



# **Mission Report**

## **APO Fact-finding Mission to the USA on Service-sector Productivity**

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**USA**

## **Mission Report APO Fact-finding Mission to the USA on Service-sector Productivity\***

Improvement of productivity measurement in the US service sector

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*The APO fact-finding mission to the USA on service-sector productivity was led by Chief Expert Prof. Toshiyuki Matsuura from 15 to 20 June 2008, with six other national experts from APO member countries. This paper is a mission report that covers both the findings on the issues of service productivity measurement and a summary of examples of best practices in service businesses in the USA.*

### **1. Introduction**

The share of the broadly defined service sector in the total economy has been growing substantially in Asian countries as well as in the USA and EU. However, the productivity growth rate in the service sector has been relatively lower than that in manufacturing. In addition, productivity levels in the service sectors of Asian countries lag behind those in the USA or EU. Therefore, if policymakers wish to strengthen economic growth and improve the foundation for future economic performance, the service sector must do better. To explore the sources of productivity differences and derive policy implications, this study mission examined the best practices in the USA by visiting research institutes and private companies in the service sector.

Moreover, taking into consideration the frequently mentioned possibility of mismeasurement of productivity in the service sector and the innate difficulties in its measurement which may account for the reported inferior service productivity, the issue of productivity measurement was discussed with representatives of US government agencies. To monitor productivity increases accurately, it is important to pay careful attention to statistical measurement issues. In the USA, government agencies have made vast strides in recent years in improving the data available for the analysis of productivity in the service industry. However, in Asian countries, statistical systems are mainly focused on manufacturing. Therefore, there is much room for improvement in the data on the service industry. To review the improved US statistics on the service sector, we conducted interviews with leading researchers and statisticians at the Bureau of Labor Statistics (BLS) and Brookings Institute.

Furthermore, to explore the source of productivity enhancement in the service sector, we visited two private companies that have achieved innovative service advantages by

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utilizing IT and investing in R&D. In the USA, the macro-level productivity growth rate has accelerated since 1995, mainly due to increases in productivity growth in the service sector. Many economists have investigated the key driver of productivity enhancement in the sector, and some concluded that the spread of IT usage had played an important role after 1995.

## **2. Issues in Productivity Measurement**

Productivity measurement plays a vital role in public policy decisions. To identify the sources of productivity gains, it is necessary to measure accurately both the output and input of individual industries. However, the difficulties in measuring productivity in services have frequently been pointed out. In the USA, the statistical system has recently made great progress in improving the data available for the analysis of productivity in the service sector to adapt to new circumstances.<sup>1</sup>

Progress has been made into two areas: expanded coverage of data available for the service sector and improved quality of statistics. For the first area, since the service sector itself is defined as the residual of the primary and secondary sectors from a macroeconomic perspective, it includes a wide variety of economic activities. Therefore, to derive appropriate policy implications, it is essential to monitor productivity in the service sector at a more detailed level. The second area is the improvement of the quality of statistics on both output and input. For example, although many economists pointed out that IT has played an important role in recent US productivity enhancement, the price index for digital products has long been criticized. However, reflecting the huge debate among economists, the BLS has improved quality measurement. For other products and services, the BLS continues to try to develop new methodology. The recent accomplishments in data availability for productivity measurement in the US service sector are summarized in the following five points.

### *Improvement of the BEA GDP account*

The BEA previously focused on industry value-added data series, the gross product originating (GPO), although it does not have consistency with input-output accounts. While GPO by industry is estimated based on BLS data for labor data and Internal Revenue Service data for capital accounts, input-output accounts are based on census data. Since there are differences in the industry classification among major data sources, it creates inconsistency between GPO by industry and value added in the input-output accounts. Now, BEA industry accounts include measures of output and input for some 60 industries and they can be linked with BEA capital stock and BLS capital and labor service estimates.

