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# Purchasing Power Parities and their Uses

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# Upfront...

PPPs are not a concept that is immediately and easily grasped by users (everything is relative, unclear links with national accounts and national price indices). This has generated a fair bit of mis-understandings

→ PPPs are used for purposes for which they are not suited

→ PPPs are not used even when they are the right concept

# Contents

- 1. What are PPPs?**
- 2. Uses of PPPs**

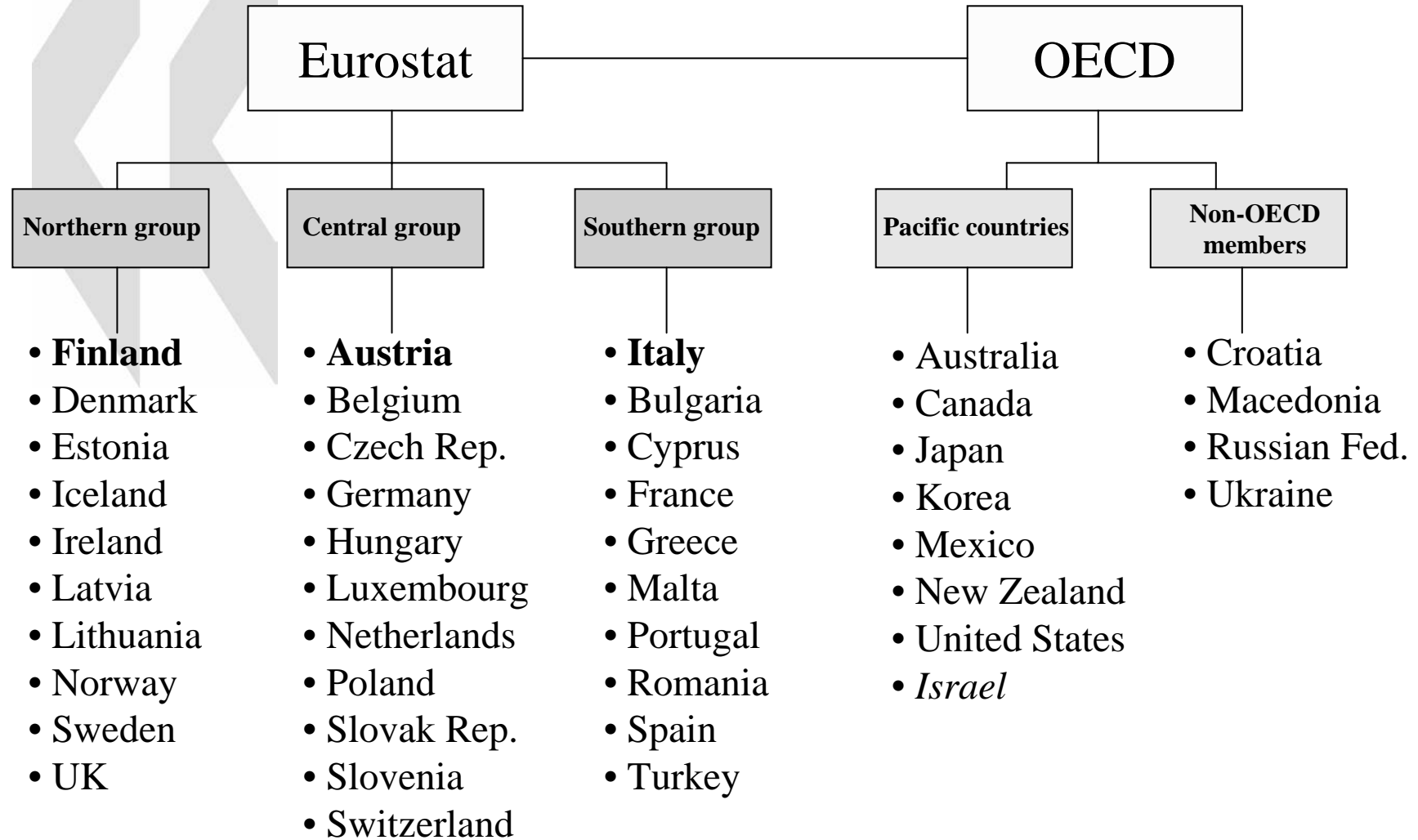
# 1. What are PPPs?

