Session 2: External trade indices

Unit value indices vs price indices: Pros and Cons of collection methods

- **1. Sources of information**
- **2. Unit value vs specific price indices**
- **3. Comparison of indices in the EU**
- **4. Way forward**

1. Data sources

2 main possible sources of information:

- Customs data ➔ Unit Value Indices (UVI)
- Enterprise-based price surveys - Survey of transactions ➔ Specific price Indices (SPI)

Other used practices:

- Specific sources for some products (quotations): electricity, water, petroleum, gas …
- Proxies: PPI, CPI…
- Partner countries (mirror price indices)

2. Unit values vs. specific prices

2.1.a Advantages of unit values

- Low cost: basic data already available
- Exhaustive coverage
- Value based on real transaction prices

2. Unit values vs. specific prices

2.1.b Problems with unit values

Main issues:

- Lack of detail and heterogeneity of items at the lowest level of the product classification

  Example of refrigerators (UNSD "Strategies for the Measurement of External Trade Indices" –1981…)

	small			Medium			Large			All sizes		
Period	q	p	v	q	p	v	q	p	v	q	p	v
Initial	5	1	5	3	2	6	2	3	6	10	1,7	17
Current	2	2	4	3	4	12	5	6	30	10	4,6	46

➔ **Overstatement of price increase by unit value of 35%**

- Quality changes not taken into consideration

2. Unit values vs. specific prices

2.1.b Problems with unit values

Other issues:

- Changes in the product classification (HS)
- Misreporting of values (e.g., transfer pricing not detected by Customs)
- Misreporting of quantities
- Consignments with mixed products
- *Arbitrary definition of outliers detection rules*
- *Sensitivity to outliers detection process*
- [Within the EU: absence of intra-EU customs data, missing quantities,…]

2. Unit values vs. specific prices

2.1.b Problems with unit values : lack of harmonisation between countries

	UNIT VALUE INDEX	VOLUME INDEX
Belgium	Paasche	Laspeyres
Denmark	Fisher (chained)	Fisher (chained)
France	Paasche (chained)	Laspeyres
Germany	Paasche (IVU)	Laspeyres
Greece	Paasche	Laspeyres
Ireland	Fisher	Fisher
Italy	Fisher	Fisher
Netherlands	Fisher (IVU)	Fisher
Portugal	Paasche (chained)	Laspeyres
Spain	Paasche (chained)	Laspeyres
United Kingdom	Laspeyres	Laspeyres
…		
EUROSTAT	Fisher (chained)	Fisher (chained)

2. Unit values vs. specific prices
2.2.a Advantages of price surveys

- Precise definition of products
- Quality changes can be taken into consideration
- Low volatility of outputs

2. Unit values vs. specific prices
2.2.b Problems with price surveys

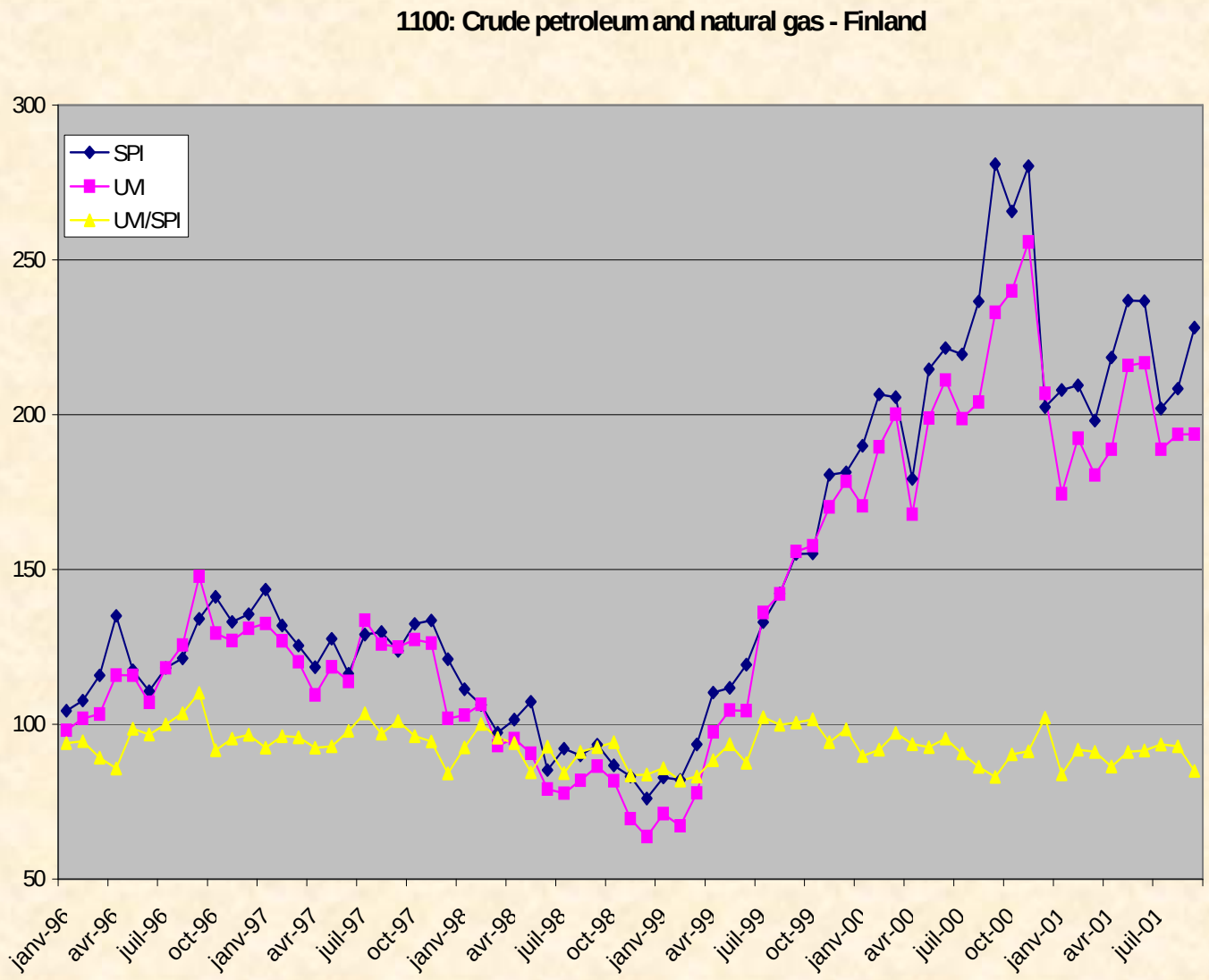
- Sampling scheme must ensure a good coverage and representativeness (traders, products)
- Size of sample (traders, items) and sampling errors
- Definition of the value (eg. for exports: FOB value, basic price, invoice value…)
- Quoted prices may differ from real transaction prices
- Price of purchase (imports) often more difficult to collect than price of sale
- Higher volatility of import flows
- Estimation of weights
- Resource and cost

