

The Central Role of Services in Economic Development: Externalities, Growth, and Public Policy*

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Strategic services play a pivotal, but largely unrecognized, role in the early growth and development of market economies. The failure to appreciate their importance at early stages of development has led to the selection of policies which often fail to support the growth of service industries, thus limiting the development of all sectors.

It is well recognized that division of labor is a major source of economic development and growth. In this paper, strategic (or organizational) services are shown to be an integral part of this progressive division of labor, and therefore of development itself. In addition, strategic services generate positive externalities which affect all other sectors in the economy, and therefore create an opportunity for supportive public policies. These positive externalities are eventually overwhelmed by the negative effects of service network congestion and rising average costs as the service industry matures.

Industrialized countries are in a unique position to offer information concerning the evolution of services throughout the entire market development process from the early stages through maturity. The United States, having arguably traveled farthest down the road toward deregulation of its service industries, provides a particularly good case study for determining the role of services in market development as well as the evolution of public policy relating to services during the development process. An empirical study of forty years of U.S. service

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data supports the theoretical assertions regarding the early importance and the dynamic path of service industry development and therefore the changing policy prescriptions. The lessons are then applied to the case of developing economies.

I. The Pivotal Role of Services in Early Development

A. Introduction

Developing countries, as is the case with all countries, struggle with the problem of allocating scarce resources among unlimited needs. Throughout the post-War decades, successive areas of need have been identified, targeted, and eventually replaced by other areas which have gained prominence in the development literature. The focus has variously fallen on promoting industrialization, improving agricultural productivity, and providing basic needs. The strategic service industry, however, has been largely neglected under the assumption that services represent tertiary production and should be dealt with only at higher stages of per capita income.

This pervasive assumption about the tertiary role of services overlooks the crucial role played by a special subset of services — the organizational services — in the early growth and development of market economies. Failure on the part of many governments to appreciate this pivotal role, especially at initial stages of development, has led to selection of policies that often fail to support the growth of service industries, thus limiting the development of all sectors. Furthermore, this neglect of services in early market development is not unique to developing countries, but also plagues transitional economies currently in the process of creating market structures from the remnants of command economies.

While the vital role of services in the earliest stages of economic development is commonly overlooked, the related issue of division of labor is better understood. As recognized by early authors such as Smith (1976) and Young (1928), as well as such current authors as Romer (1986, 1987), Yang (1988), and Yang and Borland (1991), the progressive division of labor is a major source of economic development and growth. In this paper, strategic (or organizational) services are shown to be an integral part of this progressive division of labor, and therefore of development itself.

In order to understand the dynamic evolution of service industries and their relationship to all phases of development, we must look to the

experience of mature industrialized countries which can offer information concerning this evolution throughout the entire market development process from the earliest stages to maturity. The United States, having arguably traveled farthest down the road toward deregulation of its service industries, provides a particularly good case study for determining the role of services in market development as well as the benefits of early public support for services and the detrimental effects of continuing such support as the market matures.

In Section B commodities are examined in terms of their economic functions, leading to the definition of a special class of commodities referred to as *organizational services*. It is these services which are shown to play a critical role in the economic health of the economy, as they facilitate all other production, thereby generating positive externalities as the service networks expand. In early stages of service development, these externalities are further enhanced by scale economies in service production, but are eventually overshadowed by rising costs as the industry matures. This dynamic path of benefits and costs creates an optimal early role for supportive public policy as well as a need for timely dismantling of public support. Most developing and transitional countries are clearly in the early stages characterized by positive externalities and the need for supportive government policies.

The specific role of organizational services throughout the development process is then explored, with emphasis placed on the considerable dependence of other (agricultural and manufacturing) production on the adequate provision of organizational services. The complete evolution of service industries within the context of successful market economies is then presented, tracing the development of services from infancy through maturity using regulatory history combined with forty years of empirical analysis. The knowledge gained from this investigation is then applied to the case of developing countries to form policy recommendations.

