Explaining National Differences in the Size and Industry Distribution of Employment[*]

by

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Abstract

What factors determine national differences in the size and industry distribution of employment? We stress the role of the economic policy environment as determined by business taxes, employment security laws, credit market regulations, the national pension system, wage-setting institutions and the size of the public sector. We characterize these aspects of the policy environment in Sweden prior to 1990–91 and compare them to the situation in other European countries and the United States. Our characterization and international comparisons show that Swedish policies strongly disfavored less capital-intensive firms, smaller firms, entry by new firms, and individual and family ownership of business.

We also compile evidence that these policies affect outcomes. Taking the U.S. industry distribution as a benchmark that reflects a comparatively neutral set of policies and institutions, Sweden's employment distribution in the mid-1980s is sharply tilted away from low-wage industries and industries with greater employment shares for smaller firms and establishments. Compared to other European countries, Sweden has an unusually high share of employment in large firms. Furthermore, the Swedish rate of self-employment in the 1970s and 1980s is the lowest among all OECD countries.

The institutional and policy factors emphasized by our study differ greatly across countries. This fact suggests that our approach can be fruitfully applied to other studies of national differences in industry and size structures and their evolution over time. As an example, the tax reform wave of the 1980s – which largely evened out cross-country differences in corporate taxation among OECD countries – offers some basis for projecting a movement towards greater similarity among wealthy countries in the size and industry distribution of employment.

The industry distribution of employment differs sharply across countries, even countries with similar levels of economic development. What factors determine these differences? Theories of international trade stress relative factor endowments and scale economies as major forces behind observed national differences in the industry distribution of employment. But, since these differences extend to sectors of the economy that do not produce traded goods and services (or intermediate inputs into the traded sector), other forces must also be at work.

Differences in the organization of business activity among countries with similar factor endowments also present a puzzle. Presumably, these countries have access to the same technologies for producing goods and services. Why then does the distribution of business activity by firm and establishment size differ markedly across countries?

One view is that size distribution differences are (nearly) neutral with respect to economic efficiency, so that minor differences in economic fundamentals or even random mutations lead to large country differences in the size distribution. This view is difficult to sustain in the face of other evidence. A large body of previous work documents strong, systematic relationships between business size and other business characteristics such as financial structure, capital intensity, level and dispersion of wages, worker turnover, training expenditures, and types and methods of innovation.[1] Furthemore, in looking across countries we see consistent ownership and size patterns. Restaurants, specialty retail shops and many personal and business services, for example, tend to be organized into smaller, owner-operated firms and production units, whereas capital-intensive manufacturing activities tend to be organized into large production units and firms with diffuse ownership. The prevalence of these patterns points to the role of powerful efficiency considerations. In short, other evidence strongly suggests that size distribution variation is far from neutral with respect to economic efficiency.

Prominent theories of the firm and its boundaries also imply that size distribution variation is not neutral with respect to economic efficiency. Williamson's (1985, chapter 6) analysis of firm size emphasizes the tension between efficient asset utilization and the use of high-powered incentives in larger, integrated firms. This tension increases monitoring costs and reliance on low-powered incentives in large organizations relative to smaller, less integrated firms.

These observations lead us to search for explanations of national differences in the size and industry distribution of employment. We focus on the role of several policy-determined aspects of the economic environment: the taxation of business income, the nature of employment security laws, credit market policies and national pension institutions, wage-setting institutions, and the size and scope of public sector employment. These aspects of the economic policy environment differ considerably among the wealthy countries of the world, and almost all wealthy countries have experienced major changes or evolutions in one or more of these policy factors in recent decades. Thus, to the extent that these factors influence the size and industry distribution of employment, it is reasonable to infer that they underlie important differences across countries at a point in time and changes over time.

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[1] See, for example, Brown, Hamilton and Medoff (1990), Acs and Audretsch (1988, 1990), Davis and Haltiwanger (1991, 1996), Gertler and Gilchrist (1994), Barron, Black and Loewenstein (1987) and Fazzari, Hubbard and Petersen (1988).

In this paper, we characterize these aspects of the economic policy environment in Sweden prior to 1990 or thereabout and compare them to the situation in other European countries and the United States. Our characterization and international comparisons show that Swedish policies strongly disfavored less capital-intensive firms and sectors, smaller firms, entry by new firms, and individual and family ownership of business.

We also compile evidence that these Swedish policies affected outcomes. Taking the U.S. industry distribution as a benchmark that reflects a comparatively neutral set of policies and institutions, Sweden's employment distribution in the mid-1980s is sharply tilted away from low-wage industries and industries with greater employment shares for smaller firms and establishments. These U.S.–Swedish differences in the industry distribution of employment are consistent with the predictions implied by our characterization of the Swedish policy environment. Other evidence is also supportive. For example, in the 1970s and 1980s the Swedish ratio of nonagricultural self-employment to civilian employment is the lowest among all OECD countries. Furthermore, compared to other European countries, Sweden has an unusually high share of employment in large firms.

Our study of policy factors that determine national differences in the size and industry distribution of employment is preliminary in the sense that our industry-level analysis is limited to comparisons between Sweden and the United States. For several reasons, this limitation is less severe and more natural than it might appear at first glance. First, the United States and Sweden are polar cases in many pertinent respects: the tax treatment of business income, wage-setting institutions, employment security provisions and the size of the public sector. Second, the United States is perhaps the most appropriate benchmark for a comparative study of this sort, because it approximates the outcomes of an unfettered market economy to a greater degree than other industrialized countries. Third, a cross-country study of the sort we carry out poses formidable data problems requiring first-hand knowledge of the countries under study. Hence, the choice of countries reflects our own comparative advantage in this regard.

In section 2 we briefly review international evidence on trends in the industry and size distribution of employment. In contrast to other scholars, we emphasize the systematic differences across countries in the employment shares of small and medium-sized firms rather than the similarities in the trends over time. Section 2 also reviews pertinent aspects of the postwar employment record in Sweden. Sections 3 and 4 describe how tax policy and other key features of the Swedish system disfavor younger, smaller and less

capital-intensive businesses, penalize direct individual and family ownership of businesses, and systematically distort the industry distribution of employment. International comparisons indicate that these aspects of the policy environment are more acute in Sweden than in other countries. Both sections 3 and 4 focus on the situation prior to the major Swedish tax reform in 1990–91.

Section 5 develops evidence of significant employment distortions by relating U.S.–Swedish differences in the industry distribution of employment in the mid-1980s to a variety of industry characteristics such as capital intensity, the distribution of workers by establishment and firm size, the structure of wages, and the pace at which jobs are reallocated among establishments within the industry. The pattern of U.S.–Swedish differences in the industry distribution of employment conforms well to our thesis that policy and institutional differences across countries are important determinants of differences in the size and industry distribution of employment. A plausible reading of the evidence attributes much of U.S.–Swedish differences in the industry distribution of employment to distortions associated with the tax, regulatory and wage-setting institutions described in sections 3 and 4. Section 6 concludes with a summary of our main findings and some suggestions for further research.

2.   The Size and Industry Structure of Employment

2.1   The Cross-country Picture

A fair amount has been written about the change in the industry distribution of employment and the size distribution of firms over time. The focus has been on the identification of patterns common to most countries. At least three such trends have been emphasized in the literature.

The most important and widespread trend is the large, ongoing shift in employment from goods-producing to service-producing industries. This trend cuts sharply against those sectors of the economy that have traditionally been dominated by larger firms, larger production units and more capital-intensive production processes.

A second trend, less pronounced and consistent, is the movement away from employment in larger production units within industries. Loveman and Sengenberger (1991) examine changes in the distribution of employment by establishment and firm size in the six largest OECD countries. Only in the manufacturing sector are the available data adequate for drawing a clear picture. The data indicate that the secular trend away from employment in smaller manufacturing plants reversed or at least ended by the

1970s or 1980s in these countries. More clear-cut support for a shift away from large firms and towards small enterprises within the manufacturing sector in western countries appears in Acs and Audretsch (1993) and Schwalbach (1994).

The final trend, more open to measurement and interpretation problems, is the tendency, also reported by Loveman and Sengenberger, toward employment in smaller firms in the economy as a whole for the largest OECD economies. OECD (1994) presents evidence that this trend has continued into the 1990s. On the other hand, Davis and Haltiwanger (1989) find a trend towards larger establishments within the U.S. service sector from 1963 to 1985.

Common trends notwithstanding, an equally interesting phenomenon that calls for explanation is the large national differences in the employment share of small and medium-sized firms. For instance, Loveman and Sengenberger report a small firm (< 100 employees) share in manufacturing around 1980 of 55.3 percent for Italy, but only 15.0 and 18.8 percent for Germany and the U.K., respectively. In the six countries studied by Loveman and Sengenberger, there appear to be systematic differences between Italy and Japan on the one hand and Germany and the U.K. on the other, with the U.S. and France as intermediate, less clear-cut, cases. This applies irrespective of whether one looks at manufacturing or the total economy, and whether firms or establishments are taken as the units of analysis.

Ideally, a theory of the size distribution of employment would explain both prominent trends that are common to many countries *and* pronounced cross-country differences. Indeed, empirical success on one front is likely to shed light on the other front, so that we view our study as complementary to the many recent studies that focus on within-country trends.

2.2   The Swedish Picture

In order to set the stage for and motivate the U.S.–Sweden comparison we devote this subsection to a brief characterization of Sweden's employment structure. Davis and Henrekson (1997) provide a more detailed account. As will become clear below, Sweden's employment structure differs in important respects from that of many other countries.