3. Comparison UVI/SPI on EU data

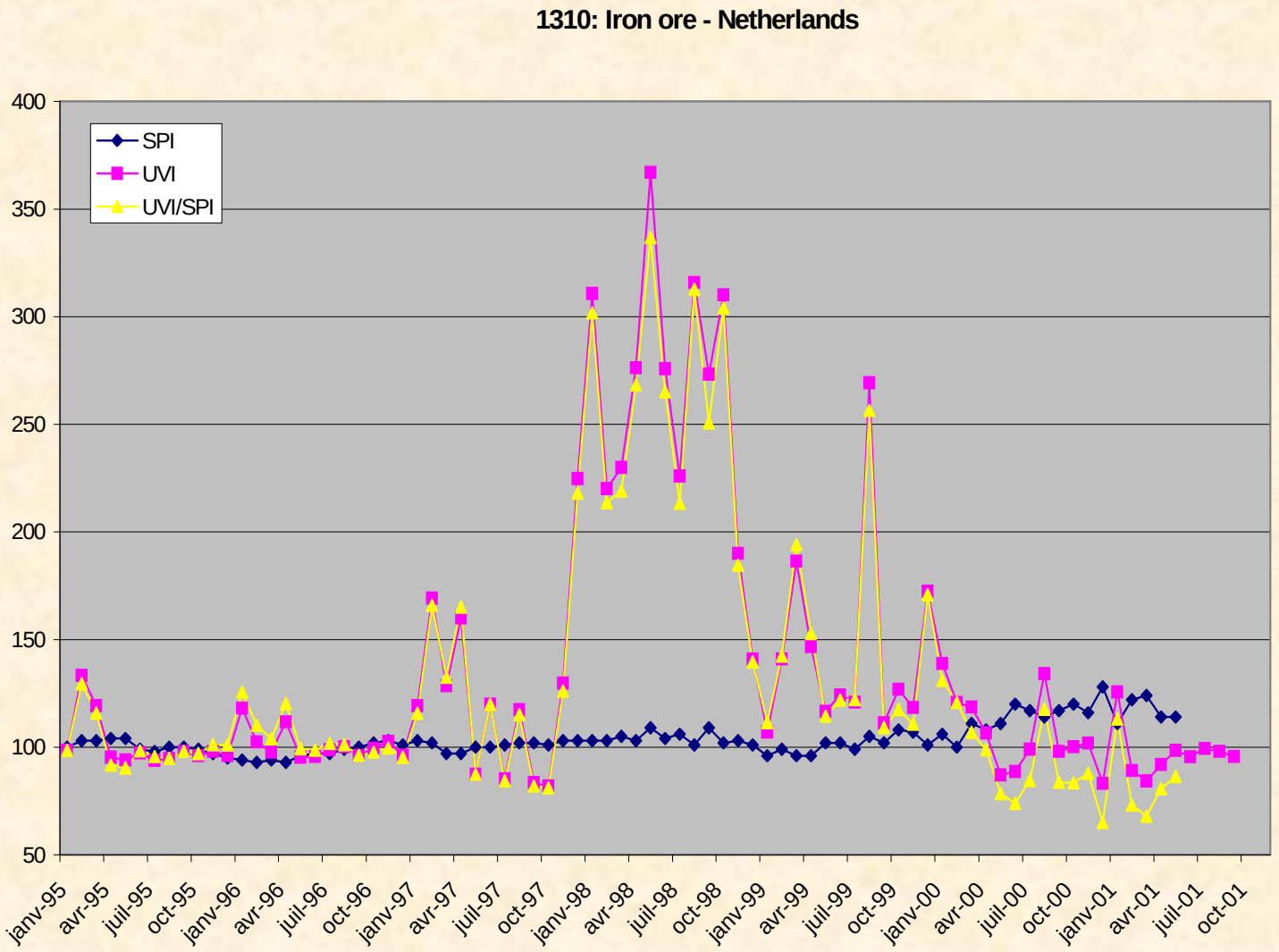
3.1. The study

- Study carried out by Eurostat on the basis of data provided by 4 Member States computing both kind of indices (prior to the 2005 EU legislation)
- Datasets: Monthly data on Imports with SPIs and UVIs; CPA 3 digits (close to CPC)
- Methodology: SPIs as a reference
- Measures: ratio UVI/SPI, discrepancy, variability / instability