### *Expansion of coverage of the Producer Price Index by the BLS*

The BLS extended the Producer Price Index (PPI) measures to cover the service sector in the 1990s. Up to 2002, nearly 1,000 indexes covered approximately 90 industries in

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<sup>1</sup>Basically, the description in this subsection comes from Chapter 11 (Data Needs) of Triplett and Bosworth (2004) and Triplett and Bosworth (2007, 2008), as well as an interview with Dr. Bosworth and Dr. Baily. For a discussion of the history of the improvement of the US statistical system, see also Triplett and Bosworth (2008). For the experiences in the UK and Europe, see Crespi et al. (2006) and Inklaar et al. (2008).

the service sector and other sectors that do not produce physical products. The PPI measures cover approximately half of the service sector's output.<sup>2</sup>

*Expansion of the Economic Census and Annual Service Survey by the Census Bureau*

Information on material or purchased service inputs is surveyed in the Economic Census (performed by the Census Bureau), which is conducted every five years. For other years, the Census Bureau has started the Annual Service Survey to collect more information on output and purchased service inputs, which improves output and input data for the service sector.

*Extension of measures of capital stock*

The BEA revised and extended the capital stock database by industry and asset type, and using these capital measures, the BLS developed detailed estimates of capital services by industry in its productivity program.

*Improvement of estimates of hours worked*

Previously, the BLS collected hours and earnings information from the Current Employment Survey only for "production workers" in manufacturing and "nonsupervisory workers" in the rest of the economy. However, there were concerns that the differences between "production workers" and "nonproduction workers" were ambiguous. The BLS has started to collect information on hours worked by all workers.

The effects of changes in labor quality associated with changes in educational attainment are also an important topic. However, employment data by sex, age, and education are available only at the two-digit level. Therefore, it is not possible to estimate the changes in labor quality within detailed industry classifications for the service sector.

Thanks to these improvements, the quality of productivity analysis has also improved substantially. For example, the Brookings Institution Program on Economic Measurement organized by Triplett and Bosworth discussed industry productivity trends based on the BEA-BLS productivity data set. The program covered the various discussions from the statistical system as a whole to measurement problems in a specific industry. Following the discussion during the workshop in the program, Triplett and Bosworth listed major data recommendations for statistical agencies in Chapter 11 of their 2004 publication. Since then, they have been updating the Detailed Data Recommendation Table periodically.<sup>3</sup> These discussions have contributed to attracting the interest of many economists to productivity measurement issues in the service sector.

Table 1 gives examples of data availability for major indicators of activities in the service sector for the US, Japan, the Republic of Korea, Thailand, the Republic of China, Malaysia, and the Philippines. Compared with the USA, less cost information is available for Asian countries, such as Japan and the Republic of Korea. Table 1 gives

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<sup>2</sup>For more details, Appendix A summarizes recent improvements in PPI measures.

<sup>3</sup>See "Summary of Data Recommendations" in Triplett and Bosworth (2007), and Table 2 in Triplett and Bosworth (2008).

only basic information, and thus more detailed investigation is necessary to determine the quality of data and differences in industry classification.

### **3. Summary of Best Practices in the Service Sector in the USA**

The fact-finding mission visited two private companies. One was ARAMARK, the world's leading professional catering service provider. It offers food services, facility management, and uniforms for hospitals, universities, schools, sports venues, businesses, and many other clients. With 250,000 employees serving clients in 19 countries, ARAMARK helps clients use these support services to achieve their missions. Since 1968 in Mexico City, the company has served at 13 Olympic Games, including Athens in 2004 and the Beijing Olympic Games in the summer of 2008.

The other was PHH Arval, which offers commercial fleet management services to corporate clients and government agencies. Its fleet leasing and fleet management services include vehicle leasing, fleet policy analysis and recommendations, benchmarking, vehicle recommendations, ordering and purchasing of vehicles, arranging for vehicle delivery, and administration of the title and registration process, as well as tax and insurance requirements, pursuing warranty claims, and remarketing used vehicles. The company also provides vehicle maintenance service cards, accident management services, and fuel card services.