- PPPs are spatial price indices
- Just as temporal price indices allow one to make real/volume comparisons in time, PPPs are designed to make real/volume comparisons in space or across countries
- OECD/Eurostat PPPs are price indices that relate to the expenditure side of GDP
- Weights for aggregation are provided by National Accounts

# Why not market exchange rates?

- Market exchange rates are currency price relatives but not spatial price indices of GDP or its main components
- Market exchange rates reflect relative prices of tradables, capital and investment flows
- Only under very restrictive assumptions will there be convergence between PPPs and exchange rates

# The organisation of the PPP programme



## 2. Uses of PPPs: a traffic light approach

1. Areas where PPPs are well placed

2. Areas where PPPs may be used but with limitations

3. Areas where PPPs should not be used

## Areas where PPPs are well placed

### **Main indicators:**

1. Volume comparisons of GDP
  - GDP per capita
  - GDP per hour worked
  - Size of economies
2. Comparisons of relative price levels

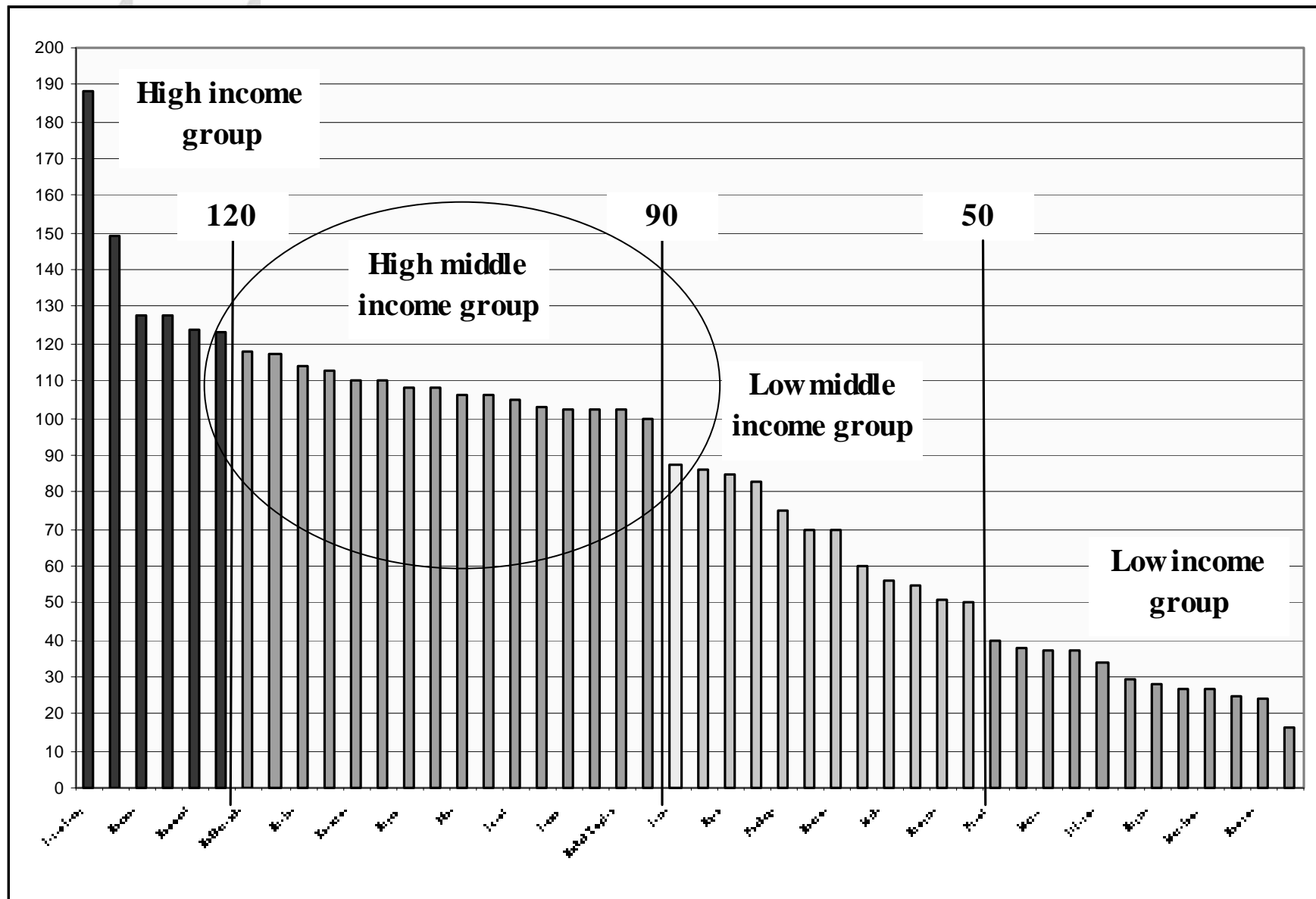


# GDP per capita

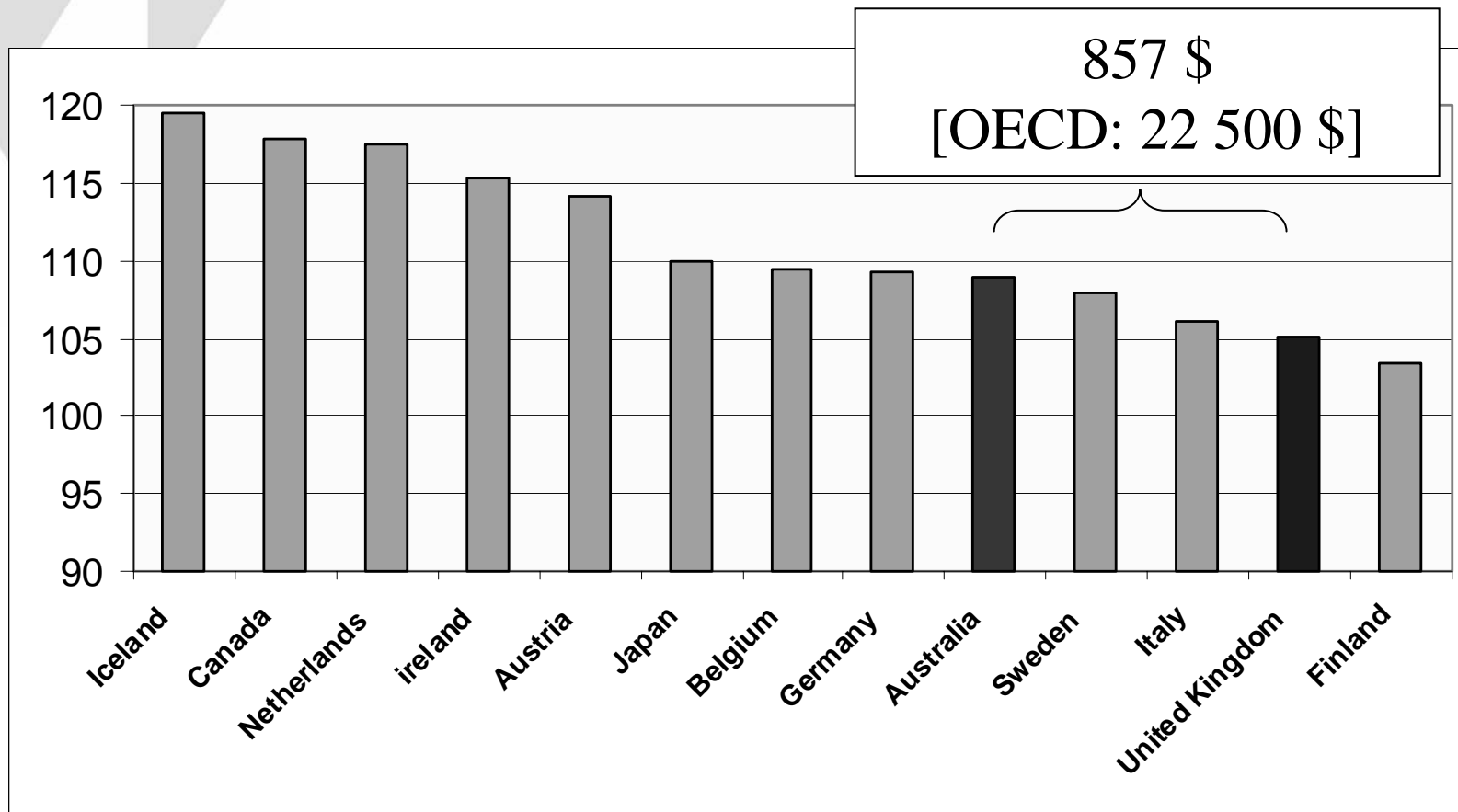
## Generally: compare with care...

- PPPs are a useful instrument but with limited precision
- Small differences between countries should not be over-interpreted
- Results may change due revisions in GDP and population data
- Example: GDP per capita across OECD countries

