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Problems with Chain Indices (I)

Introduction, general aspects
(properties, arguments pro and con)

Course delivered at the European Central Bank Frankfurt

List of slides ECB part I

Introduction, general aspects
(nos = number of slides)

section	topic	nos	slides
**	Structure of part I	1	2
1	Definition, general remarks, misunderstandings		
1.1	Chain indices and other (direct) indices: Overview (7 slides)	1	3
1.1.1	Chain an direct	2	4 - 5
1.1.2	Two elements of the definition of a chain index	3	6 - 87
1.1.3	Need for exact notation	2	9 - 10
1.2	Three common misunderstandings: Overview (11 slides)	1	11
1.2.1	More up-to-date weights	4	12 - 15
1.2.2	Chaining and chainability (transitivity)	6	16 - 21
1.2.3	Chain indices are the more general approach	3	22 - 24
1.3	The increasing relevance of chaining		25
2.	Arguments in favour of chain indices: overview	1	26
2.1	Twelve arguments in favour of chain indices (overview and general characteristics of the arguments)	2	27 -28
2.2	The arguments and rebuttals one by one		
2.2.1	Arguments class A: Focussing in the "link" (rather than the chain)	2	29 - 30
2.2.2	Arguments class B: Ambiguities of the notion "base"	4	31 - 34
2.2.3	Arguments class C: Flexibility and continual update of weights	3	35 - 37
2.2.4	Arguments class D: Approximation of superlative indices	4	38 - 41
2.2.5	Arguments class E: SNA on deflation using chained Fisher indices	1	42
2.3	Laspeyres-Paasche-Gap [LPG] (or "Paasche-Laspeyres-Spread")	1	43
2.3.1	Monotonous movement of prices (and quantities)	7	44 - 50
2.3.2	Cyclical movement of prices (oscillating prices)	2	51 - 52
2.3.3	Some theoretical observations (Hill)	2	53 - 54
3.	Chain indices: shortcomings and problems		
3.1	List of arguments against chain indices (overview)	1	55
3.2	Poor theoretical background of chain indices (overview)	1	56
3.2.1	"Classical" interpretations do not apply: expenditure ratio and mean of relatives	5	57 - 61
3.2.2	Implicit assumptions: chainability contradicts updating of weights	2	62 - 63
3.2.3	Is the most recently observed basket also the most relevant basket?	1	64
3.2.4	Is the Divisia index a theoretic underpinning of chaining?	2	65 -66
3.3	Poor axiomatic properties of chain indices	9	67 - 75
3.4	Aggregation properties: Aggregation over commodities and over time	1	76
3.4.1	Aggregation over commodities: Quantity indices (direct and chain)	5	77 - 82

3.4.2	Differences between chain indices: Nonlinearity in prices p_t	3	83 - 85
3.5	Path dependence and drift function (Overview)	1	86
3.5.1	Definition of the drift function; determinants of drift	5	87 - 91
3.5.2	Numerical example for "bouncing" prices (five cycles)	5	92 - 96
3.5.3	More about drift, LPG and covariances	3	97 - 99
3.6	The notion of "pure" price/quantity comparison	5	100- 104
3.7	Summary of the critique of chain indices	4	105-108
	References	2	109-110

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Problems with Chain Indices (II)


Aggregation ("additivity") and Deflation

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List of slides ECB part II

Implementation, Aggregation and Deflation

section	topic	nos	slides
**	Structure of part II	1	2
4.	Chain indices everywhere: The triumph of "chainers"		
4.1	European Union		
4.1.1	HICP, formula, regulations on weights and problems	4	3 - 6
4.1.2	Projects and discussions concerning the HICP	7	7- 13
4.1.3	Europe: other indices: fixed assets, PIM and chaining	3	14 - 16
4.2	Other countries: CPI + C-CPI (USA) Study of Greenlees + Williams	5	17 - 21
4.3	Experiences, empirical findings	2	22 - 23
5.	Aggregation and "additivity"		
5.1	Types of aggregation and usage of the term " additivity	4	24 - 27
5.2	Additivity and linear indices		
5.2.1	The notion of linearity (definition, relevance)	1	28
5.2.2	Theorem of L. v. Bortkiewicz on linear indices and drift	3	29 - 31
5.3	Fisher's "ideal" index is far from ideal	3	32 - 34
6.	Deflation		
6.1	Task and types of deflation, and "double deflation"	4	35 - 38
6.2	Properties of volumes at previous year prices		
6.2.1	Different notions of "volume"	2	39 - 40
6.2.2	Volume at previous year prices and decomposition of their growth rates	2	41 - 42
6.3	Criteria for good deflation	8	43 - 50
6.4	Direct and chain price indices as deflators	1	51
6.4.1	Direct Paasche and direct Fisher	1	52
6.4.2	Direct Paasche, additivity and a process of eternal recurrence	6	53 - 58
6.4.3	The sequence of volumes	2	59 - 60
6.5	How to deal with non-additivity of volumes		
6.5.1	SNA, ESA and the U.S. BEA (Bureau of Economic Analysis) on non-additivity	5	61 - 65
6.5.2	Solution of Hillinger	2	66 - 67
6.5.3	Additive volumes and chain index deflation (Balk' solution)	5	68 - 72
6.5.4	Balk' solution: critique and a numerical example	4	73 - 76
**	References		77



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Problems with Chain Indices (III)

**Quarterly National Accounts (QNA) and
Annual National Accounts (ANA)**

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List of slides ECB part III

QNA and ANA

section	topic	nos	slides
**	Structure of part III	2	1-3
7	Chainlinking in QNA		
7.1	Overview of methods and general principles	11	4 - 14
	Why special methods? (4-5), Evaluation criteria (6-10), Characteristics of the numerical example (11-14)		
7.2	Steps common to all three methods	7	15 - 21
	Concepts of volume (15-16), some calculations (17-20), the reference basis for the links (21)		
7.3	Indices for quarters and years (formulas for links and levels)	1	22
7.3.1	Annual overlap (AO)	4	23 - 26
7.3.2	Quarterly overlap (QO)	5	27 - 31
7.3.3	Over the year (OY)	4	32 - 35
7.4	Results and comparisons with traditional methods; overview: the next steps	1	36
7.4.1	Synopsis of methods: quarterly indices (inclusive of volumes at constant prices), several graphs of time series	6	37 - 42
7.4.2	Annual indices	2	43 - 44
7.4.3	Quarterly (rather than annually) chained quantity (volume) indices	3	45 - 47
7.4.4	Numerical example of the IMF Manual	5	48 - 52
7.4.5	Simulations of Eurostat (graphs taken from Kuhnert)	3	53 - 55
7.5	Time series and comparisons: Overview	1	56
7.5.1	Annual overlap (AO)	4	57 - 60
7.5.1 (x)	Digression: Contribution to growth rates	4	61 - 64
7.5.2	Quarterly overlap (QO)	4	65 - 68
7.5.3	Over the year (OY)	2	69 - 70
7.5.4	Chained indices and other indices	3	71 - 73
7.6	Final evaluation of the three methods	4	74 - 77
**	References	1	78

For this part we have got a special formula handout