Measuring the 'On the Move' Retail Trade with Automotive Fuels

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Abstract

It has become increasingly difficult to obtain accurate measures of the turnover and production of the retail trade of automotive fuels due to the complexity of the sector and rapid changes in the way retail activities are being organized , ranging from unmanned service stations to full service stations, and from independent service stations that take title of the fuels to franchise owners that are paid a service fee per liter sold. In this article building on the insights of Kaumanns (2010) we analyze the situation in the Netherlands by assessing the population of gas stations in the business register and by investigating available data in the form of the short term and business statistics.

The main findings are that the about 40 percent of local branches involved with the sale of fuels are found outside NACE 473 which make a direct comparison between the turnover of NACE 473 and total fuel sales difficult. The second difficulty with measuring turnover is caused by the fact that we see a mixture of organizational forms in NACE 473 resulting in different types of turnover (gross and net fuel sales). Although it is important to gain better insight in the organization of distribution in the sector, with current data sources we are at best able to obtain a provisional split between 'principals' and 'agents'. Finally, we found evidence that the margins in this sector are under increasing pressure in particular the fuel margins, and that the margins on shop sales are much higher than those on fuel sales.

Potential solutions to address these difficulties might exist in seeking changes to existing questionnaires. However, for the longer term, a discussion is clearly needed more generally on how (changing) structures in retail can best be measured.

JEL: National accounts; SBS; retail trade of automotive fuels; trade margins.

1. Introduction

For several years the estimation of turnover for the retail trade of automotive fuels has been regarded as a challenging issue. This issue is not only regarded challenging by Statistics Netherlands (SN), but by other European statistical institutes as well. As the enterprises found in this market are often characterized by heterogeneity in both organizational form and activities deployed, the compilation of reliable turnover statistics is difficult (Kaumanns 2010). These problems not only impact the measurement of turnover (or output) in the short term business statistics but also impact the accuracy of the retail margins in the National accounts.

At the same time, the demand for reliable statistics on the development of turnover in this market is high, particularly as a result of the current debate on the height of fuel related duties in the Netherlands.[2] It is therefore important to continue to ensure the quality of these statistics.

The objective of this paper is therefore to assess *what options are available to improve the quality of turnover statistics for the retail trade of automotive fuels?* Our main approach will be to

[1] The authors work at the business statistics and National accounts departments in Statistics Netherlands. The views expressed in this paper are those of the authors and do not necessarily reflect the policies of Statistics Netherlands.

[2] http://www.tankpro.nl/brandstof/2014/04/16/tweede-kamer-debatteert-opnieuw-over-accijnzen/

analyse both the Dutch business register as well as the main data sources that we have available regarding retail sales of fuels.

The outline of the paper is as follows. In section 2 we will first sketch the problem setting by discussing the two main problems that we face and why this complicates measurement of key economic indicators: the various types of ownership structures that exist in the sector i.e. the organization of distribution, and the allocation of turnover from retail sales of fuels to economic activities. Section 3 provides a brief overview of the main data sources that we have at our disposal. In Section 4 we will first present our main analyses regarding the population of enterprises who are engaged in the retail trade of automotive fuels. Subsequently, we will discuss possibilities to distinguish between various organizational forms in the basic data. Finally, by distinguishing principals and agents we are able to analyze the development of margins for the sector. Section 5 concludes by sketching the implications of our research.

2. Problem setting

At Statistics Netherlands two types of turnover statistics on the retail trade of automotive fuels[3] are produced that have different objectives. The first is the Short-Term business Statistics (STS). The STS aims to describe the recent development of the economy by a series of indicators, which are turnover, prices and volume. The indicators are published as indices and show the change with reference to a base period. As the main point of interest is the performance of the economy with respect to earlier periods, the STS indicators do not denote absolute or monetary values. For the retail sector, STS indicators are published monthly: at T+30 days at the Eurostat website and at T+45 days at the website of Statistics Netherlands.

The second type of turnover statistics that is produced is the Structural Business Statistics (SBS). The SBS describe the structure and performance of enterprises. Contrary to the STS, the SBS indicators are presented in absolute or monetary values. Whereas the main focus of the STS is the performance in terms of turnover, the SBS is considerably more detailed and also contains information on, among other things, employment, costs and profit. The statistic is compiled on an annual basis and published at T+18 months.

Both STS and SBS are used as inputs for the compilation of the National Accounts (NA). The production concept of the NA differs from the turnover concept that underlies the STS and SBS as it considers only the margins i.e. the difference between turnover and purchase of fuels as the output of the retail sale of fuels.

The outcomes of STS and SBS should be consistent with figures from related statistics on energy consumption and paid duties for automotive fuels. To summarize, measuring turnover growth rates and levels should be done in such a way that outcomes of STS and SBS are consistent with each other, can be used in a meaningful way by NA and are in line with developments of other related statistics.

From the literature as well as based upon our own experience, two difficulties have been identified in doing so. The first difficulty is caused by the organization of distribution in the retail market, which

[3] With the retail market in automotive fuels we refer to all activities that are related to the sale of fuel at gas stations regardless whether they are classified in NACE 473: Retail sale of automotive fuel in specialized stores. This also includes selling shop items or services provided by gas stations.

results in diverging and incompatible definitions of turnover. This aspect was already discussed by Kaumanns (2010). The second difficulty is strictly a methodological one and has to do with the classification of statistical units and their allocation to economic activities. We will briefly discuss these two issues below.

