Human capital measurement: country experiences and international initiatives

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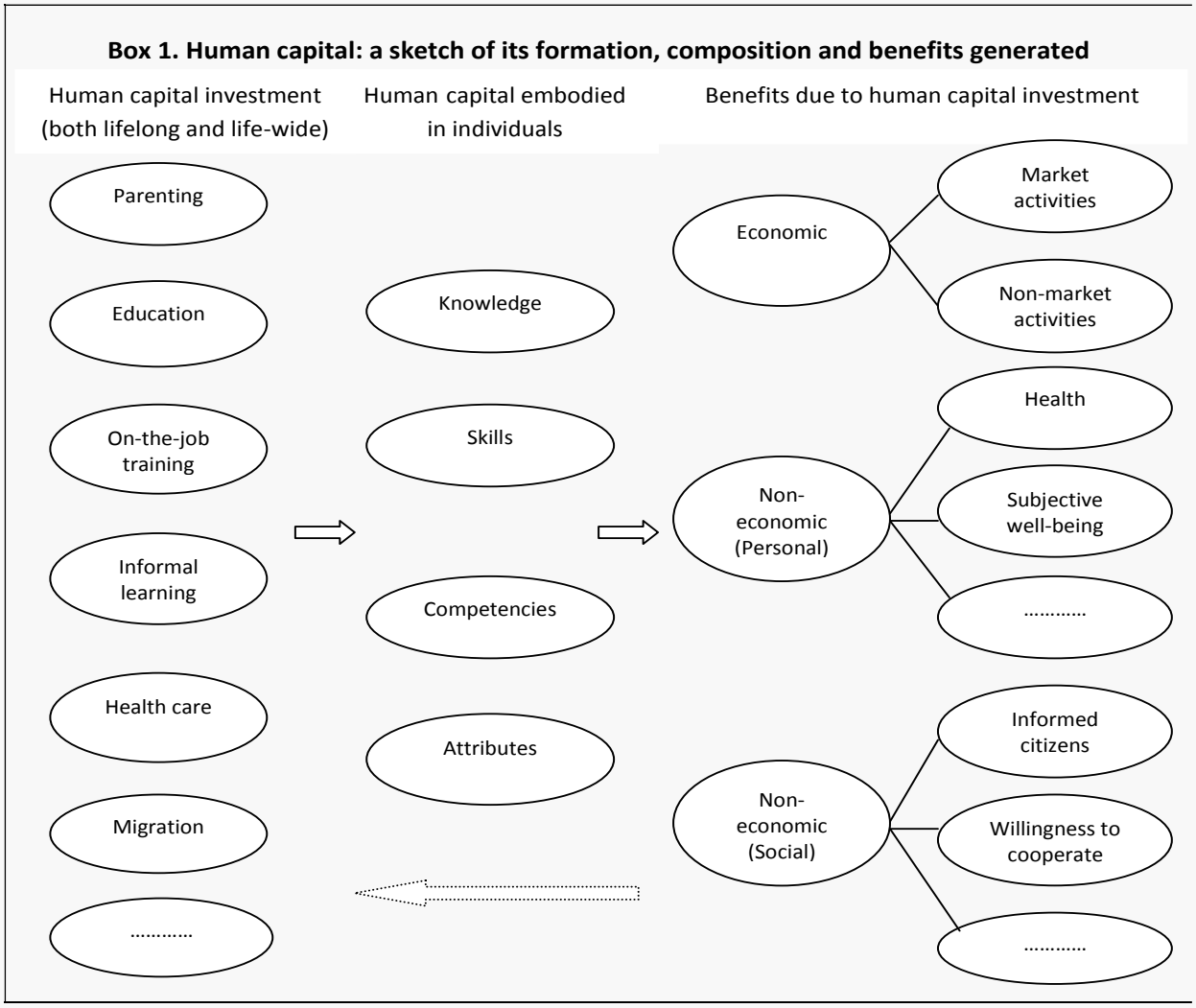
Presentation outline

1. Concept and definition
2. Implications for measurement
3. Country experiences
4. International activities
5. Main issues and challenges
6. Concluding remarks

1. Concept and Definition

- Roots can be found in the history of economic thought: Petty (1690), Smith (1776), Farr (1853), and Engel (1883).
- Recognition regained since 1960s: Schultz (1961), Becker (1964) and Mincer (1974).
- The OECD definition: '*the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being*' (OECD, 2001)
- An all-embracing definition that has obtained wide acceptance.

