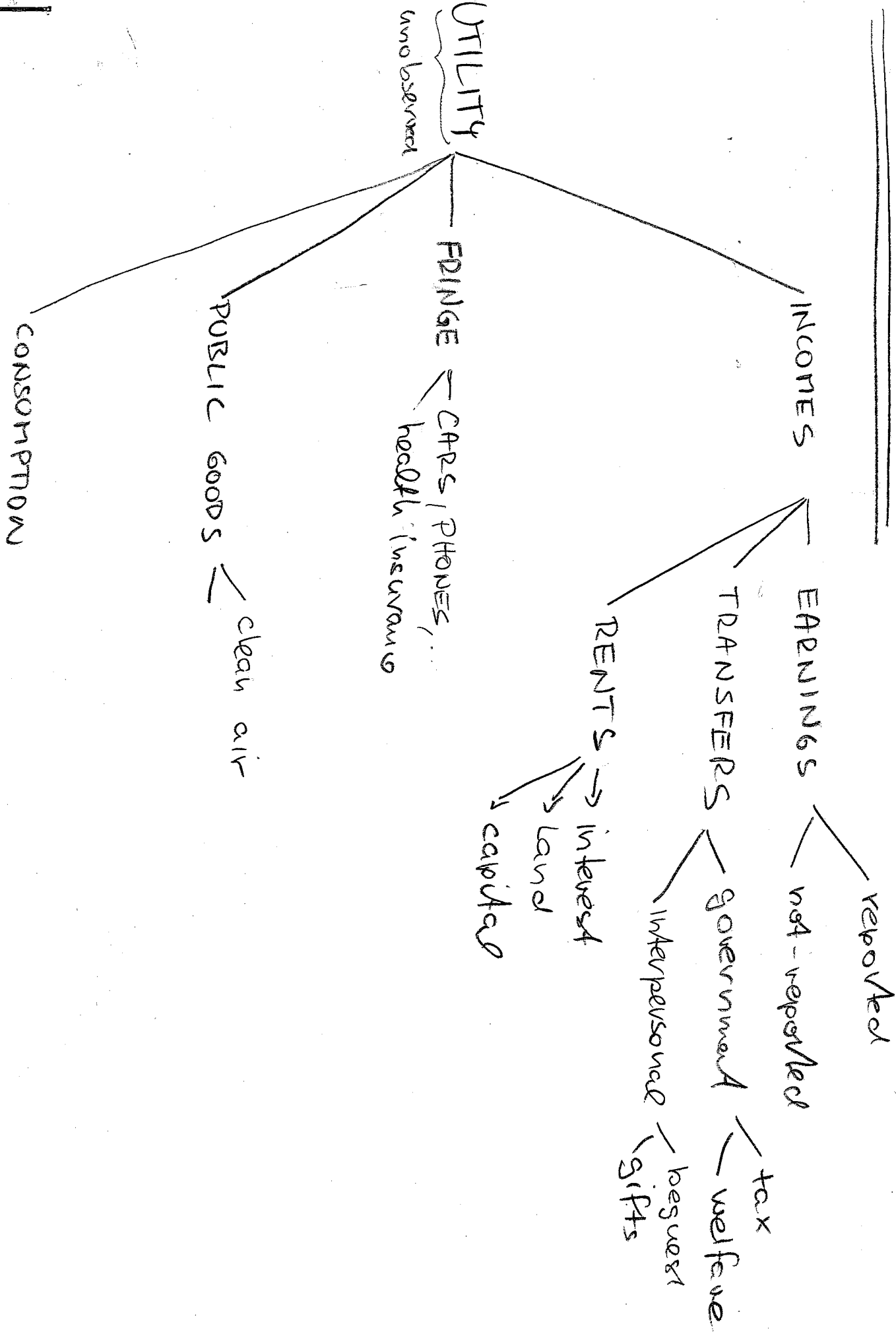
