1 SERVICES: CERTAINTIES AND UNCERTAINTIES

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This book will explore the impact of a major new technology—computer-communications—on services. There are two important aspects of the way in which mainline economists have dealt with the subject of "services." From Adam Smith to William Baumol, who has written the conclusion for this volume, economists have been biased against services on a variety of grounds. They have argued that services are nonproductive, that they are not subject to economies of scale, that in many instances technology cannot be used to replace human labor, that they cannot be readily traded and transported, and, worst of all, that they are subject to "cost disease." Not only mainline economists have taken this pessimistic view of services; the great dissenter, Karl Marx, and our own prominent dissenter, Thorstein Veblen, were also discouraging about services. Both of them had what can be described as a "commodity bias."

My colleagues and I at the Conservation of Human Resources, Columbia University—initially Hiestand, Reubens, Greenfield, Stanback, and later Cohen and Noyelle—began to focus on services in the early 1960s. *The Pluralistic Economy* (1964), which presented our work on the importance of governmental and nonprofit services, was largely ignored by economists primarily because of their market bias. We had pointed out that it was questionable whether the U.S. economy could be considered one that is almost exclusively "private sector" since,

according to our calculations, not less than one quarter of the Gross National Product (GNP) and between one third and two fifths of all workers were in the not-for-profit sector. These workers were employed by government; the products they manufactured were sold exclusively to government (such as missiles), or they held jobs in nonprofit organizations such as voluntary hospitals and private colleges.

At that time, American economists simply were unable to accept that much of the dynamism of the U.S. economy was in the service sector, particularly societal services such as education, health, defense, biomedical research, and recreation in which government plays a leading role. It is still difficult for many economists to bow to the figures even with the federal budget in the $1 trillion range.

Although our colleagues ignored us, I was pleased that the then executive vice president of ARA told me that he used our book as a manual to help train that part of his sales force that was focusing its efforts on the not-for-profit sector. He was not encumbered by ideological baggage.

Now, we will consider what "certainties" there are about services. The first important certainty is that the dominant role of services in the U.S. economy is not an abberation; it is characteristic of all advanced economies, from the Canadian to the Japanese. The major exception is the German economy, and this can be explained by the fact that Germans tend to "internalize" many producer services within their manufacturing firms.

In the United States our system of data collection obscures the extent to which services now dominate our economic life. For example, both GE and IBM are classified as manufacturing firms, and therefore all of their employees are classified under "manufacturing"; however, no more than about 35 percent of GE's total work force, according to the corporation's former chief executive officer, is directly engaged in physical production. The proportion is steadily decreasing; with advances in CAD/CAM, it will be still smaller tomorrow.

The difficulty of distinguishing between employment in goods and employment in services calls attention to the softness of the term "services." It is a catch-all category that includes everybody who is not classified as employed in agriculture, mining, manufacturing, or construction. It is not our purpose here to enter into a discussion of the different subcategories into which services can be usefully divided, but we will note that one subcategory, the "producer services"—which include banking, legal, accounting, marketing, advertising, and computerization—accounts for just about the same proportion of the GNP in terms

of value added (22 to 24 percent) as all of the manufacturing in the United States.

Here is another certainty. Adam Smith had little difficulty in discerning the movements of grain prices over several centuries since the item—"a bushel of grain"—did not change over time. Consider, in contrast, the "per-diem cost of a hospital day," not over centuries but during the last three and a half decades, between 1950 and 1985. The range and intensity of the care the patients receive—and the outcomes in terms of alleviation and cure—are vastly different.

The strong and continuing increases in the output of services in the post–World War II economy are closely linked to the availability of a large supply of women who were ready and eager to find employment out of their homes and who were well suited in terms of educational background and job preferences (part-time) to fit into many expanding sectors of the service economy. And the more active role of women in the world of work led to substantial increases in the demand for a variety of new services from child care to fast foods.

An important facet of the ways in which changes in services and employment are linked can be found in the dynamics of career mobility. In the past, the internal labor market in large manufacturing firms was the key mechanism through which workers with time and experience advanced to better and higher paying jobs. In the new service economy, career mobility requires workers to move among employers. A waiter in a small restaurant must move to a larger one for additional opportunity and income.