Public sector employment growth is a central feature of Swedish economic policy in the postwar period. The public sector accounts for all of Sweden's net employment growth after 1950. Between 1950 and 1992, public sector employment grew by 1.1 million, whereas private sector employment actually shrank by roughly 200,000 jobs. As a consequence the public sector share of total employment became very high, higher than in any other OECD country. The 35 percent government share of total employment in 1992 was 75 percent higher than the unweighted OECD average for that year.[2]

During the 1980s, the self-employment rate in Sweden stabilized at a low level relative to Sweden's historical experience and relative to the contemporaneous situation in other countries. Indeed, *Table 1* reports that, since the early 1970s, Sweden has exhibited the lowest ratio of nonagricultural self-employment to civilian employment among all OECD countries. Another recent study (The European Observatory for SMEs, 1995) finds that Sweden has a lower self-employment rate in 1992 than the then 12 member countries of the European Community (EC). The Swedish self-employment rate is less than one-half the EC average.

Table 1

A low self-employment rate is one aspect of broader differences between the structure of employment in Sweden and other countries: in Sweden, large firms account for a disproportionately high fraction of employment. A recent government study (SOU 1992:19) compares the distribution of employment by firm size among several European countries. In 1986, firms with at least 500 employees account for 60.4 percent of total employment in Sweden as compared to only 30.4 percent in the European Community as a whole. Even in the much larger economies of Germany, France and the United Kingdom, the largest firm size class accounts for less than 40 percent of employment. At the other end of the size distribution, firms with fewer than 10 employees account for

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[2]Defined as *Producers of government services* divided by *Total employment* in the OECD statistics. *Source*: *OECD National Accounts, Vol II* (Detailed Tables).

only 9.5 percent of employment in Sweden, less than half the employment share of very small firms in the European Community.[3]

The European Observatory for SMEs (1995) provides complementary evidence on the relatively small role of small firms in Sweden. Among 16 European countries, Sweden shows the largest value for mean enterprise size in 1990. Average enterprise size is 13 in Sweden, more than twice the corresponding average value for the 16 European countries.

The interpretation of these cross-country comparisons of average firm size and the employment distribution by firm size is clouded by ambiguities in the economic concept of a firm, by differences among countries in the legal definition of a firm, and by differences in measurement procedures. But there seems little doubt that Sweden's reputation as a land of big business is well founded. If anything, the raw figures fail to fully convey the extent of concentrated ownership and control in Sweden. In this regard, Fölster and Peltzman (1997) note that the five largest final owners[4] in 1985 held roughly 44 percent of the total voting rights in companies with more than 500 employees, and the ten biggest had more than half. In addition, these final owners hold shares through intermediaries which in turn are linked through joint ownership. Fourteen such groups dominate the corporate sector, with three major ones alone controlling companies that account for some two-thirds of employment, sales and total assets of the 270 largest corporations in Sweden.

Finally, while available data are fragmentary, there is some evidence to suggest that Sweden experienced low rates of new firm formation until the mid or late 1980s. Braunerhjelm and Carlsson (1993) calculate annual entry rates from 1920 to 1991 of new manufacturing firms with more than one employee. Their series show that rates of new firm formation in the Swedish manufacturing sector became extremely low by the 1950s. The annual entry rate fell to 1.5 percent in the 1970s, and the average entry rate was even lower in the 1980s.

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[3]It should be noted that these figures overstate the relative importance of large firms in Sweden, because the public sector is included for Sweden, but not for the other countries. With few exceptions, public sector employees are categorized as working in very large firms. However, even if we restrict attention to the construction, extraction and manufacturing sectors (for which public employment is very small), the share of Swedish employment accounted for by large firms (500+ employees) is still unusually high. There is only one exception among the set of countries compared in the government study: For NACE 2–4 (extraction and manufacturing), the UK share in the 500+ category is .9 percentage points higher than in Sweden. This fact may reflect the inclusion of British coal mines, which were still operating in 1986. See Henrekson in collaboration with Davis (1996) for further details.

[4]A final owner is an owner which is not in turn owned by another firm such as a subsidiary within a corporate group. Typical final owners are pension funds, individuals and family foundations. Investment companies, on the other hand, are not final owners, since they are controlled by their own shareholders.

To summarize, in comparisons among OECD countries, Sweden stands out as having the highest ratio of public sector to total employment, a low rate of self-employment, a dominant role for larger firms, and highly concentrated ownership and control of private-sector enterprises. The available evidence also points to low entry rates of new Swedish firms during a large part of the postwar period. This characterization of the employment structure of the Swedish economy was most extreme in the mid 1980s.

3.   Swedish Tax Policy and the Structure of Employment

This section outlines several features of the pre-1990 Swedish tax system that disfavored younger, smaller and less capital-intensive firms and that discouraged entrepreneurship and family ownership in favor of institutional forms of ownership. International comparisons indicate that these tax-induced distortions were more severe in Sweden than in other countries.

Several important distortions stem from high statutory rates of corporate income taxation coupled with other policies that led to low effective tax rates. *Figure 1* shows that the statutory corporate income tax rate remained in the very high range of 50–62 percent until 1990. Beginning in 1958, a large gap emerged between statutory and effective (average) tax rates as a result of accelerated depreciation rules, the so-called investment fund system, inventory valuation rules, and other *ad hoc* tax reductions. These features distort the structure of employment and output, because their usefulness as tax avoidance mechanisms differs greatly across industries and types of firms.

Figure 1   Statutory and Effective Corporate Tax Rates in Swedish Industry 1954–91 (percent).

Enclosed

Note: The statutory tax rate includes the profit-sharing tax, which was part of the wage-earner fund system, effective in 1984–90. In 1977 the effective tax rate exceeded 100%, which was due to the fact that aggregate profits were negative, while firms which despite losses wanted to pay dividends had to show book profits.
Source: Jan Södersten, see Södersten (1984, 1993).

A clear and important example was the liberal provisions for accelerated depreciation of machinery and equipment. These provisions favored machine-intensive manufacturing industries over service-producing industries. More generally, the depreciation rules

disfavored firms and sectors that are intensive in human capital, structures, financial capital and intangible forms of capital. With hindsight, it is apparent that this aspect of the tax system favored slow-growth industries at the expense of rapidly growing industries.

High statutory tax rates also favor debt financing over equity financing of investments. To the extent that debt financing is less costly and more readily available for larger, more established firms, high statutory tax rates coupled with tax-deductible interest payments work to the disadvantage of smaller firms and potential entrants. Debt financing is also more easily available to firms with ready forms of collateral. Hence, firms and sectors that more intensively use physical capital reap greater benefits from tax code provisions that favor debt financing. In practice, this aspect of the tax system favors the capital-intensive manufacturing industries relative to other industries.[5]

The Swedish investment fund system (IF), which grew in importance after 1955 and remained in effect until 1990, was designed to change the timing of investments from booms to recessions. The details of the system varied somewhat over time, but typically a firm was allowed each year to deduct up to 50 percent of taxable profits by transferring that amount to its investment fund. A portion of this fund was automatically available for investment purposes with favorable tax treatment, while the remaining portion was available in periods and under conditions that were determined at the discretion of the government. In practice, the tax subsidies granted under the discretionary aspects of the system were often limited to capital-intensive industrial sectors of the economy or structured in ways that favored larger, well-established firms (Rudberg and Öhman, 1971, pp. 20–23 and 86–87).[6]

To provide a sense of the magnitude of the distortions introduced by the Swedish tax system, *Table 2* presents effective marginal tax rates for different combinations of owners and sources of finance. Three categories of owners and sources of finance are identified, and the effective marginal tax rate is calculated assuming a pre-tax real rate of return of 10 percent. A negative number means that the real rate of return is greater after tax than before tax.

Table 2

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[5]Södersten (1984) shows that during the 1960s the effective marginal tax rate on manufacturing was considerably lowered relative to that of other industry and commerce.

[6]The reader who wants a comprehensive acount of how the IF system worked is referred to Pontusson (1992), Eliasson (1965), Forsling (1996), Rudberg and Öhman (1971), and Södersten (1989).

The table highlights three important aspects of the Swedish tax system. First, debt financing consistently receives the most favorable treatment and new share issues the least. Second, the taxation of households as owners is much higher than for other categories, and their rate of taxation increases during the 1960s and 1970s, whereas the reverse occurs for insurance companies and tax-exempt institutions.[7] From some point in the 1960s until the 1991 tax reform, more than 100 percent of the real rate of return is taxed away for a household buying a newly issued share. Third, tax-exempt institutions benefit from a large tax advantage relative to the other two categories of owners, and this advantage increases strongly during the 1960s and 1970s.

The calculations for households are based on an average household, but households owning a successful business typically faced an even higher tax rate because of the combined effect of wealth and income taxation. Until 1993, the wealth tax was levied on 30 percent of the net worth of a family-owned company, incorporated or not. As of the mid-1980s, the maximum wealth tax rate was 3 percent. Since the wealth tax was not deductible at the company level, funds required to pay the wealth tax were first subject to the personal income tax and the mandatory payroll tax.

These remarks and the entries in Table 2 make clear the extraordinary extent to which the Swedish tax system favored institutional ownership and discouraged direct household ownership of firms. The structure of taxation summarized in Table 2 is consistent with the strong postwar trend towards an increased share of institutionalized ownership of firms[8] and the increased importance of debt financing. The preferential tax treatment of debt over equity and of institutions over individual ownership benefit larger, publicly traded and more established firms.

As direct evidence on this point, *Table 3* reports effective average rates of corporate taxation for family-owned and other corporations during the 1984–87 period. Smaller family-owned firms typically show a higher effective rate of corporate taxation than larger firms, and family-owned firms show a higher rate than other firms.

