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Documents

**Price Index for
Business and Management
Consultancy Activities**

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1. Introduction

Statistics Norway has developed a Service Producer Price Index (SPPI) for Business and management consultancy activities (NACE Rev 1.1: 74.14). This document provides information on our progress in developing a final price index and current plans for how it will be executed in the years to come.

The service sector of the economy has increased tremendously in recent decades and there is a manifest need to develop new statistics within this area. The European Council Regulation concerning short-term statistics covers quarterly producer prices for services. The regulation is based on the NACE classification. A broader effort to develop service producer price indices is being carried out in Statistics Norway. The aim of this project is to develop new price indices and to improve the quality of existing indices and the development of a price index for Business and management consultancy activities is part of this effort.

The service price index is a producer price index and will serve several purposes. Its main purpose is within the Norwegian National Accounts system, where it is used for calculating fixed prices for production of services. The index is also used for planning and management, both at a political level and for economic life.

One particular challenge with regard to creating an SPPI for business consulting is the fact that the output is often not well or easily defined. Seldom within this industry can we speak about standardised projects. One important task has been to define projects into different categories depending on their characteristics.

Statistics Norway has identified one branch organisation, the Norwegian Association of Management Consultants (NAMC) (*Abelia bedriftsrådgiverforening* in Norwegian). This organisation is affiliated to FEACO (The European Federation of Management Consultancies Associations) and ICMCI (The International Council of Management Consulting Institutes). It appears that only a relatively small percentage of the businesses in the industry are members of NAMC. In our meeting with the organisation we were informed that around 20 businesses with a few hundred employees in total were members. The organisation is not very active and seems to have quite limited resources for promoting the interests of business management consultants in general.

Regarding the requirements from the Norwegian National Accounts, there is a condition that prices are collected separately for private households and others (i.e. private businesses and the public sector). In the case of business and management consultancy, this is an activity that is not primarily aimed at private households and non-profit organisations, although about two per cent of the turnover within

the industry does come from these two segments. There is reason to believe that non-profit organisations constitute the predominant part of this turnover, and, since it represents such a small share of the total turnover, it does not need to be taken into account. According to our own Classification of Products by Activity (CPA) figures, about 10 per cent of the total turnover in the industry comes from exports. Prices for exports are included in the price index, and we do not attempt to separate these data into a separate sub-index.

2. Summary

Developing a price index for NACE Rev 1.1: 74.14 Business and management consultancy activities is a part of a broader project in Statistics Norway that focuses on price statistics. The development of a price index for Business management consultancy activities started in 2005, and was finalized in the autumn of 2008.

We have studied the experiences of other countries that have established an SPPI for Business and management consultancy activities. Our method has been developed on the basis of these experiences, along with our own studies of the market in Norway, our meeting and correspondence with the branch organization and our meetings with selected business management consultancy firms.

The method used in this price index can briefly be summarized as follows: the price measure in the survey is the average charge-out hourly fees in the particular quarter. The hourly fees stated are classified in two distinct dimensions: type of activity and job category of different types of employees. This method is characterised as a B – method, and is therefore an approved and acceptable method (OECD-Eurostat 2005 Methodological Guide for Developing Producer Price Indices for Services). We started collecting data from the 1st quarter of 2007.

For the sampling design, we have used Statistics Norway's business register. In accordance with Statistic Norway's own principles, we have chosen to lay most of the burden on large businesses. Overall our sample accounted for nearly 38 per cent of the total turnover in the population.

The prices are compared with the base period, which is the 1st quarter of 2007. The weights were gathered in the 4th quarter of 2007, and will be updated every second year by means of information from Statistics Norway's own Classification of Products by Activity (CPA) figures. In each period the index also will be chained, and the base period will be regenerated.

The results from the first six quarters indicate that the total index follows a reasonable development, with a continuous increase, as shown in table 9.1. From the 1st quarter of 2007, the index has grown by of 5.2 per cent.

3. International experience

According to the OECD-Eurostat 2005 Inquiry on National Collection of Services Producer Prices, a few countries have developed price indices within this area, including New Zealand, Australia and France.

In France, the business and management consultancy branch comprises two different sub-branches; management consulting services and public relations services. INSEE uses “realised charge-out rate” to measure the prices. They require the firms in the sample to calculate an average of several contracts (Buisson 2005).

In general, it appears that some kind of charge-out rate is widely used in these countries. But how the “charge-out rate” is defined appears to vary from one country to the next.

Model pricing is also used internationally, for example in the USA.

According to the PPI Mini Presentation paper at the 20th Voorburg Group meeting, the Federal Statistical Office of Germany had not at that time determined which method to use. The alternatives under consideration appeared to be charge-out rates or a fixed-rate model, or possibly model pricing (Lorentz et al. 2005).

4. Industry description

Definition of a Management consultant: a person who has his main occupation in advising and assisting businesses, organizations and institutions etc. to improve their performance and to achieve their goals.

Firms providing business and management consultancy activities vary considerably in terms of size and scope. The scale extends from single practitioners to large international organisations employing thousands of consultants worldwide.

According to our structural business statistics from 2006, the number of enterprises, employees and turnover in the industry are distributed as follows:

Table 4. 1 NACE Rev 1.1: 74.14 – Structural business statistics 2006

Employees, Size bands	Number of enter- prises	%	Number of employees	%	Turnover (NOK Million)	%
1-4 employees ¹	6 969	95.3	3 591	42.9	6 615	33.4
5-9 employees	211	2.9	1 330	15.9	1 930	9.7
10-19 employees	72	1.0	943	11.3	2 252	11.4
20-49 employees	41	0.6	1 215	14.5	4 701	23.7
50 or more employees	16	0.2	1 294	15.5	4 301	21.7
Total	7 309	100	8 373	100	19 798	100

There is no governmental regulation of prices within this industry in Norway.

Following a number of years of recession, the market has gained pace again in the last couple of years. This is a general trend in most of Europe. According to FEACO, the market for business and management consulting in Europe is now estimated to be worth more than € 60 billion. According to the FEACO 2004 survey, *“A clear change in trend could be observed in the Nordic countries. In 2003 these countries formed the tail end of the growth scale with negative growth rates on an average minus 11.5 %, however in 2004 they demonstrated a slightly positive rate”* (FEACO 2005: 6).

Table 4.2 shows the turnover distribution between the different fields of activities as it appeared in Statistic Norway’s 2006 CPA survey. CPA is the European Union standard for products grouped according to main activity².