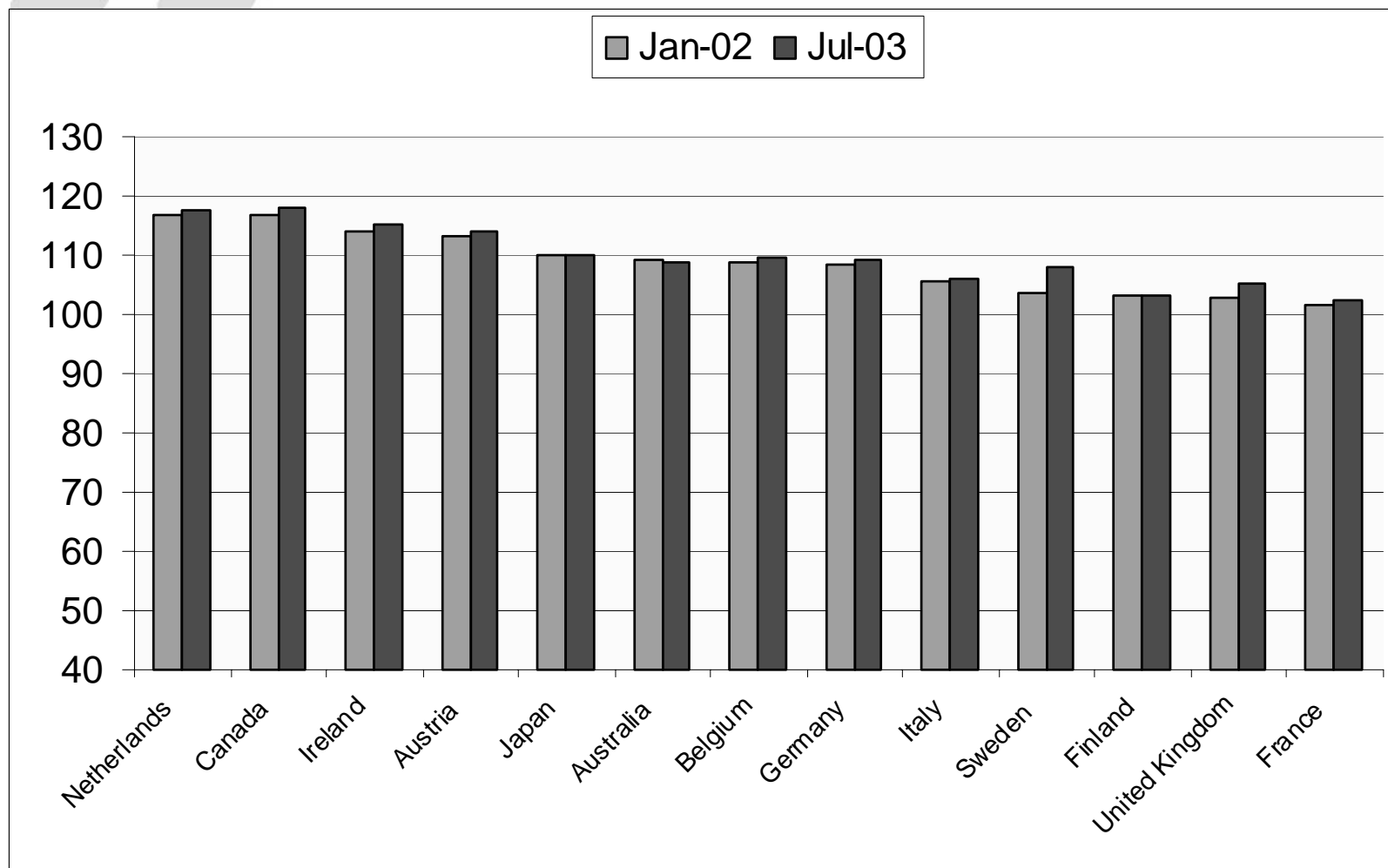
# 1999 'Benchmark' Results: GDP/head



# 1999 Results: High middle income group (Information set: December 2003)

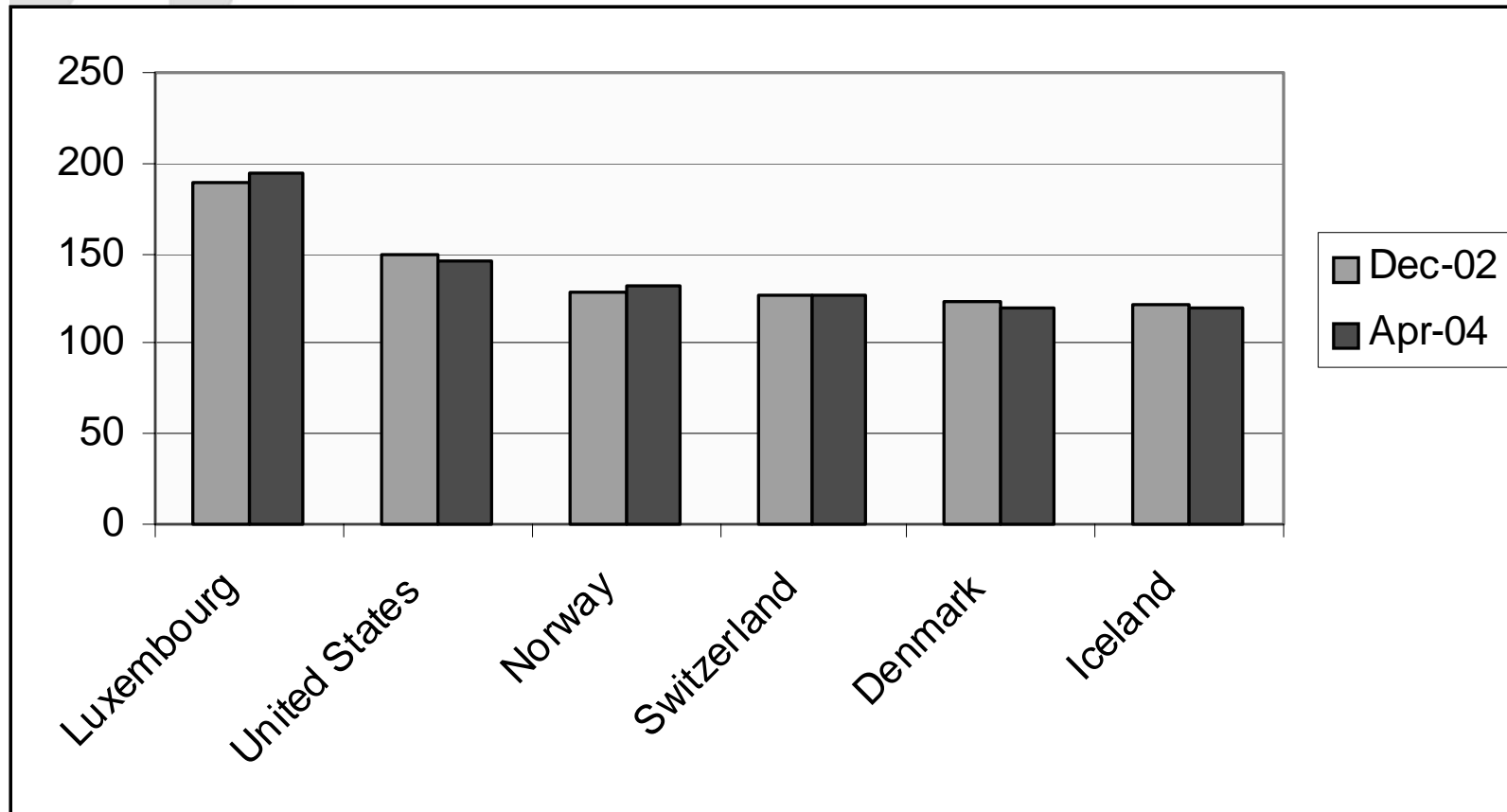


# 1999 Results: High middle income