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Cross-cutting issues part 1
"Linking Services Turnover/Output Prices to the National Macroeconomic Framework"

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Introduction

The purpose of this paper is to enlighten SPPI compilers on the macroeconomic framework ruling the uses of their figures, which resides above all - according to the author of this paper - in National Accounts concepts and practices. Hence, some NA peculiarities are explained and some future developments are suggested, which deserve for some of them an in-depth discussion within the Voorburg Group and international bodies in charge of guidance on SPPI. The current European projects FRIBS and STS-package are particularly concerned.

1 The necessity of consistency between macroeconomic indicators and/or their integration in National Accounts concepts and conventions

1.1 The conceptual necessity of consistency

The fundamental equation between value, volume and price is:
$$I_{value} = I_{volume} * I_{price}$$

In other words,
*(1 + growth rate in current prices) = (1 + growth rate in volume) * (1 + growth rate in prices)*

Value indicators can be defined *per se*, without notions of volume and price. They are also usually easier to measure (thanks to a good enterprises register, the availability of tax declarations…), at least after some delay. Agricultural products make an exception.

But volume and price are not conceptually defined indepedently from eachother. Their product must be equal to the value indicator, of which they explain and increase the economic significance. If this equation is not true, their relevance, their precision, or at least the relevance or the precision of one of them, is suspected.

In most cases, the heterogeneity of products at elementary level, or the regular introduction of new products, imposes this second equation:

$$I_{volume} = I_{quantity} * I_{quality}$$

Which can be written:

$$\textit{(1 + growth rate in prices)} = \frac{(1 + \text{growth rate in current prices})}{(1 + \text{growth rate in quantity}) * (1 + \text{growth rate in quality})}$$

The implicit or explicit measure of quality, generally a delicate notion to approach, must be conceptually shared between volume and price indicators, otherwise they cannot be consistent in the figures produced, and consequently they become irrelevant for macroeconomists and even suspicious for users of a single indicator.

In order to obtain consistent data for the verification of the fundamental equation, not only the concepts but the methods should be aligned: statistical units observed, classifications, technique of indicator and base year (Laspeyres, Paasche, fixed base or chain-linked…).

If these methods are not aligned, the "reputation" of each indicator can be "saved" in its producer's mind ("*the difference of concepts and methods explains…*"), but the relevance for macroeconomists and national accountants is lost. As NA will "force" this equality between value, volume and price indices, one of the three indicators may be reputed "poor"…

1.2 The practical impossibility of consistency

Anyway, most short term indicators have been developed *per se*, mainly driven by the kind of statistical unit easy to observe in their particular case, and the concepts have often be developed afterwards, indepedently.

A methodological limitation is that volume indicators in Laspeyres type should be associated with price indicators in Paasche type, but it is generally impossible to observe weights of the current period in due time for true Paasche indicators - same practical impossibility for Fisher type indicators. Customs statistics have for a long time been explored for consistent value, volume and price indicators, but the relevance of the two latter was definitively condemned because of their high volatility, resulting from the heterogeneity of products (hence, the "quality" component is very important for meaningful indices).

The statistical units and the operations described differ often between indicators, in spite of the text of the European Short-Term Statistics (STS) regulation, itself inconsistent between industry (annex A) and other services (annex D):

Annex A - Industry

(b) Observation unit
1. Unless otherwise stated in paragraph 2 or decided otherwise according to the procedure in paragraph 3, the observation unit for all variables in this Annex is the <u>kind-of-activity unit</u>.
2. For enterprises with few persons employed in secondary activities the local unit or the enterprise may be used as the observation unit.

Annex D - Other services

(b) Observation unit
1. The observation unit for all variables in this Annex is the <u>enterprise</u>.
2. The use of other observation units may be decided by the Commission. Those measures, designed to amend non-essential elements of this Regulation by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 18.

EU Structural Business Statistics (SBS) regulation uses "enterprises" as observation units, too.

Note that National Accounts use (theoretically) a third and a fourth notions:
- the "local kind of activity unit" (= the establishment) as base of "industry" for Supply and Use Tables (SUT);
- or the "homogenous production units" for symmetric input-output tables (and in this case, we can assimilate "homogenous production units" with "products").

The differences between these notions consist in the homogeneity of products achieved by these units, in other words the diagonality of the "Make Matrix", the availability of economic data, and the location (at national level or at fine level). United Nations statistics division (UNSD) defines KAU and LKAU as "trade-off" between homogeneity and availability of data.

Figure 1: KAU and LKAU as "trade-off" between product homogenity and data availability
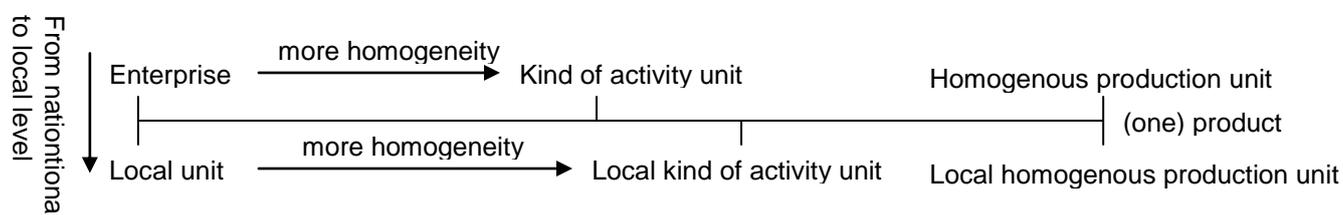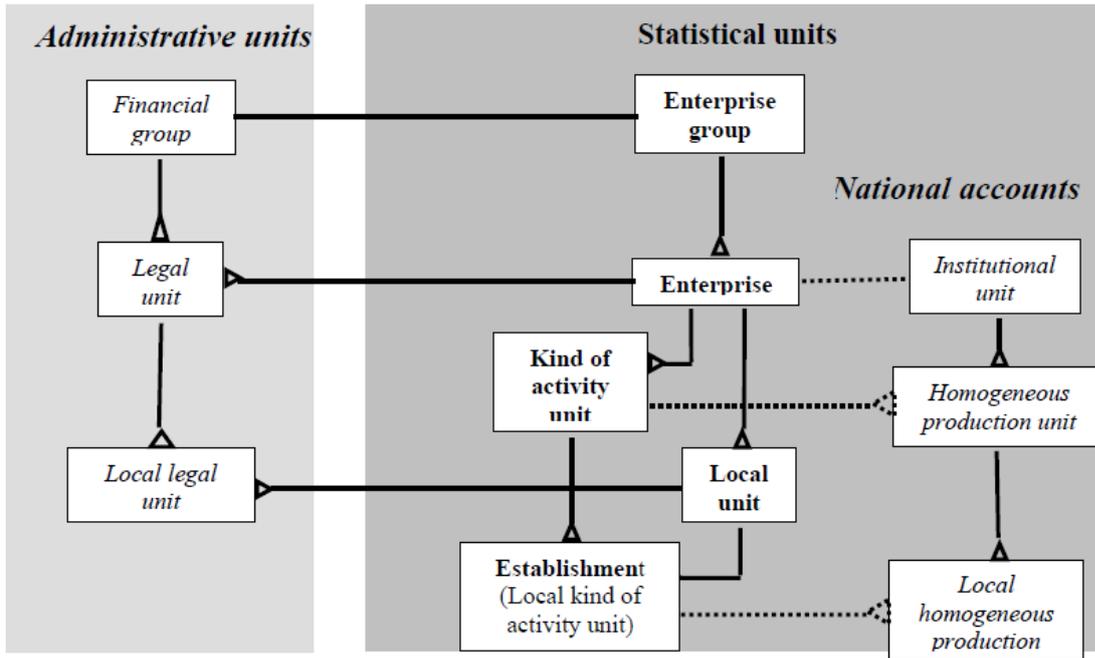
Figure 2: relations between units according to UNSD (2007)

In the French case, turnover indices rely on legal units, index of industrial production on homogenous production units and PPI or SPPI on products. The STS value indicator is therefore inconsistent with the two other ones because of its statistical unit. The local units are never used, neither in SBS, neither in STS, neither in NA and, personally, I consider that it was a mistake to introduce the local dimension in NA manual (or the "flexibility" of LKAU and SUT in SNA 2008 might be interpreted by the suppression of this dimension).

