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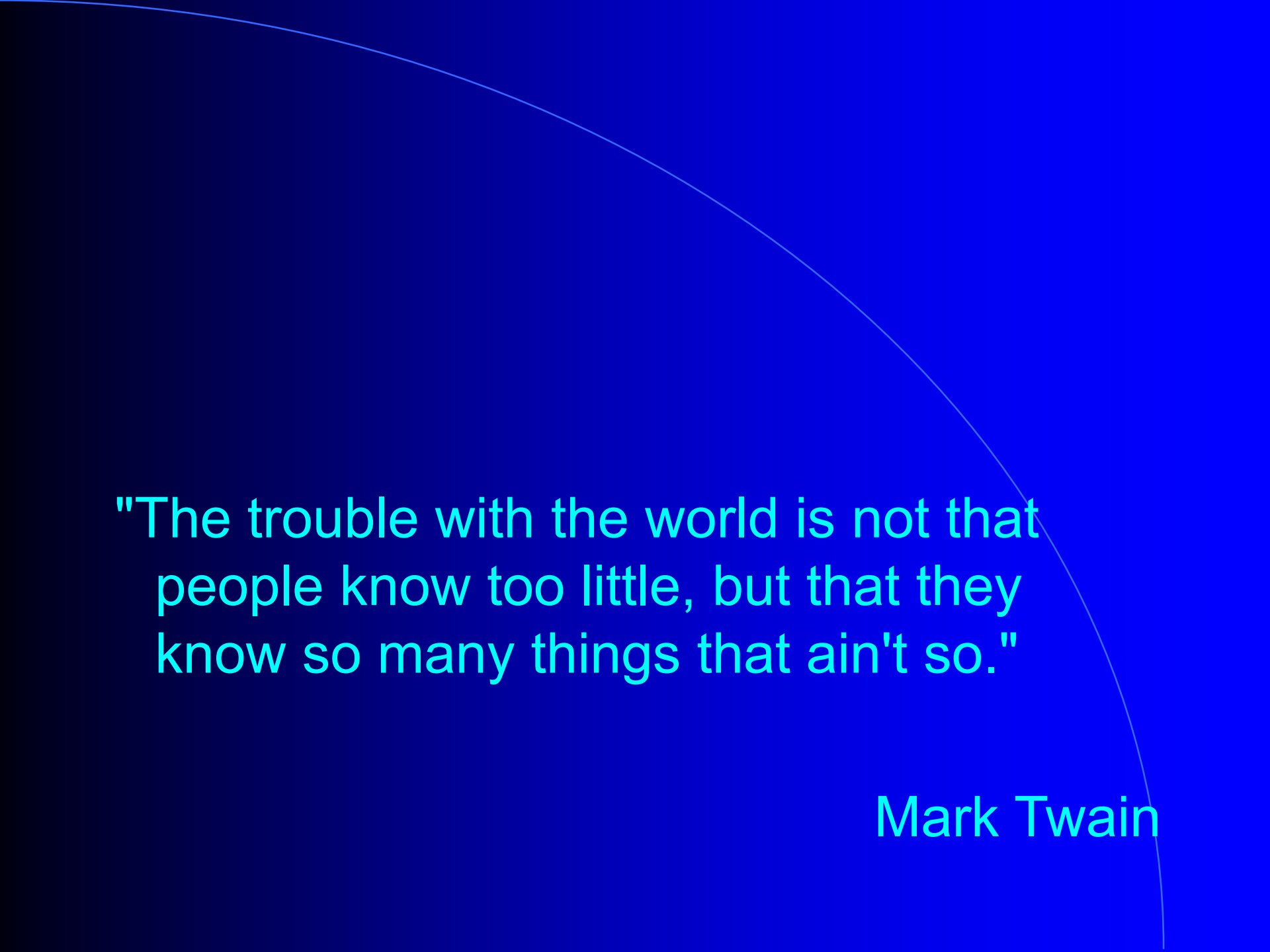
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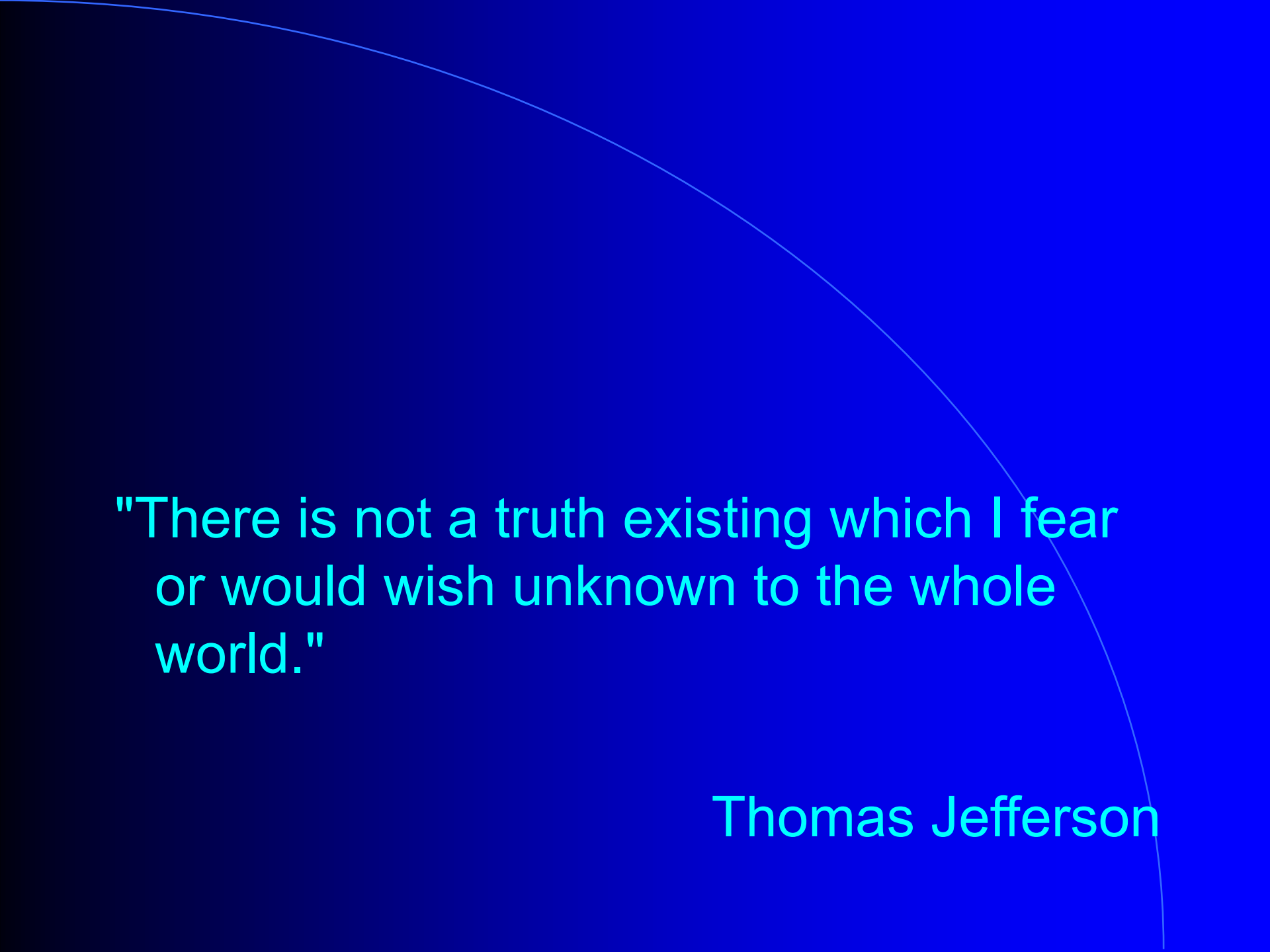
Computers and Society

Inconvenient Truths



"The trouble with the world is not that
people know too little, but that they
know so many things that ain't so."

Mark Twain



"There is not a truth existing which I fear
or would wish unknown to the whole
world."

Thomas Jefferson

Population growth

Proliferation of computer-based technologies dramatically increased human productivity.

Population growth

Proliferation of computer-based technologies dramatically increased human productivity.

Which, in turn, led to rapid **population growth**.

Population growth

Population growth

Do you remember Vice President Gore's lectures on global warming, “hockey stick”, and inconvenient truth?