¹ Also includes businesses with no registered employees

² CPA is short for Statistical Classification of Products by Activity in The European Community

Table 4. 2 Turnover, divided by CPA/type of service. CPA study 2006

Field of activity	Turnover, (NOK Mill.)	Percentage of turnover
Business and management consultancy activities	16 953	88.0
Public relations (PR)	2 354	12.2
Strategic management consulting services	3 678	19.1
Financial management consulting services (except corporate tax)	3 025	15.7
Human resources management consulting services	1 967	10.2
Marketing management consulting services	408	2.1
Production management consulting services	201	1.0
Supply chain and other management consulting services	255	1.3
Business process management services	1 762	9.1
Project management services other than for construction	620	3.2
Other business and management consultancy services	2 685	13.9

5. Pricing Methodology

There are quite a few alternatives with regard to pricing methodology. We conducted one meeting with the branch organisation (NAMC) and three meetings with different businesses within the industry. The three businesses were quite different in terms of their nature and size; one small, one mid-sized and one large firm. They also had different profiles with respect to their scope of activity and which fields of activity they were specialised in.

We outlined the possible pricing methodologies in these meetings. The common response was that some sort of charge-out rate is the best possible method that can be employed. Contract prices are also used to some extent, but, from our meetings with the different firms, it appears that hourly fees are used to calculate these contract prices. There were differing views as to how easy it would be to implement such a pricing methodology for the industry in general (or more specifically, for the sample), although no-one that we met suggested that we should try to use methods other than charge-out rates. That is not to say that it can be considered a perfect price measure, but it is probably the best one available to us. One known weakness of the charge-out rate method is that it does not take into account changes in the level of productivity.

Nonetheless, our mapping of this industry tells us that most factors point in the direction of using charge-out rates. What is more complicated is to determine at what level of detail we can collect charge-out rates. It seems to be common practice in the industry to differentiate between the prices

charged by distinct levels of staff. How many levels of staff a company operates with will differ, but, in general, operating with at least three different staff levels appears to be common. This assumption may not be valid in the case of smaller firms. Many such firms will, for example, consist of three or fewer employees, all of them are partners in the firm. The assumption does hold true, however, for mid-sized and large firms.

The level of detail on invoices will to a large extent depend on the clients' wishes and demands. In general terms, the trend seems to be towards greater openness and more detail. Typically, the price will be specified for each type of employee involved in the project, the time spent and the price per time unit.

Tendering and formal quotation also takes place. In such cases, the level of detail concerning price will be comprehensive. The relative importance of time and price may differ between clients. If the project is urgent, time will be of the essence. Some clients will be happy with an “adequate” solution, while others will be prepared to pay more to achieve management consultancy in the “high end” division.

Contract prices are also used to some extent. But, from what we learned in our meetings with the different firms, hourly fees are used to calculate these contract prices. It can therefore be said that – at least in most cases – hourly fees directly or indirectly form the basis for the bill to the client.

Other factors that might influence the price are the type of client in question and the type of business management consultancy involved in a project. Whether the client is a private firm or in the public sector may affect the price level. Furthermore, classification problems may arise due to the mix of different activities in a project. The deciding factor here has to be which field of activity the major part of the project should be classified as.

It is important to set a level of detail that is acceptable to all respondents, yet remains precise enough to provide sufficient information to yield a high-quality index.

One possibility is to measure prices according to the division made by FEACO. They divide Business and management consultancy activities into four different fields of activity. These are I) Consulting³, II) Development and integration, III) Outsourcing, and IV) Other services (www.feaco.org). The level of detail in this alternative could be described as moderate.

³ This can be divided into business consulting and IT consulting. Business consulting includes: Strategy Consulting (SC), Organization/Operations Management (OM), Project Management (PM), Change Management (CM)

5.1 Quality adjustment

The intangible nature of services such as business management consulting makes it harder to produce reliable indices. Direct quality adjustment is difficult to implement satisfactorily, and it would also represent a considerable burden on the respondents. As previously mentioned, measuring prices using charge-out rates does not take into account any changes in the level of productivity. The scope of this problem is currently unknown.

It is reasonable to assume that quality changes do occur in this market. Employees are becoming more efficient due to training and experience, and the type and nature of projects may change over time. Structural changes in both the public and private sectors of the economy (i.e. the clients) can change the pattern of the demand for business and management consultancy services, though the scope and pace of these changes are not clear.

5.2 Weights

Weights have been collected for two dimensions: I) the distribution between different types of employees, and II) the distribution between different fields of activity.

Updated weights will be gathered from the respondents in the first quarter of every second year. This will take place at the same time as we rotate the sample. This means that we will get updated weights based on the companies' turnover from the previous year, from both existing and new companies in the sample.

5.3 Questionnaire

Under the Statistics Act, Statistics Norway can instruct the respondents to report data as specified by Statistics Norway. This provides an excellent basis for a high response rate.

In the questionnaire, we have made a distinction between the different types of employees (levels of staff). This is because the price level normally differs, depending on the experience and position of the person in question.

The charge-out rates must be reported for each of the following three levels of staff: A. Partner, B. Senior Consultant, and C. (Junior) Consultant/Assistant. Some businesses will operate with fewer than three levels of staff, and some businesses will have more than three. In such cases, we ask them to report the hourly charge-out rate for the highest, medium and lowest levels of staff respectively.

For the differentiation between fields of activities, we have chosen to retain the CPA classification. This means that we will operate with nine different fields of activities. The fact that many projects will include services within several fields of activity complicates the picture somewhat. We resolve this by collecting hourly charge-out rates for each of the three levels of staff for each of these nine areas (i.e. for those areas/levels of staff with turnover in the quarter in question). The nine fields of activity are as follows⁴:

1. Public relations services
2. Strategic management consulting
3. Financial management consulting services
4. Human resources management consulting services
5. Marketing management consulting services
6. Supply chain and other management consulting services
7. Business process management services
8. Project management services other than for construction
9. Other business and management consultancy services

When the respondents fill out their prices, they are asked to state whether these are hourly charge-out rates or list prices. They are given the option of stating list prices if it is impossible for them to state charge-out rates. Our data show that the half of the respondents state their list prices.

A copy of the questionnaire is in the appendix of this report.