In several European cases, PPI and SPPI are compiled in two ways, once "by products", and once "by industries" for transmission to Eurostat, in order to respect the letter of the STS regulation (although PPI TF decided in January 2010 that SPPI "by products" was enough).

Whatever the country, the index of industrial production (IIP) is also supposed to reflect Value Added, not "production" (at elementary level, they are supposed to change proportionally), which is also sometimes different from turnover. That troubles the picture, and makes impossible an internal consistency of STS indicators in value, volume and price.

For external consistency, there is matter of discussion between privileging Structural Business Statistics or National Accounts. It is not only a formal point for the source of weights, but for the scope of indicators. For instance, will the future European index of services production for activity "68.20 - *Renting and operating of own or leased real estate*" be representative of "Businesses" (= "enterprises" = institutional sectors S11 + S12 + S141 + S142 - pure households), of "market producers" (which would include pure households actual renters), or of "total economy" (which would include owners-occupiers too)?

The current STS regulation is defined on "business" scope only and requests SBS weights, and this interpretation of "business statistics consistency" has certainly seemed more natural for institutional reasons[1], both for Eurostat and for European Member States. But even this external consistency, looked for within same statistical directorates, is necessarily imperfect, as SBS supposes turnover including taxes on products other than VAT ("producer's prices"), contrarily to STS ("basic prices"), and for industry they rely on different statistical units…

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[1] Note for instance the "Business Statistics Directors Group" (BSDG) as counterpart of "directorate G: global business statistics" in Eurostat, for strategic orientation.

1.3 Some ways explored by Eurostat for better consistency

Eurostat is aware of the lack of consistency between all kinds of business statistics, and has been developing a "Framework Regulation Integrating Business Statistics" (FRIBS) initiative, in order to correct this state of play. The "STS package" is supposed to summarize the contribution of each Short Term Statistics indicator to this goal.

A lot of "transversal" operations have been launched, of which:
- (European) Business Registers as central component;
- a European Statistical System Network (ESSnet) "profiling", for a better definition and practice of the ideal "statistical enterprise" in case of large and complex Multi-national Enterprises (MNE) groups, reasoning both on worldwide and on national scales;
- an ESSnet "consistency" between and within SBS and STS regulations, in charge among others of definition of statistical units;
- a task force "statistical units", relaying the ESSnet "consistency" on this topic, with imminent new definitions of enterprises and KAU;
- an upcoming European Business Statistics (EBS) manual.

Anyway, the most exciting discussion on "profiling" and on the new definition of (statistical) "enterprises", which will allow building units from the whole enterprise group, possibly by splitting some legal units, is not oriented for a better consistency, but for a higher significance of business statistics.

The most noticeable feature is that National Accounts have been recognized as a main user of economic indicators (main goal: closing the gaps for NA) and as a key provider of concepts and definitions for integration of economic indicators among the several domains of business statistics:

Figure 3: a slide from Eurostat's presentation on FRIBS
to Directors of Macro Economic Statistics (DMES), 28th March 2012
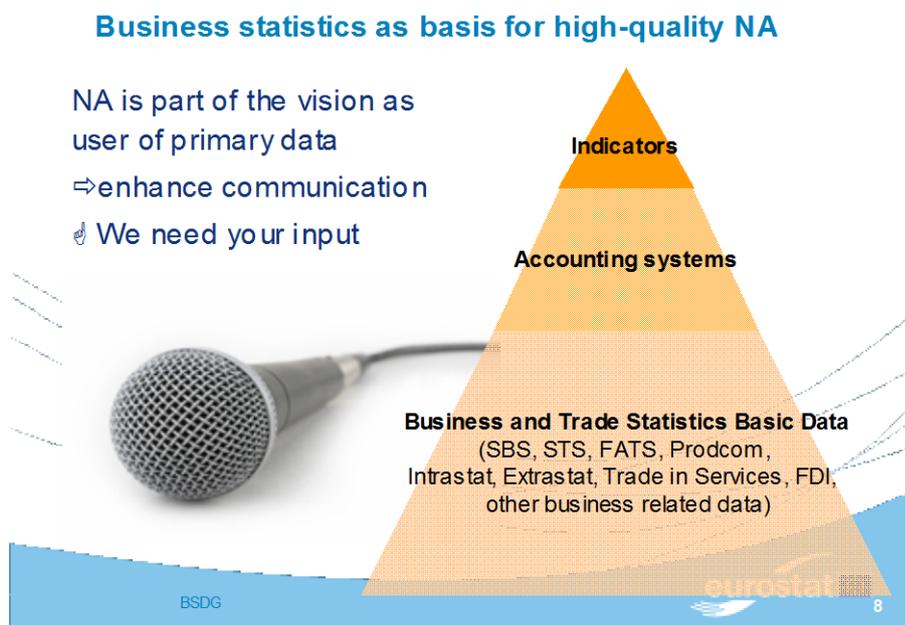
In practice, statistics on services will be enhanced both in STS (SPPI BtoAll, index of services production) and in SBS (extension to sections K, P, Q, R and S), in order to be used by NA.
Nevertheless, the removal of KAU-based series in SBS will perhaps improve the internal consistency (simplification) but not the conceptual alignment with NA…

Conceptually, the (European) Business Statistics Directors Group (BSDG) is not yet unanimous for fully adopting NA concepts:

Document 1: extract of BSDG minutes on FRIBS (June 2013)

FRIBS: Strategic progress overview of STS
A. Presentation
The BSDG was invited to comment on what the general direction of STS should be: whether STS should be seen as closer to National Accounts (given the purpose and the use made of STS) or closer to SBS (given that both describe the same universe, even though this is done by measuring mostly different phenomena in a different way). […]
B. Discussion
The delegates commented on the general direction for STS and generally saw STS closer to NA than to SBS. However, Eurostat also noted that a lot of the delegates preferred to maintain the "status quo". […]
C. Opinion(s)
1. Most of the delegations supported the view that STS should either maintain the "status quo" as regards the definition of the variables (currently aligned with the ESA) and the choice of the statistical unit (currently partly aligned with the ESA), or align even closer with the ESA.

1.4 Optimal consistency obtained by integration of macroeconomic indicators in NA concepts and conventions

Since 2006, the United Nations statistics division has been promoting an integration of economic statistics through National Accounts concepts.

Document 2: foreword of Paul CHEUNG, director of UNSD,
at the time of industry (IRIS) and trade (IRDTS) expert groups meetings (2007)

UNSD program on integrated economic statistics

I would like to say a few words on our approach to the compilation of economic statistics. We have responded to the demands of relevance and statistical consistency in revising the international recommendations on basic statistics such as industrial and distributive trade statistics and by integrating and broadening our program on economic statistics. Increasingly, the components of our ongoing and expanding statistical program are interrelated - the SNA, ISIC and CPC, tourism accounts and statistics, environmental-economic accounting. Moreover, we are taking further steps in promoting economic censuses, business registers, and use of administrative data in our present and future activities in economic statistics.