Table 3

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[7]Tax-exempt institutions by definition pay no tax on interest receipts, dividends or capital gains. This category includes charities, scientific and cultural foundations, foundations for employee recreation set up by companies, pension funds for supplementary occupational pension schemes, and the National Pension Fund (the AP Fund). In terms of industry ownership and control tax-exempt institutions have a dominant position in Sweden.

[8]McLure and Norrman (1997) show that the household ownership share of outstanding publicly listed stock went from 75 percent in 1950 to 16 percent in 1992.

Hutchinson (1995) argues that small firms have a lower efficient debt/equity ratio than large firms. Portfolio investors generally only have to be concerned with systematic risk, since specific risks can be diversified away. This does not apply to owners of small businesses, since they have a large part of their financial wealth as well as their human capital tied up in their own firm. These considerations call for a long-run survival objective resulting in a lower debt/equity ratio than in firms with a highly diversified ownership, where it is rational to choose a debt/equity ratio that maximizes the firm's market value. This tendency may be further strengthened if small firm owners desire independence in its own right. This latter desire also decreases willingness to accept new equity capital from outsiders, since it reduces the owner's ability to remain independent and in control of the company. The implication of this reasoning in the Swedish context is straightforward. It points to yet another channel through which small firms were disfavored by the relatively favorable taxation of debt financing and the extremely unfavorable taxation of equity financing. Because of the wealth tax and high rates of taxation on income, it was difficult for small firms to rapidly accumulate equity, which probably impeded the growth of many firms.

How do these distortions in the Swedish tax system compare to other countries? To partially address this question, *Table 4* reports corporate tax wedges for investments in machinery, buildings and total business capital (an aggregate of machinery and buildings) in several OECD countries as of 1985. According to the table, the marginal tax wedges are invariably negative, which means that after-tax rates of return exceed pre-tax rates of return. Among all listed countries, Sweden exhibits the largest negative wedges and, hence the largest corporate-tax bias towards capital-intensive firms and industries.

Table 4

Table 5

For a smaller set of countries, *Table 5* reports effective marginal tax rates by ownership category, accounting for both corporate and personal income taxes. Here we see that Sweden was the only country where more than 100 percent of the real return was taxed away in 1980 for households making corporate investments. This high figure comes about even though it may be presumed that, within each country, owners choose an asset distribution that is reasonably optimal relative to the tax system they face. Note that Sweden also exhibits the most favorable treatment of tax-exempt institutions.

While strongly discouraging direct household ownership of business, the Swedish tax system has generously subsidized investment in the housing stock. On this point, *Table 6* reports the estimated tax wedge for housing investment in 1985 at a 5 percent real

interest rate for eight countries. The table shows that housing investment received preferential tax treatment in all countries, but more so in Sweden. Investment in the housing stock was especially favored in the asset draw down case, in which the housing investment is financed by the liquidation of financial assets. Given the generous tax subsidies for investments in the housing stock and the truly punitive treatment of direct business ownership by households, it is surprising that Swedish households undertake *any* direct business investments.

Table 6

Finally, high marginal tax rates on personal income – another outstanding and extreme feature of the pre-1990 Swedish tax system[9] – also discourage employment in smaller, less capital-intensive firms and thereby distort the industry distribution of output and employment. As a generalization, economic activities that are highly substitutable between market and home production sectors (cooking, laundering, landscaping, home repairs, etc.) offer greater than average scope for self-employment, employment in small firms, start-ups, and family-owned business. Thus, in addition to the distortions described above, high marginal income tax rates alone work against a vibrant entrepreneurial and small-firm sector.

In summary, we have identified several features of the pre-1990 Swedish tax system that strongly disfavored less capital-intensive firms, smaller firms, entry by new firms, and individual or family ownership of business. These features are typically present in other tax systems as well, but international comparisons indicate that the tax wedges are larger, often much larger, in Sweden. The magnitude of the tax wedges points to the Swedish tax system as a major source of distortions in the industry distribution of employment and in the structure of employment within industries.

4.   Other Policies and Institutions that Influence the Structure of Employment

These features of the tax structure were not the only aspects of the Swedish system that disfavored smaller and younger employers. We now briefly describe five other aspects of economic policy and institutional arrangements that disfavored smaller, younger, and less capital-intensive firms: credit market regulations, the mandatory national pension system, employment security laws, a centralized wage-setting institution associated with highly compressed relative wages, and the rapid expansion of the public sector.

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[9]See McLure and Norrman (1997) for a documentation.

4.1 Credit Market Regulations

Throughout the postwar period until the late 1980s, the Swedish credit market was highly regulated. Inspired, among other things, by Gunnar Myrdal's 1944 paper on "high taxes and low interest rates", Swedish credit market policy was for a long time aimed at low interest rates for favored sectors of the economy. In a situation of full employment, rapid economic growth and a long-lasting boom in construction, the government felt compelled to extend credit market regulations in several steps. These developments continued until the early 1980s, when a rapid process of deregulation began. The process was completed in 1989, when the remaining foreign exchange controls were lifted.[10]

Lending to the construction and government sectors received priority over other sectors until the mid 1980s. Typically, the government imposed a ceiling on lending increases to other sectors by banks and other financial intermediaries. At the same time, interest rate ceilings were imposed in these other sectors, which led to a great deal of credit rationing. This set of regulations clearly favors credit access by larger, older, better established firms and by capital-intensive firms with ready sources of collateral. Human capital and knowledge, on the other hand, are of less value as collateral.[11]

4.2 The National Pension System

The development of Swedish net saving is indicated in *Table 7*. Net saving rose between the 1950s and the 1960s, and thereafter declined sharply. For our purposes, the most noteworthy feature is the extremely important role of the government sector for net saving in the 1960s and 70s. Close to two thirds of net saving took place there, and a large part of these funds had to be channelled to the private sector. As long as the government shunned ownership of industry, this pattern of national saving presupposed lending on a massive scale to the private sector.

Table 7

In particular, saving in the social insurance system increased from zero in 1959 to 4.7 percent of GDP in 1972. This saving took place within the mandatory national pension scheme, the ATP-system, which was introduced in 1959. It accumulated large surpluses for a long time in the so-called AP funds, so that in the early 1970s the AP funds accounted for 35 percent of the total supply of credit. The AP funds lent to industry primarily through intermediate credit institutions. At the end of 1976, it accounted for 69

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[10]See Jonung (1993) for an overview of regulations.

[11]Data presented in Ashgarian (1993) regarding the financing structure of different firms give some indication that knowledge and human capital intensive firms have lower debt/equity ratios.

percent of the long-term liabilities of these institutions (Pontusson, 1992). This fund has been (and still is) subject to politically determined rules concerning the composition of its portfolio, and priority has been given to the housing sector and the government sector. Generally, only one third or less of the financial assets in the AP funds have been invested outside the government, construction and real-estate sectors. A negligible fraction of AP fund lending has been directly to firms.

In order to channel all the public saving back to the private sector, it was logical, and perhaps even necessary, to favor debt over equity financing to a great extent. However, it appears that the negative side effects of this policy, which have been stressed here, were largely ignored at the time. In any case, the national pension system reinforced the distorted pattern of credit allocation in the Swedish economy.

4.3   Employment Security Provisions

The Swedish Employment Security Act (*Lagen om anställningskydd* or LAS) provides employees with extensive protection against unfair dismissal. Notably, Sweden is the only country where the order of dismissal is laid down in law (Kazamaki Ottersten, 1994), and where the probationary period before automatic tenure is a mere six months – very short by international comparison.[12] Furthermore, it seems that in most countries other than Sweden unfair dismissal regulations are not extended to small firms (Commission of the European Communities, 1993).

Under LAS the only legal grounds for worker dismissal are gross misconduct and redundancies. Moreover, LAS stipulates the "last in – first out" principle in case of dismissals caused by redundancy. The principle also applies to situations where a firm expands employment following an employment contraction. A worker laid off because of redundancy is guaranteed to get the job back if the firm fills the position within one year from dismissal. This principle may be overruled through special agreements between the local labor union and the employer. To our knowledge, there is no study quantifying the importance of this possibility. In general, there is scant evidence available on the application of the last-in – first-out principle in different countries, but Rasmussen (1993) argues that it is followed more strictly in Sweden than in the other Nordic countries.

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[12]In many instances, the probationary period has been shortened even further through collective agreements, and the trade union can in several industries veto temporary employment and the use of probationary periods. Storrie (1994) finds that the probationary period is less than 6 months for about one third of the blue-collar workers in the private sector.

There are good reasons to think that LAS imposes greater costs on smaller businesses. One reason involves the gains from efficiently matching heterogeneous workers to a variety of tasks and positions. As an employer learns about a worker's abilities over time, or as those abilities evolve with the accumulation of experience, the optimal assignment of the worker to various tasks is likely to change.[13] The scope for task reassignment within the firm is likely to rise with firm size. In an unfettered labor market, optimal task reassignment often involves mobility between firms, and such mobility is more likely when the initial employment relationship involves a small business. Thus, any inefficiencies induced by LAS in the assignment of workers to tasks are likely to be more severe and more costly for smaller firms. Furthermore, the law of large numbers in combination with risk aversion leads to the same conclusion and for an obvious reason: one bad recruitment is proportionately more costly to bear for a small firm.

The only direct evidence we know of on this matter is an interview study by Kazamaki Ottersten (1994). She found that LAS is mostly a restriction for medium-sized firms. Large firms have typically either found ways to circumvent the rules or have learnt to live with them, or have made special agreements with the trade union that remove the costly effects. In small firms, it is often the case that the importance of firm survival is perceived so tangibly by all employees and the trade union alike that, at least in times of hardship, it is fairly easy to agree on measures that do not strictly adhere to LAS stipulations. Nevertheless, many companies report that LAS restricts them in detrimental ways, leading to increased wariness in recruitment. Such firms cite the rigid order of dismissal and the increased cost caused by the employment protection. In addition, it has to be emphasized that if LAS has impeded the formation of new firms and not just the growth of existing firms, this aspect cannot be uncovered in an interview study (selection bias).