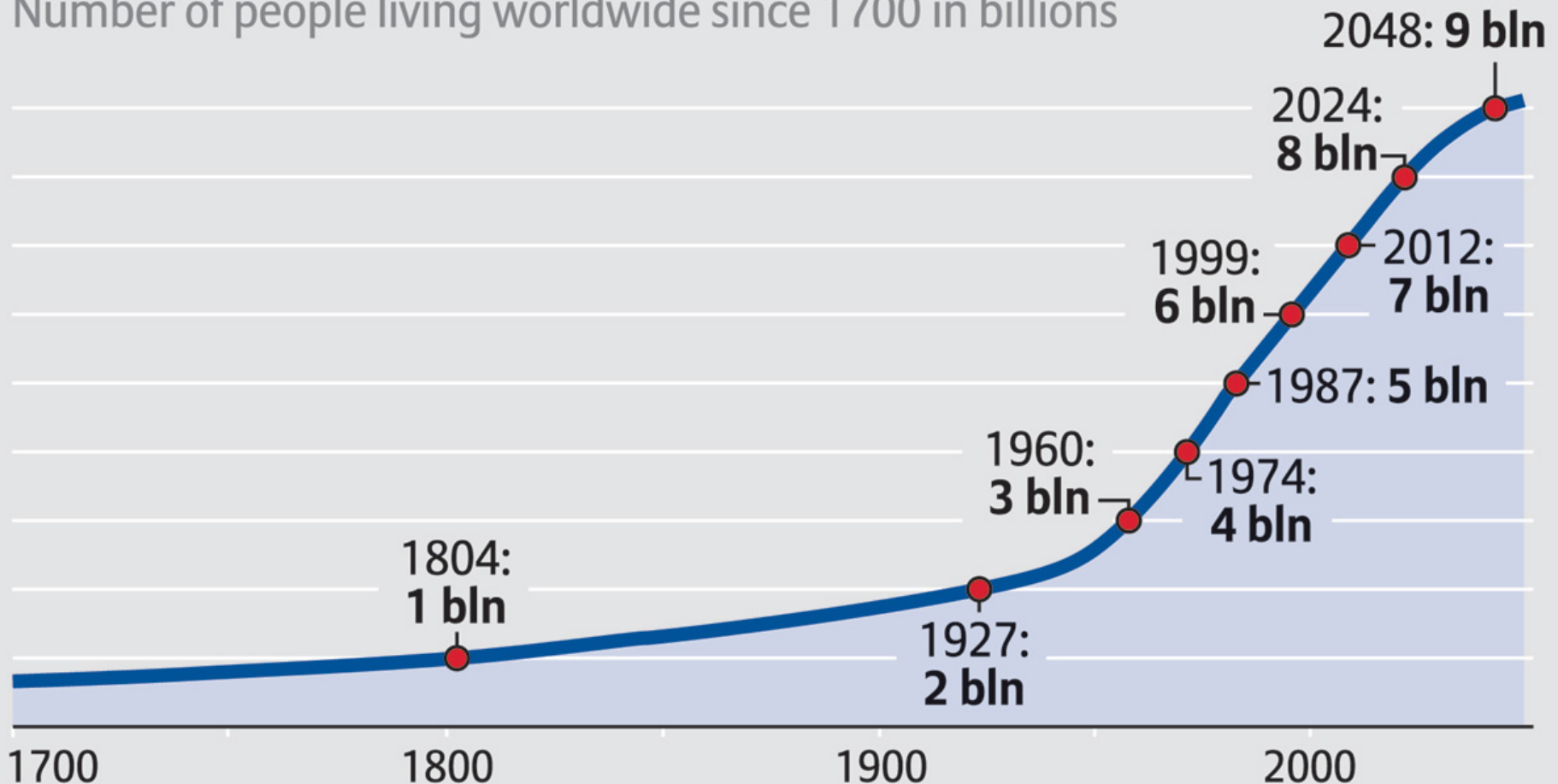
Population growth

Here is a real hockey stick

POPULATION OF THE EARTH



Number of people living worldwide since 1700 in billions



Source: United Nations World Population Prospects, Deutsche Stiftung Weltbevölkerung

For further information please visit: www.knowledge.allianz.com

Population growth

- Historically, restrained by:

Population growth

- Historically, restrained by:
 - limited food supply

Population growth

- Historically, restrained by:
 - limited food supply
 - limited habitat

Population growth

- Historically, restrained by:
 - limited food supply
 - limited habitat
 - wars

Population growth

- Historically, restrained by:
 - limited food supply
 - limited habitat
 - wars (often in overpopulated regions)

Population growth

- Historically, restrained by:
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- Historically, restrained by:
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Population growth

- Historically, restrained by:
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 - etc.

Population growth

- Historically, restrained by:
 - limited food supply
 - limited habitat
 - wars (often in overpopulated regions)
 - diseases (usually originating in overpopulated regions)
 - etc.

(e.g. exceeding the carrying capacity of the region)

- History

- linear

- linear

- wave

- diffusion

- over

- effect

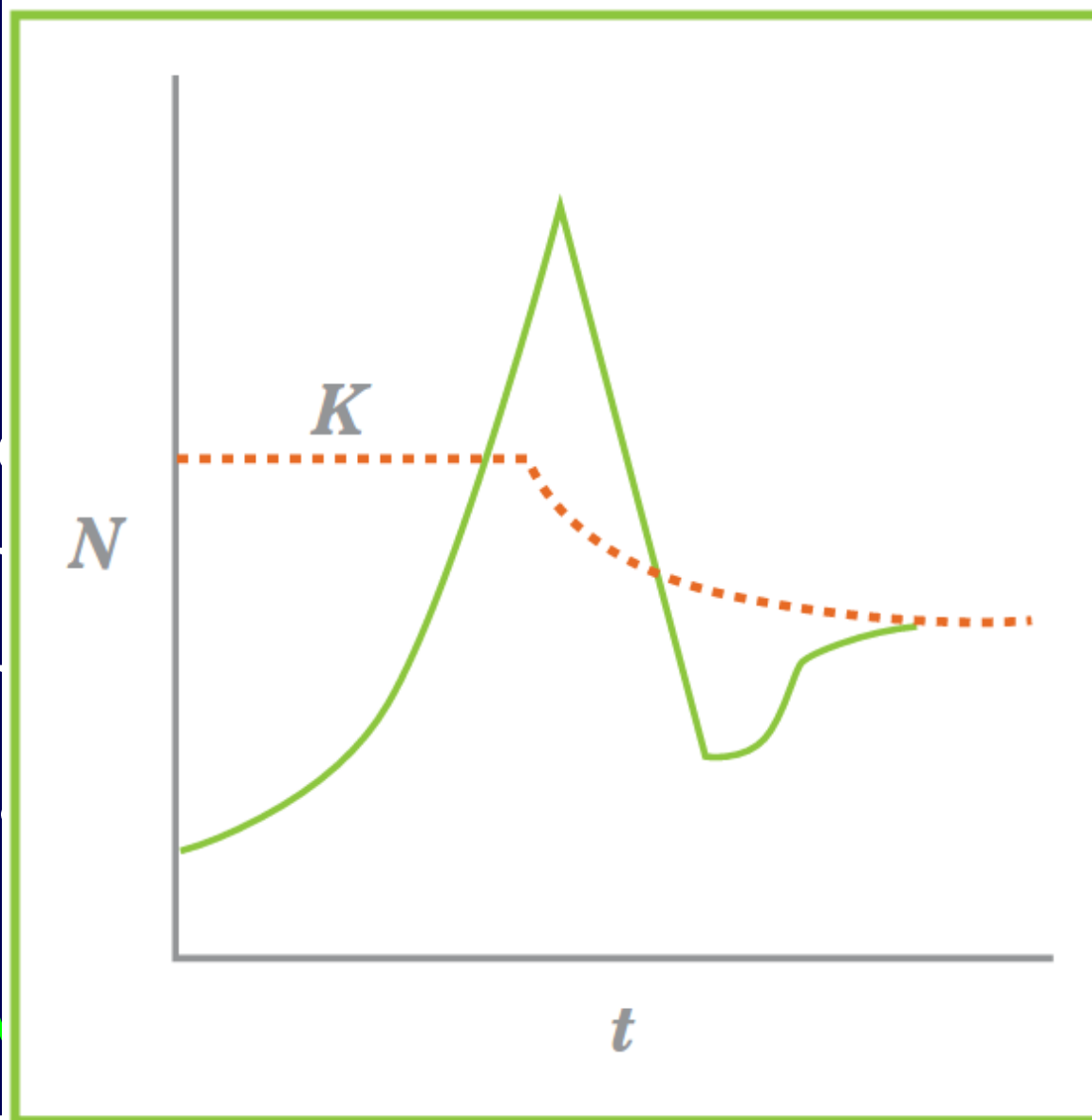


Figure 1. Population irruption, leading to overshoot and crash. Note the decrease in both K and N at about the same time. K and N eventually coincide. [N = population number (size), t = time and K = carrying capacity]

- (e.g.

ions)

gion)

Population growth

- Bubonic Plague (ca. 1346 - 1350)

Population growth

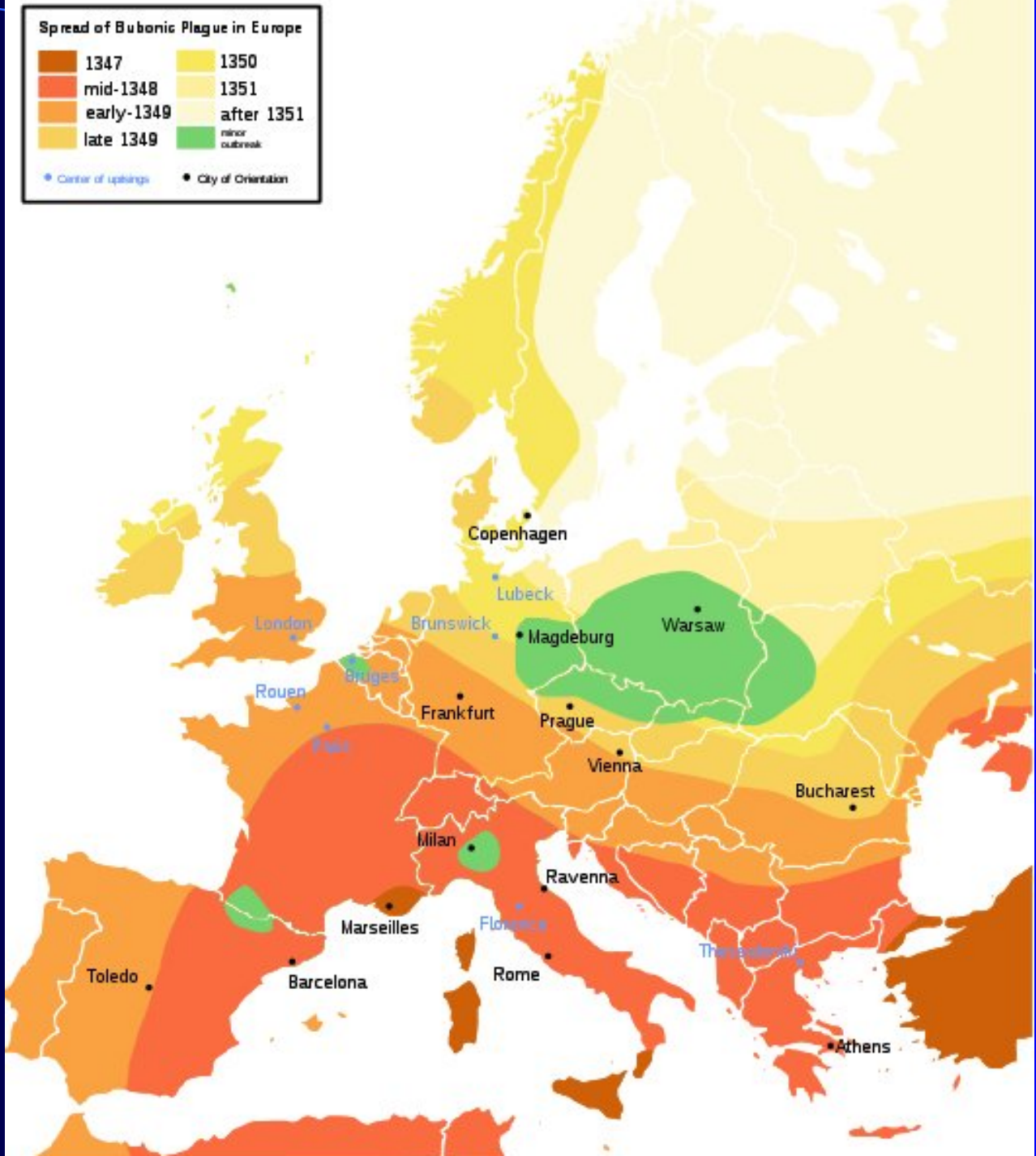
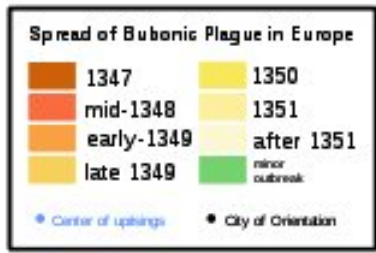
- Bubonic Plague (ca. 1346 - 1350)
 - reduced world's population from est. 450 million to est. 350 million

