

ABSTRACT. The paper presents an overview of small-business economics. Small businesses are shown to comprise a substantial and expanding segment of the U.S. economy. The role of small businesses in the economy is considered from the standpoint of various economic theories of the size distribution of firms. Firm-size related empirical regularities are reviewed and their implications for economic theory is discussed. Several small-business policy issues are discussed, including the role of small businesses in labor, macroeconomic, and regulatory policies, along with a review of research on small-business economics that might help guide these policies.

I. Introduction

Most firms are small compared with the companies that economists usually study. About 13 million of the 17 million corporations, partnerships, and sole proprietorships that filed federal tax returns in 1986 had no employees other than their owner. All but approximately 10 000 of the 4 million businesses with employees had fewer than 500 employees.¹ Businesses that were not among the 10 000 largest businesses employ about half the workforce and produced about a third of the Gross National Product in 1978.² A great deal of economic activity therefore takes place among firms about which economists know remarkably little.

These small firms are playing an increasingly important role in the economy. In the United States, the number of new business incorporations

increased by 87 percent from 376 thousand in 1976 to 703 thousand in 1986 while real Gross National Product increased by only 39 percent.³ Between 1975 and 1985 the percent of full-time nonagricultural workers who were self-employed increased from 10.7 percent to 12.0 percent for men and from 3.2 percent to 4.7 percent for women.⁴ The share of employment in firms with fewer than 500 employees increased from 51.0 percent in 1976 to 52.9 percent in 1984.⁵ The growth of the small-business sector has profound implications for macroeconomic and employment policies. Yet the causes of the surge in small businesses and the effect of this surge on the economy are not well understood.

Small-business economics seeks to better understand why firms come in different sizes, how and why firm behavior varies with size, what determines the formation, growth, and dissolution of small firms, the role of small firms in the introduction of new products and the evolution of industries, and the dynamic relationships among small firms and macroeconomic variables such as output and employment.

None of these questions is new. Many of these questions have been at least touched upon by previous economic studies. Alfred Marshall's (1890) analysis of the advantages and disadvantages of small businesses, Frank Knight's (1921) discussion of the characteristics of the entrepreneur, and Joseph Schumpeter's (1934) examination of the role of the entrepreneur in economic change are classics, while important theoretical contributions have been made in the last decade by Robert Lucas (1978), Richard Kihlstrom and Jean-Jacques Laffont (1979), and Boyan Jovanovic (1982). There are scores of empirical examinations of differential relationships across firm sizes for wages, growth, profitability, and stock-market returns. It is therefore legitimate to ask why a new specialty is required to treat these sorts of questions.

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Small-business economics is needed for at least two reasons. Economists have concentrated overwhelmingly on large businesses. The leading textbooks in economics have little or no discussion of small businesses or entrepreneurs. Most empirical research on firms examines large publicly traded companies usually in the manufacturing sector. Although small-business questions could be treated within the confines of existing areas, they have not been nor are they likely to be. Existing work on small businesses is scattered and unfocused. The first *raison d'être* for small-business economics is that there is an unfilled niche for studies of this sector of our economy.

Small firms have special characteristics that are relevant to many important economic questions. Each economic field tends to be aware only of those characteristics that concern its parochial interests. Financial economists know that the efficient markets model breaks down for small firms, labor economists know that smaller firms pay lower wages for apparently comparable workers, and industrial organization economists know that small firms are more likely to fail and have faster and more variable growth than large firms. But there has been little recognition that these regularities may be connected. The second *raison d'être* for small-business economics is that this speciality can help collect, synthesize, and explore these size-related regularities.

We provide an overview of small-business economics in this paper. We present a statistical portrait of small businesses in the United States in the next section. We concentrate on the U.S. because we are most familiar with our own country and data are more readily available on small businesses in the U.S. An important area of future research is to compare and contrast the small-business sectors in industrialized, lesser-developed, and socialistic countries. In the third section we review various economic theories that help explain the static and dynamic role of small businesses in the economy. These theories will provide a useful starting point for small-business studies. The fourth section reviews some of the key empirical characteristics of small firms and discusses their implications for economic theory. We highlight several policy issues raised by recent work on small-business economics in the fifth section. Brief conclusions are presented in the last section.

II. Small business in America

Supreme Court Justice Stewart could have been talking about small businesses instead of pornography when he said, "I [can't] define [it]. But I know it when I see it." For most questions we shall want to address there is no need to adopt any particular definition of small businesses. Mainly we shall be concerned with how certain economic phenomena vary with firm size or with other factors that are associated with firm size. We shall often find ourselves talking about smaller versus larger businesses. The question we are examining will determine whether the universe for this comparison is an industry, the economy, or some other grouping. If, for example, we are examining market structure, the relevant comparison is probably between smaller and larger firms in the same industry or market. If, to take another example, we are examining wage structures and if these structures are determined by organizational technologies that are more or less the same for all industries, the relevant comparison would probably be between smaller and larger businesses in the economy.

A snapshot of the small-business sector

That said, it is useful to adopt some purely arbitrary breakdowns for assessing the importance of smaller firms in the economy. In 1983, 89 percent of the 10.7 million sole proprietorships, 74 percent of the 1.5 million partnerships, and 39 percent of the 3.0 million corporations had receipts of less than \$100 000.⁶ But together these small firms accounted for less than 3 percent of all business receipts reported to the Internal Revenue Service. Thus, while these "microenterprises" are numerous they account for a small fraction of business sales. Even the 99.7 percent of businesses with sales of under \$1 million accounted for only 13.8 percent of business sales.

