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Industry vs. product

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1. INTRODUCTION

The international harmonization of statistical methods is unavoidable to be able to compare indicators of different countries. This statement is especially true concerning the most important macroeconomic indicators (e.g. turnover, price indices and volume indices).

To produce internationally comparable data, first of all it is necessary using of harmonised classification systems. Furthermore, it is important to clarify what is considered as observation unit, that is, what type of elements – industry vs. product – includes the relevant aggregation that you want to compare.

Currently, for the member states of European Union the issue on "industry vs. product" is particularly timely, because – according to the laws in force – in service statistics the enterprise[1] is considered as observation unit. However, regarding the European plans for the future – based on the Framework Regulation for the Integration of Business Statistics (FRIBS) concerning short term statistics (STS), the Kind of Activity Unit (KAU)[2] is proposed as the new observation (statistical) unit.

The fundamental difference between the enterprise and KAU is that an enterprise beside the main (primary) activity may offer secondary activities as well, while in case of a KAU the role of secondary activities is marginal. Therefore the aggregates at enterprise-level could be considered as industry-based, while at the KAU-level as product-based data.

In practice, in most of European countries including Hungary, currently the turnover data are industry-based however services producer price indices (SPPIs) are basically product-based data. Therefore, concerning the volume indicators, the consistency between output/turnover data and deflators must be ensured.

The overall objective of this paper is to summarize the Hungarian experience concerning the IT industry and four pilot projects on development of SPPIs as deflators.

2. STANDARD CLASSIFICATION STRUCTURE

Hungary – as a member of the European Union (EU) – for System of National accounts (SNA), and for STS and SBS statistics including producer price observation system

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[1] Enterprise : The enterprise is the smallest combination of legal units that is an organizational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit (by the Working group on Business Registers and Statistical Units).

[2] Kind of Activity Units (KAU) : The kind of activity unit (KAU) groups all the parts of an enterprise contributing to the performance of an activity at class level (four digits) of NACE Rev. 2 and corresponds to one or more operational subdivisions of the enterprise. The enterprise's information system must be capable of indicating or calculating for each KAU at least the value of production, intermediate consumption, manpower costs, the operating surplus and employment and gross fixed capital formation (by the Working group on Business Registers and Statistical Units)

concerning industrial products and services, applies harmonized national versions of the following main economic classification systems:

 - **NACE Rev 2 / TEÁOR'08** (the statistical classification of economic activities in the European Communities / in Hungary).
 - **CPA'08 / TESZOR'08** (the European/ Hungarian Classification of Products by Activity).

The structure of the above mentioned classifications is the following:

CPA 2008 is fully harmonized with NACE Rev.2. Namely, from the 6 digits (XXXX.YY) the first four are the same as those for the NACE Rev. 2. The hierarchical structure of the CPA ensures to aggregate relatively homogenous services groups from the lowest level of the CPA.

3. TURNOVER DATA

In Hungary, the main sources of SBS and STS statistics, as well as of data required for other purposes, are **statistical surveys** and using of the **administrative data** (mainly tax and VAT data).

As observations unit the **enterprise** is considered.

The turnover data – taking into account the structure of the total turnover – are available as follows:

Industry-based data:

 - **Yearly** structural business statistics (SBS);
 - **Quarterly** short term statistics (STS).

The Hungarian STS and SBS aggregates are based on the data received from enterprises, taking into account the **industry-based** approach. The administrative sources of data are also industry-based. Due to this fact, the **structure of the total turnover** (B-All) could be characterized as follows: m**ain (primary) activity** and **secondary activities** (in most of areas, aggregates are available based on data of enterprises with more than 19 employees).

Product-based data:

 - **Monthly** industry-specified statistics, including quantitative data.
 - **Limited coverage** of product-based data (e.g. retail trade, transportation, postal services, accommodation and food services, telecommunication, IT services).

4. SERVICES PRODUCER PRICE INDICES, SPPIs

In Hungary, the publication of services producer price indices required by the European STS-regulation started in 2010 with the product-based, B-B indices, followed by dissemination of B-All indices in 2013. The main parameters of available SPPIs are listed below.

SPPI's time series are available for 2007Q1- (with various base periods), published since 2010.

Industry-based data:

- **The methodology is under development,** experimental calculations are carried out.

Product-based data:

- **B-B are available** according to the current European STS regulation (time series are available for 2007Q1-), published since 2010;
- **B-All are available** to fulfil the needs of data users, for example SNA or Eurostat – (time series are actually available for 2012Q1-), published since 2013.

5. HUNGARIAN EXPERIENCE, CURRENT DEVELOPMENTS

In Hungary the main areas of the future improvements regarding the turnover/output indicators, SPPIs and the volume indices are as follows:

Hungary has started to introduce the services producer price indices to the SNA recently. The methodology concerning the all relevant aspects is under continuous development. Otherwise Hungary have participated at the ISP Task Force (Index of Services Production TF) and at a pilot project (co-financing by the European Union, Grant 2013) for development of a methodological basis for new service producer price indices (SPPI) and deflators for value data.

