Pressing measurement issues in the national accounts

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BETTER POLICIES FOR BETTER LIVES

By way of introduction

- Many of the pressing measurement issues arise from **broad shifts** in our economies
  - Globalisation
  - Interconnectedness of economies
  - Intangibles and knowledge assets and natural assets shaping competitive advantages
  - Need to embrace economic, social and environmental sustainability

By way of introduction (2)

Fairly pressing:

1. Understanding global production
2. Measuring financial wealth
3. Measuring intellectual wealth
4. Measuring land and natural resources

-Human capital: health and education output

In addition:

-Risk, financial services and what is the meaning of income anyway?

-Distribution: from production to welfare

1. Global Production

An analytical start: Trade in Value-Added

Global Value Chains

- **Traditional data on gross exports and imports may create misleading perceptions about role of trade**

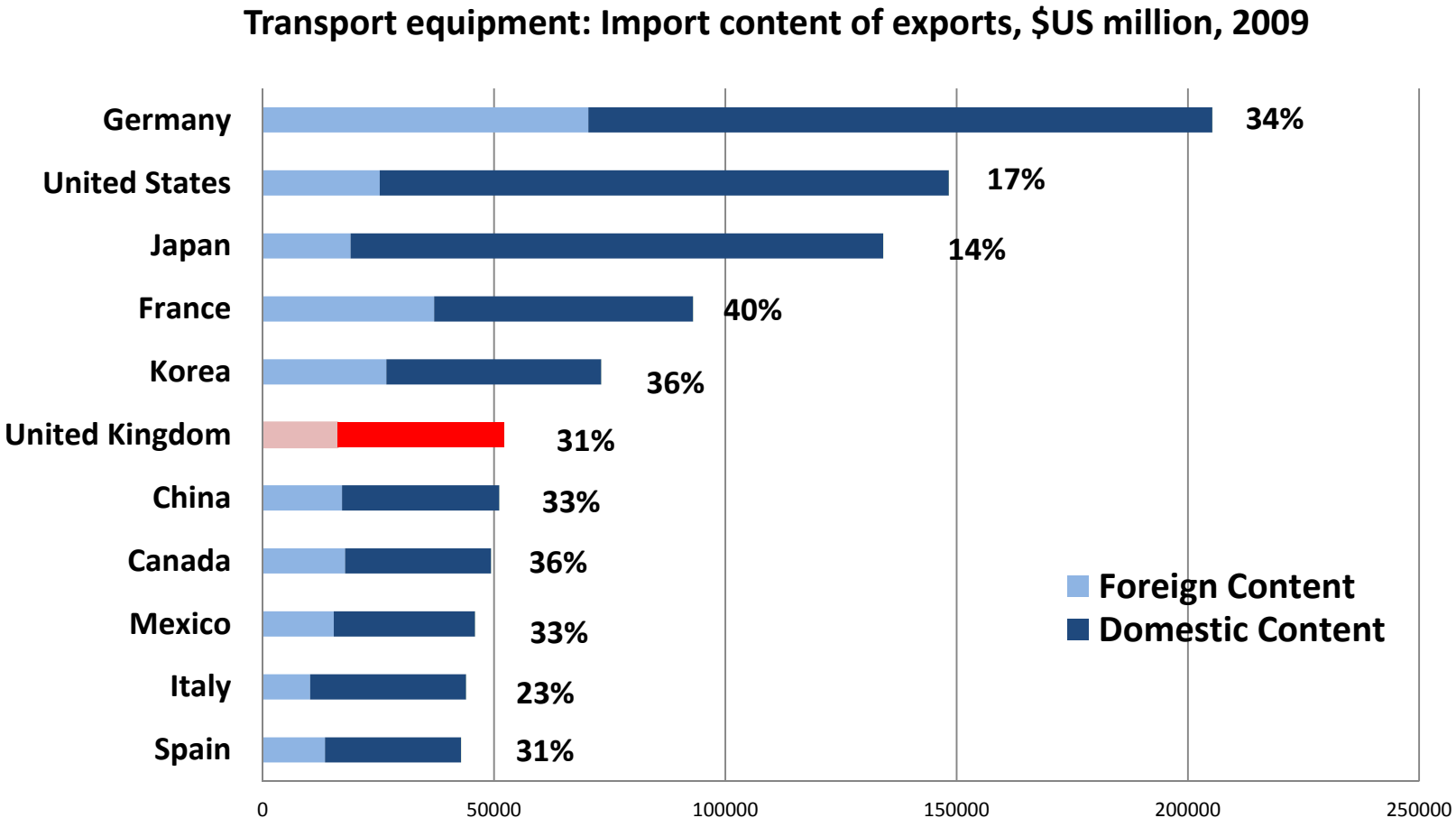
- **Gross Trade statistics**
  - typically reveal a low contribution to overall trade by the service sector (less than 25%), and
  - cannot reveal whose final consumers drive demand
  - cannot reveal where the creation of value-added (wages and profits) occurs

- **OECD's TiVA project tracks the direct and indirect flows of value-added associated with international trade**

