# 22nd Voorburg Group Meeting

## Seoul, South Korea
## September 10th to September 14th 2007

# Sector Paper on Freight Transport by Road
# (ISIC 6023)

Fred Barzyk
Statistics Canada

## 1.0 Introduction

This sector paper on the freight transport by truck provides a summary of international progress on the measurement of this service, identifies and discusses the challenges facing the accurate and coherent measurement of turnover and price change (and hence the calculation of real output), presents recommendations for dealing with these challenges and provides an overview and discussion of classification issues.

The sources of information for this paper include: presentations and summary notes from the *21st Voorburg Group Meeting on Services Statistics, Wiesbaden, Germany (2006);* the *OECD-Eurostat 2005 Inquiry on National Collection of Services Producer Prices;* the *Eurostat and OECD Methodological Guide For Developing Producer Price Indices For Services*, and the *United Nations Statistics Division – Classification Registry.*

The paper is organized as follows: section 2.0 presents an overview of international progress; section 3.0 presents a summary of the primary findings from the mini-presentations; section 4.0 contains a summary of the points of the various real world complications encountered by the various countries and recommended guidelines for determining which PPI and turnover/output data methodologies work best under particular market conditions and constraints; section 5.0 covers the evaluation of the turnover/output definition and measurement compared to the defined output activity by both PPI and turnover/output technicians; section 6.0 discusses how the suggested key methodology guidelines and results meet the needs of the national accountants; section 7.0 includes prescribed changes for standard classifications or national accounts as required – based on problems in trying to conform to 4-digit ISIC boundaries and identifying uniform product lines across countries; and section 8.0 concludes.

## 2.0 Overview of International Progress

The 21st Voorgburg group meeting in Weisbaden, Germany in 2006 presented the results from a survey of 33 participating countries. The survey asked countries to report on their progress in developing services statistics. Usable responses were obtained from 22 countries.

One sub-component of the survey dealt with the development of turnover and SPPI data for trucking services. Specifically, questions were asked about the level of detail by industry and by commodity for which data were produced by the responding country. Industry was defined under the International Standard Industrial Classification (ISIC), and product was defined under the Central Product Classification (CPC). Countries were also asked to provide information on the alignment of their turnover and price data. Table A presents the general findings.

**TABLE A: Summary Results of Voorburg Survey, 2006**

| Category | Number of Countries | Percent |
|---|---|---|
| 1. Countries responding | 22 | 100 |
| 2. SPPI detail *currently* available is greater than or equal to the CPC detail | 3 | 14 |
| 3. SPPI detail *soon to be available* will be greater than or equal to the CPC detail | 0 | 0 |
| 4. Turnover detail *currently* available is greater than or equal to the CPC detail | 3 | 14 |
| 5. Turnover *soon to be available* will be greater than or equal to the CPC detail | 1 | 5 |
| 6. Industry-level prices calculated | 12 | 55 |
| 7. Industry-level turnover collected | 15 | 68 |
| 8. Detailed turnover and prices well aligned | 0 | 0 |
| 9. Detailed turnover and prices well aligned *soon* | 2 | 9 |
| 10. Industry-level turnover and prices aligned | 6 | 27 |
| 11. Industry-level turnover and prices aligned *soon* | 6 | 27 |
| 12. Other-no industry coverage for prices and/or turnover | 8 | 36 |

Of the 22 countries who responded, 15 collect industry turnover data (68%) and 12 produce industry level prices indexes (55%). The level of detail is limited in both cases, however. At the product dimension, only 5 out of the 22 countries indicated that their turnover detail currently available either was or would soon be greater than or equal to the CPC detail.

In terms of current Services Producer Price Index (SPPI) detail, only 3 countries (14%) produce detail greater than or equal to the CPC detail, and similarly for turnover, with the exception that one additional country will *soon* produce data at this level.

Internationally there is a low degree of alignment of detailed turnover and prices data. No countries reported that they collected detailed and well-aligned turnover and prices data, although 12 countries (54%) did indicate that their industry-level turnover and prices data were either currently aligned or would soon be aligned.

Based on the results of the *OECD-Eurostat 2005 Inquiry on National Collection of Services Producer Prices,* 24 countries currently produce or are developing an SPPI for this service. A large proportion (two-thirds) of these countries collect transaction prices, mostly though contract pricing, with the remainder relying on list prices or model pricing techniques.

## 3.0 Summary of the Primary Findings from the Mini-Presentations

At VG2006, the mini-presentations on turnover statistics were given by Canada, Germany and the United States and the mini-presentations on prices were given by Australia, Germany and the Netherlands. Comparison across countries highlights regional difference in markets and available information. The principal findings are presented below.[1]

### 3.1 Definition of the service being priced

There are some notable differences of service definitions across counties. For example, Australia includes all activity of firms classified to the road freight transport industry, while Germany tracks road freight services provided by firms classified to road freight transport or freight forwarding, and the Netherlands measures only road freight activity by firms classified to road freight transport. Canada and the United States harmonized their industry classification structure and much of their concepts to the point where comparability is achieved at a sufficiently low level (NAICS 4 digit) of classification.