5.1. ISP Task Force (NACE Rev. 2: J62 and J63)

Hungary has undertaken the preparation of the drafts for the next industries:

- Computer programming, consultancy (NACE Rev.2: **J62**);
- Information service activities (NACE Rev.2: **J63**);

Methodological considerations

The issue on industry vs. product could be summarised as follows:

Ideally the ISP index should be an industry-based indicator, so it should reflect the change of volume of services provided by enterprises or KAU's classified to these divisions. Taking into account type of the observation unit or homogeneity of the total turnover by products (main/primary activity, secondary activities), you may want to consider the following alternatives for calculation of an ISP:

- The total **output/turnover is basically homogeneous**, i.e. for the total industry output an appropriate **product-based SPPI** produced for the main/primary activity could be used as deflator.

- The total **output includes significant share of secondary activities** (SA, services other than the main activity). For the total industry output an **industry-based deflator** could be used (product-based SPPI produced for the main activity combined with useable deflators for relevant secondary activities – as an weighted average applying appropriate turnover share of elements).

Description of calculation of an experimental ISP indicator

The calculation of an ISP (TOVV) is based on the index of turnover at current prices (TOVT) and on SPPI (PRON: B2All), 2010=100 (Source: Database, Eurostat).

Generally, an experimental ISP for J62 could be calculated as follows:

$$ISP = Index\ of\ Turnover\ /\ Deflator$$

Concerning the European indicators, the formula could be expressed more accurately:

$$TOVV = TOVT\ /\ PRON$$

For experimental calculation seasonally adjusted (SA) indices of turnover and unadjusted SPPI data were used.

5.1.1. Computer programming, consultancy and related activities (J62)

In Hungary – based on the SBS data – the turnover share of the main/primary activity (MA, J62) from the total value was about 85% in 2010. The secondary activities with the turnover share above 1% were classified to the divisions NACE Rev 2. G46, G47, J58, J63, N69 and N78, from which only proportions of two sectors were between 2% and 5% (G46, G47) (based on SBS data with more than 19 employees, with the turnover share about 50%). For this case a product-based $SPPI_{62}$ could be used as deflator.

The total output is basically homogeneous

Figure 1: Index of turnover at current prices and experimental ISP(I) for J62, Hungary (2010=100)
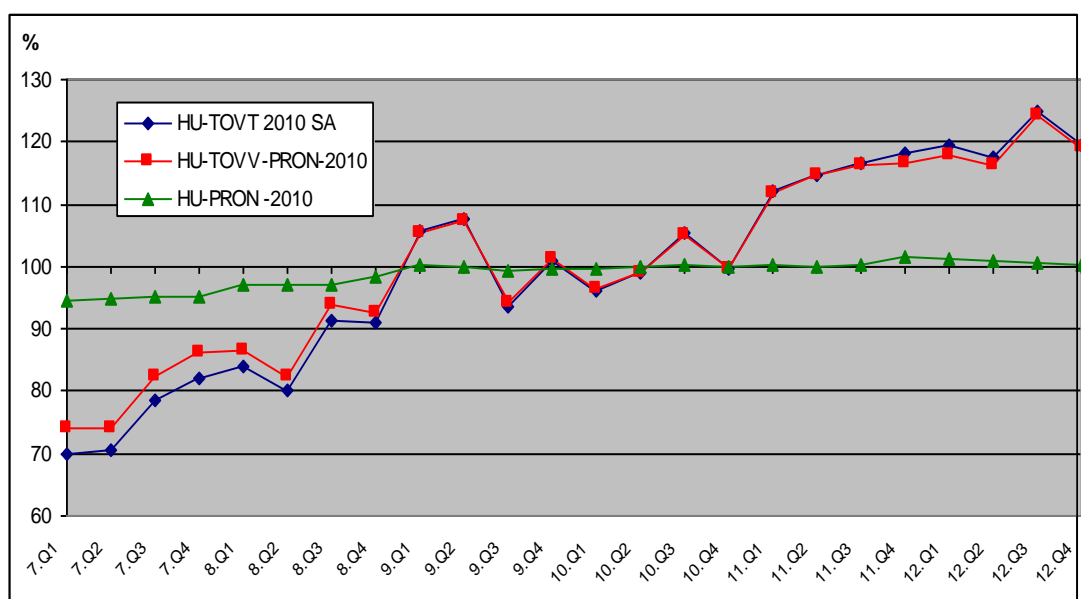
Hungarian experimental ISPs are slightly larger, than the indices at current prices at the beginning of the observation period.