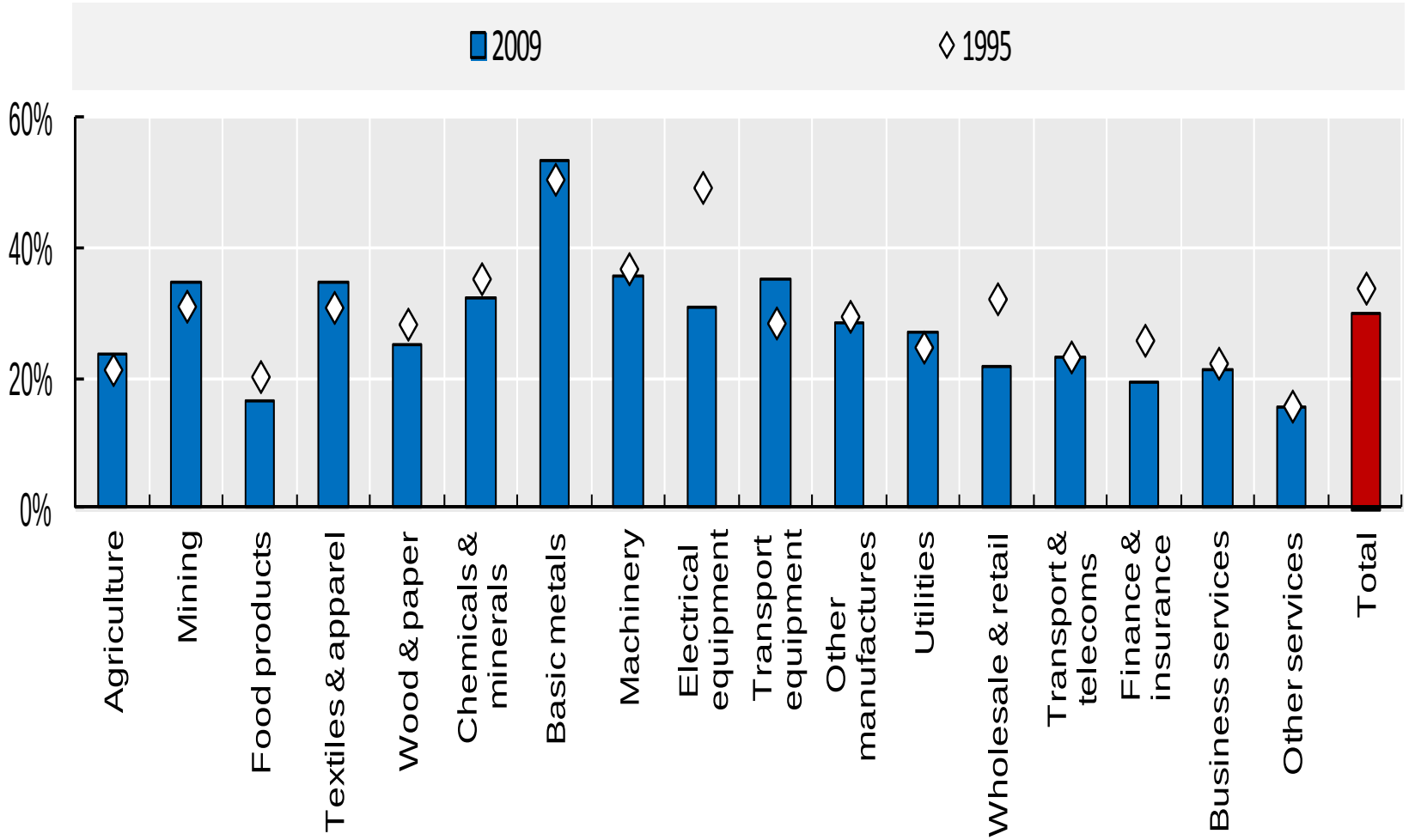
The statistical tools

- **Global IO Table for TiVA:**
  - 34 OECD countries + Brazil, China, India, Indonesia, Russia, South Africa + RoW
  - 18 industries
  - 2005, 2008, 2009
- **Dimensions: industries, countries, years**
- **Countries linked through bilateral trade data**

Example of results (1): import contents of exports



Example of results (2) intermediate imports used in exports - UK



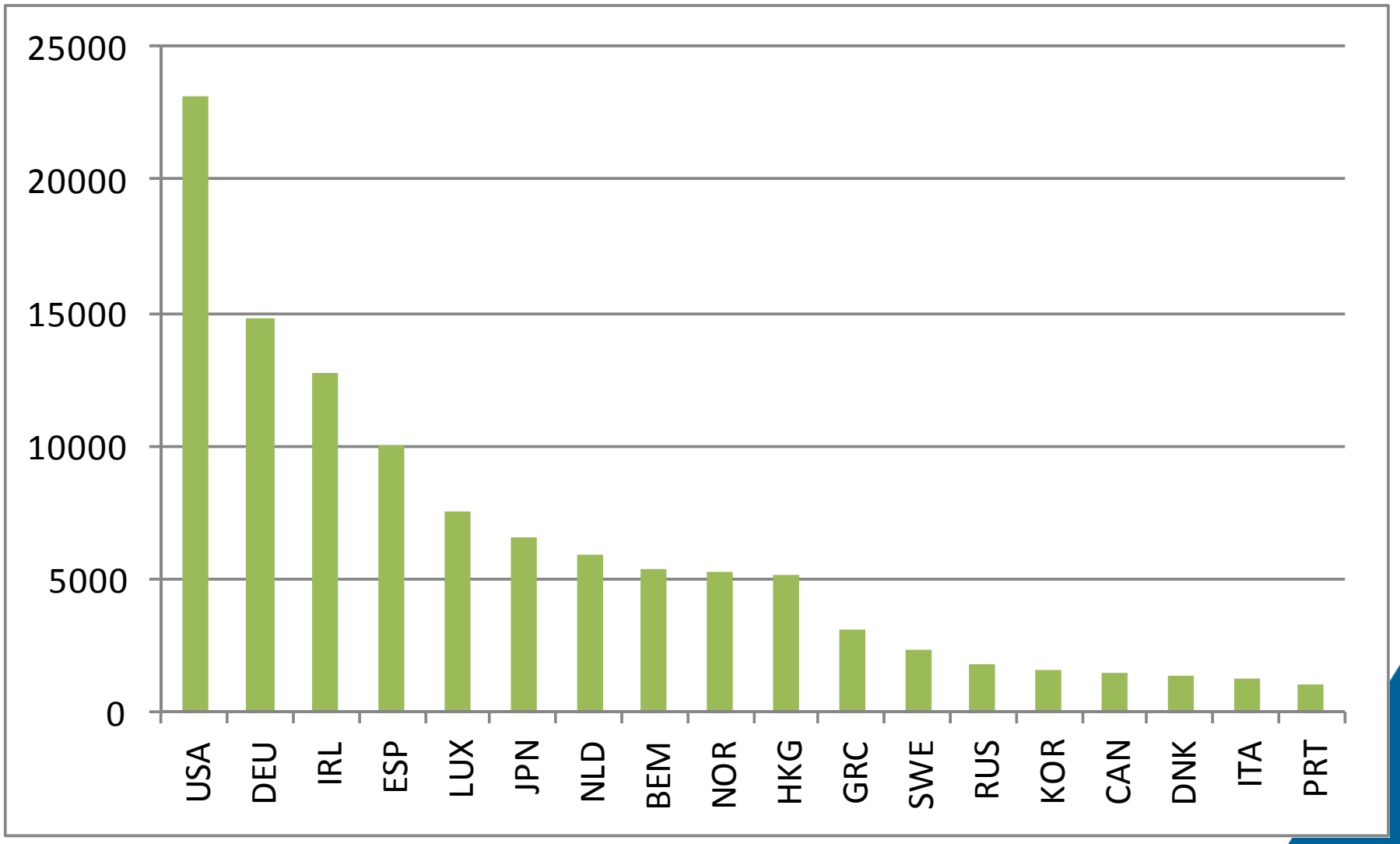
Statistical gaps become evident:

- **Strong assumptions**:
  - Import proportionality
  - Homogeneity within industrial sectors
- **Gaps:**
  - Inconsistent bilateral trade data
  - Import data not sufficiently disaggregated in SUTs
  - Deflators for intermediate consumption, services
  - Deflators for imports

Inconsistencies in bilateral trade in services statistics

Exports to U.K minus imports by U.K, 2009

Millions of USD



Thus, in response to globalisation, National Accounts need to advance on:

- Full integration of IOTs with NAs
- Improved base data:
  - intl. trade
  - services statistics
  - deflators
- Implementation of 2008 SNA rules on goods for processing
- R&D exports and imports (more to follow)