### 3.2 Unit of measure for turnover and pricing

The unit of measure for turnover data for all countries is defined as revenues. Additional activity data including distance (kilometers) and weight (tons) are collected by some countries. The unit of measure for price data typically represents a shipment, obtained by a mix of pricing methods including contract prices, list prices and model pricing.

### 3.3 Market conditions and constraints

In most countries, the trucking industry is growing and is predominant as the main mode of transport in terms of turnover. For example, in the Netherlands, road haulage represented 40% of the total transport sectors in terms of GDP in 1999. In Canada, trucking represents approximately one third of the total output generated from the transportation sector.

Large scale de-regulation of the industry has occurred in Canada, Germany and the United States over the past couple of decades. This liberalisation has resulted in a higher degree of competition, lower industry concentration, and an increased reliance on sub-contractors (owner-operators). Other common market conditions include a growing demand for road freight, higher fuel prices, highway congestion, driver shortages, safety and security issues, and additional regulations for hours of service.

### 3.4 Standard classification structure and detail related to the area – does the standard include necessary product detail based on identified price determining characteristics?

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[1] The following discussion is derived from the summary notes and papers presented for the Freight Transport by Road session.

For most countries, product classification detail is available for *some* main price determining characteristics. The detail exists mostly from the various industry classification systems where the service activity is classified by type of vehicle or cargo transported (e.g. bulk liquids, forestry products, general freight, refrigerated products), and in the case of NAICS, also by distance (short and long distance) and truckload (full and less-than-full).

However, the level of product detail is not sufficient to cover *all* the important price determining characteristics in all cases, and countries have to go below the existing classification to further split-out activity. For example, the Netherlands includes a classification for national and international movements. Australia goes beyond their 4-digit class level (the deepest level of Australia's industrial classification), using a specifically designed structure developed with the aim of classifying road freight activities into homogenous sectors that align better with industry practice. The index structure used for their price index of road freight service is structured primarily according to type of commodity being transported (e.g. beer and wine, bulk freight, general freight, refrigerated, and livestock).

One other important detail not covered by any of the classifications is the type of price arrangement or terms. Depending on the sub-industry and country, several viable and different pricing schemes can exist. In Germany the spot market is significant, while in other countries contract pricing, list-plus-fuel surcharge pricing, etc., influence price movement. Origin/destination can also be an important price determining factor, which all the classifications simply cannot handle and must be dealt with individually by each country.

3.5 Evaluation of standard versus definition and market conditions

Comparing standard classification with prevailing market conditions, countries fine-tune their classifications to more accurately measure the industry. As previously mentioned, in the Netherlands the classification of road haulage services differs from the standard in that a distinction is made between national and international transport. International transports play an important role in their industry activity and this adjustment to the classification is deemed to be compatible with market conditions.

In Germany, turnover statistics are of limited use for the construction of an SPPI, as there is no breakdown into different market sub-segments available. Furthermore, freight forwarders with their own truck fleet who have a big share in the market for freight transport by road, are grouped in NACE sector 63.40 instead of 60.24. Adding the turnover of both sectors would not give satisfactory results, because not all freight forwarders offer freight transport by road. As a result, other sources of transportation statistics along with the help of consultants are used to arrive at a more representative calculation of turnover. Likewise in Australia, the road freight sector is tending to engage more in freight forwarding activities in recent years. This trend reflects the road freight industry's desire to lower their costs and to provide a better logistic service to its clients.

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In the United States and Canada, the implementation of the North American Product Classification System (NAPCS) is intended to match the market conditions in the area of freight transportation by road. The Unites States Economic Census for 2007 essentially expands requested data for basic types of cargo and expands the list of related services that may be of interest. 2007 product inquiries will also attempt to collect information on the transportation of various inter-modal containers by road. In Canada, the Standard Classification of Transported Goods (SCTG) is employed and represents a good classification measure for the types of commodities transported and meshes well with how the data are used by the System of National Accounts (SNA). As the Canadian statistical system (both the SNA and business survey fields) moves to implement NAPCS, a historical linkage will be carried out. For both countries, the NAICS has evolved to provide a fairly accurate depiction of how the industry should be organized. In practice, data will be available for local and long distance freight transportation, general freight and specialized freight, normal trailer and inter-modal container, and basic types of commodities being transported. Application of the proposed NAPCS based products will act to complement the existing industry structure in NAICS.

3.6 National accounts concepts and measurement issues for the area related to GDP measurement

For the most part, all countries (try to) adhere to the national accounts concepts as they relate to the calculation of industry GDP. However, measurement issues do vary from country to country.

In Australia, the production approach to the national accounts uses the "output indicator" method for measurement of quarterly chain volume estimates of industry value added for the road freight industry. The output indicator method is the one most commonly used by the ABS and involves extrapolating reference year estimates of current price gross value added using movements in a volume indicator of output. In a few cases the output indicator is just a single statistic, but in most cases it is a composite of several statistics. In no cases do these output statistics precisely meet the national accounts definition of output, but in most cases they approximate the national accounts definition reasonably closely. The output indicator used for the measurement of road freight is income from sales of goods and services collected in the Quarterly Business Indicators Survey (QBIS). These sales estimates are deflated by the producer price index of road freight.