B. Organizational Services and Externalities

The word "services" is often misinterpreted to refer only to low-skilled, labor-intensive occupations like haircuts and shoeshines, which fulfill final consumer demands. Here we focus on a very different type of strategic service industry which is central to economic development — the *organizational service*¹ — which structures and facilitates the pro-

¹ For a full explanation of service roles and definitions, see Rask, 1989.

duction or distribution system. These services are not final products for consumers. Their role is to enhance the ability of private firms to produce their outputs. Therefore, these services have a direct impact on individual firm production. Examples of organizational services include financial, retail, transportation, and telecommunications services.²

The impact of services on user firms goes far beyond a simple supplier-firm relationship, however, displaying a dynamic growth path through time. In the early stages of development, utilization of services by only a few firms results in high unit costs and limited returns to both the user firms and society. However, as more individual user firms purchase externally provided services, a service network is created, and as a consequence, two categories of benefits are generated. The first is a straightforward cost economy for the user firms, including cost reductions over time in the use of services due to such factors as technological change and scale economies within the service industry itself. The second, and less tangible, benefit is that accruing directly to existing user firms in the form of enhanced production and distribution opportunities derived from additional service users as they are added to the network. This second category of benefits is the service-use externality and is described in more detail below.

The presence of external benefits creates a role for public policy in encouraging expansion of the network beyond the level that private firms would choose. Potential new users would generate gains for society if they joined the network, but they calculate only their private gains in making that decision. A subsidy to service use would internalize these external gains, resulting in a more efficient outcome.

As the organizational service networks expand and mature, scale economies decline and are eventually replaced by diseconomies in service production. At this stage, overcrowding and congestion of the networks combine with rising costs to offset the positive externalities of further enlarging the network. An individual user firm may still benefit from using the services, but the net external benefits, and therefore the rationale for continued public support, has disappeared. Public subsidies, then, must also decline and eventually be eliminated.

The simplest example of these positive and negative effects can be found in the telecommunications industry. An individual telephone

² These services can also be used by consumers as final demand commodities. *Organizational services* refers only to those portions of services used in production and distribution, leaving, for example, telephone conversations with relatives in the final demand category.

becomes much more valuable when connected to a second telephone, and the value continues to increase as more phones are added to the network. Externalities result from the fact that while the user of a telephone benefits from the addition of further units, the individual user does not *cause* the units to be added. Therefore, as each new user joins the network, previous users directly benefit from that action, over which they had no control.

Once an economy has become "saturated" with communications services, and additional users bring congestion to the system, the positive externalities generated by new users become overshadowed by the rising costs and negative effects of a crowded system. Whereas firms without telephones continue to benefit individually from joining the network, society as a whole does not. This transformation signals the realization of a mature service economy, and generally the end of justification for continued public support of services. Most service industries in developing economies have clearly not reached this point and are at an early stage with potentially very large positive externalities.

Other examples of these external effects come from financial services and more recently from information networks like the Internet. As more lenders and borrowers participate in the financial services industry, the diversity and quality of financial products (e.g., credit instruments, investment options) is enhanced for all users. As the network expands further, service delays become more prevalent and negative effects begin to dominate. In terms of information networks, the introduction of the Internet yielded enormous benefits to users as each new institution joined the network. As the Internet has become increasingly popular, however, accessing the network has become more difficult for individual users, often resulting in frustrating delays. Whereas there are still benefits to users of remaining linked through the Internet, there are also negative effects imparted to others as a result of the congestion in the network. Similar examples can be derived from all the organizational service networks.

The early stages of service industry development, then, are characterized by the tendency for new users of service networks to generate positive external benefits for existing users. It is the presence of these positive externalities that establishes a role for public policy in the form of service use subsidies. These positive net benefits, and therefore the need for public subsidy, will not persist indefinitely. As service industries mature and average costs begin to rise, new users also bring congestion to the system and the net impact on existing users gradually declines and then turns negative.

It is not possible to determine precisely the point at which the negative effects completely offset the positive externalities of new users. The theoretical link between users joining an organizational service network and imparting positive externalities to other users has been demonstrated above. In addition, these externalities continue to be generated but at a declining rate as the network expands. At the same time, cost economies are exhausted and are replaced by diseconomies. These rising average costs begin to offset the benefits to existing users of further expansion, and eventually overwhelm them. It is this associated progression of declining and then rising costs that can be tracked econometrically, and which therefore is the subject of the empirical section below.

