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SESSION 2: PRODUCER PRICE INDEX FOR SERVICES

EXPERIENCES WITH THE DEVELOPMENT OF A
PRICE INDEX FOR <u>COMPUTER SERVICES</u> IN SWEDEN

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Introduction

The purpose of this paper is to briefly describe the development of a price index for computer services and the difficulties encountered.

The Swedish computer services industry

According to Swedish Business statistics, there were 22 078 enterprises in the Swedish computer services industry in 2000. These enterprises employed 85 525 individuals. The total net turnover was SEK 109.3 billion. Sole traders accounted for 2.0% of the net turnover in 1999. Most of the enterprises are small with fewer than 10 employees. According to the intermittent survey of IT consultants during spring 2001, the 13 largest enterprises account for 25% of the total turnover in the industry. More than half of the computer services enterprises are located in or close to one of the three largest Swedish cities. In terms of customers, enterprises and public utilities account for ¾ of the total turnover while households only account for 0.2%. Government and municipal authorities account for 14%.[1]

The computer services industry in Sweden provides services in three main areas: computer consulting services, operational services, and maintenance and repair services. Large computer enterprises often offer all the services available within the industry.

Price measurement methods

Prices for computer consulting services as well as maintenance and repair services were first collected in the first quarter of 2002. Prices for operational services will be measured beginning with the third quarter.

Computer consulting services

This sector usually charges by the hour. We collect information on the average invoiced hourly rate for the following categories of consultants: project manager, system analyst, IT architect/system designer, system programmer/programmer and system engineer. Each consultant category is divided into 5 different experience levels and we request the hourly rate for consultants at experience levels 2 to 4. Since most consulting assignments are fairly short (less than 2 years), we do not take the length of the contract into account. In most cases, the enterprise can collect the requested information relatively easily. Large enterprises have the largest burden as respondents. The hourly rate for programmers is affected by which programming language is used. We therefore ask respondents to report the programming language when reporting the hourly rate for programmers.

Tracking price changes in hourly rates does not capture changes in productivity, which is particularly problematic in a sector that changes so quickly. (Both software and hardware are constantly developing. An enterprise's knowledge base increases with the number of consulting

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[1] For further information see Cerda M. & Glanzelius M. (2001) Service price index for computer and related activities SE-SIC 92 group 72, TPI project report no.2

assignments, which enables quicker and more effective completion of future assignments.) It is important to try to develop methods for estimating changes in productivity.

Operational services

Operating contracts are divided into their main parts and the respondents then determine the prices of the different parts. The services that are priced are server monitoring (model pricing), support (hourly rate), monitoring of computer communication (model pricing), physical and electronic data storage (price per unit), and backup services (price per unit).

Since operational services often consist of a package price that includes monitoring, backup, support, etc., many enterprises have difficulty breaking down the operating contract to the level for which prices are requested. But since customers also increasingly request detailed price information for the services they purchase, the majority of enterprises are working to set prices for the different components of operating contracts.

Large enterprises sometimes have separate companies that internally take care of operational services. Importing operational services from a neighbouring country is also fairly common.

Maintenance and repair of office, accounting and computing machinery

We collect prices for maintenance, repair, and installation of computers, printers and servers. We use Model Pricing for all of these services. The problem of quality adjustments arises when the model of computer, printer, or server changes.
This sector also often charges by the hour.

Sample selection

Sweden's business register is used as a sampling frame. Enterprises that have the relevant activity as a second or third line of business are also included in the sampling frame. This is because an enterprise can have a NACE category as its main line of business at the same time that it is a major enterprise within another NACE category. Sole traders are not included, since the computer industry is characterised by rapid changes, new enterprises start at the same time as others stop their activity, and mergers and acquisitions are common occurrences. Including these enterprises would increase the risk of nonresponse.

The total sample size is 100 enterprises. The sample size for each NACE group is proportional to the NACE group's weight according to the National Accounts.

Since the computer services industry consists of many small enterprises, the sample is taken using a probability sample. Probability sampling makes it possible to use statistical theory to study the properties of the estimates. A PPS sample[2] with size measure s "number of employees plus one" is taken from the relevant NACE group. For an enterprise active in multiple sectors, the size measure is multiplied by the share in the relevant sector. "Number of employees plus one" is used as the size measure since the number of employees is a more stable variable than the net turnover, which

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[2] PPS = Probability Proportional to Size

is missing for a number of enterprises and is often out-of-date in the business register. For enterprises active in several sectors, thus, the size measure, s, is (share in the sector) * (number of employees plus one).

The correlation between the number of employees and the net turnover is relatively high, which indicates that the number of employees is a reasonable proxy for the net turnover. The approximation is better for larger enterprises than for smaller enterprises.

Future plans

The goal during 2002 is to finish developing the index for computer consultancy services, maintenance and repair services, and operational services. Other remaining tasks are to extend the index to include release of systems and user tools as well as publishing services of application software.