1. Concept and Definition (*cont.*)



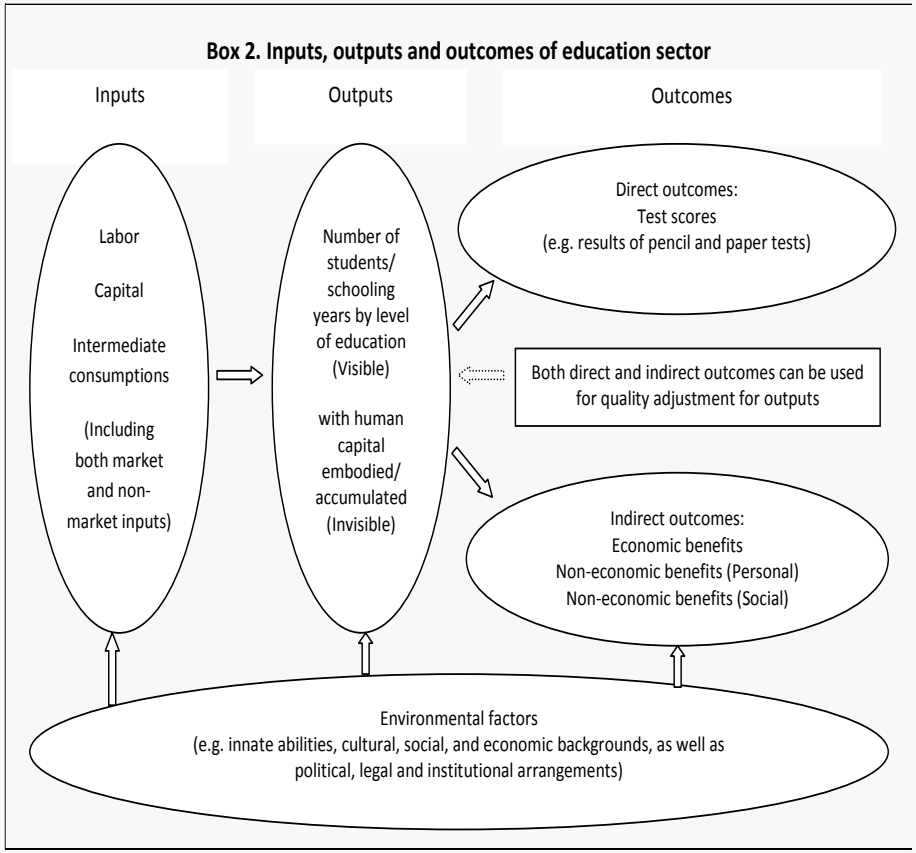
2. Implications for measurement

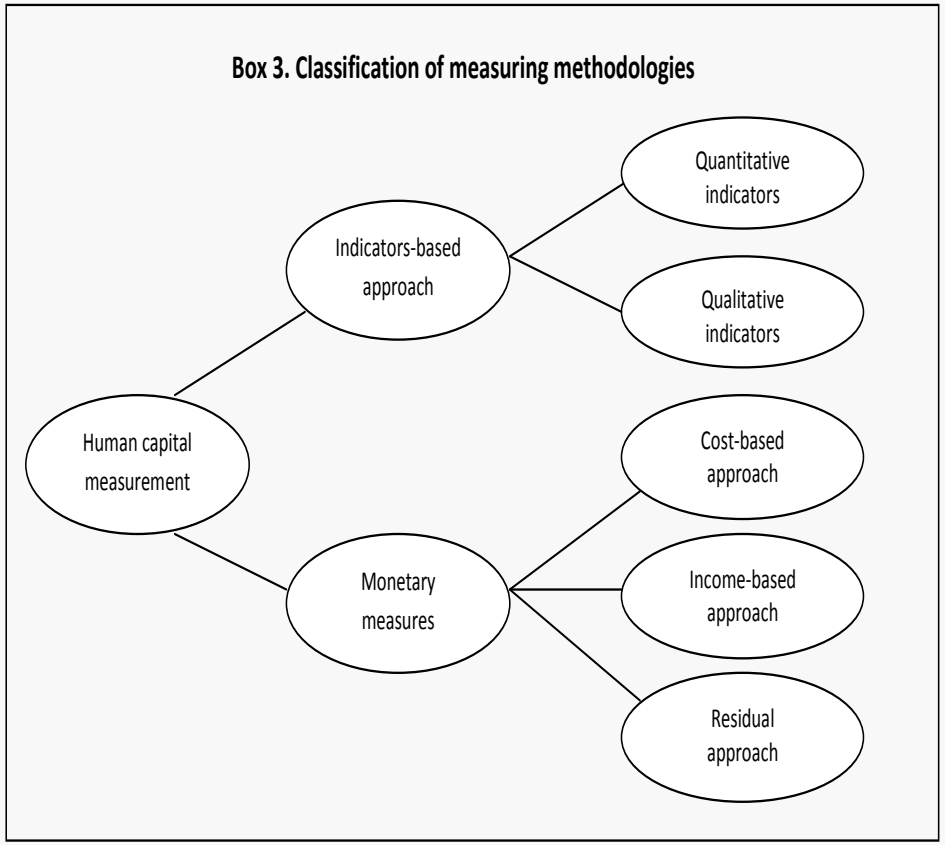
- Stepwise approach: starting from those aspects of either lower conceptual challenges or greater data availability.

- Distinguishing health capital from human capital.

- Focusing on formal education (as the main form of human capital investment); and on the economic returns to the individual (as the main benefits due to human capital investment), even if the broader OECD definition is accepted as a useful reference point.

2. Implications for measurement (*Cont.*)





3. Country experiences

3.1 Results of the UNECE CES questionnaire on measuring human capital

- Purpose
- Concept
- Methodology
- Data sources
- Status of the estimates

3. Country experiences (*Cont.*)

3.2 Representative studies using the indicators-based approach

- Single indicators : adult literacy rates (e.g. Azariadis and Drazen, 1990; Romer, 1990), school enrolment ratios (e.g. Barro, 1991; Mankiw et al., 1992), average years of schooling (e.g.Temple, 1999; Krueger and Lindahl, 2001).

- Dashboard type indicators (e.g. *Education at a Glance*; Ederer et al., 2007, 2011)

- Advantages: simple, less data-demanding

- Disadvantages: lack of common metric, not really accounting

3. Country experiences (*Cont.*)

3.3 Representative studies using the cost-based approach

- Advantages: data availability, PIM
- Disadvantages: cost of production not necessarily equal market value, investment-consumption dichotomy, choice of depreciation
- Most well-known studies: Kendrick (1976), Eisner (1985)
- Recent national studies: Germany (Ewerhart, 2001, 2003), the Netherlands (Rooijen-Horsten et al., 2007, 2008), Finland (Kokkinen, 2008, 2010)

3. Country experiences (*Cont.*)

3.4 Representative studies using the income-based approach

- Advantages: theoretically sound, practically feasible, possible to be incorporated into the SNA in the future
- Disadvantages: no perfect labor market, choice of key parameters
- Most well-known studies: lifetime income approach by Jorgenson and Fraumeni (1989, 1992a, 1992b)

