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ESA 2010: Main changes in Hungarian SIOT

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Abstract

The paper deals with the implementation of revised European system of accounts, ESA 2010, into Hungarian SIOT. In Hungarian NA there were also changes for other reasons in line with EU requirement and revision policy. SIOT are significantly affected by main changes – ESA 2010 - such as capitalisation of expenditures on R&D, net treatment of inward and outward processing, treatment of small tools and other changes as estimation the capital formation of own-account software and databases, recalculation of holding gains and losses.

In this paper, these changes in SUT and theirs impact in symmetric input-output tables will be described.

The methodology of the compilation of HUNgarian SUT and IOT have been changed from September 2014, based on Regulation (EU) No 549/2013 of the European Parliament and of the Council on the European system of national and regional accounts in the European Union. The data were also changed for other reasons than ESA2010, according to the international practice and revision policy. The main causes of other changes are the following:

- methodological changes required by EU, resulting from checking GNI Inventory
- routine revisions and data corrections

In Hungary the Supply and use Tables for the year of 2010 are compiled following the ESA95 and ESA2010 as well. It gives us a good opportunity to compare these tables and analyse the differences.

I. Main reasons for changes of SUT/IOT data

1. introduction of ESA2010
2. recommendations of Eurostat coming from checking GNI reports
3. routine and other revisions (finalisation of annual data, data correction in the basic statistics, data corrections based on additional cross-checking).

The methodological changes introduced in September 2014 had major impact on some macroeconomics aggregates: in Hungary the level of GDP in current prices increased by 1.63% or around 432 667 million HUF in 2010.

Overview of the changes on the production side approaches 2010 (Million HUF):

PRODUCTION APPROACH	Changes			TOTAL
	ESA2010	GNI reservation	routine and other	
Output of goods and services (at basic prices)	-170 419	50 943	-145 934	-265 410
Intermediate consumption (at purchasers' prices)	-588 766	70 969	-142 816	-660 613
Gross value added (at basic prices)	418 347	-20 026	-3 118	395 203
Taxes less subsidies on product			37 795	37 795
GDP	418 347	-20 026	34 677	432 998

Overview of the changes on the expenditure side approaches 2010 (Million HUF):

EXPENDITURE APPROACH	Changes			
	ESA2010	GNI reservation	routine and other	TOTAL
Total final consumption expenditure	15 613	32 718	-9 110	39 221
Gross fixed capital formation	402 018	97 952	71 829	571 799
Changes in inventories	8 509	-133 547	3 941	-121 097
Exports of goods and services	-644 030		356 257	-287 773
Imports of goods and services	-636 287	7 966	397 473	-230 848
GDP	418 397	-10 843	25 444	432 998

Overview of the changes on the income side approaches 2010 (Million HUF):

INCOME APPROACH	Changes			
	ESA2010	GNI reservation	routine and other	TOTAL
Compensation of employees			1 508	1 508
Gross operating surplus and mixed income	418 397	-20 026	-150 284	248 087
Taxes less subsidies on production			145 608	145 608
Taxes less subsidies on product			37 795	37 795
GDP	418 397	-20 026	34 627	432 998

The supply and use tables, as integrated part of the National Accounts, are compiled in a very detailed level. The changes on macroeconomic aggregates (output, intermediate consumption and expenditure categories) can be described on a detailed product level as well.

For the sake of the presentation we can show the impact of the total changes on the aggregated supply and use tables for 2010.

Overview of the changes on the Supply tables 2010 (Million HUF):