Other evidence is also consistent with the view that the employment security provisions fall more heavily on smaller firms and some other classes of firms. In the United States, both the rate at which workers separate from jobs and the rate at which employers destroy job positions decline with the size, age and capital intensity of the employer (Brown and Medoff, 1989 and Davis *et al.*, 1996). These patterns in worker separation and job destruction rates suggest that any costs imposed by a regulation similar to the LAS are likely to fall more heavily on younger, smaller and less capital-intensive employers and to distort the distribution of employment towards industries characterized by more stable establishment-level employment and longer job tenures.

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[13] See Jovanovic (1979), Jovanovic and Nyarko (1997) and Davis (1997) for formal models of learning and task reassignment.

4.4   Centralized Wage-Setting Institutions

Swedish labor organizations successfully pursued egalitarian wage policies from the mid 1960s until the breakdown of centralized wage bargaining in 1983 (Hibbs, 1990; Edin and Holmlund, 1995). The strength of Swedish labor organizations and the centralized nature of the wage-setting institutions appear to have facilitated a remarkable compression of the wage structure during this period, judging by cross-country comparisons of wage inequality trends (Davis, 1992). To the extent that Swedish wage-setting developments drove wages up in the lower tiers of the distribution relative to outcomes under other institutional arrangements, they reinforced the concentration of Swedish economic activity in larger, older and more capital-intensive employers. This inference follows from the ample evidence that wages rise with the age, capital intensity and – especially – the size of employers (e.g., Brown and Medoff, 1989 and Davis and Haltiwanger, 1991, 1996). However, Albæk *et al.* (1995) find that the employer size–wage effect is negligible in Sweden, which gives credence to the view that the egalitarian wage policies have raised the relative wage of smaller businesses.

Indeed, in the 1950s, the LO economists Gösta Rehn and Rudolf Meidner advocated a solidaristic wage policy and centralized wage setting, in part, to promote a restructuring of the economy. Rehn and Meidner "knew that efforts to raise the pay of low-wage workers would affect employment outcomes. Low-wage industries would be forced to contract, and the workers would have to go elsewhere" (Edin and Topel, 1997). Edin and Topel provide evidence that this restructuring occurred after 1960. High-wage industries did have greater growth in Sweden than in the U.S., absorbing the workers who left low-wage industries. The contraction of low-wage industries seems to have been fueled by increased relative wages in those industries. Hence, there is good reason to believe that the solidaristic wage policy reinforced the concentration of economic activity in larger and more capital-intensive firms, since these firms, relatively speaking, benefit from a high average wage in combination with a compressed wage distribution.

4.5   Public Sector Expansion

Finally, we have already pointed out that public sector jobs account for all net employment expansion in Sweden after 1950. The rapid expansion of public employment was the result of deliberate political decisions. No doubt, much of the increased production in the public sector corresponds to a genuine demand. However, it is evident that the decision to produce health care and other social services almost exclusively in the public sector had a profound impact on employment growth in the private sector. The publicly produced services are labor intensive and in most cases suitable for small firm production. As shown by Henrekson in collaboration with Davis (1996), most of

the employment growth in the public sector concerns activities that could just as appropriately have been, and in many other countries are, carried out in the private sector. Thus, the political decisions to grant the public sector a production monopoly in many highly income-elastic service industries have been an independent factor behind the slow employment growth in the private sector and the continued predominance of large firms.

4.6   Summary

In summary, we have identified several features of the Swedish institutional set up during most of the postwar period that, in addition to the tax system, contributed to an excessive concentration of economic activity in large, old and capital-intensive firms. Credit market regulation, the national pension system, employment security laws, the successful pursuit of a compressed wage structure, and the rapid expansion of public sector employment all played a role in this regard.

5.   U.S. Swedish Differences in the Industry Distribution of Employment

We now relate U.S.–Swedish differences in the industry distribution of employment to measures of employer size, capital intensity, the wage level and other industry characteristics. Our interpretation of the evidence rests on the premise that the U.S. industry distribution reflects a much more neutral set of economic policies and institutions. For this reason, we take the U.S. industry distribution as a benchmark against which to evaluate the extent of distortions in the Swedish distribution.

Of course, not all U.S.–Swedish differences in the industry distribution of employment arise from the distortionary policies and institutions that we highlight. The key issue is whether omitted determinants of U.S.–Swedish differences are correlated with the variables we consider. To gauge whether an omitted variables problem underlies our regression results, we consider the impact of omitting from our regressions certain industries in which Sweden or the United States plausibly has a pronounced comparative advantage.

5.1   Some Basic Patterns

Table 8 highlights U.S.–Swedish differences by listing industries with large absolute values of the log of the ratio, (industry share of U.S. employment/industry share of Swedish employment). The listed industries are ordered by ascending values of this ratio, as reported in the rightmost column. Inspection of the table yields four impressions:

1. Relative to the United States, Swedish employment is concentrated in basic manufacturing industries that are typically dominated by larger firms and production units.

2. Sweden exhibits a much larger share of employment in Health, Education and Social Services. In large part, this difference reflects public provision of and other subsidies for child care, elderly care and related social services in Sweden.

3. Except for items in the Health, Education, and Social Services category, the United States has a larger employment share in most service sectors.

4. The industries with relatively large U.S. employment shares appear to be drawn disproportionately from the extremes of the human capital and wage distributions: (i) Personal and Household Services, Retail Trade, Textiles and Apparel, and Restaurants and Hotels rely heavily on low-skill labor and pay relatively low wages (at least in the United States); (ii) Business Services, Instruments, Aircraft and Missiles, and Financial Institutions rely heavily on high-skill labor and pay relatively high wages.

This last pattern fits nicely with the view that Sweden has a more compressed skill distribution and more compressed skill prices than most other OECD countries, especially the United States. More generally, the impressionistic evidence garnered from Table 8 points to distortions in the Swedish industry distribution along the lines predicted by our characterization of tax policy and other aspects of the Swedish system.

Table 8

We turn now to a more detailed investigation of U.S.–Swedish differences in the industry distribution of employment. Two considerations prompt us to consider the manufacturing and nonmanufacturing sectors separately in our investigation. First, industry-level data are available in more disaggregated form for the manufacturing sector. Second, we have at our disposal a much richer set of covariates for manufacturing industries.

With one exception, we carry out our analysis at the most disaggregated level allowed by our data, bearing in mind the requirement to match U.S. and Swedish industries and to construct industry-level covariates for the regression analysis. The exception involves the extractive industries. Employment shares in these industries are largely determined by natural resource endowments and are not closely related to the factors emphasized in

our earlier discussion. For this reason, we lump all extractive industries into a single industry group. It turns out that the U.S.–Swedish employment share ratio is close to one for this industry group, even though it differs greatly from one for particular extractive industries.

5.2 The Connection to Employer Size

We begin with the connection between employer size and the industry distribution of employment. For fourteen broad nonmanufacturing industries and two broad manufacturing industries (durables and nondurables), we computed the establishment *coworker mean* – i.e., the number of employees at the average worker's place of employment.[14]

Figure 2 illustrates the 1987 empirical relationship between the Swedish establishment coworker mean and U.S.–Swedish differences in the industry distribution of employment.[15] The figure conveys a clear message: Relative to the United States, the Swedish industry distribution of employment is tilted away from industries with relatively high fractions of employment in smaller establishments. This pattern holds for the sample of sixteen major industry groups, and it holds even more strongly in a 14-industry sample that excludes the manufacture of durables and nondurables.

Figure 2   Log(Employment Share Ratio) versus Swedish Establishment
Coworker Mean: 16 Industry Groups.

Enclosed

Note: The log ratio equals 100 times the log of the ratio of the industry employment shares. The solid line shows the size-weighted regression line for the 16-industry sample. The dashed line shows the size-weighted regression line for 14 nonmanufacturing industries.
Source: Authors' calculations.

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[14]The coworker mean equals the size-weighted mean of employer size; it is the first moment of the distribution of employees by employer size.

[15]The log ratios plotted in Figure 3 are constructed from Swedish data for 1987 and U.S. data for 1987 and 1988. The Swedish establishment coworker statistics plotted in Figure 3 are constructed from 1984 data, and the Swedish firm size statistics used below are constructed from 1987 data. The U.S. size distribution summary statistics draw on data for 1985 and 1987. For the U.S. manufacturing sector, the firm and establishment size distribution summary statistics are computed directly from the establishment-level and firm-level data described in Davis, Haltiwanger and Schuh (1996). In all other cases, the size distribution summary statistics are estimated from data on the number of employees and establishments by employer size class using the algorithm described in Davis (1990).

Table 9 reports several bivariate regressions that relate U.S.–Swedish differences in the industry distribution of nonmanufacturing employment to simple summary measures of the distribution of employees by employer size. Column (2) reports regression results corresponding to the dashed line in Figure 2. Rather remarkably, the Swedish establishment coworker mean accounts for 47 percent of the variation in U.S.–Swedish differences in the industry distribution of nonmanufacturing employment. The point estimate implies that the Swedish employment share is 68 log points lower than the U.S. share for an industry group with a value of the coworker mean two standard deviations below its mean value.