Other definitions of small businesses reveal a more prominent role in aggregate economic activity. In 1977 firms with fewer than 500 employees produced 46.5 percent of business output and firms with fewer than 100 employees produced 34.1 percent of business output.⁷ In 1984 firms with fewer than 500 employees accounted for 52.9 percent of all jobs and firms with fewer than 100 employees accounted for 38.9 percent of all

jobs.⁸ Self-employed workers, who operate most of what would be considered microenterprises, account for a substantial fraction of employment although they account for a miniscule portion of business sales. Haber *et al.*, for example, estimate that 26.4 percent of the of all nonagricultural workers were employed by firms operated by self-employed individuals. This figure includes the owner, unpaid family workers, and paid workers.⁹

These employment figures overstate the importance of small firms for several reasons. First, small firms employ more part-time workers than large firms so that the share of total hours for small firms is probably less than the share of total jobs. Second, small firms pay lower wages than large firms. In 1984 establishments with less than 100 employees accounted for 56 percent of all employment but only 49 percent of all wages.¹⁰ The disparity is probably even greater than these figures suggest since smaller firms typically provide lower fringe benefits than larger firms.¹¹ Third, smaller firms are more labor-intensive than larger firms and therefore control a smaller share of capital than of employment.¹²

Nevertheless, small firms clearly do play a substantial role in the economy. Running a small business is a major occupation to which labor economists have paid little attention. They employ a sizeable fraction of the labor force if we take small firms to be those with fewer than 500 employees. A randomly selected worker is just as likely to be employed by a small firm (fewer than 500 employees) as a big firm (500 or more employees). Finally, almost half of business output, as measured by Gross Product Originating, is produced by firms with fewer than 500 employees.¹³

Changes in the small-business sector over time

Until the last decade the relative importance of small businesses in the economy was on a long secular decline that dates back to the onset of the industrial revolution. Average firm size, as measured by real gross national product per firm, increased from \$150 000 in 1947 to \$245 000 in 1980.¹⁴ The fraction of the nonagricultural labor force that is self-employed decreased from at least the late 19th century to the early 1970s.¹⁵ The fraction of the nonagricultural workforce that is self-employed decreased from about a fifth of the

workforce at the end of World War II to only 6.9 percent in 1970.¹⁶ Between 1958 and 1977 the small-business share of value added declined by 4 percent and the small-business share of employment declined by 6 percent.¹⁷

This downward trend was reversed according to several measures by the late 1970s. Average Gross National Product per firm decreased from \$245 000 in 1980 to \$210 000 in 1987.¹⁸ The percent of the full-time labor force that is self-employed increased from 6.9 percent in 1975 to 7.4 percent in 1986.¹⁹ The share of employment in small firms has risen from 51.0 percent in 1976 to 52.9 percent in 1984.²⁰

The causes of this upswing are an active area of research in small-business economics. Several possibilities are under investigation. First, we appear to be in the midst of a period of "creative destruction", Schumpeter's (1950) description of the process by which entrepreneurs develop new products and processes that displace the traditions of the past. Infant industries are often dominated by smaller firms. Second, recent technological changes, such as those that have decreased computer costs, may have reduced optimal firm size and the minimum scale of entry. Third, the increasing integration of the world economy and the emergence of strong manufacturing sectors in many previously lesser developed countries has increased competitive risks for U.S. manufacturers. Greater variability of sales due to foreign competition and unstable exchange rates may have increased the returns to "flexibility", a key advantage of smaller firms according to a number of authors.²¹ Fourth, increased labor-force participation of women and the entry of baby-boomers into the labor market may have increased the supply of exactly those kinds of workers small businesses use most intensively. This increase in supply, together with falling real wage rates during the 1970s and early 1980s, may have given labor-intensive smaller businesses a competitive edge over capital-intensive larger businesses. Fifth, changes in consumer tastes (possibly due to the indulged baby-boomers) may have increased the demand for specialty products at the expense of the mass-produced merchandise made by larger firms. While boutiques are clearly important in retail trade, they may be an increasingly important factor in manufacturing. The growth of specialty kitchen companies like Sub-Zero and Gaggenau is

one of many possible examples of such manufacturer boutiques. Sixth, the relaxation of entry regulations in some industries, such as telephone manufacturing, has increased the opportunities for small businesses.²²

The relative importance of these (and perhaps other) factors is essential for understanding the future role of small businesses in the economy. If the formation and growth of small businesses is due to the development of new products or technologies, then history teaches us that, over time, only a handful of the firms in these new industries will survive.²³ Small businesses are merely transitory and will largely disappear in the long run. There used to be hundreds of small steel, automobile, chemical, and telephone companies when those technologies and products were still young. To the extent that the growth of small businesses is due to a permanent shift in tastes towards specialty items, small businesses will be more durable. If the formation of small businesses has been due to decreases in wage rates, the aging of the baby-boom generation and decreases in fertility may raise wages and decrease the competitive advantage of small firms. Already, tight labor markets for young workers in many areas are forcing small-business closures and reducing opportunities for growth. Finally, if technological change has reduced optimal firm size, small businesses may be here to stay.²⁴ Obviously, government policies towards small businesses depend intimately on which of these stories applies to particular industries.