I would like to emphasize that the revision of these international recommendations should be seen as part of building an *integrated economic statistics programme*. This implies that the conceptual frameworks, data sources and compilation methods of industrial and distributive trade statistics should be harmonized to the extent possible in current revision with other areas of economic statistics, particularly the SNA. The benefits of such an integrated approach will increase policy relevance of economic statistics, improve the capability of

More recently (February 2012), the "Friends of the Chair on integrated economic statistics" have drafted "guidelines on integrated economic statistics". More explicitly than in Eurostat's documents, National Accounts are considered as the conceptual framework making integration desirable and possible, not only in theory (point a), but also in practice (point c, for instance the choice of the relevant and common statistical unit), as it is written page 19:

Document 3: extract of "guidelines on integrated economic statistics" (2012)

2.5   It should be recognized that one single and detailed implementation approach towards integrated economic statistics is neither possible nor desirable, because national statistical systems are different. There are, however, general guiding principles and good practices that are presented in these Guidelines. Integration requires a broad and comprehensive system-wide approach encompassing: (a) the adoption of the conceptual framework of the System of National Accounts as the umbrella framework for organizing economic statistics, (b) the alignment of the interdependencies of the components of the statistical production process and (c) the establishment of enabling institutional arrangements for statistical integration.

As example of a full "integration" of three indicators by the compilation of one from the two others, the UN "international recommendations for the index of industrial production" (2009) promotes the deflation technique in most cases, consistently with SNA 2008, which constitutes a "revolution" for this old index, which had always relied conceptually before on "quantities" of homogenous products.

Document 4: extract of "international recommendations for the IIP", part 1.5.3 (UNSD, 2009)

vii.   Topic: *Method to achieve volume estimates for the IIP*
Recommendation: In general, the deflation process with the use of an appropriate price index is recommended.

viii.   Topic: *Deflator to be used to achieve volume estimates from value data*
Recommendation: The Producer Price Index (PPI) is recommended as the price index to be used by countries when current price values are deflated to achieve volume measures of output for the IIP.

ix.   Topic: *Level at which to apply deflator*
Recommendation: It is recommended the deflator be applied to the value data at the lowest level possible but not higher than the ISIC class (4-digit) level in order to obtain a volume estimate for use in the compilation of the IIP. The detailed PPI used for deflation should be defined as closely as possible (in terms of scope, valuation and timing) to the respective product groups for which it is being used as a deflator.

Note that the importance of producer price indicators is augmented, that the 4-digit level is considered as the normal pivot between IIP and PPI (as it is in European classifications of activities and products) and that, for finer levels, the needs of IIP should enter into the requirements of PPI.
This should suggest a general methodology for upcoming European index of service production (ISP), in line with SPPI BtoAll, but STS package has never written such principles. On the opposite, the requirements on SPPI and ISP periodicity are different, making their integration problematic.

2 What National Accounts do on volume and price, and what they need for services price indicators

2.1 The preference of SNA 2008 for deflation

In its chapter 15 on price and volume measures, SNA 2008 affirms without ambiguity its preference for deflation (volume obtained by division of value by prices), for two reasons: one is economic, for the accounting of "quality" with "type of users" as part of the "quality (paragraph 15.103) and the other is statistic, for the correlation of prices between products of a same group (paragraph 15.104):

"*15.103 When independent, reliable and comprehensive data are available at current values it is generally not necessary to construct volume measures by aggregating quantity relatives. In most cases it is preferable and more practicable to use price indices to deflate current value data. Even for cases like electricity where the volume measure seems to be easily available, a direct volume measure is inappropriate because of the treatment of prices applying in different markets as explained in paragraphs 15.69 to 15.75. A change in the composition of the type of user leads to a change in the price and volume of electricity in the SNA even though the physical measure of electricity distributed may not have changed.*

15.104 As explained in section B, price information is easier to collect and aggregate than volume information because all prices are expressed in a common unit whereas volumes come in a multitude of units. Further, price relatives for a representative sample of goods and services can be used as typical for all goods and services in the same group in a way that volume measures would not be representative. More importantly, the volume changes associated with new and disappearing products can be properly reflected when current values are deflated by price indices as described in section B."

2.2 But more interest for analyses in volume terms

Per se, prices rely on expectations, at the moment of the order, which can precede the actual transaction. In volume terms, National Accounts try to track the changes of actual "technical coefficients" between inputs and outputs. These two logics can enter into conflict.

Let us take the true example of French PPI in CPA product "*20.11 - industrial gases*" for contracts "take or pay" in first months of 2009. At this time, because of the economic crisis, the supply of industrial gases was much higher than their demand, and their output prices were decreasing because of the obvious market conditions. Except for contracts "take or pay" related to industrial gases delivered through mains, negociated one year ago, where the "tariff" was independent of the actual quantities delivered as long as they were smaller than the monthly reference quantity recorded in the contract. A pure logic of "tariff" price indices, consistent with the past expectations, would have provided a flat price index, as the tariff had remained unchanged during the contract. But the volume index would have then been inconsistent with the actual quantities delivered (~ -25 %). After consultation of National Accountants, this logic of relevant "actual" volume index has prevailed, and the producer price index has been calculated on the base of the actual quantities delivered (then they were increasing, on the opposite of other products of the same class), rather on the ground of the "tariff" rule. If the tariff had included a fixed component and a variable component, it could have been another story.

Figure 4: dilemma in volume and price indices for industrial gases, in 2009

	value 2008	Ivol	volume 2009	Iprice	value 2009
industrial gases (through mains)	100	75? →	75 or 100?	100?	100

In spite of a whole chapter 15 of 28 pages on volume and price principles, price indices compilers cannot expect a detailed guidance on what a price means, except "15.11 - […] *The price of a good or service is defined as the value of one unit of that good or service. […]*".
What unit? One can guess from other paragraphs that this unit makes sense for the production function and/or the consumer utility, the notion of "Cost of Living Index" (COLI) is defined (not COGI), but it is not claimed as the ground of National Accounts aggregates.

A general guidance is provided about "price discrimination" and price variations not linked with change of quality:
"*15.74 - When there is price variation for the same quality of good or service, the price relatives used for index number calculation should be defined as the ratio of the weighted average price of that good or service in the two periods, the weights being the relative quantities sold at each price. […]. This must be recorded as a price and not a volume increase.*"
But, in case of doubt, it is said preferable to assume a variation of quality (par. 15.75).

The Eurostat's handbook on price and volume measures in National Accounts (2001) is more straightforward in linking quality with consumer's utility: "*For a producer, quality change of an input will be related to its use in the production process and the profit that can be made, and it might be possible to more or less objectively put a value to the change. For a consumer, however, the quality of a product is essentially linked to the utility he or she gets out of it.*"

2.3 What NA do on volume and price: SUT and IOT framework

The Supply and Use Tables (SUT) on one hand and the Input-Output Tables (IOT) on the other hand are very similar. The difference relies in the statistical unit (institutional sector x local kind of activity unit *vs.* homogenous production unit), in the timing (during *vs.* after synthesis of Gross Domestic Product) and in the use of the tables (synthesis *vs.* analysis).