2.1 Organization of distribution

The enterprises that have retail sale of automotive fuels (NACE 473) as their primary activity can be characterized by different types of business organization. The main distinction between these organizational forms concerns the ownership of the fuel sold. The organizational form determines how turnover is defined. When the fuel is owned by the filling station and sold for own account, the station acts as a principal. When the filling station does not own the fuel and therefore sells the fuel for the account of a third party, which is mostly a large-scale supplier, the station acts as an agent. The differences between the organizational forms, and, the impact it has on the way turnover is defined, will be explained briefly in the following section. For a more detailed description of the organizational forms, see Kaumanns (2010).

Principals: CoCo and independent stations

If a filling station's organizational form is CoCo (Company Owned, Company Operated), the filling station and the fuel is owned by a large-scale supplier. This is often a mineral oil company or a wholesaler. The stations are, if manned, operated by salaried employees. Since the large-scale supplier is both the owner of the fuel and operates the filling station, the turnover generated by the sale of fuel is directly assigned to the large-scale supplier.

An independent station is not owned by a large-scale supplier. The independent station buys fuel from a large-scale supplier and sell this to consumers in their own name and for their own account. Independent, then, refers to not-belonging to or providing a service for a large-scale supplier. Nonetheless, it is fairly common that these independent station do have long-term delivery contracts with large-scale suppliers.

The turnover definition for this type of filling stations is straightforward: volume (number of litres sold) * price (price per litre). In the remainder of the paper this will be referred to as 'gross turnover' from fuel sales. In some cases this is supplemented by the turnover from other goods sold, such as shop items, and services delivered, such as car-cleaning or repair services. According to Kaumanns (2010) the way turnover is attributed to industry, can be, and often is, different between CoCo's and independent stations. This will be discussed later on, when the implications of the organizational structure for the assignment of turnover to industry are considered.

Agents: CoDo and DoDo

The turnover definition for stations that is dealer operated are different. CoDo stands for Company Owned Dealer Operated. The difference with the CoCo construction is that the station is not operated by salaried employees, but by a dealer who leases the filling station. The dealer receives a compensation for the service he delivers, i.e. brokering the fuel. The height of the compensation depends on what services the dealer provides for the large-scale supplier besides brokering fuel, e.g. running a shop or maintaining the filling station's equipment. The DoDo (Dealer Owned Dealer Operated) construction is fairly similar to the CoDo. The difference lies in the ownership of the filling station. As in the CoDo-model, the dealer sells fuel in the name of and for the account of a large-scale supplier. Since the dealer is the owner of the filling station and therefore is responsible for the

maintenance, the compensation from the large-scale supplier is often higher than in the CoDo-construction.

In case a filling station is operated by a dealer, the turnover consists of the compensation (a fee) for the service that the dealer provides for the large-scale supplier. In the remainder of this paper this will be referred to as 'net turnover' from fuel sales. This could be supplemented with turnover generated for the sale of other goods or services. The amount of compensation the dealer receives from the large-scale supplier may vary, depending on the scope and type of services being provided. Finally, it should be noted that some companies also exemplify hybrid forms. For instance, a single enterprise could contain both company-owned and dealer-owned stations. Also, there are many examples where a dealer at the same time runs a shop for own account. This might further complicate the compilation of statistics in this market.

Complications for turnover measurement from organizational form

In the retail market of automotive fuels, what is recorded as turnover depends on the ownership of the fuel sold. As Kaumanns (2010) already notes, this causes several difficulties.

The first issue is due to double counting that occurs when principles and agents are classified into the same NACE category, as gross turnover of duel sales (principals) and net turnover of commission (agents) is added together. This leads to problems in the interpretation of the figures on both the development and the turnover levels of the market of automotive fuels. For the outside world, the figures are interpreted as if turnover figures are based on the gross turnover from fuel sales (plus turnover from sales of shop-items and some services, like car cleaning or maintenance), while the aggregates also include net turnover.

The second issue concerns deflation. The price indices that are used in order to calculate volume indices often contain fuel prices only or a basket that contains both fuel prices and prices of shop items. However, the prices of fees or commissions is mostly ignored. This issue is not easy to deal with. There is almost no a-priori information available on the organization of distribution. Furthermore, as Kaumanns (2010) observes unlike the NACE classification for wholesale trade that include a separate group for trade on a fee or contract basis (NACE 461), the retail trade in automotive fuels does not contain such a separate group. As a result, it is currently impossible to a) obtain information on the development of prices of fees and commissions and b) to estimate the scope of the dealer operated station relative to the total market. In addition, the market is very dynamic which means that ownership of the filling stations as well as the organizational form of the filling stations often change.

2.2. Allocation of turnover from retail sale of fuel to economic activities (NACE)

The second issue in the retail market of fuel is that a large share of the turnover that is generated in this market is assigned to other industries. This is the result of the methodology used in order to classify enterprises according to their primary activity. The enterprises that are involved in the retail market for fuels are characterized by many different activities. These include, among others, refining of crude oil, wholesale activities, sale of motor vehicles and maintenance and repair of motor vehicles. If the retail sale of automotive fuels is not a primary activity of a unit, the reported turnover generated from this activity might be attributed to other industries.