Supply	A	B, C, D and E	F	G, H and I	J	K	L	M and N	O, P, and Q	R, S, T and U	Total	Imports	Total supply at basic prices	....	Total supply at purchasers' prices
A	-762	-182	0	0	0	0	0	0	0	0	-944	-3 822	-4 766		-5 398
B, C, D and E	0	-573 364	-139	-1 986	0	0	-515	-6 221	0	0	-582 225	-225 747	-807 972		-454 394
F	0	0	-3 153	0	0	0	0	0	456	0	-2 697	-2 685	-5 382		-5 764
G, H and I	0	856	0	-52 460	0	0	0	0	-172	0	-51 776	12 803	-38 973		-354 124
J	192	16 905	953	9 999	20 906	5 934	624	14 107	8 409	1 450	79 479	4 437	83 916		83 916
K	0	0	0	0	0	8 800	0	0	0	0	8 800	729	9 529		9 529
L	0	0	0	0	0	0	4 759	-2 600	0	0	2 159	0	2 159		2 159
M and N	2 599	152 574	720	26 140	12 513	0	534	66 136	1 631	556	263 403	-1 051	262 352		262 352
O, P, and Q	0	0	0	0	0	0	0	0	15 899	0	15 899	-15 512	387		769
R, S, T and U	0	0	0	0	0	0	0	0	0	2 492	2 492	0	2 492		2 492
Total	2 029	-403 211	-1 619	-18 307	33 419	14 734	5 402	71 422	26 223	4 498	-265 410	-230 848	-496 258	....	-458 463

Overview of the changes on the Use tables 2010 (Million HUF):

	A	B, C, D and E	F	G, H and I	J	K	L	M and N	O, P, and Q	R, S, T and U	Total	Final consumption expenditure	GFCF	Changes in Inventories	Exports	Total use at purchasers' prices	Total use at purchasers' prices
A	1 306	1 394	0	-321	0	0	16	26	4	1	2 426	40	0	-8 536	672	-7 824	-5 398
B, C, D and E	-1 093	-426 417	-729	-21 283	-5 815	0	-10 177	-16 128	-15 844	-1 606	-499 092	24 170	162 992	-109 685	-32 779	44 698	-454 394
F	0	-610	-3 162	0	0	0	-2 000	0	-46	0	-5 818	-52	376	-2 476	2 206	54	-5 764
G, H and I	0	-33 283	-500	-12 647	-336	0	0	0	-571	0	-47 337	739	0	0	-307 526	-306 787	-354 124
J	0	170	0	-943	-8 242	0	0	0	-3 956	-120	-13 091	-8 312	97 684	-400	8 035	97 007	83 916
K	-59	-588	-127	-466	-109	40	819	-332	33	28	-761	3 171	0	0	7 119	10 290	9 529
L	0	-1 592	0	-2 000	-37	0	-2 336	-176	2 913	0	-3 228	5 387	0	0	0	5 387	2 159
M and N	-434	-38 218	-1 086	-28 842	-2 162	2 655	2 491	-11 163	1 079	-501	-76 181	13 507	307 726	0	17 300	338 533	262 352
O, P, and Q	0	0	0	0	0	0	0	0	-16 077	0	-16 077	16 846	0	0	0	16 846	769
R, S, T and U	0	0	0	-721	-280	0	0	-35	0	-418	-1 454	925	3 021	0	0	3 946	2 492
Total	-280	-499 144	-5 604	-67 223	-16 981	2 695	-11 187	-27 808	-32 465	-2 616	-660 613	56 421	571 799	-121 097	-304 973	202 150	-458 463
Compensation of employees	-12	-1 289	-126	-1 080	-2 247	2 704	2 225	-2 123	4 043	-587	1 508						
Other taxes on production minus	-146	-137	-192	-453	4	135 603	11 391	-255	-146	-61	145 608						
Operating surplus and mixed	2 467	97 359	4 303	50 449	52 643	-126 268	2 973	101 608	54 791	7 762	248 087						
Value added, gross	2 309	95 933	3 985	48 916	50 400	12 039	16 589	99 230	58 688	7 114	395 203						
Output	2 029	-403 211	-1 619	-18 307	33 419	14 734	5 402	71 422	26 223	4 498	-265 410						

Based on our compilation and balancing technique we can separate the overall changes in the SUT cell by cell by the three main reasons:

- implementation of ESA2010
- recommendations of EU connected with the GNI Inventory
- routine and other revisions

I.1. The main changes due to the implementation of ESA2010 in the Hungarian National Accounts:

- research and development (R&D) recognised as capital formation
- weapon systems in government recognised as capital assets
- government, public and private sector classification
- small tools
- goods sent abroad for processing
- merchanting
- others (for example central bank - allocation of output; valuation of output for own final use for market producers; non-life insurance - output, claims due to catastrophes, and reinsurance; land improvements recognised as a separate asset)

I.2. The main changes due to the recommendations of EU coming from checking GNI Inventory

I.2.1. Own-account software and databases

A new method has been applied to estimate the capital formation of own-account software and databases. The estimation method was changed according to the recommendations of Eurostat³. The estimation of own-account software and databases has two main components: cost (labour costs and non-labour costs) of production and the mark-up factor.