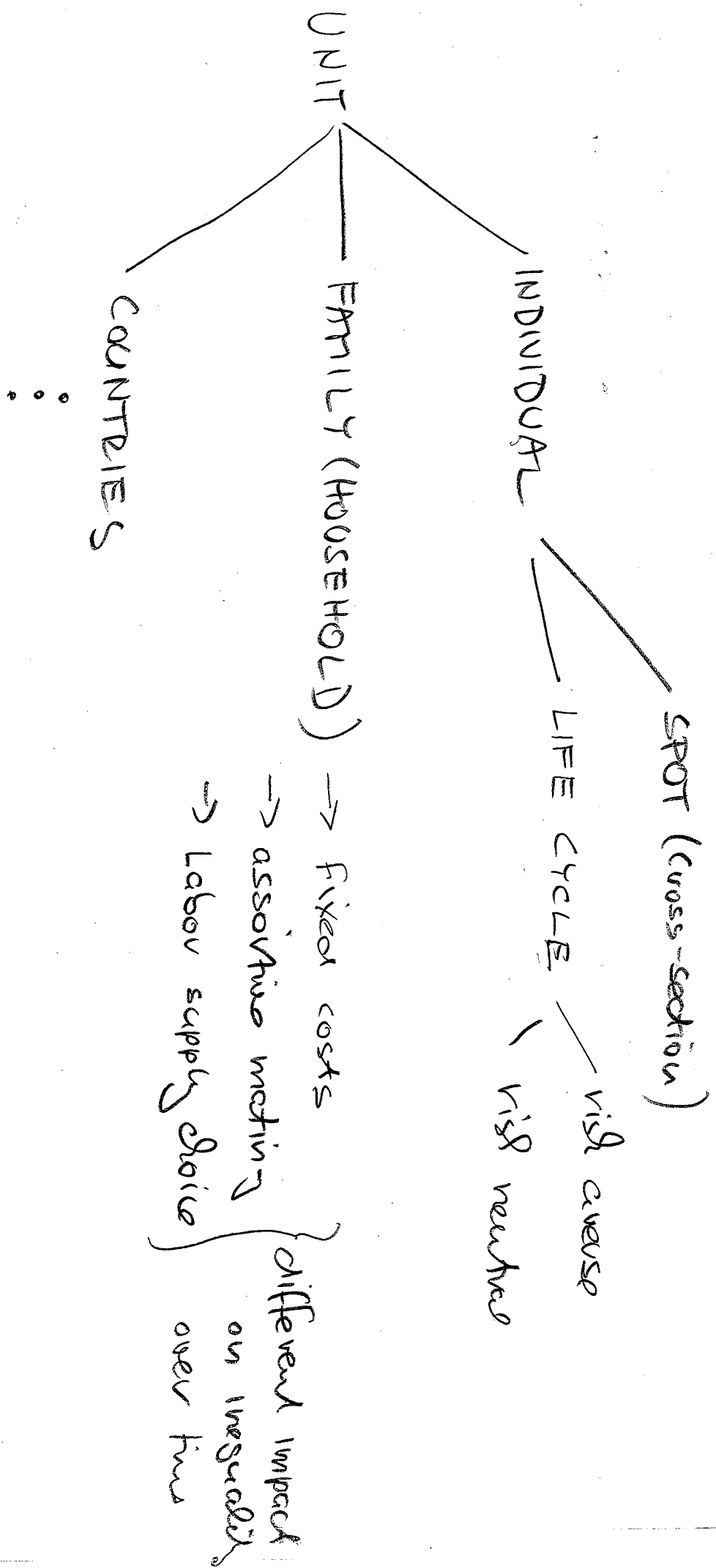