3. Country experiences (*Cont.*)

3.4 Representative studies using the income-based approach (*Cont.*)

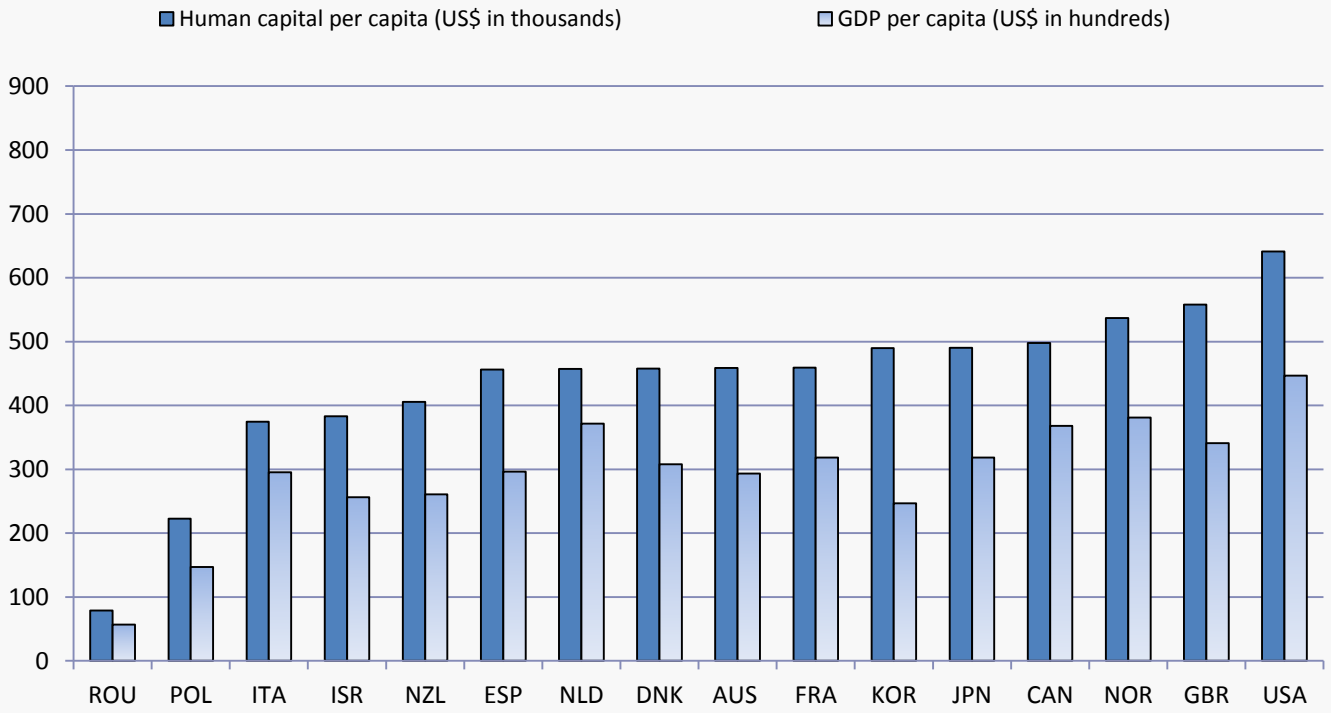
Examples of national studies	Country	Motivation	Time range	Main data sources	Population covered	Market/ Nonmarket activities
Jorgenson and Fraumeni (1989, 1992a, 1992b)	United States	New systems of national accounts, Output of education sector	1948-1984, 1947-1987	Rich data based on decades of research	Age 0-75	Both
Ahlroth, et al (1997)	Sweden	Output of education sector	1967, 1973, 1980, 1990	Level of living surveys	Age 0-75	Both
Ervik, et al (2003)	Norway	Output of higher education sector	1995	Register data	Age 20-64	Market only
Wei (2004, 2008)	Australia	Incorporating human capital into the SNA (Stock/Flow)	1981-2001	Census data	Age 18 (25)-65, labor force/whole population	Market only
Le, et al (2006)	New Zealand	Measuring human capital (Stock)	1981-2001	Census data	Age 18-64	Market only
Gundimeda, et al (2006)	India	Accounting for human capital formation	1993-2001	Surveys of employment and unemployment, Census of population	Age 15-60	Market only
Gu and Wong (2008)	Canada	Human capital contribution to national wealth account	1970-2007	Census /labour force survey	Age 15-74	Market only
Liu and Greaker (2009)	Norway	Measuring human capital (Stock)	2006	Register data	Age 15(16)-67(74), labor force/ whole population	Market only
Christian (2010)	United States	Measuring human capital (Stock/Investment)	1994-2006	Rich data	Age 0-80	Both
Coremberg (2010)	Argentina	Measuring human capital (Stock)/Output of education sector	1997, 2001, 2004	Household permanent survey	Age 15-65	Market only
Li, et al. (2010)	China	Measuring human capital (Stock)	1985-2007	Household survey/Health and nutrition survey	Urban/rural, Age 0-60 (55 for female)	Market only
Jones and Chiripanhura (2010)	United Kingdom	Measuring human capital (Stock)	2001-2009	Labor force survey	Age 16-64	Market only
Istat (2013)	Italy	Measuring human capital (Stock)	2008	Various surveys	Age 15-64	Both