The total output includes significant share of secondary activities

The deflator is computed as weighted average of available national-level deflators. Concerning the Hungarian experimental ISP, two cases were examined:

- Case 1: using $SPPI_{62}$ as proxy for the missing deflators (Def1)

- Case 2: using $SPPI_{STS}$ as proxy for the missing deflators (Def2)

Table 1: The estimated turnover structure and deflators, division J62 (MA, SA,)

	Total	G46 SA	G47 SA	J62 MA	J63 SA	M69_70 SA	N78 SA	Other SA
Turnover share (%)	100	7		85		4		4
Deflator(s)	Def1 J62	PPI C26		SPPI J62	SPPI J63	SPPI M69_70	SPPI N78	SPPI J62
	Def2 J62							SPPI STS

**Case 1**: Because the weight of the deflator – used for the main activity J_{62}, as well as for some secondary activities – covers almost the total turnover, the product-based $SPPI_{62}$ is practically the same as the computed industry-based deflator $SPPI_{62}$ (DEF1).

Figure 2: Index of turnover at current prices and experimental ISP (II-1) for J62, Hungary (2010=100)
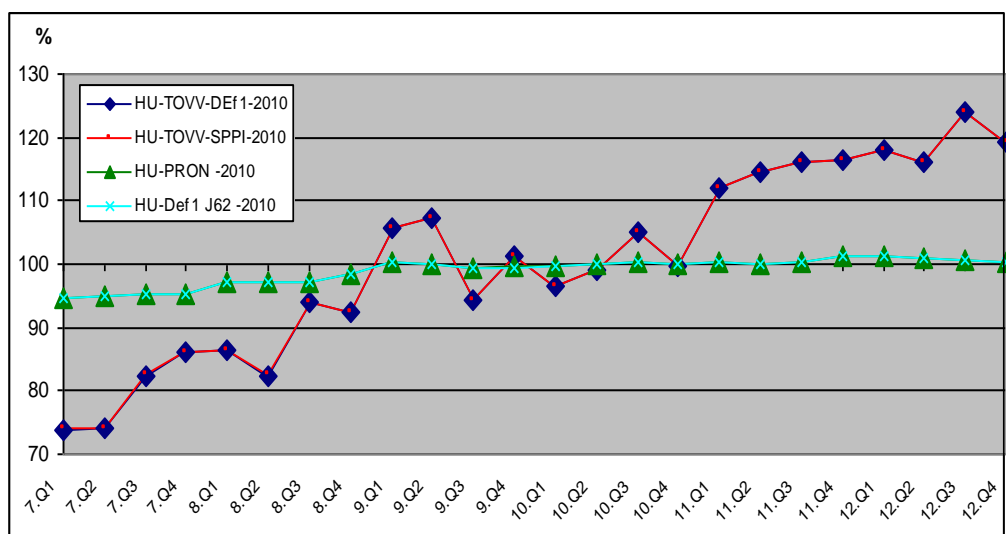
Case 2: The weight of the deflators used for secondary activities reaches 15%, thus some little difference could be observed between the product-based $SPPI_{62}$ and the industry-based deflator $SPPI_{62}$ (Def2). As a result, in a few quarters the turnover at current prices and turnover at constant prices (ISP) are slightly – but within 1% – different.

Figure 3: Index of turnover at current prices and experimental ISP (II-2) for J62, Hungary, (2010=100)
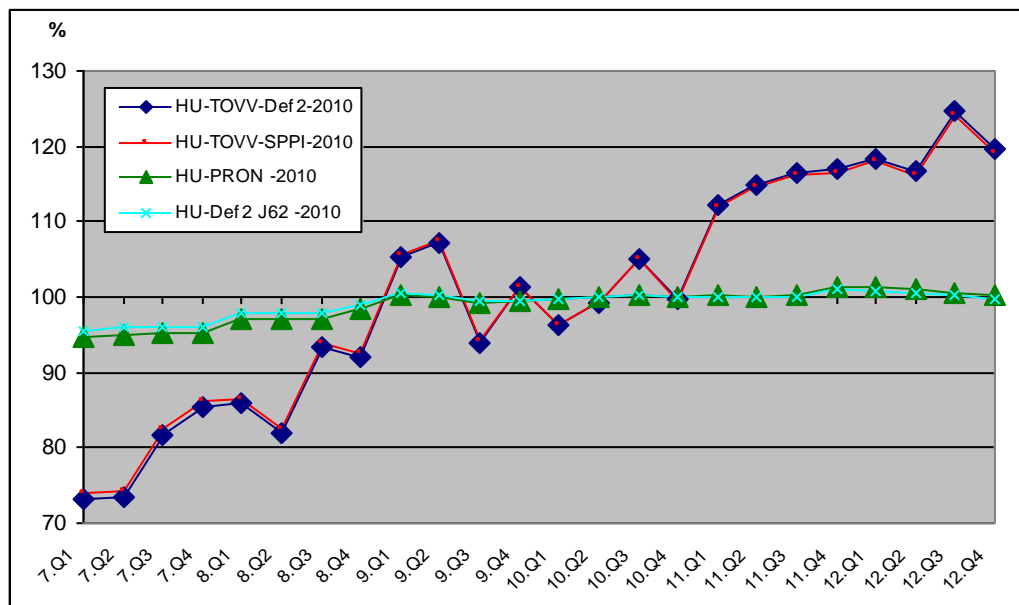
The industry-based deflators – computed from the enterprise level industry-based SPPI's – are under development.