Population growth

- Bubonic Plague (ca. 1346 - 1350)
 - reduced world's population from est. 450 million to est. 350 million
 - carried over caravan routes and by ships

Population growth

- Bubonic Plague (ca. 1346 - 1350)
 - reduced world's population from est. 450 million to est. 350 million
 - carried over caravan routes and by ships
 - kept returning until 1700s



Population growth

- **After** Bubonic Plague:

Population growth

- After Bubonic Plague:
 - Renaissance

Population growth

- **After** Bubonic Plague:
 - Renaissance
 - increased living standards

Population growth

- **After** Bubonic Plague:
 - Renaissance
 - increased living standards
 - rapid progress in science and technology

Population growth

- **After** Bubonic Plague:
 - Renaissance
 - increased living standards
 - rapid progress in science and technology
 - less wars

A Farewell to Alms

A BRIEF ECONOMIC
HISTORY OF THE WORLD

Gregory Clark

“... the next blockbuster in economics.”
—*New York Times*



Christopher Knittel

Gregory Clark is chair of the economics department at the University of California, Davis. He has written widely about economic history.

Population growth

- Gregory Clark: "A Farewell to Alms"

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap

Population growth

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 - Industrial revolution

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Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - Industrial revolution
 - Population growth
 - Social mobility

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Industrial revolution
 - Population growth
 - Social mobility
 - Emigration

Population growth

- Gregory Clark: "A Farewell to Alms"
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<http://press.princeton.edu/titles/8461.html>

Inconvenient truth



Inconvenient truth

- Thomas Malthus (1766 - 1834):

Inconvenient truth

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 - Population grows exponentially

Inconvenient truth

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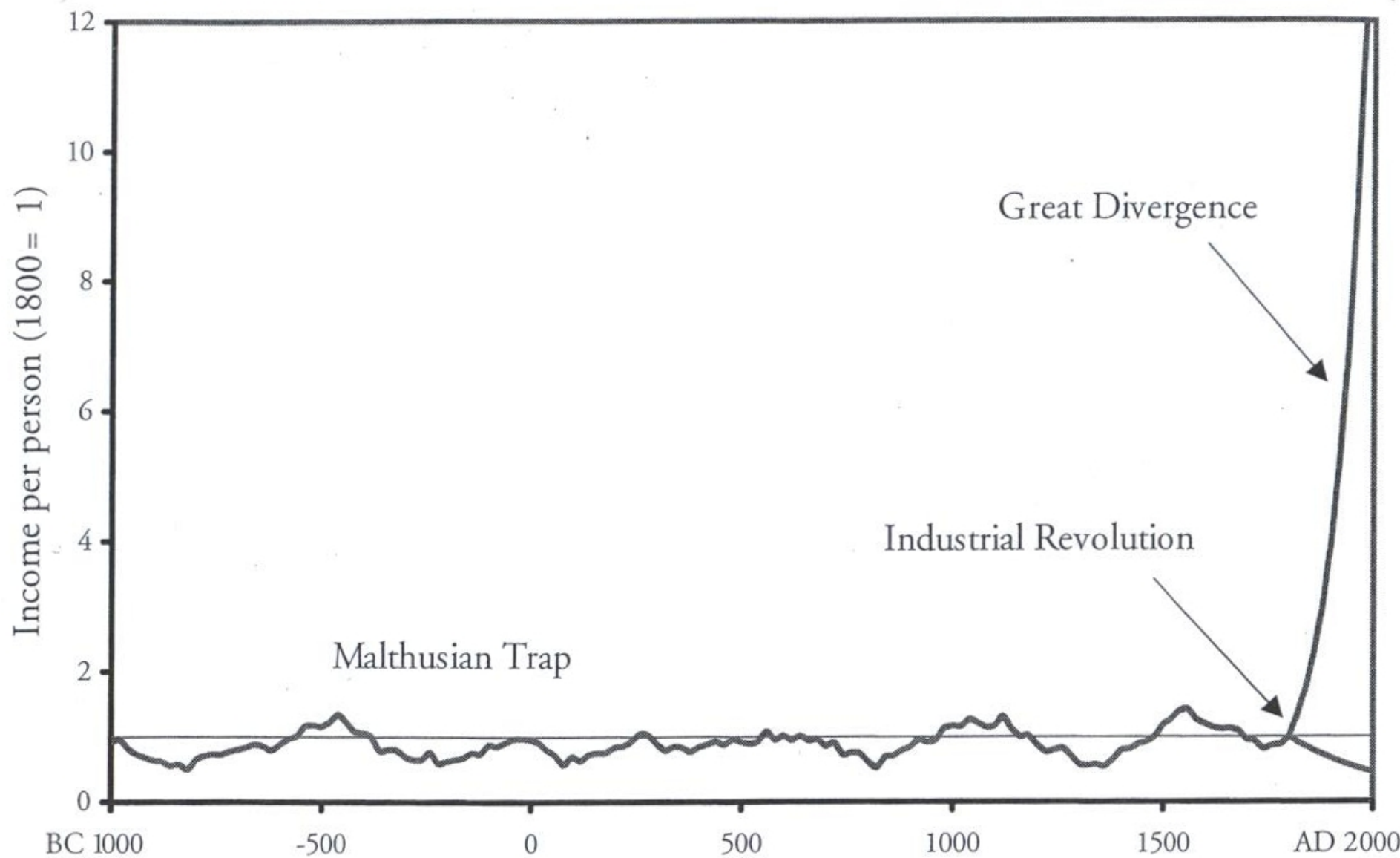


Figure 1.1 World economic history in one picture. Incomes rose sharply in many countries after 1800 but declined in others.

Inconvenient truth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap

Serra Pelada, Para State, Brazil, 1986



Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - How did Britons escape?

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - How did Britons escape?
 - growth of cognitive elite

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - How did Britons escape?
 - growth of cognitive elite and its downward mobility

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - How did Britons escape?
 - growth of cognitive elite and its downward mobility
 - growth of educated workforce

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - How did Britons escape?
 - growth of cognitive elite and its downward mobility
 - growth of educated workforce
 - mass emigration

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - How did Britons escape?
 - growth of cognitive elite and its downward mobility
 - growth of educated workforce
 - mass emigration
 - self-restricted population growth

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap
 - Why many other nations did **not** escape?

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Why many other nations did **not** escape?
 - had no growth of cognitive elite

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Why many other nations did **not** escape?
 - had no growth of cognitive elite
 - translated the increased living standards onto

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Why many other nations did **not** escape?
 - had no growth of cognitive elite
 - translated the increased living standards onto rapid **population growth**

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap ...
 - translated the increased living standards onto rapid population growth

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap ...
 - translated the increased living standards onto rapid population growth
- “Malthusian” population grows up to the point where poverty limits their further growth

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap ...
 - “Malthusian” population grows up to the point where poverty limits their further growth
 - This explains why there are so many poor people in the world

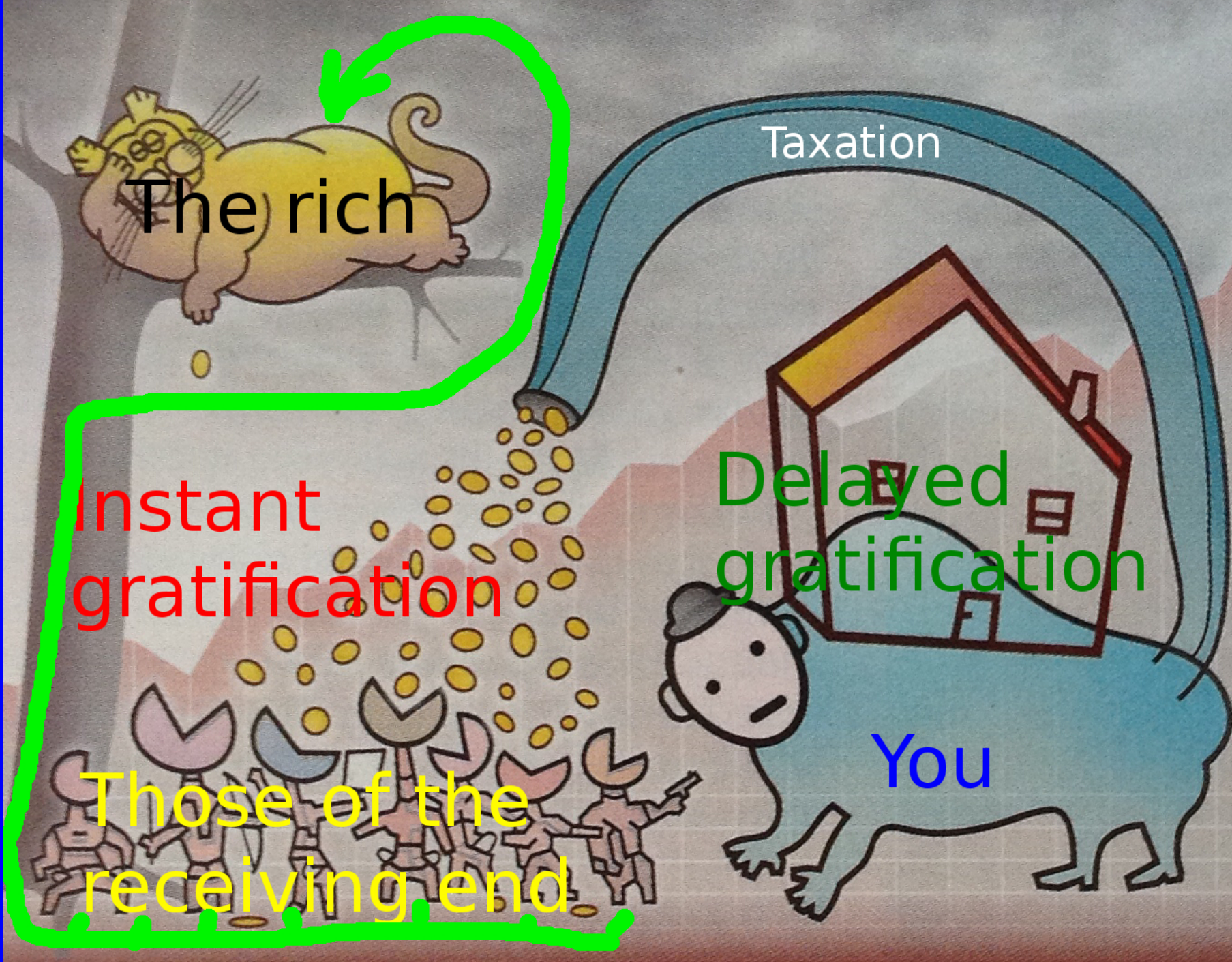
Population growth

- Gregory Clark: "A Farewell to Alms"
 - Malthusian trap ...
 - “Malthusian” population grows up to the point where poverty limits their further growth
 - This explains why there are so many poor people in the world despite rapid progress in technology and manufacturing.