III. The role of small businesses in market economies

If an unlimited number of firms had access to the same technology for producing a good and if this technology exhibited decreasing returns to scale beyond some point, it is well known that all firms would be the same size, the universal firm size would be determined by the minimum point on the long-run average cost schedule, the number of firms would be determined by the number required to equate industry supply and demand, and changes in demand or factor prices will lead to entry (e.g. demand increases or factor prices decreases) or exit (e.g. demand decreases or factor prices increase) but never both. This textbook model of industry is at odds with the facts for most industries. Firms come in many different sizes.

Many firms earn more than a competitive rate of return so that average cost is not at a minimum. At any point in time some firms are entering while others are exiting. A great deal of effort has gone into trying to reconcile the neoclassical theory of the firm with these realities.

Economists have told several stories about why small businesses coexist with large ones. The first story is that firms have differing access to some scarce factor of production. This factor could be entrepreneurial ability (e.g. Henry Ford), know-how (e.g. methods for producing corn flakes), or a physical resource (e.g. mineral water). Firms with bigger endowments of this scarce factor can produce any given level of output at a lower cost. But, because it is not possible to increase these endowments, diminishing returns eventually set in for all firms. Assuming even the best-endowed firm is small relative to the market, the industry will be competitive and there will be a size distribution of firms that corresponds to the distribution of the scarce resource.

The most sophisticated version of this story, which dates back at least to Jacob Viner (1932), is that presented by Lucas' (1978) important piece on the size-distribution of firms. There is a distribution of managerial ability θ in the population of potential workers and managers. Firm costs are given by $c(q)/\theta$ where $c(q)$ exhibits decreasing returns to scale. Better managers (higher θ 's) have lower costs and produce more output in equilibrium. Small businesses coexist with large businesses in this model because at the margin small and large firms are equally efficient even though a large firm can produce any given level of output more efficiently than a small firm can.

The second story is that there is a technological tradeoff between efficiency — the costs of producing a given level of output — and flexibility — the costs of adjusting output — that gives rise to a size distribution of firms. Larger capital-intensive firms can produce a given level of output at a lower marginal cost than smaller labor-intensive firms can. But smaller labor-intensive firms can adjust their current level of output more easily than larger capital-intensive firms. If demand fluctuates over time there is a tradeoff between efficiency and flexibility. Smaller firms incur higher marginal production costs at a point in time than larger firms but incur lower marginal adjustment costs over time as demand fluctuates. These arguments are due to David Mills (1984) and are elaborated

upon in several papers which provide some empirical support for the theory.²⁵

The third story is that the size distribution of firms at a point in time is determined primarily by how lucky firms have been over time. Due largely to Herbert Simon, this story rests on the following assumptions. Once firms have reached some technologically determined minimum efficient firm size they have constant returns to scale. All firms that are larger than the minimum efficient size are therefore equally efficient. Firm sales at a point in time are proportionate to past sales plus a multiplicative random disturbance. Over time firms that have received a lot of lucky draws get big and the size distribution of firms becomes skewed with many small firms getting a small portion of sales and a few large firms getting a large portion of sales. It is difficult to displace firms which have built up a big lead over their competitors. For example, in simulations of this sort of model Scherer (1980) found the four-firm concentration ratio increased from an average of 8 percent at the start of an industry to almost 60 percent in what could be considered the long run.

The fourth story is based on Lucas' (1967) seminal analysis of capital-adjustment. He attempted to reconcile several empirical findings. The first was that many real-world production functions seemed to exhibit constant returns to scale. The second was firms even in the same industry come in many different sizes. The third was that firm growth is roughly independent of firm size. He showed that if it is costly to adjust firm size (i.e. if there are capital-adjustment costs) firms will stagger their expansion over time. Larger firms, in effect, have had more time to adjust themselves to previous expansions in demand or reductions in cost. Except for these differences in adjustment, smaller and larger firms are the same.

Several authors have examined the implication of selection — e.g. survival of the fittest — and learning — e.g. entrepreneurs can learn how good from their profit history — on the dynamics of firm growth and industry evolution.²⁶ The models developed by these authors are especially useful for understanding firm dynamics in new industries.

Jovanovic (1982) assumes that individuals are unsure about their abilities to manage a business but that they can learn about their abilities by observing how well they perform in the rough and tumble of the business world. But, because

production is inherently risky it takes time to disentangle one's true ability from chance upswings or downswings in one's business. Individuals alter their behavior over time as they become better informed about their true abilities. People who find out they are better than they initially thought expand while those who find out they are poorer than they initially thought contract and possibly return to an alternative occupation. In this model small businesses coexist with big businesses for two reasons. First, better managers can run larger firms more efficiently than poorer managers. Poorer managers specialize in smaller firms and better managers specialize in larger firms. Second, firms start out small but grow over time as their owners learn whether they are good businessmen. Younger firms will tend to be smaller firms.²⁷

Ericson and Pakes (1988) call Jovanovic's model the passive learning model because managers do nothing to learn but observe their profits. They develop an alternative model (the active learning model) in which firms can invest in research with risky outcomes. Firms which are successful at this discovery process grow. Small firms have just started this discovery process or have not been very successful at it.²⁸

There is certainly an element of truth to each of these stories. Our task for the future is to develop richer theories which can distinguish empirically between the relative importance of these stories in explaining the static and dynamic roles of small businesses in the economy. Consider, for example, the flexibility, capital-adjustment, and learning models. At a point in time small firms might have adopted more flexible — i.e. less capital-intensive — technologies either because they have had less time to adjust their capital stock to demand shifts or because they are less sure of their abilities and therefore incur fewer sunk capital costs to minimize their risk or because fluctuations in demand over time make flexibility desirable. Determining the extent to which firm heterogeneity at a point in time is due to each of these alternative sources will be a challenging task.