4. International initiatives

- Indicators-based approach: Barro and Lee (1993, 1996, 2001, 2010, 2013); OECD (*Education at a Glance*, PISA, PIAAC); UN (works on constructing sustainable development indices, HDI)
- Residual approach: World Bank (2006, 2011)
- UN *Inclusive Wealth Report* (UN-IHDP, UNEP, 2012)
- Lifetime income approach: OECD human capital project (Liu, 2011)
- Joint work by the World Bank and the OECD (Hamilton and Liu, 2014)

4. International initiatives (*Cont.*)

Graph 1: Human capital per capita in 2006 (in thousands US dollars)

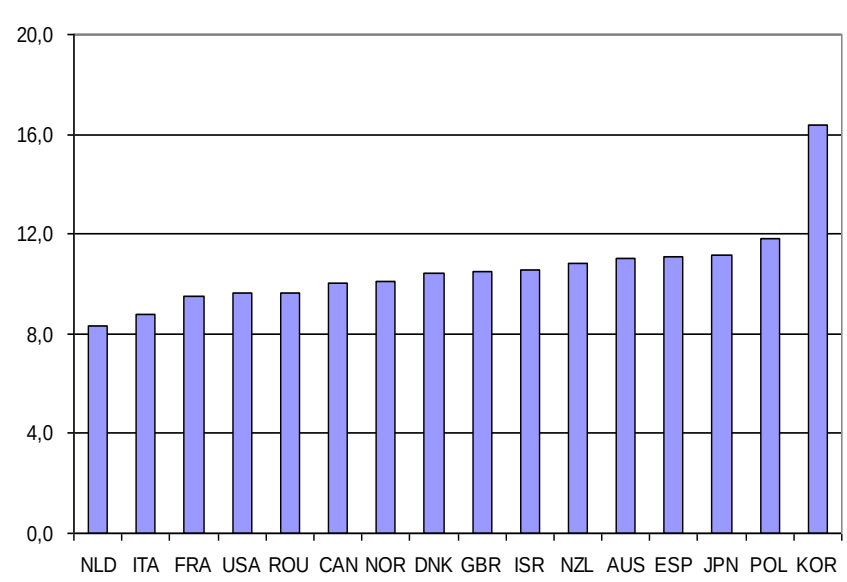


Note: Estimates for Australia refer to 2001 and for Denmark to 2002. Source: OECD human capital project.