5.4 Data collection

The respondents receive the questionnaire a couple of days before the end of the quarter. The deadline for reporting is normally three weeks (there is a longer deadline after the 2nd quarter to allow for summer holidays). The firms can either answer the questionnaire by means of the paper version or IDUN (Statistics Norway's system for electronic exchange of data with business enterprises). If Statistics Norway has not received the questionnaire by the deadline, a reminder with a warning of a compulsory fine will be sent out. A new deadline (1 week) is set. If the questionnaire is still not returned, a decision to impose a compulsory fine is made. The respondent is then informed by letter that they have one final week to send in the questionnaire before the decision is made final. Because of Statistics Norway's ability to impose disclosure requirements and our online reporting facility, we

⁴ A more detailed description of the contents of each field of activity can be found in COMMISSION REGULATION (EC) No. 204/2002 of 19 December 2001 amending Council Regulation (EEC) No. 3696/93 (CPA)

have a response rate of close to 100 per cent. All the data we collect is transferred to ISEE (Integrated System for Editing and Estimation). In ISEE we are able to audit the data and calculate the indices.

6. Index calculation

This section explains the calculation of the SPPI for NACE Rev 1.1: 74.14. Statistics Norway is currently working on a general application for data auditing and price index calculation, which is intended to be used for all SPPIs that Statistics Norway plans to develop in the next few years. The application will also be applied to Statistics Norway's existing indices. It will provide for a thorough and efficient data audit and price index calculation. It encapsulates a description of the steps involved in the index calculation, as developed by Senior Researcher Li-Chun Zhang in Statistics Norway.

Notation:

- Weight basis period (b)
- Price basis period (s)
- Statistical/actual period (t)
- Index reference period (r)

Price relative and elementary index

Denote service j in elementary group i with (ij) , for $j = 1, \dots, n_i$. p_{ij}^t is the price for (ij) at the statistical/actual period t , and p_{ij}^s the price in the base period. An elementary group for this SPPI would be as follows:

NACE 74.14

Human resources management consulting services (type of service)

Senior Consultant (level of staff)

Size band 10-19 (stratum)

The elementary group would in this case consist of all price relatives from human resources management consulting services, carried out by senior consultants working in businesses with 10-19 employees in NACE Rev 1.1: 74.14.

Furthermore let

$$I_{ij}^{s,t} = \frac{p_{ij}^t}{p_{ij}^s}$$

be a price relative. $P_i^{s,t}$ is the i elementary index⁵, also known as micro index. An elementary index is calculated without the use of weights. This is the first step of the calculation, and the most used elementary indices are:

- Carli index (average of price relatives)

$$P_i^{s,t} = \frac{1}{n_i} \sum_{j=1}^{n_i} \frac{p_{ij}^t}{p_{ij}^s} = \frac{1}{n_i} \sum_{j=1}^{n_i} I_{ij}^{s,t}$$

- Dutot index (ratio between two price relatives)

$$P_i^{s,t} = \frac{\frac{1}{n_i} \sum_{j=1}^{n_i} p_{ij}^t}{\frac{1}{n_i} \sum_{j=1}^{n_i} p_{ij}^s} = \frac{\sum_{j=1}^{n_i} p_{ij}^t}{\sum_{j=1}^{n_i} p_{ij}^s}$$

- Jevons index (geometric average)

$$P_i^{s,t} = \left(\prod_{j=1}^{n_i} \frac{p_{ij}^t}{p_{ij}^s} \right)^{\frac{1}{n_i}} = \exp \left\{ \frac{1}{n_i} \sum_{j=1}^{n_i} \log p_{ij}^t - \frac{1}{n_i} \sum_{j=1}^{n_i} \log p_{ij}^s \right\}$$

We have decided to use Jevons index as elementary. The new application for index calculations allows us easily to test for other well-known elementary indices, like the Carli index and the Dutot index.

The IMF Producer Price Index Manual describes the different results obtained by calculating these three indices. It is clear that the choice of elementary index can have a distinct impact on the results (IMF: 2004: 216). In general, an arithmetic average (Carli) will be greater than a geometric average (Jevons). The Dutot index may be greater or less than the Jevons index, but will be less than a Carli index. The manual also describes the fact that the difference between the respective index results tends

⁵ The elementary indices are actually an estimate for an unknown parameter called the theoretic elementary index

to increase as the variance of the price relatives increases. This is something that we have to be aware of, since business and management consulting activities is an industry where realised hourly rates will be affected by market trends. The Jevons index is preferred when there are extreme observations in the data and we want to minimise the effect they have on the results. The axiomatic approach to traditional elementary indices supports the use of the Jevons formula under all circumstances.

Weights

We will aggregate the elementary indices up to a “total” SPPI with the use of weights, w_i^b for elementary group i in the weight basis period b .

Let:

$$w_i^b > 0 \quad \text{and} \quad \sum_{i=1}^M w_i^b = 1$$

In addition to calculating the “total” SPPI we will calculate some sub indices. To calculate elementary indices up to a sub index at aggregation level G , we need the weight $w_{i(G)}^b$ for $i \in G$. Sub index weights are calculated as follows:

$$w_{i(G)}^b = \frac{w_i^b}{\sum_{k \in G} w_k^b}$$

Index calculation

For this SPPI we intend to calculate a Laspeyres index.

$P^{s,t}(b)$ becomes a true Laspeyres index if $b = s$ and $P_i^{s,t} = I_i^{s,t} = \frac{p_i^t}{p_i^s}$, and we will calculate the SPPI as follows:

$$P^{s,t}(s) = \sum_i \frac{q_i^s p_i^s}{\sum_k q_k^s p_k^s} \left(\frac{p_i^t}{p_i^s} \right) = \frac{\sum_i q_i^s p_i^t}{\sum_i q_i^s p_i^s}$$

From these data we can produce indices by type of activity field and type of employees. It will however not be a priority in the introductory phase to publish anything beyond the total index for the industry.

The SPPI will be chained every other year simultaneously with the sample rotation and updating of weights.

7. Sampling design

The sample design will, as a starting point, use Statistic Norway's business register. The population consists of all establishments registered as NACE Rev 1.1: 74.14 in Statistic Norway's Business Register.

In accordance with Statistic Norway's principles, we will lay most of the burden on the large businesses, in that a much higher percentage of the large businesses will be included in the sample. In addition to the fact that they have greater resources for undertaking such tasks, we will acquire sufficient coverage of the turnover in the industry using a limited number of respondents, since the large businesses represent such a substantial share of the total.