Table 9

The goodness of fit for the nonmanufacturing regression is unaffected when we replace the Swedish establishment coworker mean with the corresponding U.S. measure. In contrast, the Swedish firm coworker mean has much less explanatory power.[16] The inferior performance of the firm-based measure probably arises for several reasons: conceptual ambiguities in defining the scope of a firm, practical difficulties in measuring firm size, and the exclusion of a large fraction of public sector employees in Sweden (relative to the U.S.) when measuring the firm size distribution.

While Figure 2 and Table 9 indicate that Swedish employment is tilted towards industries dominated by larger establishments, we found no evidence that Swedish employment is more concentrated in large establishments than U.S. employment. On the contrary, the U.S. establishment coworker mean exceeds twice the corresponding Swedish value, even though U.S. employment is more heavily concentrated in industries dominated by smaller production units. For nontradables, it is quite natural that firms or establishments are smaller in smaller or less densely populated countries since their size is constrained by the size of the market. But the same pattern holds in the manufacturing sector, which is presumably dominated by tradable goods. The difference may reflect different criteria in the two countries for defining the scope of an establishment, but we can offer no evidence on this score.

A reasonable hypothesis is that smallness of local labor markets in Sweden compared to the U.S. makes it very difficult, *ceteris paribus*, to have equally large establishments in Sweden. For instance, there is no single metropolitan area in Sweden with a population exceeding 1 million inhabitants, while in the U.S. roughly 45 percent of the population

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[16]The available data do not enable us to construct a measure of the U.S. firm coworker mean for several nonmanufacturing industries.

lives in metropolitan areas with a population exceeding 2 million.[17] A simple regression of the employment share of large firms (> 500 employees) using 1991 data for 14 countries from OECD (1994) on total population indicates that total population has a positive and statistically significant relationship to the large firm employment share.[18] In any case, the difficulty of interpreting comparisons of size distribution measures between countries argues in favor of the industry-based focus of our analysis.

We constructed a more disaggregated matched industry-level data set and a richer set of covariates for the manufacturing sector. The disaggregated manufacturing data also show higher shares of Swedish employment in industries dominated by larger employers, but the effect is weaker and less consistent than in the nonmanufacturing sector. *Figure 3* shows a scatterplot of the log employment share ratio against the Swedish establishment coworker log.[19]

Figure 3   Log(Employment Share Ratio versus Swedish Establishment Coworker Log: 67 Manufacturing Industries.

<div align="center">Enclosed</div>

Note: The solid line depicts the size-weighted least squares regression, excluding the Aircrafts and Missiles industry.
Source: Authors' calculations.

Table 10 reports bivariate regressions of the log employment share ratio on several alternative summary measures of the employer size distribution. Unlike for the nonmanufacturing sector, the results show little relationship between the log employment share ratio and summary measures of the U.S. size distribution. For the full sample of manufacturing industries, the U.S. establishment coworker mean actually shows a positive relationship to the log employment share ratio, contrary to the implications of our thesis. This anomalous result disappears when we exclude the

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[17]United Nations, *Demographic Yearbook*, 1995.

[18]We deem it likely that degree of urbanization rather than total population is a better proxy for the effect of the labor market size on the large firm employment share. However, no consistent cross-country measures of urbanization exist. A regression model in log form indicates a population elasticity of the 500+ share of .08 ($t = 1.83$). A regression in levels indicate that an increase in total population of 1 million is associated with an increase in the 500+ share of .06 percentage points ($t = 2.35$).

[19]The coworker log equals the size-weighted mean of log employer size. It equals the expectation of log employer size taken with respect to the distribution of workers by employer size.

Aircraft and Missiles industry, a major outlier in terms of both U.S.-based measures of employer size and the log employment share ratio.[20]

Table 10

Taken as a whole, we interpret the results in Figure 3 and Table 10 as supportive of the hypothesis that Sweden's distribution of employment is tilted towards industries with larger employers, as compared to the United States.[21] Our results for the nonmanufacturing sector in Figure 2 and Table 8 strongly support this hypothesis. Thus, if one accepts our premise that the U.S. industry distribution reflects a comparatively neutral set of policies and institutions, the evidence pushes one to the view that Swedish policies and institutions distorted employment and productive activity away from industries in which smaller businesses play a greater role. Although not speaking directly to the matter, the evidence also suggests that Swedish policies and institutions have distorted employment and productive activity away from smaller businesses within industries.

5.3   The Connection to Other Industry Characteristics

Table 10 also reports regressions of the log employment share ratio on industry-level measures of capital intensity, energy intensity, productivity growth, exposure to international trade, average production worker wages, and job reallocation intensity.[22]

These bivariate regressions for the manufacturing sector identify a number of additional patterns of U.S.–Swedish differences in the industry distribution of employment, notably:

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[20]The U.S. Aircraft and Missiles industry is dominated by large firms and plants that engage in much large-scale production for the U.S. military. There is no comparable source of demand for military aircraft and missile products in Sweden. In this respect, the Aircraft and Missiles industry is a special case, and we report separate results for samples that exclude this industry. Our regression results are typically similar, but stronger and better fitting, when we exclude the Aircraft and Missiles industry.

[21]This conclusion is not much affected, if we exclude the six manufacturing industries in the Wood and Paper Products sector from the regressions in Table 10.

[22]The import penetration ratio in Table 10 equals the value of imports divided by imports plus domestic shipments. The export share equals the value of exports as a fraction of total domestic production. Excess job reallocation measures the extent of simultaneous plant-level job creation and destruction within an industry. It is measured as gross plant level job creation plus gross job destruction minus the absolute value of the net industry employment change, all expressed as a percentage of industry employment. The wage and factor intensity variables that appear in Table 10 are averages of 1987 and 1988 industry level values. The other variables are averages of annual industry-level values over the 1973–88 period. Data on wages, factor intensity, productivity growth and international trade are constructed from the NBER data files described in Abowd (1991). Job reallocation data are from Davis, Haltiwanger and Schuh (1996).

1. Sweden exhibits relatively high employment shares in capital-intensive and energy intensive industries. The point estimate in Table 9 implies that the Swedish employment share is 66 log points higher in an industry with a log capital per worker value two standard deviations above its mean.

2. Sweden exhibits relatively low employment shares in manufacturing industries that experienced rapid total factor productivity growth over the 1973–88 period. The opposite effect holds with respect to labor productivity growth. These results provide no support for the view that Swedish industrial policy directed resources to high productivity growth industries.

3. There is also weak evidence that Sweden's distribution of employment is tilted away from manufacturing industries that exhibit higher rates of excess job reallocation. This finding fits with the view that LAS employment security provisions penalize sectors characterized by less stable establishment-level employment.

4. Sweden exhibits higher employment shares in high-wage industries. The effects are fairly large and tightly estimated. For an industry with a mean hourly wage two standard deviations above the overall U.S. mean (4.92 in 1982 dollars), the point estimate implies that the Swedish employment share is 72 log points greater.

5.4   Multivariate Regression Results

Statistically and quantitatively significant effects of capital intensity, energy intensity, employer size, and wages carry over to multivariate regression specifications as well. See *Table 11*. The multivariate regression results differ from the bivariate results in two main respects. First, the sign of the coefficient on the capital intensity variable switches. That is, once we condition on the other regressors in Table 10, Sweden's employment distribution is actually tilted away from capital-intensive manufacturing industries.[23]

Second, the coefficient on the Swedish establishment coworker mean also switches sign. In this regard, note that the estimated effects on the Swedish firm and establishment coworker means are of the same magnitude. Note, also from Table 11, that the mean and standard deviation are roughly twice as large for the firm coworker mean as for the establishment coworker mean. Thus, the multivariate specifications also indicate that, on net, the Swedish distribution of employment is tilted away from industries in which smaller employers play a greater role.

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[23]No single covariate accounts for the reversal in the coefficient sign of the capital intensity variable.

Table 11

Our multivariate regression analysis also reveals an interesting nonlinearity in the relationship between the industry wage structure and U.S.–Swedish differences industry distribution of employment. In particular, if we think in terms of low-wage, medium-wage and high-wage industries, Sweden's distribution of manufacturing employment is sharply distorted away from low-wage industries and towards higher wage, but especially, medium-wage industries. To state the point more precisely, consider three industries. Suppose that industry 1 pays a mean wage five dollars (about two standard deviations) below the overall mean manufacturing wage, industry 2 pays a mean wage equal to the overall mean, and industry 3 pays a mean wage five dollars above the overall mean. Then, the estimated wage effects in column (3) of Table 12 imply that the U.S.–Swedish employment share ratio is 161 log points higher in industry 1 than in industry 2 (conditional on the other regressors). But the implied employment share ratio is only 61 log points higher in industry 2 than in industry 3. These are enormous effects, and the nonlinearity is a sharp one. Thus, the regression results confirm that the Swedish distribution of employment is tilted towards higher wage industries, but this tilt primarily reflects small employment shares in low wage industries and only secondarily reflects large employment shares in high wage industries.

This finding is highly consistent with the findings of Nilsson and Zetterberg (1987). In a comparison to four other countries (the U.S., Norway, Denmark and Finland) they find that Swedish manufacturing has been restructured in the following way in the 1963–80 period: away from fast-growing industries, away from high-wage industries, towards industries with stable demand, and towards medium-wage industries. Edin and Topel (1997) also develop complementary evidence that Sweden's centralized wage-setting system tilted employment away from low-wage industries.

We examined the sensitivity of the regression results in Tables 10 and 11 to the exclusion of the six manufacturing industries in the Wood and Paper Products sector. Leamer and Lundborg (1997), for example, argue that relatively high Swedish employment shares in these industries reflect natural comparative advantage. Our results are not greatly affected by excluding these industries, except for results that pertain to the factor intensity measures.[24]

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[24]In both the bivariate and multivariate specifications, the effects of the capital intensity and energy intensity variables are greatly attenuated when we exclude these industries. In many specifications, the factor intensity variables are statistically insignificant. The overall goodness of fit of the regressions deteriorates somewhat when we exclude the six industries. For the multivariate specifications in Table 11, the adjusted R^2 values decline by 7 to 12 percentage points.