IV. Small-business regularities and their implications for economic theory

One of the ways that economic science, like all sciences, progresses is by developing theories that can explain the various empirical regularities we see around us. Our understanding of the world

progresses by extending or modifying our theories in response to anomalies, that is to those empirical regularities that do not seem to be consistent with our existing theories, and to regularities that are neither consistent nor inconsistent with our theories. Business size is important to economists in good measure because of the many size-related regularities, often anomalous, that have been uncovered. This section reviews these regularities and discusses some of their implications for economic theory.

Firm growth and failure

Recent work by Evans (1987a, 1987b) and Dunne, Roberts, and Samuelson (1987) using large samples of manufacturing firms have found the following relationships between firm growth, firm size, and firm age.²⁹ (1) Firm growth decreases with firm size for firms of the same age and decreases with firm age for firms of the same size. (2) The variability of firm growth decreases with firm age for firms of the same size and, to a weaker extent, with firm size for firms of the same age. (3) The probability that a firm will fail over a given period of time decreases with firm size for firms of the same age and decreases with firm age for firms of the same size. The theory that comes closest to capturing these regularities is due to Jovanovic. Under the particular parametric cases he considers for the technology and the learning process, his theory is consistent with firm growth decreasing with firm age, with the variability of firm growth decreasing with age, and with the probability of firm failure decreasing with size.

Pakes and Ericson (1988) argue, however, that these implications are not robust to more general specifications of the technology and the learning process. Under fairly general assumptions, they show that Jovanovic's model (which they term the passive learning model) implies that (a) the size distribution of firms is stochastically increasing over time (i.e. roughly speaking the average size of survivors increases over time) and (b) past values of firm size have a longlasting effect on future firm size (i.e. there is a high degree of autocorrelation between current and lagged values of firm size). They find that (a) holds for both manufacturing and retail trade but that (b) holds for retail trade but not for manufacturing. They go on to show that their own model (which they term the active

learning model) implies (a) and (c) past values of firm size have no longlasting effect on future firm size. Their model is consistent with manufacturing but not retail trade.

Future work in this area will be needed to develop theories that can explain the age-size-growth regularities discussed above and the resulting evolution of the size distribution of firms. The results discussed above suggest that learning considerations will prove important. Individuals must learn about their general abilities as entrepreneurs, learn how to operate particular technologies, learn about location or other aspects of market demand, and learn about new technologies or ways of doing things. Our guess is that the relative importance of these various kinds of learning will vary over the lifecycle of the firm and across different industries. Integrating these kinds of learning considerations with capital adjustment considerations will prove valuable.

Wages and job stability

The second set of regularities concern wages, turnover, and other job characteristics across firm size. (1) Smaller firms and establishments pay less than larger firms and establishments even after controlling for observable worker-characteristics such as education and experience and whether the firm or establishment is unionized and the industry in which the individual works.³⁰ There is mixed evidence on whether the pay differences are due to unobservable worker characteristics. Using a fixed-effects estimator that ostensibly controls for unobservable worker characteristics, Brown and Medoff (1985) find that most of the differential remains while Evans and Leighton (1988) find that virtually all of the differential disappears for firms with more than 25 employees. (2) Small-firm jobs are less stable. Workers in these jobs have shorter tenures, are more likely to quit or to be fired, and are more likely to experience a future spell of unemployment.³¹ (3) Small-firm jobs are more likely to be part time and small firms employ a disproportionate number of women, blacks, and teenagers.

The wage-size relationship is especially important because it is inconsistent with the theory of compensating differentials which has been centerpiece of labor economists since Adam Smith. Brown and Medoff (1985) argue that larger firms

and establishments do not appear to get better workers than smaller firms and establishments. Workers at larger firms and establishments appear to get rents (even without the benefit of a union) which are difficult to reconcile with competitive theory.

The finding that wages are apparently not being set equal to marginal value products is broadly consistent with efficiency-wage theory which is the leading alternative to the competitive-wage theory.³¹ Efficiency wage theory argues that firms choose the wage to minimize the per-unit cost of labor. Firms may find it profitable to pay supracompetitive wages if, faced with imperfect information about worker quality, higher wages lead to higher quality *on average*. For example, suppose that larger firms have more trouble monitoring workers than do smaller firms. By paying workers more than their reservation wage large firms reduce shirking in the face of imperfect monitoring.³²

As Brown and Medoff (1985) point out, however, none of the existing theories of labor-market behavior is entirely consistent with the known regularities. For example, it is unclear why larger firms would use supracompetitive wages to deter shirking rather than steep wage-tenure profiles, stock options, or bonuses. Moreover, the efficiency-wage theories do not have very sharp predictions about the precise structure of the wage-size relationship other than that there might be one. Evans and Leighton (1988) have found that the cross-sectional wage-size relationship is due to very small firms (fewer than 25 employees) paying low wages and very large firms (1000 or more employees) paying high wages. Wages are independent of firm and plant size for firms with 25–999 employees. This sort of finding places important restrictions on the effect of size on personnel technologies for hiring and monitoring workers. Further work is also needed to determine the importance of unobserved worker quality. The findings of Evans and Leighton (1988) suggest that compensating differentials for unobserved worker quality might be almost the whole explanation for the regularities cited above.