In Canada, the SNA defines the standard unit used for industry measurement as the establishment in which the main activity is truck transportation. It includes all for-hire trucking establishments, common or contract, local or long distance. To conform to the concept of operating revenues, all subsidies are excluded. The SNA produces its estimates of GDP using the value-added approach (i.e. as a sum of value-added by all industries) and by measuring final demand in the I-O (Input-Output) framework. They present two slightly different perspectives of activity that achieve the same result. From an industry-based point of view, the truck transport industry is treated as a "margin" industry by the SNA. Total operating revenues for this industry are distributed across all commodities. In this sense, the transportation charges for a good form part of the eventual

purchaser price concept (along with other types of margins such as wholesale and retail). The current deflator is based on unit value indexes of revenue and tonne-kilometres for 76 commodities classified by distance groups from the domestic portion of the turnover survey. Volume indexes from the same survey are also used to check the results of this deflator. These unit value indexes have exhibited some volatility and are subject to changes in the quantity/quality mix in adjacent time periods. As a result, the deflator in any given year could be based on all of the above data plus any relevant information available on the trucking industry.

Germany has more pronounced measurement challenges. There are three main data sources combined to arrive at GDP estimates; the business register, the annual VAT statistic, and the annual structural business statistic (SBS) for service industries. None of the original data sources are fully in accordance with NA concepts, so it is necessary to combine different data sources and to make special adjustments. NA concepts do not fully agree with German national business accounting rules and the data sources often do not offer the appropriate information in a sufficient breakdown. The calculation of up-to-date quarterly NA figures for output in "freight transport by road" is based on tonne-kilometres as an indicator for extrapolation of previous year's values. These indicators are also used for the breakdown of final annual figures to get quarterly results. The indicator tonne-kilometres is derived from official monthly transportation statistics in freight transport by road.

In the Netherlands, the largest portion total service production of truck transport is from exports. Statistics Netherlands uses a ratio of 76 to 24 by which volumes of international freight transport by road are allocated to exports and domestic intermediate consumption respectively. This breakdown is based on tonne-kilometers of moved cargo. Consequently, the volume for road haulage services is made compatible with Dutch national accounts. Statistics Netherlands integrates the PPI for road haulage services into the national account system without changing the figures. For national accounts use, SPPIs for domestic intermediate consumption and for exports are produced for deflation.

For the United States, census industry data for road freight transportation does include data for the production of transportation for own use within enterprises. NAICS classifies establishments based on the activities that they perform rather than who the unit is serving. However, the additional inquiry regarding the classification of the enterprise being served as well as indicators on the file allow the separation of this data if so desired by national accounts.

### 3.7 Turnover/output and pricing data method(s) and criteria for choosing various method(s)

All countries use a combination of methods for collecting turnover/output statistics, including surveys and administrative data. In Canada, turnover/output data is collected over several surveys. For-hire carriers with operating revenues of more than $1 million

CAD annually are surveyed for their financial and operational (turnover) information under the annual and quarterly survey programs. For carriers under the $1 million threshold, administrative (tax) data are used to obtain estimates of their financial and operational activity. Administrative data is also used for owner-operators earning over $30,000 annually (owner-operators below this threshold are excluded). The annual commodity origin-destination survey also collects turnover data by electronic data reporting; profiles, but via computer-assisted telephone interviews (CATI); and on-site visits. Although the survey coverage is significantly enhanced, it does not meet all the users' requirements. The Canadian non-trucking companies, or "Private Carriers", as well as the foreign companies that transport goods in Canada are excluded. The $1 million threshold was used in the redesigned survey in order to reduce the response burden on small companies and to respect the budget constraints

In Germany, turnover is measured annually as an absolute value, and quarterly as a percent change. Both surveys – the annual structural business survey in the service sector and the quarterly survey in selected service branches – are mandatory sample surveys. The reporting unit for freight transport by road statistics is the "goods road transport vehicle", and the statistical unit is the tractive vehicle. Trucks with a capacity less than 3.5 t are excluded. The sampling register used for the survey is the register of tractive vehicles maintained by the Federal Motoring Office (Kraftfahrt-Bundesamt – KBA). The micro data concern the vehicles themselves, their journeys and the transported goods. Included are all journeys of single road transport vehicles (truck), or combination of road vehicles, namely road trains (truck with trailer) or articulated vehicles (road tractor with semi-trailer), designed to carry goods. Information about the vehicle is taken from the vehicle-register. The respondents report information about all journeys of the vehicle and the goods transported for the reporting period. The quarterly figures are published as working day and seasonal adjusted figures as well. At the moment monthly VAT-turnover information is being evaluated as a possible method to estimate quarterly turnover change, however the tax authorities use a slightly different definition for turnover. This definition includes more revenues than the revenues linked to the direct market activities.

In the United States, the primary source of product data is the Economic Census performed in years ending with 2 and 7. Interim data is often available from annual sample surveys of producing units but in less detail than the Economic Census.