The impact of technology on services varies according to the nature of the technology involved. One certainty is that the computer-communications technology belongs to the genre of basic technological breakthroughs such as the telephone, the railroads, electric power, the automobile. Accordingly, we must anticipate that over time it will result in major transformations both in the types of services that are produced and the ways in which they are produced. The revolution that is occurring in "financial services," and it is a revolution, foreshadows the impacts of the new technology on many other sectors in the years ahead.

It may be useful to consider the evolution of the computer-communications technology so far and what may lie ahead. After three decades of penetration, the computer has been used primarily for "numbers crunching." The next stage of the technology is likely to have a much more pervasive impact by increasing the types of products that will be available and, further, by making it possible to restructure organizations and the ways in which business decisions are made and corporations are managed.

These are the certainties. Now, we will have a quick look at the uncertainties. The concept of impact involves time as well as extent, and when technology is involved, time is hard to capture except in retrospect. I once heard Kuznets explain at some length that at any point in time many embryonic technologies appear to be promising but most of them are stillborn. Only a few will get off the ground and even fewer will be successful. We will know which few do make it only in retrospect.

Let us consider briefly where the computer revolution may be on its expansion course relative to that of the automobile. Is the industry at present at the comparable level of 1915, 1935, or 1955? The answer is elusive, but I would pick 1915!

A second uncertainty is what we mean when we use the phrase "information technology." More specifically, what do we mean by information? I like to distinguish among data, information, and knowledge—and while I admit that one may fade into the other, I believe that in many cases there is nothing but data and more data. One thing is certain—we have much more data than we have knowledge. I would venture the hypothesis that the more we develop technology that is capable of processing large amounts of data at a low cost, the further we get from, not the closer to, useful knowledge. I admit that this may be a rationalization of my ineptness with the new technology because I still prefer to do most of my calculations in my head!

Another area of uncertainty is the issue of access to data bases versus the protection of proprietary property. I remember that a not very radical president, Herbert Hoover, when he served as Secretary of Commerce, considered it important that the U.S. government strengthen its data collecting–data disseminating capabilities since he was convinced that a stronger informational infrastructure would help U.S. business. Today, however, few observers other than Nobel Laureate Leontief ever think about the appropriate balance between public and private data files.

Closely related are the policy issues involved in developing sensible laws and agreements about the transmission of data across national boundaries. The United States insists that such transmission be free and unencumbered or that it be as close to that ideal as possible. A leading expert, Walter Wriston, has estimated that the United States moves about 80 percent of all data across national borders. But what is sensible for the United States does not necessarily meet the goals of other national states that face many challenges from national security to essential record keeping, with protection of confidentiality and other issues in the middle.

I realize that most U.S. economists (and other specialists) can make a strong case for the reduction and removal of government from most regulatory activities affecting the protection and distribution of information. While I acknowledge that some of the evidence they present in support of deregulation is telling, I am not totally convinced. I am impressed with the evidence that my colleague Eli Noam has presented about the "monopolistic" tendencies that have led the European Postal Telegraph & Telephones (PTTs) and their respective trade unions to persuade their respective governments to continue a large number of restrictive policies. At the same time, however, I do not think that dismantling the entire regulatory structure would be sensible for most large or small countries. They have too much to lose, too little to gain.

Here is one more uncertainty. There is no answer to the critical question of how much life and work and leisure will change as the information society continues to evolve. The deputy editor (Norman Macrae) of *The Economist* pointed out some years ago that large cities are doomed and that before long most of us will be working out of our own homes. I am reasonably sure that he will be found wrong on both counts, but we must wait and see. We are told that before long we will be doing our banking with personal computers at home. This is possible, but not for certain. Only a prophet would have been able to foretell in 1915 the impact of the automobile on the structure and functioning of the U.S. economy and society in 1985. And it is my hunch that the computer-communications revolution today is at a comparable point in its growth curve.

I offer this endnote. Both "services" and "information technology" are soft concepts. This is especially true if we consider their usefulness for long-term projections. Nevertheless, I would bet that by the end of this century, which is less than fifteen years away, information technology will be the leading industry in all advanced economies.[1]

NOTE

1. For reinforcement of this forecast, I refer the reader to Stephen McClellan's recent book. *The Coming Computer Industry Shake-out: Winners, Losers, Survivors* (New York, John Wiley, 1984).