5.1.2. Information service activities (J63)

In Hungary – based on the SBS data – the proportion of the main activity (MA, J63) from the total turnover of the division J63 was only 45% in 2010. The secondary activities with the turnover share above of 2% were classified to the divisions NACE Rev. 2: J62, M69, M72, N77 and N82, from which the ratio of "Office administration, office support and other business support activities" (M82) was close to 40%. (However, as mentioned before, these SBS data cover enterprises with more than 19 employees, see Table 2.). For this case an industry-based deflator Def_{J63} should be used.

The total output is basically homogeneous

Figure 4: Index of Turnover at current prices (TOVT$_{J63}$) and experimental ISP(I)$_{J63}$ (TOVV$_{J63}$) for J63, Hungary, 2010 = 100
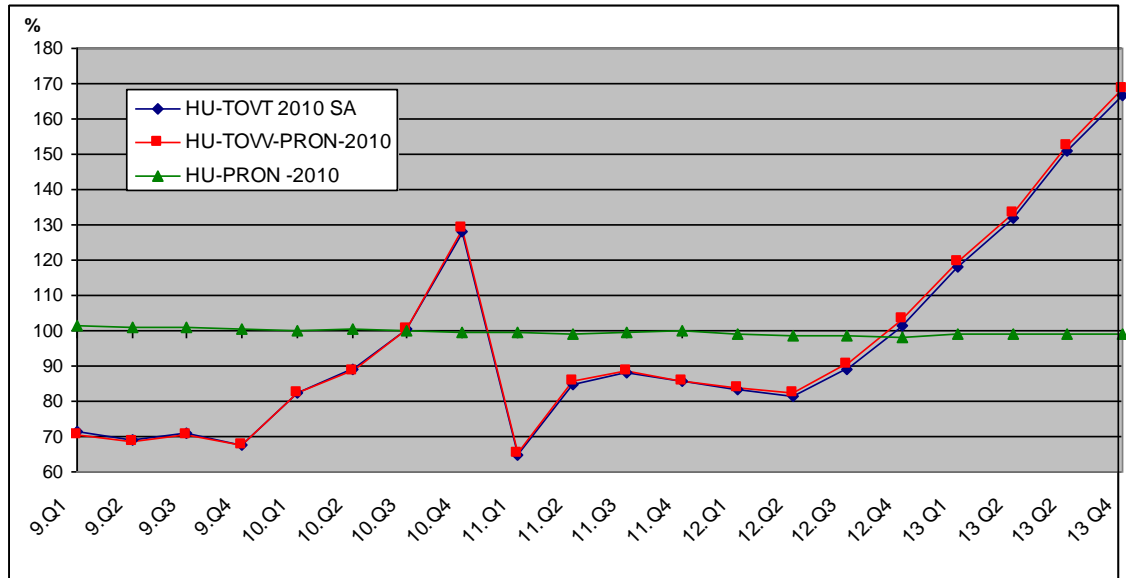
The total output includes significant share of secondary activities

To estimate of an industry-based deflator Def$_{J63}$ for the total output of the division J63 three cases were examined by calculation of indicators Def1$_{J63}$, Def2$_{J63}$ and Def3$_{J63}$.

Case 1 (Def1): using SPPI$_{J63}$ as proxy for the missing deflators

Case 2 (Def2): using SPPI$_{STS}$ as proxy for the missing deflators

Case 3 (Def3): using section-level SPPI$_M$, SPPI$_N$ and SPPI$_{STS}$ as proxies

In Hungary all SPPIs required by the STS-regulation are available, as well as the section-level indices (STS$_M$, STS$_N$) and the index aggregated at the level of the services groups required by the STS-regulation (SPPI$_{STS}$).

Deflators **Def1$_{J63}$**, **Def2$_{J63}$** and **Def3$_{J63}$** were calculated as weighted averages of available aggregates: SPPI$_{J63}$ for the main activity J63 and other SPPIs for relevant secondary activities at 2-digit level (see Figure 5).