Another reason why turnover generated in the retail market is attributed to other industries is the organizational form. As Kaumanns (2010) states, in case a unit is organized as a CoCo, turnover will be assigned to the industry in which the owner of the fuel is classified. This means that for many

CoCos turnover is assigned to other industries. Typically, these are, among others, NACE 1920 *Refining of petroleum products* and 4671 *Wholesale of solid, liquid and gaseous fuels and related products*.

In conclusion it is challenging to compile turnover statistics for the market for retail trade of automotive fuels. Both the fact that the way turnover is defined depends on the organizational form of filling stations and the way the population is defined create difficulties in estimating appropriate turnover developments and/or levels. In Section 4 we will discuss in more detail how this is reflected in the production of turnover statistics at Statistics Netherlands. Also, we will discuss potential solutions in order to deal with these issues.

3. Data sources

The main data source for the STS is a monthly survey that contains information about turnover, purchase value and inventories. For turnover and purchase value a distinction is made between trade and other activities. The largest companies are integrally observed, for the smaller enterprises a sample is used. About 400-420 enterprises are surveyed on a monthly basis.

For the SBS the main data source are the production surveys (PS). The PS are an annual survey for which enterprises report detailed information on employment, revenues, costs, and financial results. Annually, the sample for NACE 473 normally contains 130-150 reporting units. Here again, the smaller enterprises are observed by means of a sample, the larger are integrally observed. The PS are the main data source for the National accounts for their estimates of production and value added. As the PS contains detailed information on many subjects, its microdata is quite suitable for research purposes. In this research we have used PS data from 2010-2012.

An auxiliary source for the SBS is the VAT-data that is supplied by the Dutch Tax Office. The VAT data is used in order to improve estimations for the SBS. The main advantage of the VAT-data is that it contains information on the whole population, whereas the STS and SBS are based on a sample.

For all statistics the population of enterprises is derived from the Dutch Business Register (BR). The BR contains information on all enterprises, legal entities and other organizations that have economic activities in the Netherlands. The data of the enterprises is obtained from the Trade Register from the Dutch Chamber of Commerce. The Trade Register includes contact details, information on the ownership of a business, branch details, among which the activities of a local branch and number of employees.

4.1 Population analysis

In this section the characteristics of the enterprises that are involved in the retail trade of automotive fuels will be described. In order to give a comprehensive picture, the way enterprises are observed and classified according to activity will be briefly explained (see UNSD 2007 for a more in depth discussion). The regulation for the assignment of activity of an enterprise is formulated by Eurostat. The activity of an enterprise is assigned according to its principal economic activity. This is the activity

that contributes most to the value added of the enterprise. If the enterprise performs only one activity, the classification is straightforward. However, if it performs more than one activity, the value added criterion should be applied. Although the value added criterion makes sense in an economic way, it is of little practical use, given that enterprises are usually classified in the absence of financial data, as only administrative non-financial information is available during the classification process. Therefore, Eurostat provides several alternatives, that allow to substitute the value added principle for a criterion that can act as a proxy. This list of proxies contains 'number of persons employed in an activity', which has been applied by Statistics Netherlands. A unit with more than one activity is therefore allocated to the activity with most persons employed.

The methodology of the classification by industry based on activity follows international standards[4], with some minor adaptions. The hierarchy of statistical units contains different levels. For the sake of the argument, the methodology will be slightly simplified and some more technical aspects will be omitted in this paper.

The activity of an enterprise is derived from the activities of the underlying legal units. Each enterprise consists of at least one legal unit, but could contain more legal units over which it has control. The relation is one-to-many, which means that a legal unit could not belong to more than one enterprise. The activity of a legal unit, then, is derived from the economic activity of the local branches that it contains. If it does not contain any local branches, the legal unit itself is classified according to economic activity. The assignment of activity of the enterprise is based on the number of employed persons within each legal unit. If an enterprise holds only one legal unit, the classification of activity is straightforward and the enterprise will be classified according to the activity of this unit. In case that the enterprise contains more than one legal unit, the number of employed persons of all legal units will be aggregated in order to determine the activity. This will be done gradually, by first looking at the alphabetical code of the section that corresponds to the activity in which most persons are employed, and then to digits that correspond successively to the division, group and class of the activity that employ most persons. So, the number of persons employed in each activity determines the NACE-code of the enterprise.

To illustrate how this process works, consider an enterprise that contains two legal units, entity A and B. Entity A contains a wholesale in fuel products and employs 5 persons. Entity B contains 10 manned gas stations and employs 20 persons. The enterprise will be classified according to the activity that employs most persons. In this case, the unit will be classified as *Retail trade in automotive fuels*, NACE 473. Therefore, turnover that is generated by both underlying units will be attributed to this NACE-position as well.

For the approximately 2,000 largest and most complex enterprise groups in the Netherlands the approach is slightly different. As these enterprise groups are generally involved in many different activities, the different activities are isolated and treated as a separate enterprises. Furthermore, the methodology for assigning an activity as described above can be manually overruled. This allows for classifying enterprises according to the value-added criterion, which makes more sense for these type of enterprises. Furthermore, for these enterprises legal units can actually be linked to more than one enterprise.