Figure 5: SUT and IOT framework
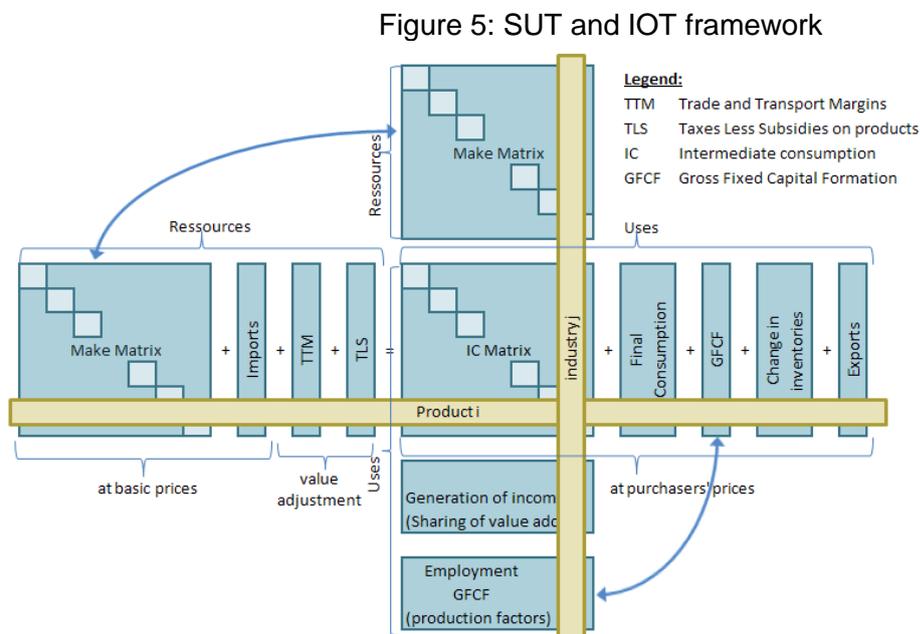
By row, the SUT can be read as the "commodity flow" of a product (or a balance of a product), with a detail of resources by origin on one side, and the detail of uses by "market" on the other side.
By column (LKAU or homogenous production unit = product), the SUT explicits and confronts Value Added by the production approach (production - intermediate consumption) and by the income approach (compensation of employees + taxes - subsidies on production + consumption of fixed capital + net operating surplus).

It is by row, in the "commodity flow" that value, volume and price are reconciled:

Figure 6: typical structure and method of balancing for a commodity flow of a good

	Val n-1	I. vol	Vol n	I. Price	Val n
SUPPLIES					
Output at basic prices by product	Hard data			PPI	Hard data
Imports of goods CIF from members of the euro area			Deflation	MPI	
Imports of goods CIF from non-members of the euro area	Hard data		Val n / I. Price	MPI	Hard data
Extra EU imports of goods CIF				MPI	
Imports of goods CIF			Subtotal		
Imports of services from members of the euro area				?	
Imports of services from non-members of the euro area	Hard data		Deflation	?	Hard data
Extra EU imports of services			Val n / I. Price?	?	
Imports of services			Subtotal		
Trade and transport margins					
taxes on imports	Good estimates		from uses side		Good estimates
other taxes - subsidies on products					
VAT	uses x rates n-1		uses x rates n-1		uses x rates n
Total supply at purchasers' prices			Total		
USES					
Intermediate Inputs Deductible	Soft data		Deflation	?	Soft data
Intermediate Inputs non deductible			Val n / I. Price	?	
Intermediate consumption			Subtotal		
Content of IC in domestic output at basic prices	Residual		Residual		Residual
Content of IC in imports of goods at cif prices	Proposal		Deflation	MPI?	Proposal
Content of IC in imports of services	Proposal?		Deflation	?	Proposal?
Content of IC in transport and trade margins	split of res.		Extrapolation		split of res.
Content of IC in taxes on imports	prop to imports		Extrapolation		prop to imports
Content of IC in other taxes - subsidies on products	split of res.		Extrapolation		split of res.
Content of IC in VAT	x rates n-1		x rates n-1		x rates n
Final consumption expenditure by households					
Individual consumption expenditure by general	Good estimates		Deflation	CPI	Good estimates
Collective consumption expenditure by general			Val n / I. Price		
Final consumption expenditure by NPISH					
Final consumption expenditure			Subtotal		
Content of final consumption in …	xxx		xxx		xxx
Gross fixed capital formation by non-financial enterprises			Deflation	?	
Gross fixed capital formation by financial enterprises	Soft data		Val n / I. Price	?	Soft data
Gross fixed capital formation			Subtotal		
Content of GFCF in…	xxx		xxx		xxx
Changes in inventories at producers				?	
Changes in inventories at traders	Soft Data			?	Soft Data
Changes in inventories at users				?	
Changes in inventories			Subtotal		
Content of changes in inventories in…	xxx		xxx		xxx
Exports of goods FOB from members of the euro area				XPI	
Exports of goods FOB from non-members of the euro	Hard data			XPI	Hard data
Extra EU Exports of goods FOB				XPI	
Exports of goods FOB			Subtotal		
Content of exports of goods in…	xxx		xxx	PPI for. mark. ?	xxx
Exports of services from members of the euro area				?	
Exports of services from non-members of the euro area	Hard data			?	Hard data
Extra EU exports of services				?	
Exports of services			Subtotal		
Content of exports of services in…	xxx		xxx		xxx
Total use at purchasers' prices			Total		

Consumer Price Index (CPI) is the main price indicator, the most significant for GDP expenditures approach, and it is very delicate not to respect it totally (anyway, it is possible for some products like FISIM, insurances, gambling, non-market services…).

PPI and XMPI are taken into account in first draft, but the constraints of balancing (first in value, then in volume) can lead to modify them. If IIP is obtained by deflation, NA will always prefer to work with value and price indicators rather than with a "second hand" IIP (or ISP).

Note that there can be conflict of concepts and uses between XPI and PPI for foreign markets according to NA:

Figure 7: differences between XPI and PPI for foreign markets
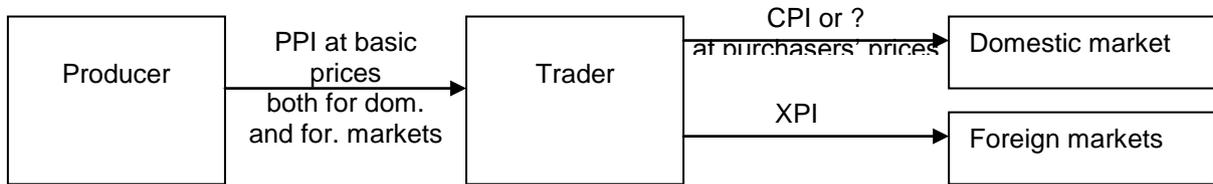
After the balancing of commodity flow (expenditures approach), it is the time of production approach.

The Make Matrix is deflated by row (by products), by the price index of production in the commodity flow. Hence, the compilation of SPPI "by industries" is not necessary, as the Make Matrix and the link between industries and products is finely managed by NA, after balancing (or SPPI should be directly compiled "matricially" industry x product).

The volume index by "industry" of the output is then used in order to extrapolate the Intermediate Consumption (IC) Matrix of previous year (sometimes with distinction between IC DED and IC NDED institutional sectors, *i.e.* with exclusion or inclusion of VAT rates), which is afterward "inflated" by the price index of intermediate consumption in the commodity flow (with same possible distinction between IC DED and IC NDED).