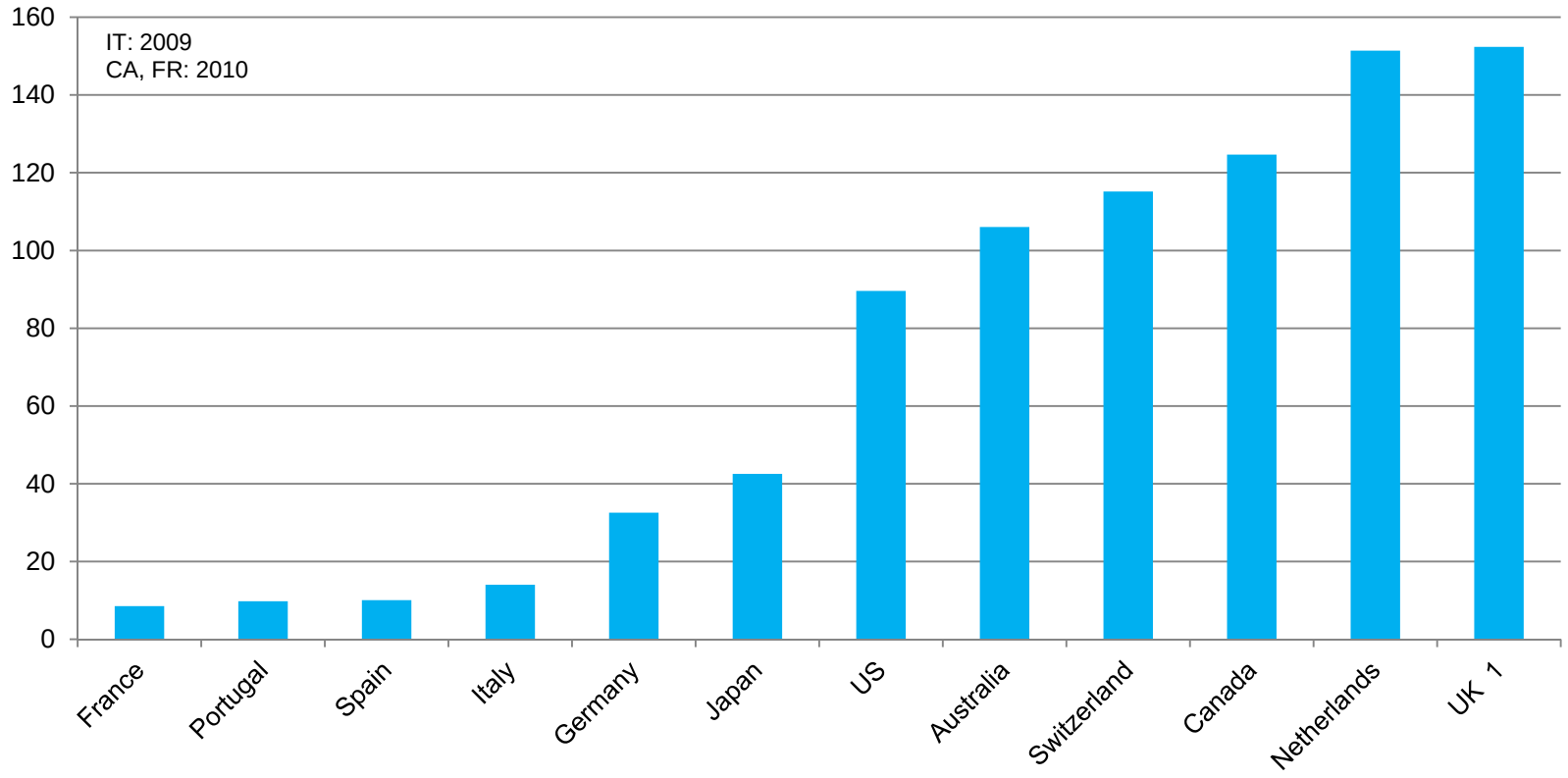
2. Measuring Financial Wealth

Pension liabilities

- **SNA 1993**: recognise pension liabilities only in 'private' schemes which are funded
- Problem: unfunded pension promises not recognised
- **SNA 2008**: from 'reserves' to 'entitlements': record all employment-related pension schemes in core accounts, funded & unfunded (some exceptions)
- Entitlement: financial claims of pensioners against their employer (SNA2008, p.629)

SNA 93 data: limited comparability

Households net equity in (funded) pension funds in 2011, % GDP



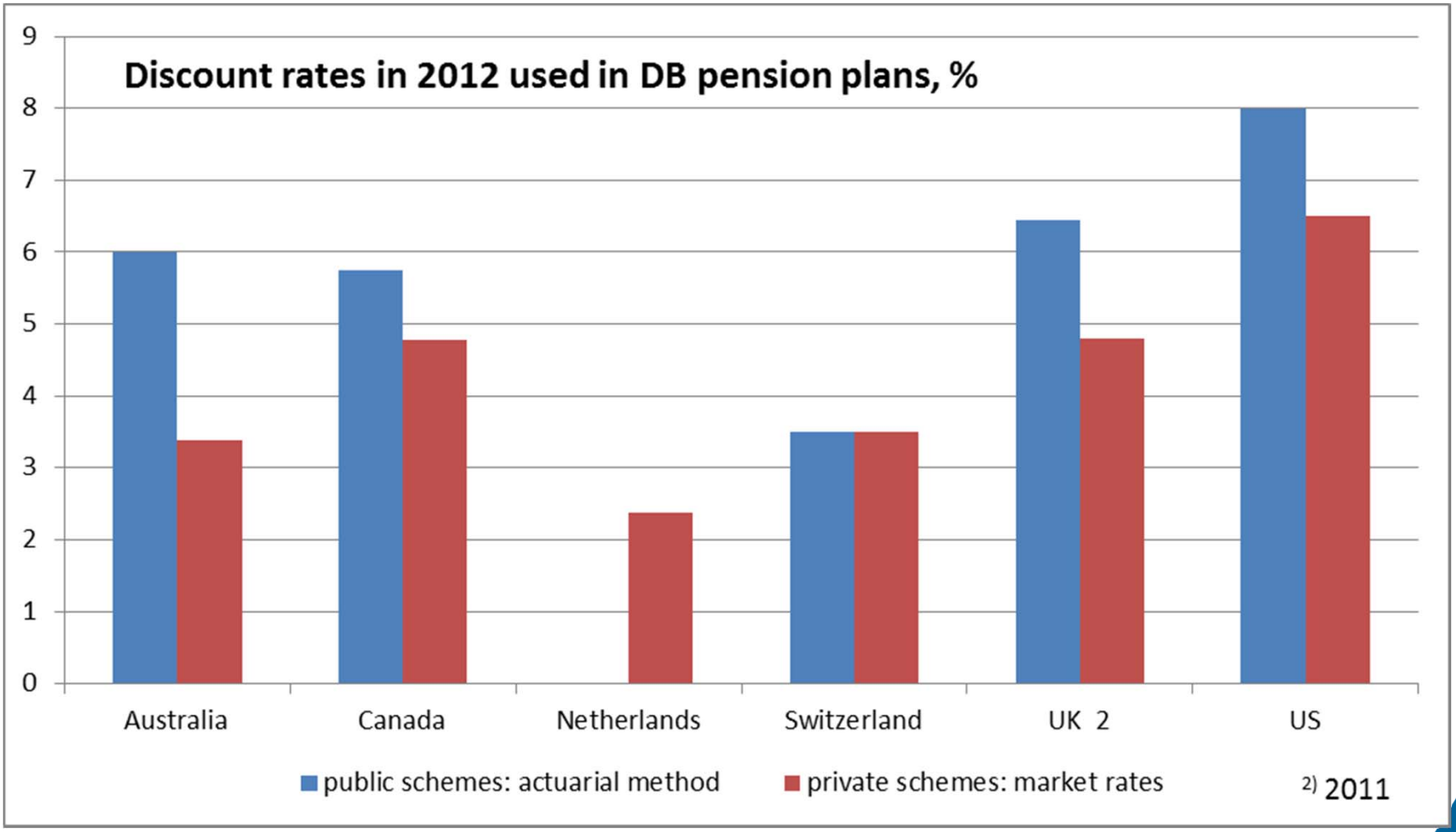
Source: van de Wal, presentation to 2013 OECD NAWP, based on OECD Financial statistics