group under two information sets



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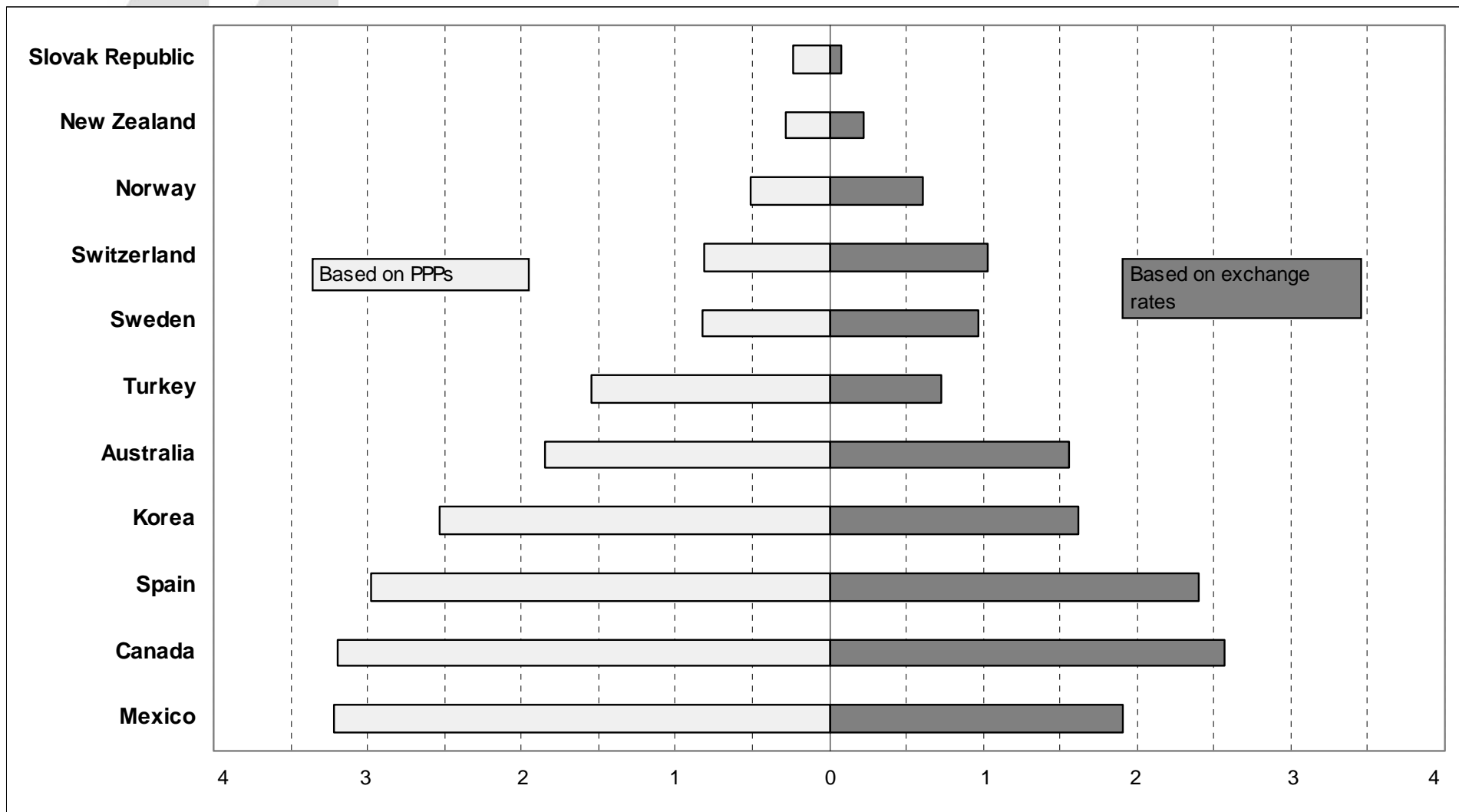
## 1999 Results: High income group under two information sets: small effects of PPP and GDP revisions