This might have implications for the way the filling stations from the larger enterprises are observed; based on the value-added criterion, the retail branch of the larger enterprises is separated

[4] See: http://unstats.un.org/unsd/isdts/docs/StatisticalUnits.pdf

from the other activities and observed in the 'right' NACE-position (i.e. NACE 473). In 2012, NACE 473 contained more than 25 enterprises that belonged to these top 2000-enterprise groups.

In the following analysis, first, all enterprises that have their principal activity in the retail trade of automotive fuels (i.e. in NACE 473) will be described. As part of this exercise, the most noteworthy characteristics of the 20 largest enterprises that have their main activity in this sector will be discussed. Secondly, the characteristics of those enterprises that are not observed in NACE 473, but nonetheless do have activities within the retail market of automotive fuels are discussed. For the analysis of the population, information was extracted from the Business Register (BR) as of September 2013.

Enterprises that have their principal activity in NACE 473

Activities of the local branches

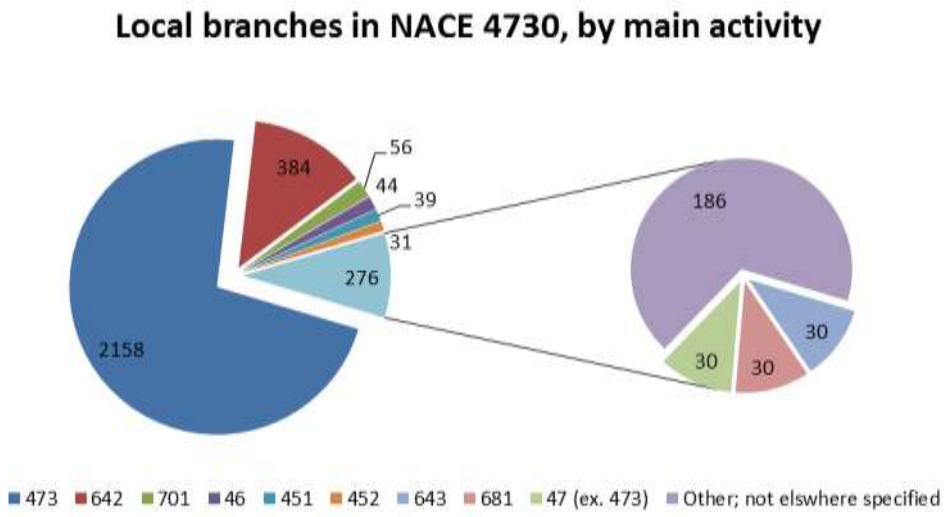
According to the September 2013 copy of the BR, the population of NACE 473 consisted of 924 enterprises. Table 1 shows the population classified according to class size. About 80 per cent of all enterprises have less than 10 persons employed and about 97.5 per cent have less than 50 persons employed.

Table 1: Enterprises by number of persons employed

Number of employed persons	Number of enterprises
0	74
1	121
2-4	325
5-9	222
10-19	75
20-49	83
50-99	15
100-149	2
150-249	2
250-499	1
500+	4
Total	924

The 924 enterprises that constitute the population of NACE 473 are associated with 2,988 unique local branches. Figure 2 show these local branches by principal activities.

Figure 2: Distribution of local branches within NACE 473, according to primary activity



The principal activity of these local entities is not necessarily retail trade of automotive fuels: for about 28 per cent of all local branches retail trade in automotive fuels is not the principal activity. Principal activities of local branches that are quite common in this market are NACE 642 *Activities of holding companies* and NACE 701 *Activities of head offices*. These two activities are auxiliary activities that generally employ only few persons. Also, it is expected that these units generate little turnover. Other primary activities of the local branches include NACE 46 *Wholesale trade* and NACE 451 *Sale of motor vehicles*.

About 21 per cent of the local branches deploy secondary activities. For only a very small share of the local branches, retail trade in automotive fuels is a secondary activity. The most common secondary activity is concerned with the sale and repair of motor vehicles. For about 1 per cent of the population retail trade in automotive fuels is the tertiary activity. Only 6 per cent of the local branches deploy tertiary activities.

In conclusion, about three-quarters of all local branches (2,194 out of 2,988) are involved in the retail trade of automotive fuels as their principal, secondary or tertiary activity[5]473473The analysis shows that the NACE 473 is quite homogeneous and predominantly contains units that are involved in the retail sale of automotive fuels. Some other activities are included as well of which wholesale and sale of motor vehicles are the most common non-auxiliary activities.

Analysis of the top-20 enterprises

There are different ways to discuss the largest companies within an industry. These companies can either be ranked according to the turnover they generate or according to the number of persons they employ. Theoretically, both approaches may not give a 'true' insight in the largest companies of the industry. A rank based on turnover ignores the fact that the companies in this industry report both net and gross turnover. On the other hand, ranking enterprises according to the number of employed

[5] This share would rise if auxiliary activities – like administrative and financial units – of local branches were to be excluded. About 90 per cent of all local branches would have NACE 473 as its primary activity and about 94 per cent of the branches would have NACE 473 as its primary, secondary or tertiary activity.

persons excludes those companies that mainly contain unmanned gas stations, which, as discussed earlier, is quite common in the Netherlands.