The distinctive role of organizational services in the process of economic development is detailed in the next section, followed by regulatory and empirical evidence which further demonstrate these special characteristics.

C. Organizational Services in Economic Development

Proponents of the Fisher-Clark hypothesis believe that during economic development there is a shift in output composition from an initial preponderance of agricultural production, through the emergence and dominance of manufacturing, to the final stages in which services play the central role in terms of both share of output and labor participation. The implication that has been drawn for services in developing countries, therefore, is that their development lags behind that of industrial production, and emphasis is placed instead on aiding the first transition, from agriculture to industry, leaving services for later stages of growth.

We argue that this treatment of services as a homogeneous group obscures the crucial role of organizational services in the earliest stages of development: *organizational services* are not the result of the final stages of economic development, but rather are the very commodities which *allow* development to take place. The process of economic development is inseparable from the process of increasing specialization in production, which in turn is critically dependent upon the presence of organizational services. In addition, since both private and public benefits flowing from service use are greatest at the earliest stages of development, so is the opportunity for supportive public policy which should gradually decline until support is withdrawn before the industry reaches maturity. The ability of a country to produce agricultural or manufactured goods efficiently is unquestionably dependent on the adequate provision of organizational services.

1) Division of Labor, Development, and Organizational Services

Division of labor, which is an important element of economic development, is a process in which a relatively complicated procedure is broken down into two or more component parts, each of which is then performed independently. It is the role of organizational services to re-connect these fragments created by the specialization of labor.

The first division of labor in the earliest stages of development occurs when workers cease to provide entirely for their own needs, but rather specialize in a limited number of commodities which they then trade for other products. This phenomenon, which is simply replacing self-sufficiency with a market, creates laborers with identifiably different skills: farmers, weavers, blacksmiths, commercial intermediaries. Such specialization allows each worker to concentrate on his or her own skills, thereby increasing the total level of human capital available in the economy. The specialized producers created by division of labor then trade their products for those of other producers who have specialized in different areas. The organizational services of transportation and exchange (wholesale and retail) are born.

With the conversion to institutionalized production (factories, firms), division of labor is replicated on a larger scale, in that laborers within the firm perform separate duties, the fruits of which are then combined in order to produce the final product of the factory. The total production of the specialized workers is greater than would be the case under conditions of no specialization. Again, the total level of human capital in the society, as well as total output, is enhanced by this division of labor, and the organizational services of managers are required to coordinate the intermediate outputs.

Specialization has been carried far beyond the simple examples discussed above. Division of labor *between* industries disconnects various stages of commodity production (vertical disintegration), allowing comparative advantage of producers to be defined over smaller and smaller portions of the production process, thereby enhancing the overall efficiency of production, the level of human capital in the economy, and the increasing returns to specialization. Taken a step further, international division of labor raises specialization to a global level, resulting in even greater efficiency. Once again, the organizational services of transportation and communications, as well as wholesale, retail and professional services, are required as a result of this division of labor.

The distinction made between organizational services and other ser-

vices is a crucial one. The growth in final demand services *is* in part a result of increase in consumer demand for these services, based upon higher incomes and income elasticity of demand for final services, and in part a result of insufficient employment opportunities in the formal sector. The unique quality of organizational services is that they provide links between producers, and in the process generate externalities in their use.

In summary, specialization in production is linked inextricably to the process of economic development. The fact that specialization and organizational services represent two sides of the same coin leads to the following central conclusion: *Organizational services are absolutely essential components of the economic development process.* Far from being a result of development, organizational services represent a *condition* for growth.