The rich

Taxation

Instant gratification

Delayed gratification

Those of the receiving end

You

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Industrial revolution

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Industrial revolution
 - Who benefited the most?

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Who benefited the most?
 - Wage earners (the poor) and foreign customers.

Population growth

- Gregory Clark: "A Farewell to Alms"
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 - Who benefited the most?
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Population growth

- Gregory Clark: "A Farewell to Alms"
 - Industrial revolution
 - Who benefited the most?
 - Wage earners (the poor) and foreign customers.
 - Many major inventors died in poverty due to weak protections of intellectual property.

Population growth

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Population growth

- Gregory Clark: "A Farewell to Alms"
 - Industrial revolution
 - Many major inventors died in poverty due to weak protections of intellectual property.
 - Did anyone say: "No patents for software"?

Population growth

- Gregory Clark: "A Farewell to Alms"
 - Industrial revolution
 - Many major inventors died in poverty due to weak protections of intellectual property.
 - Did anyone say: "No patents for software"?
 - How about free copying and duplicating on a large scale?

Population growth

- Malthusian trap a danger again

Population growth

- Malthusian trap a danger again
- Historic restrains not a factor, anymore

Population growth

- Historically, population was restrained by:
 - limited food supply
 - limited habitat
 - wars (often in overpopulated regions)
 - diseases (usually originating in overpopulated regions)

Population growth

- Historic restrains not a factor, anymore

Population growth

- Historic restrains not a factor, anymore
 - increased food supply

Population growth

- Historic restrains not a factor, anymore
 - increased food supply
 - rationalization of habitat

Population growth

- Historic restrains not a factor, anymore
 - increased food supply
 - rationalization of habitat
 - no major wars

Population growth

- Historic restrains not a factor, anymore
 - increased food supply
 - rationalization of habitat
 - no major wars
 - modern medicine prevents and cures deadly diseases

Population growth

- Malthusian trap a danger again

Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?

Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?

Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?
 - Look at smaller and smaller cars to accommodate skyrocketing population.

Population growth

- Malthusian trap a danger again



A
future
car
(concept)

Population growth



Population growth



Population growth



Population growth



Population growth



Population growth



Population growth



Population growth



Population growth



Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?





Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?
 - Remember the garbage floating on Carribean Sea?

Population growth



Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?
 - Even if not, will it trigger new diseases caused by mutating pathogens?

Population growth

- Malthusian trap a danger again
 - Will rapid progress in technology and production offset Malthusian trends?
 - Even if so, will population excess lead to irreversible natural resources depletion?
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Population growth

- Malthusian trap a danger again
 - Since 1950:

Population growth

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 - Since 1950:
 - U.S. and Europe less than doubled their population

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Population growth

- Malthusian trap a danger again
 - Since 1950:
 - U.S. and Europe less than doubled their population
 - World almost tripled its population
 - China and India more than tripled their populations
 - Africa increased it 7-fold.

Population growth

- Malthusian trap a danger again
 - “In 1951, the world population was 2.5 billion. It is now 7.3 billion, and the overwhelming bulk of the growth has been in those very countries that are so miserable that huge numbers of their citizens want to leave.”

[Quote from the Internet]

Population growth

- Malthusian trap a danger again
 - “... overwhelming bulk of the growth has been in those very countries that are so miserable that huge numbers of their citizens want to leave.”

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Population growth

- Malthusian trap a danger again

—“... so miserable that huge numbers of their citizens want to leave.”

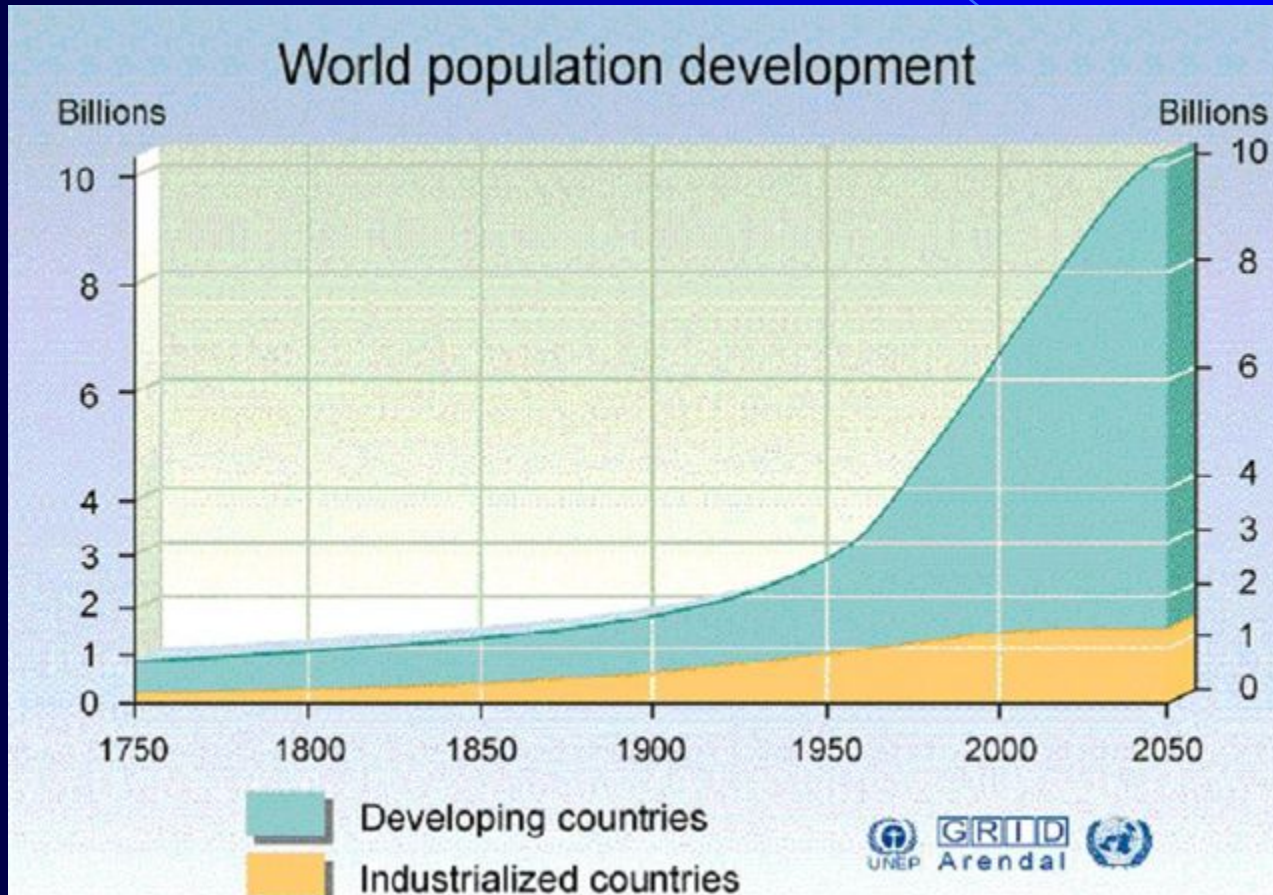
[Quote from the Internet]





Population growth

- Malthusian trap a danger again



Naive utilitarianism in its extreme.

Population growth

- Malthusian trap a danger again

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - offshoring of high paying jobs

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - offshoring of high paying jobs
 - mass importation of low paid workers (“cheap labor”).

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - exportation of manufacturing

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - exportation of manufacturing
 - <https://www.youtube.com/watch?v=ItyQZ3xji50>



Population growth

- Malthusian trap a danger again
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Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - growth of non-wealth creating government jobs

Population growth

- Malthusian trap a danger again
 - U.S. driven back into the Malthusian trap
 - A trend is accelerated by:
 - growth of non-wealth creating government jobs
 - growth of (underfunded) entitlements



HIGH
WAGES

¢ LOW
WAGES



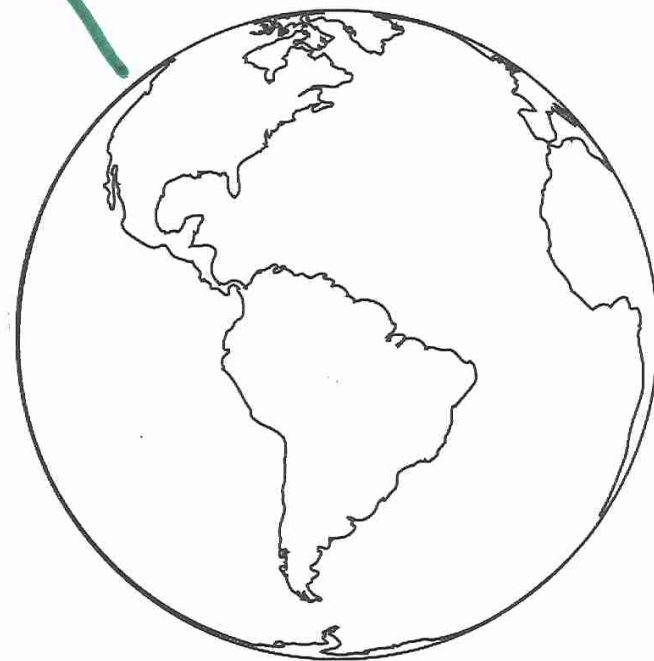


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HIGH
WAGES

LABOR

¢ LOW
WAGES





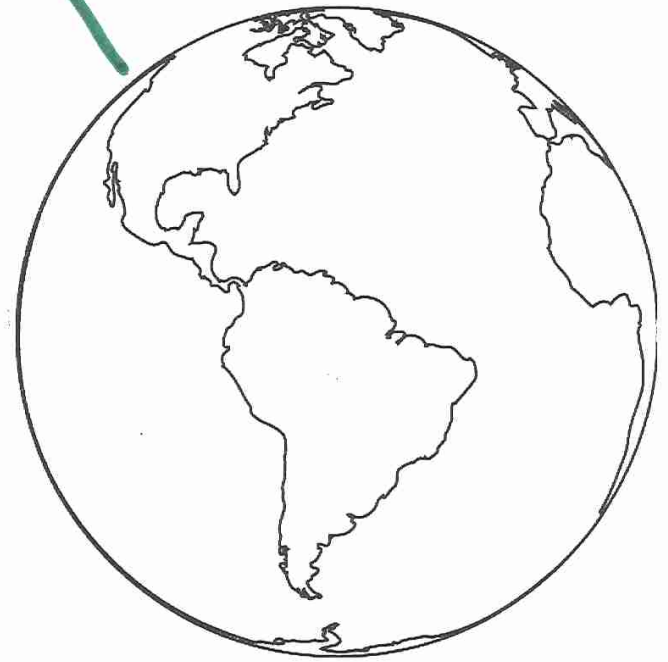
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HIGH
WAGES

