

Measuring Output and Productivity in Thailand's Service-Producing Industries

EXECUTIVE SUMMARY

The services sector is a substantial and growing component of the Thai economy, accounting for nearly half of aggregate production and 40 percent of national employment. Although government policies in emerging economies tend to focus on the growth of manufacturing, the service-producing industries in Thailand have been the dominant source of new job creation in recent years, expanding by 2.6 million jobs between 2000 and 2005 compared to just 1.6 million in the industrial sector. Yet, Thailand's national statistics paint a sobering picture of the performance of the services sector in recent years. Labor productivity fell sharply during the 1997-98 financial crisis and has remained stagnant ever since. The generally poor productivity performance of the services industry in recent years raises concerns about the potential of this sector to be an engine for gains in the real wages and living standards of Thai workers in the future. However, it is unclear whether these estimates reflect the accurate growth in services productivity, or are a result of the low quality of available data on service-producing industries in Thailand.

Thus, this report has three primary purposes. First, we review the methodology for computing productivity and apply that methodology to various levels of the Thai economy. Second, we construct measures of productivity performance in greater detail for four services industries that can be then be used for benchmarking purposes against other countries. Finally, we examine the procedures for measuring output and productivity in the services sector and suggest areas that are in need of improvement.

Macroeconomic Overview

The growth accounting framework allows us to allocate Thailand's economic growth over the past quarter century among the contributions of changes in factor inputs (labor and capital) and a residual called total factor productivity (TFP), which measures any efficiency changes in the use of those inputs. The growth account estimates provided

below are similar to those published by the National Accounts Office (NAO) of the National Economic and Social Development Board (NESDB), except for the inclusion of improvements in the educational attainment of the workforce, and an increase in the share of income attributed to labor to account for the contribution of the self-employed and unpaid family workers.

Total Economy

The growth accounting analysis for the total economy of Thailand highlights the composition of the slowdown in output growth brought about by the financial crisis of 1997-98. The measure of growth in output per worker (or labor productivity) is particularly important, because it provides a useful efficiency indicator and is similar to a measure of income per capita—the typical indicator of living standards. Output per worker declined from 4.7 percent in the pre-crisis period of 1980-1996 to 2.6 percent during 1999-2005. Thus, the reduced rate of labor productivity growth accounts for two-thirds of the overall growth slowdown in the post-crisis period. If we decompose the changes in output per worker into the contributions from increased physical capital per worker, education, and TFP, we observe a dramatic collapse of physical capital accumulation during 1999-2005. This has been offset by a somewhat higher rate of TFP growth, and the contribution from improvements in the educational level of the workforce has remained largely unchanged.

Major Sectors

Extending our analysis to the major sectors of the economy, we examine the composition of productivity growth for the agricultural, industrial and services sectors. In agriculture, growth in output and productivity appear to be relatively free of any lasting impact from the crisis. Since 1999, output growth has been close to the pre-crisis average while the proportion of the labor force employed in agriculture has steadily declined as workers find better opportunities in industry and services. Improvements in labor productivity have been largely due to increased capital per worker, and the gains in TFP have been small but persistent, averaging one percent per annum in 1999-2005.

In contrast, output growth in the industrial sector has slowed substantially, from an impressive average of 10 percent per year in 1980-96 to 6 percent per annum since 1999. Output per worker fell by one third after the financial crisis, which was predominantly due to a falloff of 3.8 percent per year in the gains attributed to increases in capital per worker. There is however, an offsetting acceleration in the residual calculation of TFP growth for the industrial sector, which suggests that some of the decline in the contribution of capital may be an overstatement.

The services sector experienced an extraordinary decline in both output and productivity as a result of the 1997-98 financial crisis. Although output recovered to exceed the 1996 level by 2003, labor productivity dropped by 10 percent during 1996-99, and has been largely stagnant in subsequent years. As in the industrial sector, the weak labor productivity growth is attributable to a sharp decline in capital accumulation. But unlike the industrial sector, services continue to exhibit a very low rate of gain in TFP: only 0.5 percent per year. Thus, the sector has been achieving very weak efficiency gains, as measured from the perspective of either labor productivity or TFP.

