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SPPI for Data Center Colocation Services

Part of NACE 63.11 Data processing, hosting and related services

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Introduction

In order to comply with EBS regulations, Statistics Netherlands has worked tirelessly over the past few years to expand the scope of the SPPI. However, in order to be able to deliver a top quality Index of Service Production, improvement works are also needed on a few of the most important existing SPPIs. This document describes part of the results our research into an improved, up-to-date methodology for measuring J63 (Information services) producer prices. Our SPPI for industry J63 is currently not published. The methodology used is outdated, just like the panel to which the web survey is sent out to. Our research has provided a solid basis to implement an improved methodology in 2023.

For some industries, producer prices are harder to measure than for others. When expanding the SPPI, an important principle for Statistics Netherlands has been to give priority to industries where meaningful indices can be compiled. For industries where prices are practically impossible to measure, we prefer to employ a proxy instead of making fruitless attempts to approximate the true price change through surveys (EBS regulations allow for proxies to be employed instead of actual producer prices for some industries). This principle has also been applied when redeveloping the SPPI for industry J63. This industry consists of various different sub-industries, some of which are highly complex. In the early stages of the research period, we have identified three large sub-industries for which it seemed feasible to adequately measure producer prices: platform services, data center colocation services and online advertisement.

For platform services, we have performed desk research into revenue models. Consequently, we have developed a theoretical framework for dealing with platform services in the SPPI. This theoretical framework has been translated to a draft survey. In 2023, Statistics Netherlands will implement it into practice. Platform businesses will be drawn into the SPPI sample and receive the survey.

For online advertisement, desk research was performed and three businesses were interviewed. A draft survey has been compiled. For the major business in the field of online advertisement, talks are ongoing about a detailed dataset to be shared through a secure https- or sftp-connection (instead of using a standard survey). The research into online advertisement offered synergy benefits with regard to research into setting up SPPIs for J58 (print advertisement) and J60 (radio and tv advertisement), which have several conceptual similarities to online advertisement. There is also an overlap in the businesses that produce these services.

For data center colocation services, we held several in-depth interviews with external industry experts. Model pricing has appeared to be an appropriate method for tracking colocation prices. A survey has been composed that will be sent out to data centers in 2023.

In this document, further details are provided about our research on data center colocation services. Contrary to platform services and online advertisement services, we do not believe this industry has been discussed before at the Voorburg Group, while it is a rapidly growing business. Data center colocation services are classified as part of NACE 63.11 and CPA 63.11.19. It is expected datacenters will be given a class of their own in the upcoming NACE revision.

Limited sample sizes are needed for all three sub-industries, because the industries are rather concentrated. For platform services, a sample of 25 businesses is foreseen. For colocation, a sample of 15 businesses is foreseen. For online advertisement, a sample of 35 businesses is foreseen. Regular annual production costs are expected to be 0.4 fte for the three sub-industries combined.

The current planning is to publish the three new indices in 2024Q1, retrospectively from 2023Q1 onwards. By then, it should also not be necessary anymore to consider the SPPI for industry J63 as confidential, because the three industries together cover a huge share of J63. A large missing sub-industry is cloud and hosting. We may still research this sub-industry at a later stage.

1. Data center colocation services

1 Introduction

A data center is a building where IT equipment can be stored with access to power and the internet. Instead of placing their servers at their own workplaces, more and more businesses choose to place them in a data center and to work with them remotely. This offers significant benefits: less disruptions and less costs. The data center market is growing strongly and is expected to continue its growth. The Netherlands is a popular place for establishing data centers due to its high degree of connectivity, stable energy supply, and stable political climate.

Data centers can be multi-tenant or single-tenant. Multi-tenant data centers are commercial data centers that are specifically built to facilitate servers of external customers. Single-tenant data centers are data centers that only meet the needs of the company's own facilities. A special form of single-tenant data centers are hyperscale data centers. These data centers are generally the well-known data centers, because they are owned by large tech companies such as Google, Amazon, and Facebook. They are specifically built for their own servers and not for external customers. Because the SPPI should only describe market transactions, we do not consider single-tenant data centers in this research.

Multi-tenant data centers rent out the space for customers to accommodate IT equipment and to connect to the internet/network. The connection with the outside world, connectivity, enters the data center via a 'meet me room'. In this room there are modems which will make a connection to a customer's server. Connectivity refers to connections for data transfer, connection to the Internet and networks. The connection with the outside world is not offered by the data center itself. Providers, also carriers, directly provide the connectivity services that arrive in the 'meet me room' of a data center. These companies are the internet providers in CPA J61, telecommunication services. The connection from the 'meet-me-room' to the customer's server in a rack, corridor or suite is established by the data center with a cable. This is called patching.