Table 2: The estimated turnover structure and deflators, division J63 (MA, SA)

Activities CPA 2008	Total	J63 MA	J62 SA	M69 SA	M72 SA	N77 SA	N82 SA	Other SA
Turnover share	**100%**	**45%**	6%		49%			
Deflators — $Def1_{J63}$		$SPPI_{J63}$	$SPPI_{J62}$	$SPPI_{J69\_70}$	$SPPI_{J63}$			
$Def2_{J63}$					$SPPI_{STS}$			
$Def3_{J63}$					$SPPI_M$	$SPPI_N$	$SPPI_N$	$SPPI_{STS}$

Figure 5: Information service activities (J63), Total output price index and deflators, Hungary, 2010 = 100
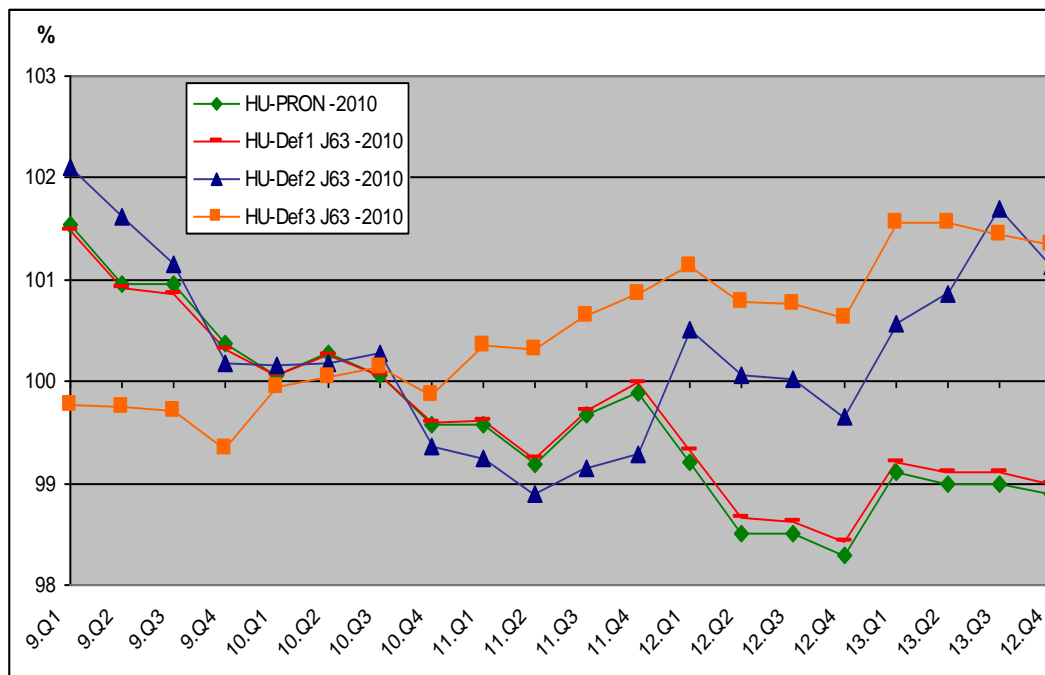

Case 1: Because the weight for the $SPPI_{J63}$ – used for the main activity (MA, J63) as well as for most of the secondary activities (SA) – covers almost 94% of the total turnover, the product-based $SPPI_{J63}$ is similar to the computed industry-based deflator $Def1_{J63}$. Therefore the $ISP(I)_{J63}$ and $ISP(II\text{-}1)_{J63}$ (TOVV-Def1) are

also similar. The maximum difference between them is only 0.2 percentage points during the whole observation period.

Case 2: The weight – used for the secondary activities (SA) deflated by $SPPI_{STS}$ covers almost 49% of the total J63 industry turnover. However, the $ISP(I)_{J63}$ and $ISP(II-2)_{J63}$ (TOVV-Def2) are also similar. The maximum difference between them is only 0.5 percentage points during the period between 2009 and 2013.

Case 3: The aggregated weight of indices used for missing SPPIs of secondary activities exceeds 48% and some difference could be observed between the product-based $SPPI_{63}$ and the industry-based $Def3_{J63}$. As a result, in a few quarters the difference between the $ISP(I)_{J63}$ and $ISP(II-3)_{J63}$ (TOVV-Def3) reaches 4 percentage points.

Figure 6: Index of Turnover at current prices ($TOVT_{J63}$) and experimental $ISP(II-3)_{J63}$ (TOVV-Def3) for J63, Hungary, 2010 = 100
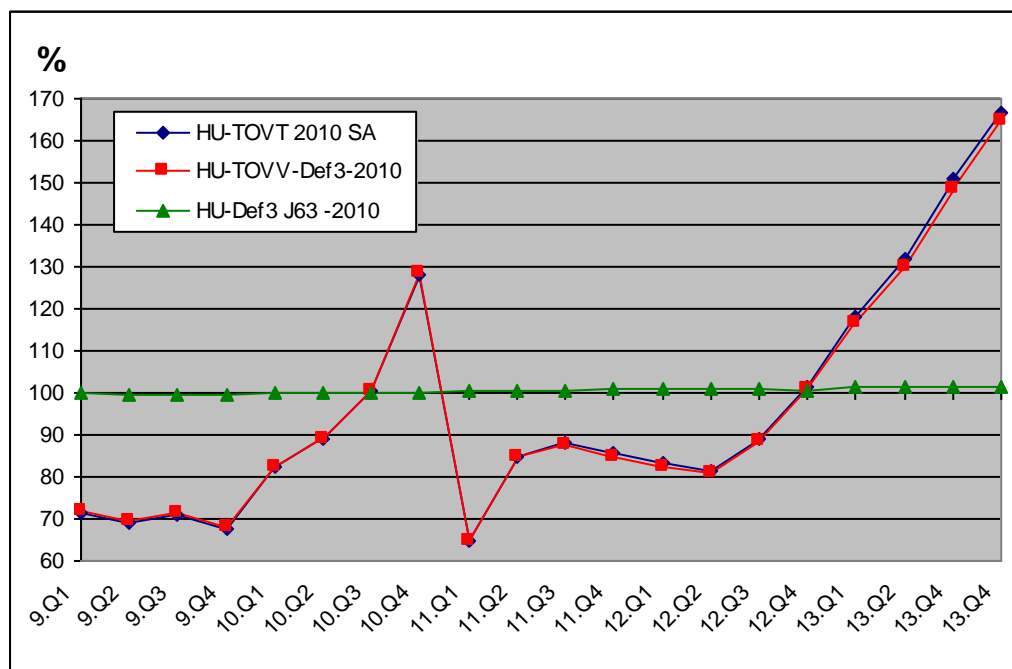
The industry-based deflators – computed from the enterprise level industry-based SPPI's – are under development.