The consumption of fixed capital and fixed capital (stock) are calculated with the Hungarian PIM. The impact of this new method on GDP at current prices in 2010 was increasing 80 300 million HUF.

I.2.2. Originals

The estimation of originals was introduced in the Hungarian national accounts in 2009. Now this method was improved in line with the recommendation of Eurostat. The main improvements are the following: in the case of books the estimation was expanded (textbooks, maps, dictionaries etc. are included now); in the case of films the cost based method is used from now on. The impact of this improved method on output of originals at current prices in 2010 was increasing 17 758 million HUF.

I.2.3. Holding gains and losses

The estimation of holding gains and losses was introduced in the Hungarian national accounts in 2009. Now according to the recommendation of Eurostat the calculation method of price indices used for the deflation of the stock of inventories was changed, and holding gains and losses were recalculated accordingly. Changes of GDP in current prices in 2010 due to recalculation of holding gains and losses was -133 547 million HUF.

I.2.4. Consumption of fixed capital for roads, bridges and other public infrastructure

The lifetimes for roads, bridges and other public infrastructure were revised in line with the recommendation of Eurostat. It implies the changes of consumption of fixed capital.

As the consumption of fixed capital is part of the output and the gross value added of non-market producers, changes in the lifetime of these assets influenced the value of output and GDP directly. The impact of this modification on GDP at current prices in 2010 was 13 587 million HUF.

I.2.5. Illegal activity – smuggling

In line with the recommendation of Eurostat three kinds of illegal activity have to be recorded in the national accounts: drugs, prostitution and smuggling. The estimation of drugs and prostitution were introduced in the Hungarian national accounts in 2009. Now it is supplemented with the estimation of smuggling. The estimation should cover alcoholic beverages and tobacco. Our research proved that the smuggling of alcohol is negligible in Hungary, while the smuggling of tobacco is quite significant. The estimation of tobacco smuggling is based on the seizure data of the National Tax and Customs Administration (Excise Duty Division) and on several studies from many different research institutes. The

impact of this modification on the GDP at current prices in 2010 was increasing 11 032 million HUF.

I.3. The main changes due to the routine and other revisions (finalisation of annual data, data correction in the basic statistics, data corrections based on additional cross-checking)

The effect of this type of changes on the GDP at current prices in 2010 was 11 032 million HUF.

II. From the above mentioned changes we concentrate and describe only the changes due to the implementation of ESA 2010 and from that which have significant impact on the Hungarian National Accounts:

II.1. Research and development (R&D) recognised as capital formation

II.2. Weapon systems in government recognised as capital assets

II.3. Small tools

II.4. Goods sent abroad for processing

II.5. Merchanting

II.1. Research and development (R&D) recognised as capital formation

**Changes due to the capitalisation of Research and development in the Supply table 2010
(Million HUF)**

SUPPLY	NACE 21	NACE 26	NACE 29	NACE 46	NACE 62	NACE	Total market producer	Non-market producer	Total output at basic prices	Imports	Valuation item	Total supply at purchasers' prices
Product												
Product												
R&D market	51 352	13 579	6 2348	23 420	10 654		20 3377					203 377
in the year of the performance R&D non-market (P12)								71 724				71 724
P13 non-market output								-71 724				-71 724
Succeeding year P13 non-market output								80 208				80 208
Total	51 352	13 579	62 348	23 420	10 654		20 3377	80 208				283 585

One of the most important changes in ESA2010 is that research and development (R&D) are recognised as a produced asset and not as current expenses.

There are two main changes required by ESA2010 to the treatment of R&D in the National Accounts.

- Change to the measurement of R&D
- Change to the National Accounts treatment of R&D

ESA2010 extends the asset boundary by including results of research and development as intellectual property under the heading of produced assets.

Considering that the impact of capitalisation of R&D on the accounts is different for a market producer from a non-market producer, estimations are broken down by sectors and industries.