[1] incl. life insurance

Measurement issues

- **Benefits approach:**
  - Projected benefit obligation
    - Assumes future compensation increases
  - Accumulated benefit obligation
    - Assumes benefit accumulations end on the valuation date
- **Choice of discount rate – how much harmonisation do we need?**
- Measurement of **non-core social security** and old age social assistance

Differences in discount rates



Source: van de Wal, presentation to 2013 OECD NAWP

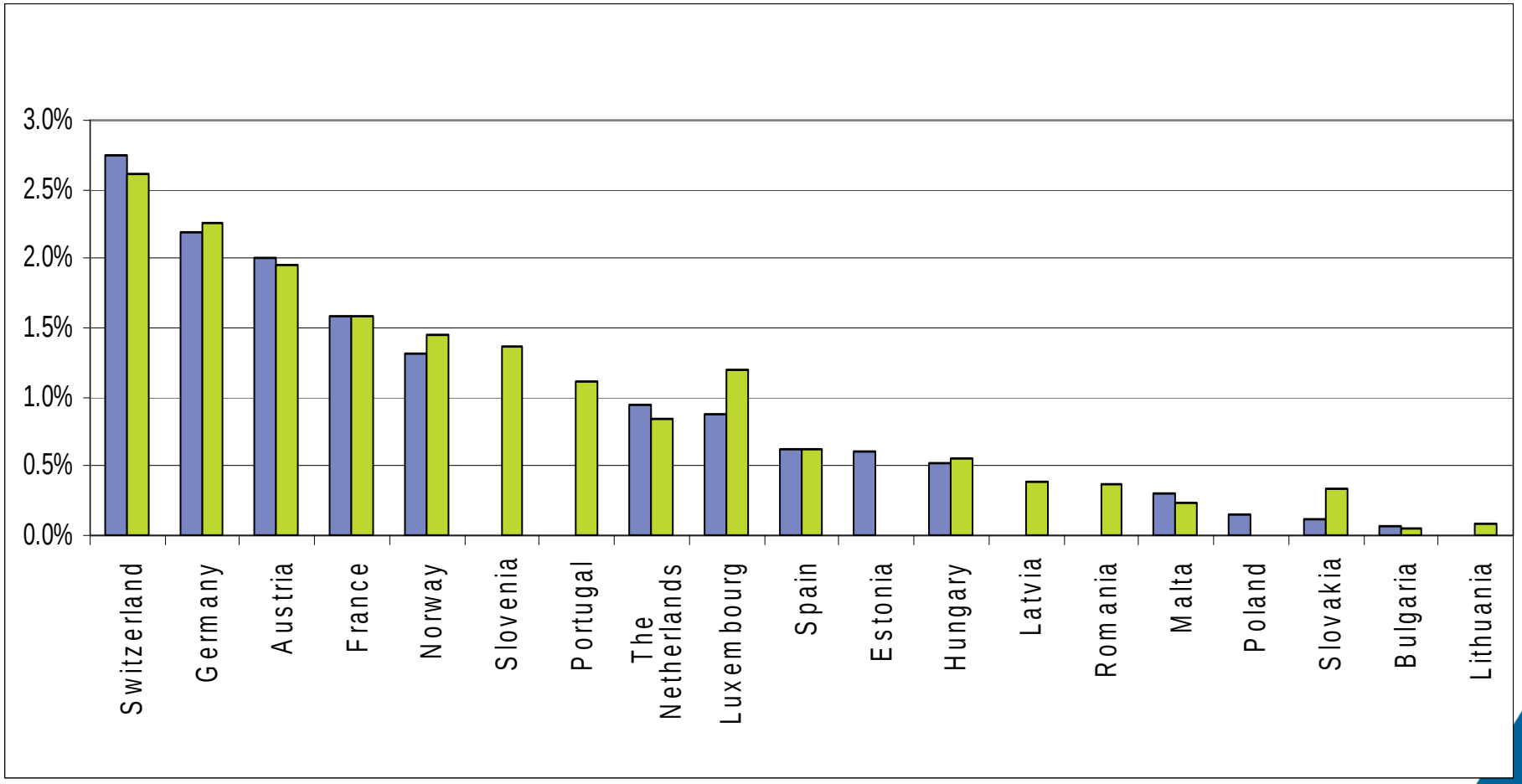
3. Measuring Intellectual Wealth

R&D Stocks

- SNA 2008: capitalisation of R&D
- Data on R&D expenditure are fairly well developed
- But measurment issues concerning:
  - R&D service lives
  - R&D deflator
  - R&D imports and exports
  - Licening fees: property income or payment for service?
- And in productivity measurement: is R&D just another 'K'?
- Or is the R&D asset a right to capture monopoly rents? (Diewert)

Country	Service life	Depreciation function	Mortality function
Austria	13 years (basic research)	Geometric	Delayed linear
	11 years (applied research)		
	9 years (experimental development)		
Belgium	10 years*	Geometric	Double-declining
Canada	6.2 years	Geometric	
Czech Republic	8 years	Linear	Log-normal
Denmark		Geometric	
Finland	Detailed information available by industry: range of 7 – 10 years.	Geometric	
Germany	Survey in progress, alternative is 10 years*	Linear	
Ireland	Work in progress		
Israel	Detailed information by industry available from a pilot study**	Linear	Truncated normal
Italy	10 years*	Geometric	Double-declining
The Netherlands	12 years (exc. Chemical and electronics)	Winfrey	Weibull
	15 years (chemical)		
	9 years (electronics)		
Norway	10 years*		
Portugal	10 years*	Linear	Delayed linear
Slovak Republic	Various		
Slovenia	10 years*	Geometric	Double-declining
Sweden	10 years*, additional work in progress	Geometric	
United Kingdom	4.6 years, additional work in progress	Geometric	Weibull

