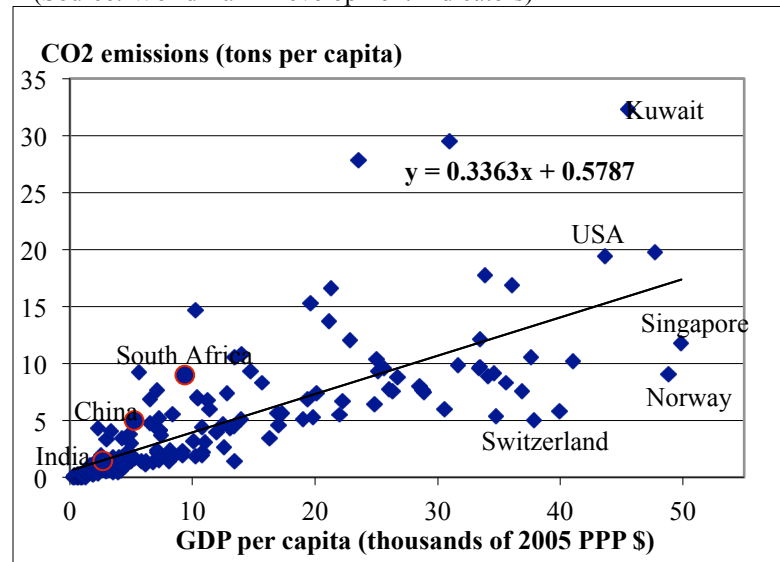
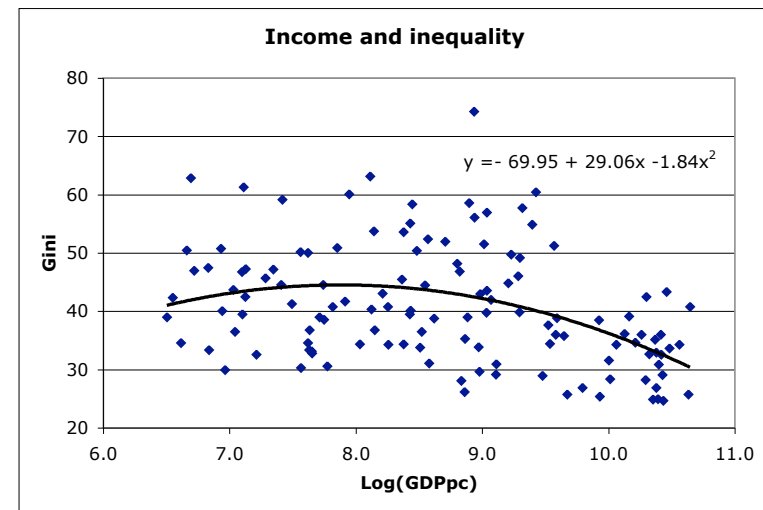


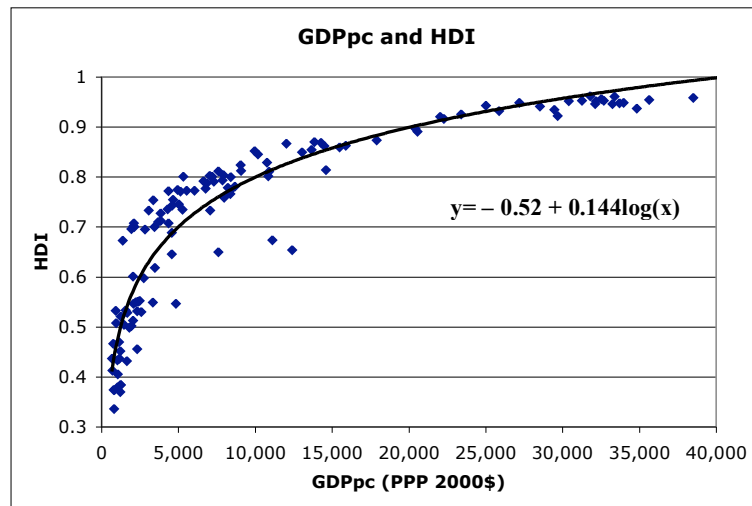
A linear relationship: CO2 emission per capita and GDP/capita in 2007
(Source: World Bank Development Indicators)