II.1.1. R&D produced on own account by a market producer:

In the production approach, the output increases as an output for own final use (P.12) is identified and consequently the value added increases by the amount of estimated R&D output for own final GFCF (costs plus mark-up).

In the expenditure approach, gross fixed capital formation increases by the estimated amount of R&D output for own GFCF.

In the income approach, gross operating surplus or mixed income increase by the estimated amount of R&D output for own final GFCF.

As a consequence, GDP at current prices increased in ESA 2010 with 203.377 million HUF.

II.1.2. A market producer purchases R&D:

The purchases are reclassified from intermediate consumption (ESA 95) to gross fixed capital formation (ESA 2010).

As a consequence, GDP at current prices increased in ESA 2010 with 32 625 million HUF.

II.1.3. R&D produced for own account by a non-market producer:

In the year of the performance of the R&D

In the production approach, the total output as measured by the sum of costs remains the same in the year of the performance of the R&D. The estimated own-account R&D output is counterbalanced with the decreasing of non-market output (P.13).

In the expenditure side of GDP, in the year of creation, the estimated R&D output for own final use (P.12) is accounted as GFCF (P.51) and the final consumption expenditure of the non-market producer (P3) is eliminated by the amount allocated to GFCF as own-account R&D. So, R&D expenditure will be reclassified from consumption expenditure to GFCF.

There is no change in the income side as well.

In the succeeding years of economic life of the R&D asset

The costs are increased by the amount of consumption of fixed capital in each year (extra consumption of fixed capital), until the asset value is exhausted. So over time, output and value added are increased by the amount of CFC due to the R&D product.

The final consumption expenditure increases by the same amount of CFC due to the R&D product.

In the income approach, the gross operating surplus or mixed income increases by the amount of consumption of fixed capital due to the R&D product in the years following the year of creation, until the value of the asset is exhausted.

To sum up, GDP increase by the amount of the consumption of fixed capital of the capitalized R&D, in the years following the investment.

II.2. Weapon systems in government recognised as capital assets

Capitalising Government Spending on Military Weapons

Under the ESA 95 the government spending on military weapons was treated as Intermediate Consumption in the National Accounts. According to ESA2010 military weapon systems used continuously or for more than one year in production should be reclassified from government final consumption expenditure to government gross capital formation. Weapons systems (planes, ships, tanks etc.) become fixed capital, and the single use items (for example bombs) are treated as military inventories. The fixed capital items will then be consumed over a number of years as Consumption of Fixed Capital. Military inventories are still considered Intermediate Consumption when they are used. The value of the change in military inventories is Capital Formation.

As a consequence, GDP increased in 2010 by 21 124 million HUF. Gross capital formation increased by 14 073 million HUF. The non-market output value and the government consumption expenditure

increased by 7 051 million HUF. Gross Operating Surplus (B.2g) increased by 21 124 million HUF in the government sector.

Changes due to the weapon systems in government recognised as capital assets in the Supply table (2010, million HUF)

	Industry	Industry	Public administarti on and defence (NACE 84)	...	Output at basic prices	Imports	Trade margins	Taxes less subsidies	Total Supply at purchasers prices
Product									
Product									
CPA 84 (P13 non- market)			-14073 + 21124 = 7051		7051				7051
Total			7051		7051				7051

Changes due to the weapon systems in government recognised as capital assets in the Use table (2010, million HUF)

Products	Industries				Total Intermediate Consumption	HCE	GG	NPISH	GFCF	Changes in inventories	Exports	Total uses
	Industry 1	Industry ...	Public administration and defence (NACE 84)	...								
..												
CPA25			-4310		-4310				3544	766		0
CPA26			-3279		-3279				3279			0
CPA30			-2621		-2621				2621			0
CPA32			-3863		-3863				3863			0
CPA84 (P13 non-market output)							-14073 +21124 =7051					7051
Total			-14073		-14073		7051		13307	766		7051
GVA			21124		21124							
from that B2g. (CFCF)			21124		21124							
Output			7051		7051							

II.3. Small tools

ESA95 set a lower bound of 500 euros at 1995 prices for small tools to be recognised as capital expenditure. The purchase of items below this threshold is classified as intermediate consumption. There were some differences between Hungarian bookkeeping rules and the ESA95 methodology, and for this reason a transition item had to be estimated for private book-keeping data to reach the ESA95 requirement.

