

Class 13:

You Are Not a Lottery Ticket

Problem set 4: due Wednesday, 11:59pm

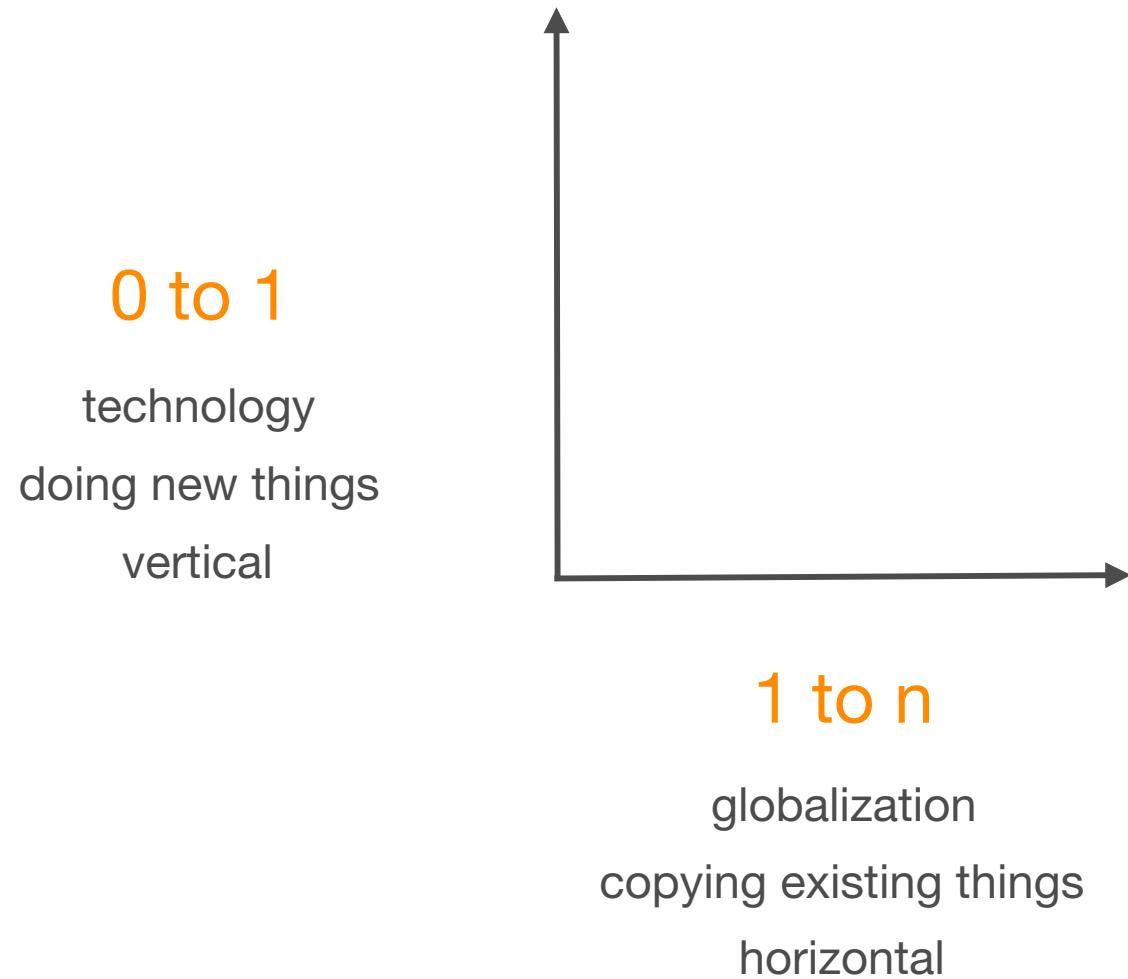
Pitch deck feedback sent this week

In-person pitch presentation: next week

outline

1. the question of luck
2. determinate vs. indeterminate futures
3. is indeterminate optimism possible?
4. the return of design

the nature of progress



the analytical challenge

with a sample size of 1, statistical tools become meaningless

variance

$$S^2 = \frac{1}{n-1} \sum_{i=1}^n (X_i - \bar{X})^2$$

standard deviation

$$\sigma = \sqrt{\frac{\sum_{i=1}^n a_i^2}{n} - \left(\frac{\sum_{i=1}^n a_i}{n}\right)^2}$$

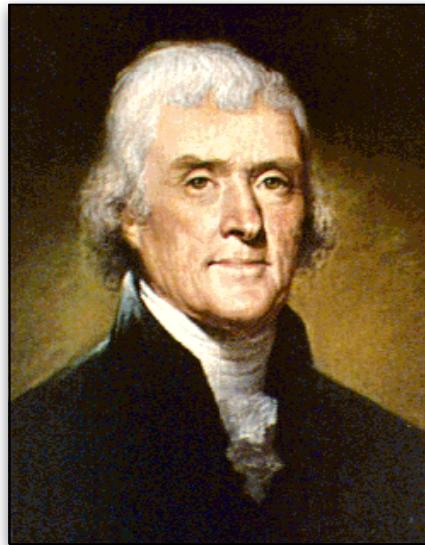
confidence intervals

$$\left[\bar{x} - \frac{cs}{\sqrt{n}}, \bar{x} + \frac{cs}{\sqrt{n}} \right]$$

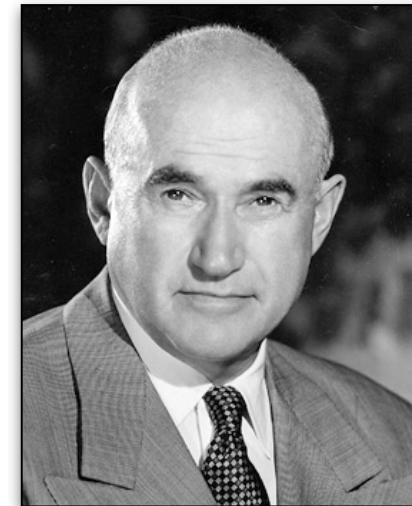
evidence of repeatability



claims of agency



"I'm a great believer in luck, and I find
the harder I work, the more I have of it."
- Thomas Jefferson



"The harder I work, the luckier I get."
- Samuel Goldwyn

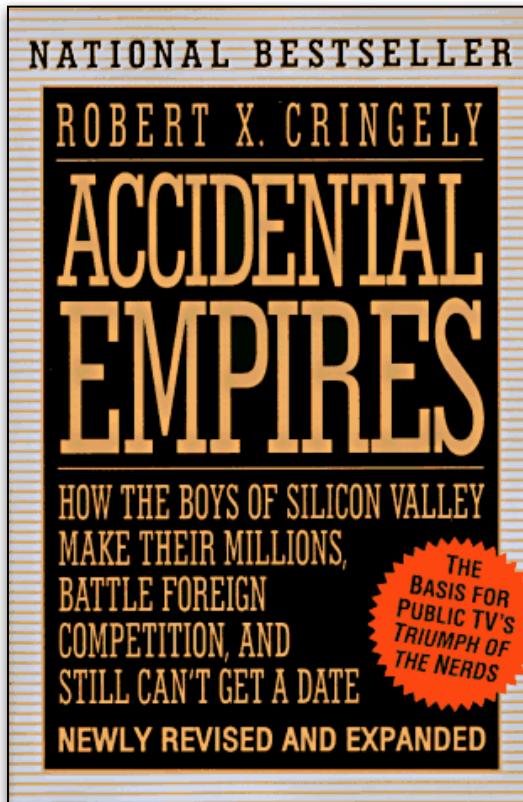
today's cultural view



“Success seems to stem as much from context
as from personal attributes.”