5.5   Summary

In summary, we uncovered systematic and quantitatively important U.S.–Swedish differences in the industry distribution of employment. For the most part, the pattern of these differences fits well with the distortions we anticipated from our characterization of Swedish economic policies and institutions. In particular, Sweden's employment distribution is tilted sharply away from lower wage industries and industries in which smaller employers play a greater role.

On balance, we conclude that tax policy, credit policy, the national pension system, employment security provisions and Sweden's system of centralized wage bargaining probably caused large distortions in the industry distribution of Swedish employment. It stands to reason that these aspects of the Swedish system also seriously distorted the structure of employment within industries, but the limitations of our data preclude a direct assessment of that hypothesis.

6.   Conclusion

The economic policy environment in Sweden prior to 1990 strongly disfavored younger and smaller businesses, preferentially treated capital-intensive firms and sectors, and discouraged direct individual and family ownership of businesses relative to institutional ownership. The Swedish tax system played a major role in each of these respects. Its effects on the industry distribution and the organization of business activity were reinforced by several other aspects of the policy environment: employment security laws that effectively imposed greater burdens on smaller businesses, credit market policies that favored more established and capital-intensive firms, a national pension system that contributed to the dominant position of institutional investors and large firms, a centralized wage-setting institution that successfully compressed the structure of relative wages, and a rapid expansion of the public sector into areas of the economy that would otherwise have offered considerable scope for self employment and small business activity.

Several pieces of evidence support our thesis that these aspects of the policy environment had important effects on the industry distribution of employment and the organization of business activity in Sweden. First, taking the U.S. industry distribution as a benchmark that reflects a comparatively neutral set of policies and institutions, Sweden's employment distribution is sharply tilted away from low-wage industries and industries with greater employment shares for smaller firms and establishments. Second,

throughout the 1970s and 1980s Sweden had the lowest rate of self employment among all OECD countries. Third, Sweden has an unusually high share of employment in large firms compared to other European countries and an unusually high concentration of corporate ownership and control.

In a companion paper to this one, we are examining the evolution over time of U.S.–Swedish differences in the industry distribution of employment. We gather detailed data on the industry distribution of employment in each country at regular intervals from 1960 to 1994. Our objective is to relate the timing of any divergence or convergence in the industry distribution of employment to changes in the Swedish policy environment. As we discuss in the companion paper, many Swedish economic policies that are likely to influence the industry distribution of employment were introduced in the 1950s and 1960s and then later relaxed or repealed in the mid 1980s or early 1990s.

We strongly suspect that our thesis regarding the reasons for U.S.–Swedish differences in the industry distribution of employment and for the predominance of big business in Sweden applies to other cross-country comparisons. As of the mid-1980s, there were large variations in tax structures among OECD economies (Fukao and Hanazaki, 1987). An interesting issue for future research is the role these differences play in accounting for international differences in the size and industry distribution of employment. To the extent that the tax system is an important determinant of the structure of employment, the tax reform wave of the 1980s – which largely evened out cross-country differences in corporate taxation among OECD countries (OECD, 1991) – offers some basis for projecting a movement towards greater similarity among wealthy countries in the industry and size distribution of employment. Since other factors, many of which are highlighted in this paper, also influence these aspects of the employment structure, such changes may be difficult to detect until systematic and in-depth studies are undertaken for a large number of countries. Such studies require much care in spelling out the characteristics and implications of country-specific institutions. No doubt, a fuller evaluation of our thesis regarding national differences in the size and industry distribution of employment would benefit from the concerted efforts of a large network of scholars in a broad range of countries. Perhaps our study can inspire an undertaking of this kind.

References

Abowd, J.M. (1991), "Appendix: The NBER Immigration, Trade and Labor Market Data Files." In Abowd, J.M. and Freeman, R.B. (eds.), *Immigration, Trade, and the Labor Market.* Chicago: University of Chicago Press.

Acs, Z.J. and Audretsch, D.B., (1988), "Innovation in Large and Small Firms: An Empirical Analysis." *American Economic Review* **78**(4), 678–690.

Acs, Z.J. and Audretsch, D.B., (1990), *Innovation and Small Firms*. Cambridge, MA: MIT Press.

Acs, Z.J. and Audretsch, D.B. (eds.), (1993), *Small Firms and Entrepreneurship: An East West Perspective*. Cambridge: Cambridge University Press.

Albæk, K., Arai, M., Asplund, R, Barth, E. and Strøyer Madsen, S. (1995), "Employer Size-Wage Effects in the Nordic Countries." Helsingfors: ETLA Discussion Papers No. 532.

Ashgarian, H. (1993), "Inter-industry Differences in Capital Structures." Department of Economics, University of Lund. Mimeo.

Barron, J.M., Black, D.A. and Loewenstein, M.A. (1987), "Employer Size: The Implications for Search, Training, Capital Investment, Starting Wages and Wage Growth." *Journal of Labor Economics* **7**(1), 76–89.

Braunerhjelm, P. and Carlsson, B. (1993), "Entreprenörskap, småföretag och industriell förnyelse 1968–91." *Ekonomisk Debatt* **21**(4), pp. 317–328.

Brown, C., Hamilton, J. and Medoff, J. (1990), *Employers Large and Small*. Cambridge, MA: Harvard University Press.

Brown, C. and Medoff, J. (1989), "The Employer Size Wage Effect." *Journal of Political Economy* **97**(5), pp. 1027–1059.

Commission of the European Communities (1993), *Employment in Europe.* Luxembourg: Official Publications of the European Community.

Davis, S.J. (1990), "Size Distribution Statistics from County Business Patterns Data." Unpublished manuscript.

Davis, S.J. (1992), "Cross-Country Patterns of Change in Relative Wages." *NBER Macroeconomics Annual Vol. 7*, pp. 239–292.

Davis, S.J. (1997), "Sorting, Learning, and Mobility When Jobs Have Scarcity Value: A Comment." *Carnegie-Rochester Conference Series on Public Policy,* **46**.

Davis, S.J. and Haltiwanger, J. (1989), "The Distribution of Employees by Establishment Size: Patterns of Change and Comovement in the United States, 1962–85." Mimeo, University of Chicago and University of Maryland.

Davis, S.J. and Haltiwanger, J. (1991), "Wage Dispersion between and within U.S. Manufacturing Plants." *Brookings Papers on Economic Activity: Microeconomics*, pp. 115–180.

Davis, S.J. and Haltiwanger, J. (1996), "Employer Size and the Wage Structure in U.S. Manufacturing." *Annales d Économie et de Statistique*, No. 41–42, January/June.

Davis, S.J., Haltiwanger, J. and Schuh, S. (1996), *Job Creation and Destruction*. Cambridge, MA: MIT Press.

Davis, S.J. and Henrekson, M. (1997), "Industrial Policy, Employer Size and Economic Performance in Sweden." In Freeman, R.B., Swedenborg, B. and Topel, R. (eds.), *The Welfare State in Transition*. Chicago: University of Chicago Press.

Edin, P.A. and Holmlund, B. (1995), "The Swedish Wage Structure: The Rise and Fall of Solidarity Policy?." In Freeman, R. and Katz, L. (eds.), *Differences and Changes in Wage Structures*. Chicago: Chicago University Press.

Edin, P.A. and Topel, R. (1997), "Wage Policy and Restructuring – The Swedish Labor Market Since 1960." In Freeman, R.B, Swedenborg, B. and Topel, R. (eds.), *The Welfare State in Transition*. Chicago: University of Chicago Press.

Eliasson, G. (1965), "Investment Funds in Operation." Occasional Paper 2. Stockholm: National Institute of Economic Research.

European Observatory for SMEs (1995), *Third Annual Report 1995.* Zoetermeer, Nederländerna: EIM Small Business Research and Consultancy.

Familjeföretagens skatteberedning (1988, 1989), "Nyckeln till familjeföretagen." Mimeo.

Fazzari, S., Hubbard, G. and Petersen, B.]1988], "Financing Constraints and Corporate Investments." *Brookings Papers on Economic Activity*, No. 1, 141–195.

Fukao, M. and Hanazaki, M. (1987), "Internationalization of Financial Markets and the Allocation of Capital." *OECD Economic Studies*, No. 8, pp. 35–92.

Fölster, S. and Peltzman, S. (1997), "The Social Cost of Regulation and Lack of Competition in Sweden." In Freeman, R.B., Swedenborg, B. and Topel, R. (eds.), *The Welfare State in Transition*. Chicago: University of Chicago Press.

Forsling, G. (1996), "Utilization of Tax Allowances: A Survey of Swedish Corporate Firms, 1979-93." Tax Reform Evaluation Report 22. National Institute of Economic Research, Stockholm.

Gertler, M. and Gilchrist, S. (1994), "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms." *Quarterly Journal of Economics* **109**(2), 309–340.

Henrekson, M. in collaboration with Davis, S.J. (1996), *Företagandets villkor   Spelregler för sysselsättning och tillväxt*. Stockholm: SNS Förlag.

Hibbs, D.A., Jr (1990), "Wage Compression under Solidarity Bargaining in Sweden." In Persson-Tanimura, I. (ed.), *Generating Equality in the Welfare State: The Swedish Experience*. Oslo: Norwegian University Press.

