HUMAN CAPITAL MEASUREMENT IN THE UNITED STATES

Stock, Flow, Value & Data Sources

A Comprehensive Reference for Researchers,
Policy Analysts & Practitioners

Topics Covered

Contents

1. Conceptual Framework

Human capital and the economic value it generates are measured in the United States across multiple dimensions by several agencies and institutions. Measurement operates across three distinct levels:

Level	Question It Answers	Examples
STOCK	How much human capital exists?	Education attainment, skills, health, experience
FLOW	What value does it generate?	Wages, labor productivity, returns to education
QUALITY	How efficiently is it deployed?	Labor composition index, skill utilization

2. BLS — Labor Composition Index

The primary U.S. federal measure of human capital quality. Labor input is obtained by aggregating hours worked classified by age, education, and gender — with weights determined by each group's share of the total wage bill — capturing shifts in workforce composition as a measure of human capital quality.

2.1 What It Measures

- Human capital quality contribution to economic output
- Skill-adjusted labor input by industry and sector
- Workforce composition change over time (age, education, gender mix)
- Contribution of labor composition to Total Factor Productivity (TFP) growth

2.2 Data Sources & Direct Links

Dataset	What It Measures	Direct Link
BLS Multifactor Productivity (MFP) Statistics	Labor composition index + TFP by sector	https://www.bls.gov/productivity/tables/
BLS Productivity & Costs Release	Quarterly labor productivity updates	https://www.bls.gov/lpc/
BLS Technical Notes on Labor Composition	Full methodology for measuring HC quality	https://www.bls.gov/productivity/technical-notes/home.htm

Dataset	What It Measures	Direct Link
FRED — Labor Composition Series	Downloadable time series data	https://fred.stlouisfed.org/series/LABCOM
BEA-BLS KLEMS Production Accounts	Integrated Capital, Labor, Energy, Materials, Services inputs	https://www.bls.gov/productivity/articles-and-research/bea-bls-integrated-production-account htm

3. BEA — Human Capital Accounting

The BEA has produced foundational research on measuring human capital in dollar terms for the United States, integrating human capital components into the National Income and Product Accounts (NIPA).

3.1 What It Measures

- Dollar value of U.S. human capital stock (1994–2009 and beyond)
- Human capital investment flows (education, births, migration)
- Human capital depreciation (deaths, aging, emigration)
- Integration of human capital with GDP and national accounts

3.2 Data Sources & Direct Links

Resource	What It Covers	Direct Link
BEA Human Capital Accounting Paper	Dollar value of U.S. human capital stock	https://www.bea.gov/research/papers/2011/human-capital-accounting-united-state
BEA-BLS KLEMS Production Accounts	Integrated production accounts with human capital	https://www.bls.gov/productivity/
BEA National Income & Product Accounts	Core economic accounts with HC research integration	https://apps.bea.gov/iTable/
BEA Research Data & Methods	BEA's ongoing human capital measurement agenda	https://www.bea.gov/research

4. NCES — Education Attainment & Returns to Human Capital

The National Center for Education Statistics (NCES) measures the stock of human capital through educational attainment and tracks the economic returns to education, connecting human capital investment to labor market outcomes.

Dataset	What It Measures	Direct Link
Digest of Education Statistics	Educational attainment rates by level, age, demographic	https://nces.ed.gov/programs/digest/
Condition of Education	Annual snapshot of U.S. education pipeline	https://nces.ed.gov/programs/coe/
Education Longitudinal Study (ELS)	Tracks students from school into labor market	https://nces.ed.gov/surveys/els2002/
Baccalaureate & Beyond (B&B)	Earnings & employment outcomes of college graduates	https://nces.ed.gov/surveys/bb/
NAEP — Nation's Report Card	Cognitive skill levels of U.S. students	https://nces.ed.gov/nationsreportcard/
College Scorecard	Returns to education by institution and field of study	https://collegescorecard.ed.gov

5. World Bank — Human Capital Index (HCI)

The most widely cited composite international measure of human capital. The HCI quantifies the contribution of health and education to the productivity of the next generation of workers, ranging from 0 to 1.