- Malcolm Gladwell, Outliers

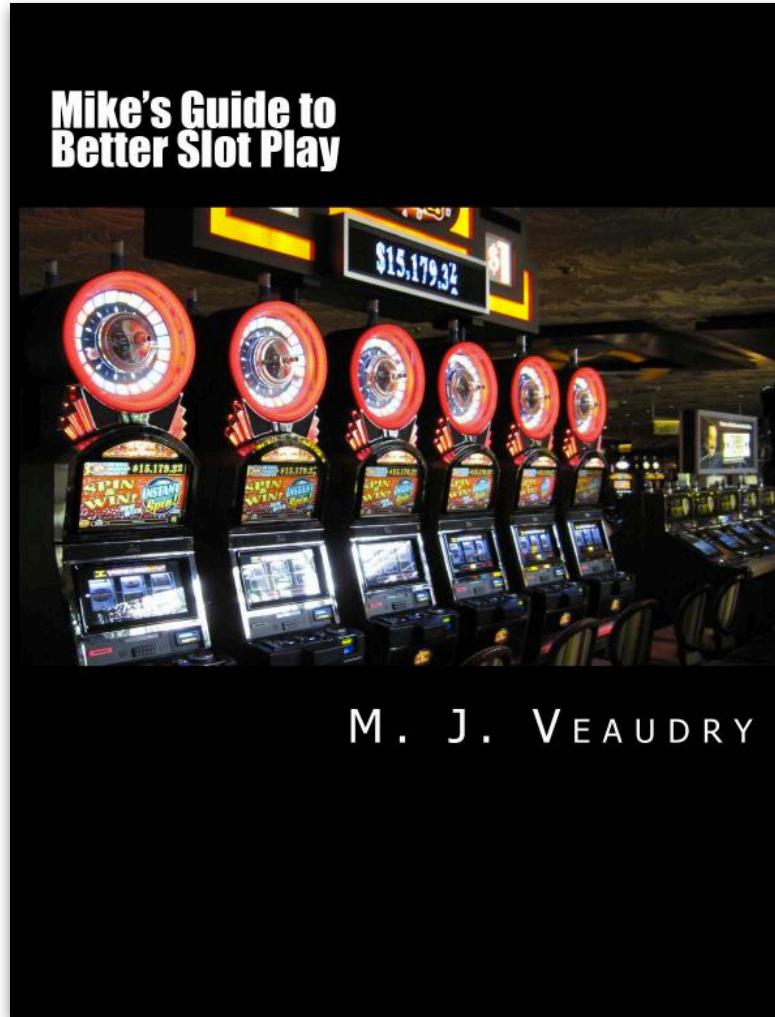
luck and startups



If you think about famous startups, it's pretty clear how big a role luck plays.

- Paul Graham, YC

we didn't cancel class 13



orientation

past

how did I get here?



future

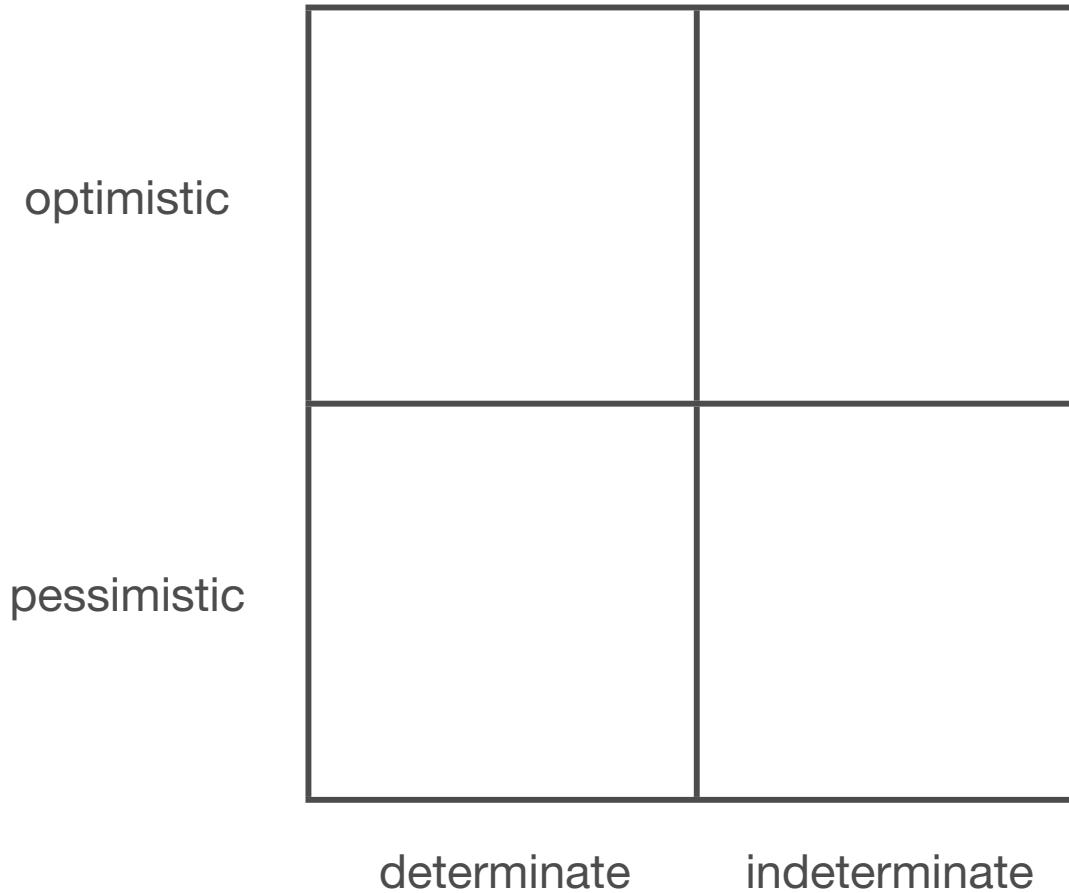
where can I go next?



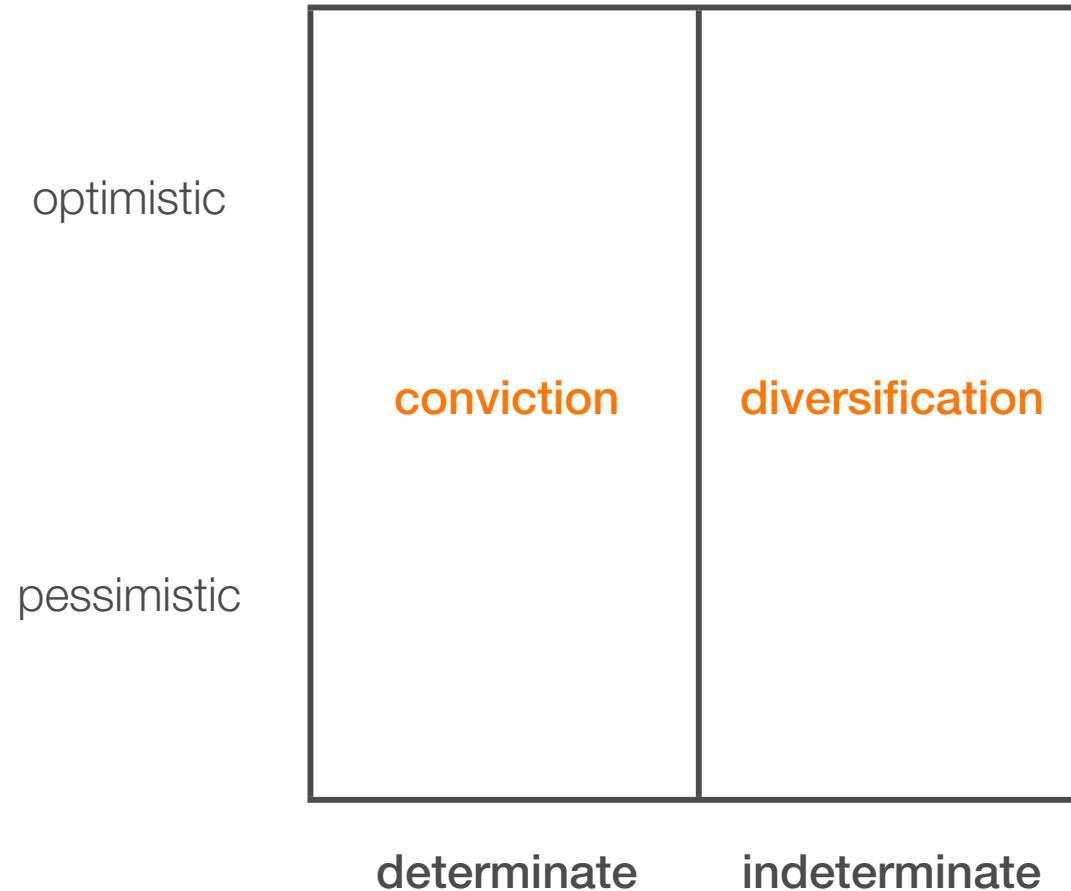
outline

1. the question of luck
2. **determinate vs. indeterminate futures**
3. is indeterminate optimism possible?
4. the return of design