2) Preliminary Policy Recommendations

Services, particularly organizational services, clearly are critical elements of the economic growth process at all stages of development. Public policy in developing countries, however, focuses primarily on the relative needs of the manufacturing and agricultural sectors, hoping to deal with services at later stages of growth. Therefore, organizational services have been under-supported relative to industrial concerns, resulting in unbalanced growth, bottlenecks, and inefficiencies in production and distribution. More importantly, the neglect of organizational services retards the progressive division of labor which must take place in order for economic development to proceed. A vital source of increasing returns and self-sustaining growth is overlooked when organizational services are ignored. In addition, through their role of linking stages of the production process, organizational service industries generate externalities in their use, which create a role for optimal subsidies which must decline over time as scale diseconomies begin to overshadow these externalities.

In the empirical section we examine the production structure of various organizational service industries throughout forty years of development in the United States. The presence of economies of scale in the early production of services is accepted, and point estimates indicate that scale economies for this mature economy peaked in the 1960s and generally declined thereafter, with some variation among specific industries. We conclude that subsidies are currently appropriate for most developing countries.

II. The Regulatory History of Services

A. Differential Regulatory Policy

Throughout the past four or five decades in both developed and developing countries, manufacturing industries and final demand services have largely escaped regulatory notice except in the areas of health and safety, environmental concerns, and labor practices. Legislative actions affecting these concerns do not distinguish among industries, and are therefore not targeted to any particular line of business. Instead, they are intended to protect workers and the environment throughout the economy. This equal treatment of manufacturing industries and final demand services is further evidence of the fact that there is no significant difference in the economic role played by these two groups of producers, compared to the special function of organizational services.

Organizational services, on the other hand, have been the major focus of regulatory policy in all countries. In the cases of financial services, telecommunications, and transportation, such regulation has often been explicitly aimed at improving economic welfare by ensuring access to these services. In terms of the theory developed above, the positive networking externalities associated with service use in the early stages of development (when service provision also exhibits strong scale economies) have induced regulators to attempt to control many vital aspects of their provision, including entry and exit, rate schedules, and even research programs.

For industrialized countries, the declining scale economies have reduced the net benefits from expansion of organizational services, and regulation has declined concurrently. In addition, these industries have become more competitive through technological advances, in part circumventing the remaining regulations. Where deregulation has lagged the changing structure and technology of organizational service provision, regulation has had a negative impact on service quality and has increased its price. Deregulation of U.S. service industries, for example, including financial, telecommunications, and transportation services, began in the late 1970s and early 1980s due to an increasing awareness of the destructive nature of the regulatory process as these industries matured.

These differential regulatory policies provide only circumstantial evidence of the need to subsidize these services until they mature economically. We present further evidence in the empirical section. The lesson for developing economies is that they should initially promote the

efficient development of organizational services, thereby benefiting all other sectors of the economy which depend on services. Any government intervention must be very carefully targeted in order to minimize unintended distortions. Of course, as these industries mature, externalities are overshadowed by diseconomies of scale, and subsidies must be dismantled. The magnitude and changes in scale economies are explored in the empirical section.

B. Lessons from Regulation and Deregulation in a Mature Economy

As developing countries mature, they can look to the experience of the industrialized countries to identify potential problem areas. Several lessons can be learned from the U.S. experience with regulation and deregulation of service industries. Although regulation encouraged expansion of fledgling organizational service industries, it also fostered inefficiencies in terms of rate setting, capital use, and research and development expenditures. Initial regulatory successes in capturing the positive externalities of these industries gave way to later failures in terms of welfare losses as regulation continued beyond the point at which externalities were overshadowed.

Deregulation of service industries improved efficiency and quality while lowering prices. The pace and coverage of deregulation legislation, however, was often problematic. The financial services industry provides the stronger example of the difficulties encountered when delayed deregulation is followed by a hasty dismantling of the regulatory apparatus without proper concern for the impact on the economy of such rapid changes. Financial innovations rendered many of the regulations obsolete and ineffective long before they were dismantled. When deregulatory legislation was ultimately enacted the government relinquished its power to oversee the detailed operations of individual financial institutions while retaining its public guarantee of deposits. This decision proved to be an enormously costly mistake.

The pattern followed by most industries in changing from a regulated market to a competitive one is as follows. Initial rapid entry into the market by new competitors dramatically reduces the market power of existing, previously regulated firms. As competition intensifies many firms are forced out of business, creating a more concentrated industry. The industry then stabilizes with several large providers and many smaller companies on the fringe.