# GDP per capita

- A measure of output, and with some reservations, a measure of economic well-being (NDP per capita and PPPs for NDP?)
- EU: allocation of structural funds
- Analysis: GDP per capita/GDP per hour worked
- Statistics: zone totals

# Size of economies



# Comparative price levels (1)

CPL is intuitively familiar to any international traveller: comparison between the relative prices of the same product at home and abroad and the market exchange rate.

Example:

- Swiss traveller pays hotel room in Paris: 100 EUR
- Traveller's calculation whether this is "expensive" or not:  
Convert 100 EUR into CHF with market exchange rate, say 0.67EUR/CHF:  $100 \text{ EUR} / (0.67 \text{ EUR/CHF}) =$   
**150 CHF**
- Take price of an equivalent hotel room in Bern.



## Comparative price levels (2)

- If the equivalent hotel room there costs 200 CHF, the traveller will perceive the price level for hotels in Bern as high compared to Paris.
- Thus, travelling in France is 'inexpensive' if the PPP for hotel rooms ( $100 \text{ EUR}/200 \text{ CHF}=0.5 \text{ EUR/CHF}$ ) is less than the exchange rate ( $0.67 \text{ EUR/CHF}$ ) and vice versa.
- Comparative price level  $\text{FRA/SWI} = \text{PPP (EUR/CHF)}/\text{Exchange rate (EUR/SFR)}$
- Thus, CPL varies with exchange rates
- This has to be kept in mind whether observing CPLs over time

# Comparative price levels (3)

A look at Switzerland

Swiss and German price levels compared to the United States...

## CPLs

	2001	2002	2003
Switzerland	115	123	138
Germany	89	93	110
USA	100	100	100

## Exchange rates

CHF/USD	1.687	1.557	1.347
EUR/USD	1.117	1.061	0.885 <sub>8</sub>

# Areas where PPPs may be used but with limitations

- Cost of living index across countries
- Time series analysis of relative GDP per capita
- Analysis of price convergence

# Cost of living index yes, but...

- Relative price level of actual final consumption
  - For average consumption patterns of resident population
- *Not* normally appropriate for expatriates

# Time series analysis of relative GDP or price levels (1)

- Take the Swiss per capita GDP relative to that of the OECD area in 1996
- Multiply that measure by the rate of GDP growth for Switzerland relative to that of the OECD area between 1996 and 1999 and divide by the relative population growth
- Surely, the resulting GDP per capita index for Switzerland for 1999 corresponds to the one that comes directly out of the 1999 survey?