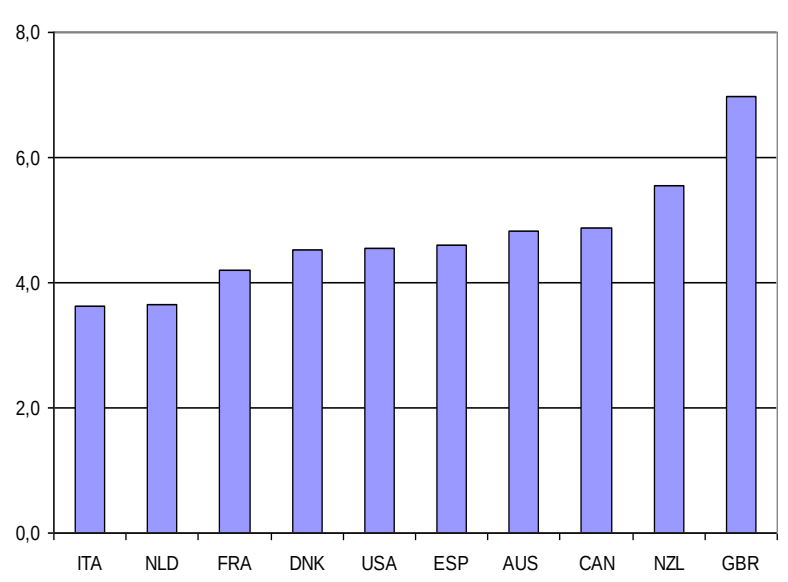
4. International initiatives (*Cont.*)

Graph 2. Stock of human capital relative to GDP and to the stock of produced capital, 2006