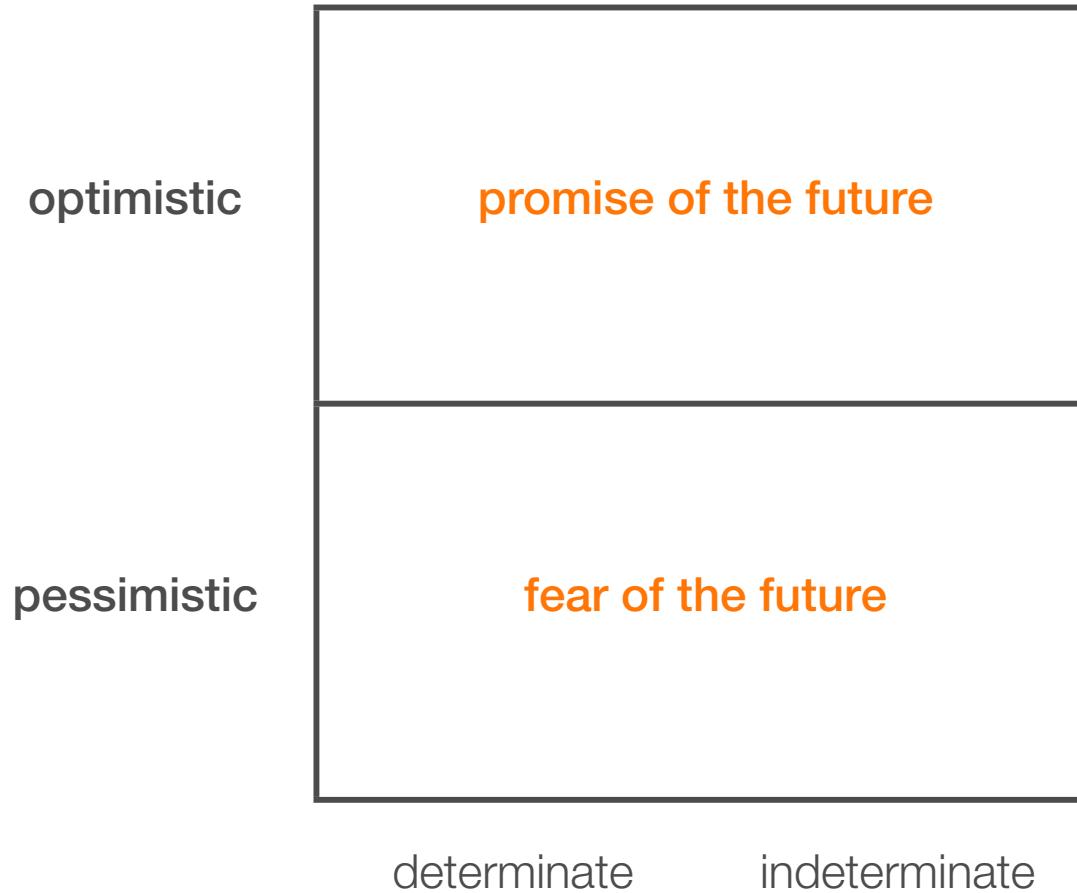
future framework



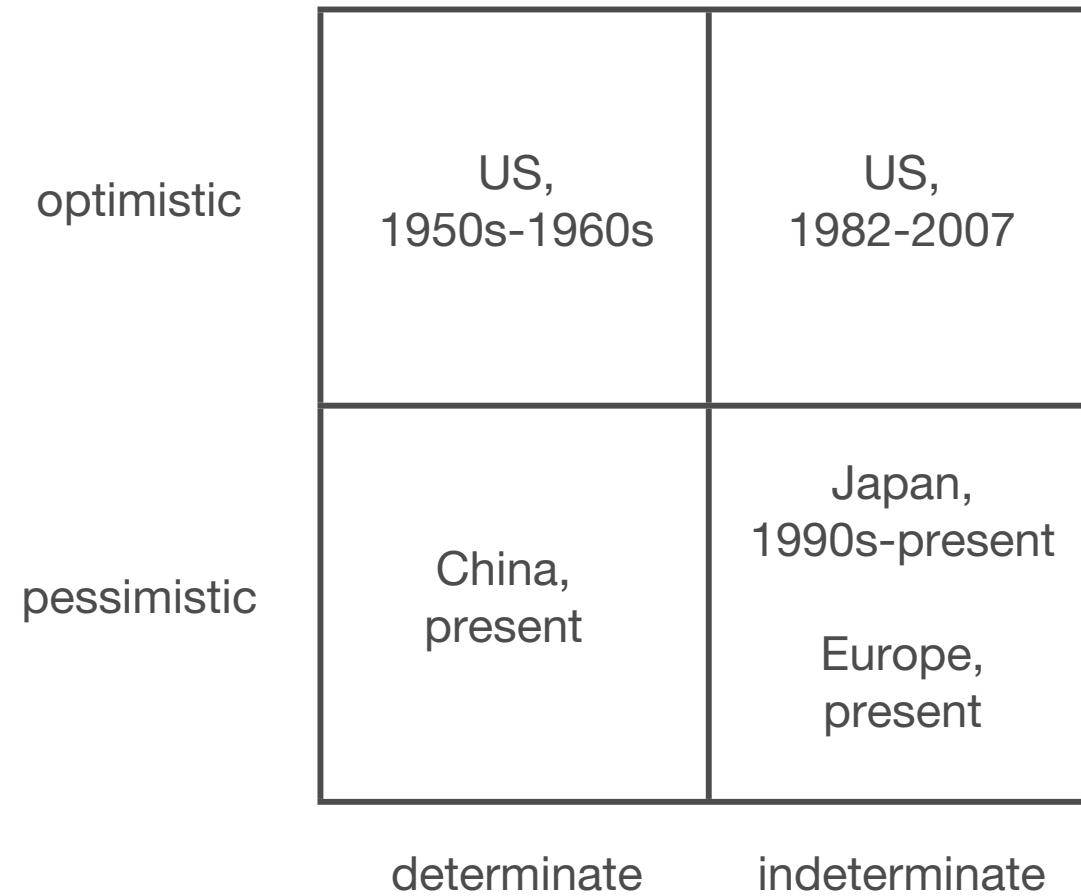
determinate-indeterminate



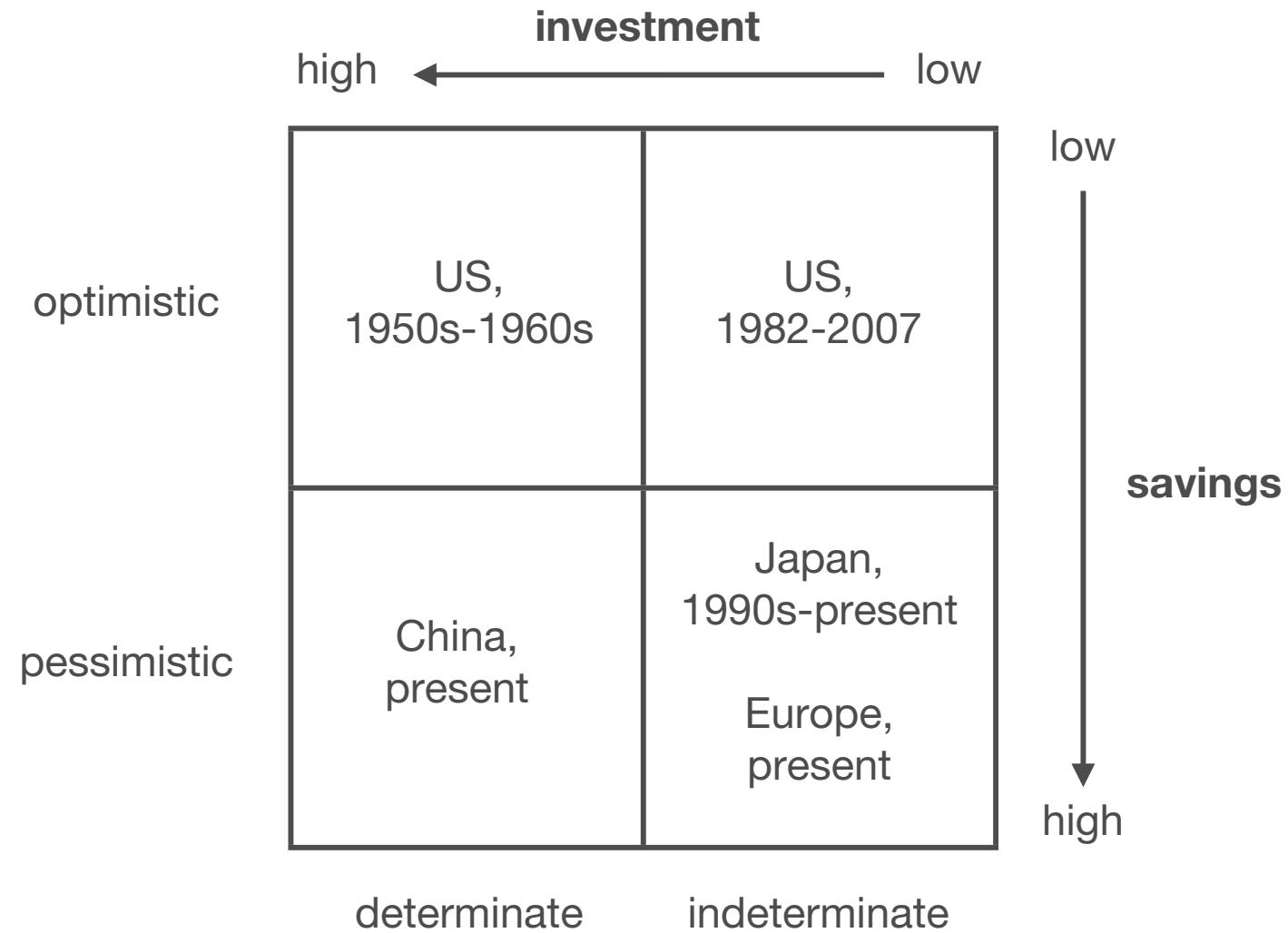
optimistic-pessimistic



shifting paradigms



shifting paradigms

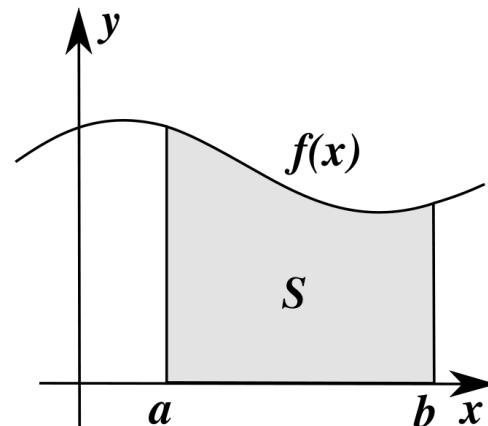