INEQUALITY OF WHAT?



UNIT OF MEASUREMENT



MEASURES OF INEQUALITY

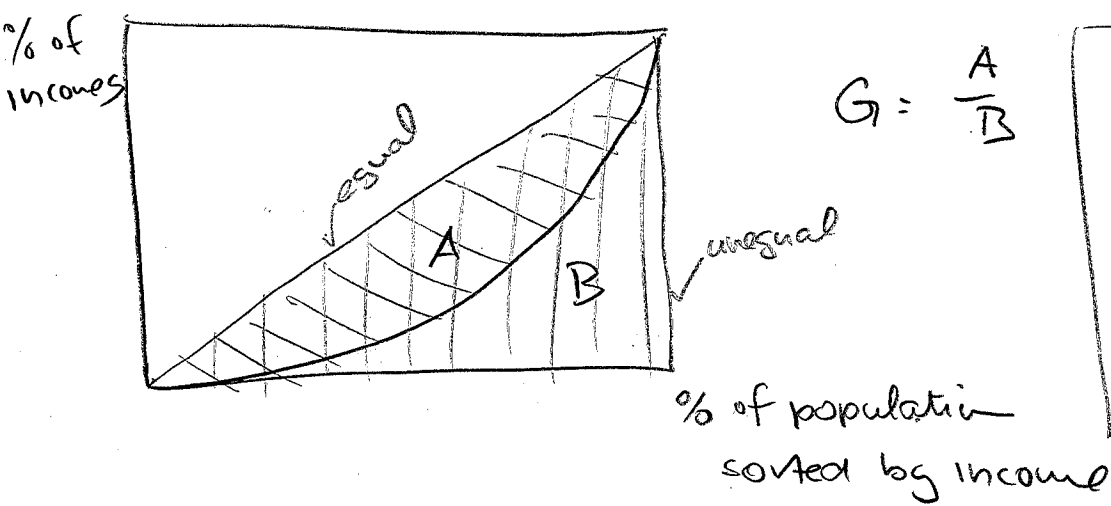
- 1) VARIANCE (std. deviation) - sensitive to outliers
- 2) PERCENTILE RATIOS
- 3) INTERQUARTILE RANGE (RELATIVE)