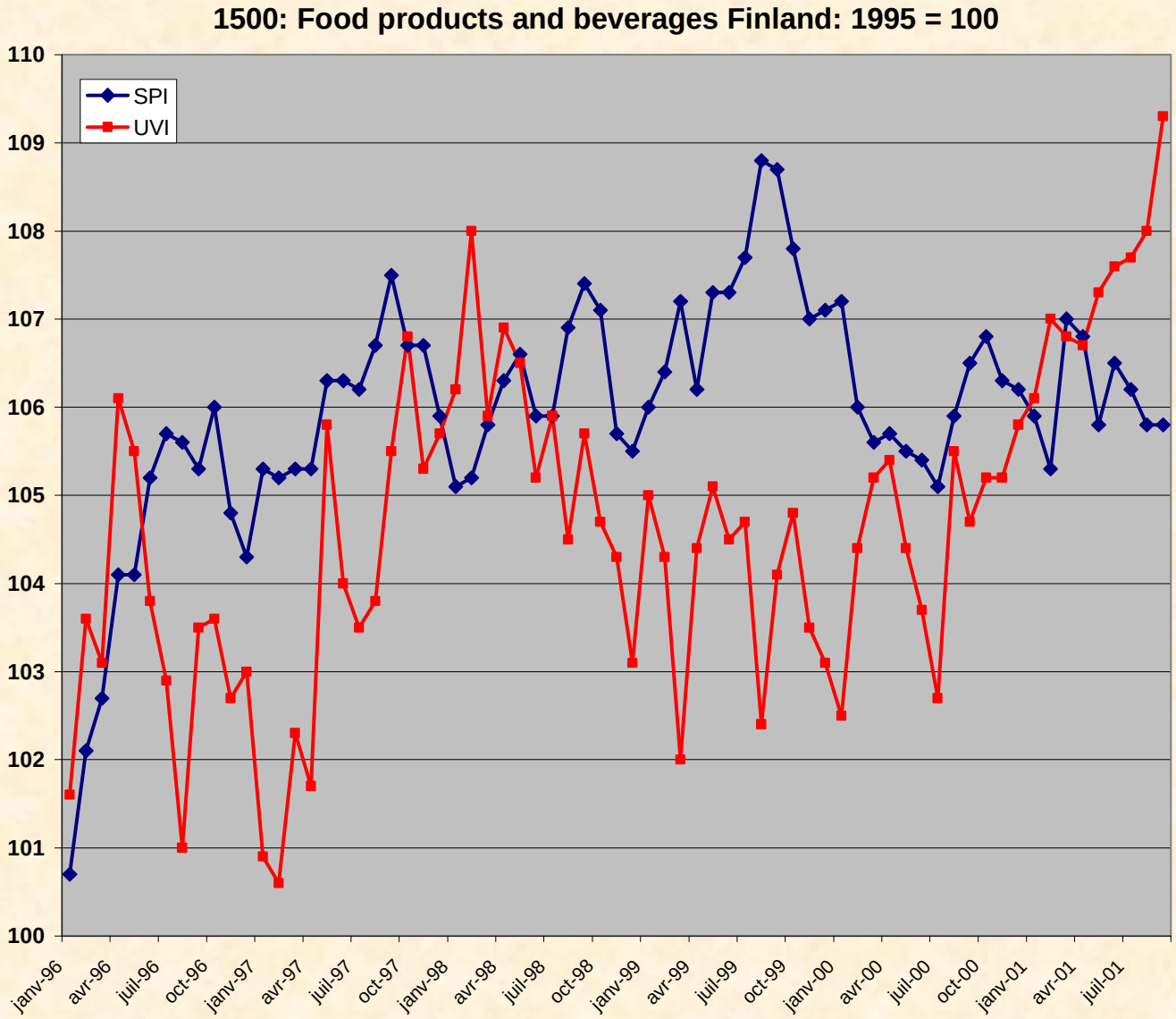
Pros and Cons of various collection methods