Pricing methods generally used are contract pricing and model pricing. Most countries often rely on a combination of the two in order to address respondent burden. In Australia, data availability and the bookkeeping and contractual requirements of individual respondents also influence the pricing methods employed by the ABS. Consequently, the pricing method adopted in the road freight PPI is determined on a firm-by-firm and even a commodity-by-commodity basis. The types of pricing methods used within the road freight services in the ABS are specification pricing (where clearly identified representative services are selected along with conditions of sale), and contract pricing (where ongoing large contracts with a respondent's key clients are monitored).

In the Netherlands, the respondents supply prices on a quarterly as well as annual basis for a number of trips. Each respondent provides prices for up to 20 representative trips. These trips are described using the various specifications that determine the price, such as type of truck and cargo, packing material, weight of cargo, loading and unloading, etc.,. Another important price determining characteristic is the frequency of service. Large haulers have mainly clients for whom they perform the same services repeatedly for many years, and in this case, contract pricing is preferred. A lot of smaller companies' trips are ad-hoc, one-off or irregular trips. Because these trips are generally not directly comparable over time (i.e. their specifications or terms vary from one trip to another) model pricing is used.

Germany also collects contract prices whenever possible, and relies on model pricing for those instances where real transaction prices are not feasible. For example, model pricing is used when smaller companies are in competition for shipments with few or no repeated services, or for transportation of heavy loads which are not repeated services. Model pricing is also used for the grouped cargo market, where customers and payment conditions are constant over time but the quantity and type of cargo varies.

## 4.0 Summary of the Points of the Various Real World Complications Encountered by the Various Countries and Recommended Guidelines for Determining Which PPI and Turnover/Output Data Methodologies Work Best Under Particular Market Conditions and Constraints

*Point 4.1:*

One of the major difficulties encountered by various countries with regards to turnover data is surveying the appropriate service activity consistent with the classification definition. Australia includes all activity of firms classified to the road freight transport industry; Germany is tracking road freight services provided by firms classified to road freight transport or freight forwarding; and the Netherlands measures only road freight activity by firms classified to road freight transport. The variation in service definition stems from the differences in international markets. In Germany, the market is dense (more carriers), sub-contracting is popular as is the use of the spot market for return trips, and it is very difficult to separate out freight forwarding as an activity. In the Netherlands, there are issues surrounding the separation of multi-modal activity (e.g. ferry boat transport), while in the United States, the industry also performs other significant secondary activities, such as warehousing and storage and packaging.

*Recommendation 4.1:*

In order for turnover to be measured accurately and for comparability purposes, countries implementing surveys should adopt and focus on the relevant industry classification definitions (e.g. ISIC) in collection as their main objective. Adhering closely to classification service definitions during collection will provide data that is more transparent in what it does and does not cover. Wherever possible, separating out ancillary activities is advocated when publishing series, so that users can better match

their turnover data requirements. This may be difficult to do, however, in the case of administrative data sources and given respondent bookkeeping practices.

*Point 4.2*:

A second topic with regards to turnover data is the collection of product detail. The industry vs. product dimension is important to national accountants. From their perspective, it is desirable to develop separate turnover by product detail and separate price indexes for important secondary products (warehousing, storage & packaging). However, few countries survey this level of detail, as it requires adequate frames, additional sample and resources, and imposes more respondent burden.

*Recommendation 4.2:*

Turnover surveys should aim to collect a minimum level of product detail consistently over time. The level of detail needs to be evaluated against the availability of resources and the addition of respondent burden. Turnover data by product will meet the needs of national accountants and serve as weighting and sampling source for product-based SPPIs.

*Point 4.3:*

One important challenge confronting the development of an SPPI for road transport is to determine which type of price should be collected so that the index is accurate and representative. Several options exist and they include: contract prices, list prices and model prices. Contract pricing is ideally based on transaction prices, while a list price is the published price for services (usually published as rates applied, based on mileage, weight, volume and additional services) and is often used as a starting point to negotiate discounts for a spot price or transaction/contractual price. Model pricing collects the fictitious price of specified road freight journeys. The trips are priced in the base period and all subsequent collection periods.

*Recommendation 4.3:*

The primary recommendation is that the method(s) used to collect prices reflect as closely as possible the real world activity of firms within the industry. The goal is to collect actual transaction prices and normally, contract pricing is the preferred method for collecting prices for the SPPI when large firms have several large, repeat customers and contracts are readily available. However list pricing, if used extensively in the industry, can be representative as well, provided that discounts and fuel surcharges are collected. When response burden is an issue or when similar contracts are rarely repeated over time, then model pricing can also be used. Model pricing can control for quality change, but the models require frequent updating in order to remain representative. Depending on the size of the firm, a combination of all these methods could be used. In the end, respondent cooperation is a big determining factor in what prices can be obtained.

*Point 4.4:*

Another important issue related to pricing is what to include in the price. This can depend on several items: the type and terms of the service, whether there is bundling or not, discounts, surcharges, tolls, etc. For example, in addition to contracts, Germany also has a vibrant spot market industry for return cargo, which comprises about 10% of total market activity. The spot market consists of transport services for a single journey unlikely to be repeated, and the price movements, unlike that of contract pricing, are quite volatile. Therefore surveying these prices can be problematic.