Regulators of new service industries in developing economies can benefit from this experience by promoting more timely deregulation of

the industries, while protecting against excessive concentration through the use of antitrust initiatives. As the benefits of regulations are eroded by inefficiencies, the regulatory apparatus must be dismantled. Developing economies may improve upon the U.S. experience by beginning deregulation somewhat earlier, before the industries have reached maturity, and by proceeding sequentially in order to avoid the massive disruptions attendant upon the major restructuring of service industries faced with rapid deregulation.

III. Econometric Evidence

A. Introduction

We have argued that organizational services generate positive externalities in their use, which are eventually overshadowed by rising average costs as scale economies decline in a maturing service industry. In order to demonstrate empirically the full range of increasing and decreasing scale economies, data from mature service economies is required. We have chosen to test the economies of scale assertion using U.S. service industries data and a symmetric generalized McFadden cost function. We find that U.S. organizational services do in fact exhibit scale economies in the post-War period, which peaked in the 1960s and declined thereafter. These findings are consistent with the regulatory history of service industries, which is characterized by heavy regulation prior to the 1970s, followed by regulation in subsequent years.

B. Model

Data availability allows the consideration of three inputs for each industry examined. Capital, "skilled" labor, and "unskilled" labor comprise the inputs used to produce output. The skilled and unskilled labor inputs are proxied by salaried and wage labor respectively. Given this choice of inputs, a production function allowing for non-neutral technical change and economies of scale is specified as:

$$Y = f(\text{Capital}, \text{Labor}_b, \text{Labor}_w, t)$$

where t is a proxy for technical change, and Labor_b and Labor_w are "blue collar" and "white collar" labor respectively. Assuming the normal regularity conditions, duality theory implies the existence of a cost function dual to the production function which contains all the original information of the production function. The cost function dual to the

production function can be written as follows:

$$C = g(p_k, P_b, P_w, Y, t)$$

Estimation of the cost function rather than direct estimation of the production function is adopted because of econometric reasons. The production function suffers from endogeneity of input quantities to the production process, and the data requirements for instrumentation are great. The cost function has factor prices, not quantities, as exogenous variables, and their exogeneity is likely at the two-digit SIC level of the data. Before estimation, an appropriate functional form for the cost function must be chosen.

Diewert and Wales (1987) performed tests on some of the most commonly used functional form specifications in applied production analysis. Of central concern is how each form conforms to the constraints placed on the estimation by microeconomic theory. The most problematic violation of microeconomic theory in applied analysis is the satisfaction of the regularity conditions. More often than not unconstrained estimated cost functions do not satisfy the requirement of concavity of the cost function over much of the data sample (see Berndt and Field, 1981, chapters 2 and 10, and Diewert and Wales, 1987). Many attempts to impose concavity result in a subsequent loss of flexibility of the function form. Diewert and Wales propose the use of the symmetric generalized McFadden functional form. This new specification allows the researcher to test the concavity restrictions without incurring any loss of flexibility. If the conditions are not met, a Cholesky decomposition of the price parameters is used to impose them. This form allows for the investigation of economies of scale, an issue which is central to the examination of the characteristics of organizational service industries. The three aggregate factors are capital, production labor, and salaried labor.

A Symmetric Generalized McFadden Cost Function for Service Industries

$$\begin{aligned}
 (1) \quad C(p_k, p_b, p_w, y, t) = & g(p)y + b_{kk}p_k y + b_{bb}p_b y + b_{ww}p_w y \\
 & + b_k p_k + b_b p_b + b_w p_w + b_{kt}ty + b_{bt}ty + b_{wt}ty \\
 & + b_t \alpha_k p_k t + b_t \alpha_b p_b t + b_t \alpha_w p_w t \\
 & + b_{yy} \beta_k p_k y^2 + b_{yy} \beta_b p_b y^2 + b_{yy} \beta_w p_w y^2 \\
 & + b_{tt} \gamma_k p_k t^2 y + b_{tt} \gamma_b p_b t^2 y + b_{tt} \gamma_w p_w t^2 y
 \end{aligned}$$