In practice, we have found that within NACE 473 the approach does not matter that much. Either approach will give a list that contains more or less the same enterprises. This means that the largest companies in terms of turnover also employ most persons. [6]

Generally, three types of enterprises can be found in the top-20. The first group contains the networks of CoCo-stations of most of the A-brands. These networks are the retail outlets for the large-scale supplier. According to Kaumanns (2010), the turnover generated by these CoCo-stations is generally not reported in NACE 473. However, at SN, most of these stations are observed within this industry. This is the result of the 'special' treatment of the largest and most complex companies described previously. The networks of filling stations that belong to the large-scale supplier of most well-known A-brands are separately observed in NACE 473.

The second type of enterprises that are found in the top-20 comprise both a retail and a wholesale branch. The gas stations owned are often supplied by the own wholesale branch, and therefore, these stations are also generally CoCo. They commonly carry a local brand. The wholesale unit usually also supplies filling stations outside the company. Furthermore, it is noteworthy that most companies in the top-20 that combine wholesale and retail activities, also run networks of dealer operated gas stations of the A-brands. This is often not restricted to only one brand.

The third type of enterprises is harder to classify. These companies contain mostly dealer operated networks of gas stations or independent gas stations. There are also examples of mixtures of organizational forms.

The analysis of the top-20 of companies that are observed in NACE 473 demonstrate how heterogenic the market is, as it contains:

- Both manned and unmanned stations;
- Gas stations with different organizational forms and often mixtures of different organizational forms within one company;
- Networks of gas stations of different brands within one company;
- Wholesale activities for a considerable number of enterprises.

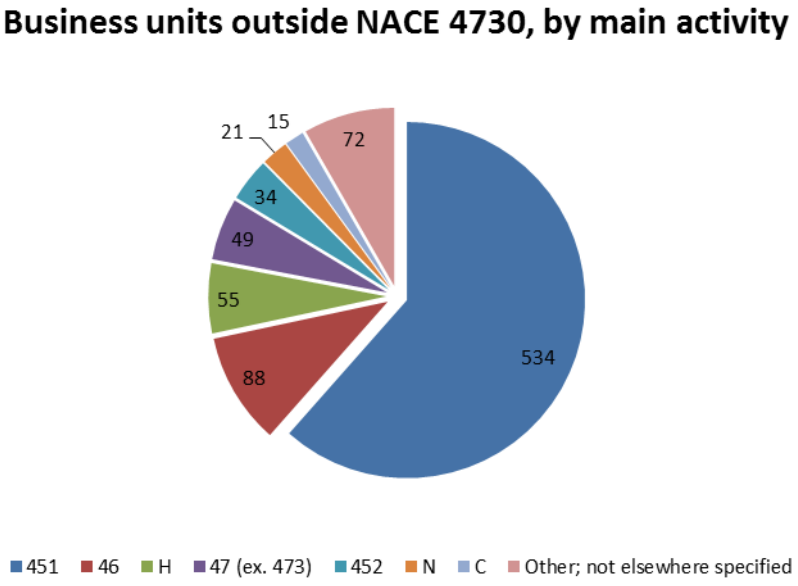
Local branches involved in the retail sale of automotive fuels, but classified outside NACE 473

As argued earlier in this paper, not all gas stations will be found in the defined population of NACE 473. If an enterprise contains filling stations, but has a principal activity outside NACE 473, turnover is assigned to another industry.

Outside NACE 473 there are 868 enterprises that contain local entities that deploy activities in the retail trade of automotive fuels. This could be either the primary, secondary or tertiary activity. Looking more closely to the main activity of the enterprise see Figure 3, it is noticeable that the principal activity of more than 61 per cent of all enterprises is the sale of motor vehicles. More than 10 per cent of the enterprises are typified as a wholesaler (NACE 46). Other often seen activities are transport and storage (section H), retail trade, trade in automotive fuels excluded (NACE 47) and maintenance and repair of motor vehicles (NACE 452).

[6] Subsequently, this means that most companies that only report net turnover generally have smaller networks of gas stations or contain mostly unmanned gas stations.

Figure 3: Distribution of enterprises outside NACE 473 that have some activities within the market of automotive fuels, according to primary activity



In total, 1,482 local entities that are involved in the retail sale of fuel are associated with these 868 enterprises. About 50 per cent of these local branches have retail sale of fuel as its primary activity, 42 per cent as its secondary activity and 8 per cent as its tertiary activity.

The types of enterprises that are involved in the retail sale of automotive fuels outside NACE 473 can be classified into four groups. The first group contains networks of unmanned stations from the known Brands. These are CoCo stations. These stations are not included in NACE 473 due to the fact that they do not employ any persons in this activity (but in others). As the criterion applied uses employed persons as a proxy for value added, these stations are observed outside NACE 473. This is different from the manned CoCo stations that were mostly included in NACE 473.

The second type of enterprises contain a wholesale branch and a network of predominantly unmanned stations. These stations are supplied by their own wholesale branch. Besides, the wholesale branch also supplies other gas stations. For these enterprises the number of employed persons in the wholesale activities exceeds the number of persons employed in the retail activities.