Innovation

Schumpeter's conjecture that larger firms are

more innovative than smaller firms has stimulated many empirical studies of the relationship between firm size and innovation.³³ While these studies face enormous measurement problems because of the difficulty of quantifying innovation, they tend to show that smaller firms are at least as innovative as smaller firms. Scherer (1982) concludes from a review of the qualitative and quantitative evidence that

A little bit of bigness — up to sales levels of \$250 to \$400 million at 1978 price levels — is good for invention and innovation. But beyond the threshold further bigness adds little or nothing, and it carries the danger of diminishing the effectiveness of inventive and innovative performance.

Data collected by the U.S. Small Business Administration suggests an even stronger connection between innovation and firm size. The SBA identified innovations from a variety of publications for 1982.³⁵ They found that firms with fewer than 500 employees generated 36.2 innovations per million employees while firms with 500 or more employees generated 31.0 innovations per million employees. The difference is particularly striking for manufacturing in which firms with fewer than 500 employees generated 32.2 innovations per million employees while firms with 500 or more employees generated 25.5 innovations per employee. A recent analysis of the manufacturing data by Acs and Audretsch (1987) found that the difference between the small-firm and large-firm innovation rates systematically differs across industries. The small-firm innovation rate is relatively higher in industries which have a high proportion of skilled labor, high proportion of large firms, high overall innovation rates, low capital intensity, low concentration, low unionization rates, and more standardized products.

Financial characteristics

Our final set of regularities concern evidence, on the one hand, that smaller firms have more difficulty obtaining capital and evidence, on the other hand, that smaller firms have abnormally high stock market returns. Several recent papers have found that liquidity constraints bear more heavily on smaller firms, that is smaller firms are more likely to be unable to obtain capital at market interest rates and therefore to be subject to

credit rationing. Evans and Jovanovic (1988) find that most individuals who switch from wage work to self-employment face binding liquidity constraints that forces them to use an inefficiently small amount of capital and some individuals are deterred altogether from starting businesses because of binding liquidity constraints. Fazzari, Hubbard, and Petersen (1987) find that the smaller publicly traded firms face liquidity constraints and that smaller firms have more difficulty obtaining capital during downturns. According to Fazzari *et al.*, smaller firms are more dependent on internal finance or bank loans than are larger firms. The largest firms account for 74 percent of total manufacturing assets over the period of their study but issued 99 percent of all new shares and 92 percent of all new corporate bonds. Changes in liquidity supply therefore bear more heavily on smaller firms who rely more heavily on bank loans. Fazzari *et al.* document that the credit sources for smaller firms dry up more rapidly during downturns than the credit sources for larger firms.

Recent research in finance has tried to explain several anomalies that are directly or indirectly associated with small firms.³⁶ First, there are deterministic seasonalities in stock market returns. The most famous of these is the January effect. Small firms display excess returns in January. Second, stock returns are negatively correlated at a frequency of 3–5 years. This effect, known as mean reversion, is strongest for small firms and coincides roughly with the business cycle. Third, the random-walk model of efficient securities markets is rejected most strongly for small firms using a variety of tests.

We conjecture that the anomalies found in the finance literature can be explained in good part by the fact that liquidity constraints bear more heavily on smaller firms together with the fact that the availability of liquidity to firms varies seasonally and over the business cycle. The January effect can be explained by the fact that smaller firms have especially high liquidity in January after the Christmas sales season. Mean reversion can be explained by the fact that liquidity dries up faster for smaller than for larger firms when the economy goes into a recession. Notably, the 3–5 year frequency of recessions corresponds roughly to

the autocorrelation pattern found in the mean-reversion literature. See Brock (1988) for further details.

Explaining the small-firm effects we have examined in this section will help economists not only better understand the role of small businesses in the economy, but also obtain a richer understanding of the operation of markets. These empirical aspects of small firms also have interesting implications for government policies towards small business, a topic to which we now turn.

V. Policy applications of small-business economics

The expanding role of small businesses in the economy has confronted policy makers with a number of important issues and economists with a plethora of fascinating research questions. We highlight some of the key policy questions that are or should be under investigation by economists. We begin by discussing the role of small firms in the labor market. David Birch's pioneering work on this topic, of course, stimulated much of the early work on small-business economics. We then turn to the relationships among small firms and macro-economic policies. We conclude by reviewing some of our own research on the differential effect of government policies on small firms.

Small firms and the job market

Birch's (1979) claim that small businesses create a disproportionate share of new jobs piqued the interest of policymakers who, in the high unemployment days of the early 1980s, were interested in new methods for reducing unemployment. While we have not conducted a systematic survey, our casual impression from newspaper accounts in the last decade is that a number of states have adopted programs for small business — loan funds, technology parks, incubator programs, and tax-incentives — at least in part because of their belief that small-business formation would promote jobs and economic prosperity. Policymakers have also expressed interest in programs that stimulate small-business formation by unemployed or otherwise disadvantaged workers. Several Western European countries have adopted

programs to stimulate small-firm formation by unemployed workers.³⁷ These programs, which provide financial and other assistance to unemployed workers who start firms, were a response to chronically high rates of unemployment on the one hand and low rates of business formation on the other hand compared with the United States. In this country several experimental programs have tried to encourage business formation by disadvantaged workers — e.g. low-income, unskilled workers, many of them on welfare.³⁸ The U.S. Department of Labor is implementing experimental programs in several states to provide financial and managerial assistance to unemployed workers who start small firms.³⁹

It is perhaps a good measure of the need for a new specialty in small-business economics that the development and implementation of small-business policies has quickly outpaced economic research that might help guide these policies. To illustrate this point it is helpful to consider some of the unresolved issues raised by the job generation literature. The finding that small businesses create a disproportionate share of new jobs, while interesting, begs a number of questions which need to be addressed before we can understand the precise importance of small firms in the labor market. We review some of the research on these questions below.