Table 7. 1 Sample design

Number of employees	Turnover (NOK mill.)	Per cent	Establishments in population	Per cent	Probability of inclusion in the sample	Establishments in sample	Per cent	Turnover in sample (NOK mill.)
0	1 727	16.9	4531	66,4%	1.5%	68	23%	26
1-4	3 487	34.1	1992	29,2%	5.0%	100	33%	174
5-9	1 411	13.8	190	2,8%	20.0%	38	13%	282
10-19	1 292	12.6	68	1,0%	75.0%	51	17%	969
20-49	1 209	11.8	32	0,5%	100.0%	32	11%	1 209
50+	1 109	10.8	12	0,2%	100.0%	12	4%	1 109
Total	10 236	100	6 825	100%		301	100%	3 769
								37%

Since the inception of this index, the sample size has been halved. In the second quarter of 2008 the sample consists of 156 firms. The desertion has several causes: a number of firms were placed in incorrect industrial classification groups, some company addresses had been incorrectly registered and the questionnaires were returned undelivered, and several firms were reported as inactive or sold.

8. Documentation of the statistical procedures

To ensure that the data we collect from the respondents are reliable and represent a realistic picture of the industry, we need quality assurance. Every questionnaire is closely examined and edited if necessary. This process requires both judgement and knowledge about the index. The examination is done manually, supported by electronic auditing applications.

The review comprises essentially two methods: micro-based and macro-based. The first of these assesses each piece of information received from the respondents. For this, a data editing application called Dynarev is used, which allows controls to be defined that mark a data field with "error" if the

item of information does not meet the right criteria. This functions only as an alarm; the actual editing has to be performed manually. There are three particular types of controls that we employ with each item of price information:

- Value compared with previous period. This control raises an alarm when there is a large change in price compared with the previous quarter. A large change might indicate a discontinuity.
- Value compared with the same quarter previous year. This control raises an alarm if the price is lower than it was in the corresponding quarter of the previous year. Normally we expect prices to increase. However, there have been cases where verified price decreases occur. These are confirmed by contacting the respondent.
- Continuity. This control raises an alarm if the value has remained unchanged over five quarters. A source of error in the index calculation that may be difficult to detect is where observations remains unchanged over a long period. This may be due to a respondent's lack of commitment to the accuracy of the survey, or it may be attributable to natural causes. Here, we usually contact the respondent, either by phone or e-mail. It is not unusual for a company to have unchanged prices over several periods, especially in the case of smaller companies located outside the major cities. It may at some stage be appropriate to extend the number of periods of unchanged prices needed to trigger an alarm.

In the macro review, we control which price observations have the strongest effect on the calculated indices. We employ Rstudent and DFFITS to rank the most outlying and influential values. We also have to make assessments as to whether the observations are actually problematic.

Figure 8. 1 Screen print of Rstudent controls

Rstudent kontroll						
VEKT	PRIS	ORGNR	PRIS	ei_gruppe	Studentized Residual without Current Obs	ref_rstudent
0,100628	2000	973931XXX	2500	2;1;1	2,01485	2
0,100628	1500	986450XXX	2000	2;1;1	2,20481	2
0,065021	3065	976528XXX	4800	2;2;3	9,15832	2
0,064930	2000	973931XXX	2500	1;1;1	2,01485	2
0,042367	5473	976528XXX	6228	2;1;3	2,13687	2
0,042367	2000	980533XXX	2500	2;1;3	2,01485	2
0,042367	3600	984667XXX	4600	2;1;3	4,25908	2
0,038429	1751	976528XXX	2400	2;3;3	2,94896	2

Rstudent is a standardized residual (with constant variance) by regression of the present price over the basis price. An example of an Rstudent control is shown above. “Orgnr” tells us which company the observation comes from. “Vekt” or weight gives us an indication on how significant the observation is in proportion to the calculated index. Only Rstudent values greater than +/-2 are shown in this table. In the example above, we have a price observation with an Rstudent value of greater than 9. This reflects a price increase from NOK 3 065 to NOK 4 800 (hourly charge-out rates). This observation needs closer examination.

DFFITS is a diagnostic meant to show how influential a point is in a statistical regression. In other words, it is a method we use to detect price relatives that have strong influence on the index calculation.

9. Results

9.1 Index results

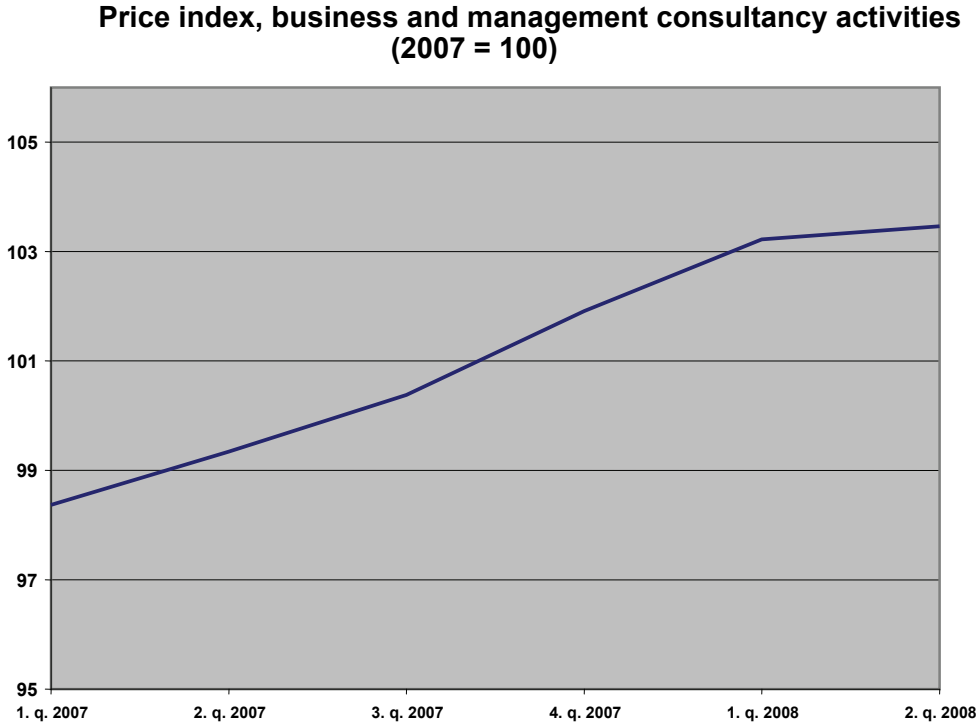
Table 9.1 shows the development of the price index for business and management consultancy activities from the first quarter of 2007 to the second quarter of 2008. Figure 9.1 gives a graphic depiction of this development.