Hutchinson, R.W. (1995), "The Capital Structure and Investment Decisions of the Small Owner-Managed Firm: Some Exploratory Issues." *Small Business Economics* **7**(3), 231–239.

Jonung, L. (1993), "Riksbankens politik 1945–1990." In Werin, L. (ed.), *Från räntereglering till inflationsnorm*, Stockholm: SNS Förlag.

Jovanovic, B. (1979), "Job Matching and the Theory of Turnover." *Journal of Political Economy, **87**, 972-990.

Jovanovic, B. and Y. Nyarko (1997), "Stepping Stone Mobility," *Carnegie-Rochester Conference Series on Public Policy, **46**.

Kazamaki Ottersten, E. (1994), "Yrkeskompetens och rekryteringskrav." In Eliasson, G. and Kazamaki Ottersten, E., *Om förlängd skolgång*. Stockholm: Almqvist & Wiksell International.

King, M.A. and Fullerton, D. (eds.), (1984), *The Taxation of Income from Capital. A Comparative Study of the United States, the United Kingdom, Sweden and West Germany*. Chicago: Chicago University Press.

Leamer, E.E. and Lundborg, P. (1997), "A Heckscher-Ohlin View of Sweden Competing in the Global Marketplace." In Freeman, R.B, Swedenborg, B. and Topel, R. (eds.), *The Welfare State in Transition*. Chicago: University of Chicago Press.

Loveman, G. and Sengenberger, W. (1991), "The Reemergence of Small-Scale Production: An International Comparison." *Small Business Economics* **3**(1), pp. 1–37.

McLure, C.E., Jr and Norrman, E. (1997), "Tax Policy in Sweden." In Freeman, R.B, Swedenborg, B. and Topel, R. (eds.), *The Welfare State in Transition*. Chicago: University of Chicago Press.

Myrdal, G. (1944), "Höga skatter och låga räntor." In *Studier i ekonomi och historia tillägnade Eli F. Heckscher*. Uppsala: Almqvist & Wicksell.

Nilsson, C. and Zetterberg, J. (1987), *Lönestruktur och strukturella arbetsmarknadsproblem.* Report No. 10 to the 1987 *Medium-Term Survey* (SOU 1987:3). Stockholm: Allmänna Förlaget.

OECD (1991), *Taxing Profits in a Global Economy. Domestic and International Issues*. Paris.

OECD (1994), "Job Gains and Job Losses in Firms." *OECD Employment Outlook*, July, 103–135.

Pontusson, J. (1992), *The Limits of Social Democracy. Investment Politics in Sweden*. Ithaca: Cornell University Press.

Rasmussen, P.-H. (1993), *Stillingsværn: Virkninger for ungdom.* SNF-rapport 79/93. Bewrgen: Stiftelsen for samfunns- och næringslivsforskning.

Rudberg, K. and Öhman, C. (1971), "Investment Funds – The Release of 1967." Occasional Paper 5. Stockholm: National Institute of Economic Research.

Schwalbach, J. (1994), "Small Business Dynamics in Europe." *Small Business Economics* **6**(1), 21–25.

SOU 1992:19, *Långtidsutredningen 1992*. Stockholm: Allmänna Förlaget.

Storrie, D.W. (1994), "Regleringar av visstidsanställningar i kollektivavtal. Konsekvenser av 1994 års lagstiftning." Report No. 30 from EFA, Ministry of Labor, Stockholm.

Södersten, J. (1984), "Sweden." In King, M.A. and Fullerton, D. (eds.), *The Taxation of Income from Capital. A Comparative Study of the United States, the United Kingdom, Sweden and West Germany*. Chicago: Chicago University Press.

Södersten, J. (1989), "The Investment Funds System Reconsidered." *Scandinavian Journal of Economics* **91**(4), 671–687.

Södersten, J. (1993), "Sweden." In Jorgenson, D.W. and Landau, R. (eds.), *Tax Reform and the Cost of Capital. An International Comparison*. Washington D.C.: Brookings.

Williamson, O.E. (1985) *The Economic Institutions of Capitalism.* New York: The Free Press.

Table 1   Non-agricultural Self-employment as a Proportion of Civilian Employment in OECD Countries, 1973, 1979, 1986 and 1990.

Country	1973	1979	1986	1990
Australia†	9.5	12.4	12.7	12.4
Austria	11.7	8.9	6.1	6.4
Belgium	11.2	11.2	12.6	12.9
Canada†	6.2	6.7	7.2	7.4
Denmark	9.3	9.2	7.0	7.2
Finland	6.4	6.1	6.8	8.8
France†	11.4	10.6	10.5	10.3
Germany	9.1	8.2	7.6	7.7
Greece	n.a.	32.0	27.5	27.2‡
Ireland	10.1	10.4	11.3	13.3
Italy	23.1	18.9	21.6	22.3
Japan†	14.1	14	12.7	11.5
Luxembourg	11.1	9.4	8.4	7.1
Netherlands†	n.a.	8.8	8.2	7.8
New Zealand†	n.a.	9.5	13.3	14.6
Norway†	7.8	6.6	6.5	6.1
Portugal	12.7	12.1	16.9	18.5
Spain	16.3	15.7	17.9	17.1
Sweden†	*4.8*	*4.5*	*4.2*	*4.5*
Turkey	n.a.	n.a.	n.a.	27.6
United Kingdom†	7.3	6.6	10.0	11.6
United States†	6.7	7.1	7.4	7.6

†Excluding owner-managers of incorporated businesses (in the U.K. data this category is partly included).
‡1989.
Note: The OECD finds that the share of employment in Sweden attributable to self-employment increased from 4.2 to 7.0%, i.e., by 67% between 1986 and 1990. This finding is a result of the fact that OECD gathers its data on Sweden from the *Labor Force Surveys* (AKU). Between 1986 and 1987, the AKU altered its definition of "self-employed" which boosted the number of self-employed in that period by over 100,000, or 2.5 percentage points. The difference was that those who before 1987 had called themselves "self-employed", but who ran their firm in the form of a limited company were re-classified as "employees". However, if one uses the national accounts, where the definition of "self-employed" remained unaltered, this increase does not appear.
Source: *OECD Employment Outlook*, July 1992, p. 158.

Table 2   Effective Marginal Tax Rates for Different Combinations of Owners and
Sources of Finance, 1960, 1970, 1980, 1985 and 1991 (real pre-tax rate of
return 10% at actual inflation rates).

	Debt	New share issues	Retained earnings
1960			
Households	27.2	92.7	48.2
Tax exempt institutions	–32.2	31.4	31.2
Insurance companies	–21.7	41.6	34.0
1970			
Households	51.3	122.1	57.1
Tax exempt institutions	–64.8	15.9	32.7
Insurance companies	–45.1	42.4	41.2
1980			
Households	58.2	136.6	51.9
Tax exempt institutions	–83.4	–11.6	11.2
Insurance companies	–54.9	38.4	28.7
1985			
Households	46.6	112.1	64.0
Tax exempt institutions	–46.8	6.8	28.7
Insurance companies	–26.5	32.2	36.3
1991			
Households	31.7	61.8	54.2
Tax exempt institutions	–9.4	4.0	18.7
Insurance companies	14.4	33.3	31.6

Note: All calculations are based on the actual asset composition in manufacturing. The following
inflation rates were used: 1960: 3%, 1970: 7%, 1980: 9.4%, 1985: 5%, 1991: 5%. The calculations
conform to the general framework developed King and Fullerton (1984). The average holding period is
assumed to be 10 years.
Source: Jan Södersten.

Table 3   The Effective Average Rate of Corporate Taxation for Firms of Different Size and Ownership, 1984–87.

	Employment	1984	1985	1986	1987
Family-	0–19	20	24	27	30
owned	20–49	16	24	24	27
firms	50–199	16	20	22	26
	200–	19	14	19	17
Other firms		14	19	18	21

Source: Familjeföretagens skatteberedning (1989).

Table 4   The Estimated Marginal Tax Wedge for Business Capital
at a 5 Percent Real Interest Rate and the 1985 Inflation Rate

(percentage points)

		Machinery	Buildings	Total Business Capital
U.S.	Old	–5.26	–2.41	–3.25
	New	–2.32	–0.68	–1.16
Japan		–1,67	–0.81	–1.08
Germany		–2.37	–2.40	–2.38
France		–3.45	–3.29	–3.35
U.K.	Old	–5.55	–3.21	–4.58
	New	–3.03	–1.67	–2.46
Italy		–3.85	–3.95	–3.91
Canada	Old	–3.61	–2.22	–2.77
	New	–1.53	–1.28	–1.38
Australia		–7.98	–2.31	–4.78
Belgium		–6.95	–4.39	–5.51
Netherlands		–4.52	–2.17	–3.20
Spain		–6.21	–4.64	–5.32
Sweden		*9.11*	*5.09*	*7.05*

Source: Fukao and Hanazaki (1987).

Table 5   Average Effective Marginal Tax Rates on Corporate Profits
Four Countries in 1980
(10% real pre-tax rate of return and actual inflation rates)

	U.K.	Sweden	Germany	U.S.
Households	42.0	105.1	71.2	57.5
Tax-exempt institutions	–44.6	–51.8	6.3	–21.5
Insurance companies	–6.7	35.6	48.1	37.2

Note: The figures in the table constitute the averages for each category, given its specific investment pattern in the respective countries.
Source: King and Fullerton (1984).

Table 6   The Estimated Marginal Tax Wedge for Housing Investment in 1985
5 Percent Real Interest Rate and the 1985 Inflation Rate
(percentage points)

		Borrowing case	Asset draw down case
U.S.	Old	–5.26	–2.41
	New	–2.32	–0.68
Japan		–1,67	–0.81
Germany		–2.37	–2.40
France		–3.45	–3.29
U.K.		–5.55	–3.21
Canada		–3.61	–2.22
Australia		–7.98	–2.31
Sweden		*9.11*	*5.09*

Source: Fukao and Hanazaki (1987).