The reasons for choosing these two companies were intensive IT use and extensive overseas operations. Both make the best possible use of IT and have succeeded in enhancing productivity. However, they have two different approaches. While ARAMARK utilizes IT to share information or internal best practices among its facilities, PHH uses IT as an interactive customer fleet management system. Both invest in foreign countries, including some APO member countries. Therefore, their business models might be excellent examples for Asian service companies.<sup>4</sup>

The features of the ARAMARK business model are a central R&D center and information-sharing system through IT. Next to the headquarters building, ARAMARK has an innovation center, where 120 full-time employees are engaged in analysis of customer satisfaction, menu development, and facility design. In addition, the results of research on customer satisfaction and best practices among ARAMARK facilities are delivered through a Web-based training system. It has an e-learning system, such as self-paced training with checklists, process and assessment worksheets, and 120-day action plan.

The strength of PHH lies in its fleet management system, which enables not only reduced management costs but also provides consulting services to customers. The fleet consulting services allow PHH to provide its customers with comprehensive fleet analysis, benchmarking, cost improvement recommendations, and analytical tools and best financial models to manage client fleets. Specifically, PHH provides fleet best practices on acquiring, managing, and selling fleet vehicles to its customers. In addition, PHH also consults on price and vehicle specifications, lease payment calculations, operating cost comparisons, and planned fleet acquisitions such as recommended vehicles, current models, and future automotive company plans from a customized Web site for each client.

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<sup>4</sup>For details on ARAMARK and PHH Arval, see Appendix B.

We saw two different approaches to learning about the requirements of customers. ARAMARK has invested in its innovation center, which is purely research based, relying the results of behavioral surveys and experiments. PHH has established a state-of-the-art IT center that collects almost all transactional data tracking overall fleet management for its clients. In addition to providing fleet services, PHH can be viewed as an information provider on how its clients use their fleets. These are value-added services by companies competing for market share, which can be viewed as quality improvements in their services.

#### **4. Conclusion and Policy Recommendations**

At the macro level, economists are discussing how to reflect quality improvements in certain services. This is a very important issue in how productivity is measured in the service sector. The price of a specific service may stay almost the same for a certain period of time but that does not mean there is no improvement in the productivity of the company offering that service. Therefore, the improvement of statistical systems is essential to monitor the productivity movement. One recommendation to the APO and NPOs is to develop and periodically update a “data recommendation table for statistics in the service sector” in accordance with the report by Bosworth and Triplett. Table 1 is an example of a data recommendation table for APO member countries. Currently, we have only superficial knowledge of data availability and the details must be confirmed.

At the same time, collecting the best practices in service businesses and disseminating that knowledge is also important. The practices of ARAMARK and PHH are valuable for Asian companies. However, since companies in the service sector have a wide variety of characteristics, the examples introduced here might not be directly applicable to service-sector companies in different countries. However, the concept and system of using the Internet internally or interactively with clients may be adaptable to all service businesses. Thus, productivity organizations or research institutions should take the initiative in collecting best practices in this area.