Fuel surcharges can be an important price-determining factor, particularly in periods of rising fuel prices. Depending on how fuel surcharges are paid and collected, their inclusion should be straightforward, but may not necessarily be so. In France, the fuel charge is not necessarily always paid, and it is it can be negotiated 2-3 months after the transaction. Usually it is billed separately from the transportation service, unlike other countries, where the surcharge is readily available as part of the price.

*Recommendation 4.4.1:*

The price collected should reflect as closely as possible the producer price for road transport. It should include any applicable discounts, rebates, surcharges (fuel and other), etc. that may apply to the customers. Taxes should be excluded from prices whereas subsidies received by the producer, if there are any, should be added. Ideally both domestic and export activity should be captured during price collection, although many countries just collect the domestic component of intermediate service provision.

*Recommendation 4.4.2:*

The specification and terms of the service require significant detail to ensure that a repeatable service and recognized customer are defined and re-priced over time (e.g. timeliness of delivery, size and type of vehicle, nature and weight of cargo, distance of journey and/or destination, type of customer). This is necessary to produce a constant quality price index. When a service is no longer representative of the activity of the business, an alternative replacement should be sought that is as close to the original service as possible in order to make a comparable substitution.

## 5.0 Evaluation of the Turnover/Output Definition and Measurement Compared to the Defined Output Activity by Both PPI and Turnover/Output Technicians

In order for turnover data and price indexes to be used together appropriately (e.g. turnover data for use in weighting price indices), the concepts and definitions used to measure and collect them both must be highly coherent and consistent. An overall evaluation of the papers presented at VG2006 leads to conclusion that the degree of coherence varies from country to country from medium to high. Some countries collect

most if not all of the turnover detail necessary to produce an SPPI, while those that do not have to rely on other sources of activity data for producing their weights.

In the Netherlands, the comparability of SPPI with turnover data is generally very good. Exceptions include international border-crossing freight transports by road, where volumes are reallocated on exports and intermediate consumption by estimation based on tonne-kilometers. These exceptions aside, the turnover classification is compatible with SPPI classification. Turnover data is available for PPI only with a time lag of two years.

For the United States, the proposed 2007 Economic Census product collections for freight transportation by road can be easily aggregated to supply weighting information for the SPPI and thus produce highly comparable deflators for the output data. Because the turnover and prices surveys both use different frames, some coverage differences will exist. For example, sampling frame issues for private carriers (included in Census data), non-employers or owner-operators that do not report paying wages (not included in Census data), and similar technical differences will impact the usability and comparability of output data and price index deflators.

In Canada, quarterly turnover data has been collected since the late 1980's. The SPPI for road transport is in the pilot phase of development however initial evaluation of the comparability is high. The weights for SPPI are based on a combination of detail available from the central business register and turnover data coming from the various motor-carrier of freight surveys at Statistics Canada. Together, they provide the SPPI with enough turnover detail by industry classification (NAICS) as well as turnover by commodity transported (SCTG) to produce weights at the most basic level. The current index methodology relies on drawing a sub-sample of the survey frame from the turnover surveys to arrive at the SPPI sample. In addition, the micro-data results are a valuable source for constructing company profiles of shipment activity. The micro-data will be used to identify the top revenue- grossing commodities being shipped, the typical shipping distance and the typical weight of shipment. Having this type of detail available ensures a high degree of coherence between during turnover and price data

In Australia, as in other countries, the blurring of activities between different levels of the industrial classification poses problems for turnover measure and the compilation of price statistics. Bundling is common, where many providers of road freight transport services also provide other services such as freight forwarding or courier services. The solution used by Australia is to classify all outputs of a business according to the primary activity of the take-all-unit. The approach adopted for the SPPI is to measure price changes of discrete service activities, which can be difficult if the price movements of the primary and secondary activities of the industry are different. However this is not the case for road freight services, where the major influences on cost (and price) continue to be fuel, maintenance and labor which are also associated with the secondary activities of freight forwarding and courier services.

For Germany, output data is the most important source for the weighting pattern of the SPPI due to its detailed level of information. However, output statistics use a different

system of classification than the SPPI, so the data has to be regrouped to fit into the structure of the SPPI. Turnover figures for freight transport by road and freight forwarding have been produced since 2000, and while the accuracy of measurement of turnover figures has continuously improved, the statistics are not detailed according to market segments. The result is that only an impression of the market size can be derived from service statistics, not a breakdown that would facilitate the development of an SPPI. In order to estimate the weights for the SPPI, turnover statistics have to be combined with unit value data from the Federal Office for Freight Transport to arrive at the proper detailed weighting scheme.

## 6.0 How the Suggested Key Methodology Guidelines and Results Meet the Needs of the National Accountants

The recommendations presented in Section 4.0 of the paper are intended to address real world complications and concurrently help meet the needs of the national accountants in producing more accurate and reliable estimates of economic activity for the road freight transport industry. Their needs can be described broadly as focusing on three key aspects: 1.) Definition of industry scope and alignment of turnover and prices data, 2.) Constructing a high quality SPPI, and 3.) Timeliness.