Thirdly, there are many examples of gas stations found near car dealers. These gas stations can either be manned or unmanned. The exploitation form for these kind of enterprises can be different. A fourth category contains a myriad of types of stations that are hard to qualify. Most of these filling stations seem to be unmanned. If the filling station is manned, this is mostly a secondary or tertiary activity of the local entity. Also, some non-commercial filling stations are included in this last category. For instance a filling station at a transportation company that is only used for the supply of fuel to the own trucks. The analysis of the population outside of NACE 473 shows that about 40 percent of the local entities (branches) that have the retail sale of automotive fuel as a primary, secondary or tertiary activity are not included in our figures on the turnover of NACE 473. As a result the turnover of fuels that is reported in NACE 473 will only represent a part of the total fuel sales in the Netherlands. As we have seen two main reasons can be identified:

First of all, enterprises that are involved with the sale of automotive fuels often also deploy other activities. Depending the number of persons involved in these activities, an enterprise will be

classified. If the core activity of an enterprise is not the retail sale of fuel, the filling stations will be observed outside NACE 473.

Secondly, the prevalence of unmanned filling stations might create difficulties when classifying units. In the Netherlands, about 40 per cent of all filling stations are unmanned[7], and its share is still growing. The criterion applied for the classification of activity, based on the number of persons employed, might not perform well here, because the value added and number of persons employed are not related: the number of persons employed is always zero. Especially in a market where the number of unmanned outlets is large, the estimation of turnover statistics is challenging, as the unmanned stations are underrepresented in the sample - or almost not represented at all.

4.2 Ownership structures

Analysis of organization of distribution within the population

As discussed earlier in this paper, the organization of distribution influences the way turnover from fuel sales is defined. Principal and independent filling stations are expected to report gross turnover from fuel sales, while dealer-owned stations are expected to report net turnover (i.e. the service fees they receive on fuel sales) only. Although these filling stations also report income from the sale of other goods (like shop items) as well as a variety of services, fuel sales form the lion's share of total turnover in this retail market.

A main challenge is that we do not possess information on the organizational form of the filling stations that comprise the population of NACE 473. Only some companies disclose information regarding their organizational form.

In this section we will try to see whether it is possible identify the organizational form indirectly by analysing key indicators from our own data sources. In order to do so, first several hypotheses on the different models of exploitation will be formulated. After that, these hypotheses will be tested in order to see whether it is possible to discern between different types of organizational form. This will be followed by a brief discussion of the main difficulties encountered in doing so.

Hypotheses on organizational form

There are three types of sources that can be used in order to distinguish the different organizational forms. The STS- and VAT-data are limited to total turnover only, while the SBS contains very rich information on both income, expenditure and other financial information. All sources will be used in this exercise, but, due to its extensiveness, the SBS will be the most consulted source.

As referred to earlier, Kaumanns (2010) argued that the organizational form determines whether net or gross turnover on fuel sales is reported. Gross turnover, the total amount received for the sales of fuel, is reported by principals, while net turnover, which refers only to the compensation for brokering the fuel in name of the large-scale supplier, is reported by dealers. Hence, the expectation is that the turnover that is reported by dealers is substantially lower than the turnover reported by principals. As the number of filling stations that an enterprise contains as well as the size of these filling stations impacts total turnover, this will be controlled for. The hypothesis, then, is that *turnover per employed person and/or local branch for dealers is lower than for*

[7] Directlease, accessed at 22 July 2014 at: http://directlease.nl/tankservice/

principals. This will be tested by using turnover data from either the SBS, STS and/or VAT-data in combination with the data from the Business Register.

The SBS provides a further breakdown of turnover in traded goods and services. Traded goods, then, consists of both turnover from fuel sales and turnover from shop items. In a strict sense, dealers should not generate any turnover from fuel sales, as they are not the owner of the fuel. Therefore, the second hypothesis is that *dealers do not report any turnover from fuel sales*. Likewise, it is also expected that dealers do not purchase fuel from large-scale suppliers and consequently that *dealers do not report any purchase value for fuels sales* either.

Turnover generated from supplying services in NACE 473 are also further split into different items in the questionnaire of the SBS. These include turnover from repair and maintenance, rental and lease activities, car cleaning, contracted work and other services not elsewhere classified. The activities of a dealer can be regarded as a service: rather than selling a good, the dealer is brokering it. Therefore, one would expect that a dealer will report its activities as a service, most likely as an *'other service not elsewhere classified'*. Another possibility is that the dealer reports its activities as *'turnover from other activities'* besides sales of goods or from services. On the expenditure-side differences are expected in reporting between principals and agents. The first of these expenditure items is '*administrative costs'* that will be reported by dealers. Secondly, if a dealer runs a company owned filling station (CoDo) he will report *'lease for buildings and land'*. In Table 4 the hypothesised reporting behaviour of dealers and principals is summarized.

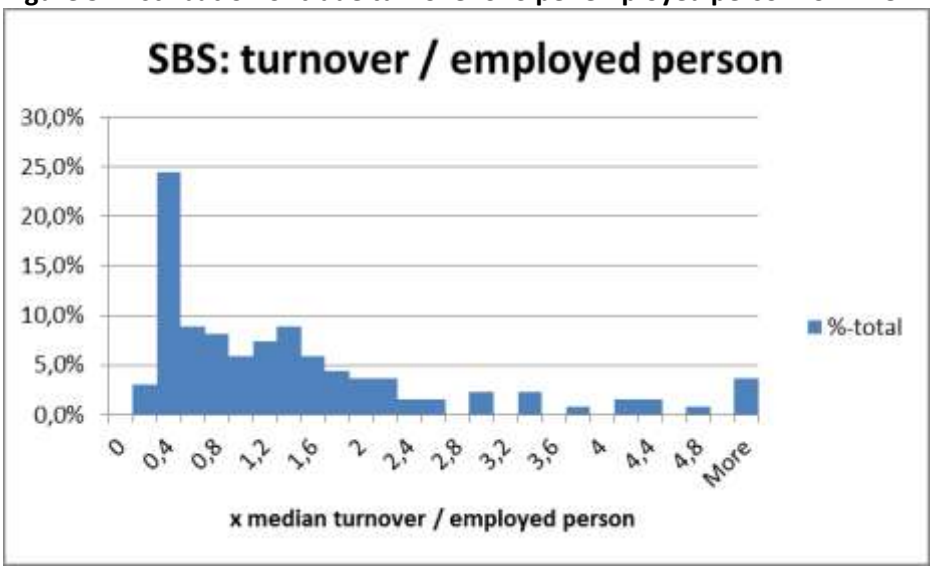
Table 4 Potential indicators to deduce organizational form