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Table 1

Data availability  
 Survey for service sector

Country	Name of the survey and its frequency	Total revenue	Revenue by business segment	Total cost	personal cost	Expensed material	Expensed purchased service	Operating expenses	Number of employee	Tangible asset	Department in charge	URL	Link for survey form (or list of survey items)
U.S.A.	Economic census (Every 5 years), Service annual survey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Census Bureau	<a href="http://www.census.gov/econ/census02/">http://www.census.gov/econ/census02/</a> <a href="http://www.census.gov/econ/www/services/sas/sas_forms/forms.htm">http://www.census.gov/econ/www/services/sas/sas_forms/forms.htm</a>	<a href="http://www.census.gov/svsd/www/services/sas/sas_forms/forms.htm">http://www.census.gov/svsd/www/services/sas/sas_forms/forms.htm</a>
Japan	Survey on service industry (Every 5 years), Economic census will be launched from 2010.	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Ministry of Internal affairs and communications	<a href="http://www.stat.go.jp/english/data/service/index.htm">http://www.stat.go.jp/english/data/service/index.htm</a>	<a href="http://www.stat.go.jp/data/service/2004/pdf/cyosahyo.pdf">http://www.stat.go.jp/data/service/2004/pdf/cyosahyo.pdf</a> <a href="http://www.stat.go.jp/english/data/service/2004/yougo.htm">http://www.stat.go.jp/english/data/service/2004/yougo.htm</a>
Rep. of China	Economic census (Every 5 years), Service annual survey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Ministry of Economic affairs R.O.C.	<a href="http://eng.stat.gov.tw/mp.asp?mp=5">http://eng.stat.gov.tw/mp.asp?mp=5</a>	
Rep. of Korea	Service Industry Census(Every 5 years) / Service Industry Survey (yearly)	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Korea National Statistical Office	<a href="http://www.nso.go.kr/eng2006/e02_0000/e02e_0000/e02eb_0000/e02eb_0000.html">http://www.nso.go.kr/eng2006/e02_0000/e02e_0000/e02eb_0000/e02eb_0000.html</a>	<a href="http://www.kosis.kr/eng/index.html">http://www.kosis.kr/eng/index.html</a> <a href="http://www.nso.go.kr/eng2006/e01_0000/e01b_0000/e01bd_0000/e01bd_0000.html">http://www.nso.go.kr/eng2006/e01_0000/e01b_0000/e01bd_0000/e01bd_0000.html</a>
Malaysia	Survey on selected services sector (monthly and yearly);2. Census on selected services sector (Every 5 years)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Department of Statistics Malaysia	<a href="http://www.statistics.gov.my/">http://www.statistics.gov.my/</a>	<a href="http://www.statistics.gov.my/english/frame_set_download.php?file=download">http://www.statistics.gov.my/english/frame_set_download.php?file=download</a>
Philippines													
Thailand	Business Trade and Services Survey (ISIC 2 digits: 50-52, 55, 70-74, 92-93) (ISIC 4 digits: 5010-9303), annual survey, the latest years are 2001-2004 (the Menu is in Thai)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	National Statistics Office	<a href="http://service.nso.go.th/nso/nsopublish/service/serv_downdata.html">http://service.nso.go.th/nso/nsopublish/service/serv_downdata.html</a>	<a href="http://service.nso.go.th/nso/nsopublish/service/datadownload/business_47.zip">http://service.nso.go.th/nso/nsopublish/service/datadownload/business_47.zip</a>



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## **Appendix A. Details of the Expanded Coverage of the PPI by the BLS<sup>5</sup>**

Measuring the price index for the service sector involves many difficulties. Suppose the quality of service in a retail outlet has increased through longer trading hours, with the price level remaining constant. In this case, we should consider that the “real” price has been decreasing reflecting the improved accessibility to outlets due to longer trading hours. Otherwise, since the associated cost has increased, the productivity of the retail sector would be decreasing despite improvements in the quality of service. For other industry, e.g., the business sector, there is discussion of how we should define output. The airline industry and telecommunications industry offer various discount packages for passengers or users; therefore, data collection will cost a lot of money and time.

In the BLS, there are three approaches to avoid the above difficulties: 1) the hedonic regression approach; 2) unit-value calculation; and 3) “model” pricing approach. The following are brief explanations of these approaches.

### *Hedonic approach*

The hedonic approach is a common method to adjust the changes in the quality of digital products.<sup>6</sup> However, its application to the service sector is limited only to housing or office rent due to the cost of data collection, stability of estimates, etc.

### *Unit-value calculation*

In this methodology, the average price is defined as revenue per quantity within homogeneous service categories. For example, in the case of wireless telephone service, revenues per minute are calculated according to peak and off-peak minute categories. This method is applied to the PPI in the airline industry and wireless telephone service. As for the sources of data, the BLS has negotiated with service providers and obtained the necessary data under a special agreement. Some researchers, such as Gordon (1992) and Morrison and Winston (1986) proposed using the hedonic approach to adjust for changes in quality in the airline industry. However, although there are tremendous numbers of discount packages and plans and mileage programs, it is difficult to incorporate them into hedonic regression analysis. Therefore, BLS prefers unit-value calculations.<sup>7</sup>

### *“Model” pricing methodology*

This method was originally developed by Statistics Canada for pricing in the construction sector. It sets a model of a particular service and asks respondents to reprice at periodic intervals. Based on this methodology, the BLS has developed PPIs for some service-sector businesses, such as advertising and nonresidential construction.