Figure 8: general scheme of the production approach
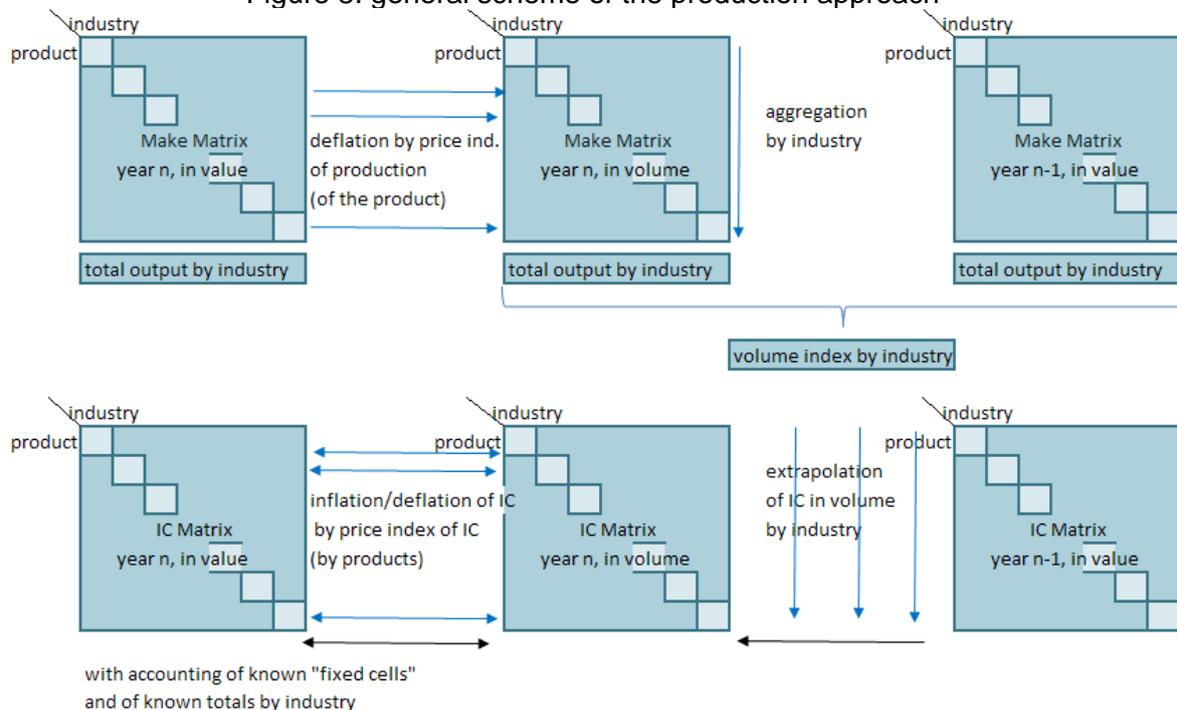
Value Added in volume of an industry is then obtained by "double deflation": in subtracting this IC in volume obtained partly by deflation (and partly by extrapolation in volume) from the production in volume.

2.4 Focus on output and Make Matrix, return to statistical units

Structural Business Surveys are the source of the Make Matrix. They can be combined with administrative data in order to constitute the Structural Business Statistics that will feed also the production and generation of income accounts. Another interesting result of the SBS survey, especially for services, is the detail of sales by "market" ("BtoB", "BtoC", "BtoE"…).

The output that NA describe in the "Make Matrix" derives from sales by products, after a lot of conceptual and methodological treatments. It is the reason why <u>NA will always prefer to work with PPI by products that they will compile by industries, rather with "second hand" PPI by industries</u>.

The delicate issue is how "enterprises" funding SBS statistics can provide so many data according to a dimension "products" and another one "industries", supposed to rely on "establishments" (= local kind of activity units) in SNA 2008:
"*5.2: […] Thus, for analyses of production in which the technology of production plays an important role, it is necessary to work with groups of producers that are engaged in essentially the same kind of production.*
This requirement means that some institutional units must be partitioned into smaller and more homogeneous units, which the SNA defines as establishments. An establishment is an enterprise, or part of an enterprise, that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. Further, the SNA defines industries in terms of establishments. An industry consists of a group of establishments engaged in the same, or similar, kinds of activity. In the SNA, production accounts and generation of income accounts are compiled for industries as well as sectors."

as well as in European System of Accounts (ESA) 2010:
"*2.150 - Definition: an industry consists of a group of local KAUs engaged in the same, or similar, kind-of-activity. At the most detailed level of classification, an industry consists of all the local KAUs falling within a single class (four digits) of NACE Rev. 2 and which are therefore engaged in the same activity as defined in the NACE Rev. 2. […]*"

Figure 9: From Structural Business Statistics to Make Matrix
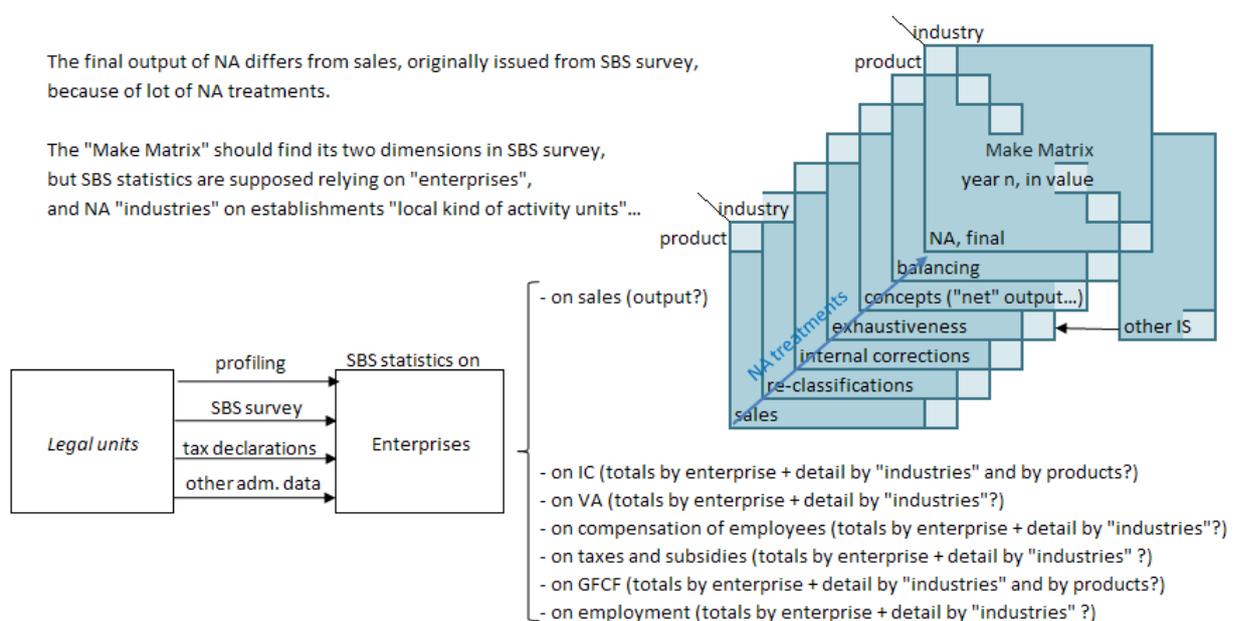
2.5 What NA do and should do for services price indicators

The current lack of price indicators for services makes national accountants take CPI for common price index of all resources and uses for a given product:

Figure 10: usual commodity flow of "services" product, with CPI as lone price indicator