Indicator	Source	Principal	Agent
Turnover per employed person/per local branch	SBS /STS/VAT	High	Low
Turnover fuel	SBS	>0	0
Purchase value of fuel sales	SBS	>0	0
Turnover from other services	SBS	0	>0
Turnover from other sources	SBS	0	>0
Administrative costs	SBS	0	>0
Housing costs/lease	SBS	0	>0 (if CoDo)

Turnover per employed person and/or per local branch

In the SBS, the turnover is reported excluding taxes. Besides, it is possible to split total turnover in turnover from trade and turnover from other sources (such as services), but there is no distinction made for turnover in trade between wholesale en retail trade. In this exercise, therefore, the turnover from total trade has been selected. Figure 5 shows turnover relative to the median turnover of all enterprises that are active in this market, so that the data is anonymized and does not contain company-sensitive information.

Figure 5: Distribution of trade turnover SBS per employed person for NACE 473 (2012)



In Figure 5 two distributions can be discerned; the first distribution has its peak around 0.4 times the median turnover. The other distribution is somewhat wider and has its peak at 1.4 times the median turnover with a tail to the right. Furthermore, there are some observations on the far right of the second distribution, which can be considered outliers. The two distributions correspond to the expectation that fuel sales are reported in both gross and net terms. However, these results should be interpreted with care. The two distributions undoubtedly do reflect the distinction between net and gross turnover to some extent, but might also be distorted by other features of the different enterprises in the population of NACE 473. For instance, the results might also reflect the difference in turnover per employed person between manned and unmanned filling stations or whether an enterprise contains a wholesale branch.

When looking more closely to the turnover per employed person in the STS and the VAT data, the differences between the two groups seem to be less pronounced. Nonetheless, a peak can still be seen on the left of the graph, which indicates that there are many enterprises with rather low turnover per person relative to median turnover per person.

The histograms for turnover of the enterprises per local branch give a less clear image than turnover per person. They show a high frequency of enterprises that have a relative low revenue per branch. The enterprises that have higher turnover per branch have a very large spread, and the histograms do not contain a pronounced peak like the one that contained turnover per employed person. The same is true for the histograms that show turnover per employed person per local branch.

The results from this analysis Indicate that it is very difficult to deduce organizational form by choosing selected indicators only. More detailed information on the types of enterprises within the population is needed in order to make better claims on organizational form. This might include information on the number of manned and unmanned filling stations and a distinction between retail trade and wholesale activities.

Turnover from fuel sales and purchase value of fuel

In the SBS, we have selected those enterprises that did not report any turnover from fuel sales or purchase value of fuel. The sample size of enterprises that were classified in NACE 473 in the SBS in 2012 was 135. From these 135 units, 38 did not report any turnover from fuel sales, while 42 did not report any purchase value for fuels. Furthermore, all 38 units that did not report turnover from fuel sales did not report purchase value of fuels either. So 4 units did report turnover from sales of fuel, while they did not report the purchase value thereof. In all cases, the turnover from fuel sales was, compared to total turnover, so low, that it is fair to assume that these units are dealers.

In Figure 6 the histograms are displayed of both groups. The figure contains the same information as Figure 5, but further split-up into two categories: those units who report turnover from and purchase value of fuel sales (the principals) and those who do not (the agents). As can be seen clearly, the two distributions that we discerned in Figure 6 correspond quite closely with the distribution of the assumed dealers (on the left hand side – i.e. where turnover per person is low), and the assumed principals (to the right with significantly higher turnover per person). The fact that those enterprises that do not report turnover from fuel sales also have low total turnover makes perfect sense, when considering on average 80 per cent of total turnover consists of fuel sales in the SBS.

This analysis demonstrates that the SBS does allow to distinguish between principals and agents based on whether on the unit reports fuel purchases and sales to some extent. However, the results should be interpreted with care. In this exercise only those enterprises that only contain dealer stations have been identified. However, those enterprises that contain filling stations with different organizational forms (both as principal and agent) cannot be singled out.

Figure 6: Distribution of net trade revenue per employed person for NACE 473 (2012); by organizational form

Other indicators

The expectation that reported turnover for other services or other turnover would be an indication for type of organizational form were not confirmed in the data. As a matter of fact, these items seemed to be completely unrelated to either turnover or other turnover items. The same is true for the expenditure items - administrative costs or housing costs/lease. The assumption that the

organizational form does influence the expenses of an enterprise are still highly plausible, but this is not supported by the data in the SBS.