$$\frac{E_{75} - E_{25}}{E_{50}}$$

subscripts ~ percentiles

$$3) \frac{E_{90}}{E_{10}} / \frac{E_{80}}{E_{20}}, \dots$$

4) Gini coefficient - Lorenz curve



US	~ .36
Ger	~ .36
Fran	~ .38
Cze	~ .18 - .20

MEASUREMENT PROBLEMS

- CPI problem ← housing, quality, cons. subset.
- unreported
- fringe benefits
- longitudinal data

	Impact over time	Impact in cross-section

DECOMPOSITION OF LIFE-CYCLE EARNINGS

discounted income $\bar{Y}_i = \frac{1}{T} \sum d_t Y_t$; $d_t \sim$ disc. factor

$$\text{VAR}(\bar{Y}) = \sum_t d_t^2 V(Y_t) + 2 \sum_t \sum_s d_s d_t \text{COV}(Y_t, Y_s)$$

CAPITAL & LABOR INCOME INEQUALITY DECOMP.

Y_1 ... Income from Labor \approx 60% 1929 \longrightarrow 1993
 Y_2 ... ---|--- capital \approx 40% 74%
26%

$$Y = Y_1 + Y_2$$

$$\text{let } d_i = \frac{\bar{Y}_i}{\bar{Y}}$$

$$\sigma^2 = \sigma_1^2 + \sigma_2^2 + 2\rho\sigma_1\sigma_2$$

$$V = \frac{\sigma^2}{\bar{Y}^2} = \frac{\sigma_1^2}{\bar{Y}_1^2} \left(\frac{\bar{Y}_1}{\bar{Y}} \right)^2 + \frac{\sigma_2^2}{\bar{Y}_2^2} \left(\frac{\bar{Y}_2}{\bar{Y}} \right)^2 + 2\rho \frac{\sigma_1}{\bar{Y}_1} \frac{\sigma_2}{\bar{Y}_2} \frac{\bar{Y}_1}{\bar{Y}} \frac{\bar{Y}_2}{\bar{Y}} =$$

$$= \underbrace{d_1^2}_{\#1} V_1^2 + \underbrace{d_2^2}_{\#2} V_2^2 + \underbrace{2\rho d_1 d_2}_{\#3} V_1 V_2$$

Empirically:

$$d_1 \approx 3d_2$$

$$V_2^2 > V_1^2$$

$$\rho > 0$$

$$\underline{\underline{\#1 > \#3 > \#2}}$$

INEQUALITY VIEWED BY MINCERIAN MODEL

$$\log w_s = \log w_0 + r_s + u$$

$$\text{VAR}(\log w_s) = \text{VAR}(\log w_0) + \text{VAR}(r_s) + \text{VAR}(u) + 2\text{COV} \dots$$

①
②
③
④

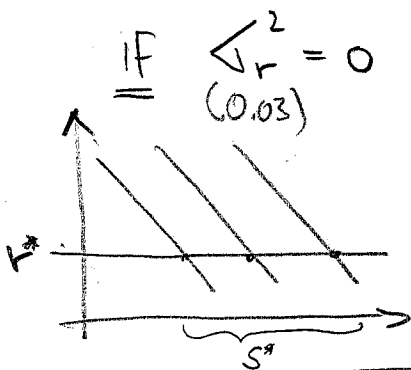
① Natural (ability) component

② schooling

③ Luck

① if $w_0 \sim \text{Normal} \Rightarrow \log w_0 \sim \log \text{Normal}$

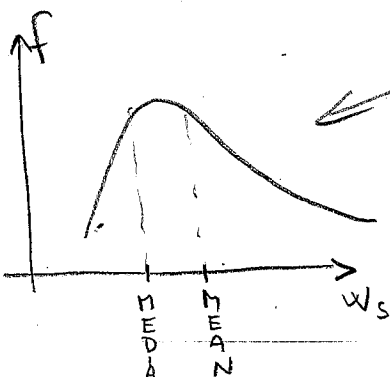
② $\text{VAR}(r_s) = \bar{r}^2 \text{VAR}(s) + \bar{s}^2 \text{VAR}(r) + \text{COV}(\dots)$



