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TURNOVER AND OUTPUT MEASUREMENT FOR

TECHNICAL TESTING

AND ANALYSIS IN NORWAY

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Introduction

The aim of this paper is to describe the turnover and price development in the industry of technical testing and analysis in Norway. In the first chapter we will describe the classification of this industry and the definition of the services included. In chapter 2 we will have a closer look on the unit of measure to be collected. In chapter 3 we will explain the market conditions and the constraints in the industry. Then we will state the standard classification structure and product details (chapter 4). In chapter 5 we have an evaluation of the standard classification structure compared to the actual industry and market conditions. In chapter 6 we will have a closer look at National accounts concepts and measurements issues for this industry. In chapter 7 the we describe the turnover methods and the criteria for choosing various methods. In chapter 8 we will compare turnover data with SPPI in general. The paper is finished with a brief summary in chapter 9.

1. Definition of the Service being measured

The industry of technical testing and analysis is in NACE Rev.2 classified in industry 71.200. According to the Statistical Classification of Products by Activity (CPA 2008) 71.20.1 is divided into five 6-digit subcategories:

➢ 71.20.11 – Composition and purity testing and analysis services

This subcategory includes:

- o testing and analysis services for the chemical and biological properties of materials such as air, water, waste (municipal and industrial), fuels, metal, soil, minerals, food and chemicals
- o Testing and analysis services in related scientific fields such as microbiology, biochemistry, bacteriology, etc.

➢ 71.20.12 – Testing and analysis services of physical properties

This subcategory includes:

- o testing and analysis services of physical properties such as strength, ductility, electrical conductivity and radioactivity of materials such as metals, plastics, textiles, woods, glass, concrete and other materials
- o tests for tension, hardness, impact resistance, fatigue resistance and high-temperature effects

➢ 71.20.13 – Testing and analysis services of integrated mechanical and electrical systems

This subcategory includes:

- o testing and analysis services for the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances, communication equipment and other equipment incorporating mechanical and electrical components
- o The results of the testing and analysis generally take the form of an assessment of the performance and behavioural characteristics of the object tested. Tests may be performed using models or mock-ups of ships, aircraft, dams, etc.

➢ 71.20.14 – Technical inspection services of road transport vehicles

This subcategory includes:

- o periodical technical inspection services for automobiles, motorcycles, buses, lorries, trucks and other road transport vehicles

➢ 71.20.19 – Other technical testing and analysis services

This subcategory includes:

- o testing and analysis services of a technical or scientific nature that do not alter the object being tested
- o radiographic, magnetic and ultrasonic testing of machine parts and structures in order to identify defects. These tests are often conducted on site.
- o certification of ships, aircraft, dams, etc.
- o certification and authentication of works of art
- o radiological inspection of welds
- o analysis services of police laboratories
- o all other technical testing and analysis services not elsewhere classified

In the Norwegian CPA – survey we have chosen to extract the certification activities from 71.20.19 and handle it as an individual subcategory. A reason for doing this is that these activities are conducted by only a few companies in Norway, which in that case represent a homogenous and specialized field of activity.

2.   Unit of measure to be collected

Norway is obliged to provide Eurostat with data concerning turnover both within the SBS and the STS regulation.

Turnover is defined as the sum of remuneration for rendering of services to customers and sales of merchandise, and gross income from other activities. Rental income, commissions and special taxes are included, while subsidies and profits from sales of business assets are not. VAT is not included in the statistics.

Turnover data at CPA-level are collected on a yearly basis (from 2009), through the SBS-regulation Statistical unit is enterprise and a questionnaire is used for this purpose. The sample is the same as for the structural business statistics.

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3.   Market Conditions and Constraints

3.1   Size of industry

According to Statistics Norway's Structural Business Statistics for 2009 the industry of technical testing and analysis accounts for almost 11.5 billion Norwegian kroner, about 1.5 billion Euros. Compared with the other 5-digit industries in the division of NACE 71 (Architectural and engineering activities; technical testing and analysis), NACE 71.2 accounts for more than 11 per cent of the total turnover. This division is at a great extend dominated of NACE 71.129, with over 40 per cent of the turnover. Also the industries of civil engineering and geological surveying are bigger than technical testing and analysis.
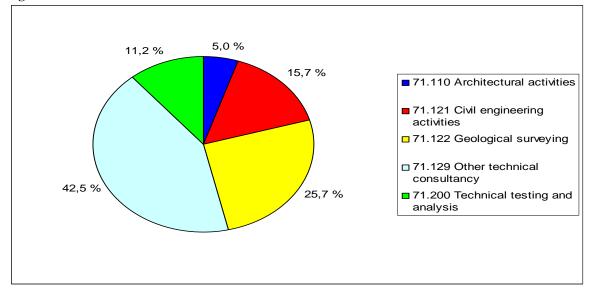
Figure 1. Distribution of the turnover in NACE Rev.2 71. Structural Business Statistics 2009.