Summary for divisions J62 and J63

In Hungary the total turnover for Computer programming, consultancy and related activities (J62) is practically homogeneous. However the proportion of the secondary activities of enterprises regarding the Information service activities (J63) is significant (it is close to 40%). For this reason, applying different deflators – a product-based SPPI or an industry-based deflator – may result modest differences in volumes.

To summarize the lessons learnt – a cost efficient deflator for the total output (turnover) of the division J62 – with the homogeneous turnover structure – could be estimated by the product-based $SPPI_{J62}$ (B2All or B2B).

However in the case of the division J63, when the ratio of the secondary activities is remarkable – applying an industry-based deflator Def_{J63} may result in more accurate data.

5.2. The development of a methodological basis for new service producer price indices (SPPI) and deflators for value data (NACE Rev.2.: H49, L68, M74, N77)

The development of overall methodology, pilot survey and experimental calculation of SPPIs as deflators and ISP indices was carried out" concerning four actions (service divisions) as follows:

Action 1: Land transport and transport via pipelines (H49)

Action 2: Real estate activities (L68)

Action 3: Other professional, scientific and technical activities (M74)

Action 4: Rental and leasing activities (N77)

5.2.1 The total output/turnover is basically homogeneous

For the total industry output (turnover) a product-based service producer price index, SPPI (B2All) could be used as deflator, as an appropriate estimation of the industry-based deflator (Def). Indices of turnover and experimental ISPs produced by using of product-based deflators are illustrated by the Figure 6 (deflators used in calculations are not seasonally adjusted).

Because in each division a modest increase of prices was measured, the volume indicators (ISPs) are slightly lower than Indices of Turnover. The difference exceeded 2 percentage points in the area of Rental and leasing activities.

Figure 7: Experimental Index of Services Production (ISP) for observed divisions Hungary, Q1 of 2014 (previous quarter =100)
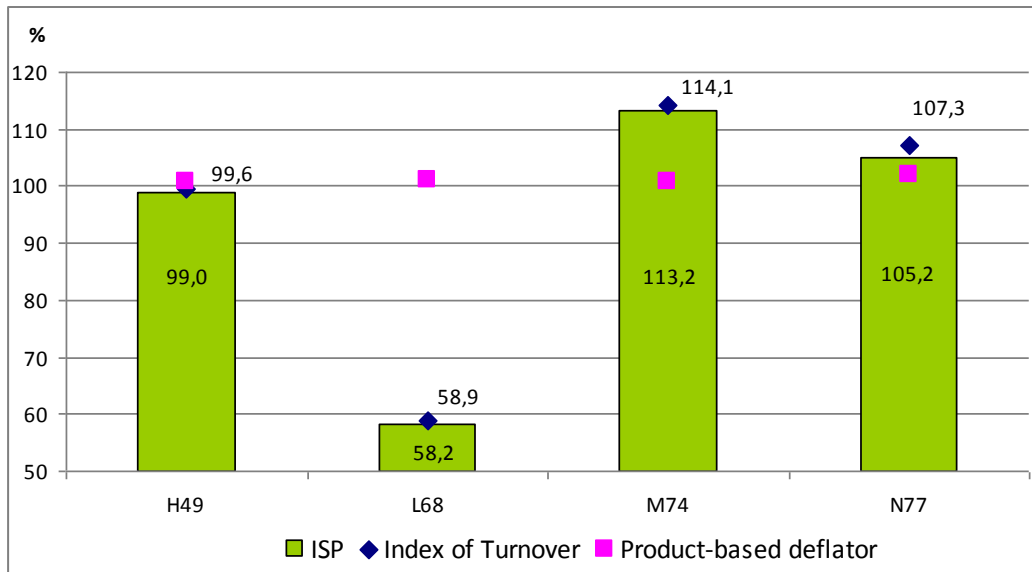
5.2.2. Compilation of industry-based SPPIs

Concerning these divisions, beside the product-based B2All SPPI, additional deflators were calculated and examined. The experimental industry-based deflators have been computed by weighting of B2All SPPI and further appropriate indicators – using the SBS turnover structure.