Reallocation Effects

It is important to note that gains to overall growth result not only from increases in labor productivity within each sector, but from movements in labor from low productivity sectors to those with higher productivity. An example of this second process is the movement of workers out of agriculture, where they are often underutilized, and into higher productivity jobs in industry and services. Indeed, this reallocation effect can be a very important source of growth for an economy such as Thailand, where today the level of output per worker in industry averages nine times that of agriculture and that of services is five times higher. Separating the sector gains in output per worker from the reallocation effects, it is clear that reallocation continues to be a strong contributor to the growth in aggregate labor productivity (and hence real incomes) after the crisis. Reallocation effects added 2 percent per year to growth in 1980-96 and 1.6 percent per year in 1999-2005. With a lower overall growth rate after 1999, the reallocation effects account for 60 percent of the total gain in labor productivity.

Output and Productivity in Service-Producing Industries

The services sector has shown the lowest rate of growth in both labor productivity and TFP over the past twenty-five years. In calculating the sources of growth for 10 major service-producing industries, perhaps the most striking feature is the large number of industries with negative rates of growth in labor productivity. Five out of the ten major service-producing industries (wholesale and retail trade, hotels and restaurants, finance, real estate, and health and social work) all displayed negative rates of growth in output per worker during 1993-2005. Given the use of cost-reducing technologies and the accumulation of knowledge that typically contribute to improved efficiency over time, a finding of sustained negative rates of productivity growth within an industry is difficult to rationalize. Overall, the productivity measures of service industries are suggestive of severe measurement problems in the construction of the output estimates and of difficulties in aligning the measures of industry output and employment.

Detailed Industries Productivity Performance

Finally, we analyze the productivity performance at a more detailed level for four key service-producing industries: airlines, commercial banking telecommunications, and trucking. Since all four industries are important parts of the business infrastructure, improvements in their productivity can have substantial benefits for resource allocation and competitiveness in the broader economy. For each industry, we construct measures of output and productivity that facilitate international comparisons of productivity performance, so that Thailand's industries can be benchmarked to those in other countries, particularly those in Southeast Asia.

Airlines

Output growth in Thailand's airline industry declined after the financial crisis, from an exceptional average rate of 10 percent per year during 1993-96 to just 5 percent per annum in 1999-2006. The contribution of employment to output growth declined to 0.7 percent per year, while capital's contribution to output fell to one-third its pre-crisis rate. The airline industry continued to record significant gains in TFP, but at only half

the rate of 1993-96. In relation to Malaysia, Singapore, and the United States, Thailand's airline industry has achieved steady gains in efficiency, but its level of labor productivity and TFP remain below those of Singapore and the U.S. Much of the difference lies in the area of labor productivity, which is to some extent expected as lower wage rates in Thailand create opportunities to improve service through greater use of labor.

Commercial Banking

An evaluation of the productivity and efficiency of the banking industry is particularly important because of the contribution that a strong banking system can make to financial stability and overall economic growth. However, the longstanding debate on how to measure banking output has yielded no conclusive methodology, and most measures focus on various physical indicators of bank services.

We develop two trial indexes of banking output and compare them to the official output index from Thailand's national accounts. Our trial indexes display reasonably similar results, yet both differ substantially from the national accounts' measure, particularly since the beginning of the financial crisis in 1997. The differences result because none of the physical measures used in the trial indexes provide any evidence of a sharp drop in bank activity after 1997. Instead, the output indexes imply that all of the fall in reported bank income was due to capital losses (nonpayment of loans), rather than a reduced flow of bank services. Similarly, the large sustained falls in labor productivity and TFP evident in the official output index seem implausible. Given the fact that both employment and the capital stock are again growing, it is difficult to argue that the industry is still in disequilibrium. It is far more likely that the Thai banking industry has achieved substantial productivity gains under the pressures of the financial crisis and the emergence of new IT technologies.

Regrettably, we were unable to compare the output and productivity of Thailand's banking industry with other Asian economies due to a lack of comparable data. Yet, a simple comparison of operating-expense ratios suggests that Thailand's banks have operating costs similar to banks in India, but higher costs than those in Taiwan or Australia.