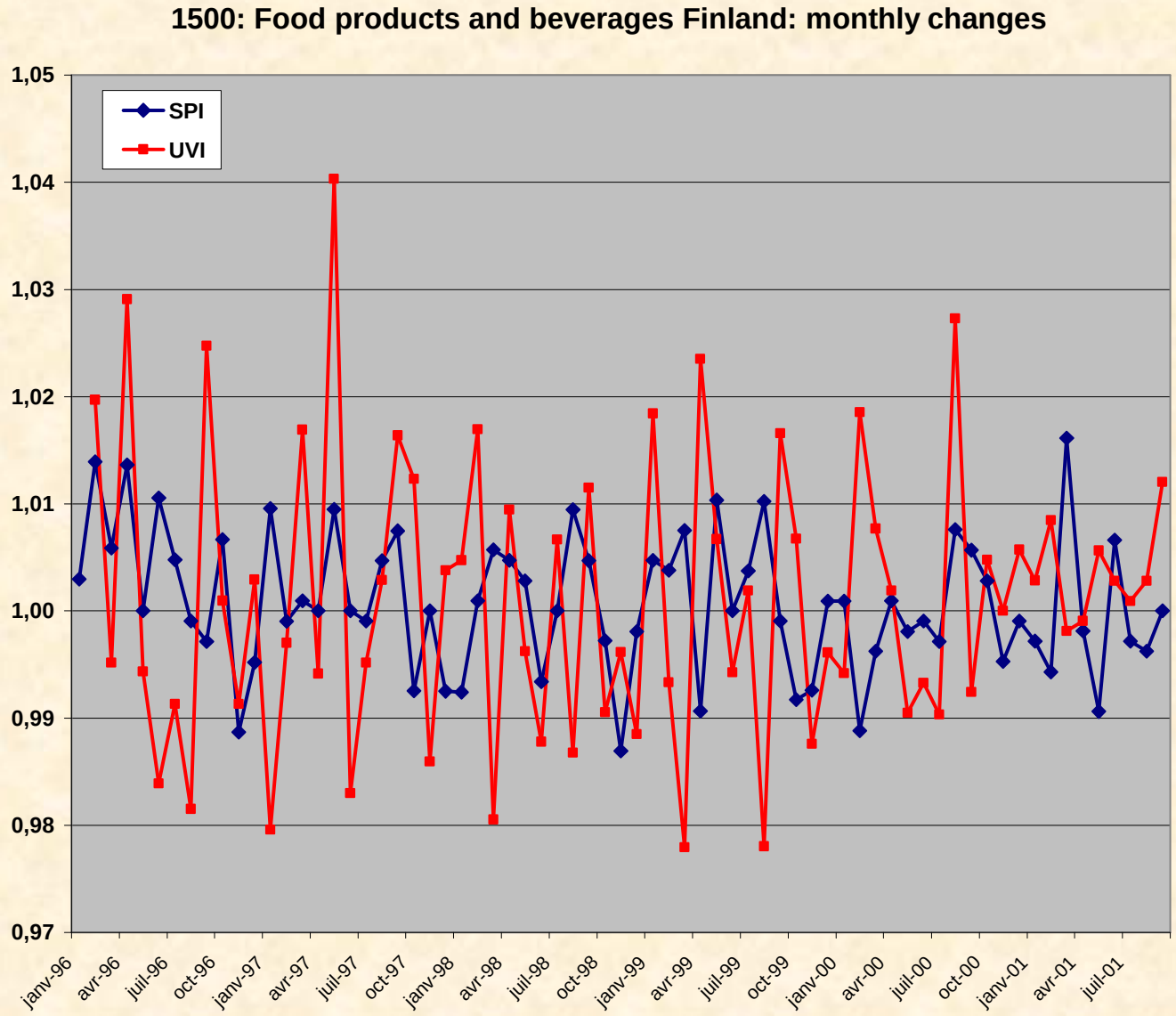
Pros and Cons of various collection methods