As appropriate indicators– included proxies for the turnover share of significant secondary activities – PPIs (Producer Price Indices for industry), SPPI at section level and a general SPPISTS (the level of actual STS coverage concerning the services prices) have been considered.

The general scheme for the weighting structure and related deflators is shown in the Table 3 (details see under description of the related action).

Table 3: The scheme of the turnover structure and deflators (MA, SA)

Activities CPA 2008	Total Turnover	MA	SA1	SA2	SA3	SA…	SAn
Turnover share	**100%**	$\%_{MA}$	$\%_{SA1}$	$\%_{SA2}$	$\%_{SA3}$	$\%_{SA…}$	$\%_{SAn}$
Deflator (s)	**Def**	$SPPI_{MA}$	Def_{SA1}	Def_{SA2}	Def_{SA3}	$Def_{SA…}$	Def_{SAn}

Industry-based indices compiled according to the above scheme, including the SBS turnover structure and the combinations of possible indicators (proxies) as well as the results of calculations are included in Tables 4-7.

Table 4: The estimated industry-based SPPIs/deflators

Hungary, **H49,** Q1, 2014 (previous quarter = 100)

Products CPA 2008		Total (SBS)		H49 / MA	H52 / SA1	G47 / SA2	G45 / SA3	Other / SA4
Turnover share		%		%				
		100		85,6	7,9	1,9	1,1	3,5
Deflators	Product	$SPPI_{H49}$	100,60	$SPPI_{H49}$	$SPPI_{H49}$			
	Industry	$DEF1_{H49}$	100,65	$SPPI_{H49}$	$SPPI_{H49}$	PPI_{C19}	PPI_{C29}	$SPPI_{H49}$
		$DEF2_{H49}$	100,66		$SPPI_{STS}$			$SPPI_{STS}$
		$DEF3_{H49}$	100,72		$SPPI_{H}$			
		$DEF4_{H49}$	100,74					$SPPI_{H}$

Table 5: The estimated industry-based SPPIs/deflators

Hungary, **L68,** Q1, 2014 (previous quarter = 100)

Products CPA 2008		Total (SBS)		L68 / MA	D35 / SA1	N77+N81 / SA2	F41+F43 / SA3	I55+I56 / SA4	G46+G47 / SA5	Other / SA6
Turnover share		%		%						
		100		66,7	5,3	6.0	4,5	3,2	3,1	11,2
Deflators	Product	$SPPI_{L68}$	101,10	$SPPI_{L68}$	$SPPI_{L68}$					
	Industry	$DEF1_{L68}$	100,77	$SPPI_{L68}$	PPI_{D35}	$SPPI_{N77}$ + $SPPI_{N812}$	$CPPI_{F41}$ + $CPPI_{F43}$	HICP-CT	PPI_C	$SPPI_{STS}$
		$DEF2_{L68}$	100,73						$SPPI_{L68}$	
		$DEF3_{L68}$	100,70						HICP-CT	

Table 6: The estimated industry-based SPPIs/deflators

Hungary, **M74,** Q1, 2014 (previous quarter = 100)

Products CPA 2008		Total (SBS)		M74 / MA	C28 / SA1	M70 / SA2	G46+G47 / SA3	M71 / SA4	N78 / SA5	Other / SA6
Turnover share		%		%						
		100		81,6	4,8	2,8	3,6	1,6	1,2	4,5
Deflators	Product	$SPPI_{M74}$	100,80	$SPPI_{M74}$	$SPPI_{M74}$					
	Industry	$DEF1_{M74}$	100,86	$SPPI_{M74}$	PPI_{C28}	$SPPI_{M74}$	$SPPI_{M74}$	$SPPI_{M71}$	$SPPI_{N78}$	$SPPI_{STS}$
		$DEF2_{M74}$	100,91	$SPPI_{M74}$			PPI_C			

Table 7: The estimated industry-based SPPIs/deflators

Hungary, **N77,** Q1, 2014 (previous quarter = 100)

| Products CPA 2008		Total (SBS)		N77	C25	G45+G46	H49	M74	S96	Other
				MA	SA1	SA2	SA3	SA4	SA5	SA6
Turnover share		%		%						
		100		82,1	1,1	5,6	2,1	2,2	1,7	5,2
Deflators	Product	$SPPI_{N77}$	102,00		$SPPI_{N77}$					
	Industry	$DEF1_{N77}$	101,89	$SPPI_{N77}$	PPI_{C25}	PPI_{C29} + PPI_{C28}	$SPPI_{H49}$	$SPPI_{M74}$	$SPPI_{STS}$	$SPPI_{N77}$
		$DEF2_{N77}$	101,82							$SPPI_{STS}$
		$DEF3_{N77}$	101,80							$SPPI_{N}$
		$DEF4_{N77}$	101,91						$SPPI_{N77}$	$SPPI_{N77}$
		$DEF5_{N77}$	101,84							$SPPI_{STS}$
		$DEF6_{N77}$	101,82							$SPPI_{N}$