In figure 2 we can see that the industry has experienced a rather stable growth in turnover since 2003. In 2002 it was a small decrease, but since 2003 the turnover has increased with almost 119 per cent. Between 2003 and 2008 the annual growth has been between 10 and 20 per cent. In 2009 however, the increase was just above 5 per cent. This may be a consequence of the financial crises.

From 2008 to 2009 the industry also experienced a decrease in number of enterprises, which fell from 600 to 575 enterprises. The total number of employees in the industry, did not, on the other hand suffer from this. From 2008 to 2009 about 100 more people were employed in NACE 71.2.
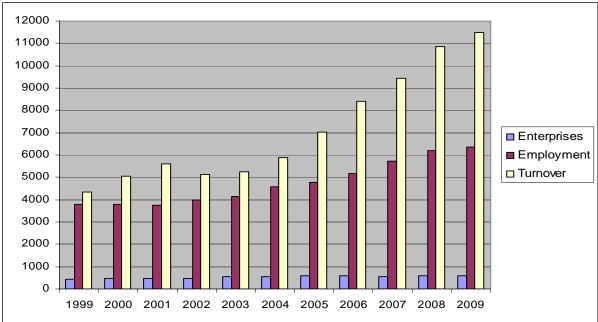
Figure 2. Development in turnover (in 1 000) and number of enterprises and employees in NACE Rev. 2 71.2. 1999 - 2009. Structural Business Statistics.

As shown in figure 2 it has not been a severe growth in the number of enterprises in this industry. Since 1999 about 150 new enterprises has been established, which make a growth rate just above 30 per cent. The number of employees has, in conformity with the turnover increased stable since 2003.

The situation where the number of enterprises has been reduced from 2008 to 2009, and not the turnover or the number of employees can be addressed to the fact that this industry is highly dominated by a few large and global companies.

Table 1. Selected variables, divided by employment groups. NACE Rev.2 71.2. Structural Business Statistics 2009.

Employment groups	2009		
	Enterprises	Employment	Turnover
0	**53,1 %**	**0,0 %**	**1,7 %**
1-4	**27,8 %**	**4,5 %**	**3,6 %**
5-9	**7,5 %**	**4,7 %**	**3,0 %**
10-19	**3,8 %**	**5,0 %**	**3,4 %**
20-49	**4,7 %**	**13,0 %**	**9,7 %**
50 +	**3,1 %**	**72,9 %**	**78,6 %**
Total	100,0 %	100,0 %	100,0 %

In table 1 we can see that only 3 per cent of the companies in the population have above 50 employees. Nevertheless, these companies accounts for almost 80 per cent of the turnover in the industry. Of the 25 companies that were lost between 2008 and 2009, the half was one-man firms. Only one company had more than 50 employees.

The industry is – compared to other service industries – export oriented. Approximately 20 per cent of the turnover is a result of export activities in 2009.

3.2   Special conditions or restrictions

One of the things that make the industry of technical testing and analysis special is the complexity. By complexity we refer to variety of services being produced. To exemplify this heterogeneity, in our sample we have one company that has classification of enormous tankers as their main activity; another one conducts small sample analysis of soil and seeds. The industry is dominated by a few large and global actors, who offer a broad spectre of services, remaining a lot of small companies, who are specialized in different niches. The small niche companies are often involved in services within testing and analysis, and inspections and controls, e.g. control and inspection of elevators. The small niche companies are often located regional. Services within certification and classification can usually be subjected to the large global companies.