calculus to statistics

determinate

calculus

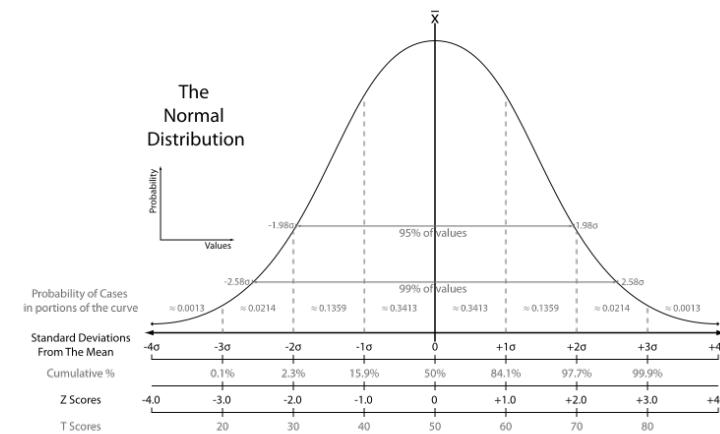
$$\int_a^b f(x) dx = F(b) - F(a)$$



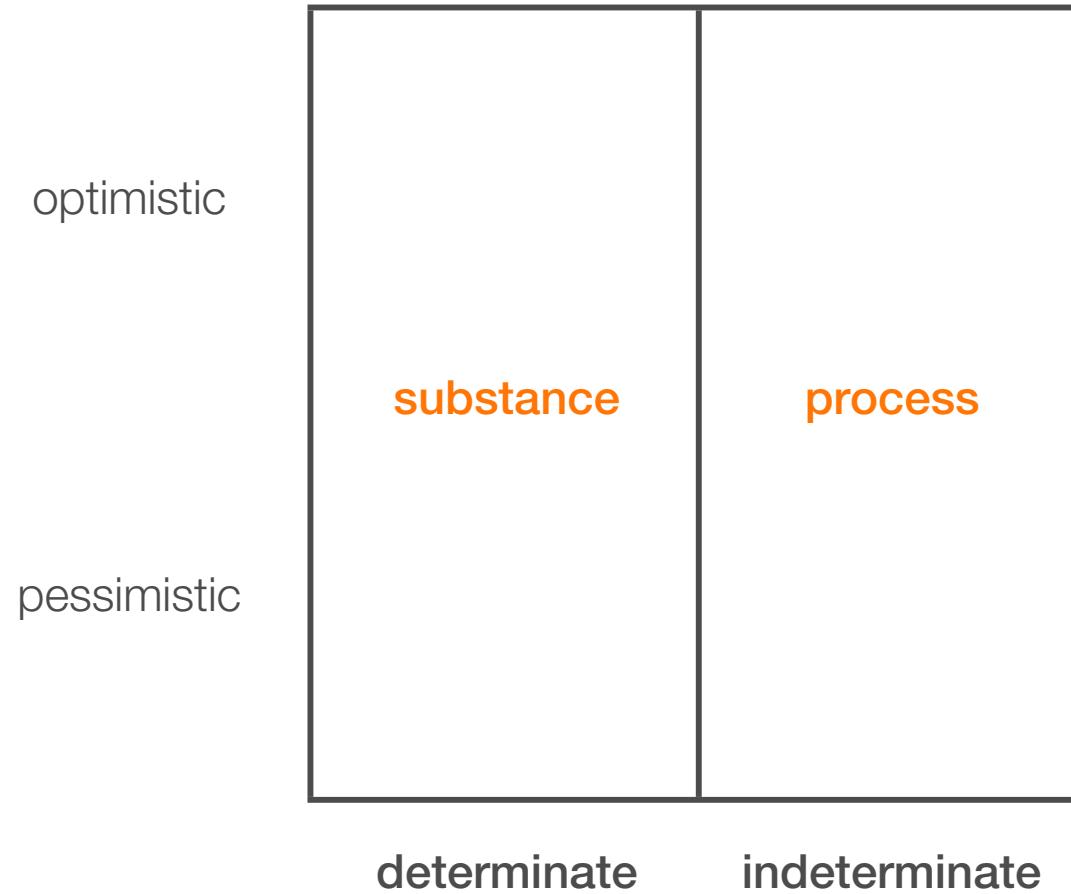
indeterminate

probability and statistics

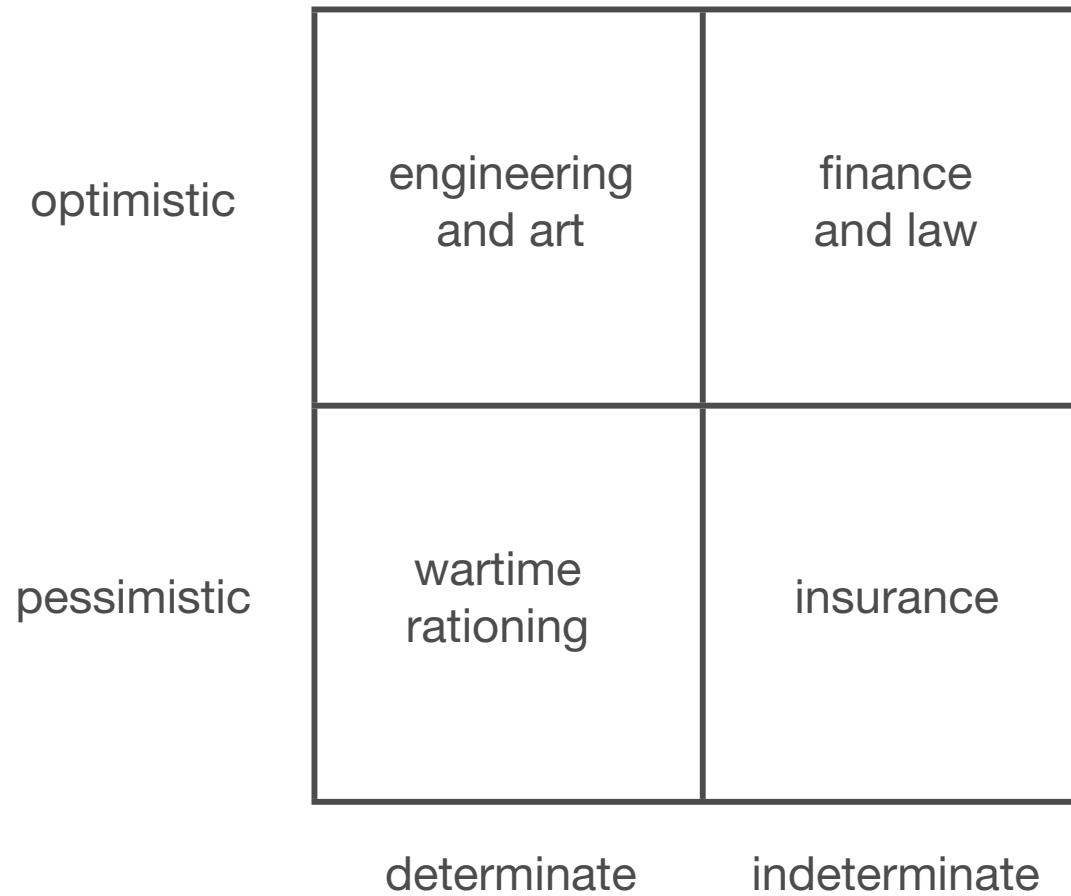