The total turnover of above divisions contains a significant share of secondary activities, thus an industry-based deflator is considerable to be used for deflation of the industry output (turnover) accounted by enterprises classified to the presented divisions H49, L68, M74 and N77. In Hungary, based on previous experiences, from the above experimental indicators theoretically the deflators with the green background seem to be the most suitable. However for the first quarter of 2014, the experimental industry-based deflators are practically the same (because different proxies were available and used only for limited coverage of secondary activities).

ISPs produced by using of these industry-based deflators are illustrated by the Figure 8 (deflators used in calculations are not seasonally adjusted).

Similarly to the calculation with using of product-based deflators, the volume indicators (ISPs) are slightly lower than Indices of Turnover in each division. The difference is close to 2 percentage points in the area of Rental and leasing activities.

The impact of industry-based deflators compared to the product-based SPPIs is negligible for Land transport and transport via pipelines and Other professional, scientific and technical activities. In the areas of Real estate activities and Rental and leasing activities ISPs were slightly higher than those calculated by product-based SPPIs in the first quarter of 2014. It is worth point out, that due to the very short deadline of the pilot project, data of experimental calculations have been available for only one quarter. It means that the results should be handled with caution and a definite opinion on development of indices could be formulated only on the basis of a longer series of data.

Figure 8: Experimental Index of Services Production (ISP) for observed divisions
Hungary, Q1 of 2014 (previous quarter =100)
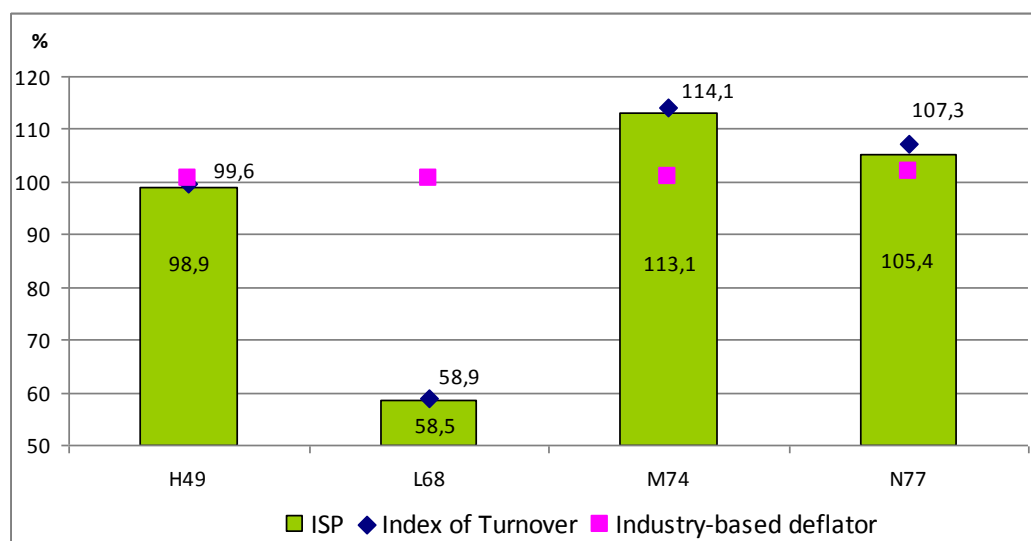
6. SUMMARY

In general, the Hungarian macroeconomic indicators are based on the data received from enterprises. Regarding the services statistics, to ensure the necessary consistency between the turnover data, price data and other deflators could be considered as one of the most important fields to be improved.

Hungary has started to introduce the services producer price indices to the SNA recently. Concerning the presented IT activities, the total turnover for Computer programming, consultancy and related activities (J62) is practically homogeneous. However the proportion of the secondary activities of enterprises regarding the Information service activities (J63) is significant (it is close to 40%). For this reason, applying different deflators – a product-based SPPI or an industry-based deflator – may result modest differences in volumes. A product-based $SPPI_{J62}$ could be proposed for J62 and an industry-based deflator Def_{J63} for the division J63.

On the other hand HCSO takes part in the development work of the European Task Forces aiming to develop methodology for new SPPIs as deflators, as well as to define a new service volume indicator (ISP) and develop an internationally harmonized ISP manual for the potential users.

As a conclusion of pilot surveys and experimental calculations, when the observation unit is the kind of unit (KAU), a product-based SPPI could be used. However, in case of enterprise, probably an industry-based deflator would be the most appropriate to produce an ISP as good quality as possible.