Pros and Cons of various collection methods

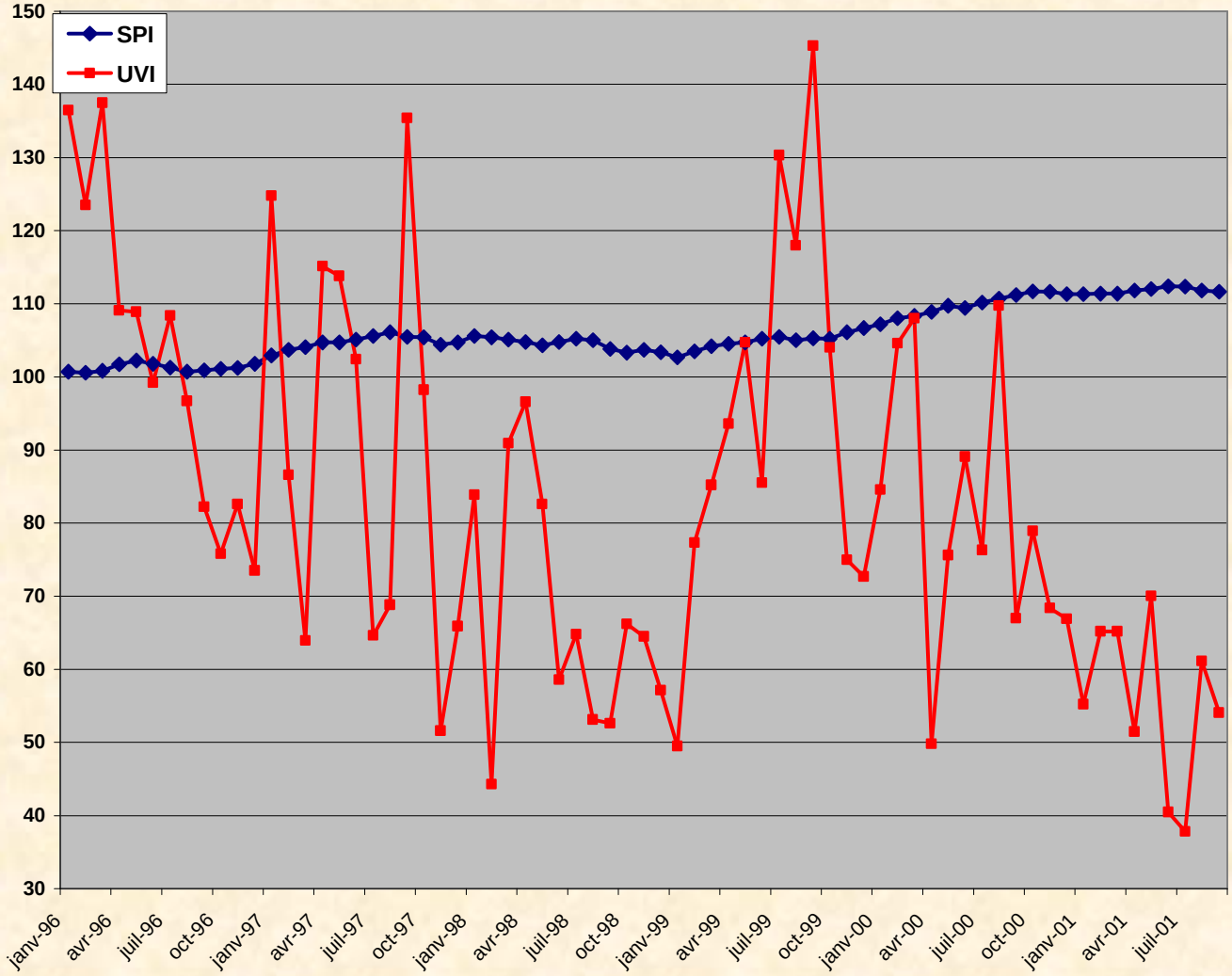


Pros and Cons of various collection methods



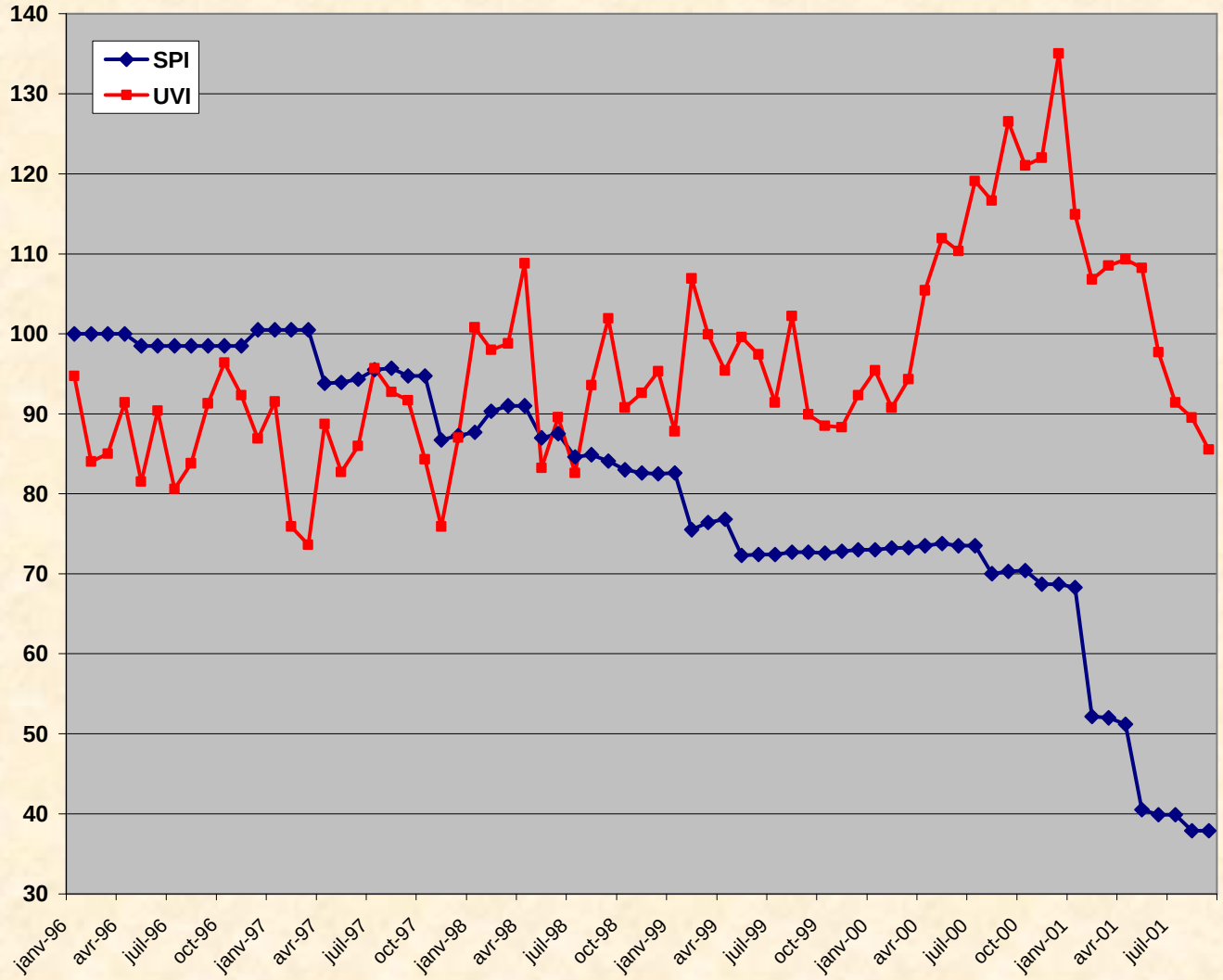
Pros and Cons of various collection methods

2830: Steam generators, except central heating hot water boilers, Netherlands: 1995 = 100