$$\sigma = \sqrt{\frac{\sum_{i=1}^n a_i^2}{n} - \left(\frac{\sum_{i=1}^n a_i}{n}\right)^2}$$



substance to process



in practice



definite optimism: the transcontinental railroad



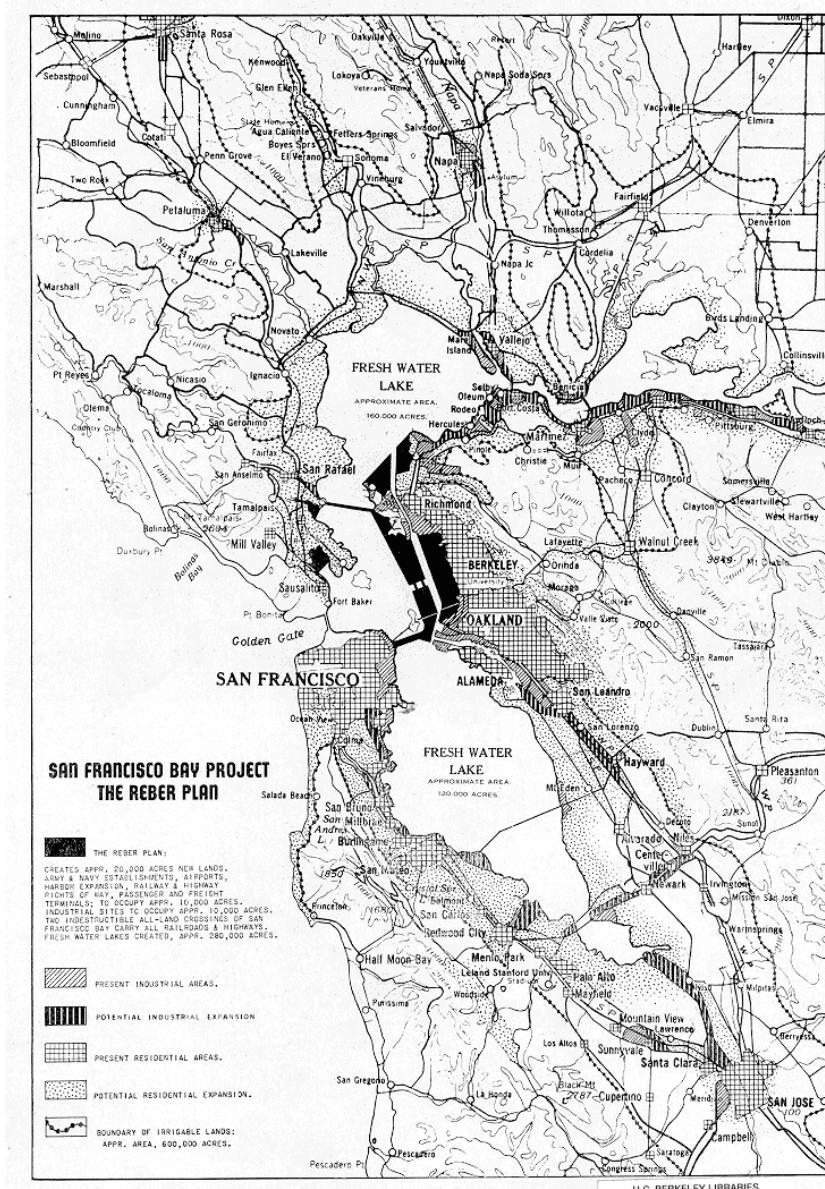
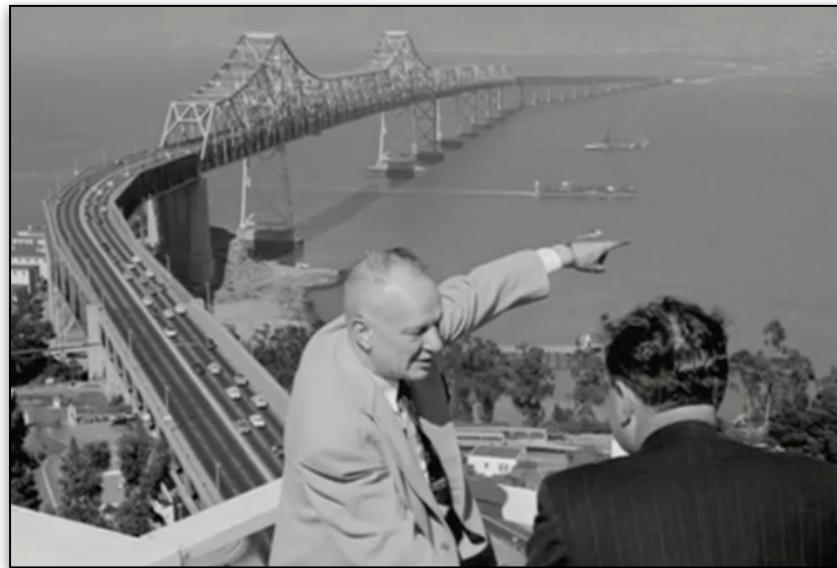
The Last Rail is Laid