Table 9. 1 Price index for business and management consultancy activities. 1. q. 2007 - 2. q. 2008

Price index for business and management consultancy activities	
2007=100	
1. quarter 2007	98.4
2. quarter 2007	99.3
3. quarter 2007	100.4
4. quarter 2007	101.9
1. quarter 2008	103.2
2. quarter 2008	103.5

We can see that there was continuous growth through 2007. Between the 1st and 2nd quarters of 2008, the growth stops. The graphic below shows how the index increases gradually for the first three quarters of 2007, and then makes a small leap of 1.5 per cent between the third and the fourth quarter of the year. The trend then continues in the same manner into the new year. However, in the 2nd quarter of 2008, the trend changes, and more or less levels out.

Figure 9.1 Price index, business and management consultancy activities, 1. q. 2007 – 2. q. 2008



From this brief account, we can state that the total index for business and management consulting services follows a continuous growth. Within the last 18 months, it shows a price increase of 5.2 per cent. From the first quarter of 2007 until the corresponding quarter in 2008 the increase is 4.9 per cent. The growth is more moderate, at 4.1 percent, between the second quarter of 2007 and the second quarter of 2008.

Figure 9.2 Total index and sub indices

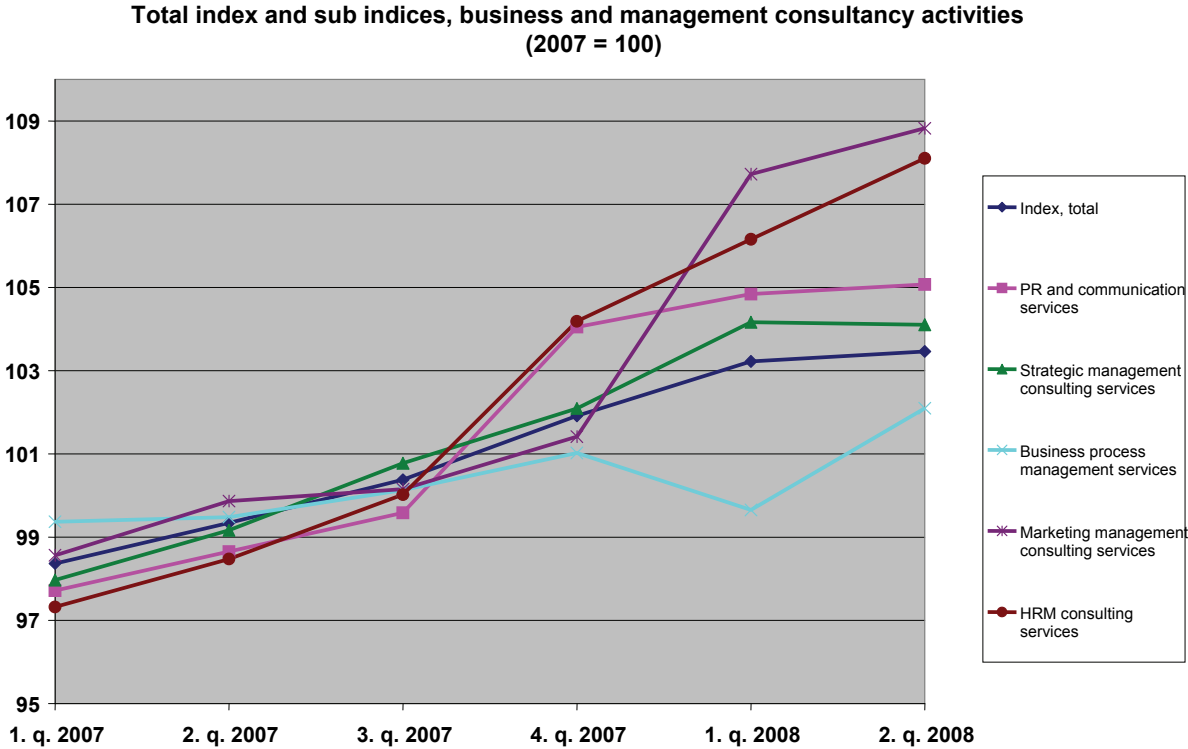


Figure 9.2 gives us an indication of the price development within the distinct fields of activity. Although we are able to collect this kind of information about the different activity fields, we do not intend, for the time being, to publish these sub indices, since there are simply too few observations for most of them. Consideration may eventually be given to publishing the two sub indices for PR and strategic management consulting services; these are the two activity fields with the most observations, and consequently the fields with the closest similarity to the total index. As can be clearly seen in the figure, these sub indices level out in the second quarter of 2008, just as the total index does, whereas the smaller indices, such as business process management, marketing management and HRM, continue to rise.

In the first three quarters of 2007 all of the indices remain close to each other. In the 4th quarter of 2007 they start to diverge, and by the beginning of 2008, the differences are starting to be noticeable. It is too early to say if these divergences will continue into the future, or if the sub indices will become more congruent in the quarters to come.

Since the data collection started in 2007, we can see that there are two sub indices that have experienced a considerably stronger growth than the rest. These are the indices for marketing management and HRM consulting services. HRM had a prominent increase in the 4th quarter of 2007, while marketing management showed a dramatic leap in the 1st quarter of 2008. The sub index for

HRM has increased by 11.1 per cent since the 1st quarter of 2007, and a similar increase, of 10.3 per cent, has occurred in marketing management consulting services. As mentioned above, the sub indices for PR and strategic management have followed the total index fairly closely. One exception is the period between the 3rd and 4th quarters of 2007, where the sub index for PR showed divergent behaviour. Also notable is the change in the business process management index in the 1st quarter of 2008, when the sub index fell by 1.3 per cent from one quarter to the next. In the following quarter the sub index rises again and rejoins the general trend. We need to be aware that this type of variance can occur when the number of observations for indices is small. This is one of the reasons for not publishing the sub indices at the present time. Figure 9.3 illustrates the number of observations for the different sub indices in our last quarter. These numbers are likely to remain constant in the periods to come.