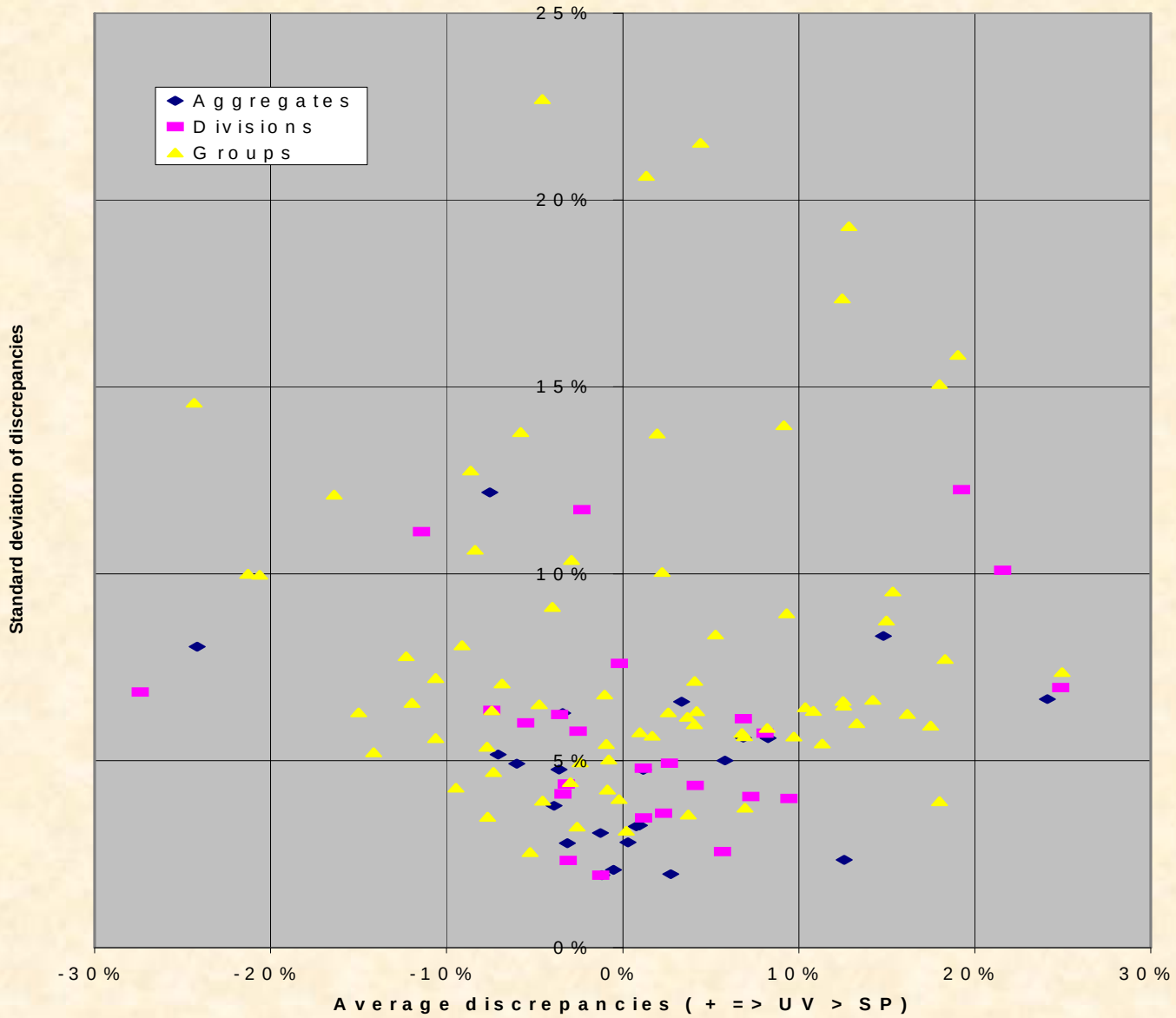


Pros and Cons of various collection methods

3220: TV and radio transmitters & apparatus for line telephony & line telegraphy, Finland: 1995 = 100



Pros and Cons of various collection methods



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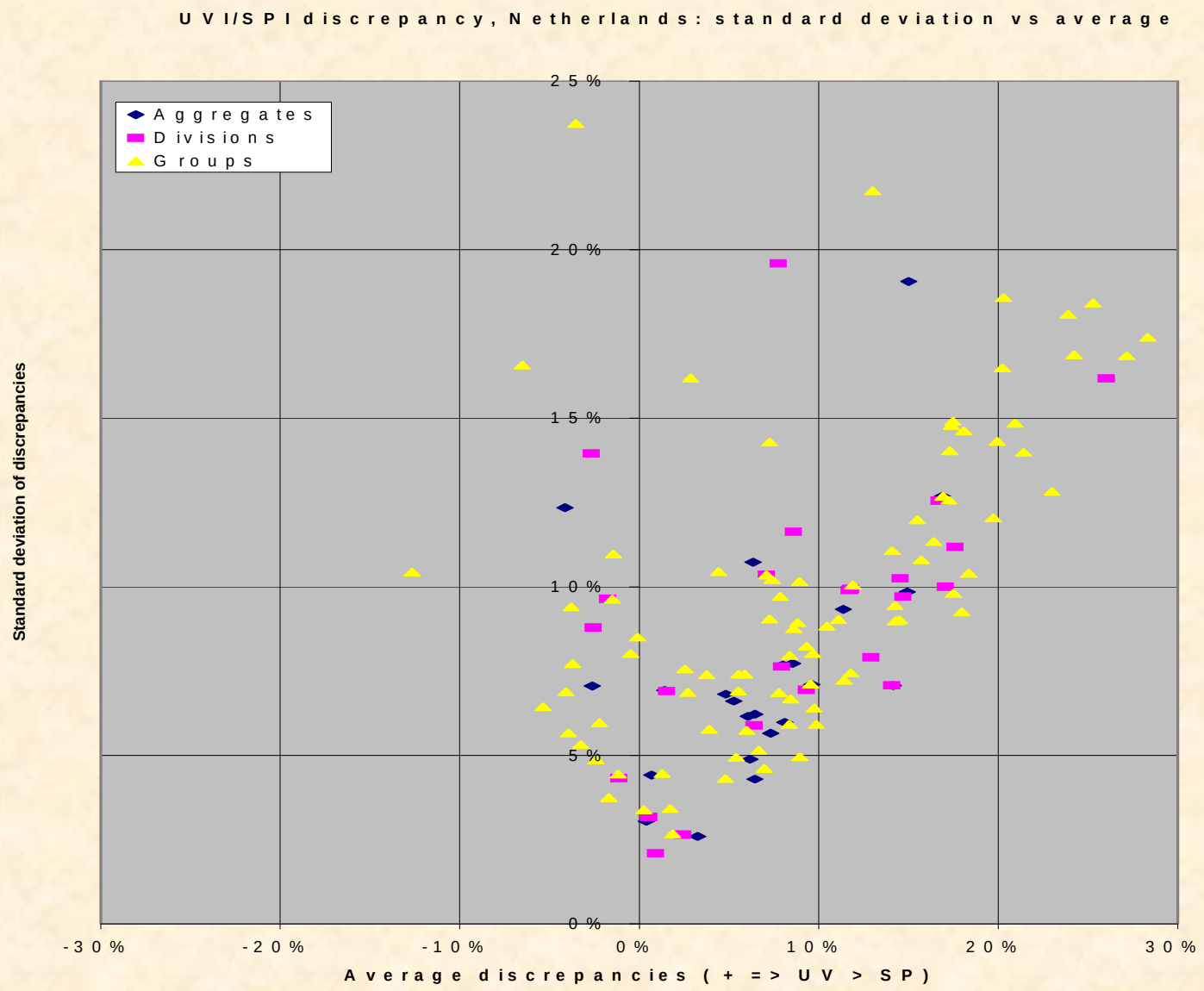