Obviously, technical services in Norway will be closely related to our biggest production sector, namely the oil- and gas sector. Many of the companies, also the niche companies, in NACE 71.2 have their biggest customers within this sector. Naturally NACE 71.2 will be affected by the production level and the price level in the oil- and gas sector. Other major activities in the industry of technical testing and analysis are services connected to sea transport and the shipping industry. One of them is classification of ships and offshore installations. This industry will obviously depend on the production level of ships. Another activity is to analyse the quality of the petroleum that is used in the sea transport. This activity will depend on the maritime transportation intensity.

Norway has a relative large public sector and a lot of the services provided by NACE 71.2 will depend on which priority areas the government chooses. For instance, if the Norwegian government decides to accept for exploratory drilling and eventually oil production in northern parts of Norway , the industry of technical testing and analysis will experience an increased demand.

4.   Standard Classification Structure

The Norwegian Standard Industrial Classification (SIC2007) is identical to NACE Rev.2 at the 4-digit level. ISIC2007 does not have a more detailed level breakdown of activities in the industry of technical testing and analysis. However, an additional service is included to the definition; classification.

5. Evaluation of Standard vs. Definition and Market Conditions

Statistics Norway has published annual (except for 2008) detailed turnover data at service product level. We have used a slightly different questionnaire than the one requested from Eurostat.

Table 2. Percentual distribution of turnover in NACE Rev. 2 71.2 CPA).	
CPA - classification	**%**
Total – Technical testing and analysis	**100**
2.1 Certification	8,4
2.2 Composition and purity testing and analysis services	9,2
2.3 Testing and analysis services of physical properties	5,3
2.4 Testing and analysis services of integrated mechanical and electrical systems services	4,2
2.5 Technical automobile inspection services	0,8
2.6 Other technical testing inspection and analysis services	60,6
2.7 Other additional products	11,4

Certification is treated as an own product, belongs originally to the group "other technical testing, inspection and analysis services".

Certification is a collective term for services which includes an issue of a certificate or an attestation from a third party. The certification is based on an evaluation whether a system/product or personnel is in accordance with a certain standard. The certification provides a confirmation to the customers or the government, that the companies' systems satisfy different national and international standards. An example of such services is certification in connection with environmental management systems (ISO 14001/EMAS-verification).

The other products are described at page 3-4.

Even that certification has been excluded from "other technical testing, inspection and analysis services" this product still accounts for approximately 60 per cent of the total turnover in 2009

The activity *classification*" covers probably a large part of this product. Within the Norwegian SPPI survey for this industry, classification account for 31 per cent of the total weights.

It is a group of very few, but large companies that operates within this field of activity. They are especially involved in classification of ships, oil rigs and other offshore vessels. Classification is a comprehensive verification service providing assurance that a set of requirements laid down in rules and standards established by the classification society are met during design and construction, and maintained during operation. The rules and standards are aimed at ensuring safety against hazards to the unit, personnel, and against hazards to the environment. Classification implies an activity, in which a ship or an offshore unit is surveyed during construction on the basis of design approval, tested before being taken into service, and surveyed regularly during its whole operational life. The aim is to verify that the required safety standard is built in, observed and maintained (Det Norske Veritas).

A conclusion is that current the CPA-classification does not fit the Norwegian market conditions very well. Residuals cover around 80 per cent of the total turnover in the industry. We have taken "national steps" to fit the product statistic better to the current conditions, but it might be necessary to investigate this challenge even more.

6. National Accounts Concepts and Measurement Issues for the Area

For NACE Rev.2 71 NA uses following classification:

Table 3. Classification used by the NA. Classes covered by the Norwegian SPPI are in bold.

711100	**Architectural activities**
711210	**Civil engineering activities**
711230	Geological surveying
711290	Other technical consultancy
712000	**Technical testing and analysis**

NA uses the structural business statistics as a main source in their calculations for the final yearly national account. Furthermore they use the turnover index to estimate the quarterly development in production. Within the industries where a SPPI is produced, the volume can be deflated from the turnover index and the SPPI.

The National Accounts Department within Statistics Norway has not yet put to use the SPPI for technical testing and analysis, since it just has been completed.