Figure 9.3 Number of observations per sub index

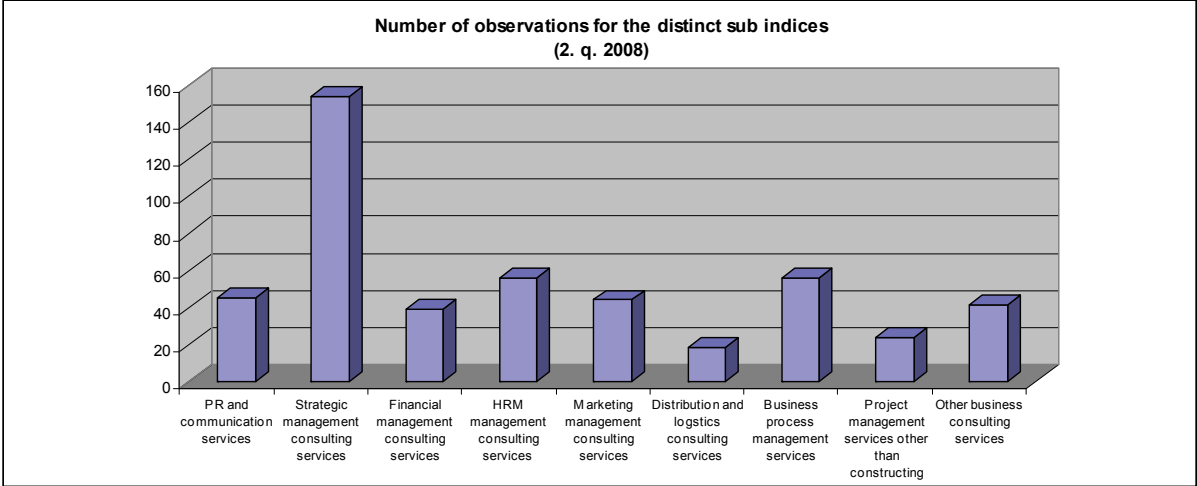


Figure 9.4 Price index changes within different categories of employees

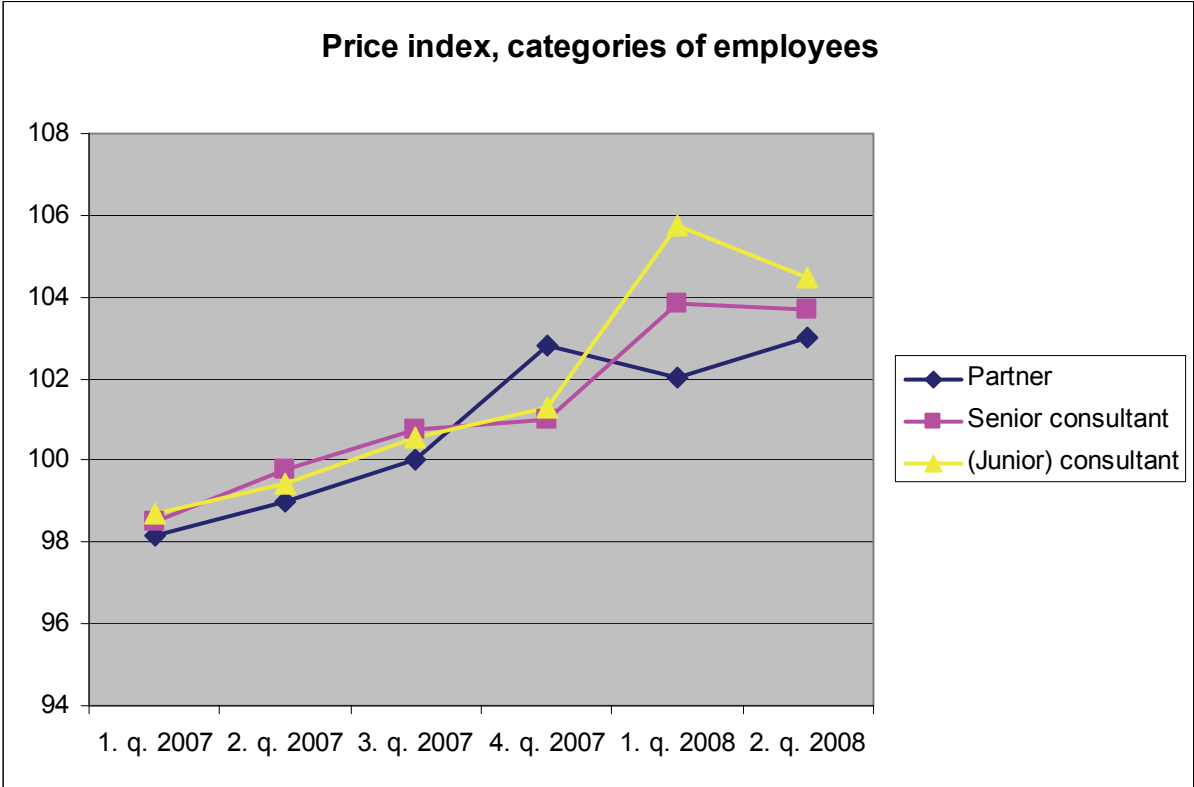
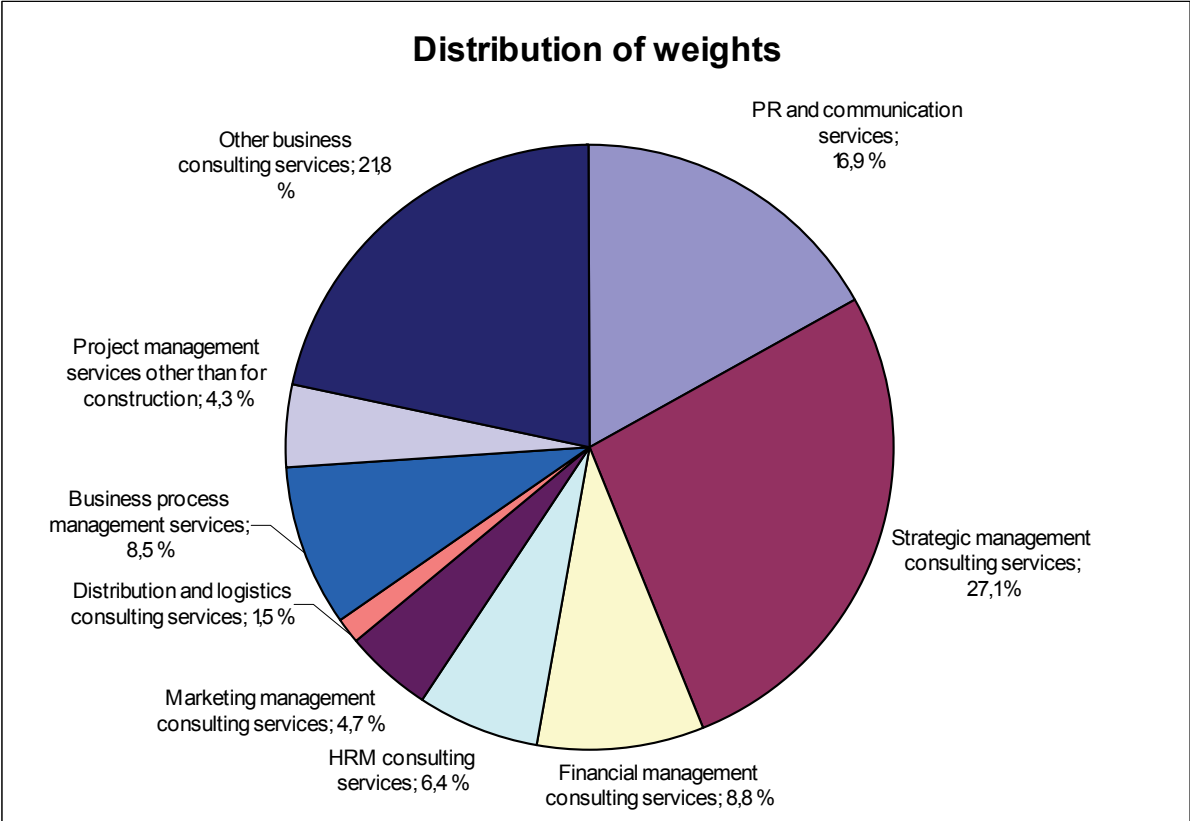