	Val n-1	I. vol	Vol n	I. Price	Val n
SUPPLIES					
Output at basic prices by product	Hard data			CPI	Hard data
Imports of goods CIF from members of the euro area			Deflation	adj. VAT rates	
Imports of goods CIF from non-members of the euro area	Hard data		Val n / I. Price	CPI	Hard data
Extra EU imports of goods CIF				adj. VAT rates	
Imports of goods CIF			**Subtotal**		
Imports of services from members of the euro area				CPI	
Imports of services from non-members of the euro area	Hard data		Deflation	CPI	Hard data
Extra EU imports of services			Val n / I. Price?	adj. VAT rates	
Imports of services			**Subtotal**		
Trade and transport margins					
taxes on imports	Good estimates		from uses side		Good estimates
other taxes - subsidies on products					
VAT	uses x rates n-1		uses x rates n-1		uses x rates n
Total supply at purchasers' prices			**Total**		
USES					
Intermediate Inputs Deductible			Deflation	adj. VAT rates	
Intermediate Inputs non deductible	Soft data		Val n / I. Price	CPI	Soft data
Intermediate consumption			**Subtotal**		
Content of IC in domestic output at basic prices	Residual		Residual		Residual
Content of IC in imports of goods at cif prices	Proposal		Deflation	CPI	Proposal
Content of IC in imports of services	Proposal?		Deflation	adj. VAT rates	Proposal?
Content of IC in transport and trade margins	split of res.		Extrapolation		split of res.
Content of IC in taxes on imports	prop to imports		Extrapolation		prop to imports
Content of IC in other taxes - subsidies on products	split of res.		Extrapolation		split of res.
Content of IC in VAT	x rates n-1		x rates n-1		x rates n
Final consumption expenditure by households					
Individual consumption expenditure by general			Deflation	CPI	
Collective consumption expenditure by general	Good estimates		Val n / I. Price		Good estimates
Final consumption expenditure by NPISH					
Final consumption expenditure			**Subtotal**		
Content of final consumption in ...	xxx		xxx		xxx
Gross fixed capital formation by non-financial enterprises			Deflation	adj. VAT rates	
Gross fixed capital formation by financial enterprises	Soft data		Val n / I. Price	CPI	Soft data
Gross fixed capital formation			**Subtotal**		
Content of GFCF in...	xxx		xxx		xxx
Changes in inventories at producers				CPI	
Changes in inventories at traders	Soft Data			adj. VAT rates	Soft Data
Changes in inventories at users				CPI	
Changes in inventories			**Subtotal**		
Content of changes in inventories in...	xxx		xxx		xxx
Exports of goods FOB from members of the euro area				CPI	
Exports of goods FOB from non-members of the euro	Hard data			adj. VAT rates	Hard data
Extra EU Exports of goods FOB				CPI	
Exports of goods FOB			**Subtotal**		
Content of exports of goods in...	xxx		xxx		xxx
Exports of services from members of the euro area				CPI	
Exports of services from non-members of the euro area	Hard data			adj. VAT rates	Hard data
Extra EU exports of services				CPI	
Exports of services			**Subtotal**		
Content of exports of services in...	xxx		xxx		xxx
Total use at purchasers' prices			**Total**		

Note that CPI is sometimes to adjust on (change of) VAT rates, for resources or uses that deduct VAT.

The simplicity of this kind of commodity flow suggests same technique with "SPPI BtoB" in the case of services without private final consumption. It is certainly the implicit motivation for original European STS regulation, with a curious list of miscellaneous products/activities.

But for "mix" services, quite numerous, National Accountants would appreciate a framework more similar to goods, with a price indicator for output ("SPPI BtoAll"), another for IC or GFCF ("SPPI BtoB"), a CPI or "SPPI BtoC" for final consumption, and "SPPI BtoE" for exports. They would also appreciate a price indicator for imports ("MPI").

Figure 10: adaptation to a commodity flow of "services" product

	Val n-1	I. vol	Vol n	I. Price	Val n	
SUPPLIES						
Output at basic prices by product	Hard data			SPPI BtoAll	Hard data	
Imports of goods CIF from members of the euro area			Deflation	MPI		MPI for books,
Imports of goods CIF from non-members of the euro area	Hard data		Val n / I. Price	MPI	Hard data	paintings… ?
Extra EU imports of goods CIF				MPI		
Imports of goods CIF			Subtotal			
Imports of services from members of the euro area				MPI?		"true" MPI
Imports of services from non-members of the euro area	Hard data		Deflation	?	Hard data	of services
Extra EU imports of services			Val n / I. Price?	?		are not requested
Imports of services			Subtotal			
Trade and transport margins						
taxes on imports	Good estimates		from uses side		Good estimates	
other taxes - subsidies on products						
VAT	uses x rates n-1		uses x rates n-1		uses x rates n	
Total supply at purchasers' prices			Total			
USES						
Intermediate Inputs Deductible	Soft data		Deflation	SPPI BtoB	Soft data	
Intermediate Inputs non deductible			Val n / I. Price	adj. VAT rates		
Intermediate consumption			Subtotal			
Content of IC in domestic output at basic prices	Residual		Residual		Residual	
Content of IC in imports of goods at cif prices	Proposal		Deflation	MPI?	Proposal	
Content of IC in imports of services	Proposal?		Deflation	?	Proposal?	
Content of IC in transport and trade margins	split of res.		Extrapolation		split of res.	
Content of IC in taxes on imports	prop to imports		Extrapolation		prop to imports	
Content of IC in other taxes - subsidies on products	split of res.		Extrapolation		split of res.	
Content of IC in VAT	x rates n-1		x rates n-1		x rates n	
Final consumption expenditure by households						
Individual consumption expenditure by general			Deflation	CPI		
Collective consumption expenditure by general	Good estimates		Val n / I. Price	(≈SPPI BtoC)	Good estimates	
Final consumption expenditure by NPISH						
Final consumption expenditure			Subtotal			
Content of final consumption in …	xxx		xxx		xxx	
Gross fixed capital formation by non-financial enterprises			Deflation	SPPI BtoB?		
Gross fixed capital formation by financial enterprises	Soft data		Val n / I. Price	?	Soft data	
Gross fixed capital formation			Subtotal			
Content of GFCF in…	xxx		xxx		xxx	
Changes in inventories at producers				?		
Changes in inventories at traders	Soft Data			?	Soft Data	
Changes in inventories at users				?		
Changes in inventories			Subtotal			
Content of changes in inventories in…	xxx		xxx		xxx	
Exports of goods FOB from members of the euro area				XPI		XPI for books,
Exports of goods FOB from non-members of the euro	Hard data			XPI	Hard data	paintings… ?
Extra EU Exports of goods FOB				XPI		
Exports of goods FOB			Subtotal			
Content of exports of goods in…	xxx		xxx		xxx	
Exports of services from members of the euro area				SPPI BtoE		
Exports of services from non-members of the euro area	Hard data			SPPI BtoE	Hard data	
Extra EU exports of services				SPPI BtoE		
Exports of services			Subtotal			
Content of exports of services in…	xxx		xxx		xxx	
Total use at purchasers' prices			Total			

When balancing, if SPPI BtoB and so on are better known as SPPI BtoAll index (relying on some assumptions for the weights by uses/"markets"), NA would certainly solve on production the commodity flow in volume. On the other hand, a direct output price indicator SPPI BtoAll is more comfortable to handle.

Note that commodity flows of "services" activities can include some "goods", like books or paintings, and that their XMPI are not ruled by the European STS regulation (XMPI or more exactly PPI for foreign markets and imports price indices are only mentioned in annex A - industry), which means that UVI are usually the only indicators for these resources and uses, or NSI are able to coordinate across borders of classifications and regulations.

2.6 Some peculiarities of National Accounts concepts and conventions; consequences on SPPI concepts and definitions?

"SPPI BtoB" (or "corporate price indices") have been invented in order to complete Consumer Price Indices, close to "BtoC" concept, but it is not exactly what National Accountants would expect.

In NA taxinomy, what is expected is an output price index, an IC price index, a private final consumption price index (CPI suits normally this definition), a possible GFCF price index and an export price index.

Note that, at the commodity flow stage, the institutional sectors of producers are usually no longer distinguished. Hence, if SPPI are restricted to "business" producers, they will anyway be used for "total economy" producers. NA would expect "SPPI AlltoAll" at basic prices…
but also "IC price index" including all kinds of producers <u>and</u> imports and perhaps some taxes or subsidies *i.e.* at purchasers' prices, "GFCF price index" including all kinds of producers <u>and</u> imports and perhaps some taxes or subsidies at purchasers' prices, and "exports price index" that in the case of services should be equivalent to "SPPI BtoB" at basic prices.

"Pure" households (*i.e.*, which are not "enterprises") can be economic producers in some cases, especially for rental of dwellings (even out of the case of owners-occupiers). Because of this situation, NA would prefer "SPPI BtoB" in product "68.3 - *Real estate services on a fee or contract basis*" including IC by households linked to the rental of dwellings (as landlords), similarly as in products "69.10.16 - *notarial services*" and "71.11 - *architectural services*" including GFCF by households, linked to the acquisition of dwellings. Another solution, less simple for NA, is to provide specific "SPPI BtoC" complementary to CPI for these cases.