There are important differences in job characteristics across firm sizes as we have already seen. Smaller-firm jobs pay lower wages, offer fewer job benefits, and are more likely to be temporary or part time. Therefore smaller firms may not have generated a disproportionately large share of new hours worked or new compensation (wages plus fringe benefits) even if they have generated a disproportionately large share of jobs. Unfortunately, this question is not easy to address because the datasets — e.g. Dun and Bradstreet — used to estimate job creation have little or no data on hours of work or compensation.⁴⁰

Job stability also differs across firm sizes. Because small firms are more likely to fail and have more variable growth than large firms, the jobs created by small firms are more likely to disappear than the jobs created by large firms. Dunne, Roberts, and Samuelson (1987) have shown that, when the higher failure rate of small

firms is taken into consideration, the expected number of jobs created by small businesses is not disproportionately greater than the expected number of jobs created by large businesses. Their analysis, however, ignores the fact that high small-business exit rates are often accompanied by high small-business formation rates. Thus the jobs lost by failing small businesses may be quickly replaced by jobs created by new small businesses. For example, Massachusetts has had a low unemployment rate in recent years despite the high failure rate of technology-based businesses around Boston. Many of these companies quickly fail. But the workers dismissed from them quickly find jobs with newly formed high technology companies.

Jonathan Leonard (1986) argues that Birch's finding may be a statistical artifact resulting from the expansion of businesses who for whatever reason are less than their optimal sizes and the contraction of businesses who for whatever reason are larger than their optimal sizes. At a point in time small businesses will have a disproportionate number of businesses that are less than their equilibrium size and large businesses will have a disproportionate number of businesses that are greater than their optimal size. Businesses that are too small expand over time and businesses that are too large contract over time giving the appearance that small firms are generating a disproportionate share of new jobs. Many of these new jobs are, in effect, being created by large firms that are temporarily small. Leonard presents data from Equal Employment Opportunity Commission files that suggest that at least part of Birch's finding is a statistical illusion.^{41, 42}

Lost amidst the controversy over whether small firms create a disproportionate share of new jobs and whether those jobs are worthwhile jobs, is the significance of small-business job creation for government policies. In and of itself the fact that small firms create a disproportionately large share of new jobs does not provide an efficiency justification for government assistance programs to stimulate small-firm formations. For example, government assistance might stimulate the formation of businesses by entrepreneurs who were not sufficiently efficient to make a go of it on their own. The firms started by such entrepreneurs

might be less likely to grow and more likely to fail than firms started by entrepreneurs without government assistance.⁴³ Bendick and Egan (1987) find evidence of just such an effect for the British and French start-up assistance programs for unemployed workers and question whether such programs are a cost-effective means of creating new jobs.

To justify small-business assistance programs on efficiency grounds it is necessary to identify market breakdowns that lead to too few small firms or too few small-firm jobs. A traditional rationale for small-business loan subsidies is that capital-market imperfections lead to small firms getting too small a supply of capital. Until recently, most of the evidence of such imperfections was anecdotal. But, as mentioned earlier, work by Evans and Jovanovic and Fazzari, Hubbard, and Petersen finds that smaller firms are more likely to face liquidity constraints. Depending upon the precise reason for these liquidity constraints — an important topic for further research — government assistance programs to small firms might increase economic efficiency.

Another possible justification for small-firm assistance programs is that other government programs may reduce the number of small firms below the efficient level by imposing fixed costs that bear more heavily on smaller firms. We explore this issue in more detail below when we discuss the optimal design of regulatory programs towards small firms. But it is useful to point out the implication of this problem for the jobs question. Suppose that large firms find it efficient not to hire low-skilled workers.⁴⁴ These workers would be unemployed unless they can be absorbed by small firms. But the imposition of fixed costs by various government programs reduces the number of small firms below the efficient level. For example, FICA taxes probably bear more heavily on smaller firms because of the administrative costs in meeting the FICA requirements and because of the increased capital requirements they place on liquidity-constrained small firms. Consequently, an insufficient number of small firms are formed and therefore too few of the unemployed workers are absorbed into small firms. It is *conceivable* that a second-best policy in these circumstances would involve subsidizing the creation of small firms.⁴⁵ Much additional work will be necessary before

economists will be able to determine whether small-business assistance programs are efficient.

Small firms and macroeconomic policy

The expansion of the small-business sector has potentially important macroeconomic implications. The increase in the fraction of workers employed by small firms which are less able to weather economic downturns suggests that unemployment will increase more rapidly in future recessions. More jobs are likely to be lost because of firm closures and because of layoffs compared with previous recessions.⁴⁶ Of course, the flip side of this problem is that unemployment might decrease more rapidly in future upturns to the extent that smaller firms expand more rapidly than larger firms.⁴⁷ To help government policymakers address these concerns, more research is needed on the unemployment experience of small versus large firm workers — Do workers at smaller firms experience longer unemployment durations than otherwise comparable workers at larger firms? — and on the historical experience of job loss across firm sizes — Is our conjecture correct that small firm jobs are more fragile during downturns?