In addition to the above three approaches, the BLS has tried to improve the deflator for the retail sector. Since 2000, the BLS has introduced a margin deflator for retail. The margin price is defined as the difference between the retail price of an item and its acquisition cost. Currently, the BLS has released margin deflators only for products for which the PPI program determines that margin prices exist and are meaningful. At this moment, the PPI

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<sup>5</sup>More detailed discussion can be found in Swick et al. (2006).

<sup>6</sup>For more details, see Moulton (2001).

<sup>7</sup>Note that the CPI for airline tickets is based on direct measure of prices through the SABRE system, a reservation system used by travel agents.

margin price does not cover all subsectors in retail trade.<sup>8</sup> However, in the BLS methodology, changes in the quality of service are not taken into consideration for margin prices. In this regard, the BLS is currently conducting a research program that asks individual outlets for store characteristics, such as square footage, storage area, and retail prices, and is developing a hedonic index based on changes in service characteristics.

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<sup>8</sup>According to Manser (2004), for those products such as some delicatessen items or goods baked on the premises, the BLS failed to develop a meaningful margin price.

## **Appendix B. Corporate Profiles of ARAMARK and PHH**

### **ARAMARK**

ARAMARK specializes in providing food services, facilities management, and uniform and career apparel to healthcare institutions, universities and school districts, sports venues, and businesses around the world. ARAMARK has approximately 250,000 employees serving clients in 20 countries, with headquarters in Philadelphia. ARAMARK serves 15 national and state parks and forests, with over 11 million visitors a year, and has served 13 Olympic Games since 1968, including the 2008 games in Beijing. In the *Fortune* 2008 list of America's Most Admired Companies, ARAMARK was ranked number one in its industry, consistently ranking since 1998 as one of the top three most admired companies in its industry as evaluated by peers and analysts. ARAMARK also ranked first in its industry in the 2007 Fortune 500 survey. The strength of the company's business model lies in its intensive IT usage and centralized R&D and human capital development. These enable the company to enhance productivity and attract talented employees.

#### *Web-based human resources development system*

To enhance productivity, it is essential to reduce overtime and increase the quality of services. Since facilities operated by ARAMARK are located in all over the USA, the company makes the best possible use of IT. For example, it developed a labor-focused Web site resource called Labor-101. Using this Web site, all managers can access best practices among ARAMARK facilities, indicators, FAQs, feedback, and help services. It also provides an e-learning system, such as self-paced training with checklists, process and assessment worksheets, and 120-day action plans.

#### *Innovation center*

To expand its culinary offerings and provide clients with the latest products and services, ARAMARK has established a state-of-the-art innovation center where the company's research, design, and merchandising divisions work together on developing menus and programs for application among all segments of its on-site food services. The center is staffed by 120 full-time employees who focus on consumer research, brand strategy, culinary development, retail merchandising, and promotion. ARAMARK firmly believes that long-term growth comes from product and service innovation. With this capability, ARAMARK is able to be much more than simply a service provider to its clients, it also acts as a consultant. Its product and service innovations are mainly based on the results of the company's own research on consumer eating patterns.

The innovation center helps ARAMARK respond better to its customers' needs. For example, the company found that first-rate cafeterias are a must for companies looking to boost productivity. A high-quality on-site dining facility eliminates the need for employees to go outside the office for lunch, and therefore they spend less time away from their desks. ARAMARK believes that the approach of a business to dining can be a proxy for understanding how a company manages its people. Lavish facilities are among the perks that help companies find the best workers and keep them close to their desks. The innovation center gives ARAMARK the ability to understand what consumers are looking for and to anticipate and create products that are necessary as well as desired by the general public.