5.1 How the HCI Is Constructed

The HCI combines three main components:

Component	What It Captures	Data Used
Child Survival	Probability of surviving to school age	Under-5 mortality rate (UN IGME)
Education (Quantity + Quality)	Learning-adjusted years of schooling	School enrollment + PISA/TIMSS test scores

Component	What It Captures	Data Used
Health (Adult Survival + Stunting)	Adult health limiting productivity	Adult survival rate + child stunting rates

5.2 Data Sources & Direct Links

Resource	What It Provides	Direct Link
HCI Country Data Portal	U.S. HCI score, components, trends	https://humancapital.worldbank.org/en/home
HCI Raw Data Download	Full dataset by country including U.S.	https://datacatalog.worldbank.org/search/dataset/0038030/human-capital-index
World Bank Open Data	Time series: HD.HCI.OVRL	https://data.worldbank.org/indicator/HD.HCI.OVRL
HCI DataBank	Full disaggregated HCI database by gender	https://databank.worldbank.org/source/human-capital-index
HCI Country Briefs	U.S.-specific HCI summary	https://humancapital.worldbank.org/en/country-briefs
Our World in Data — HCI	Visualized & downloadable HCI data	https://ourworldindata.org/grapher/human-capital-index-in-2018

6. UNDP — Human Development Index (HDI)

The HDI combines health, education, and income on equal footing into a broader notion of human development. It assesses human capital from a well-being perspective rather than purely economic productivity.

Dimension	Indicator Used
Health	Life expectancy at birth
Education	Mean years of schooling (adults 25+) + Expected years of schooling (children)

Dimension	Indicator Used
Standard of Living	Gross National Income (GNI) per capita (log scale)

Resource	What It Provides	Direct Link
UNDP HDI Data Center	U.S. HDI score, ranking, components	https://hdr.undp.org/data-center/human-development-index
Human Development Reports	Full methodology and country data	https://hdr.undp.org
UNDP Data Downloads	Full downloadable HDI dataset by country and year	https://hdr.undp.org/data-center/documentation-and-downloads

7. OECD — Human Capital Measurement

The OECD measures human capital both through adult skills surveys (PIAAC, PISA) and through productivity-linked macroeconomic approaches that explicitly account for labor composition. OECD estimates show that human capital ratios to GDP range from 8 to over 10 across member countries.

Resource	What It Measures	Direct Link
OECD Education at a Glance 2024	Educational attainment, returns to schooling, U.S. benchmarked globally	https://www.oecd.org/en/publications/education-at-a-glance-2024_c00cad36-en.html
OECD PIAAC — Adult Skills Survey	Literacy, numeracy, and problem-solving skills of U.S. adults	https://www.oecd.org/en/topics/piaac.html
OECD PISA — Student Skills	U.S. student cognitive skills vs. global benchmark	https://www.oecd.org/en/about/programmes/pisa.html
OECD Data Explorer	Downloadable OECD human capital series	https://data-explorer.oecd.org/

Resource	What It Measures	Direct Link
OECD New HC Measure Paper	Productivity-linked human capital methodology	https://www.oecd.org/en/publications/a-new-macroeconomic-measure-of-human-d12d7305-en.html

8. Opportunity Insights — Value from Human Capital

Opportunity Insights (led by Raj Chetty at Harvard) measures the economic returns to human capital investments and mobility outcomes across geographies, institutions, and demographic groups.

Resource	What It Measures	Direct Link
Opportunity Atlas	Earnings outcomes by childhood ZIP code — value of local human capital	https://www.opportunityatlas.org
College Mobility Report Cards	Human capital returns and social mobility by college	https://opportunityinsights.org/paper/mobilityreportcards/
Social Capital Atlas	Network effects amplifying human capital value	https://www.socialcapital.org
Opportunity Insights Data Library	Full downloadable research datasets	https://opportunityinsights.org/data/

9. NBER — Research-Grade Human Capital Data

Resource	What It Measures	Direct Link
Jorgenson-Fraumeni Human Capital Accounts	Lifetime income approach to valuing U.S. human capital stock	https://www.nber.org/papers/w25864
Barro-Lee Educational Attainment Dataset	Years of schooling by country including U.S.	http://www.barrolee.com

Resource	What It Measures	Direct Link
Penn World Tables (PWT 10.0)	Human capital index embedded in growth accounting	https://www.rug.nl/ggdc/productivity/pwt/
NBER Working Papers — Human Capital	Latest research on U.S. human capital measurement	https://www.nber.org/topic/human-capital

10. Health as Human Capital — CDC & HHS

Health is a core dimension of human capital. Poor health reduces workforce participation, productivity, and lifetime earnings. These datasets capture the health component of human capital stock.