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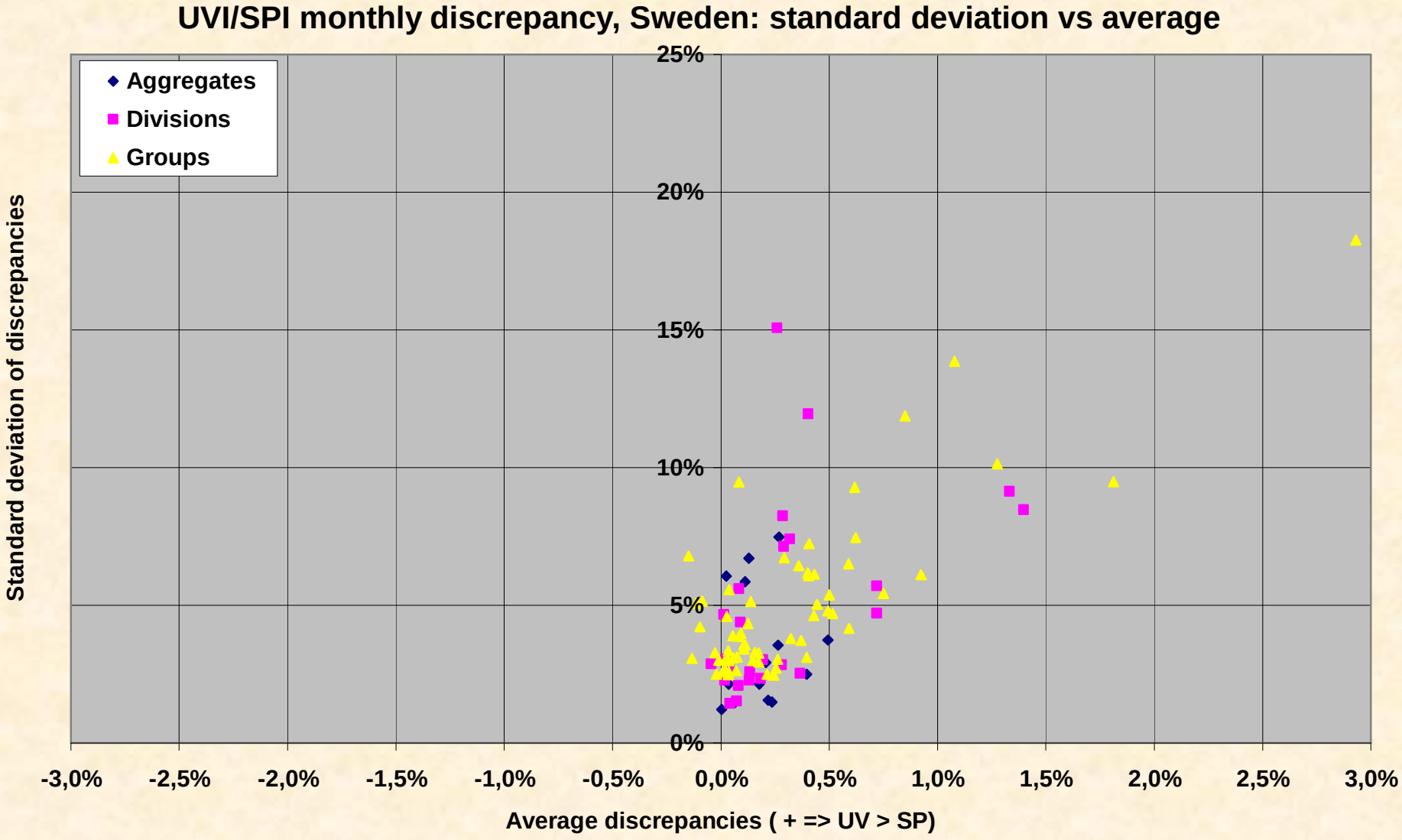

Normalised average standard deviation of monthly, quarterly, annual and pluriannual UVI / SPI discrepancies by product