LABOR

¢ LOW
WAGES

JOBS





\$\$\$

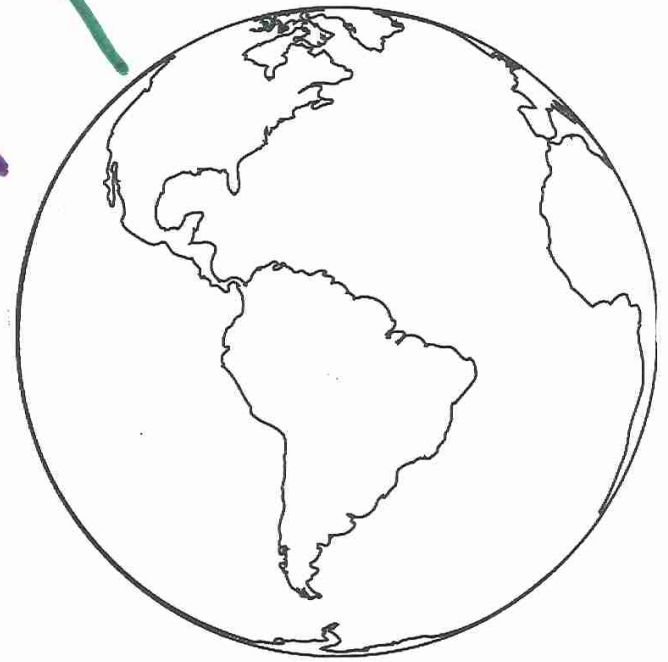
HIGH
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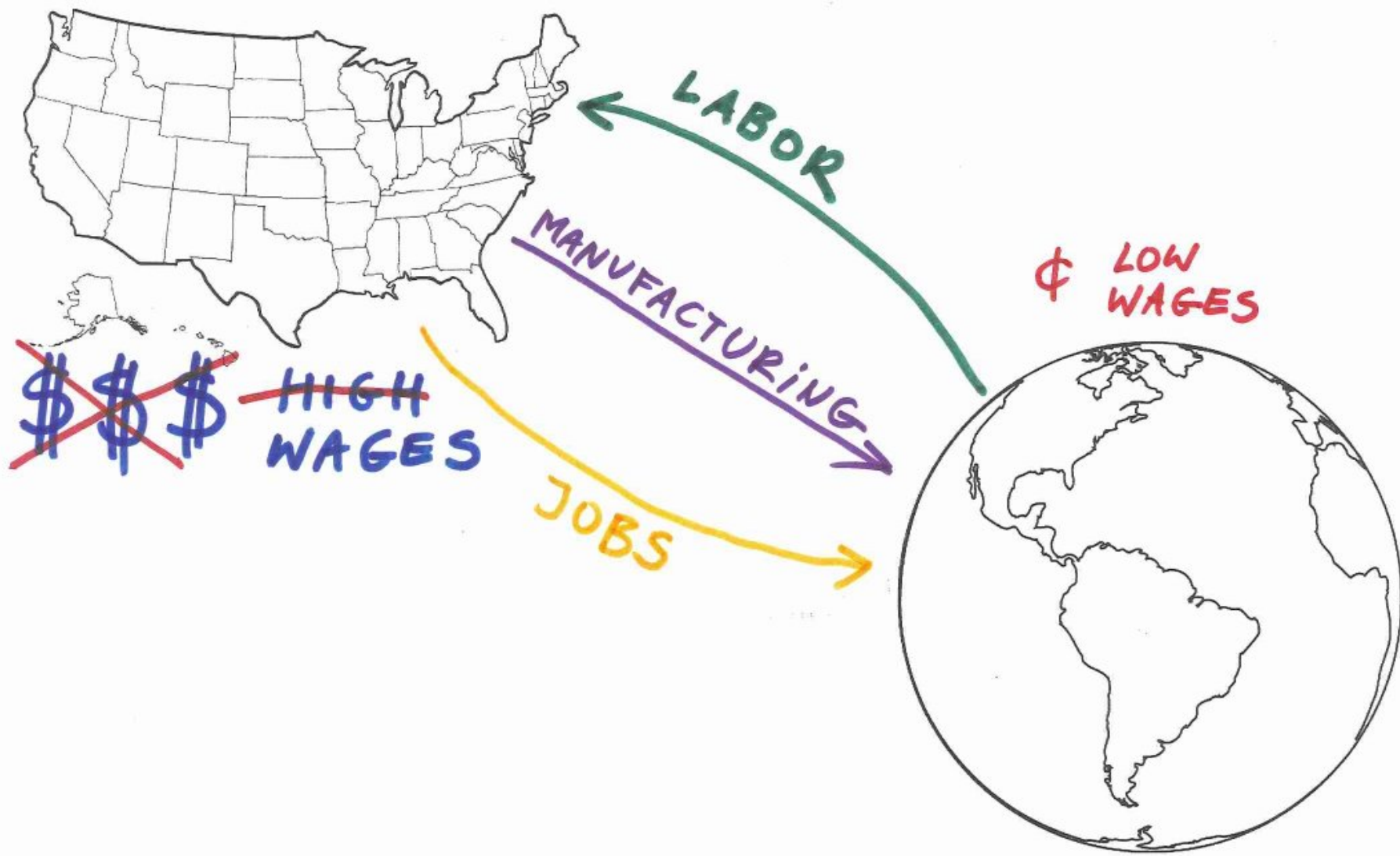
LABOR