For service industry production the three variable factor version of $g(p)$ is written as follows:

$$(2) \quad g(p) = \frac{s_{kb}p_k p_b + s_{kw}p_k p_w + s_{bw}p_b p_w + \frac{1}{2} s_{kk}p_k^2 + \frac{1}{2} s_{bb}p_b^2 + \frac{1}{2} s_{ww}p_w^2}{\theta_k p_k + \theta_b p_b + \theta_w p_w}$$

Once the form of the cost function is specified the input demand system can be derived directly from Shepard's Lemma as the first derivative of the cost function in prices. The three equations that make up the demand system for the variable factors are written below. A unique feature of the symmetric generalized McFadden cost function is that the input demands are not cost shares as is the case in the commonly used translog and generalized Leontief forms. The independent variables of each demand equation (after dividing by output) are the ratio of input use to output. This is preferable to the estimation of cost shares because the assumption of homoskedasticity of the errors is made more plausible. The three demand equations that make up the system for estimation are represented by:

$$(3) \quad \frac{x_i}{y} = \left(\frac{\sum_{j=1}^3 s_{ij} p_j}{\sum_{k=1}^3 \theta_k p_k} \right) - \theta_i \left(\frac{\frac{1}{2} \left(\sum_{k=1}^3 \sum_{j=1}^3 p_k p_j s_{kj} \right)}{\left(\sum_{k=1}^3 \theta_k p_k \right)^2} \right) + b_{it} + \frac{b_i}{y} b_{it} + \frac{\alpha_i t}{y} + \beta_i y + \gamma_i t^2 + u_i$$

The above system of three equations for each time period is estimated with the following restrictions imposed: all the $s_{ij} = s_{ji}$ and $\sum_{i=1}^3 s_{ij} = 0$ for $j = 1, 2, 3$.

All well-behaved cost functions must exhibit homogeneity of degree one in factor prices. This implies restrictions on the following parameters of the cost function:

Homogeneity Constraints:

$$\sum_{i=1}^N s_{ij} = 0 \quad \text{for } j = 1, \dots, N.$$

These, combined with the symmetry constraints, $s_{ij} = s_{ji}$, restrict the free parameters for estimation to 21.

C. The Elasticity of Cost and Elasticity of Scale

The elasticity of cost with respect to output is derived directly from the cost function. Ohta (1974) defines a measure of economies of scale which is simply the reciprocal of the elasticity of cost derived from the cost function. For (1) the elasticity of cost with respect to output can be written as:

$$(4) \quad \epsilon_{C,Y} = \frac{\partial \ln C(P_i, Y, t)}{\partial \ln Y} = \beta_y + \beta_{yy} \ln Y + \sum_i \beta_{yi} \ln P_i + \beta_{Ty} t$$

and the corresponding elasticity of scale measure (ϵ) is simply $1/\epsilon_{C,Y}$. For any industry, the scale economies are defined as follows. If $(\epsilon) < 1$ then the production function $F(x)$ exhibits diseconomies of scale, $(\epsilon) = 1$ implies constant returns to scale, and $(\epsilon) > 1$ implies economies of scale.

D. Estimation

Data availability allowed estimation of cost functions for 11 organizational service industries at the 2-digit SIC level. F-tests were performed to test whether the data could be pooled across industries. The results allowed the pooling of the 11 industries into two main groups. The SIC 40's (*Local/Interurban Transport, Trucking and Warehousing, Pipe Lines, Communications*) were pooled into one organizational service group. The other group contained the remaining seven service industries from the SIC 50's, 60's, 70's and 80's (*Wholesale trade, Retail trade, Banking, Credit agencies other than banks, Insurance carriers, Business services, Miscellaneous services*).