Impact of R&D capitalisation on GDP – in per cent of GDP – Preliminary results



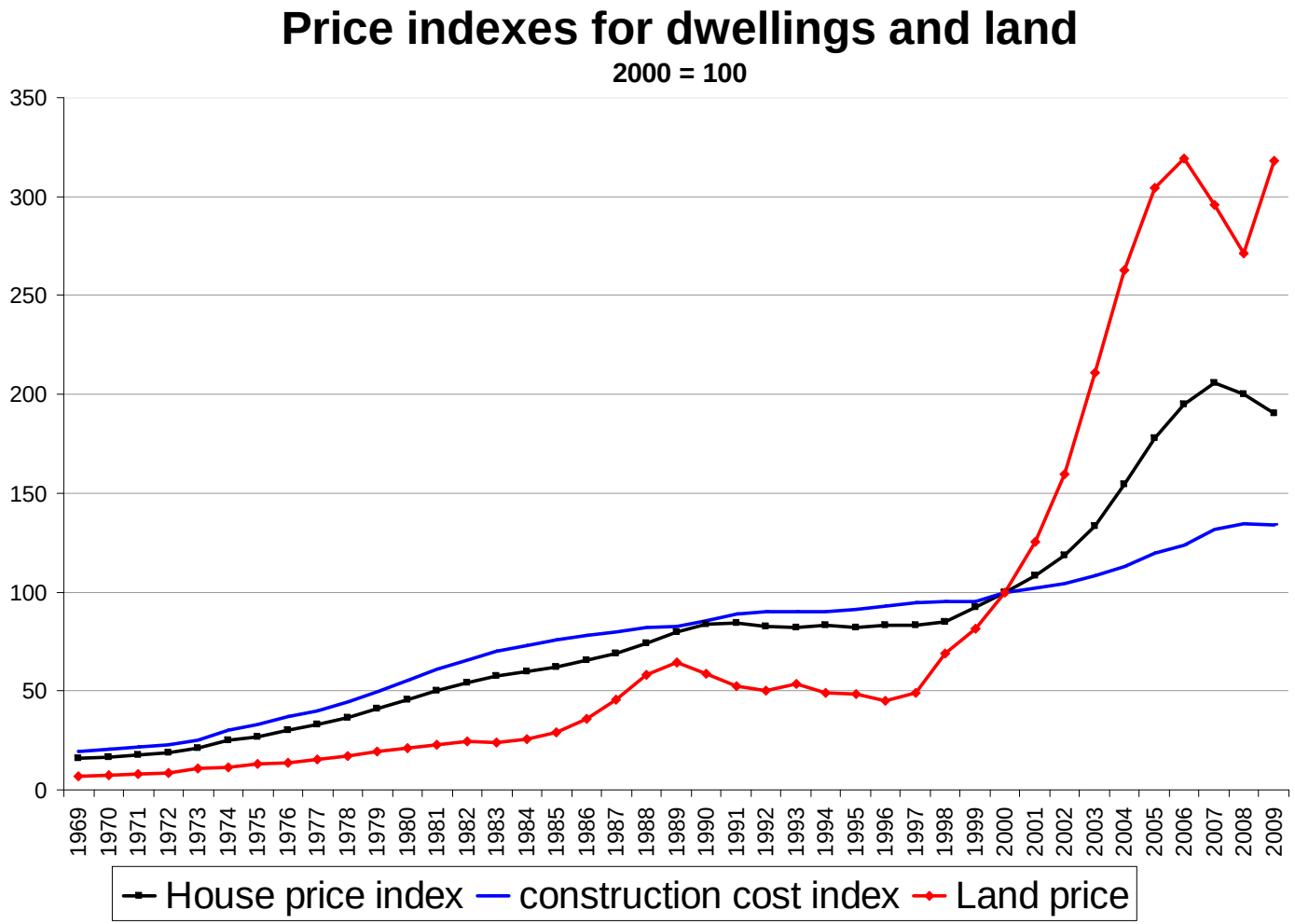
Source: Eurostat Taskforce on R&D Results of the questionnaire on capitalisation of R&D in 2011(blue) and in 2012 (green)

4. Measuring Natural Wealth

Land (and dwellings)

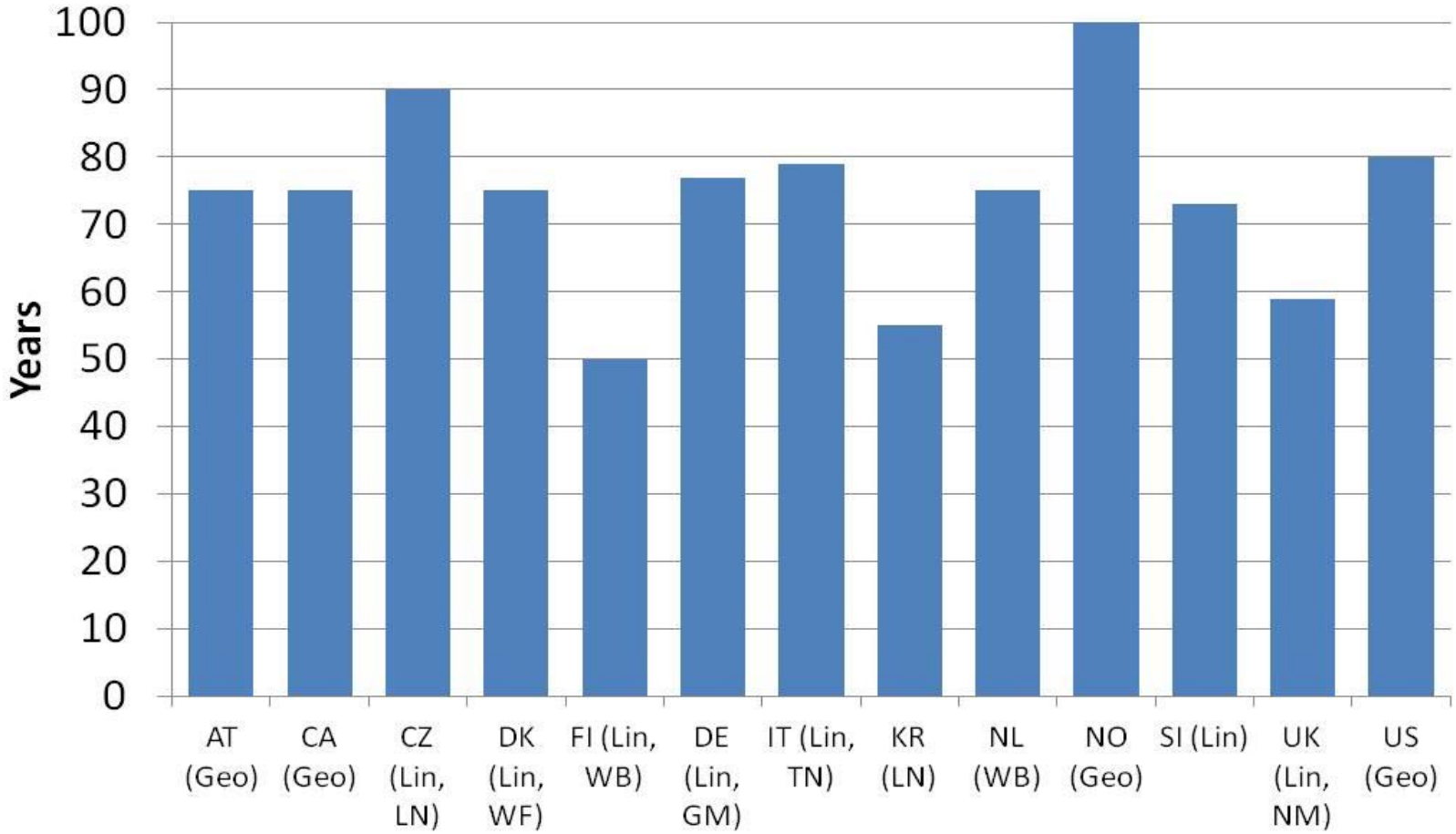
- Valuation of natural resources may require forward-looking measures
- Land:
  - Quantity data less than complete
  - Price data even more so
  - Residential properties: seperating price indices for land and structures
- Dwellings: are service lives comparable?