### 6.1 Defining industry scope and aligning turnover and prices data

*Recommendation 4.1* deals with defining industry scope consistently and coherently for both turnover and price statistics. Adhering to or following the classification definitions closely ensures this consistency. The importance of this for national accountants is obvious – they have to know what economic activity is being measured by all components in order to produce accurate measure of real output and confront the data.

The degree of alignment of turnover and price data is vital for this objective. When survey data consists of additional items normally accounted for in other industries, real economic activity is overestimated in one industry and under-estimated in another, causing a measurement shift in economic activity. Successfully implementing *Recommendation 4.1* will help answer the following important questions:

- Is the *definition* of the economic activity consistent with the requirements of national accountants?

- If so, is the actual data *collected* in this way?

- Specifically, do the data meet the needs of national accountants to the extent that turnover and price series themselves consistently measure the *same* activity?

For example, biased results arise if we deflate turnover data which includes bundled services with an SPPI that does not include bundling and vice versa. The definitions and coverage of the two series need to be aligned for more accurate deflation.

Realistically, this recommendation can prove difficult to carry out fully. While the parameters and definitions seem obvious to the classifications expert, at least in terms of what they *should be* if not in terms of what they are, the statistician has to deal with the realities of how the industry operates and evolves. In some countries, this evolution is more pronounced and enterprises or firms whose sole activity used to be freight transport by truck now have highly integrated service bundles. Their total client orientation means they are now offering service packages that add services such as warehousing and freight forwarding. The prevalence of bundling in the industry leads to great difficulty in separating out turnover activity and the corresponding price component. Inter-modal arrangements, if not separable, add to this phenomenon of misclassification.

As it becomes more and more difficult to identify the various sub-components of the bundle or package service, perhaps accepting the larger scope might be the only practical solution, whether this is moving up the aggregation scheme or creating new classifications altogether.

*Recommendation 4.2* suggests that the level of detail for turnover and price data be expanded to include some basic level of product groups (in addition to industry detail) which would be beneficial to national accountants. The need for more precise detail leads to focused measurement efforts on the commodity dimension once industry coverage is attained. In addition to industry data, national accountants require commodity (or product) level data to trace real production and the flow of goods through the economy. In this context, commodity detail can take two forms: 1) turnover data of road freight transport services as products or commodities (i.e. under CPC or NAPCS), and, 2) turnover data estimates by commodity for the calculation of real transport margins by commodity. The former is a direct input into the production accounts and requires minor modification to survey programs and resources in comparison to the latter. In the latter, the number and variety of commodities moved by truck can become quite large, requiring larger samples and more costly surveying efforts.

As well, it may be desirable to develop separate turnover by product detail and separate price indexes for important secondary products, such as warehousing, storage & packaging, in an effort to more exhaustively measure real economic activity. The main obstacle to obtaining more commodity-specific detail is the lack of an adequate frame from which to draw representative samples.

### *6.2 Constructing a high quality SPPI*

*Recommendations 4.3, 4.4.1 and 4.4.2* centre on the proper construction of an SPPI for deflation purposes. These suggestions address five out of the six components of the *VG Quality PPI Assessment Framework* and if implemented successfully, will result in

producing an A or B quality deflator.[2] *Recommendation 4.3* proposes the SPPI be based on real transactions prices (or at least *very* close substitutes) which in turn represent actual output and shipment prices. If turnover is measuring transaction activity, then for purposes of consistency, the SPPI should also price transaction activity. Similarly, *Recommendation 4.4.1* aims at providing the proper conceptual price as defined by national accountants (i.e. producer price).

*Recommendation 4.4.2* deals with constructing a constant quality SPPI that is representative of current period production. Apart from the bundling issue, countries have experienced that there is very little change in quality over time, so that maintaining constant quality can be easy if adequate service pricing specifications or details are collected and maintained. Representation can be an issue in cases where having appropriate prices for market segments is required for corresponding turnover activity. For example, it is ideal, yet challenging, to deflate the portion of turnover stemming from spot market activity with an appropriate SPPI which measures the price change for this market.

### 6.3 Timeliness

While no specific recommendation for timeliness was made in Section 4.0, it is one of the key desirables from a national accountant's perspective and it is a component of the *VG Quality PPI Assessment Framework*. Both turnover and prices need to be timely to produce an accurate and current measure of real economic activity. Similarly, different frequencies between turnover and the corresponding SPPI can cause measurement problems. Accurate measurement of quarterly real GDP requires quarterly turnover data and a corresponding quarterly SPPI. In cases where only annual turnover data are available, some form of sub-annual projection might be desired, however resource constraints might interfere with this goal. Most international experience to date has the development and production of a sub-annual SPPI (quarterly or monthly) with annual turnover statistics being produced.

## 7.0 Prescribed Changes for Standard Classifications or National Accounts as Required – Based on Problems in Trying to Conform to 4-Digit ISIC Boundaries and Identifying Uniform Product Lines Across Countries

### 7.1 Industry Classification

On an industry basis, the various classification systems are fairly harmonized for the freight transport by road industry. The various industry classification definitions for the service are comparable across general levels. The service broadly defined is the same. Depending on the country, localized differences show up at the lower levels of their

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[2] The assessment framework identifies six major concepts of fundamental importance to output price measurement. They are: *Output price, Transaction price, Shipment price, Representative of current period production, Constant quality,* and *Timely price measure.*

respective industry classification structure. Nonetheless, there exists a high degree of standardization and integration in terms of the definition of the service measured, leading to the conclusion that many prevailing issues and concerns for service measurement are cross-cutting internationally, with minor exceptions arising from particular circumstances.