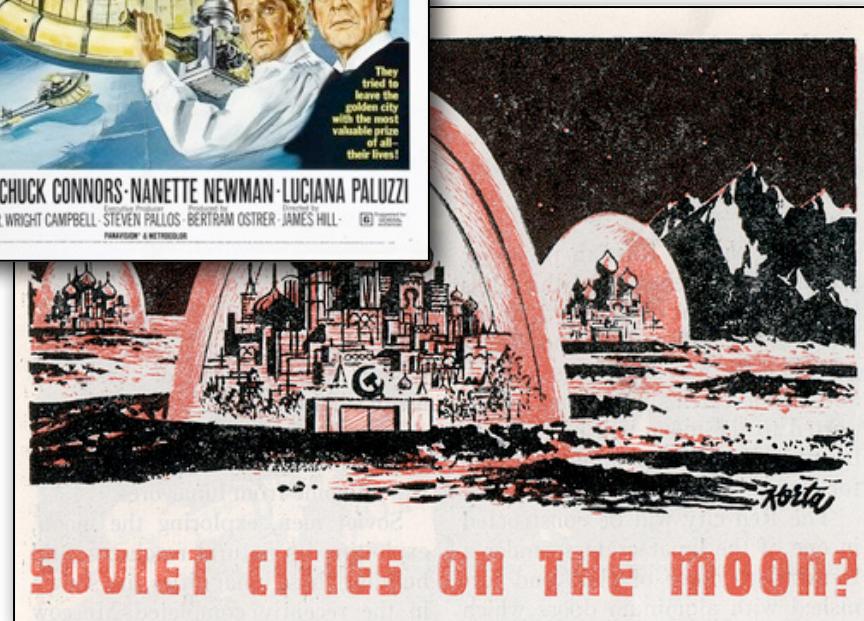
definite optimism: city planning



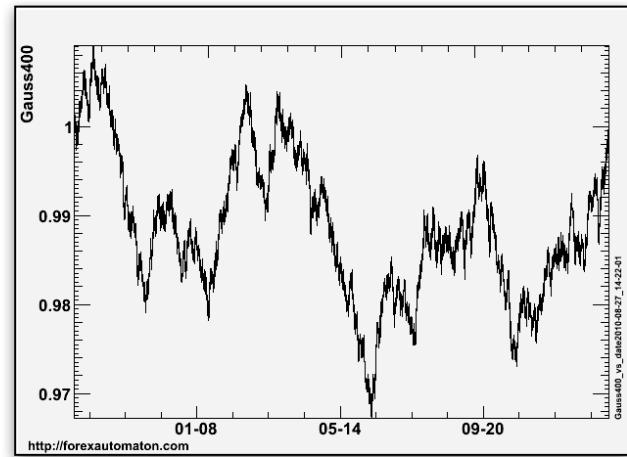
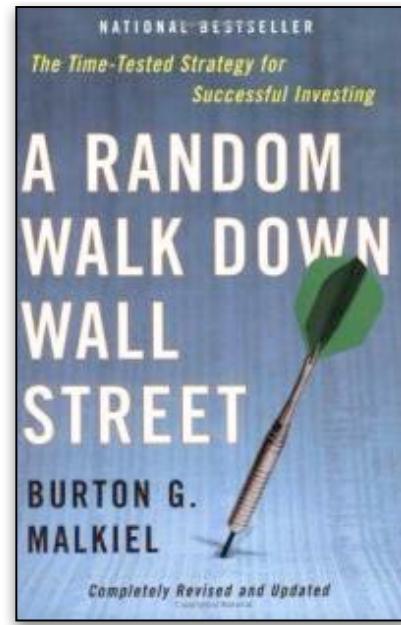
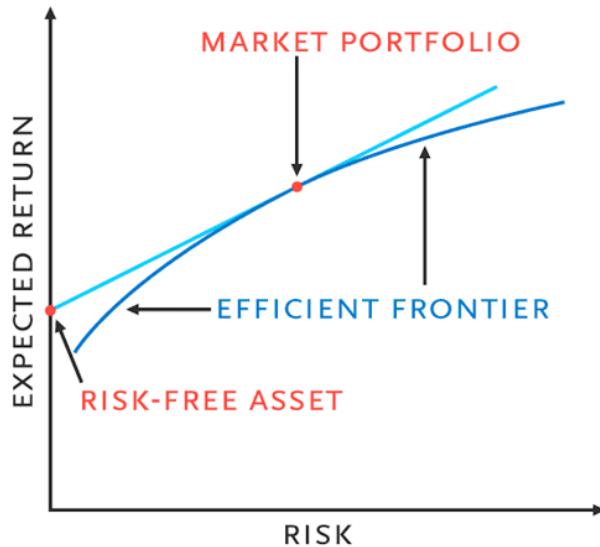
definite optimism: civil engineering