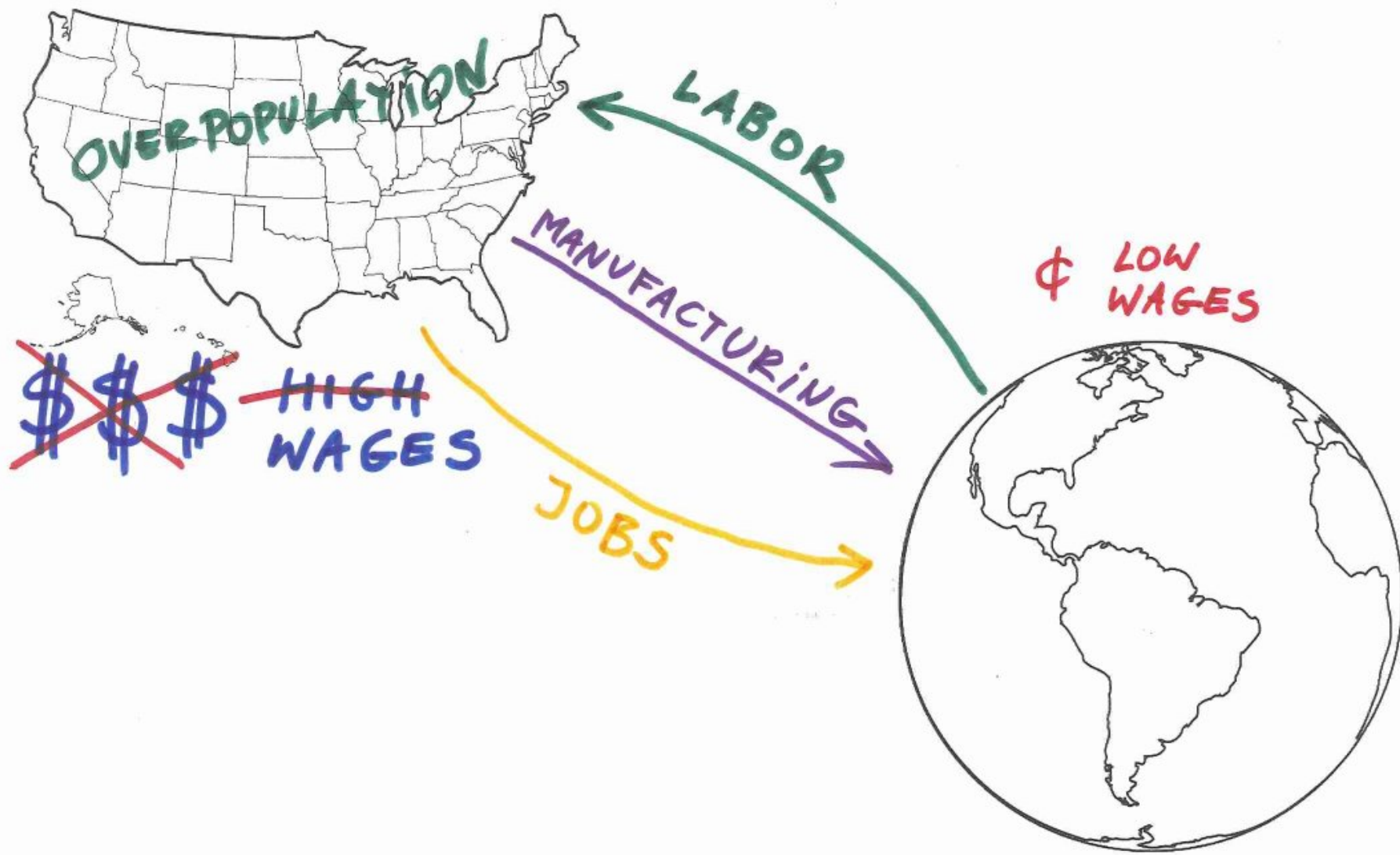
MANUFACTURING

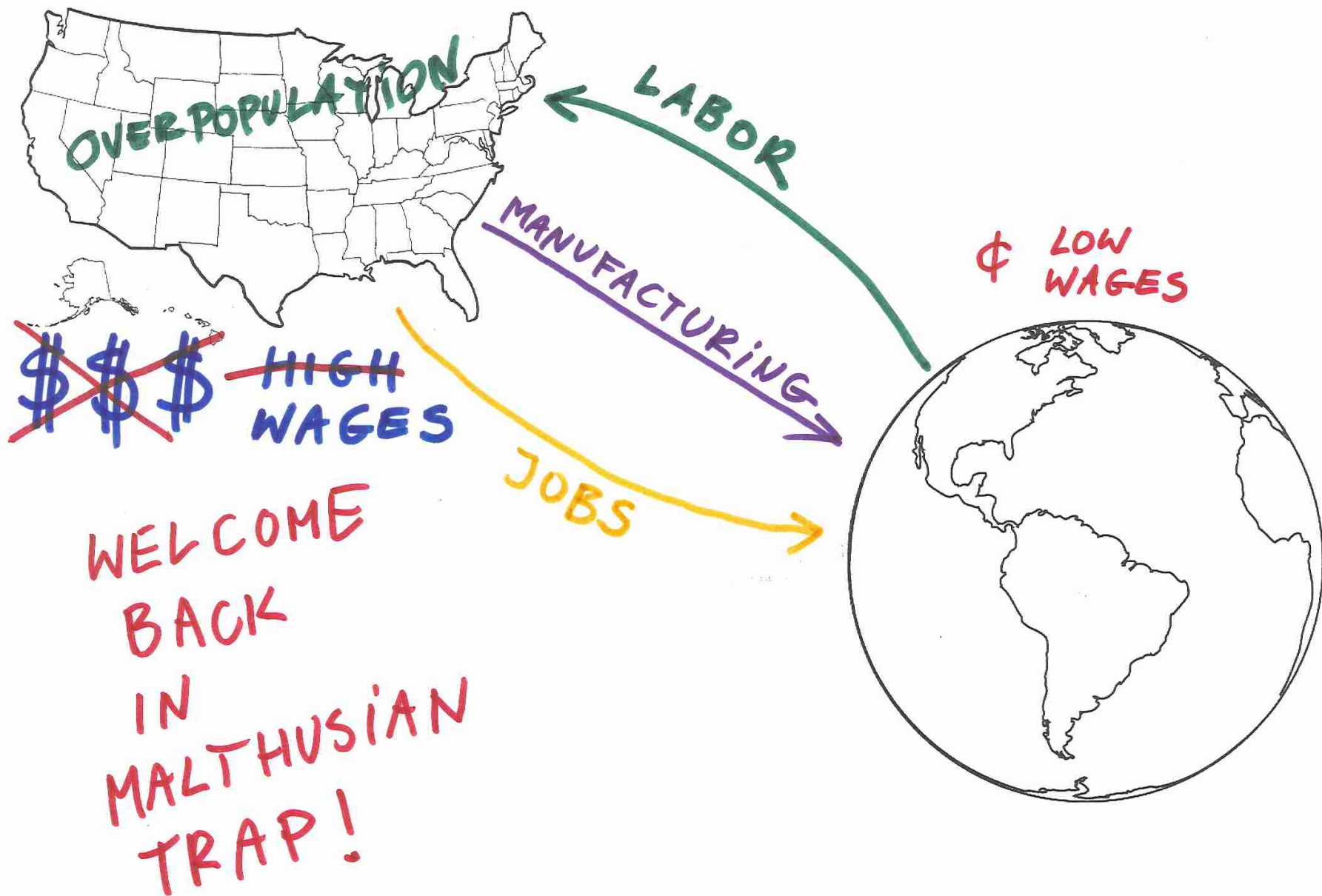
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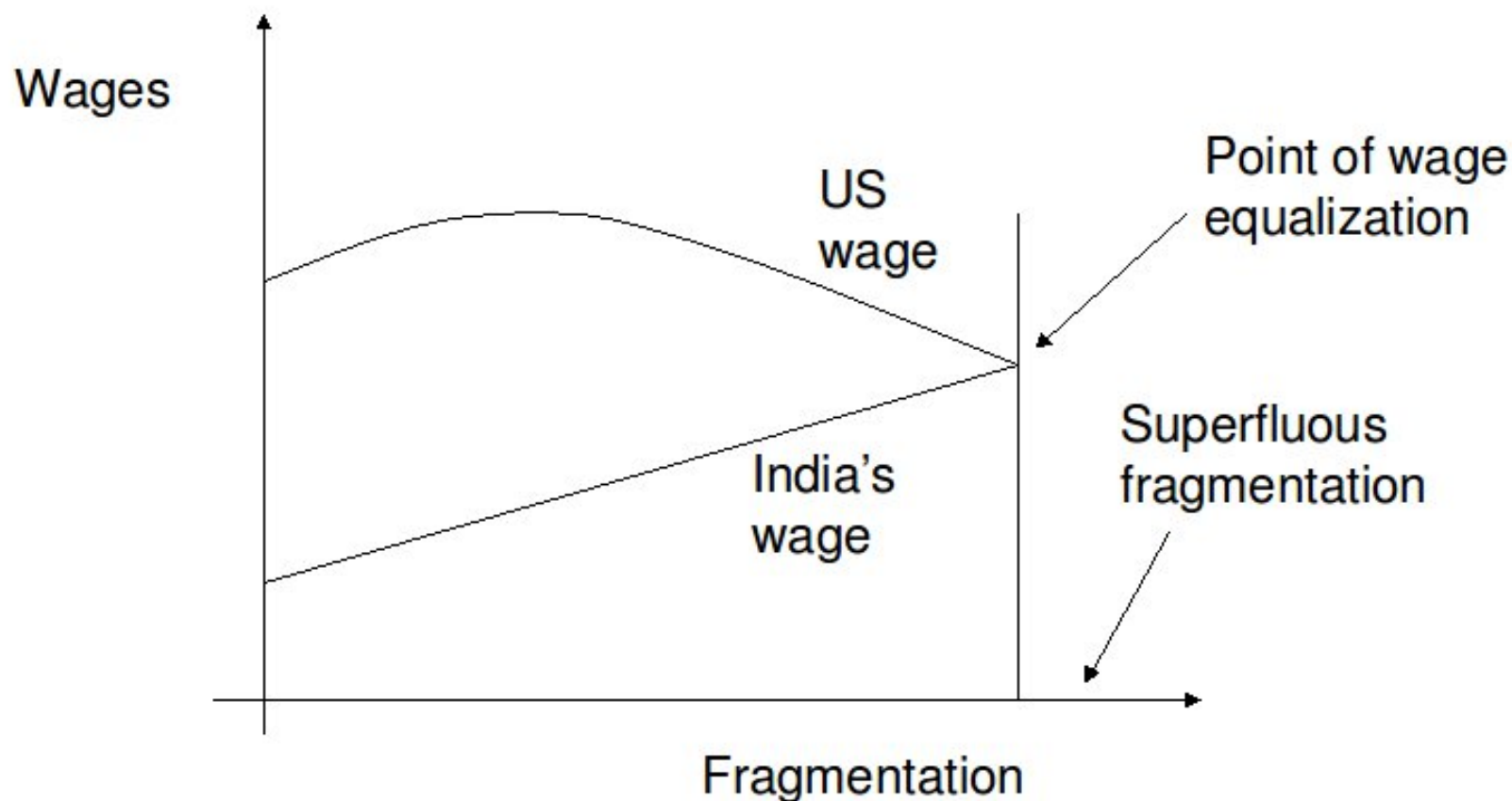









Overall effects: a simple model





Welcome to offshoring!



**Welcome back to
Malthusian trap!**

Computer Technology Role

Offshoring on large scale was made possible because of ...

Computer Technology Role

Offshoring on large scale was made possible because of ... computers.

Computer Technology Role

Offshoring on large scale was made possible because of ... computers.

The technology of storing and sending quickly and cheaply gargantuan amounts of information made large-scale offshoring economically feasible.

Computer Technology Role

Offshoring on large scale was made possible because of ... computers.

The technology of storing and sending quickly and cheaply gargantuan amounts of information made large-scale offshoring economically feasible.

We, CS pros, should take a closer look ...

Quotes

In 2006 (*est*):

Quotes

In 2006 (*est*):

high national debt (\$9 trillion),

Quotes

In 2006 (**est**):

high national debt (**\$9 trillion**),

high non-bank corporate debt (**\$9 trillion**),

Quotes

In 2006 (**est**):

high national debt (**\$9 trillion**),

high non-bank corporate debt (**\$9 trillion**),

high mortgage debt (**\$9 trillion**),

Quotes

In 2006 (**est**):

high national debt (**\$9 trillion**),

high non-bank corporate debt (**\$9 trillion**),

high mortgage debt (**\$9 trillion**),

high financial institution debt (**\$12 trillion**),

Quotes

In 2019 (est):

high national debt (\$23 trillion),

high non-bank corporate debt (\$10 trillion),

high mortgage debt (\$14 trillion),

high financial institution debt (\$15 trillion in 2010),

Quotes

In 2006 (**predictions**):

Quotes

In 2006 (**predictions**):
high unfunded Medicare liability (**\$30**
trillion),

Quotes

In 2006 (**predictions**):

high unfunded Medicare liability (**\$30 trillion**),

high unfunded Social Security liability (**\$12 trillion**),

Quotes

In 2019 (predictions):

high total unfunded promises to pay to individuals (\$122 trillion)

high unfunded Medicare liability (\$37 trillion),

high unfunded Social Security liability (\$14 trillion),

Quotes

In 2006:

Quotes

In 2006:

high external debt (amount owed to foreign lenders) and a serious deterioration in the United States net international investment position (NIIP) **(-24% of GDP)**

http://en.wikipedia.org/wiki/Balance_of_trade

Quotes

In 2006:

high external debt (amount owed to foreign lenders) and a serious deterioration in the United States net international investment position (NIIP) **(-24% of GDP, or \$14.3 trillion in 2009)**