Panel a. Stock of human capital to GDP



Panel b. Stock of human capital to produced capital

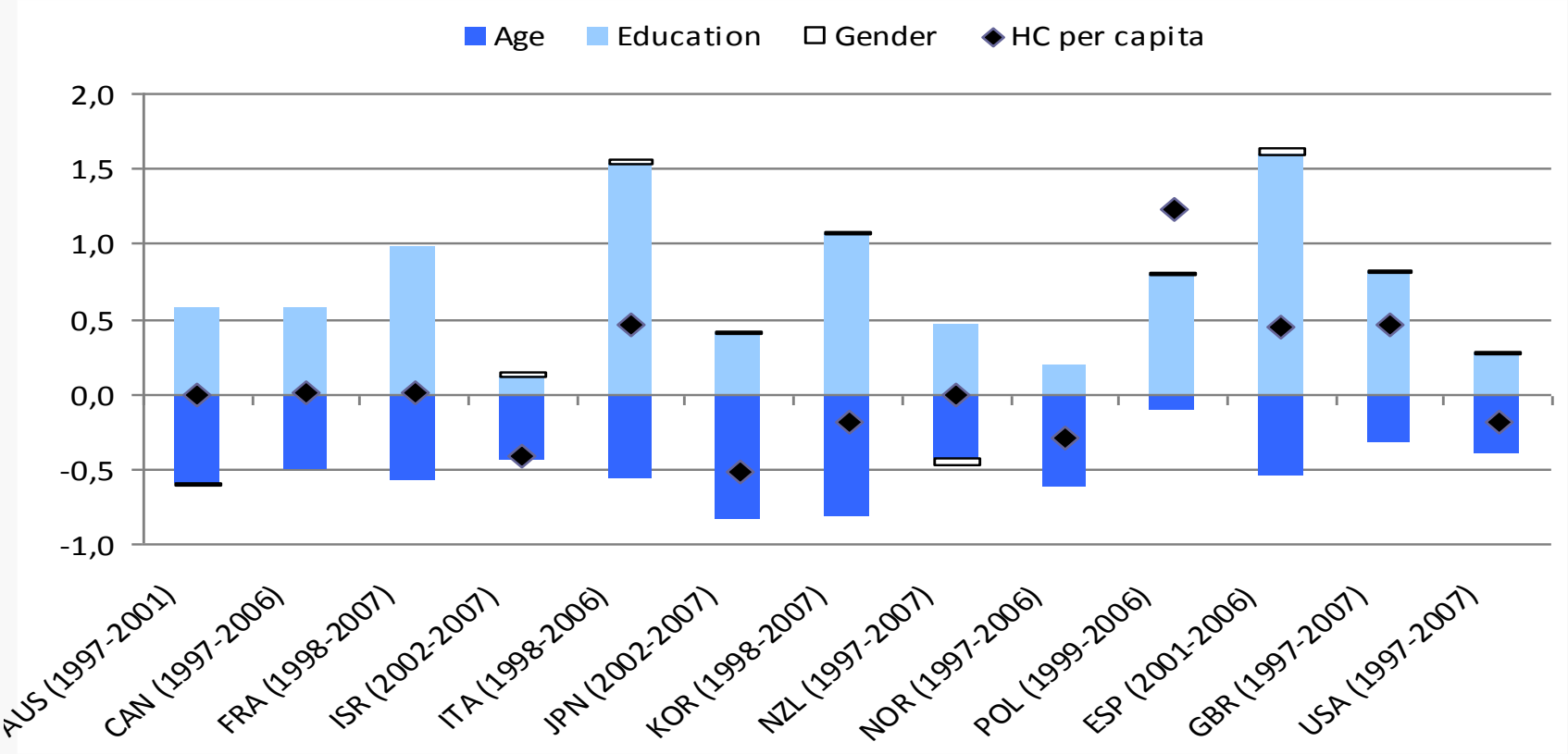


Note: Estimates for Australia refer to 2001, those for Denmark to 2002.

Source: OECD human capital project.

4. International initiatives (*Cont.*)

Graph 3. Decomposition of average annual growth of human capital volume per capita due to age, gender and educational attainment (first-order partial volume index, percentages)



Note: For many countries, the contribution from gender is too small to be discernable in the figure.

Source: OECD human capital project.

4. International initiatives (*Cont.*)

Table 2. Country rankings of human capital measured by different approaches

	PISA Science 2006	PIIAC Literacy 2011-2	PIAAC Numeracy 2011-2	PIAAC Problem-solving in Tech-rich Environments 2011-2	Barro-Lee Average Educational Attainment 2005	Jorgenson-Fraumeni Human Capital per Capita 2006[1]	World Bank Intangible Capital 2005
AGES	15	16-65	16-65	16-65	15-64	15-64	All Ages
Australia	3	3	5	4	7	9	6
Canada	4	5	6	5	3	4	7
China					17	18	17
Denmark	10	8	3	3	14	8	2
France	9	11	10		11	7	9
Great Britain	5	7	8	6	16	2	8
India					18	17	18
Israel					8	13	4
Italy	14	13	12		12	14	11
Japan	2	1	1	6	6	6	13
Netherlands	6	2	2	1	9	10	5
New Zealand	1				2	12	3
Norway	12	4	3	2	4	3	1
Poland	11	10	9	10	15	15	14
Romania					10	16	15
South Korea	7	5	7	9	5	5	12
Spain	13	12	13		13	11	10
United States	8	9	11	8	1	1	16

Notes:

1. *The J-F figures for Australia and India are for 2001; those for Denmark are for 2002.*
2. *The ages covered for China include ages 16 through 55 for females and 16 through 59 for males. The ages covered for India include ages 15 through 60.*

5. Main issues and challenges

- Data issues: earnings, enrolments, labor force survey, educational attainment, mortality rates

- Methodological difficulties: cohort effects, business cycle effects, choice of key parameters, accounting for divergence between estimates by the cost-based and the income-based approaches

6. Concluding remarks

- The multifaceted nature requires stepwise approach for human capital measurement, e.g. focusing on formal education and economic returns to individuals as a point of departure.
- Monetary measures, such as those by the cost-based and the income-based approaches, and esp. by the lifetime income approach seem to be most promising to be incorporated into the SNA in the future.
- Continue the work on data compilation and harmonization.
- Modify the methodologies, possibly based on new sources of data.
- Construct experimental satellite accounts.
- Link the estimates of human capital to the standard growth accounting framework.
- Encourage research on streamlined approach for those countries in which the needed data is not available.