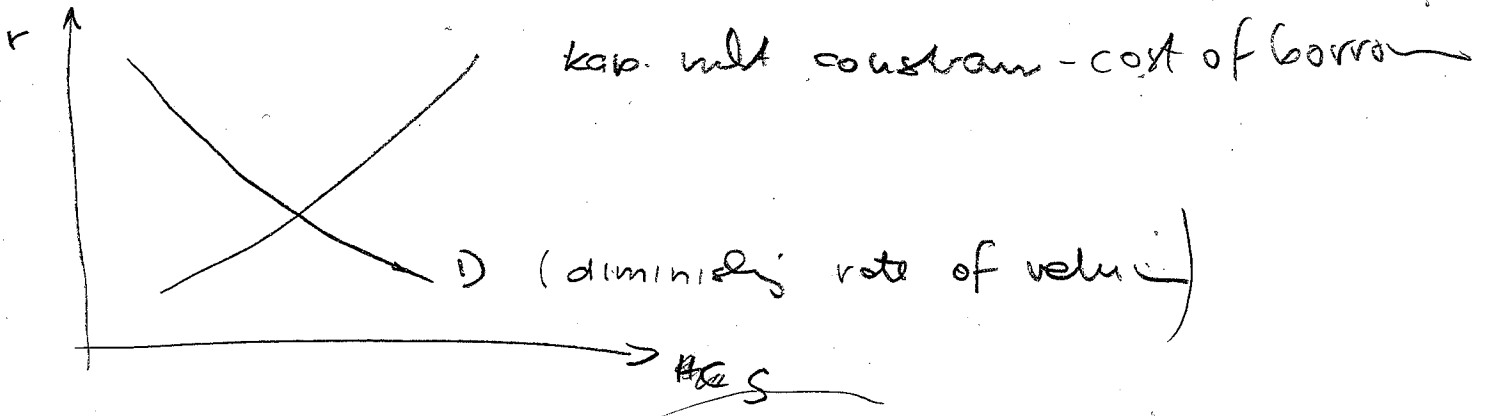
$$\text{VAR}(r_s) = \bar{r}^2 \text{VAR}(s)$$

empirically
 $\sigma_s \gg \sigma_r$

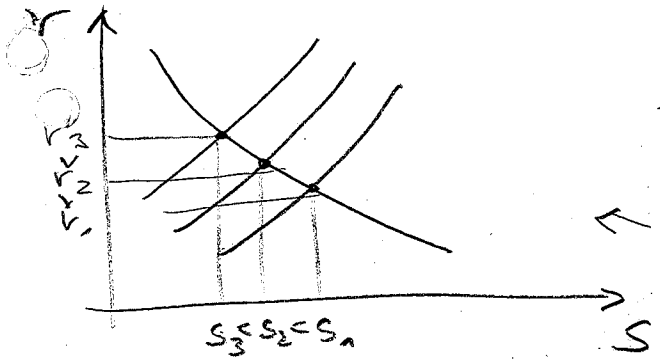
if $s \sim \text{Normal}$ (as ability) $\Rightarrow \log w_s = \bar{r} * s \Rightarrow \log \text{normal}$ distr. of wages



• demand for edu



CASE People face different kap. milts



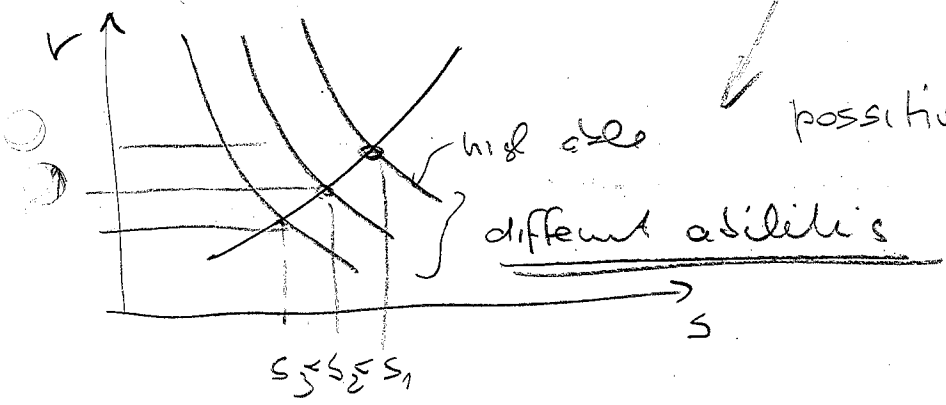
→ negative correlation of S & r

$$\ln y_i = \ln w_{0i} + r_i s_i$$

negative correlation

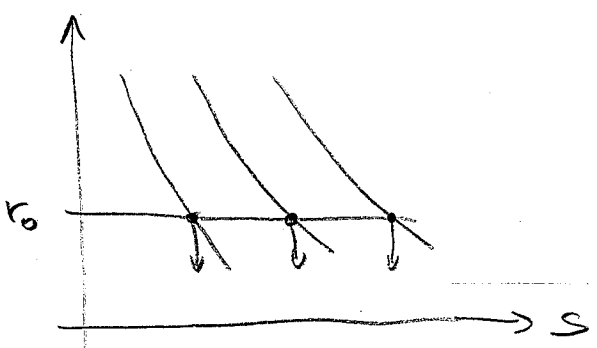
• if only r gauges we can estimate r from var in (S)