The cif-fob adjustment is specific to National Accounts (*vs.* genuine "business statistics"), even to each particular system of national accounts, as it leads to modify some "business statistics" in order to describe imports and exports of goods and services without omission neither double account. In SNA 2008, each commodity flow of goods includes imports at cif prices, but total imports of goods are globally described fob. The most important is that each commodity flow of goods is described cif. Hence, a domestic production of international inward freight transportation must be recorded in exports of transport services, whatever the country of residence of who has paid the transport, as this value is already included in the cif value of goods, imputed to the rest of the World. Same reasoning for domestic production of international outward freight transportation, as exports of goods must be recorded fob, *i.e.* without the international freight transportation part. For both senses, international freight transportation must be recorded in exports of transports services ("SPPI BtoE") according to NA concepts (business statistics would have followed the country of residence of who pays for the transport).

Accommodation and "touristic" services present also some NA peculiarities. If an accommodation service is consumed (on the economic territory) by a non-resident household, it is recorded in private final consumption, and it is only globally, by a specific "territorial correction" commodity flow, that the private final consumption on the economic territory is adjusted to the private final consumption of the residents, with imports of "tourism services" (private final consumption of residents abroad) and exports of "tourism services" (private final consumption of non-residents on the economic territory). But if the accommodation service is provided to a non-resident enterprise (a business traveller), it should be recorded in exports, not in IC. Conversely, the intermediate consumption of resident enterprises in foreign hotels should be recorded in imports. SPPI should take into account this phenomenon, although Eurostat recommends to use CPI as a good proxy.

2.7 Practical consequences when National Accounts are considered as main conceptual framework and user

The classification of products, even their identification (profiling, interpretation of ancillary units) and the step where the prices are measured should be aligned with NA.

The country of residence (or of economic interest) of the customer is not the only border between "BtoB" or "BtoC" and "BtoE":
- all international freight transportation should be put into SPPI BtoE;
- sales to non-resident pure households on the economic territory should remain in private final consumption ("BtoC");
- sales to non-resident enterprises on the economic territory should be classified in exports ("BtoE");
- sales to non-residents (households or enterprises) outside the economic territory should be classified in exports ("BtoE").

NA should become the source of weights, which differ from business statistics not only because of some NA treatments (for instance hidden economy, or "net" concept of output vs. "gross" concept of sales) but because of their completeness vis-à-vis the scattered parts of activities and products covered by STS regulations. A supplementary question is to interpret these weights as representative of the "total economy" (S1) or only to the "enterprises" (S11 + S12 + S14 - pure households), noting the fact that in any case NA will use these price indicators for all kinds of market producers.

SPPI BtoB could include some IC and GFCF of pure households when they are renting dwellings to other people.

SPPI should aim to be consistent with complete treatments of definitive annual national accounts, as no further price indicator will be available afterward. But it should also aim a timing consistent with a use by quarterly national accounts, *i.e.* they should be available at T+60 (first estimates with aggregates and possible use of a SUT, which is not the case at T+45 for "flash estimates").

2.8 Metaphysical interrogation on integrated volume indicators: more relevant, but less useful?

Indirect volume indicators obtained by deflation are undoubtedly more relevant for NA. But are they still useful for NA? NA should prefer the use of direct indicators on value and prices, as well as prices defined by products rather than by industries / enterprises.
These volume indicators could anyway be useful for analytical purpose, at a finer level than in NA, and in a STS perspective, complete and consistent (but perhaps quickly out of date).

3 International trade of services price indicators: the new frontier of SPPI

Note that, restricted to Intermediate Consumption, SPPI BtoB do not contribute directly to the sharing of GDP as a whole into volume and price (GDP is the sum of the final uses less imports in the expenditures approach), but only to the breakdown of GDP in volume into VA by industries in volume.

Some SPPI BtoB include by the way some GFCF, or are used more or less adequately to other (final) uses.

But the SPPI BtoE contribute directly to the estimation of GDP in volume, and the perpetual movement of globalization should increase the importance of such indicators. Hence, they should receive more and more attention by international organizations and stakeholders.

3.1 The GATS and the four modes of international trade of services

The first General Agreement on Tariffs and Trade (GATT) was negociated in Geneva and signed in 1947, between 23 countries. It concerned only (customs) tariffs on goods. After several rounds (Annecy, Torquay, Geneva II, Dillon, Kennedy, Tokyo) and an increasing number of countries involved (141 for the Doha round), the Uruguay round led to the creation of the World Trade Organization in 1995, where the GATT revised 1994 was joined by the General Agreement on Trade in Services (GATS), and by an agreement on intellectual property.
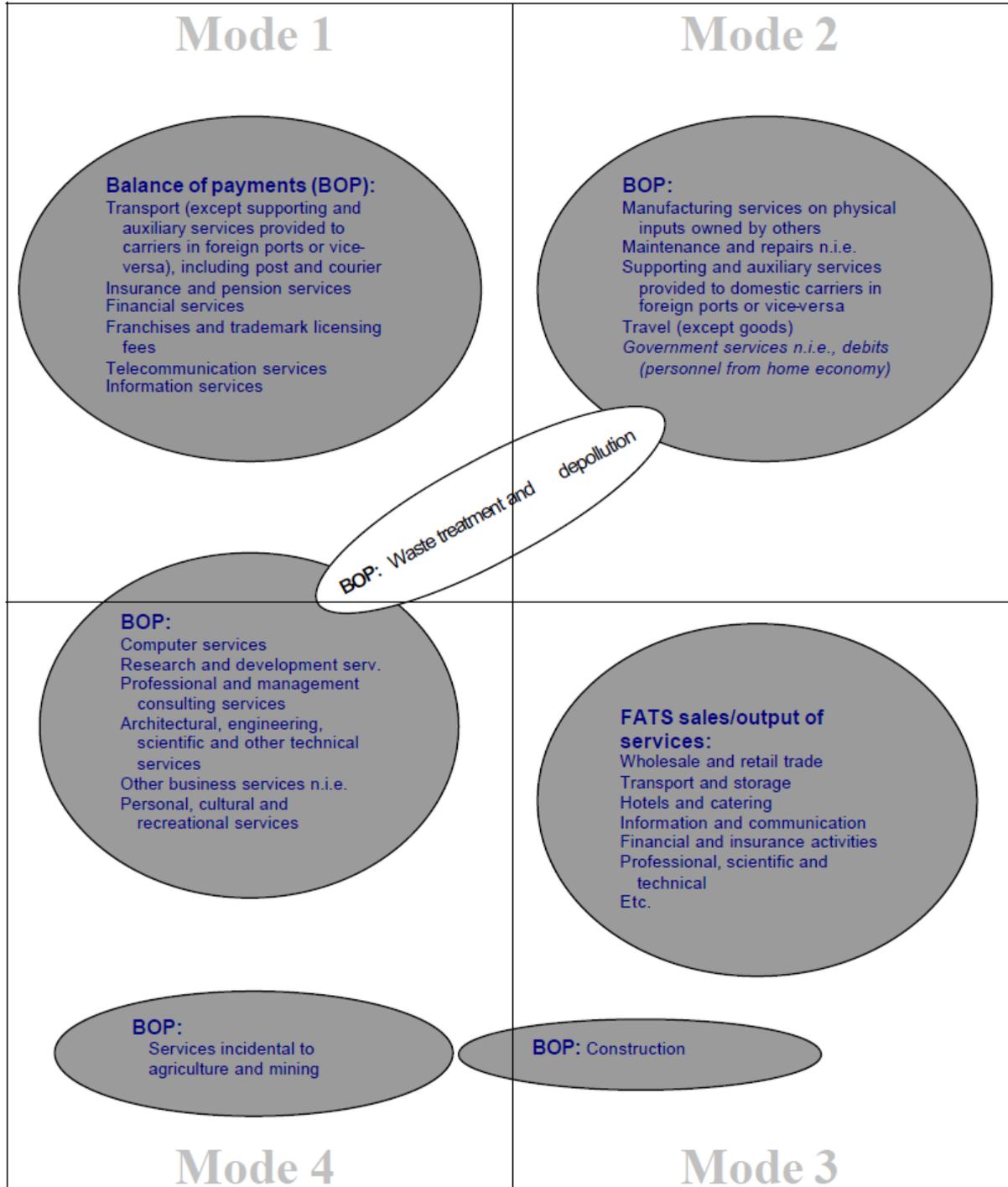
Typically, the GATS agreement describes and rules four modes of supply for the delivery of services in cross-border trade:

Table 1: the four modes of ITS according to GATS

Mode	Supplier presence	Criteria	Treatment in NA / BoP
Mode 1: Cross-border supply	Service supplier not present within the territory of the consumer	Service delivered within the territory of the consumer, from the territory of another country (of the supplier)	imports / exports
Mode 2: Consumption abroad		Service delivered outside the territory of the consumer, in the territory of another country (of the supplier)	Households: FC / tourism Others: imports / exports
Mode 3: Commercial presence	Service supplier present within the territory of the consumer	Service delivered within the territory of the consumer, through the commercial presence of the supplier	FATS revenue of property
Mode 4: Presence of a natural person		Service delivered within the territory of the consumer, with supplier present as a natural person	imports / exports

The compilers of statistics for international trade in services have attempted to describe which mode concerns which activities:

Figure 11: mode of supply and activities, in TFSITS newsletter n° 4, December 2008

Mode 1

Balance of payments (BOP):
Transport (except supporting and
   auxiliary services provided to
   carriers in foreign ports or vice-
   versa), including post and courier
Insurance and pension services
Financial services
Franchises and trademark licensing
   fees
Telecommunication services
Information services

Mode 2

BOP:
Manufacturing services on physical
   inputs owned by others
Maintenance and repairs n.i.e.
Supporting and auxiliary services
   provided to domestic carriers in
   foreign ports or vice-versa
Travel (except goods)
*Government services n.i.e., debits
   (personnel from home economy)*

BOP: *Waste treatment and depollution*

BOP:
Computer services
Research and development serv.
Professional and management
   consulting services
Architectural, engineering,
   scientific and other technical
   services
Other business services n.i.e.
Personal, cultural and
   recreational services

**FATS sales/output of
services:**
Wholesale and retail trade
Transport and storage
Hotels and catering
Information and communication
Financial and insurance activities
Professional, scientific and
   technical
Etc.

BOP:
Services incidental to
agriculture and mining

BOP: Construction

Mode 4

Mode 3

3.2 The expectation of prices indices for external trade in services, from many stakeholders and international manuals

SNA 2008 dedicates one page to export and import volume and price. The first paragraph on this topic is quite mysterious:
"*15.160: Exports and imports consist of both goods and services. For both exports and imports, goods and services are expressed in volume terms using quite different deflators because of the very different sources available for goods and services. New initiatives are under way to improve price indices for external trade in services that should lead to improved data in this area.*"

In its presentation on "*National accounts & measurement of constant price output of the service sector*" for the 23rd Voorburg Group meeting in Aguascalientes in 2008, Matt BERGER had reported the <u>lack of SPPI's for international trade in services</u> (slide 22) felt by national accountants.

Published in 2009, the Balance of Payments Manual 6th version (BPM6) includes a very short section on "*Price and volume data*":
"*10.12: Goods and services have price and volume dimensions, so it is useful for analysis and data validation to have volume and price data, as well as current price values.*"

Published in 2009 too, the IMF manual on Exports and Imports Prices (XMPI) is supposed to provide guidance for prices in exported and imported services, as well as for exported and imported goods:

"*Introduction, 1.0: A price index is a summary measure of the proportionate, or percentage, changes in a set of prices over time. Export and Import Price Indices (XMPIs) measure the overall change <u>in the prices of transactions</u> in goods <u>and services</u> between the residents of an economic territory and residents of the rest of the world. The prices of different goods and services all do not change at the same rate. [...]*"

In chapter 3, the theoretical principle of the inclusion of services is repeated:

"*3.23: This current XMPI Manual also incorporates approaches to the measurement of <u>prices of exports and imports for services</u>.*"

It is interesting to notice that in the draft version, put on an electronic forum in 2008, the same paragraph was supposed to be completed by a contribution of the Voorburg Group, or to announce a specific work of the Voorburg Group:

"*The current XMPI manual also incorporates approaches to the measurement of prices of services exports and imports. <u>[and, as such, has benefited from review by the International Working Group on Service Sector Statistics (the Voorburg Group). To be done.]</u>*"

In chapter 11 ("*Treatment of Specific Products and Issues*"), section H is dedicated to services (2 pages on 13), with an explicit contribution of the US BLS on freight or passenger transportation services. Travel and tourism are briefly described (although not exactly according to the NA point of view). Education is mentioned for future research.

The Manual on Statistics of International Trade in Services (MSITS) was updated in 2010. At a time (workshop in Kiev, October 2008), it was planned to introduce in MSITS 2010 a specific annex on service export and import prices. This idea was given up, but we can read:
"*5.5. At a disaggregated level, it would be desirable to have <u>information on flows by mode of supply and partner</u>. This would allow analyses of the origin of the service or service supplier, and its territorial presence at the moment of the transaction. Ideally, statistics on the international supply of services should, therefore, be available by country of origin and destination, allowing identification of principal suppliers and consumers. A link between trade and output data, whether by activity or product, would enable a more complete and improved analysis of the international supply of services. <u>Data at volume level would allow complementary analysis for constant price considerations</u> in various statistical frameworks.*"

3.3 The stronger difficulties of import prices for services

Although National Accounts and XMPI manual authors would appreciate a simultaneous development of export and import price indices, the compilation of the first category is quite easy, while the second one is more difficult:
- the selection of service producers, in order to get domestic S-PPI, includes naturally the service producers that export some of their output (for goods, a distinction should be operated between direct exporters and traders exporting domestic output, so that industrial PPI of the non-domestic market is not exactly a XPI, but for services this distinction should have no sense or less sense). The only point is no longer to exclude them or this kind of transactions (for the countries that excluded them), or to identify and record them apart (for the countries that would already include them in "SPPI BtoB");
- the selection of service importers has no natural administrative database, or not very detailed. The customs can provide detailed data (by goods) for what is called "services" in the Balance of Payments but belongs in fact to manufacturing industries: manufacturing services on inputs owned by others (goods for processing) and maintenance and repairs (only maintenance and repair of computers and some other goods belongs to services industries). The Balance of Payments own database is rarely much detailed by products, and is less comprehensive (only the most important importers and exporters are obliged to declare), but it must depend on the countries: those who want to implement the Extended Balance of Payments Services classification (EBOPS) 2010 or even the EBOPS 2002 list have maybe transformed their information system.

3.4 The European "trade package" for a better consistency of all macroeconomic indicators related to international trade of services

As for Structural Business Statistics (SBS) and Short Term Statistics (STS), Eurostat has defined a "trade package" that should improve the consistency of all indicators linked with International Trade of Services:
- in short term, Eurostat would like to link micro data of Business register with ITS database, in order to get trade in services by enterprise characteristics;
- in long term, Eurostat would like international trade in services as primary statistics on the basis of CPA.

To give a practical case, Insee has recently compiled a SPPI BtoE (export price) index for CPA "*6391 - News agency services*", but… the corresponding value does not exist in French NA, as it has certainly been misclassified with "leasing of intellectual property" or something else. It is difficult to know, as neither NA neither SPPI unit are used to exchange micro data with Balance of Payments service ; it should become as usual as for customs statistics, for consistent commodity flows in NA and proper SPPI BtoAll relying on NA weights.