In ESA2010 no fixed threshold is given, the criterion to recognise an asset acquisition as capital expenditure is its use in production for more than one year. Now in respect of this the Hungarian accounting rules is in line with the ESA2010 methodology, that is why it became unnecessary to make this correction from now on.

The change in value added is opposite to the change in intermediate consumption (production approach) and equal to the change in gross fixed capital formation (expenditure approach) and in gross operating surplus/mixed income (income approach).

Changes due to the small tools in the Use table (2010, million HUF)

CPA NACE Rev.2 section	A	B,C,D, and E	F	G, H and I	J	K	L	M and N	O, P, and Q	R, S, T and U	Total	Final consumption	GFCF	.....	Total Final use
...															
CPA25	-435	-4847	-3164	-4266	-115			-95	-346	-223	-13491				
CPA26	-276	-7520	-1468	-11653	-6195		-3801	-9968	-2012	-1233	-44126				
CPA27	-9	-1862	-1047	-2809	-39		-75	-334	-449	-278	-6902				
CPA28	-1554	-6048		-7085	-100		-107	-694	-157	-5	-15750				
...															
CPA31-32		-223		-205					-191	-97	-716				
.....															
Total	-2274	-20500	-5679	-26018	-6449	0	-3983	-11091	-3155	-1836	-80895				

II.4. Goods sent abroad for processing

Between ESA 95 and ESA 2010, there has been a fundamental change in the treatment of goods sent abroad for processing without change of ownership. In ESA 95 these transactions were accounted on the gross method and there was imputed a change of ownership. ESA 2010 do not impute a change of ownership, but rather show only one entry – an import of the processing service fee. This would be an export of the service for the country in which the processing takes place. This recording is more consistent with the commercial book-keeping records and associated financial transactions. It does however cause an inconsistency with the international merchandise trade statistics (IMTS).

This change has not had any impact on GDP, however, export and import figures have become significantly lower. Furthermore, the impacts on the import and export data were not the same, since not all of the materials are processed and leave the country within the same accounting period. The small difference was added to changes in inventories on the expenditure side.

The net treatment of inward and outward processing has significant impact on the structure of output, intermediate consumption, exports, imports matrix and on the input coefficients as well.

Changes due to the net treatment of goods sent abroad for processing in the Supply table (2010, million HUF)

SUPPLY	...	CPA13	CPA14	CPA15	.....	CPA20-22	CPA23	CPA24-25	CPA26	CPA27	CPA28	CPA29-30	CPA31-32	...	TOTAL	Imports	Total supply at basic prices/purchasers' prices
.....														
CPA13		-18 811	-479	-2		-4	0	0	0	0	-2	-299	-529		-20 231	-57 939	-78 170
CPA14		-760	-51 357	-1		-3	0	0	0	0	0	0	-48		-53 877	-19 803	-73 680
CPA15		-1 299	-347	-18 579		-260	0	-12	0	0	0	-266	-76		-21 445	-26 270	-47 715
CPA16-19		0	-3	-1		-8	0	0	-1	0	-1	0	-41		-145	-7 335	-7 480
CPA20-22		-1 178	-8	-245		-9 083	0	-112	-141	-511	-5	-1 889	-209		-17 755	-53 114	-70 869
CPA23		0	0	0		0	-10 428	-90	0	-3	0	0	-10		-10 531	-16 291	-26 822
CPA24-25		0	-2	-1		-819	0	-9 960	-2 786	-101	-4 034	-1 000	-87		-18 979	-53 713	-72 692
CPA26		0	0	0		0	0	-88	-31 139	-3 205	-145	-988	-172		-39 212	-116 861	-156 073
CPA27		0	-1	0		-480	0	-1 957	-76 718	-40 273	-11 215	-7 443	-504		-139 233	-151 421	-290 654
CPA28		0	0	0		-2 131	0	-4 755	-358	-7 724	-38 562	-5 531	-1 422		-60 536	-52 780	-113 316
CPA29-30		-842	-238	0		-221	0	-9 466	-1 089	-8 272	-378	-46 665	-94		-67 283	-51 112	-118 395
CPA31-32		-500	-152	-38		-9 475	0	-412	-4	0	0	-226	-10 561		-22 955	-24 823	-47 778
.....														
TOTAL	...	-23 390	-52 587	-18 867	...	-22 484	-10 428	-26 852	-112 236	-60 089	-54 342	-64 307	-13 753	...	-474 922	-636 286	-1 111 208