CASE

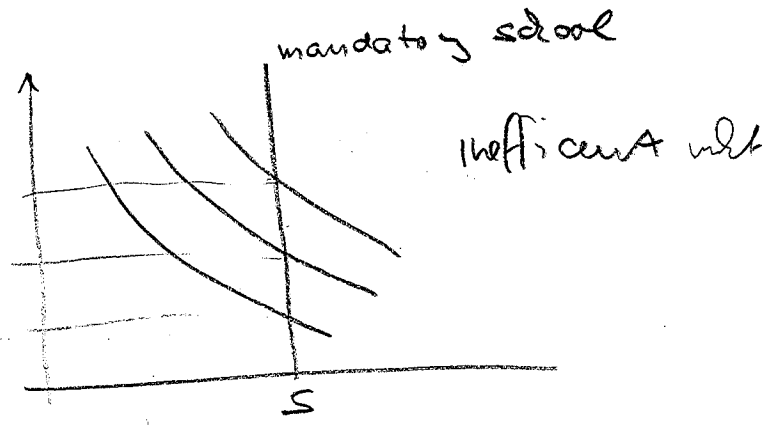


positive correlation

EXTREMES



- differences only due A
- the most efficient allocation



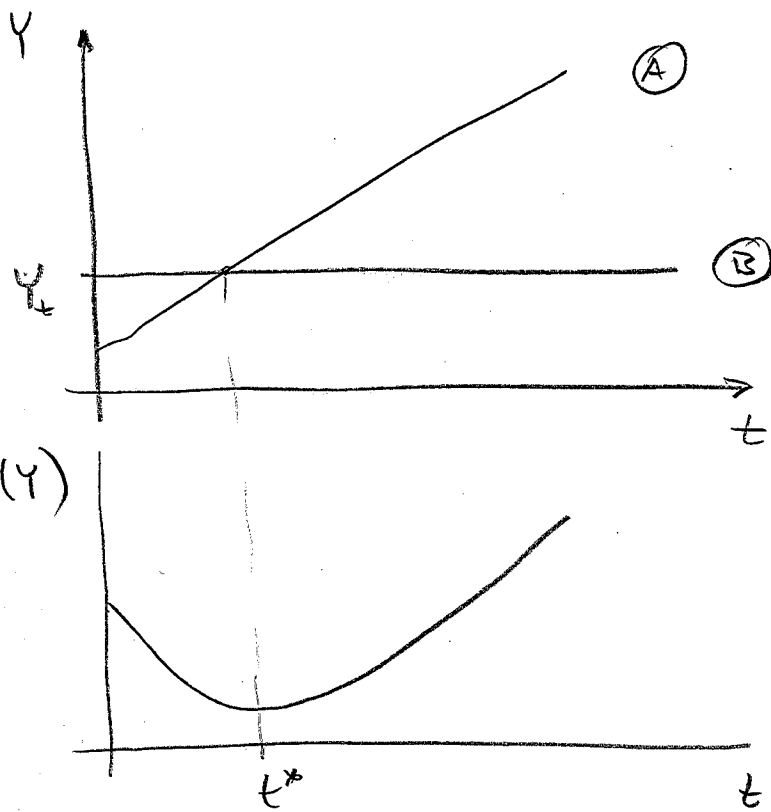
Cohort view:

$$E_t = E_{t-1} + r C_{t-1}$$

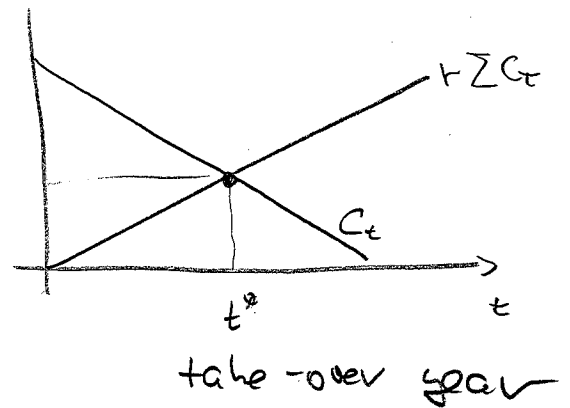
$$E_t = E_s + r \sum_{z=1}^{t-s} C_z$$

$$Y_t = E_s + r \sum_{z=1}^{t-s} C_z - C_t$$

consider 2 workers
 ↙ investing on-the-job (A)
 ↘ not (B)



For person (A)



⇒ early EXP → high VAR(Y_t) due different invest.