Figure 9.4 illustrates changes in prices within three distinct categories of employees. Note this does not indicate that (junior) consultants have higher charge-out rates than partners, but rather that the change in charge-out rates has been greater in that particular employee category. As the chart shows, the development was congruent across the different categories in first three quarters of 2007. In the 4th quarter of 2007 partners showed an increase in their charge-out rates. In 2008 this increase stops, and stabilizes. For senior consultants and (junior) consultants, the increase occurs in the 1st quarter of 2008, and stabilizes in the 2nd quarter. For all of the three categories of employees, the trend is congruent. Over the last 18 months, all of the categories have had an increase of between 5 and 6 per cent.

9.2 Distribution of weights

In chapter 5 we stated that the price observations will be weighted in proportion to the total turnover within the different fields of activity. In the 4th quarter of 2007 we asked the respondents to report their total turnover in 2007, and the percentage breakdown of the turnover by different activity fields. Figure 9.5 illustrates this distribution, with a few of them clearly larger than the others.

Figure 9. 5 Distribution of weights (collected in the 4th quarter of 2007)



The three largest activity fields combined account for almost two-thirds of the total turnover in the sample. As indicated above, two of the fields are PR and strategic management consulting services, the third being 'Other business consulting services'. Business and management consultancy activities are multi-faceted. Many of the companies offer customised and highly specific business services to large and regular clients, and therefore find it difficult to place themselves in one of the more rigidly defined activity fields. 'Other business consulting services' here includes IT management, offshore consulting services, crises management, innovation consulting services, quality control/management, lecture delivering and training, sales coaching, management support, and much more. The largest fields in the remaining third of the chart are financial management consulting services, HRM consulting services and business process management services.

One clear trend is that the largest companies either operate within strategic management consulting services, or they offer services across all of the different activity fields. Companies that operate within the smaller sectors, such as marketing management, project management and consulting on distribution and logistics are often smaller companies that have chosen to specialize in a particular business management field.

9.3 Evaluation of uncertainty

We have a stochastic approach in the calculation of this price index, an approach to index number theory that treats each price relative as an estimate of a common price change. The advantage of this approach is that uncertainty is quantified, by estimation of probability distributions for the results. This uncertainty can be estimated with model variance, which is the weighted sum of variance in the elementary indices. The variance that we measure will mainly be affected by variance within single price observations, as well as the number of price observations that are included in an elementary index.

Table 9. 2 Standard error

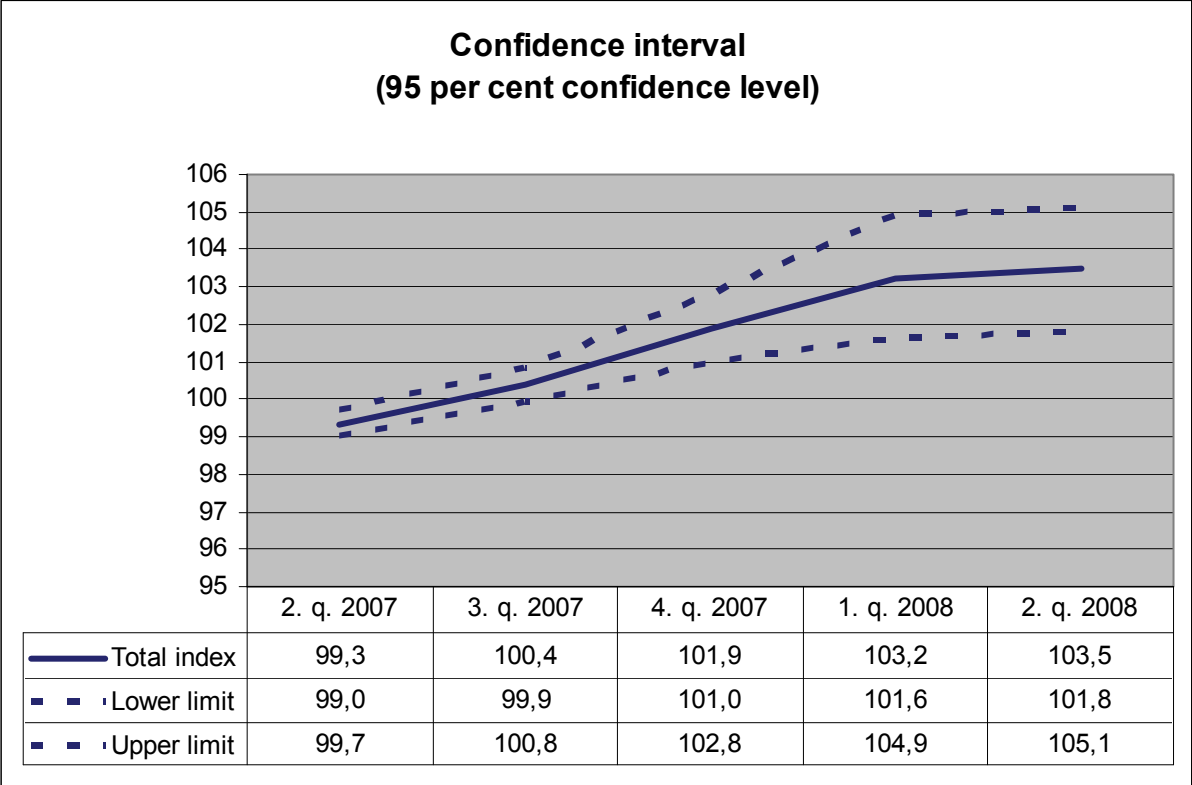
	Price index and standard error	
<u>Period</u>	<u>Index</u>	<u>Standard error</u>
1 st quarter of 2007	1.0000	0.0000
2 nd quarter of 2007	1.0099	0.0017
3 rd quarter of 2007	1.0204	0.0024
4 th quarter of 2007	1.0360	0.0048
1 st quarter of 2008	1.0494	0.0087
2 nd quarter of 2008	1.0518	0.0085

