



Discussion of A Stylized Satellite Account for Human Capital

by Gang Liu

IARIW, Dresden, Germany, August 26, 2016

Barbara M. Fraumeni

China Center for Human Capital and Labor Market Research
Central University of Finance and Economics, Beijing, China

Center for Economics, Finance, and Management Studies, Hunan
University, Changsha, China

National Bureau of Economic Research, Cambridge, MA USA

Muskie School, University of Southern Maine, Portland, USA



Paper Objective

- **To construct a human capital satellite account**
 - **Consistent with the SNA**
 - **Showing the cost and lifetime income approach**

Context

Interest in Human Capital

- **Stiglitz-Sen-Fitoussi Commission 2008-9**
 - **“Beyond GDP”**
- **Wealth estimates**
 - **World Bank 2006, 2011**
 - **Inclusive Wealth Report 2015**
- **OECD Human Capital project – Liu (2011)**
- **UNECE Task Force (TF) on Human Capital**
 - **Draft report January 2016**

HC Violating SNA Rules

- Fails SNA 3rd party criterion
 - ➔ Outside production boundary
- Not tradable, is embodied
 - ➔ Not an asset
- Ch. 2 TF (van de Ven)
 - But HC does bring benefits to “owners”
 - 3rd party not referred to under asset definition
 - Goodwill already an exception

Straight-jacket?

- **SNA can restrict measurement innovation**
- **World is becoming much more “intangible”**
- **Difficult to see education as anything but an investment yielding a future income stream**

Satellite Approaches – Ch. 2 TF

- To look upon the relevant activities in the sector paying for the produced services as producing a
 - Capital input which is transferred to the household sector via capital transfers.
 - Non-capital market output that is transferred to the households where it is used as intermediate consumption into the production process of households producing HC.

Allocation of Difference Between Cost-based & Lifetime Income-based Measures

- **Liu and Gu (TF ch. 6) essentially agree**
 - **Liu GOS**
 - **Gu GOS/mixed income**
 - **Net compensation of employees & consumption of human capital**



Supply Table Discussion

Exposition with Supply Table

- **Cost rows: Other products vs. education products (school level + training & courses) broken out**
- **Cost columns: Other industries vs. education by:**
 - **Market producer, Government, & NPISHs**
 - **Imports set to zero for convenience**
- **Lifetime rows: Adds HC investment by school level + training & courses**
- **Lifetime columns: Adds individuals taking education as an industry**

Exposition with Supply Table

- **Non-blank entries the same in both approaches through the education by industry column (market, gov't, NPISH)**
- **Lifetime: In the intersection of the HC investment by type row (school level + training & courses) and individuals taking education column, the lifetime value of the education appears**
- **Lifetime: Total supply=total output is larger by the sum of these entries**

Summary of Supply Table Results

- **Lifetime: Column: Total output=total supply is higher by the amount of individuals taking education industry**
- **All other changes are breakouts of 1) all products into other products vs. education products (school level + training & courses) rows and 2) all industries into other industries vs. education by type industries (market, gov't, NPISH) columns**



Use Table Discussion

Cost Exposition with Use Table

- **Rows: Other products vs. education products (school level + training & courses) broken out**
- **Rows: Value-added includes compensation of employees, other net taxes on production, CFC, NOS**
- **Columns: Industries: Other industries vs. education industries by type (market, gov't, NPISH) broken out**
- **Columns: Final use: HH, Gov't, NPISH, GCF, & Export**

Lifetime Exposition with Use Table

- **Rows:** Adds before total use, HC investment by type (school level + training & courses)
- **Columns:** Adds individuals taking education as an industry
- **Columns:** Splits GCF into other assets vs. HC

Exposition with Use Table

- **Rows:** Entries the same through total use by other industries and education by industries columns (market, gov't, NPISH), except for training & courses
- **Cost:** Training & courses are assumed to be provided by other industries and have a positive number entry, but a zero other industries entry in lifetime table
- **Lifetime: Shift:** This training & courses entry appears in individuals taking education column

Exposition with Use Table

- 1) Lifetime: In industry by education type rows (school level + training & courses), final consumption by type entries are summed and transferred into the individuals taking education column**
 - 2) Lifetime: In other products industry, expenditures for books and other products used for education are deducted from final consumption by HH and entered into the individuals taking education column**
- Lifetime: Total uses for final consumption by type (market, gov't, NPISH) is lower due to 1) and 2)**

Exposition with Use Table

- **Column:** Total use entries are the same for the industry education by type columns (market, gov't, NPISH)
- **Lifetime: Column:** The GFC HC entry now has positive entries in the HC investment by type row (school level + training & courses)

Exposition with Use Table

- **Lifetime: Columns:** Assumes that training & courses input is all labor, so compensation is higher by the amount of training & courses provided by other industries
- **Row:** Total use column entries identical through education by type row (school level + training & courses)
- **Row:** Total output entries identical through education by type column (market, gov't, NPISH)

Summary of Use Table Results

- **Lifetime: Column: Total use is higher by the amount of GCF HC**
- **Lifetime: All other changes are simply transfers among cells**
- **Investment share of final use goes up and industry output increases**

Comparison with TF ch. 6 - Gu

- Liu uses the HC produced in the household sector approach
- Gu shows both – HC produced in the household sector and capital transfer approach
- Gu constructs many more component accounts of the SNA
 - Current, capital, & wealth accounts
 - Current & capital accounts include HH, NPISH, corporation, government, & ROW sub-accounts

Kendrick cost-based approach

- In common usage, the term “cost-based” is narrowly defined
- Expenditures already appearing in the SNA, maybe without complete enumeration of some expenditures such as those for training
- Kendrick’s cost-based approach was far more complicated and inclusive

Kendrick (1976)

Extra HC Investment

- **Average constant dollar rearing costs per child up to age 14, but excludes cost of parent time**
- **Informal education investment**
- **Intangible medical, health & safety investment**
- **Intangible mobility investment such as unemployment, job search, hiring, and moving, including immigration, costs**
- **Avg. cohort lifetime investment includes current and earlier ages**

Productivity –Based Integration

- In a 1992 paper by J-F “Investment in Education and U.S. Economic Growth”, the impact of HC on economic growth was assessed by constructing GDP as the combination of an education and a non-education sector
- Productivity/NIPA based formulation, not a SNA construct

Output, Outcome, & Quality

- **Have some issues with Liu and the Schreyer papers he cites**
- **Outcome an even trickier issue**
- **But this analysis would require writing another paper!**

Bottom Line

- **Excellent paper**
- **Substantial contribution**
- **Of course, I prefer the lifetime income HC produced in the household sector approach**