⇒ late EXP → ————— returns

⇒ middle EXP → minimum VAR(Y_t)

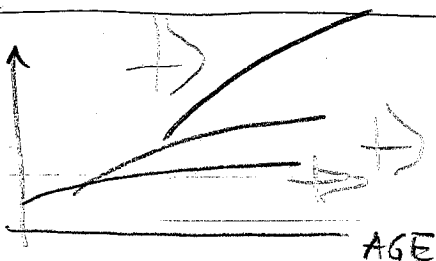


Table 5. Distribution of income or consumption

Economy	Survey year	Gini index	Percentage share of income or consumption						
			Lowest 10%	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%	Highest 10%
Albania									
Algeria	1995 ^{a,b}	35.3	2.8	7.0	11.6	16.1	22.7	42.6	26.8
Angola									
Argentina									
Armenia									
Australia	1989 ^{c,d}	33.7	2.5	7.0	12.2	16.6	23.3	40.9	24.8
Austria	1987 ^{c,d}	23.1	4.4	10.4	14.8	18.5	22.9	33.3	19.3
Azerbaijan									
Bangladesh	1992 ^{a,b}	28.3	4.1	9.4	13.5	17.2	22.0	37.9	23.7
Belarus	1995 ^{c,d}	28.8	3.4	8.5	13.5	17.7	23.1	37.2	22.6
Belgium	1992 ^{c,d}	25.0	3.7	9.5	14.6	18.4	23.0	34.5	20.2
Benin									
Bolivia	1990 ^{c,d}	42.0	2.3	5.6	9.7	14.5	22.0	48.2	31.7
Botswana									
Brazil	1995 ^{c,d}	60.1	0.8	2.5	5.7	9.9	17.7	64.2	47.9
Bulgaria	1992 ^{c,d}	30.8	3.3	8.3	13.0	17.0	22.3	39.3	24.7
Burkina Faso	1994 ^{a,b}	48.2	2.2	5.5	8.7	12.0	18.7	55.0	39.5
Burundi									
Cambodia									
Cameroon									
Canada	1994 ^{c,d}	31.5	2.8	7.5	12.9	17.2	23.0	39.3	23.8
Central African Republic									
Chad									
Chile	1994 ^{c,d}	56.5	1.4	3.5	6.6	10.9	18.1	61.0	46.1
China	1995 ^{c,d}	41.5	2.2	5.5	9.8	14.9	22.3	47.5	30.9
Hong Kong, China									
Colombia	1995 ^{c,d}	57.2	1.0	3.1	6.8	10.9	17.6	61.5	46.9
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	1996 ^{c,d}	47.0	1.3	4.0	8.8	13.7	21.7	51.8	34.7
Côte d'Ivoire	1988 ^{a,b}	36.9	2.8	6.8	11.2	15.8	22.2	44.1	28.5
Croatia									
Czech Republic	1993 ^{c,d}	26.6	4.6	10.5	13.9	16.9	21.5	37.4	23.5
Denmark	1992 ^{c,d}	24.7	3.6	9.6	14.9	18.3	22.7	34.5	20.5
Dominican Republic	1989 ^{c,d}	50.5	1.6	4.2	7.9	12.5	19.7	55.7	39.6
Ecuador	1994 ^{a,b}	46.6	2.3	5.4	8.9	13.2	19.9	52.6	37.6
Egypt, Arab Rep.	1991 ^{a,b}	32.0	3.9	8.7	12.5	16.3	21.4	41.1	26.7
El Salvador	1995 ^{c,d}	49.9	1.2	3.7	8.3	13.1	20.5	54.4	38.3
Eritrea									
Estonia	1995 ^{c,d}	35.4	2.2	6.2	12.0	17.0	23.1	41.8	26.2
Ethiopia	1995 ^{a,b}	40.0	3.0	7.1	10.9	14.5	19.8	47.7	33.7
Finland	1991 ^{c,d}	25.6	4.2	10.0	14.2	17.6	22.3	35.8	21.6
France	1989 ^{c,d}	32.7	2.5	7.2	12.7	17.1	22.8	40.1	24.9
Georgia									
Germany	1989 ^{c,d}	28.1	3.2	9.0	13.5	17.5	22.9	37.1	22.6
Ghana	1997 ^{a,b}	32.7	3.6	8.4	12.2	15.8	21.9	41.7	26.1
Greece									
Guatemala	1989 ^{c,d}	59.6	0.6	2.1	5.8	10.5	18.6	63.0	46.6
Guinea	1994 ^{a,b}	40.3	2.6	9.4	10.4	14.8	21.2	47.2	32.0
Haiti									
Honduras	1996 ^{c,d}	53.7	1.2	3.4	7.1	11.7	19.7	58.0	42.1
Hungary	1993 ^{c,d}	27.9	4.1	9.7	13.9	16.9	21.4	38.1	24.0
India	1994 ^{a,b}	29.7	4.1	9.2	13.0	16.8	21.7	39.3	25.0
Indonesia	1996 ^{c,d}	36.5	3.6	8.0	11.3	15.1	20.8	44.9	30.3
Iran, Islamic Rep.									
Ireland	1987 ^{c,d}	35.9	2.5	6.7	11.6	16.4	22.4	42.9	27.4
Israel	1992 ^{c,d}	35.5	2.8	6.9	11.4	16.3	22.9	42.5	26.9
Italy	1991 ^{c,d}	31.2	2.9	7.6	12.9	17.3	23.2	38.9	23.7
Jamaica	1991 ^{a,b}	41.1	2.4	5.8	10.2	14.9	21.6	47.5	31.9
Japan									
Jordan	1991 ^{a,b}	43.4	2.4	5.9	9.8	13.9	20.3	50.1	34.7
Kazakhstan	1993 ^{c,d}	32.7	3.1	7.5	12.3	16.9	22.9	40.4	24.9
Kenya	1994 ^{a,b}	44.5	1.8	5.0	9.7	14.2	20.9	50.2	34.9
Korea, Rep.									
Kuwait									
Kyrgyz Republic	1993 ^{c,d}	35.3	2.7	6.7	11.5	16.4	23.1	42.3	26.2
Lao PDR	1992 ^{a,b}	30.4	4.2	9.6	12.9	16.3	21.0	40.2	26.4
Latvia	1995 ^{c,d}	28.5	3.3	8.3	13.8	18.0	22.9	37.0	22.4
Lebanon									
Lesotho	1986-87 ^{a,b}	56.0	0.9	2.8	6.5	11.2	19.4	60.1	43.4
Lithuania	1993 ^{c,d}	33.6	3.4	8.1	12.3	16.2	21.3	42.1	28.0
Macedonia, FYR									
Madagascar	1993 ^{a,b}	46.0	1.9	5.1	9.4	13.3	20.1	52.1	36.7
Malawi									
Malaysia	1989 ^{c,d}	48.4	1.9	4.6	8.3	13.0	20.4	53.7	37.9