Period	PR	Strat. man.	Finan. man.	HRM	Marketing man.	Distr. & Logist. man	Business proc.	Proj. man.	Other business cons.
1.q.07	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2.q.07	0.0058	0.0033	0.0085	0.0063	0.0075	0.0154	0.0006	0.0109	0.0006
3.q.07	0.0070	0.0061	0.0093	0.0069	0.0078	0.0153	0.0049	0.0135	0.0020
4.q.07	0.0154	0.0081	0.0219	0.0311	0.0099	0.0287	0.0170	0.0137	0.0048
1.q.08	0.0214	0.0129	0.0245	0.0263	0.0438	0.0279	0.0177	0.0238	0.0268
2.q.08	0.0180	0.0116	0.0208	0.0299	0.0455	0.0274	0.0281	0.0250	0.0267

Table 9.2 includes the price index from every quarter and standard errors, which are calculated based on model variance. As we can see, the standard error for the total index starts out very low. The estimate increases gradually, but remains quite low through the whole period. Looking at the sub indices, we can clearly observe that the standard errors gradually increase. Notice also that the sub indices with the most observations have the lowest standard errors.

Another way to describe the uncertainty is by calculating the confidence interval. A confidence interval is an interval that, with great probability, contains the X that we wish to estimate. We use a 95 per cent confidence interval. Figure 9.6 illustrates where the confidence intervals lie in relation to the total index.

Figure 9. 6 Total index with 95 per cent confidence interval



We calculate the 95 per cent confidence interval by taking the index value and adding or subtracting the standard error multiplied with 2. As with the standard errors in table 9.2, the confidence interval increases with the progression of time. However, the difference between the lower and upper limit levels out in the 2nd quarter of 2008. This might be an indication of a stabilizing trend for the confidence interval.

9.4 Publishing

As we mentioned in the introduction to this report, the main purpose of this index is for use in the Norwegian National Accounts system. To ensure topicality, we publish our indices within 45 days of the end of the quarter, or 60 days for the second quarter, when the deadline for respondents is extended due to the summer holidays.

From the first quarter of 2009, the price index for business and management consultancy activities will be published together with other indices from the same Standard Industrial Classification (SIC2007). The index belongs to classification M, professional, scientific and technical activities, and will be published together with the indices for 71.11 Architectural activities, 69.10 Legal activities and 69.20 Accounting, bookkeeping and auditing activities.

Within the last few years, the development of Service Producer Price Index (SPPI) statistics has been a clear priority for Statistics Norway. This focus is reflected in our subject site for price indices on our website (http://www.ssb.no/priser_en/).

9.5 Estimation of data back to 2006

According to COUNCIL REGULATION (EC) No. 1165/1998 of 19 May 1998 concerning short-term statistics AMENDED by the REGULATION (EC) No. 1158/2005 of the EUROPEAN PARLIAMENT and of the COUNCIL and by COMMISSION REGULATION (EC) 1503/2006 the first reference period for transmission of the output price variable No 310 is not later than the first quarter of 2006. Since we began our data collection in the 1st quarter of 2007 we have to estimate data back to 2006, in order to set the base year to 2006.

To avoid as much uncertainty as possible we have employed Statistics Norway's statistics on average monthly earnings within the industrial classification of legal, accounting, book-keeping and auditing activities (NACE Rev 1.1 74.1). Another reason to use the wage statistics was to avoid further respondent burden. We took the original index (2007=100) presented in table 9.1 and estimated these figures backwards by means of annual growth in monthly earnings from 2006 and 2007.

Table 9.3 Price index for business and management consultancy activities, 2006=100

Price index for business and management consultancy activities	
2006=100	
1. quarter 2006	98.4
2. quarter 2006	99.3
3. quarter 2006	100.4
4. quarter 2006	101.9
1. quarter 2007	104.6
2. quarter 2007	105.6
3. quarter 2007	106.7
4. quarter 2007	108.4
1. quarter 2008	109.8
2. quarter 2008	110.0

With index figures from the four quarters of 2006 we were able to set the base year to 2006. The calculation procedure will proceed as usual, but since we don't have actual data from 2006 we have to multiply the future index outputs we get from our calculation application (PRIS) with the index output we estimated in the 1st quarter of 2007. Accordingly we will get index figures adapted the desired base year.

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Prices for business management and consultancy activities

1. What was the average hourly charged-out rate for business management and consultancy carried out by the establishment

	1. quarter 2007	2. quarter 2007	3. quarter 2007	Turnover 2006
Public relation services				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Strategic management consulting				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Financial management consulting services				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Human resources management				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Marketing management consulting services				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Supply chain and other management				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Business process management services				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Project management services other than construction				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Other business and management consultancy services				
Partner	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Senior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000
Junior consultant	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> 000

2. Which kind of charge-out rate did you use to answer question 1

Real charge-out rates	<input type="checkbox"/>
List-prices	<input type="checkbox"/>