The comparison between Short-term statistics (STS) and structural business statistics (SBS) gives an indication of how the well STS predict the final result (SBS). Technical testing and analysis is only one element in the new area M (old area K) and accounts only for 6 of the total production in area M. No turnover data concerning 71.2 are published are published in connection with the yearly or the quarterly national account.
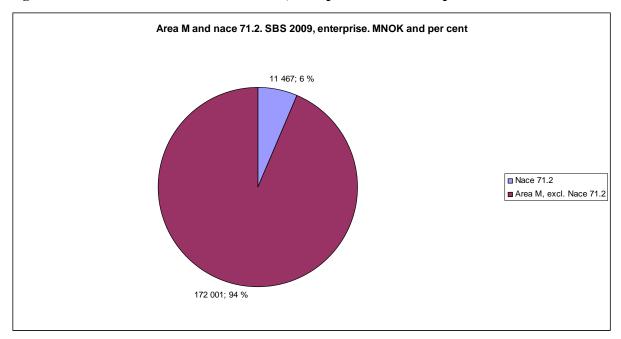
Figure 3. Area M and NACE 71.2. SBS 2009, enterprise. MNOK and per cent

Table 4. Turnover development. Structural business statistics and short-term statistics

Year	SBS	STS
2006	19,4 %	19,7 %
2007	10,2 %	12,2 %
2008	20,2 %	13,3 %
2009	0,2 %	4,5 %

7. Turnover methods and criteria for choosing various output methods

1.The SBS produces absolute, yearly data concerning turnover, gross value added and economical variables. A sample is drafted (probability proportional to size), statistical unit is enterprise. From these units we receive the yearly accounts and a questionnaire concerning the turnover on product level

From the tax authorities we receive annual accounts for units outside the sample. If information is missing information from units in the population, turnover data are collected from the VAT-register and Brønøysund register (includes only joint-stock companies). In practice, when it comes to turnover, the SBS is a census survey.

Table 5. Coverage rates, SBS, 2009. NACE 71.2

	Coverage rate, turnover	Coverage rate, no.
VAT-register	2,4 %	12,5 %
Annual accounts, outside the sample	13,9 %	77,4 %
Brønøysund register	1,1 %	3,1 %
Annual accounts, sample (equal to CPA sample)	82,6 %	6,8 %

2. The STS produces only an index and no absolute values. The survey is a census survey. All data from the VAT-register are collected at enterprise level. This information is broken down to establishment level, based on keys from the latest SBS, at micro level.

8. Evaluation and Comparability with Price measures

Norway has developed an SPPI for technical testing and analysis. It will be published for the first time in the end of august 2011. Data at macro level are available 45-50 days after the end of the reference period. . Data for turnover are available 55 days after the end the reference period. The comparability between the SPPI and the short-term turnover data is high. First of all, both statistics uses the same industrial classification, NACE Rev.2. Second, the reporting unit is enterprises[1], and with the high turnover coverage rate (over 85 per cent) in the SPPI we have a very similar group of units included. Figure 4 shows the development in turnover and out put prices from the 1st quarter of 2010 to the 1st

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[1] In the short-term statistics on turnover the reporting are enterprises. However, by means of distribution formulas from the Structural Business Statistics the turnover is further spread out to the different establishments within the enterprises.

quarter of 2011. The time series are fairly short, due to the fact that the SPPI just has been finalized, so with that in mind it is probably too soon to say anything firmly about this comparison.
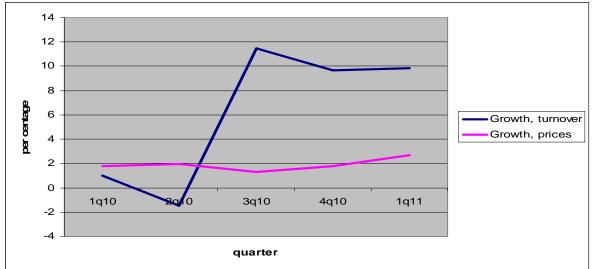
Figure4. Turnover and price. Growth rates. 1q.2010 - 1q.2011. NACE Rev.2 71.2

Anyway, we can see that the development for the prices has been rather stable, while the growth rates for turnover has periods with fluctuations. This indicates that fluctuations mainly are caused by change in the volume rate. The stable development in the growth rates for prices can possibly be explained by high correlation with the wage development.

9. Summary

- Statistics Norway collects information concerning turnover both on a yearly and a quarterly basis. In addition yearly information concerning CPA is gathered and published
- The Norwegian market for NACE 71.2 does not "suit" the classification. Approximately 80 per cent of the turnover belongs to one of the two groups of residuals
- The industry is characterized by a few large players and by relatively high degree of export
- It is to early to compare the turnover data with SPPI data, the since SPPI data has only been collected since 2009