Dataset	What It Measures	Direct Link
CDC National Health Interview Survey (NHIS)	Population health status — key HCI component	https://www.cdc.gov/nchs/nhis/
HHS Health, United States	Annual compendium of U.S. population health	https://www.cdc.gov/nchs/hus/
AHRQ Medical Expenditure Panel Survey (MEPS)	Health investment and its economic impact	https://meps.ahrq.gov/mepsweb/
CDC National Vital Statistics System	Mortality and life expectancy data (HCI component)	https://www.cdc.gov/nchs/nvss/
CDC Behavioral Risk Factor Surveillance	Adult health risk behaviors limiting human capital	https://www.cdc.gov/brfss/

11. Deep Dive: Jorgenson-Fraumeni Lifetime Income Approach

The Jorgenson-Fraumeni (JF) approach is the dominant methodology for valuing human capital in dollar terms, endorsed by the OECD Consortium, UNECE Guidelines, and the World Bank. It treats individuals as assets whose value equals the present discounted value of their current and future lifetime earnings.

11.1 Core Concept

The human capital associated with a person equals their current and future lifetime earnings in present discounted value. The stock of human capital equals the sum of lifetime earnings across all persons in a population.

11.2 The Valuation Formula

Lifetime income at age a is computed recursively:

$$HC(a) = y_{\text{inc}} \times epr \times svr \times \frac{1+G}{1+R} + HC(a+1) \times svr \times enr$$

$HC(a)$	= Human capital value at age a
y_{inc}	= Annual earnings estimated from Mincer wage model
epr	= Employment-participation rate
svr	= Survival rate (probability of living to next age)
enr	= School enrollment rate
G	= Exogenous real income growth rate (historically $\approx 1.47\%$)
R	= Discount rate (historically $\approx 4.58\%$)

11.3 Three Approaches to Valuing Human Capital Stock

Approach	Method	Key Strength	Key Limitation
1. Lifetime Income (JF)	Present discounted value of future earnings	Captures forward-looking productivity	Sensitive to discount rate assumptions
2. Cost-Based (Input)	Sum of all investments in education & training	Grounded in actual expenditure data	Misses returns; excludes innate ability
3. Residual Method	TFP growth unexplained by physical capital	Linked directly to productivity data	Residual may include non-HC factors

11.4 Five Components of JF Human Capital Investment & Depreciation

Component	Type	Description
Investment from Births	Investment	New individuals entering the population
Investment from Education	Investment	Increased lifetime earnings from schooling
Depreciation from Deaths	Depreciation	Human capital lost when individuals die
Depreciation from Aging	Depreciation	Declining remaining lifetime earnings with age
Residual Net Investment	Both	Immigration, emigration, population adjustments

11.5 Market vs. Non-Market Human Capital

The JF approach is unique in including both market and non-market components:

Component	What Is Included	Valuation Method
Market Human Capital	Lifetime earnings from paid employment	Actual wages from labor market data
Non-Market Human Capital	Time in household production, leisure, caregiving	Opportunity cost = wage $\times$ (1 $-$ tax rate)
Schooling Time	1 300 hours/year per enrolled student	Future earnings premium from education
Personal Maintenance	10 hours/day (eating, sleeping)	Excluded from human capital valuation

11.6 Key Data Sources for JF Methodology

Data Needed	U.S. Source	Direct Link
Population by age & gender	Census Bureau ACS	https://www.census.gov/programs-surveys/acs
Earnings by age, education, gender	BLS Current Population Survey	https://www.bls.gov/cps/
School enrollment rates	NCES Digest of Education Statistics	https://nces.ed.gov/programs/digest/
Survival / mortality rates	CDC National Vital Statistics	https://www.cdc.gov/nchs/nvss/

Data Needed	U.S. Source	Direct Link
Employment rates	BLS Employment Situation	https://www.bls.gov/news.release/empsit.nr0.htm
JF U.S. Human Capital Estimates	NBER Working Paper 25864	https://www.nber.org/papers/w25864

12. Deep Dive: BLS Labor Composition Index

The BLS Labor Composition Index is the U.S. government's primary operational measure of human capital quality within its national productivity accounts. Unlike the JF approach, it does not produce a dollar value but instead measures how changes in workforce skill composition contribute to output growth.

12.1 How It Is Constructed

Labor input is calculated via a Tornqvist aggregation — a weighted average of hours worked by different worker groups, where each group's weight is determined by its share of the total wage bill:

$$\text{Labor Input Index} = \sum_i \bar{w}_i \cdot \ln\left(\frac{H_i(t)}{H_i(t-1)}\right), \qquad \bar{w}_i = \tfrac{1}{2}\left[w_i(t) + w_i(t-1)\right]$$

$H_i(t)$	= Hours worked by group i in period t
$w_i(t)$	= Group i's share of total wage bill in period t
$\bar{w}_i$	= Average wage share across two periods

12.2 Worker Classification Grid

Worker groups are classified by three dimensions:

Dimension	Categories
Age	16–24, 25–34, 35–44, 45–54, 55–64, 65+
Education	Less than high school, High school, Some college, Bachelor's, Advanced degree
Gender	Male, Female

12.3 What the Index Tells Us

The Labor Composition Index rises when the workforce shifts toward higher-skilled (higher-paid) workers. The index separates two distinct effects:

Effect	What It Captures
Pure Hours Growth	More workers working more hours — quantity of labor
Composition Effect	Workers becoming more skilled / educated — quality of human capital

12.4 Key Data Series

Series	Access	Direct Link
BLS MFP Annual Release with Labor Composition	Annual table downloads	https://www.bls.gov/productivity/tables/
Industry-Level Labor Composition	Industry MFP tables	https://www.bls.gov/productivity/industries/
Fernald TFP Series (utilization-adjusted, quarterly)	FRBSF data portal	https://www.frbsf.org/research-and-insights/data-and-indicators/total-factor-productivity-tfp/
Penn World Tables Human Capital Index	HC index in growth accounting framework	https://www.rug.nl/ggdc/productivity/pwt/

13. Deep Dive: World Bank Human Capital Index

The HCI is the World Bank's flagship measure for tracking human capital across countries. It estimates how much potential economic productivity is unrealized due to poor health and insufficient education of the labor force.

13.1 HCI Score Interpretation

HCI Score	What It Means
1.0	Full health + complete education: maximum productivity benchmark
0.70	Workers 30% less productive than the ideal benchmark
0.50	Country could double GDP if it reached full health and education
$<$ **0.40**	Significant human capital deficit; large productivity losses

13.2 HCI Components in Detail

Component	Indicator	Data Source
Child Survival	Probability of survival to age 5	UN Interagency Group for Child Mortality Estimation
Expected Years of School	Years a child can expect to attend school	UNESCO Institute for Statistics
Harmonized Test Scores	Quality-adjusted learning score (300–625 scale)	PISA, TIMSS, PIRLS — harmonized by World Bank
Adult Survival Rate	Probability of surviving from age 15 to 60	WHO Global Health Observatory
Healthy Growth (Non-Stunting)	Share of children not stunted	UNICEF/WHO/World Bank Joint Dataset

13.3 HCI+ (Extended Measure)

The HCI+ extends the standard HCI by also accounting for employment outcomes over a person's working life — not just health and education at age 18. It measures the human capital a child born today can expect to acquire over their entire working life if current conditions persist.

13.4 How to Access U.S. HCI Data

#	Resource	Direct Link
1	View U.S. scorecard	https://humancapital.worldbank.org/en/country-briefs
2	Download full dataset	https://datacatalog.worldbank.org/search/dataset/0038030/human-capital-index
3	Query time series	https://databank.worldbank.org/source/human-capital-index
4	API access (HD.HCI.OVRL)	https://data.worldbank.org/indicator/HD.HCI.OVRL
5	Visualize & compare	https://ourworldindata.org/grapher/human-capital-index-in-2018

14. Master Data Source Summary

Agency / Source	Measure	Type	Direct Link
BLS	Labor Composition Index	Flow / Quality	https://www.bls.gov/productivity/
BEA	Human Capital Accounts	Stock + Value	https://www.bea.gov/research
BEA-BLS KLEMS	Integrated Production Accounts	Flow	https://www.bls.gov/productivity/articles-and-research/bea-bls-integrated-production-accounts.htm
NCES	Education Attainment & Returns	Stock	https://nces.ed.gov
World Bank HCI	Human Capital Index (0–1)	Stock	https://humancapital.worldbank.org
UNDP HDI	Human Development Index	Stock + Value	https://hdr.undp.org
OECD PIAAC	Adult Skills & Cognitive Ability	Stock	https://www.oecd.org/en/topics/piaac.html
Opportunity Insights	Economic Returns to HC	Value	https://opportunityinsights.org
Penn World Tables	HC Index (growth accounting)	Stock	https://www.rug.nl/ggdc/productivity/pwt/
CDC / HHS	Health as HC Component	Stock	https://www.cdc.gov/nchs/
Jorgenson-Fraumeni / NBER	Dollar Value of HC Stock	Stock + Value	https://www.nber.org/papers/w25864
College Scorecard	Returns to Education	Value	https://collegescorecard.ed.gov
Barro-Lee Dataset	Years of Schooling (historical)	Stock	http://www.barrolee.com
FRED (St. Louis Fed)	One-stop HC time series portal	All types	https://fred.stlouisfed.org

End of Document — Human Capital Measurement in the United States