6. Human Capital: Health.

Reference: Weil, Chapter 6.1.

Idea

- Physical and mental strength are not natural constants.
- They are variable and, in particular, accumulable.
- Thus we speak of *human* capital.
- It fulfills the basic features of (physical) capital. Recall: producible, productive,...)
- It comes in a different form.

Main difference: human capital is attached to persons ($\rightarrow$ I can rent my brain capacity but I cannot sell it).

Human capital comes in 2 main varieties

- Health
- Education.

Robert Fogel (1994): About 1/3 of economic growth in the U.K. 1780 - 1980 can be *directly* attributed to improved health.

Why is health so important?

1. Work force
   - My basal metabolic rate: 2813 cal./day. Yours:
   - http://www.weightlossforgood.co.uk/bmr_calculator.htm
   - Thus, one can be too malnourished to exercise even 1 hour of work.
   - Fogel: Around 1780 this applied to 20 % of the adult population.

Table 2. A Comparison of the Probable French and English Distributions of the Daily Consumption of Kcals per Consuming Unit Toward the End of the Eighteenth Century

| | | A France c. 1785 $\overline{X} = 2.290$ $(s/\overline{X}) = 0.3$ | | B England C. 1790 $\overline{X} = 2.700$ $(s/\overline{X}) = 0.3$ | |
	Decile (1)	Daily kcal consumption (2)	Cumulative % (3)	Daily kcal consumption (4)	Cumulative % (5)
1.	Highest	3.672	100	4.329	100
2.	Ninth	2.981	84	3.514	84
3.	Eighth	2.676	71	3.155	71
4.	Seventh	2.457	59	2.897	59
5.	Sixth	2.276	48	2.684	48
6.	Fifth	2.114	38	2.492	38
7.	Fourth	1.958	29	2.309	29
8.	Third	1.798	21	2.120	21
9.	Second	1.614	13	1.903	13
10.	First	1.310	6	1.545	6

Sources: See Fogel (1993b), especially table 4 and the appendix.

Today, average calorie intake still differs fundamentally across countries:

Nutrition vs. GDP
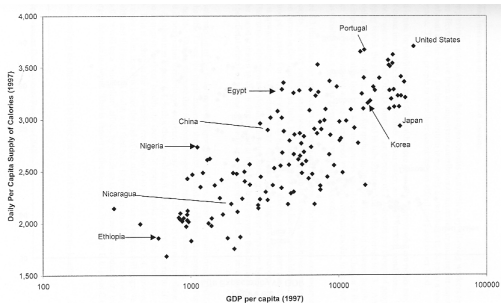
Yet, the picture blurs the actual problem:

- Unequal distribution of food within countries.
- The problem occurs only at the low end of the distribution.
- Latin America, for example: the first quintile of the income distribution consumes 50 % more kcal. than the fifth quintile.
- Also important: quality (variety) of food.

2. Healthy people are more productive:
- they can work harder and longer,
- think more clearly and learn faster.

How should we measure aggregate health?   →   2 Proposals:

a) an obvious one: Life-expectancy at birth:
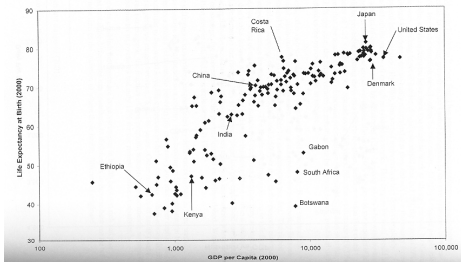
LE depending on
- Nutrition
- Hospitals, doctors per capita (or km^2)
- Medicine availability and costs (→ int. property rights)
- Disease environment (geography)

b) A not so obvious proxy: height

- Between 1775 and 1975 male Brits became 9.1 cm taller on average.
- (Calorie intake rose approx. from 2.900 to 3700)
- Between 1962 and 1990 male Koreans became 5 cm taller.
- (Calorie intake rose approx. from 2200 to 3100)

Main cause:

- unique relationship of nutritional status of the mother and size at birth
- and of birth size and size when grown up.

Like with income, higher ontogenetic growth is a very recent phenomenon in world history:

Male heights in Europe and the US 1 AD to 2000 (Clark, 2006)
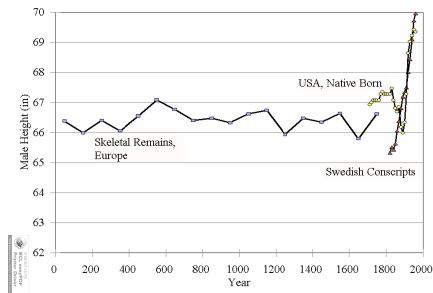
Taller people are more productive. Yet this process is limited from above. From Micro-studies nowadays:

- In Brazil: 7.7 % higher wages for every 1% increase in height
- In the U.S.: 1 % higher wages for every 1% increase in height.

Important *indirect* effects of health:

- High child mortality $\rightarrow$ low human capital investment $\rightarrow$ low growth.
- High adult mortality $\rightarrow$ low savings $\rightarrow$ low growth.

we discuss both channels later.

Problem:

- Besides the effect of health on income there exists also an effect of income on health.
- Richer people (nations) can afford to spend more on high quality food, clean water, vaccines, medical treatment etc.

$\rightarrow$ Debate about causality:

- Wealthier is Healthier (Pritchett and Summers, 1996).
- Or is it the other way round? (Sachs and co-authors).

[Insert: interaction of health and income]

Observe: (y, h)-equilibrium.

Problem:

- We don't observe the curves.
- We observe only scatterplots of points.

Consider 2 points, understood as 2 (y, h) equilibria. How did we get from A to B? (Why is country B richer than A?)

1. Possibility: Something unrelated to health improved income.

[The Income View]

For example, better quality of institutions (Acemoglu and Johnson, 2000). Observe:

- A shift of the income curve $y(h)$.
- This causes better health.
- and thus a further improvement of health through higher productivity (the health multiplier, movement along the curve).

2. Possibility: Something improved health:

[The Health View]

For example, better nutrition, medical care through foreign aid (Sachs). Observe:

- Shift of the health curve.
- Healthier people are more productive, income increases.
- This leads to further improvement of health (movement along the $h(y)$ curve.

In other words: why are countries A and B different?

- Is it geography, the tropical disease environment? (health view)
- Is it something else only seemingly related to health, like institutions? (income view)

Deep determinants $\rightarrow$ later.

- In principle, we can unearth the $y(h)$-curve with instrumental variable techniques.
- Yet, IV involve some serious problems.
- Shastry and Weil (2003) use Micro-Data on the contribution of health (adult survival rate and height) to the determination of wages (productivity).

Their result: the variance of income per capita across countries is explained by

- physical capital: 20.1
- human capital from education: 21.6
- human capital from health: 19.0
- productivity: 39.3

percent.