The operation system developed by ARAMARK's innovation center is demonstrated in the cafeteria and convenience store in the Children's Hospital of Philadelphia (CHOP). For example, dietary management for patients relies on a database that supplies information directly to the kitchens on computer monitors. Patient requests for menu items are frequently updated in the dietary management database, contributing to greater customer satisfaction. In addition, to control costs, ARAMARK makes continuous efforts to reduce food waste. This cost-effective system enables ARAMARK to maintain a relatively low average cost of only \$2.50 per meal.

### **PHH Arval**

Founded in 1946, PHH Arval is the second-largest commercial fleet management company in North America. A wholly-owned subsidiary of PHH Corporation, PHH Arval provides outsourced fleet management solutions to corporate clients. The company has over 1,300 employees, manages more than 600,000 vehicles, and purchases more than 80,000 vehicles annually. PHH clients include corporations, government agencies, and emerging and growing companies.

PHH Arval has been recognized in several categories, including customer service, technology, and community relations: the Stevie Award for Best Product or Service for the PHH Arval GreenFleet; the Bausch & Lomb Corporate Citizen of the Year Award; Stevie Award Finalist for PHH Collision Prevention; Merck's Outstanding Strategic Supplier Collaboration Award; UTC's General Procurement Key Supplier of the Year Award; and Stevie Award for Best Product or Service for PHH Onboard.

Services provided by PHH include accident services, expense reporting, fleet administration service outsourcing, financing, fuel, maintenance, PHH Green Fleet, PHH Onboard telematics, regulatory services, used vehicle sales, and vehicle acquisition. In addition, PHH has special services and teams focused on energy fleets and pharmaceutical and healthcare fleets. PHH helps clients maximize investments in fleet operations, minimize total operating costs, and support the productivity of employee drivers. What makes PHH different from other fleet management companies is its consulting services, which are unique in this business. The fleet consulting services allow PHH to provide its customers with comprehensive fleet analysis, benchmarking, cost improvement recommendations, and analytical tools and best financial models to manage client fleets. Specifically, PHH provides best practices on acquiring, managing, and selling fleet vehicles to its customers. In addition, PHH also offers consultancy on tool, price and vehicle specifications; lease payment calculations; operating cost comparisons; and planned fleet acquisitions by recommending vehicles, advising what is new in the current model year, and the plans of automotive companies for the future.

The comparative advantage of PHH relative to its competitors is its long-term commitment to the use of IT. PHH is able to convert huge amounts of transaction data into intelligence for its operations and customers. From very basic information such as odometer records, maintenance logs, fuel charges, accident reports, and fleet acquisition costs, PHH can produce maintenance forecasts, replacement schedules, calculations of cost per mile, three-year odometer forecasts, and many other customized reports for its clients. PHH clients receive these reports from an interactive system as needed. The following are examples of IT management tools.

### *PHH InterActive*

PHH Arval's award-winning, Internet-based information management system provides real-time access to comprehensive fleet vehicle data and analytical tools.

### *PHH InterActive Dashboard*

The PHH InterActive Dashboard radically simplifies fleet management reporting by summarizing information drawn from the fleet industry's most comprehensive data warehouse and presenting it in clear charts and graphs. This at-a-glance view enables customers and their staff to understand complex fleet data quickly and easily.

### *PHH Onboard*

The first fleet solution that integrates telematic data with comprehensive fleet information and consultation, PHH Onboard reduces costs, increases driver safety and productivity, and enhances the performance of critical business assets.

The sheer size of the fleet managed gives PHH bargaining power with repair and maintenance shops, gasoline companies, and insurance companies. This advantage has allowed PHH to provide even more value-added services such as fuel cards and vehicle maintenance programs to its customers, which in turn gives PHH more access to information on how its clients operate their fleets. PHH is now working with automakers to install electronic monitoring devices that will automatically send information via satellite to PHH showing how each vehicle is operated. PHH calls itself the only company that can give customers total control of their fleets through the use of advanced information management systems.