Note: For data comparability and coverage, see the Technical Notes. Figures in italics are for years other than those specified.

Economy	Survey year	Gini index	Percentage share of income or consumption						
			Lowest 10%	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%	Highest 10%
Mali	1994 ^{a,b}	50.5	1.8	4.6	8.0	11.9	19.3	56.2	40.4
Mauritania	1995 ^{a,b}	58.9	2.3	6.2	10.8	15.4	22.0	45.6	29.9
Mexico	1995 ^{a,d}	53.7	1.4	3.6	7.2	11.8	19.2	58.2	42.8
Moldova	1992 ^{a,d}	54.4	2.7	6.9	11.9	16.7	23.1	41.5	25.8
Mongolia	1995 ^{a,b}	53.2	2.9	7.3	12.2	16.6	23.0	40.9	24.5
Morocco	1990-91 ^{a,b}	39.2	2.8	6.6	10.5	15.0	21.7	46.3	30.5
Mozambique	..	..	..	..	..	..	..	..	..
Myanmar	..	..	..	..	..	..	..	..	..
Namibia	..	..	..	..	..	..	..	..	..
Nepal	1995-96 ^{a,b}	36.7	3.2	7.6	11.5	15.1	21.0	44.8	29.8
Netherlands	1991 ^{a,d}	31.5	2.9	8.0	13.0	16.7	22.5	39.9	24.7
New Zealand	..	..	..	..	..	..	..	..	..
Nicaragua	1993 ^{a,b}	50.3	1.6	4.2	8.0	12.6	20.0	55.2	39.8
Niger	1995 ^{a,b}	50.5	0.8	2.6	7.1	13.9	23.1	53.3	35.4
Nigeria	1992-93 ^{a,b}	45.0	1.3	4.0	8.9	14.4	23.4	49.3	31.4
Norway	1991 ^{a,d}	25.2	4.1	10.0	14.3	17.9	22.4	35.3	21.2
Pakistan	1996 ^{a,b}	31.2	4.1	9.4	13.0	16.0	20.3	41.2	27.7
Panama	1995 ^{a,d}	57.1	0.7	2.3	6.2	11.3	19.8	60.4	43.8
Papua New Guinea	1996 ^{a,b}	50.9	1.7	4.5	7.9	11.9	19.2	56.5	40.5
Paraguay	1995 ^{a,d}	59.1	0.7	2.3	5.9	10.7	18.7	62.4	46.6
Peru	1996 ^{a,d}	46.2	1.6	4.4	9.1	14.1	21.3	51.2	35.4
Philippines	1994 ^{a,b}	42.9	2.4	5.9	9.6	13.9	21.1	49.6	33.5
Poland	1992 ^{a,b}	27.2	4.0	9.3	13.8	17.7	22.6	36.6	22.1
Portugal	..	..	..	..	..	..	..	..	..
Romania	1994 ^{a,d}	28.2	3.7	8.9	13.6	17.6	22.6	37.3	22.7
Russian Federation	1996 ^{a,b}	48.0	1.4	4.2	8.8	13.6	20.7	52.8	37.4
Rwanda	1983-85 ^{a,b}	28.9	4.2	9.7	13.2	16.5	21.6	39.1	24.2
Saudi Arabia	..	..	..	..	..	..	..	..	..
Senegal	1991 ^{a,b}	53.8	1.0	3.1	7.4	12.1	19.5	57.9	42.3
Sierra Leone	1989 ^{a,b}	62.9	0.5	1.1	2.0	3.8	7.7	13.4	13.6
Singapore	..	..	..	..	..	..	..	..	..
Slovak Republic	1992 ^{a,d}	19.5	5.1	11.9	15.8	18.8	22.2	31.4	18.2
Slovenia	1993 ^{a,d}	29.2	4.0	9.3	13.3	16.9	21.9	38.6	24.5
South Africa	1993-94 ^{a,b}	59.3	1.1	2.9	5.5	9.2	17.7	64.8	45.9
Spain	1990 ^{a,d}	32.5	2.8	7.5	12.6	17.0	22.6	40.3	25.2
Sri Lanka	1990 ^{a,b}	30.1	3.8	8.9	13.1	16.9	21.7	39.3	25.2
Sweden	1992 ^{a,d}	25.0	3.7	9.6	14.5	18.1	23.2	34.5	20.1
Switzerland	1982 ^{a,d}	36.1	2.9	7.4	11.6	15.6	21.9	43.5	28.6
Syrian Arab Republic	..	..	..	..	..	..	..	..	..
Tanzania	..	..	..	..	..	..	..	..	..
Tanzania	1993 ^{a,b}	58.2	2.8	6.8	11.0	15.1	21.6	45.5	30.1
Thailand	1992 ^{a,b}	46.2	2.5	5.6	8.7	13.0	20.0	52.7	37.1
Togo	..	..	..	..	..	..	..	..	..
Tunisia	1990 ^{a,b}	40.2	2.3	5.9	10.4	15.3	22.1	46.3	30.7
Turkey	..	..	..	..	..	..	..	..	..
Turkmenistan	1993 ^{a,d}	35.8	2.7	6.7	11.4	16.3	22.8	42.8	26.9
Uganda	1992-93 ^{a,b}	39.2	2.6	6.6	10.9	15.2	21.3	46.1	31.2
Ukraine	1995 ^{a,d}	47.3	1.4	4.3	9.0	13.8	20.8	52.2	36.8
United Kingdom	1986 ^{a,d}	32.6	2.4	7.1	12.8	17.2	23.1	39.8	24.7
United States	1994 ^{a,d}	40.1	1.5	4.8	10.5	16.0	23.5	45.2	28.5
Uruguay	..	..	..	..	..	..	..	..	..
Uzbekistan	..	..	..	..	..	..	..	..	..
Venezuela	1995 ^{a,d}	46.8	1.5	4.3	8.8	13.8	21.3	51.8	35.6
Vietnam	1993 ^{a,b}	35.7	3.5	7.8	11.4	15.4	21.4	44.0	29.0
Yemen, Rep.	1992 ^{a,b}	39.5	2.3	6.1	10.9	15.3	21.6	46.1	30.8
Zambia	1996 ^{a,b}	49.8	1.6	4.2	8.2	12.8	20.1	54.8	39.2
Zimbabwe	1990 ^{a,b}	56.8	1.8	4.0	6.3	10.0	17.4	62.3	46.9

a. Refers to expenditure shares by percentiles of population. b. Ranked by per capita expenditure. c. Refers to income shares by percentiles of population. d. Ranked by per capita income.