Example from France: separation of land and structures, residual calculation of dwelling prices



Source: R. Mahieu (INSEE), presentation to 2013 meeting of OECD NAWP

Results from a 2013 OECD survey of service lives: dwellings



Other natural resources

- Starting point: set of natural resources as defined in SEEA
- Largely part of SNA's non-produced assets
  - Mineral and energy resources
  - Soil resources
  - Timber resources
  - (Aquatic resources)
  - Other natural biological resources
  - (Water resources)

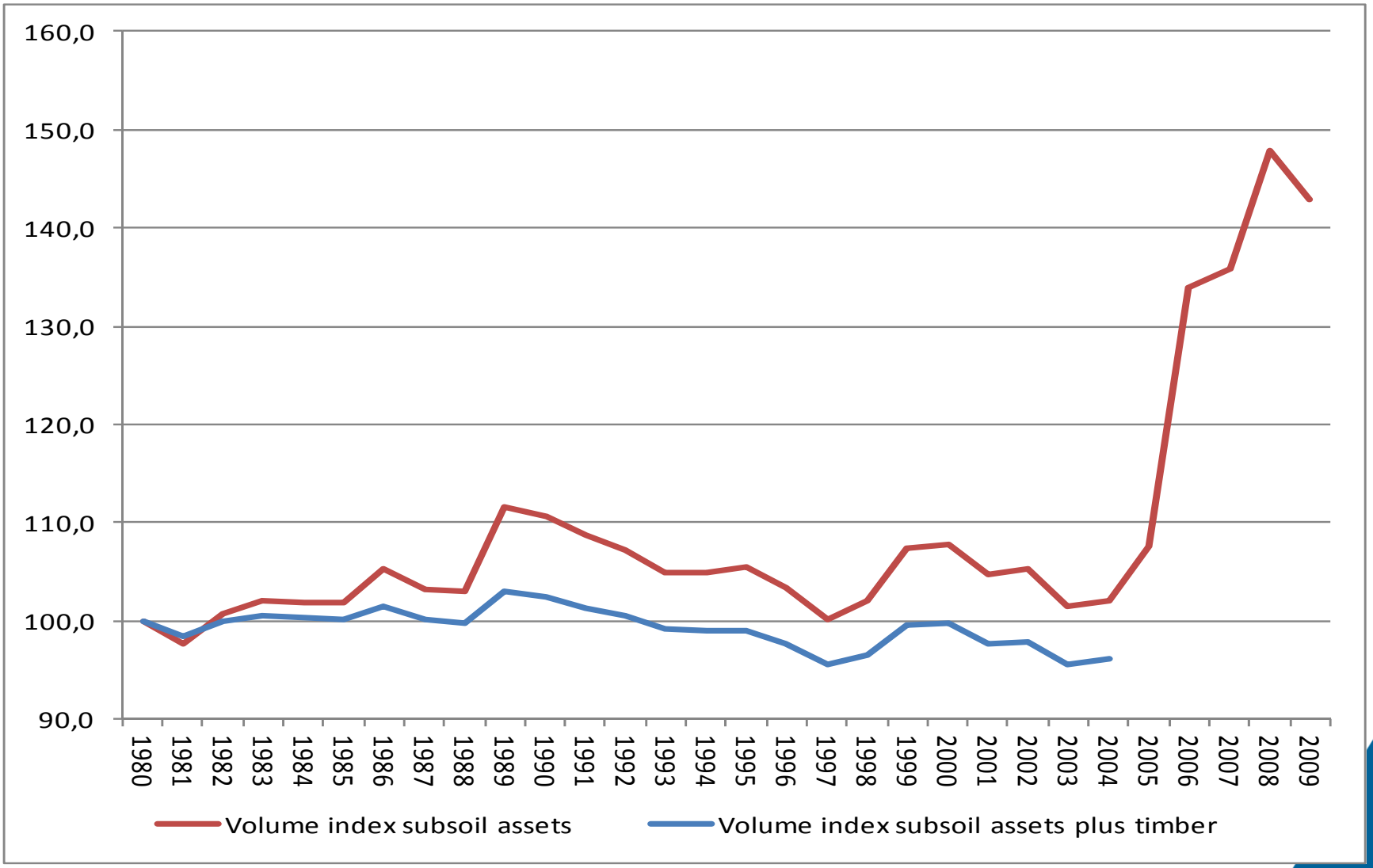
Why of interest? (1)
Evolution of natural asset base

- Natural resource index = $I^{t/t-1} = \sum w_i^t \frac{X_i^t}{X_i^{t-1}}$
- Weighted average of net change in stocks X_i^t
- Net change in stocks = 'Economic' Discoveries - Removals
- Weights = each asset's share in the total value of assets
- Then, $I^{t/t-1} < (>) 1$ indicates a decline (increase) in the natural asset base