Changes due to the net treatment of goods sent abroad for processing in the Use table (2010, million HUF)

USE	...	CPA13	CPA14	CPA15	...	CPA20-22	CPA23	CPA24-25	CPA26	CPA27	CPA28	CPA29-30	CPA31-32	...	TOTAL	Changes in Inventories	Exports	Total use at purchasers' prices
.....														
CPA13		-16 253	-33 863	-3 094		-288	0	-2	-18	-42	-148	-2 114	-2 272		-58 267	10 357	-30 260	-78 170
CPA14		-34	-13 229	-13		-215	0	-10	0	0	0	0	-61		-13 804	-1 779	-58 097	-73 680
CPA15		-1 043	-693	-11 087		-64	0	0	-29	-3	0	-35	-5 081		-18 390	1 785	-31 110	-47 715
CPA16-19		-396	-1 302	-518		-559	0	-12	-1 184	-354	-26	-258	-350		-5 961	982	-2 501	-7 480
CPA20-22		-3 291	-1 346	-2 652		-7 876	0	-430	-3 370	-4 715	-2 406	-14 606	-1 604		-46 308	10 262	-34 823	-70 869
CPA23		-10	-59	-24		-37	-10 428	-227	-126	-376	-495	-2 944	-4		-14 731	-1 372	-10 719	-26 822
CPA24-25		-556	-761	-879		-769	0	-10 761	-6 889	-4 195	-4 909	-7 059	-308		-37 494	-10 492	-24 706	-72 692
CPA26		-4	-3	-60		0	0	-3	-49 803	-6 326	-12 727	-1 770	-135		-73 056	-6 179	-76 838	-156 073
CPA27		-207	-2	0		-1 361	0	-73	-49 194	-40 861	-13 926	-7 333	-947		-114 384	5 605	-181 875	-290 654
CPA28		-361	-53	-18		-2 235	0	-4 328	-449	-2 835	-19 391	-10 494	-33		-41 451	-3 753	-68 112	-113 316
CPA29-30		-727	0	-319		-536	0	-9 119	-505	-339	-310	-17 637	-5		-30 612	-8 560	-79 223	-118 395
CPA31-32		-340	-1 191	-203		-8 526	0	-1 887	-669	-35	-4	-47	-2 958		-16 861	11 526	-42 443	-47 778
.....														
TOTAL	...	-23 631	-52 587	-18 867	...	-22 484	-10 428	-26 852	-112 236	-60 089	-54 342	-64 307	-13 802	...	-474 922	7 744	-644 030	-1 111 208

II.5. Merchanting

Merchanting is defined as goods that are purchased by a resident (of the compiling economy) from a non-resident combined with the subsequent resale of the same goods to another non-resident, without the goods being present in the compiling economy. Under the ESA 95 the Merchanting was classified under trade in services. Based on the new approach Under ESA 2010 merchanting is reclassified from trade in services to trade in goods. The acquisition of the goods is classified as a negative goods export of the economy of the merchant, and the sale is classified as a positive goods export. The effect of reclassifying merchanting reduces trade in services equal to the increase in trade in goods, so overall there is no impact on net trade and therefore the effect on GDP at current prices. But the structure of export and the allocation of trade margin are affected.

Impact of the new treatment of merchanting in Supply and Use side 2010 (Million HUF)

ESA95				USE	
Output				Export	
CPA 46	trade service	321 188			321 188
	trade margin	0			

ESA2010				USE	
Output			Valuation item	Export	USE
CPA 26			24 353		24353
CPA 27			27 679		27679
CPA 28			233 792		233792
CPA 29			17 058		17058
other manufacturing products			18 306		18306
CPA 46	trade service				
	trade margin	321 188	-321 188		
TOTAL		321 188	0		321 188