
**The U.S. Information
Economy: Value,
Employment, Industry
Structure, and Trade**

The U.S. Information Economy: Value, Employment, Industry Structure, and Trade

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The U.S. Information Economy: Value, Employment, Industry Structure, and Trade

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Abstract

This study examines the evolution of the United States (U.S.) economy after 1999, extending our previous studies [4, 8] up to 2007. The U.S. economy has moved steadily toward services and information-intensive sectors in terms of Gross National Product (GNP), employment, and wage distribution. Information-intensive services, the nexus of these two major trends, now compose the largest portion of the U.S. economy in terms of GNP value, jobs, and wages. In addition, we study the growth of international trade in services and information sectors, which is likely to become increasingly important in the future. Finally, we examine the factors underlying the shifts observable in the economy and the impact on competition, strategy, and sector structure.

An online technical appendix that discusses the definitions and conceptual framework, and describes the data sources and the detailed calculations used to measure the size and structure of the U.S. information economy in 2002 is available at http://dx.doi.org/10.1561/02000000013_app.

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1

Introduction

Most of the large economies in the world are already dominated by services, in that services compose more than 50% of national income. We are now in the midst of another major evolutionary trend: that from a material or physical to an information economy. This change is most visible in developed economies, but is occurring in all economies. Some of the research studies that have examined, established, and measured this trend for the United States (U.S.) are those by Machlup [60], Porat [73], Apte and Nath [8], and Apte et al. [4]. Choi et al. [32], following the same methodology as Apte and Nath, demonstrate that a similar evolution has taken place in South Korea, which, while having a relatively larger manufacturing sector than the U.S., was also effectively an information economy by 2000 and has continued to trend in that direction until 2005.

In this monograph, we explore the confluence of these two trends by examining the double dichotomy of products versus services and information versus material (noninformation), which divides the economy into four supersectors. Figure 1.1 provides some illustrative examples of industries in the four supersectors. Note that certain physical manufacturing and service examples (e.g., computers, telecom) fall in the

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		Delivery Form	
		Products	Services
End Output	Material	Material Products Steel, Cement, Automotive, Consumer goods	Material Services Transportation, Retailing, Construction
	Information	Information Products Computers, Books, Magazines, Data bases, Music CDs	Information Services Telecommunications, Financial Services, News/Information, Consulting

Fig. 1.1 A 2×2 decomposition of the U.S. economy with sector examples.

information sector following the definition by Porat [73]. It also should be pointed out that many industries do not really lie entirely inside one cell. For example, both Machlup and Porat arrived at nearly identical conclusions about the health care industry: It breaks down just about evenly across the material and information sectors.

In previous articles, we have examined the way in which Gross National Product (GNP) in the U.S. divides across these sectors using data on U.S. GNP from 1967, 1992, and 1997 [4]. The current article revisits the earlier estimates and extends them to 2007. Since we examine data across several years, we are also able to look at the changes during that period. Our analysis of the broad changes in the U.S. economy uses sector-level data organized by the Standard Industrial Classification (SIC) and North American Industrial Classification System (NAICS) codes.

We also examine the evolution of jobs and wages in the U.S. This is different from the GNP studies and gives a more detailed perspective. Wages are a major part of GNP but are not exactly the same. Also, the number of jobs can and do distribute differently across the economy, since average wage rates differ substantially across sectors. Furthermore, the GNP data are aggregated at the level of SIC/NAICS codes. But in fact, companies and jobs often cut across the boundaries

of the supersectors we are examining. The data on jobs and wages thus present a different perspective and at a finer level of resolution. We analyze data on the U.S. job market (employment and wages by more than 800 occupational categories) since 1999 and extended up to 2007. One major finding is that information workers in services now account for the largest share of total U.S. jobs. This is a significant change from the historical pattern, where noninformation workers in services were the largest segment of the labor market. This shift occurred around 2000. In addition, information workers in services had already captured the largest share of the total wage bill by 1999, and this pattern has continued. Interestingly, the highest average wage rate is for information workers in products, and that has been the case for more than a decade, although the total wage bill is much larger for other segments of the labor market.

In short, it is fair to say that the U.S. economy is now an “information economy” in terms of GNP, jobs, and wages. What is more, the largest component of the U.S. economy is now “information-intensive services.” While the economic crises in the last decade have resulted in some moderation of these trends, we can expect continued movement in the same direction in the near future.

This transformation to information and information-intensive services has a wide array of consequences. In this study, we examine some of these consequences to indicate the substantial implications for both management and policy decisions. First, the economics of information-intensive sectors are different in certain specific ways that affect competition. Entry barriers are low, and simple economies of scale are less pronounced. Physical location is less of a differentiator. All of these tend to make competition more intense. On the other hand, barriers like network externalities can have the opposite effect. Furthermore, there may be opportunities for finding niche audiences. While trade in services is generally difficult due to their intangibility, trade in content-based services and even transactional services is now feasible. There are many other structural implications for economies. One systematic phenomenon is the de-integration occurring in many verticals such as music and publishing. Another is the appearance of mechanisms such as open sourcing and of direct exchange and barter,

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which can create a kind of “demonetization” effect. Finally, the structural changes extend below the sector level down to organizations and even jobs and tasks.

In the next section, we review research on the information economy in the U.S. and survey the literature on related topics. In Sections 3 and 4, we present the main results of our study, in terms of the two-way breakdown of the U.S. economy based on GNP data (as in Figure 1.1) and labor statistics. In Section 5, we present the changing patterns of international trade in information services. The GNP data over a 40-year period show the significant trends noted above. In Section 6, we discuss possible reasons for these trends. Productivity increases have long been recognized as a cause for the growth of services relative to manufacturing. We suggest that they are also the reason for the growth of information-intensive services relative to physical services. Underlying productivity changes are a range of management actions that we describe collectively as a process of “industrialization,” having a close analogy to the historical industrialization process associated with manufacturing. We analyze the consequences of industrialization for information-intensive services in Section 7. The monograph concludes in Section 8, with a summary and a description of our ongoing research on these topics.

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