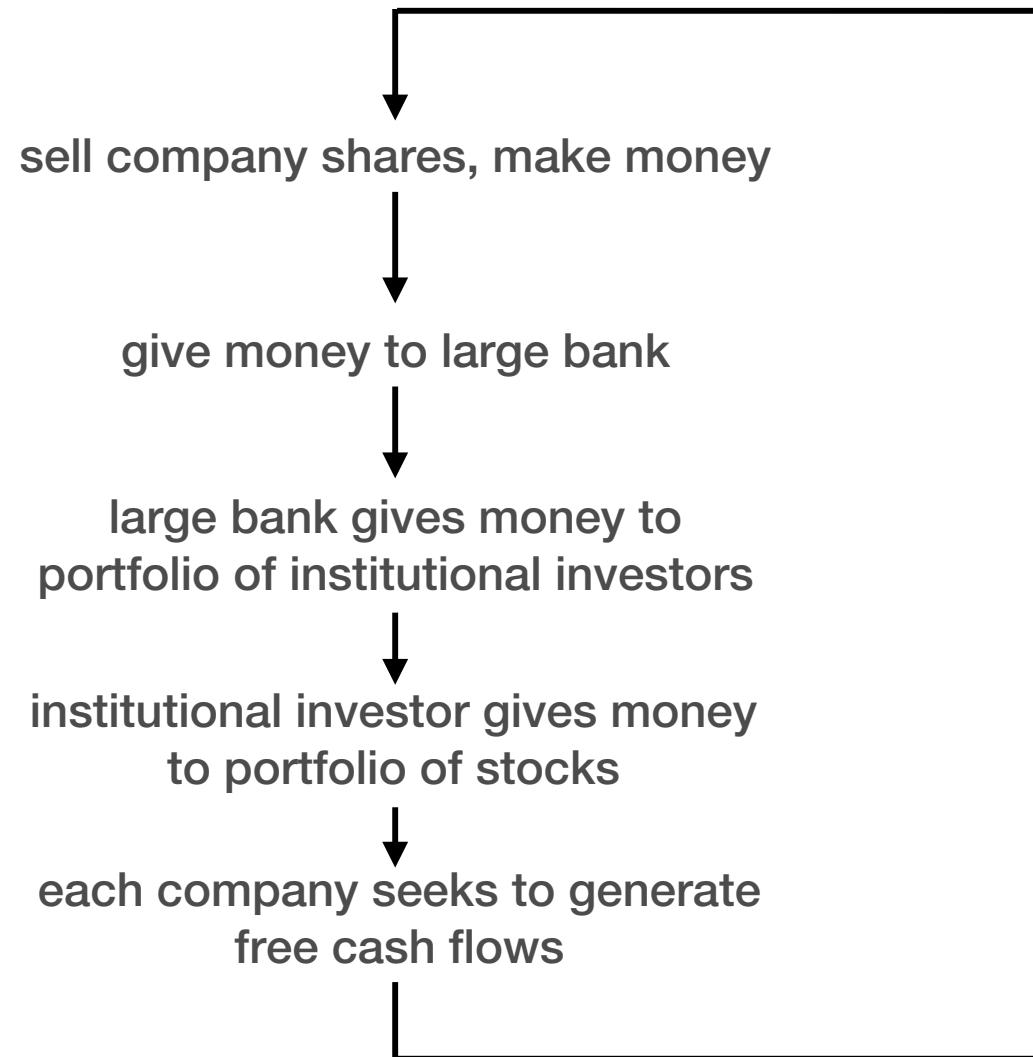
visions of the future



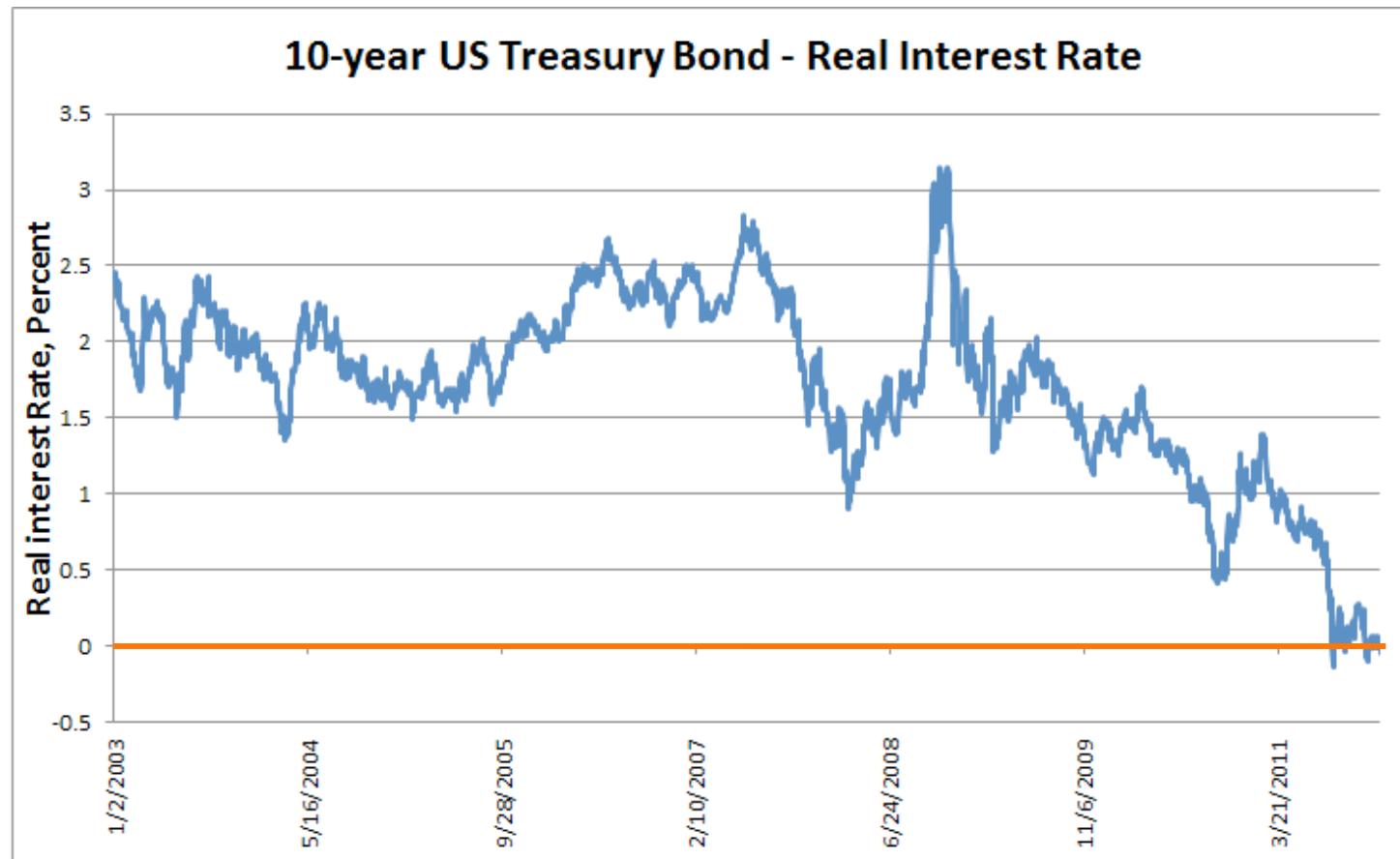
indefinite optimism: portfolio investing



money is king



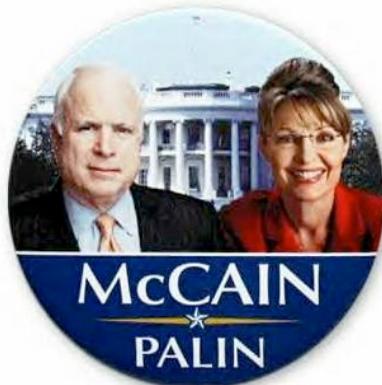
the end of indefinite optimism?



finance or insurance?



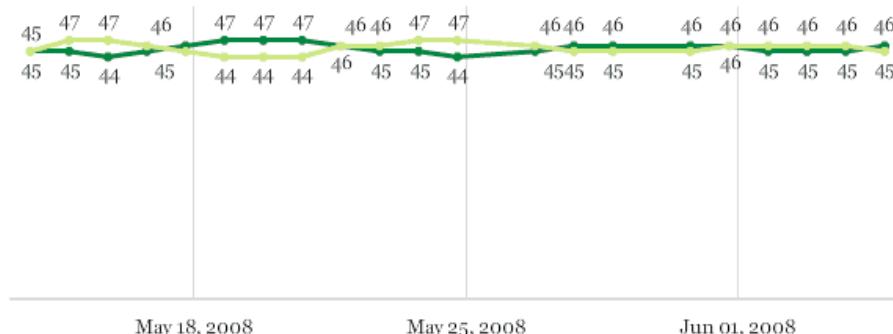
indeterminacy and politics



Gallup Daily Election Polling Results for the Presidential General Election,
Obama vs. McCain, trend since May 10-14, 2008

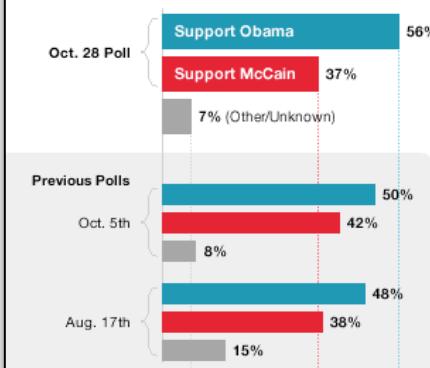
Based on national registered voters

■ % Obama ■ % McCain



GALLUP POLL

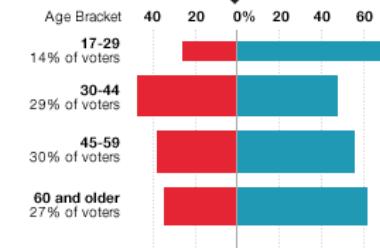
Poll: Presidential choice of Minnesotans



Obama's lead has increased considerably since Aug. 17, when a poll showed him with a 10-point lead.

Democratic Sen. Barack Obama now holds a 19-point lead over Republican Sen. John McCain.

Obama also holds a remarkable 44-point lead among younger voters, and a substantial 27-point lead among seniors.



Source: Minnesota Public Radio-Humphrey Institute Poll

"New Hampshire Senate:
Shaheen 50%
Sununu 45%"
-October 27, 2008

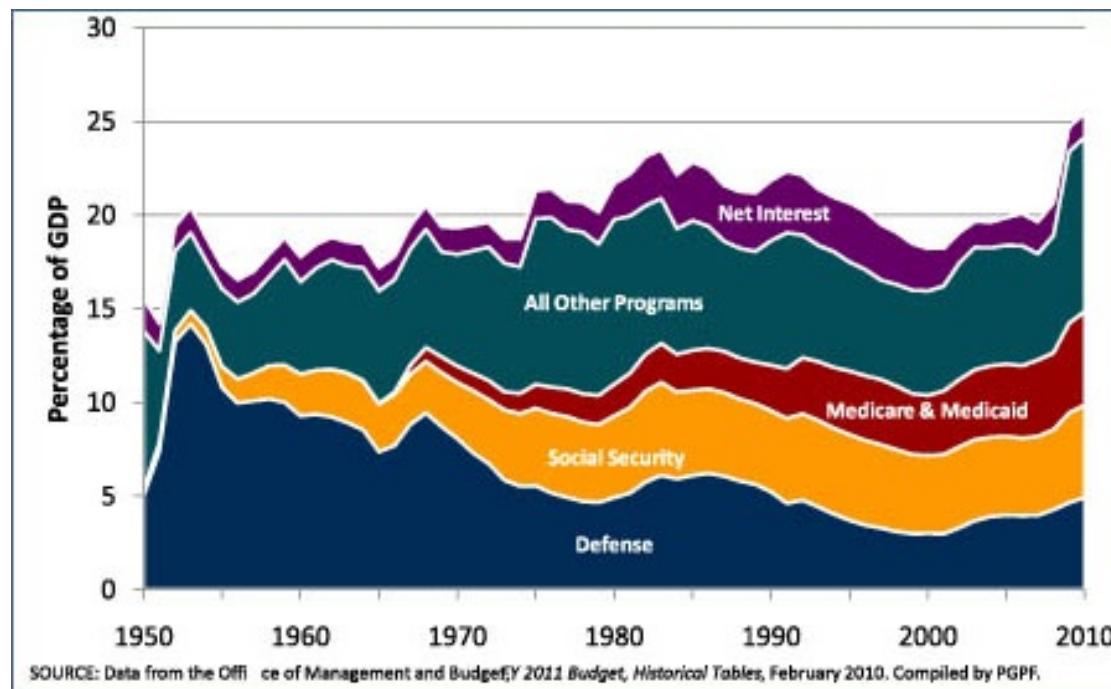
"Coleman Tops Franken
43% to 39% in Minnesota"
-October 29, 2008