The possibility of a high run up in unemployment as a result of recession-induced small business failures and contractions suggests that policymakers might want to exercise more caution in implementing macroeconomic policies that have especially adverse effects on small firms. Evidence that smaller firms are more likely to face liquidity constraints, for example, suggests that policies which increase capital rationing by financial institutions or decrease the amount of self-financing available to firms will have a larger effect on smaller firms. Fazzari, Hubbard, and Petersen argue that the Tax Reform Act of 1986 may have had a more positive effect on investment than is widely believed. Although this Act may have increased the marginal cost of capital it also decreased the tax rate of inframarginal as well as marginal corporate profit. By increasing cash flow the Act may have stimulated investment by liquidity-constrained firms. Changes in the supply of high-powered money in the economy may also have a differential effect on small firms. If there is credit rationing, reductions in the quantity of high-powered money may have a greater effect on

the quantity of credit supplied (and thus on the fraction of firms that are liquidity constrained) than on real interest rates.⁴⁸ Efforts to reduce inflationary pressures by reducing the money supply may have especially high costs for small firms and their employees. The effect of credit rationing on small firms over the business cycle is an especially interesting area of research.

Small firms and regulatory policy

Many government rules and regulations impose easier requirements on smaller firms or exempt smaller firms from the requirements altogether. The "Mrs. Murphy" exemption to the Civil Rights Act of 1968 is the classic example. Owner-occupied apartment buildings with four or fewer units — such as the rooming house owned by Mrs. Murphy, an imaginary constituent — are exempt from the nondiscrimination provisions of this act.⁴⁹ We have shown (Brock and Evans (1985) and Brock and Evans (1986)) that these measures, rather than being populist attempts to help small businessmen, may be sensible attempts to minimize the social cost of implementing government rules and regulations. The argument is worth going through because it illustrates how the application of a simple model of small businesses (based on Lucas (1978)) can help guide government policies.

Suppose that the cost function for an industry is $c(q, \theta) = c(q)/\theta$ where θ is an index of managerial ability, q is output, and $c(q)$ exhibits decreasing returns to scale.⁵⁰ Higher θ 's correspond to better managers. At any given price better managers produce more output than poorer managers. The competitive equilibrium (which will exist under certain additional assumptions) for this industry is described by an equilibrium price p' and a marginal manager θ' who breaks even. Individuals with $\theta > \theta'$ operate firms. Those with $\theta < \theta'$ choose their next best opportunity (e.g. wage work). Individuals with higher θ 's produce more output and have higher profits. Smaller firms are as efficient at the margin as larger firms in this model and the resulting size distribution of firms maximizes social surplus assuming there are no externalities.

This model can be used to analyze the effect of government regulations on the size distribution of businesses. Without any special treatment for

small firms regulations will tend to impose higher costs per unit of output on smaller firms. These regulation-induced scale economies will tend to force smaller firms to close down in equilibrium. Under certain circumstances, the closure of small firms may decrease economic efficiency (as measured by social surplus) even after taking into account the costs of the activity (e.g. pollution) that the regulation was supposed to curtail. Exempting small firms from the regulation or imposing lighter requirements on them might be one way to avoid this welfare loss. Brock and Evans (1985, 1986) discuss several qualifications to this finding and suggestions for designing regulations that take the differential effects of regulation across firm size into account.

VI. Summary

We have tried in this paper to summarize some of what is known and much of what is not known about small businesses. The small-business sector — which a cynic might define as those businesses that economists hardly ever study — is a sizeable and growing part of the U.S. economy. The precise role of small businesses in the economy and the causes of the recent reversal in the secular decline of small businesses is a fertile area of research. Small businesses present a number of conundrums for economists. We have uncovered many facts about smaller businesses which are inconsistent with our theories. Workers at smaller firms getting paid less or smaller listed firms having excess stock market returns in January are two examples. Like most anomalies in science, these facts will help stimulate the development of more refined theories which will have implications well beyond small-business economics. Recent evidence on patterns of growth and failure across different sizes and ages of firms is stimulating the development of richer theories of firm dynamics. Evidence on pay differentials across firm sizes have motivated several theories of firm hiring and monitoring practices.

The paucity of research on small businesses together with the rising importance of small businesses in the economy has created a significant gap between what policymakers would like to know and what economists can say with some confidence. Research on the role of small busines-

ses in the labor market, the relationship between the business cycle and small business formation, dissolution, and growth, and the effects of macro-economic policies on small businesses will prove especially critical for the sensible formulation of government policies.

Notes

* We wish to thank Zoltan J. Acs and an anonymous reviewer for helpful comments.

¹ Based on data reported in the U.S. Small Business Administration (1988), pp. 20–21.

² Brock and Evans (1986).

³ *Statistical Abstracts* (1987), p. 357, Table B–95.

⁴ Evans and Leighton (1987).

⁵ U.S. Small Business Administration (1986).

⁶ *Statistical Abstracts of the United States* (1987).

⁷ Based on a study by Joel Popkin and Associates reported in Brock and Evans (1986). Business output is measured by “gross product originating” which is almost the same as value added. Gross product originating includes employee compensation, net interest, indirect business taxes, and capital consumption allowances. It does not include rents paid to others which are usually included in value added.