2 Services

The primary service of a data center is colocation, i.e. the rental of space for IT equipment to external customers, including energy and patching. Traffic of data is arranged directly with an internet provider by the customer. The rented space is protected 24/7 and has a climate control system. A customer can choose from various options to store their own IT equipment such as a rack unit (part of a drawer in a cabinet), full rack (private rack/drawer in a cabinet), corridor (2 full rows of racks facing each other, so the equipment is not distributed over available racks in a room), and suite (fully customized private room).

Colocation services are offered in standardized and customized ways. Standard colocation services are colocation services for smaller customers who purchase a limited amount of space. Customized colocation services are colocation services for customers who purchase a large amount of space with specific requirements. These customers often have a longer contract period.

The IT equipment of a customer has to be installed in the data center when the colocation service starts. This is called a set-up service. This service is included in this research, because this service is an essential prerequisite for the colocation service to be provided.

Some data centers may also offer cloud services. Because the primary service of data centers is colocation and most of the revenue is generated here, we do not include other services such as cloud services in this study.

3 Input of industry experts

Information was exchanged with colleagues within Statistics Netherlands. This highlighted the importance of identifying relevant data centers; commercial data centers storing IT equipment of external customers. In the Netherlands there are a number of large single-tenant data centers of large technological companies. In consultation with National Accounts it was decided not to include these types of data centers. These data centers only supply to their own company and work with internal transfer prices. The SPPI of the Netherlands follows only market prices.

In order to understand the business of data centers a few experts were interviewed for this study. The input of different field experts has been included in this study. The following field experts were interviewed:

- Dutch Data Center Association (DDA)
- One medium-sized business
- One large business

Based on the input of the above interviews the following concerns/specific topics have been pointed out:

Research shows that there are huge differences in prices across data centers. This difference is reflected in location-based prices. The location of a data center is a price-determining factor of colocation services. A data center becomes more valuable when higher connectivity can be offered. There are more internet exchanges located around Amsterdam than around other areas in the Netherlands.

The concept of connectivity was previously introduced. Different field experts have pointed out the difference between connectivity and patching. Connectivity is not offered by the data center itself but can be seen as a kind of mediation service. The customer arranges the connectivity himself with the chosen carrier. The data center ensures that when the connectivity arrives at the data center, it is linked to the customer's IT equipment. This is called patching.

A determining factor for the price of a colocation service besides location is power, kilowatt. A kilowatt is a measure of how much power an IT equipment uses. The power gets the customer's server working. A kilowatt could differ per rented space (m2). The amount of a rented space is a slightly less important variable and the kilowatt (power) is more important.

The primary service of a data center, colocation, consists of two more components in addition to rent space for IT equipment: energy usage and patching. It depends per data center whether the colocation service is offered as a total or whether the components are billed separately. This is also reflected in the administration. Some data centers administer energy usage separately and other data centers as a bundle, and cannot separate the bundle in components. In addition, it is possible that data centers keep one component artificially cheap and earn it back through the other component, which means prices of individual components can be somewhat meaningless. Finally, discounts and savings also occur. Some data centers process these discounts and savings in the bundle and others by unit. By tracking the total price per month of the bundle, the effect of a discount is captured adequately.

Energy usage can either be billed per kWh, or a fixed price can be agreed regardless of the actual usage. Optionally, a fixed price can be agreed in combination with an agreed usage limit.

For two reasons, customer A may pay a different price than customer B for exactly the same colocation service:

- It appears from the discussions with the field experts that data centers agree a fixed annual price indexation with most customers when the colocation service starts. So when inflation rises faster than the fixed indexation, customer A who joined a few years ago was lucky and pays a lower rate for the same service than customer B who joined just now.
- Customer A may pay a different price than customer B for the same service, depending on how important a particular customer is to a data center (bargaining power). The customer can get a lower price for exactly the same service when the presence of the customer attracts more customers or when they purchase a higher volume.

Industry experts stated they are capable of estimating the average price for a certain service across all current customers.

Industry experts pointed at the important difference between customized colocation services (large customers) en non-customized colocation services (small customers). The turnover of colocation services is approximately 50% customized and 50% non-customized.

It is possible that a customer of a customized colocation service scales up during the contract period. How often this occurs is not entirely clear and seems to be depended on the type of customer. The field experts believe that the scaling up mainly occurs in the first three years. When a customer scales up or down, the change in the value of the service can best be made based on the quantity of kilowatt. For example, if a customer purchased 20% extra kW, the service can be assumed to be worth 20% more to the customer.