Table 7 Net Saving as a Percentage of GDP, Annual Averages 1950–92.

	1950–59	1960–69	1970–79	1980–92
Total	11.9	14.7	11.5	4.3
Household	4.5	3.6	2.1	0.9
Corporate	4.0	2.6	3.0	3.7
Consolidated government	3.4	8.4	6.4	–0.4

Source: Statistics Sweden, National Accounts.

Table 8 Differences in the Industry Distribution of Employment, Sweden[a] and the United States,[b] Selected Industries.

		Percent of Employment			*Log Ratio[c]*
Country		Sweden	Sweden	USA	
Year		1987	1992	1987/88	1987/88
Industry[d]					
Motor Vehicles		2.6	2.2	1.1	−.89
Fabricated Metals		3.0	2.6	1.3	−.85
Primary Metals		1.4	1.0	.6	−.79
Wood and Paper Products		3.6	3.2	1.8	−.71
Ships and Rail Equip.		.4	.3	.2	−.63
Machinery and Equip.		5.7	4.6	3.3	−.55
Health, Education, Social Services and Community Org.[e]		30.8	33.0	19.8	−.44
Food and Drink		2.0	1.9	1.4	−.34
Transportation and Public Utilities		9.4	9.4	6.8	−.33
Construction		5.9	6.3	4.7	−.23
Personal and Household Services[f]		1.0	1.0	1.4	.34
Real Estate ad Business Services		5.2	6.4	8.5	.49
Insurance		1.1	1.1	1.9	.55
Retail Trade		6.6	6.5	12.0	.60
Financial Institutions		1.6	1.7	3.0	.62
Textiles and Apparel		1.0	.5	1.8	.65
Instruments		.4	.4	.9	.94
Aircraft and Missiles		.2	.2	.8	1.09
Restaurants and Hotels		1.9	1.9	7.1	1.34

Notes:

[a]The Swedish employment data are tabulated by Statistics Sweden and cover all economic sectors.

[b]The U.S. industry-level data are from the 1988 County Business Patterns data (nonmanufacturing) and the 1987 Longitudinal Research Data Base (manufacturing). Together, these two data sets cover the population of tax-paying private business establishments with one or more paid employees, excluding agricultural production, railroad and household employment. We supplemented these private-sector data with 1988 BLS Establishment Survey data on public sector employment in hospitals, education, transportation, public utilities, and the postal service. The industry-level U.S. data exclude self-employed persons, but employment shares are calculated as the ratio of industry employment to total civilian employment including self-employed persons.

[c]The log of the industry's U.S. employment share minus the log of the industry's Swedish employment share. The industries are ordered by ascending values of this quantity in the table.

[d]Industrial classifications are based on the authors' concordance between the 1987 U.S. Standard Industrial Classification (SIC) system and the Swedish Standard Industrial Classification of All Economic Activities (SNI). The document on the Swedish SNI is dated 1985.

[e]The U.S. data do not include all public sector social service employees and, hence, understate the relative U.S. employment share in this category.

[f]Because the U.S. data do not include domestic household workers and self-employed persons, they substantially understate the relative U.S. employment share in this category.

Source: Authors' calculations.

Table 9 U.S.–Swedish Industry Employment Share[a] Ratio Regressions: Summary Statistics[b] and Regressions[c] for Nonmanufacturing Industries.

Dependent variable: $\log\left(\dfrac{U.S.\ \text{Industry Employment Share}}{\text{Swedish Industry Employment Share}}\right) \times 100$

Mean: 3.07   Standard Deviation: 12.76

Regressor[c]	*Mean* *(St. Dev.)*	*Regression Slope Coefficients* *(Standard Errors)*			
	(1)	(2)	(3)	(4)	(5)
Swedish Establ. Coworker Mean	199.2 (72.3)	−.471 (.1329			−.267 (.199)
Swedish Firm Coworker Mean	710.6 (542.2)		−.011 (.029)		
U.S. Establ. Coworker Mean	460.0 (327.4)			−.118 (.033)	−.067 (.050)
Adjusted R^2		.473	−.072	.473	.506

Notes:
[a]There are fourteen industry-level observations for each variable.
[b]All summary statistics are computed as employment-weighted quantities.
[c]All regressions include a constant and are weighted by the U.S.–Swedish average value of the industry employment share.
[d]The Swedish firm coworker mean and the U.S. establishment coworker mean are computed from private sector data only. The Swedish establishment coworker mean is computed from data that covers the public and private sectors.
Source: Authors' calculations.

Table 10   U.S.–Swedish Industry Employment Share Ratio Regressions: Summary
Statistics[a] and Bivariate Regressions[b] for Manufacturing Industries.

Dependent variable: $\log \left(\dfrac{\text{U. S. Industry Employment Share}}{\text{Swedish Industry Employment Share}} \right) \times 100$

Regressor[c]	Mean	Std Dev.	Regr. Coeff.	Std Error	Sample Size[d]	Adj. R^2
Swed. Est. Coworker Mean[e]	703.8	781.7	–.029	.01	66	.094
Swed. Est. Coworker Log	5.25	1.064	–41.7	39.9	67	.046
Swed. Est. Coworker Log[e]	5.22	1.041	–26.5	7.14	66	.165
Swed. Firm Coworker Mean	1338.4	1255.5	–.025	.006	66	.21
Swed. Firm Coworker Log	5.76	1.33	–16.9	6.03	67	.094
Swed. Firm Coworker Log[e]	5.79	1.32	–22.4	5.54	66	.19
U.S. Est. Coworker Mean	1510.1	2452.6	.0087	.0041	67	.05
U.S. Est. Coworker Mean[e]	1029.4	1122.5	–.004	.007	66	–.012
U.S. Firm Coworker Mean[e]	25537	41223	–.00029	.00017	66	.029
U.S. Log(Capital/Worker)	2.96	.71	–46.8	10.4	65	.23
U.S. Log(Energy/Worker)	.578	.864	–33.8	8.29	65	.196
U.S. Excess Realloc. Rate	.141	.03	539.2	263.5	65	.048
U.S. Labor Prod. Growth	.073	.011	–1492	675	65	.057
U.S. TFP Growth Rate	.0018	.0091	2078	900	65	.063
U.S. Export Share	.086	.077	12.7	117.2	65	–.016
U.S. Import Penetr. Ratio	.075	.054	–67.4	165.5	65	–.013
U.S. PW Hourly Wage	10.5	2.63	–11.15	2.88	65	.18
U.S. PW Hourly Wage	10.26	2.46	–14.57	2.53	64	.338

Notes:
[a]All summary statistics are computed as employment–weighted quantities.
[b]All regressions include a constant and are weighted by the U.S.–Swedish average value of the industry employment share.
[c]The Swedish firm coworker mean and the U.S. establishment and firm coworker means are computed from private–sector data only. The Swedish establishment coworker mean is computed from data that covers the private and public sectors.
[d]The sample size varies because of missing observations on some variables.
[e]Excludes the Aircraft and Missiles industry.
Source: Authors' calculations.

Table 11   U.S.–Swedish Industry Employment Share Ratio Regressions:
Multivariate Regressions for Manufacturing Industries.

Dependent variable: $\log \left(\dfrac{\text{U. S. Industry Employment Share}}{\text{Swedish Industry Employment Share}} \right) \times 100$

Regressor	Regression Coefficients			(Standard Errors)		
	(1)	(2)	(3)	(4)[a]	(5)	(6)[a]
U.S. Establishment	0.0105					
Coworker Mean	(.0083)					
U.S. Firm	–.0000					
Coworker Mean	(.0002)					
Swedish Establishment		.0354	.0368	.0442	.0381	.0454
Coworker Mean		(.0145)	.0141	(.0161)	(.0141)	(.0155)
Swedish Firm		–.0323	–.0398	–.0403	–.0418	–.0443
Coworker Mean		(.0091)	(.0094)	(.0108)	(.0100)	(.0106)
U.S. Log(Capital/Worker)	–2.18	53.14	70.08	52.36	62.7	40.9
	(21.96)	(22.49)	(23.15)	(26.16)	(23.87)	(25.85)
U.S. Log(Energy/Worker)	–10.7	–34.66	–45.53	–50.69	–43.99	–46.8
	(15.0)	(12.72)	(13.31)	(15.21)	(13.32)	(14.83)
U.S. Excess Reallocation	–481	–646.8	–506.2	–632.6	–403	–409.2
Rate	(347)	(312.6)	(309.7)	(353.9)	(320.4)	(357.2)
U.S. Production Worker	–17.5	–22.55	–22.21	–17.28	–18.37	–10.59
Hourly Wage	(5.5)	(5.21)	(5.05)	(5.65)	(5.96)	(6.25)
U.S. Absolute Deviation			9.94	12.15	8.37	8.7
from Mean Wage[b]			(4.58)	(5.23)	(4.75)	(5.3)
U.S. Total Factor					1021	2000
Productivity Growth					(853)	(908)
Observations	64	64	64	65	64	65
Adjusted R^2	.35	.451	.484	.395	.488	.433

Notes:
[a]Includes the Aircraft and Missiles industry. The other regressions reported in this table exclude
Aircraft and Missiles.
[b]This variable equals the absolute deviation from the employment–weighted mean hourly wage for
production workers in the U.S. manufacturing sector. It has a weighted mean value of 2.118 and a
weighted standard deviation of 1.563.
See also notes *b* and *c* in Table 10.
Source: Authors' calculations.