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Quotes

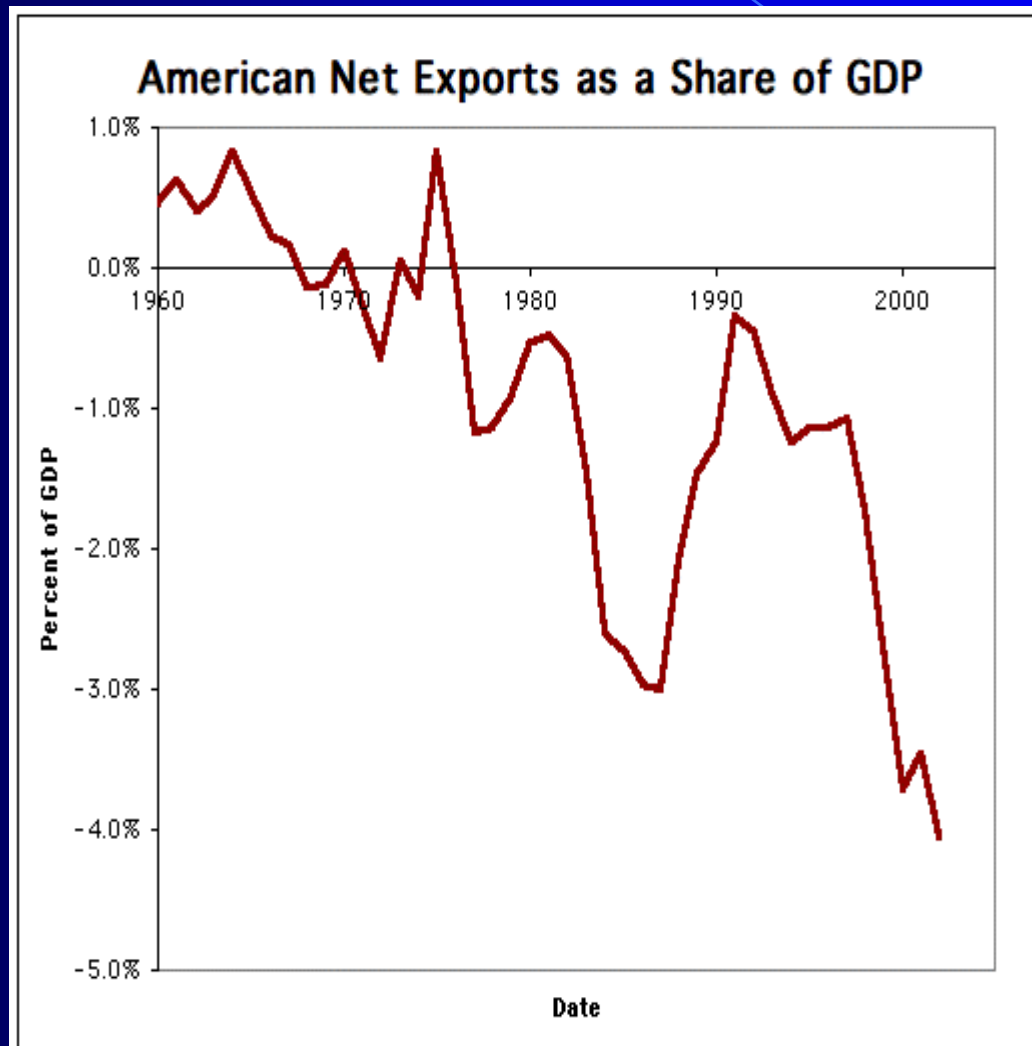
In 2006:

high external debt (amount owed to foreign lenders) and a serious deterioration in the United States net international investment position (NIIP) **(-24% of GDP, or \$14.3 trillion in 2009)**

high trade deficits.

http://en.wikipedia.org/wiki/Balance_of_trade

The facts of life



Re: Some reasons of offshoring

Minimum wage laws

Other labor laws

Strong labor unions

Regulation of hiring/firing standards

Deterioration of education

Free trade (esp. free movement of
capital)

State subsidies for selected companies

Progressive taxation

Re: Some reasons of offshoring

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Progressive taxation

Re: Some reasons of offshoring

Legislative “progressive” regulation that
replaces competition with “intelligent
design” of society and economy

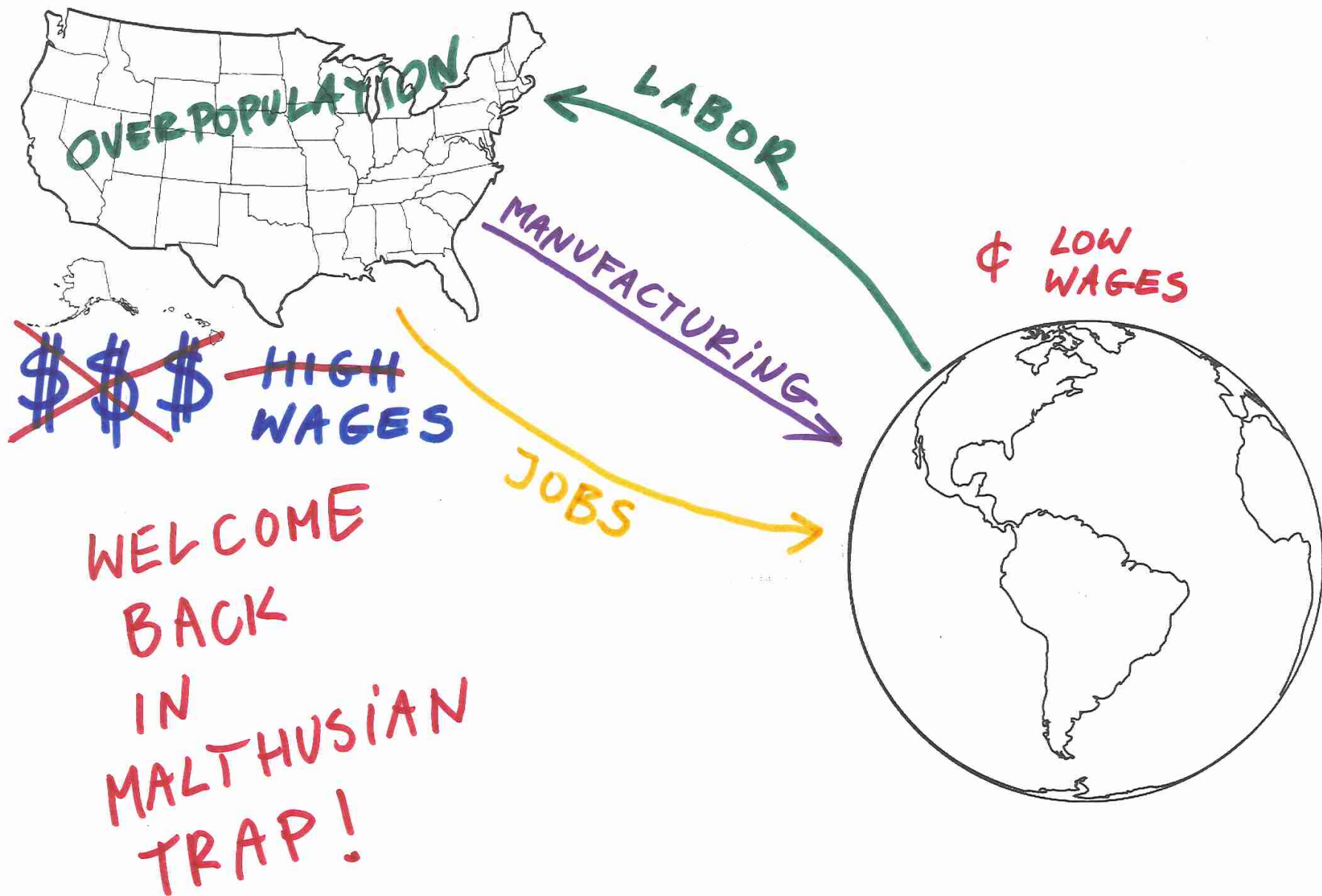
Progressive taxation

Re: Some reasons of offshoring

Legislative “progressive” regulation that
replaces competition with “intelligent
design” of society and economy

Progressive taxation

So, businesses “vote with their feet”.



Offshoring

Offshoring

And what are the results?

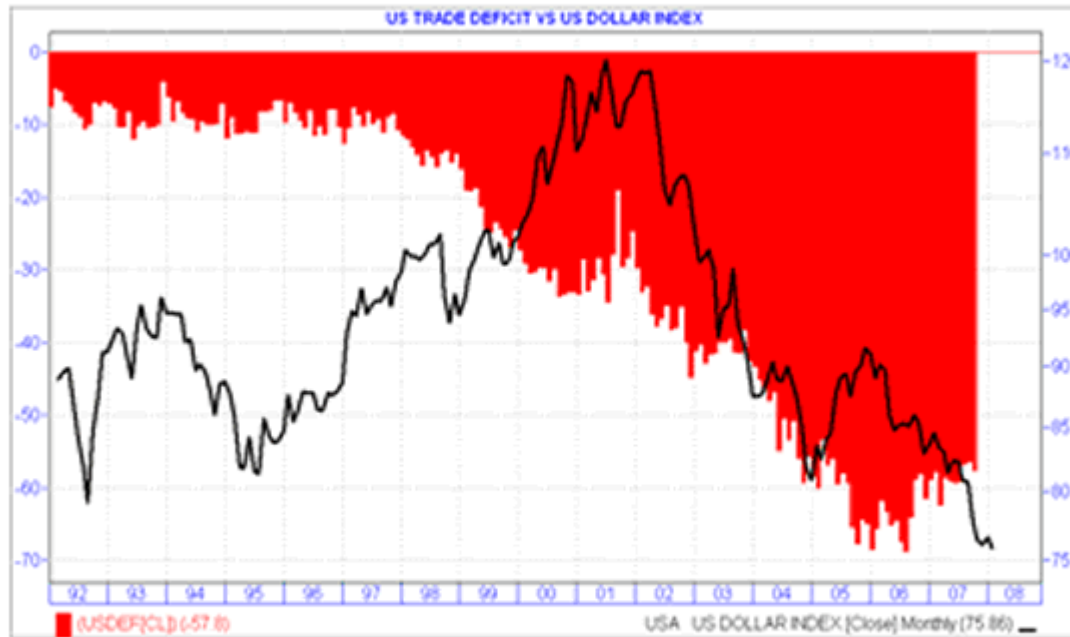
Offshoring

And what are the results?

Here is what we get:

Offshoring

US TRADE DEFICIT VS US DOLLAR INDEX



Source: Plexus Asset Management (based on data from I-Net Bridge)



Here is what **we** get:

Offshoring

And what are the results?