⁸ See U.S. Small Business Administration (1987), Table A1.25. These figures are based on the Small Business Data Base which is not as comprehensive as Census data. The 1982 *Enterprise Statistics* shows that 55.8 percent of employment is in firms with fewer than 500 employees.

⁹ Haber *et al.* report this number as a lower estimate of the fraction of workers employed by private businesses. Note, however, that their calculations do not reflect hours of work. Many of the owners and workers in their calculations work only part time and may have multiple jobs.

¹⁰ *Statistical Abstracts* (1987), Table 858. Note these figures are for establishments. Some small establishments are operated by large firms.

¹¹ See Brown and Medoff (1985).

¹² According to IRS data reported in the U.S. Small Business Administration (1987), p. 82 firms with 250 or more employees had \$217 thousand of assets per employee and firms with 10–24 employees had \$83 thousand of assets per employee.

¹³ Based upon 1980 figures reported in Brock and Evans (1986).

¹⁴ Based on GNP data and from the *Economic Report of the President* for 1988 and the number of businesses filing tax returns from the *Statistical Abstracts of the United States for 1988*. GNP figures are in 1982 dollars.

¹⁵ See Blau (1987) and the references cited therein. *Historical Statistics of the United States from Colonial Times to 1970* show that the fraction of the civilian labor force that is self-employed decreased from 19 percent in 1949 to 8.9 percent in 1970. These figures are based on workers under government social insurance programs. The 6.9 percent figures is based on Census information which includes all nonagricultural workers.

¹⁶ Based on data reported in the *Historical Statistics of the United States from Colonial Times to 1970* and *Statistical Abstracts of the United States*.

¹⁷ See Brock and Evans (1986), p. 21. Small firms are defined as those with fewer than 500 employees.

¹⁸ In 1982 dollars.

¹⁹ See Evans and Leighton (1987).

²⁰ See U.S. Small Business Administration (1987), Table A1.25, which is based on the Small Business Data Base. Figures from the Census Bureau's *Enterprise Statistics* indicate that the share of employment in firms with fewer than 500 employees decreased from 55.1 percent in 1958 to 52.5 percent in 1977 and then increased to 54.1 percent in 1982.

²¹ See Mills (1984) and Acs, Audretsch, and Carlsson (1988).

²² See Shephard (1982) who shows that concentration has decreased in the economy partly because of deregulation.

²³ See Klepper and Graddy (1985).

²⁴ See Blau (1987) and Acs *et al.* (1988).

²⁵ See Acs, Audretsch, and Carlsson and the references cited therein.

²⁶ See Nelson and Winter (1982) who have made a number of seminal contributions to this area over the years.

²⁷ Some of these results are based on fairly special assumptions and might not generalize to richer models.

²⁸ Also see Nelson and Winter (1982) for models which are similar in spirit.

²⁹ Many previous studies have documented some aspects of these regularities using smaller samples and without distinguishing separately between size and age effects. For an excellent recent study of firm growth and size see Hall (1987).

³⁰ See Brown and Medoff (1985) and Evans and Leighton (1988) for an analysis of a number of datasets.

³¹ See Brown and Medoff (1985) and Evans and Leighton (1988) for an analysis of several datasets.

³² See Krueger and Summers (1988) for a recent analysis.

³³ See Bulow and Summers (1984) for a model along these lines.

³⁴ See Kamien and Schwartz (1975) and F. M. Scherer (1982) for a critical review of the theoretical and empirical literature.

³⁵ See U.S. Small Business Administration (1985).

³⁶ For a review of these see Thaler (1987a, 1987b).

³⁷ See Bendick and Egan (1987) for a summary and critique.

³⁸ See Balkin (1988).

³⁹ See U.S. Department of Labor (1987) for a description of the proposed project.

⁴⁰ It is not impossible however. The May 1979, 1983, and 1987 Current Population Surveys have information on the size of the firm in which respondents work. It would be possible to use this information to calculate changes in the distribution of working hours and wages across firm sizes between these years.

⁴¹ His results are not sufficiently refined for us to determine how much is an illusion and how much is real.

⁴² An important point to keep in mind about Dunne, Roberts, and Samuelson's finding and Leonard's finding, however, is that their datasets do not cover most of the 1980s, a period which has had unusually rapid small business growth.

⁴³ Such would be the case in the Lucas and Jovanovic models of small businesses discussed earlier.

⁴⁴ This would be possible under some of the efficiency-wage theories.

⁴⁵ It is important to note that if there are binding liquidity constraints, subsidized loans may attract "good" entrepreneurs who would have entered but for the constraints. See Evans and Jovanovic for details.

⁴⁶ The greater potential instability of jobs is not just a small-business phenomenon. Larger businesses are making greater use of part-time or part-year workers, temporary workers provided by personnel supply services, full-time workers who receive fewer pension and health benefits than regulator employees, and self-employed individuals who work as outside contractors for other businesses. Based on U.S. Labor Department figures reported by Louis Uchitelle (1988).

⁴⁷ And, to continue the previous footnote, to the extent that larger firms are more willing to hire temporary workers than permanent workers.

⁴⁸ For a discussion see Stiglitz (1987) and the references cited therein.

⁴⁹ For other examples see Brock and Evans (1986), Chapter 4 and the references cited therein.

⁵⁰ For details see Brock and Evans (1986).

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