The model discussed above is used to obtain estimates of the parameters of a production function for the organizational service industries for which the proper data are available. The data set contains 11 such industries at the 2-digit SIC level. Input price, quantity, and output data was available for a sufficient time period to facilitate estimation of cost functions for the industries presented below. The data for the statistical estimation is drawn from various government sources.³

³ All the employment, wages, and hours worked data are contained in the Bureau of Labor, Statistics' *Employment and Earnings* publications. The measures of output, gross and net capital stocks, total wages and salaries are taken from the National Product Accounts published in the Bureau of Economic Analysis' *Survey of Current Business* publication. The price index and treasury bill rate come from *International Financial Statistics* published by the International Monetary Fund. Any remaining data come from various issues of *Census of Services*, along with the *Census of Wholesale Trade, Retail Trade, Transportation, and Manufactures*.

While wage rates for production labor and average hours per week worked are readily obtainable, similar data for salaried labor is needed. The variables for white collar employment are constructed as follows. The difference between total employment and the number of production workers employed is called *white collar employment*. The average hours for salaried workers is assumed constant. This assumption is employed in most productivity studies and is supported by surveys on the subject of whether average white collar weekly hours have changed significantly over the past few decades. The implicit hourly wage for salaried workers is then obtained from the salary payments divided by the hours worked.

Lastly the service flows and implicit prices of capital must be estimated. We assume the service flow is proportional to the stock of capital in each year. The capital stock data is provided by the Bureau of Economic Analysis. The price of capital is comprised of two parts. The opportunity cost of capital includes the corporate service price and the rate of return. The notion of a price and a quantity of capital used has always been a difficult one to quantify in applied analysis. The measures adopted here seem to be the most reasonable, keeping in mind the goal of comparability across industries and time periods, along with the obvious constraint of service data availability.

E. Summary of Results

The data support our hypothesis that organizational services exhibit strong scale economies in the early stages, which decline with maturity. The parameters of the cost functions with their respective standard errors and t-statistics along with the R-squared values and number of observations are presented in Table 1 and Table 2 in the Appendix. Table 3 contains the point estimates and the percent changes over the sample period for the elasticity of scale. The overall fit of the data to the equations is excellent, and the parameters are efficiently estimated.

F-tests during the estimation rejected constraining the cost function to constant returns to scale. The level of the point estimates in Table 3 should be interpreted with caution because these are based upon aggregate data and because of the previous discussion of quantifying service output levels and capital usage levels. However, the evolution of these point estimates from the beginning to the end of the sample period almost uniformly conforms to the theory outlined above. We find a significant decline in scale economies after the mid-1960s which continues to the present. As was indicated above, deregulation in most of these industries began in the late 1970s, following a belated recognition of the declining value and increasing cost of continued interference in

Table 1
ORGANIZATIONAL SERVICE INDUSTRIES: SIC 40's

Parameter Estimates of the Symmetric Generalized McFadden Cost Function			
Parameter	Estimate	Standard Error	t-Statistic
S_{12}	5.225	.360	14.50
S_{13}	2.130	.149	14.25
S_{23}	1.528	.353	4.33
b_{kk}	8.470	3.411	2.48
b_{bb}	13.750	1.056	13.02
b_{ww}	1.966	.438	4.48
b_k	-24.098	4.322	5.58
b_b	.729	1.456	0.50
b_w	-2.127	.565	3.77
b_{kt}	-.165	.092	1.80
b_{bt}	-.326	.028	11.51
b_{wt}	-.043	.012	3.67
α_k	.582	.071	8.22
α_b	-.066	.024	2.77
α_w	.029	.0092	3.13
β_k	.047	.0044	10.73
β_b	-.0041	.0018	2.32
β_w	.0031	.0006	5.09
γ_k	.0004	.0006	0.69
γ_b	.0021	.00018	10.90
γ_w	.0002	.00007	2.76
Individual Equation R-Squared:		N = 114	
Capital Demand - .8733			
Blue Collar Demand - .9022			
White Collar Demand - .2471			

these markets. Declining scale economies indicate the maturation of the service industries and a weakening of the economic rationale for further subsidization through regulation. Scale economies, and therefore net benefits do not have to disappear entirely to make intervention inappropriate; the costs inherent in market intervention must be weighed against the benefits of internalizing the externalities.