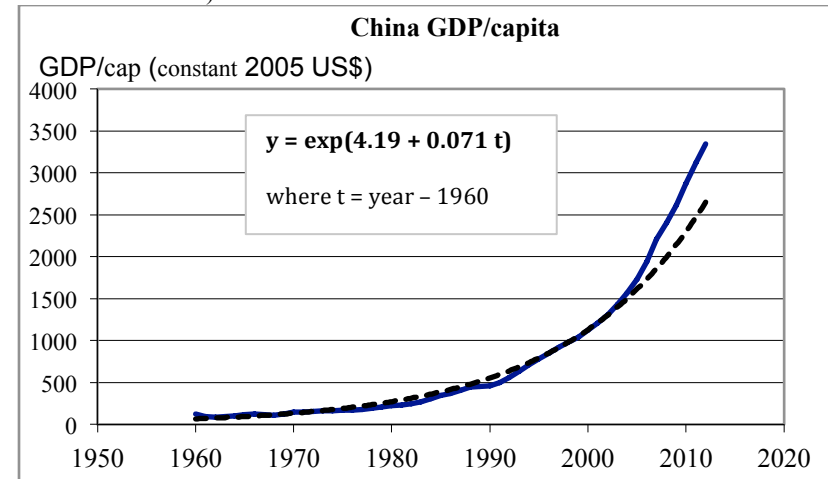
A quadratic relationship: The Kuznets curve (Source: UNDP: Human Development Report, 2007)



A logarithmic relationship: Human Development Index and GDP/capita
(Source: UNDP: Human Development Report, 2007)



An exponential relationship: China GDP/capita over time (Source: World Bank data on line)



Examples of density functions

Source: **2012 Census – California – Adults 25 years old and above, with earnings.**

wagp annual earnings (in \$)

educy years of education

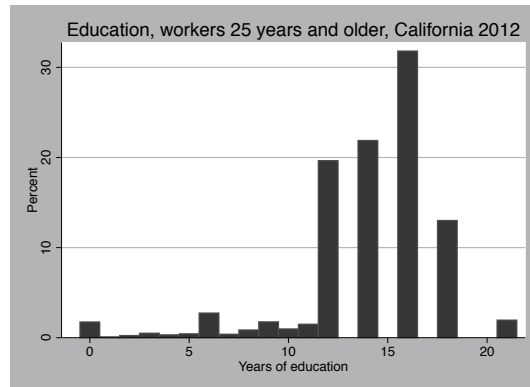
A discrete variable: education

Population mean $\mu = 14.01$ years

Population standard deviation $\sigma = 3.06$

```
. histogram educy, percent discrete title("Education, workers 25 years and older, California 2012")
. tabulate educy
```

Years of education	pdf	cdf
0	1.76	1.76
1	0.11	1.86
2	0.25	2.11
3	0.51	2.62
4	0.33	2.95
5	0.44	3.39
6	2.75	6.14
7	0.40	6.53
8	0.87	7.40
9	1.77	9.17
10	0.98	10.15
11	1.50	11.66
12	19.65	31.31
14	21.90	53.21
16	31.82	85.02
18	13.02	98.04
21	1.96	100.00



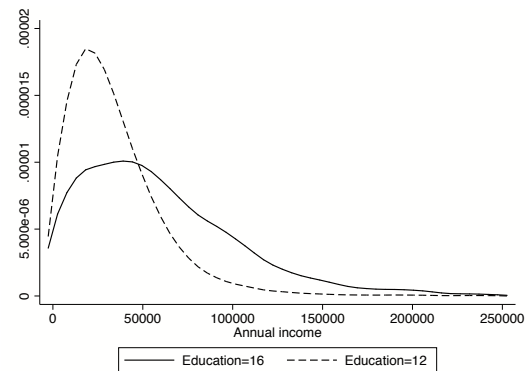
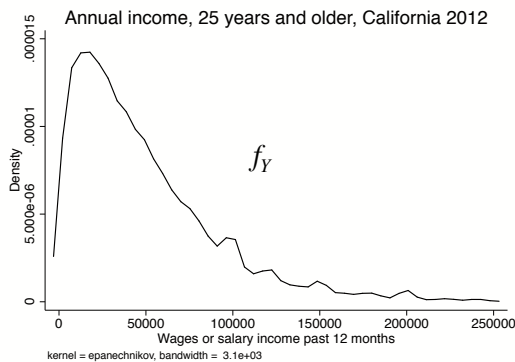
Education	Not married	Married
Less than HS	15.52	15.54
HS	20.67	20.42
Some college	32.24	32.23
BA	21.55	19.23
Master	8.86	10.92
PhD	1.16	1.65

A continuous variable: annual earnings

Population mean= \$54,349

Population standard deviation $\sigma = \$60,305$

```
. kdensity wagp, title("Annual income, 25 years and older, California 2012")
```



Conditional densities