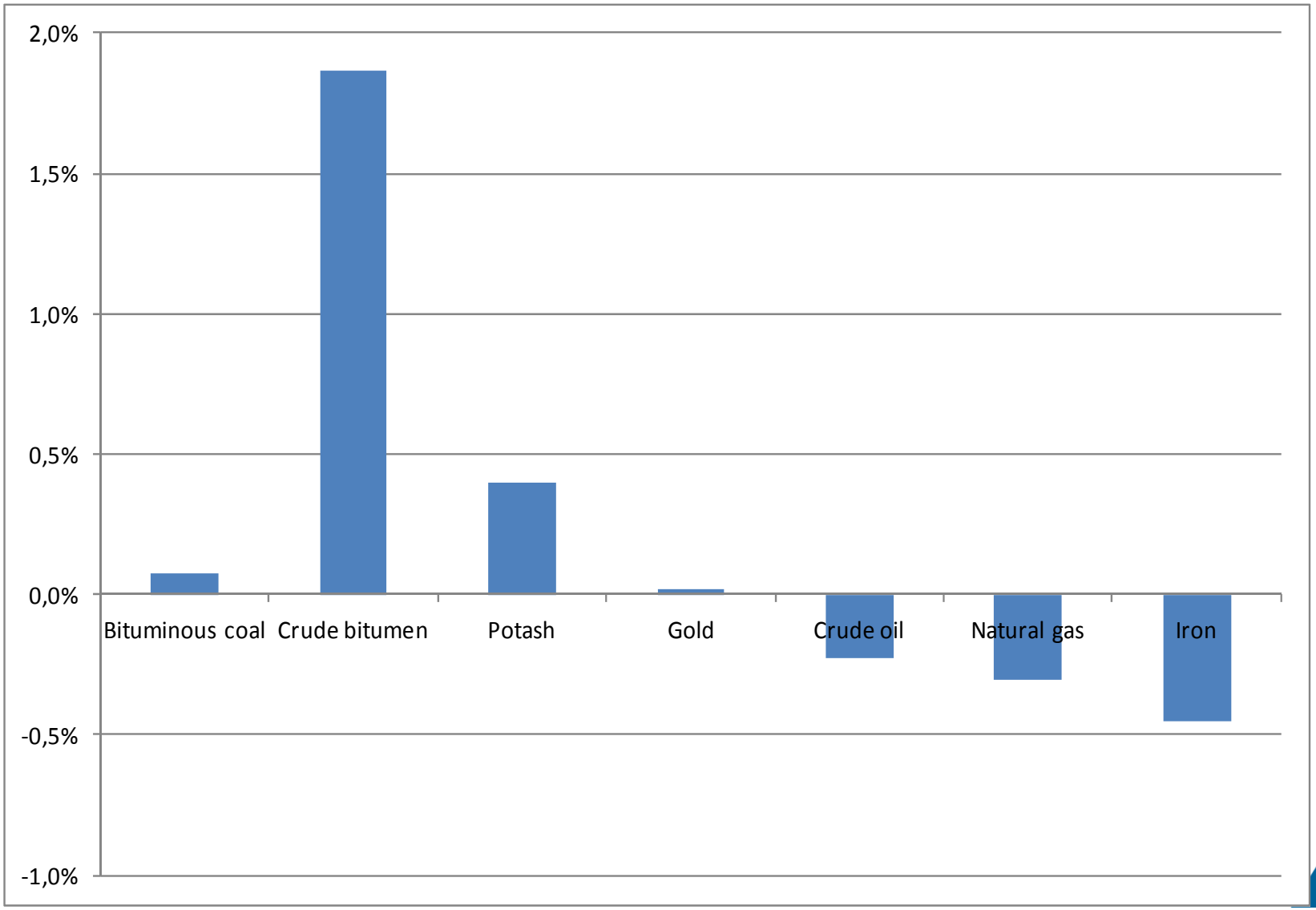
Example: Canada

- Scope: sub-soil resources plus timber
- Excluded (lack of readily available data): soil, aquatic resources, water
- Asset value = discounted flow of expected income to owners of asset

Volume index of sub-soil assets and timber, Canada, 1980=100



Drivers of growth in index of sub-soil assets, Canada, 1980-2009



Issues for consideration

- Valuation of resources in the presence of subsidies and taxes
  - E.g., tax payer subsidises water distribution network

    → will increase producers' resource rent

    →will/may also reduce prices for consumers
- Valuation of acquatic stocks (eg fish stocks) in international waters (outside SNA though)
- Account for depletion of all known resources?

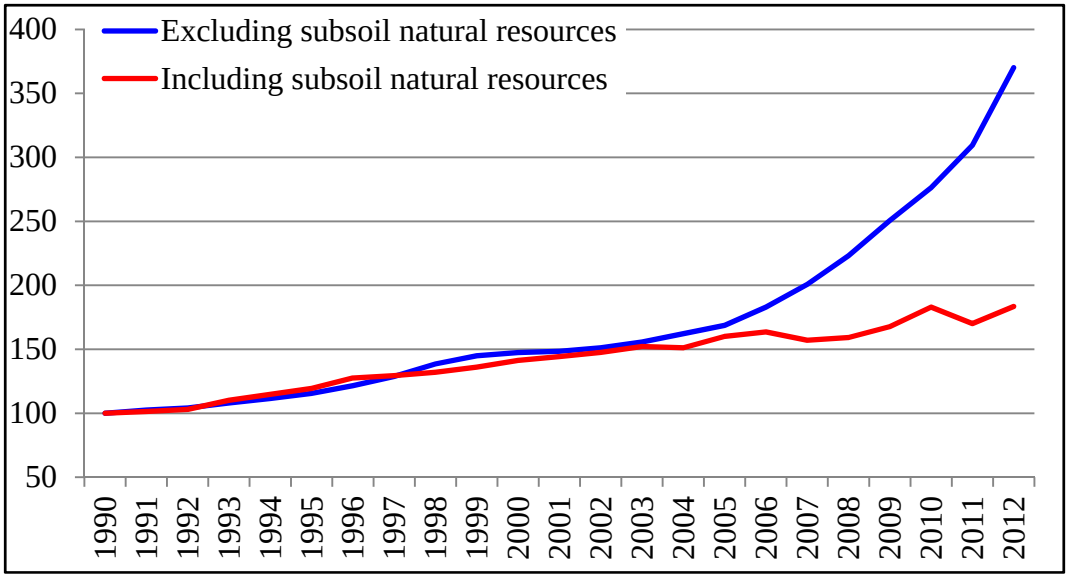
Why of interest? (2) Getting productivity measures right

- Ignoring services from natural capital = assuming they grow in proportion to labour and produced capital inputs
- Strong assumption
- If:
  - growth (Kn) > growth (other inputs)
  - Inputs under-estimated
  - Productivity over-estimated
  - And vice versa

ABS computations: Mining capital services index

- Growth in mining capital services is moderated significantly due to the inclusion of subsoil natural resources, from 10.2% average annual growth since 2003-04 to 2.2% average growth.

Mining industry capital services index, 1989-90 to 2011-12.