Although there are a large number of variables that are asked in the SBS (production of other services, fees paid by headquarters etc.) it is very difficult to distill from these responses alone a breakdown into principals and agents. We have also analyzed whether it is possible to use these responses sequentially, that is first select the agents based on whether they report fuel purchase and in a second step obtain a further breakdown into CoCo, CoDo etc. Unfortunately, this also proved not feasible. It therefore seems very difficult to classify units beyond a provisional principal agent dichotomy into CoCo, CoDo etc.

4.3 Analyzing trade margins in the National accounts

In the National accounts the production that is recorded is not the total sales but the trade margins i.e. the difference between sales and purchases of goods. Double counting is less of an issue as the focus of National accounts compilation usually lies on obtaining measures of value added. One of the main difficulties in compiling National accounts data on NACE 473 is however choosing the correct products that are being produced and intermediately consumed i.e. obtaining the correct structure of the sector. For instance, the units that recorded fuel sales but no fuel purchases (allegedly agents) would, unless being corrected, be recorded as producing margins whereas they are in fact producing a service. Obtaining better insight in the organizational form of respondents is therefore also of great importance for enhancing the quality of National accounts.

It is instructive, building upon the provisional distinction between principals and agents obtained in the previous section, to further analyze the sector. In the Dutch PS, NACE 473 is one of the industries where there is a further breakdown of purchases of trading goods (into fuels and shop sales), which allows analyzing the development of their respective margins.

Table 7: Fuel and shop margin percentages realized by alleged principals and agents (2010-2012)

		2010	2011	2012
Principals	Total margins	10.6%	10.0%	9.9%
	Fuel margins	8.6%	8.0%	8.1%
	Shop margins	20.8%	20.8%	20.7%
Agents	*Shop margins*	21.6%	21.6%	16.5%

Source: analysis of PS data adjusted to National accounts levels

Table 7 shows that the margins seem to be under pressure; the overall margins (expressed as the ratio of margins and sales) realized by the alleged principals decreased from 10.6 percent in 2010 towards 9.9 percent in 2012. This is primarily caused by a decrease in fuel margins, as shop margins have remained fairly stable during this period. This development might be explained by increased competitiveness between companies and the surge of unmanned gas stations, which causes diversification of services provided by stations.

Another striking finding is that the realized margins on fuel sales are a lot lower than the margins on shop sales. This supports the hypothesis that shop sales are becoming increasingly important for gas stations.

A final observation is, that that the shop margins realized by the alleged agents are in the same range as those realized by alleged principals, although we see a sharp drop from 2011 towards 2012. However, we should caution to draw firm conclusions here, given the provisional nature of the distinction.

5. Conclusions

The interpretation of turnover data from NACE 473 is complicated by two factors: due to commonly accepted classification principles, we have seen that in 2012 almost 40 percent of local branches involved in retail of automotive fuels are found outside NACE 473. This makes a direct comparison between the turnover of NACE 473 and total fuel sales in the Netherlands difficult. This situation is becoming increasingly problematic with the increase in the number of unmanned gas stations which are due to classification conventions usually classified outside NACE 473 A possible solution would be to single out such companies as 'complex' and give them a separate treatment, but this would require additional capacity for analysis. The second difficulty with the interpretation of turnover is caused by the rapid changes in organizational form which results in a mixture of principles and agents in NACE 473. Changes in turnover may therefore also be the result of changes in ownership structures and not due to increases in fuel sales. Given these difficulties it is important to be able to separately identify the different organizational forms.

Based on an analysis of available data sources we found that the best possible option is to distinguish between principals and agents based upon whether or not they report fuel purchases (and sales) in the SBS. It seems not possible with the current survey responses to further differentiate and, for instance, make a further breakdown of principals into CoCo or independent stations. In order to do so, we would be dependent on additional external sources such as company reports and/or third-party branch information or adjustment of the current questionnaires. In the STS the options are limited and no indicator seemed to work well.

Both these difficulties have an impact on the statistics that are produced at Statistics Netherlands. In order to get a better understanding of the implications, as well as to improve the statistics published, some revisions and/or additions of the questionnaires for both the STS and SBS will be further investigated. These include a further specification of gross and net turnover and a question on the number and type of filling stations. Furthermore, within the SBS, a further distinction could be made between trade turnover from retail and wholesale. Furthermore, as we have seen that many of the filling stations outside NACE 473 were concentrated in two other industries –about 75% of the local branches involved in the retail sale of automotive fuels were found in either NACE 451 Sale of motor vehicles or NACE 46 Wholesale- it is worth exploring whether adding a question on retail trade of fuels on questionnaires for these branches could give a better understanding of the market.

As remarked by Kaumanns (2010), the issues discussed here, although they might be more pronounced in the retail trade of automotive fuel sector, occur in many retail sectors, and it may be important to discuss further how the changing way in which enterprises organize themselves can – continue to - be adequately captured in economic statistics. A possible more long-term solution (building on Kaumanns' observation) could be to introduce in the industry classification within retail

trade a separate section for activities on a contract bases similar to the distinction made in wholesale trade (NACE 461).

Literature

Kaumanns, S., 2010. Problems of measuring retail trade due to the impact of different ways of organizing distribution. Paper presented at the Voorburg Group Meeting, Eurostat

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