Table 2
ORGANIZATIONAL SERVICE INDUSTRIES: SIC 60's, 70's, 0 80's

Parameter Estimates of the Symmetric Generalized McFadden Cost Function			
Parameter	Estimate	Standard Error	t-Statistic
S_{12}	1.899	.993	1.91
S_{13}	7.227	.642	11.26
S_{23}	5.956	1.356	4.39
b_{kk}	6.082	.986	6.17
b_{bb}	8.020	.679	11.81
b_{ww}	.508	.177	2.87
b_k	-93.871	3.773	24.88
b_b	-28.070	2.617	10.73
b_w	-9.188	.697	13.18
b_{kt}	-.160	.029	5.56
b_{bt}	-.179	.019	9.01
b_{wt}	-.012	.005	2.25
α_k	1.466	.053	27.79
α_b	.531	.036	14.51
α_w	.171	.0097	17.56
β_k	.0004	.0003	1.17
β_b	.0035	.0003	12.71
β_w	.0003	.00008	3.72
γ_k	.0011	.00021	5.20
γ_b	.00099	.00014	6.99
γ_w	.00008	.00004	2.03

Individual Equation R-Squared:	N = 209
Capital Demand - .9048	
Blue Collar Demand - .8911	
White Collar Demand - .9437	

F. Implications for Developing Countries

Economies of scale and positive externalities exist in the provision of organizational services, particularly the networking services such as financial, communications, and commercial services. These scale economies are particularly pronounced in the early stages of development, declining as the industries mature. Therefore, a developing economy will

Table 3
AVERAGE POINT ESTIMATES AND
THE EVOLUTION OF SCALE ECONOMIES¹

SIC: Industry	Period Average Scale Estimate	% Change from 1947-1965	% Change from 1965-1989
41: Local and Inter- urban Transport	217.39 [1417.77]	NA	-260.0%
42: Trucking and Warehousing	2.68** [0.14]	3.3%	-57.9%
46: Pipe Lines	5.14** [2.12]	-5.1%	224.4%
48: Communications	1.72** [0.09]	-26%	-86.7%
50: Wholesale Trade	9.23* [5.12]	42.9%	-52.1%
52: Retail Trade	9.73 [8.52]	65.8%	-41.9%
60: Banking	11.51** [3.97]	47.6%	-8.7%
61: Credit Agencies other than Banks	5.56* [3.09]	NA	-18.3%
63: Insurance	22.32** [9.96]	56.6%	-32.5%
73: Business Services	12.29** [6.04]	NA	-36%
89: Miscellaneous Services	10.68** [4.57]	NA	-57.1%

¹ Standard Errors are reported in brackets below the estimate.

* = Significance at the 90% level.

** = Significance at the 95% level.

benefit from governmental assistance to and intelligent regulation of these services during the period of scale economies, but such assistance must be withdrawn before the economies are exhausted.

Scale economies and positive externalities in service provision can be exploited by developing economies in two ways. The most direct method

of promoting efficiency in the face of positive externalities is subsidization. As the externalities are based on service *use*, subsidizing such use is the efficient prescription. Once the service industries mature and scale economies decline, these subsidies can and should be rescinded. Apart from empirical evidence showing declining levels of scale economies, indications that networking externalities have been offset and regulation should be dismantled include signs that the industry is maturing (for example, the service is provided to the majority of the population, so that further expansion is limited), increasing inefficiencies in provision of the service under regulation (for example, declining load factors in the airline industry), and extensive efforts by the industry to circumvent regulation through technological innovations designed specifically for that purpose.

Developing economies with severe budget constraints may prefer to allow unrestricted international trade in organizational services as an alternative to subsidies. By importing services developing economies can immediately take advantage of more extensive networks and lower costs. This option, while unpopular for many reasons,⁴ allows the agricultural and manufacturing sectors to produce more efficiently as well.

The central lesson is that efficient provision of services is crucial to the development of market economies. Organizational services coordinate, structure, and facilitate all other economic activities. For this reason, their development can either constrain or enhance the economic performance of all other sectors, and therefore policies which impact on services have a substantial impact on the rest of the economy as well.

⁴ Several negative aspects of opening a developing country's economy to free trade in services are explored in Rask (1989).

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