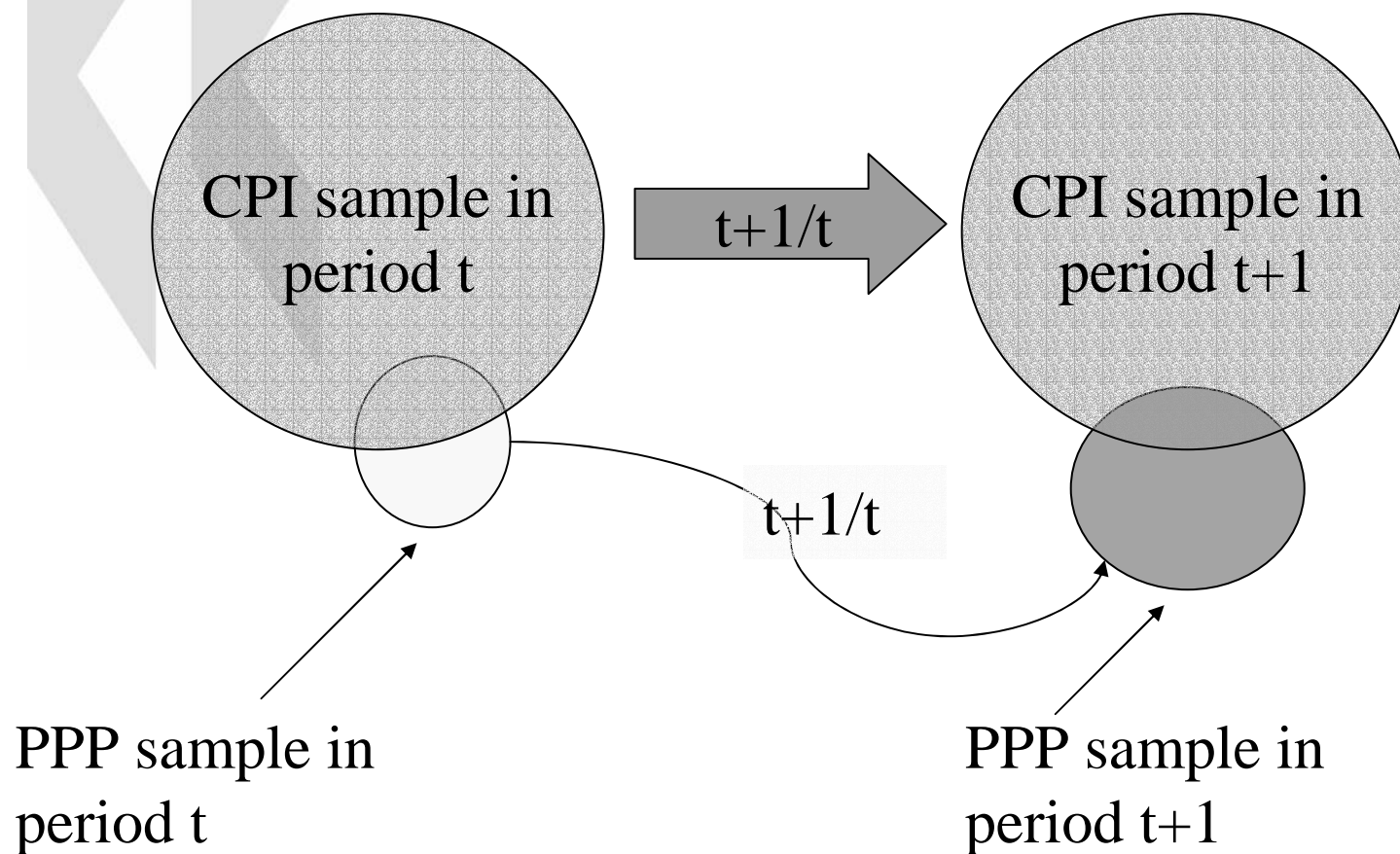
# Time series analysis of relative GDP or price levels (2)

- Unfortunately, no. And this is a source of much discussion
- Even more so as this is what policy makers want to know: where does my country stand relative to others and how has its position evolved over time?
- Why are there differences?

# Time series analysis of relative GDP or price levels (3)

- The first calculation used fixed PPPs (*fixed* 1996 international prices)
- The second result comes from the 1999 survey and thus reflects *current* 1999 international prices
- One source of differences are thus changes in price structures
- But there are other sources. Here is an important one, the underlying samples

# Differences in samples: price indices underlying national accounts and PPPs





# Time series analysis of relative GDP or price levels

(4)