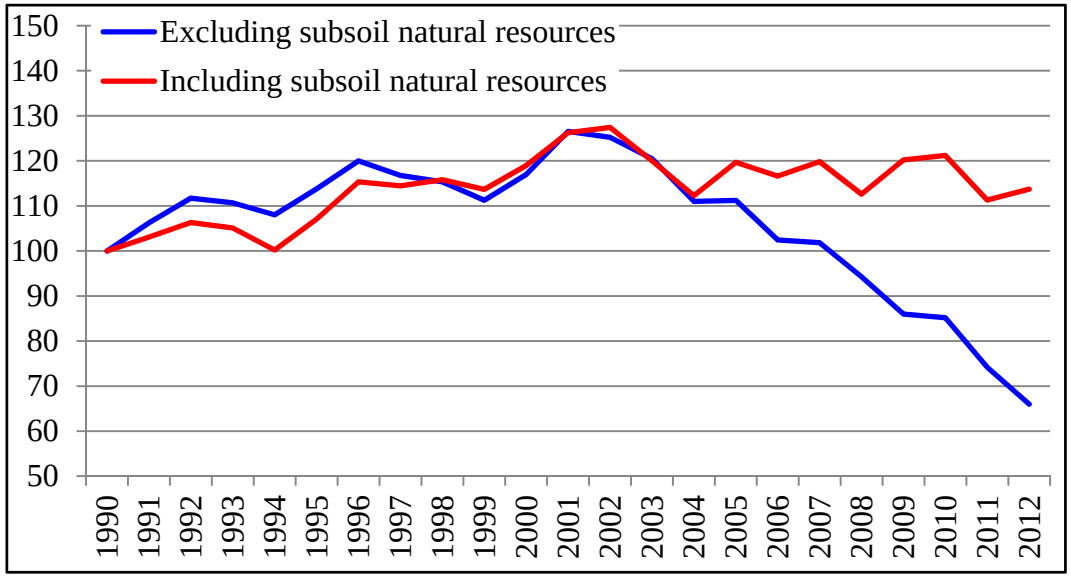
Reference year 1989-90

Source: M Smedes, presentation to 2013 OECD NAWP

ABS computations: Mining MFP

- The decline in the mining industry multifactor productivity is also moderated significantly, from -6.4% on average annually to -0.5% annually since 2003-04.

Mining industry multi factor productivity index, 1989-90 to 2011-12.



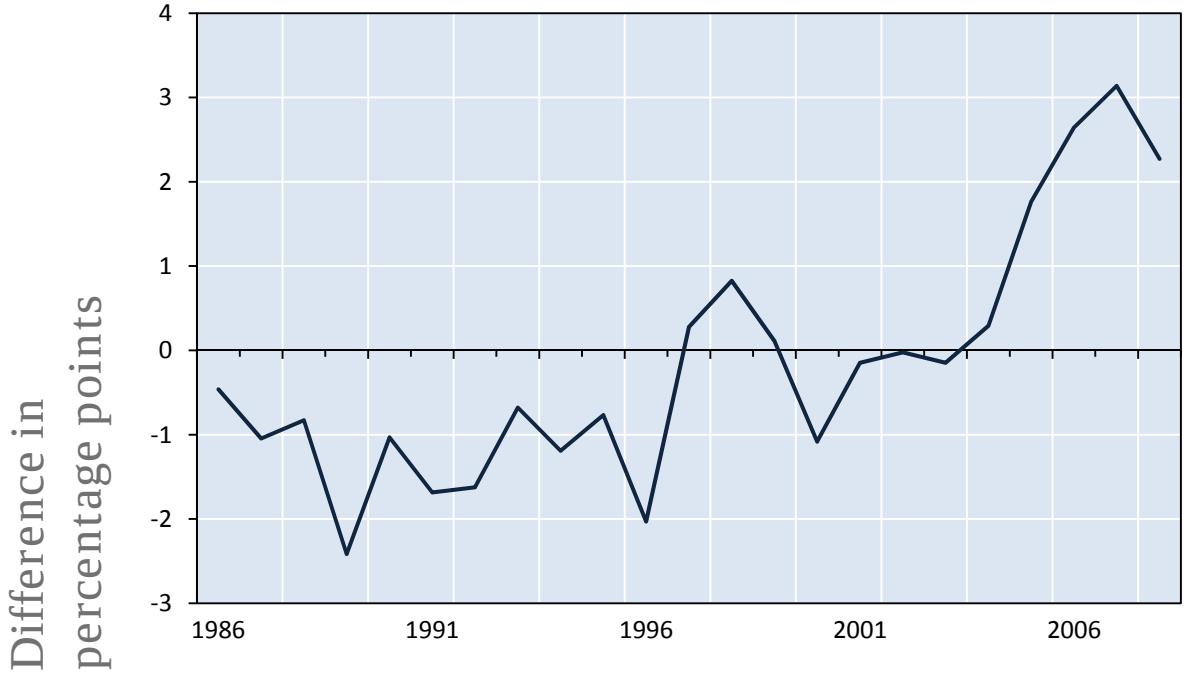
Reference year 1989-90

Source: M Smedes, presentation to 2013 OECD NAWP

This may even carry over to the macro-economy

- Example: Norway
- New OECD work (Brandt, Schreyer and Zipperer 2013 forthcoming)
- Also: inclusion of land changes assessment of Korean income accounting

Norway: Difference between adjusted and traditional MFP growth



Source: Brandt, Schreyer and Zipperer (2013, forthcoming)

Adjustment a-priori unclear as other inputs grow also fast in resource booms

Including natural assets, 1985 - 2008

Country	Traditional MFP growth in %	MFP growth with natural resources in %	Difference in percentage points	Traditional inputs growth in %	Natural capital growth in%	Share of resource rent in total cost in %
NOR	1.18	1.02	-0.16	1.46	4.82	16.97

Country	Traditional MFP growth in %	MFP growth with natural resources in %	Difference in percentage points	Capital stock growth in %	Natural capital growth in%	Share of resource rent in GDP in %
CHL	0.54	0.73	0.19	5.85	4.46	7.03

Source: Brandt, Schreyer and Zipperer (2013, forthcoming)

Conclusions

- Many of the pressing measurement issues arise from **broad shifts** in our economies
  - Globalisation
  - Interconnectedness
  - Intangibles and knowledge assets shaping competitive advantages
  - Need to embrace economic, social and environmental sustainability

- This puts measurement of **wealth** to the forefront

- Valuation of wealth is inherently **forward-looking → theory and models required**

- More granual information requires access to and linking of **micro-data**

- **OECD is working on nearly all of these issues but more needs to be done by us, in countries and by the academic community**

Thank you!

Additional slide: estimation of land prices for France

		Dwellings	Land	Total
year n+1 since 1989	**Volume**	Estimated by PIM **(1)**	**(2)**= value in year n * volume index known (from surface survey n+1/n)	**(3 =1 + 2)**
	Value	Estimated by PIM **(4)**	**(6 = 5 - 4)**	**(5 = 3***House price index)
	Price	cost of construction idex	**(7 = 6 / 2)**	House price index