Apart from the situation where a customer scales up, quality changes are unlikely in this industry. Possible quality improvements of a colocation service such as an advanced cooling system or internal cabling are limited. Such technological improvements are valid for longer periods (5 to 25 years) because of the size of the investments.

About 5-10% of datacenter turnover stems from set-up services, as estimated by the industry experts.

4 Method

For non-customized colocation services, the best option seems to be model pricing. Businesses can be asked to describe several typical colocation services out of their portfolio for small customers, consisting of space/kilowatts, energy usage and patching. Because some datacenters do not administer prices for these individual components, and because discounts may be given on the total price, we should track the full price for this bundle, rather than tracking the prices of the individual components. Furthermore, because each customer may pay a somewhat different price for the same service, we should specifically ask for the average price across all current customers. Care must be taken not to track the price that a new customer would pay for the described service.

A consideration that has been made with model pricing is to follow the price of the 2nd month of a quarter or the sum of the months within the quarter. Practice shows that agreements are made about how often the electricity price will be adjusted (usually adjusted once a year, on 1 January). In

general, the price of electricity is quite stable during the year. So the 2nd month of a quarter is representative for the quarter.

For customized services, it is not possible to collect an average price across all current customers, because there is only one customer for the specific service. Instead the price for this specific service must be tracked (contract pricing). We can ask businesses to describe several real customized contracts out of their portfolio. A problem here is that the specific customer we track may consume a different amount of energy kWh in each period. Then, the price will fluctuate (unless a fixed price for energy is agreed regardless of actual usage). These fluctuations should not show up in the SPPI, as these are volume changes. To ensure that the we compare apples with apples, a realistic fictitious amount of energy usage must be chosen for the described service, so that we can repeatedly collect the price that would be paid if that would be the actual usage.

Another problem is that the specific customer we track may scale up. If this happens, quality adjustment must take place by calculating the price T-1 based on the extra purchased kW. Beside the T-1 price also the fictitious amount of energy usage must be corrected. When a customer concludes an additional contract for scaling up in addition to the initial contract, no correction needs to be made because the original contract remains unchanged. A side note that has to be made is that a correction is only made when the main variable, kilowatt, changes. This is not an ideal situation because it is possible that there are minor quality changes in other components of the service.

In addition to tracking average prices of non-customized services and tracking real contracts of customized services, the price is also requested for the one time installation of the customers' servers at the data center. Model pricing can be applied here.

5 Survey

Non-customized colocation services:

The table below shows the request for a non-customized colocation service. The price should be based on the average across all current customers. As mentioned before, we track the price of the service as a bundle. This means including patching and energy usage. In addition, the calculation and measuring method of energy has to be specified so the respondent uses the same method every quarter. Also the type of electricity (grey or green power) is included as an price-determining factor. Because there may be a surcharge on the price for green electricity.

Colocation service	Renting out rack space
Customer	Average current customer
Size	47U Full rack
Location	Amsterdam South-East
Patching	1x UTP cable
Power and energy	Power: 3 kW Calculation method: ☐ Recalculation, consumption of … kWh per month ☐ Fixed contract price with an agreed limit of … kWh per month, consumption of … kWh per month ☐ Fixed contract price without agreed limit
Type of energy	☐ Grey power ☐ Green power
Contract duration	12 months
Price 2022Q4 (November):	€ 250 per month excluding VAT

Customized colocation services:

The price of a customized colocation service should be based on a current contract of a specific customer. The price of a current contract should be submitted with a fictitious amount of energy usage. As mentioned earlier, the amount of energy can fluctuate per month. Therefore, the respondent has to specify a realistic fictitious amount of energy with the service. Specifying and pricing a fictitious amount of usage with an actual contract can be confusing for the respondent. This is an point of attention during the production process.

Colocation service	Private Suite or private corridor customized
Customer	External customer with anonymous customer number 12345
Location	Eindhoven
Patching	2x Fiber Cable
Power and fictitious amount of energy consumption	Power: 48 kW Calculation method: ☐ Recalculation, consumption of … kWh per month ☐ Fixed contract price with an agreed limit of … kWh per month, consumption of … kWh per month ☐ Fixed contract price without agreed limit
Type of power	☐ Grey power ☐ Green power
Price 2022Q4 (November):	€ 5.000 per month excluding VAT

Set-up colocation service

We define set-up colocation services as the one-off installation of renting out racks. The service has to be specified with the associated characteristics that are typical to provide this service. We follow the one-time market based price of the detailed service.

Set-up standardized colocation service	
Size	22U half rack
Location	Amsterdam Southeast
Patching	1x UTP kabel
Power supply	Dual feed power supply
Security	Access pass/badge
Price 2022Q4 (november):	€200 excluding VAT