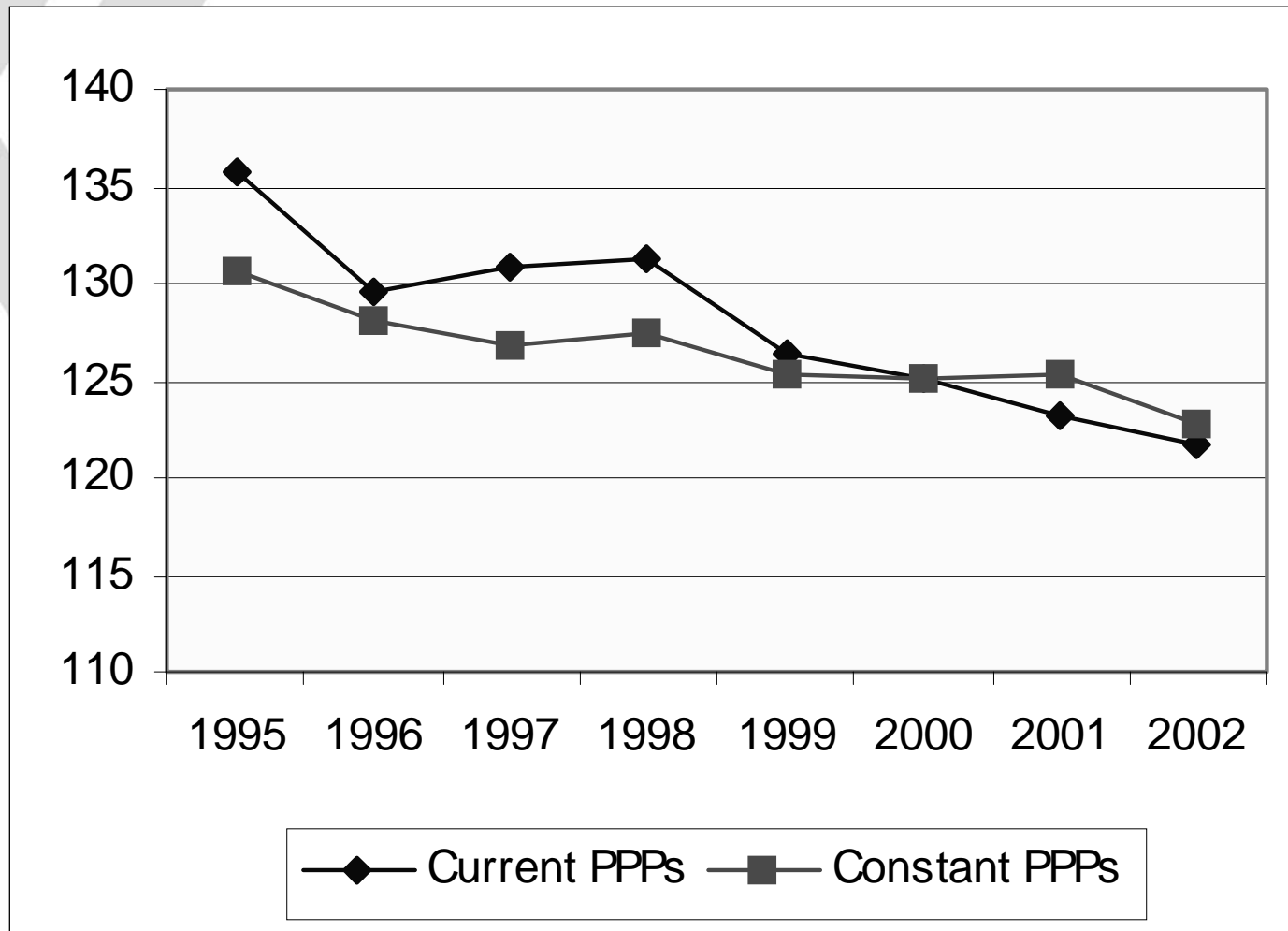
- PPP samples tend to be small and change over time: this makes the temporal comparison of price levels difficult. But PPP samples are conceived to maximise comparability of items across countries.
- Samples for temporal price indices tend to be larger and conceived to maximise comparability over time within a country. But they are not set up to deliver international comparability of items.
- Thus, when PPP samples change over time, it makes little sense to compare prices over time.

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# Time series analysis of relative GDP or price levels (5)

- OECD recommends constant PPPs for time-series comparisons, as long as the periods under consideration are not too long
- Note trade-off between advantage of national accounts consistency and disadvantage of imposing constant international price structure
- How about Switzerland, then?

# Switzerland's GDP per capita (OECD = 100)



## Analysis of price convergence

- In principle, the spread of prices over time can be used to make a statement about price convergence, in particular in the Euro area
- But: does not make sense for all products (e.g. non-tradeables) – special basket may be needed
- Also: small sample size in PPP surveys, such convergence cannot be measured at product level but this is where it should occur

## PPPs are not recommended...

1. As an indicator for the over- or under-valuation of a currency
2. As a precision tool to establish rankings between countries
3. As a measure to generate output and productivity comparisons by industry (unless there are industry-specific PPPs)
4. As a way of constructing national growth rates
5. As a 'volume' measure of exports or imports across countries

# Conclusion

- Care must be taken not to over-interpret results and not to use PPPs for purposes that they are not designed for
- But for all the health warnings, PPPs are an important – in fact the only - tool for price and volume comparisons across countries
- Want to know more?
- **<http://www.oecd.org/>**