The main industrial classifications considered are the International Standard Industry Classification (ISIC Rev 3.1), the North American Industry Classification System (NAICS v. 2002 US) and the Australian and New Zealand Standard Industrial Classification (ANZSIC 1993). Table B provides a general overview along with classification details.

The NAICS *484 Truck Transportation* class comprises establishments primarily engaged in the truck transportation of goods. These establishments may carry general freight or specialized freight. Specialized freight comprises goods that, because of size, weight, shape or other inherent characteristics, require specialized equipment for transportation. Establishments may operate locally, that is within a metropolitan area and its hinterland, or over long distances, that is between metropolitan areas. Lower level industry classification focuses on long distance versus local trucking, and full truckload versus less than truckload.

A third internationally used industry classification system is the Australian and New Zealand Standard Industrial Classification 1993, (ANZSIC). Under *ANZSIC 6110 Road Freight Transport*, this class consists of units mainly engaged in the transportation of freight by road. It also includes units mainly engaged in renting trucks with drivers for road freight transport. Specifically, 6110 includes units mainly engaged delivery service, road (except courier); furniture removal service (road); log haulage service (road); road freight transport service; taxi truck service (with driver); and truck hire service (with driver). The excluded services are classified under several other ANZSIC groups.

The derived NACE classification (Statistical Classification of Economic Activities in the European Community) has a similar structure of coverage for this service under NACE 1.1 *Code: 60.24 Freight transport by road*.

## Table B: Overview of International Industry Classifications

| | Classifications | | | |
|---|---|---|---|---|
| | ISIC Rev.3.1 6023 - Freight transport by road[3] | NAICS 484 - Truck Transportation[4] | ANZSIC 6110 - Road Freight Transport[5] | NACE 1.1 6024 - Freight transport by road[6] |
| **Definition** | | Industries in the Truck Transportation sub-sector provide over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers. The sub-sector is subdivided into general freight trucking and specialized freight trucking. | This class consists of units mainly engaged in the transportation of freight by road. It also includes units mainly engaged in renting trucks with drivers for road freight transport. | - |
| **Inclusions** | - logging haulage<br>- stock haulage<br>- refrigerated haulage<br>- heavy haulage<br>- bulk haulage, including haulage in tanker trucks including milk collection at farms<br>- haulage of automobiles<br>- transport of waste and waste materials, without collection or disposal<br>- furniture removal<br>- renting of trucks with driver<br>- freight transport by man or animal-drawn vehicles | - local trucking of general freight (NAICS 484110)<br>- long distance full truckload trucking of general freight (NAICS 484121)<br>- long distance less than truckload (mixed shipments from various clients to create a full truck) general freight trucking (NAICS 484122)<br>- transportation of used household goods (movers) (NAICS 484210)<br>- local specialized freight trucking (tanker, car carrier, live stock carrier, or other specialized equipment) includes flatbed trucking, dump trucking, and log trucking (NAICS 484220)<br>- long-distance specialized freight trucking (tanker, car carrier, livestock carrier, or other specialized equipment) includes flatbed trucking, dump trucking, and log trucking (NAICS 484230) | - Delivery service, road (except courier);<br>- Furniture removal service (road);<br>- Log haulage service (road);<br>- Road freight transport service;<br>- Taxi truck service (with driver);<br>- Truck hire service (with driver) | - logging haulage<br>- stock haulage<br>- refrigerated haulage<br>- heavy haulage<br>- bulk haulage, including haulage in tanker trucks including milk collection at farms<br>- haulage of automobiles<br>- transport of waste and waste materials, already collected by third parties.<br>- furniture removal<br>- renting of trucks with driver<br>- freight transport by hand or animal-drawn transport |
| **Exclusions** | - log hauling within the forest, as part of logging operations (see ISIC 0200)<br>- operation of terminal facilities for handling freight (see ISIC 6303)<br>- crating and packing services for transport (see ISIC 6309)<br>- post and courier activities, (see ISIC 641)<br>- waste transport as integrated part of waste collection activities carried out by specialized enterprises (see ISIC 9000) | - local hauling of garbage (562110, Waste Collection)<br><br>- trucking forest products in the bush (i.e., within logging limits) (115310, Support Activities for Forestry) | - providing road freight terminal facilities or services on a contract or fee basis to road transport units are included in Class 6619 Services to Road Transport n.e.c.;<br>- road freight forwarding are included in Class 6642 Road Freight Forwarding;<br>- freight forwarding by rail and/or air and/or sea are included in Class 6643 Freight Forwarding (Except Road);<br>- crating or packing for road freight transport on a contract or fee basis are included in Class 6649 Services to Transport n.e.c.; and<br>- leasing or hiring trucks from own stocks, without drivers are included in Class 7741 Motor Vehicle Hiring | - operation of terminal facilities for handling freight,<br>- post and courier activities, and<br>- waste transport as indissoluble part of waste collection activities carried out by specialized enterprises |