Telecommunications

The telecommunications industry in Thailand has been a major source of growth over the past decade, as the explosion of mobile services has brought telephone coverage to nearly 75 percent of the population. Because mobile communications require a much less expensive infrastructure than the traditional fixed-line service, Thailand has been able to upgrade its telecommunications to a level approaching that of higher income countries at a fraction of the cost. As such, labor productivity in Thailand and Malaysia has soared well above that of the United States. Similarly, output per unit of capital has also increased dramatically in Thailand, and is well above that of both Malaysia and the United States. The high output growth in this industry is largely a result of large contributions of capital during the 1993-2000 period. After 2000, output growth is largely driven by increases in TFP as the utilization of the new network increases at a rapid pace. It remains to be seen, however, if the mobile technology will be able to provide the full range of internet and broadband services that are becoming critical parts of the communications infrastructure in higher-income countries.

Trucking

The efficient performance of the logistic industry is critical to enhancing the integration of Thailand's industries into the global economy. Trucking in particular provides an indispensable network between inland production centers and the seaports that provide a link to global trade. Despite its importance, there are severe data limitations on the output, employment, and capital stock of the trucking industry. Using an output index based on a freight-tonnage measure from the Ministry of Transport, we calculate upper bound estimates of growth in labor productivity and TFP. There has been substantial growth in labor productivity, averaging about 3 percent per year during the 1991-2005 period. Given the rapid increase in the stock of trucks, however, the growth in TFP has remained modest, at about one percent per year. This appears to result largely from the shift toward larger trucks, rather than just an increase in the number being utilized.

Implications and Recommendations

The frequency with which we found negative rates of growth in labor productivity in the service-producing industries suggests that the growth of output in these industries is being underestimated in Thailand's national accounts. Thus, it is equally likely that the rate of growth of total GDP is being underestimated as well. An alternative explanation for the negative rates of productivity change is a systematic over-estimation of the growth of employment in these industries. However, there is no obvious reason for the employment estimates provided by the labor force survey to be overstated.

The analysis is most suggestive of an underestimation of output growth for the industries that displayed strong negative trends in productivity: trade, hotels and restaurants, finance, and business services. In contrast, we obtained significantly positive estimates of productivity growth in the public administration and education industries. Since the typical methodology for these industries should have produced a constant level of labor productivity, a review of the productivity growth estimates for these industries should be considered in future work.

The problems of estimating output and productivity in the service-producing industries arise largely because of the lack of basic survey information on these industries that could be used in the construction of the national accounts. Measures of the economic performance of the service sector are underrepresented in the statistical systems of many countries. The reasons for the bias in favor of agriculture and industry are several. First, there are unique difficulties in defining and measuring the intangible output of some service-producing industries. Second, attitudes toward the production of services were strongly influenced in the early stages of industrialization, when the focus was on the need to increase the production of food and other material necessities of life. Finally, as few services were historically tradable across national borders, they could not be used to finance the purchase of advanced capital equipment and other products that were unavailable in the domestic economy.

As such, the statistical systems of many countries continue to underinvest in information on the service-producing industries. Thailand is no exception in this regard. We have highlighted below a number of data or measurement problems that limit the statistical system of Thailand to generate quality measures of productivity performance in the services sector, along with some proposed solutions.

Data or Measurement Problem	Proposed Solution
Thailand has no comprehensive economic census for the services industries and annual surveys are limited to a few select industries. Information on employment is limited.	A series of regular surveys of the service industries, building on the Business Trade and Services Survey conducted by the NSO.
Assuring completeness of coverage is difficult due to the large informal sector.	Utilize a ‘labor input’ method supplemented with special surveys that examine the value added of informal workers in more detail.
The output price deflators employed for services do not accurately distinguish between price and quality changes.	Build on the experience of other countries in developing effective models for measuring price change in service-producing industries.
Need for detailed explanation of the sources and methods used to construct the national accounts	Information is available on the web site of the National Accounts Office of the NESDB, but only in Thai.