Green:	< 2 %	Blue:	2 to 4 %	Black:	4 to 8 %	Red:	> 8 %

Code	Divisions and groups	Month	Quar-ter	Annual	Whole period
1000	Coal, lignite & peat	22,4%	18,1%	12,1%	7,5%
1010	Coal	21,9%	14,6%	8,2%	5,7%
1020	Lignite	78,2%	40,8%	22,4%	2,1%
1030	Peat	39,9%	31,7%	21,6%	17,4%
1100	Crude petroleum & natural gas	24,2%	17,0%	11,9%	3,2%
1110	Crude petroleum & natural gas	22,0%	16,8%	13,3%	4,3%
1300	Metal ore	50,7%	38,6%	27,4%	7,9%
1310	Iron ore	61,8%	58,4%	42,9%	4,1%
1320	Non-ferrous metal ores, except uranium and thorium ores	37,1%	26,9%	18,1%	4,3%
1400	Other mining and quarrying materials	18,4%	13,0%	7,8%	3,9%
1410	Stone	33,0%	23,4%	13,9%	30,5%
1420	Sand & clay	19,6%	13,6%	9,0%	2,3%
1430	Chemical and fertilizer minerals	33,3%	20,7%	9,7%	5,3%
1440	Salt	68,0%	48,7%	20,7%	13,4%
1450	Other mining and quarrying materials n.e.s.	27,4%	19,3%	10,8%	8,4%
1500	Food products and beverages	5,2%	3,8%	3,2%	1,6%
1510	Meat & meat products	12,6%	10,3%	6,7%	1,1%
1520	Fish & fish products	13,9%	12,5%	10,2%	8,0%
1530	Fruit and vegetables	11,3%	9,2%	6,5%	5,1%
1540	Vegetable and animal oils and fats	16,6%	13,0%	11,0%	15,4%
1550	Dairy products	9,1%	6,4%	4,1%	2,7%
1560	Grain mill products, starches and starch products	10,1%	6,7%	4,4%	3,3%
1570	Prepared animal feeds	21,3%	16,2%	10,3%	5,5%
1580	Other food products	9,2%	7,9%	6,6%	3,9%
1590	Beverages	17,4%	12,6%	6,7%	13,3%

Normalised average standard deviation of monthly, quarterly, annual and pluriannual UVI / SPI discrepancies by product

Green:	< 2 %	Blue:	2 to 4 %	Black:	4 to 8 %	Red:	> 8 %

3200	Radio, television and communication equipment & apparatus	22,0%	17,0%	13,3%	20,8%
3210	Electronic valves & tubes & other electronic components	40,5%	29,8%	21,5%	15,1%
3220	TV & radio transmitters & apparatus for line telephony & line telegraphy	33,4%	24,9%	20,7%	49,0%
3230	TV & radio receivers, sound or video apparatus & associated goods	22,7%	15,3%	11,4%	7,8%
3300	Medical, precision and optical instruments, watches & clocks	17,5%	12,1%	7,4%	7,4%
3310	Medical & surgical equipment & orthopaedic appliances	29,1%	19,0%	11,1%	8,9%
3320	Precision instruments, except industrial process control equipment	24,5%	16,5%	9,2%	9,8%
3340	Optical instruments & photographic equipment	39,1%	25,3%	15,1%	6,3%
3350	Watches and clocks	70,4%	47,0%	23,5%	8,3%
3400	Motor vehicles, trailers and semi-trailers	7,8%	5,4%	3,5%	0,7%
3410	Motor vehicles	8,8%	5,6%	3,8%	1,4%
3420	Bodies (coachwork) for motor vehicles; trailers & semi-trailers	19,9%	12,9%	8,9%	6,6%
3430	Parts & accessories for motor vehicles & their engines	14,5%	11,2%	6,3%	3,0%
3500	Other transport equipment	52,1%	29,1%	18,6%	11,4%
3520	Railway & tramway locomotives & rolling stock	95,8%	72,1%	35,9%	23,4%
3530	Aircraft and spacecraft	126,6%	70,1%	47,5%	21,8%
3540	Motorcycles and bicycles	18,9%	12,6%	7,2%	5,1%
3550	Other transport equipment n.e.s.	39,3%	29,2%	24,5%	4,0%

3.2. Results (1)

- Stability
  - ☞SPIs more stable than UVIs
  - ☞Monthly UVIs often very unstable
  - ☞More discrepancies on the short-term than on the long-term
- Aggregation level
  - ☞less discrepancies at aggregated levels
  - ☞low-discrepancy product groups differ among MS

3.2. Results (cont'd)

- Technological levels – for high tech products
  - ☞more short-term discrepancies
  - ☞long-term systematic upward bias of UVIs
- Eurostat vs. national UVI data:
  - ☞sensitivity to methodology (detail, outliers)

3.2. Results (cont'd)

Overall conclusions of the study:

- Any list of product categories for which UVIs are a priori acceptable as proxies for SPIs would be very short, especially as regards monthly data. It would include almost only aggregates and raw materials,
- Apparently, any list of product categories for which short-term UVIs are acceptable proxies for SPIs seems country-specific.
- For a few low-tech products, for which quality changes are slow, UVI changes over the long term (several years) may be acceptable proxies for SPIs

3.3 Consequences in the EU

➔ Changes introduced in 2005 in the EU legislation on short term statistics:

- the following variable is added to paragraph 1: "**Import prices**"

- The information on output prices for non-domestic markets (No 312) and import prices (No 340) may be compiled using unit values for products originating from foreign trade or other sources **only if there is no significant deterioration in quality compared to specific price information**. The Commission shall determine, in accordance with the procedure laid down in Article 18, the conditions for assuring the necessary data quality.

➔ **Most of EU countries have introduced surveys** to measure import/export price indices, at least for industrial goods (hybrid indices).

4. The way forward (1)

Strategies for the Measurement of External Trade Indices (UNSD 1981)
Strategies for compiling index numbers (part VI)

1. Limited Budget
   a) Unit Value Indexes – detailed Customs data – selection of "stable" items - data screening
2. Average Budget
   a) Unit Value Indexes – sophisticated data editing
   b) Commodity specialists – possible use of a variety of sources to fill the gaps
3. Large Budget
   a) sophisticated Unit Values and Price surveys (dual or combined strategy)
   b) Commodity specialists

4. The way forward (2)

- a. More detailed specification for UVI ?
  - Country of origin or destination
  - Point of export / import
  - Size of shipment
  - Individual trader

4. The way forward (3)

- b. Different formulas?
- c. Improving data editing?
  - Lack of benchmark
  - The risk of discarding all large price changes, even real ones…
  - Cooperation between countries?
- d. Hybrid solutions… (EU countries)
- e. What about services ?

- Thank you