistently fail to appear in any of the models, including measures related to agglomeration, social diversity, costs of conducting business, and unemployment.
12. The analysis reported is based on data provided by the U.S. Small Business Administration to Regional Economic Development Associates, Incorporated (Edina, Minnesota) in fulfillment of Contract SBA 3067-OA-88 and financial support provided through the University of Minnesota by the Rural Poverty and Resources Program of the Ford Foundation (Grant No. 900-013) and administered by the Aspen Institute. None of the sponsors are responsible for the analysis or the interpretations.

13. Estimate of Chronbach’s alpha without the item from SPSS-PC V3.1 "Reliability" procedure. Provides an estimate of the contribution of the item to overall scale reliability. A negative value indicates serious departures from linearity in the inter-item relationships. Can only be computed if at least three items are candidates for an index.

14. Chronbach’s alpha as estimated by SPSS-PC V3.1. Estimate of the extent to which errors of measurement are reduced by an index that gives equal weight to all constituent items.

15. Transfer payments are mostly welfare and retirement benefits payments.
Notes: (1) Diversity index computed using the M5 formula discussed in Gibbs, Jack P. and Dudley L. Poston (1975), "Division of Labor: Conceptualization and Related Measures" Social Forces 53(3):468-476. (2) Because of lack of data, same values used for several years.

16. In about two fifths of the states of the United States, workers have a right to a job in an establishment with a collective bargaining agreement without being a dues-paying member of the union. Such states are referred to as "right-to-work" states.
### Table B.2.2 -- **Coefficients of Linear Models Predicting Firm Birth Rates:**
**Short and Medium Term**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Description</th>
<th>Value</th>
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Country Study Teams and Sources of Research Support

Co-ordination:

David Storey and Paul Westhead of the SME Centre, Warwick University, are financed by the European Commission Directorate-General for Enterprise Policy (DG23) to co-ordinate the studies of European countries by the teams listed below.

France

Germany
Analysis completed by Michael Fritsch, Department of Economics, Bergakademie Freiberg and David Audretsch, Wissenschaftszentrum Berlin fur Sozialforschung, with financial support from the European Commission Directorate-General for Enterprise Policy.

Ireland
Analysis completed by Mark Hart and Graham Gudgin at the Northern Ireland Economic Research Centre, Belfast, United Kingdom. Data on firm births and deaths provided by the Industrial Development Authority (IDA), Dublin. Limited VAT registration data provided by the Office of the Chief Inspector of Taxes, Dublin. Financial support provided by the European Commission Directorate-General for Enterprise Policy.

Italy
Analysis completed by Gioacchino Garofoli, University of Pavia, Italy. Financial support provided by European Commission Directorate-General for Enterprise Policy.

Japan
Analysis completed by Paul Reynolds and David J. La Plant at the Center for the Study of Entrepreneurship, Marquette University, Milwaukee, Wisconsin, USA. Data on firm births provided by Professor Yoshio Sato, Keio University, Tokyo, Japan.
Sweden  Analysis completed by Per Davidsson and Leif Lindmark, Umeå Business School, University of Umeå and Christer Olofsson, Institute of Management of Innovation and Technology, Linkoping University. The research is financed by the National Swedish Board for Industrial and Technical Development and the Department of Industry and Trade in Sweden. Specialised data sets were prepared for this study by Statistics Sweden. Mr. Gunnar Petersson provided valuable support in the presentation of the data for analysis.

United Kingdom  Analysis completed by David Keeble and Shelia Walker of the Department of Geography and Small Business Research Centre, University of Cambridge, United Kingdom, with sponsorship from the UK Employment Department and the European Commission Directorate-General for Enterprise Policy. The research used VAT business registration statistics now available from the UK Department of Trade and Industry. Parallel times series analyses completed by Martin Robson of the Department of Economics, University of Newcastle-upon-Tyne, Newcastle-upon-Tyne, United Kingdom.

United States  Analysis completed by Paul Reynolds, Wilbur Maki and Brenda Miller at the University of Minnesota, Minneapolis, Minnesota, USA under Grant No. 900-013 from the Rural Poverty and Resource Program, Ford Foundation, New York City. Data on business births and deaths provided from a custom data set prepared from the Small Business Data Base of the U.S. Small Business Administration for a project supervised by Paul Reynolds and Wilbur Maki (Contract 3067-OA-88).