Here is what others get:

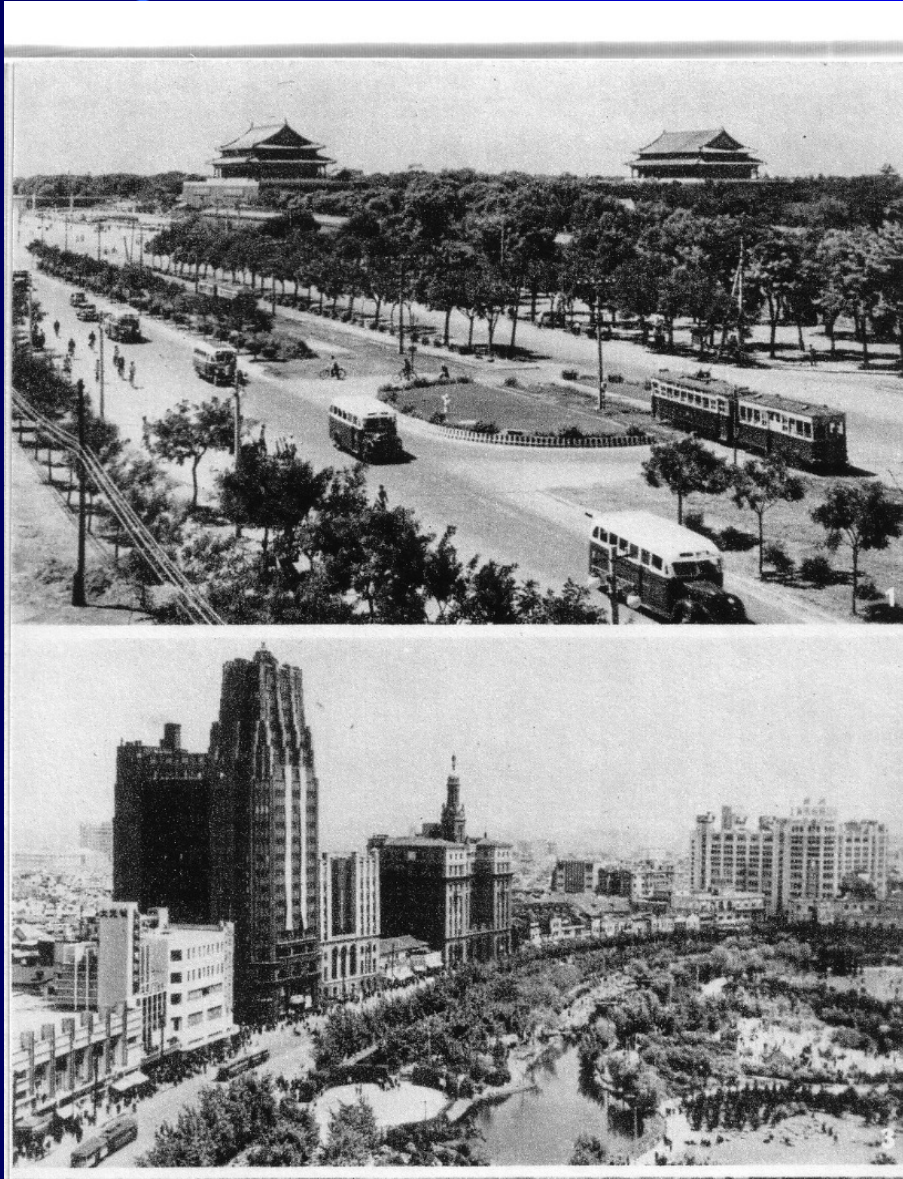
Debt



Here is what **others** get:



Here is what others get:



Here is what **others** had (Beijing 1956):

Defining



Here is what **others** get:

Offshoring

This does not look like a fair deal,
does it?

Offshoring

This does **not** look like a fair deal,
does it?

Offshoring

Yet our lawmakers think that they did not
inflict **enough damage** with regulation.

Offshoring

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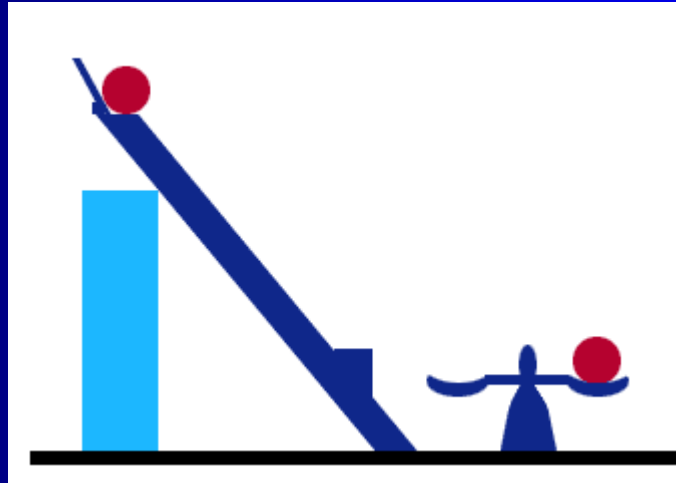
So they try harder and harder to revive ailing economy.



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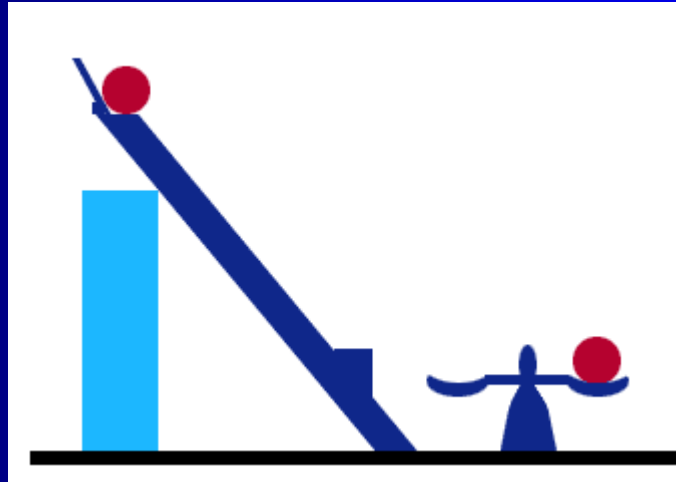
Re-inventing America

Is this what they are trying to build?



Re-inventing America

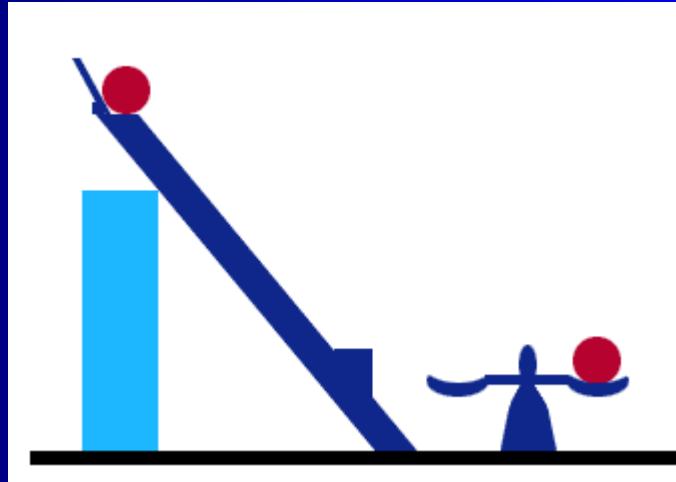
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No competition, just regulating and planning?

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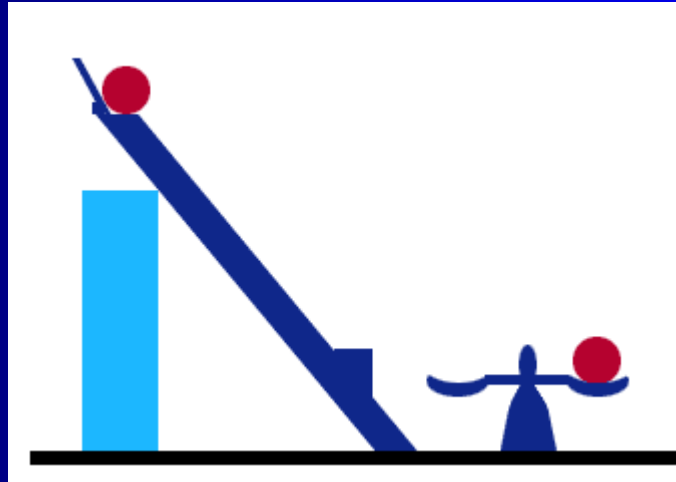


No competition, just regulating and planning?

If you are skeptical, you are a menace to humanity.

Re-inventing America

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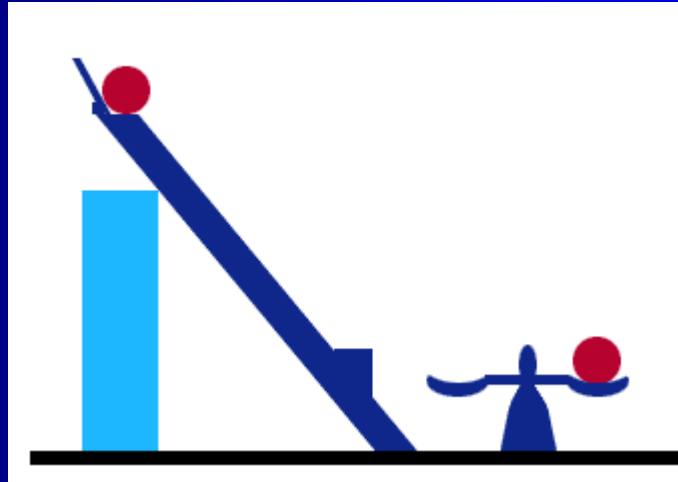


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Re-inventing America

Is this what they are trying to build?



No competition, just regulating and planning?

If you are skeptical, you are a menace to humanity. Or so they say.

Population growth

- Malthusian trap a danger again

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- Greece is in the trap, already!

https://kb.osu.edu/dspace/bitstream/1811/4144/1/V54N02_131.pdf

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- It's a case of Great Divergence



Population growth

- Malthusian trap a danger again



—A “Farwell to Alms”, indeed.

GRECIAN FORMULA



California arguably leads the nation in government dependency, while events in Greece illustrate the ultimate destination of that path.

Orange County Register

Population growth

- Malthusian trap a danger again
 - US faces same problems as Greece, says Bank of England
 - <http://blogs.telegraph.co.uk/finance/edmundconway/100005657/us-faces-same-problems-as-greece-says-bank-of-england/>

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 - Big business and ruling elites will be the only benefactors when we fall into the Malthusian trap.

Population growth

- Malthusian trap a danger again
 - Big business and ruling elites will be the only benefactors when we fall into the Malthusian trap.
 - So, they are vigorously pushing us into that direction.

Serra Pelada, Para State, Brazil, 1986



What can you do?

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What you learned in this class may serve you as a compass in your future endeavors.

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Just be relentless in search for truth, whatever that truth may be.

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Just be relentless in search for truth, whatever that truth may be.

And never let any ideology obscure your knowledge of facts.



**Now you know
Computers and Society**