[3] http://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=17&Lg=1&Co=6023
[4] http://www.census.gov/epcd/naics02/def/NDEF484.HTM
[5] http://www.abs.gov.au/AUSSTATS/abs@.nsf/7d12b0f6763c78caca257061001cc588/AB5BBF69CFDC2B30CA25697E0018FC13?opendocument
[6] http://www.insee.fr/en/nom_def_met/nomenclatures/naf/pages/rp_naf03_17_i.htm

*7.2 Product Classification*

Unlike the industry classification comparison, product classifications are not harmonized to the same degree. The Central Product Classification (CPC v.1.1) is one of the main product classification systems applicable to this industry and the relevant category is *Class: 6433 - Road transport services of freight*. The other major international classification system for consideration is the North American Product Classification System (NAPCS), specifically category *Transportation and warehousing services*. Both are presented in more detail in Table C.

Comparing the CPC to NAPCS, several noticeable differences are evident in product lines:

- Moving services are included in the CPC *64335 - Moving services of household and office furniture and other goods*, while NAPCS has them separated into their own output group *484001 -Moving services*.
- The CPC includes letters and parcels (*64336 - Road transport services of letters and parcels*), while NAPCS places these under a different output group (*492001 Courier, parcels, and local messenger and delivery services*)
- The CPC has a category freight transport by man- or animal-drawn vehicles (*64334 - Road transport services of freight by man- or animal-drawn vehicles*), which is excluded in NAPCS for road transport.

For product line statistics to be comparable internationally, it is strongly recommended that a concordance be built which would take these differences into account.

## 8.0 Conclusion

A review of the freight transport by road industry leads to several conclusions. First, it is apparent that more detail is needed in order to accurately measure the activity of this sector. Separation of the components of the service bundle is one important goal, but a second emerging objective is the need for greater commodity shipment detail. An important consideration is the tradeoff between respondent burden and data quality: as this service sector becomes more and more integrated, how much detailed information the respondent *can* and *will* provide becomes less obvious.

Second, the degree to which turnover and prices can be properly aligned will result in more accurate estimates of real output for this service industry. In order to achieve proper alignment, the national accountant, turnover specialist and price statistician need to confront the issue of alignment *together* in order to improve it. To this end, we recommend a consistent definition of the service that is used to measure turnover and price change.

Finally, with the arrival of NAPCS, product classifications need to be harmonized if meaningful product line comparisons are to be carried out. Building a concordance to reflect common service products (outputs) should be a priority.

## Table C: Overview of Product Classifications

|  | CPC v.1.1[7] | | NAPCS (Provisional Version 0.1)[8] | |
|---|---|---|---|---|
|  | Class | Sub-classes | Output Group | Sub-groups |
| Inclusions | 6433- Road transport services of freight | 64331 - Road transport services of freight by refrigerator vehicles | 484002 Truck freight transportation services (except moving) | 484002.1 Transportation of bulk liquids and bulk gases in intermodal tank containers by road |
|  |  | 64332 - Road transport services of freight by tank trucks or semi-trailers |  | 484002.2 Transportation of bulk liquids and bulk gases, except in intermodal tank containers, by road |
|  |  | 64333 - Road transport services of containerized freight by trucks equipped with a container chassis |  | 484002.3 Transportation of dry bulk, except in intermodal containers, by road |
|  |  | 64334 - Road transport services of freight by man- or animal-drawn vehicles |  | 484002.4 Transportation of climate-controlled boxed, palletized and other packed goods, except in intermodal containers, by road |
|  |  | 64335 - Moving services of household and office furniture and other goods |  | 484002.5 Transportation of boxed, palletized and other packed goods, not climate-controlled, not in intermodal containers, by road |
|  |  | 64336 - Road transport services of letters and parcels |  | 484002.6 Transportation of climate-controlled intermodal containers, n.e.c., by road |
|  |  | 64339 - Other road transport services of freight |  | 484002.7 Transportation of intermodal containers, not climate-controlled, n.e.c., by road |
|  |  |  |  | 484002.8 Transportation of automobiles and light-duty trucks by road |
|  |  |  |  | 484002.9 Transportation of livestock by road |
|  |  |  |  | 484002.10 Transportation of waste, without collection, by road |
|  |  |  |  | 484002.11 Transportation of other goods by road |
| Exclusions |  |  |  |  |
|  |  |  | 484001 -Moving services | 484001.1.1 Household moving 484001.1.2 Commercial moving 484001.1.3 Other moving |

[7] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=16

[8] NAPCS will eventually become an economy-wide classification covering both goods and services. This provisional version of NAPCS includes the products that are characteristic outputs of a range of service-producing industries, specifically those in NAICS Sectors 48-49, 51, 52, 53, 54, 56, 61, 62, 71, 72 and 81.
For reference, see http://stds.statcan.ca/english/napcs/napcs_io.asp?product_group_id=895&source_url=napcs_product_groups.asp

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