"Georgia Senate:
Chambliss 48%
Martin 43%"
- October 31, 2008

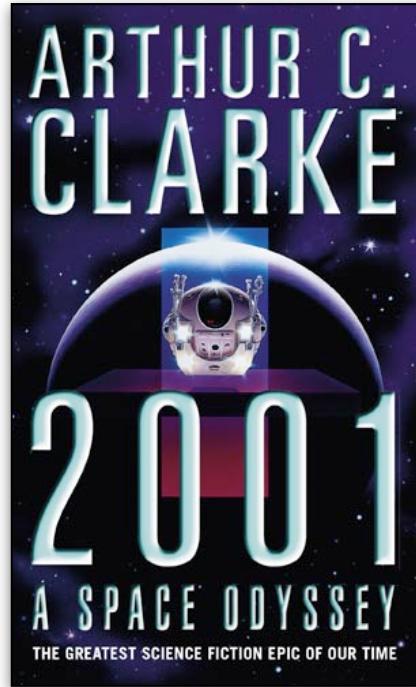
"Merkley Leads Smith By
Three in Oregon Senate Race"
- October 31, 2008

indeterminacy and government

the shift to transfer payments

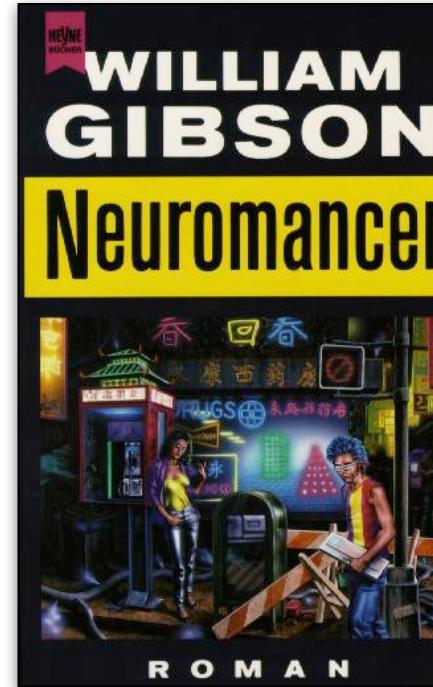


indeterminacy and literature



“The text was updated automatically on every hour... one could spend an entire lifetime doing nothing but absorbing the ever-changing flow of information from the news satellites.”

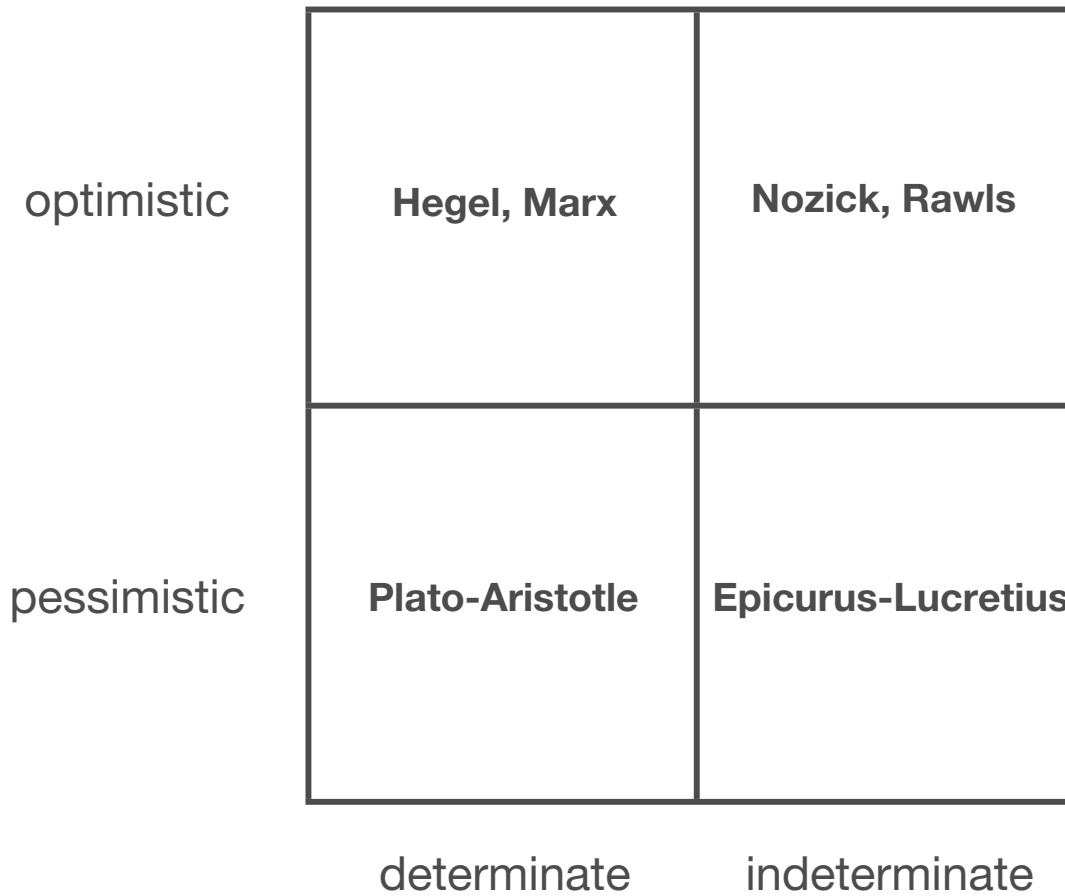
2001: A Space Odyssey, 1968



“The sky above the port was the color of television, tuned to a dead channel.”

Neuromancer, 1984

indeterminacy and philosophy



indeterminacy and death

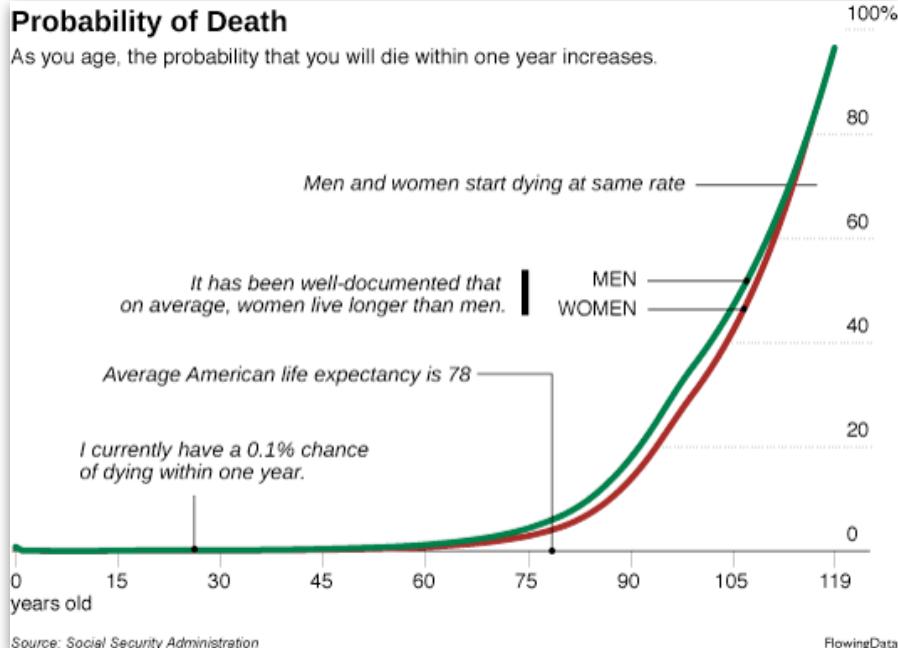
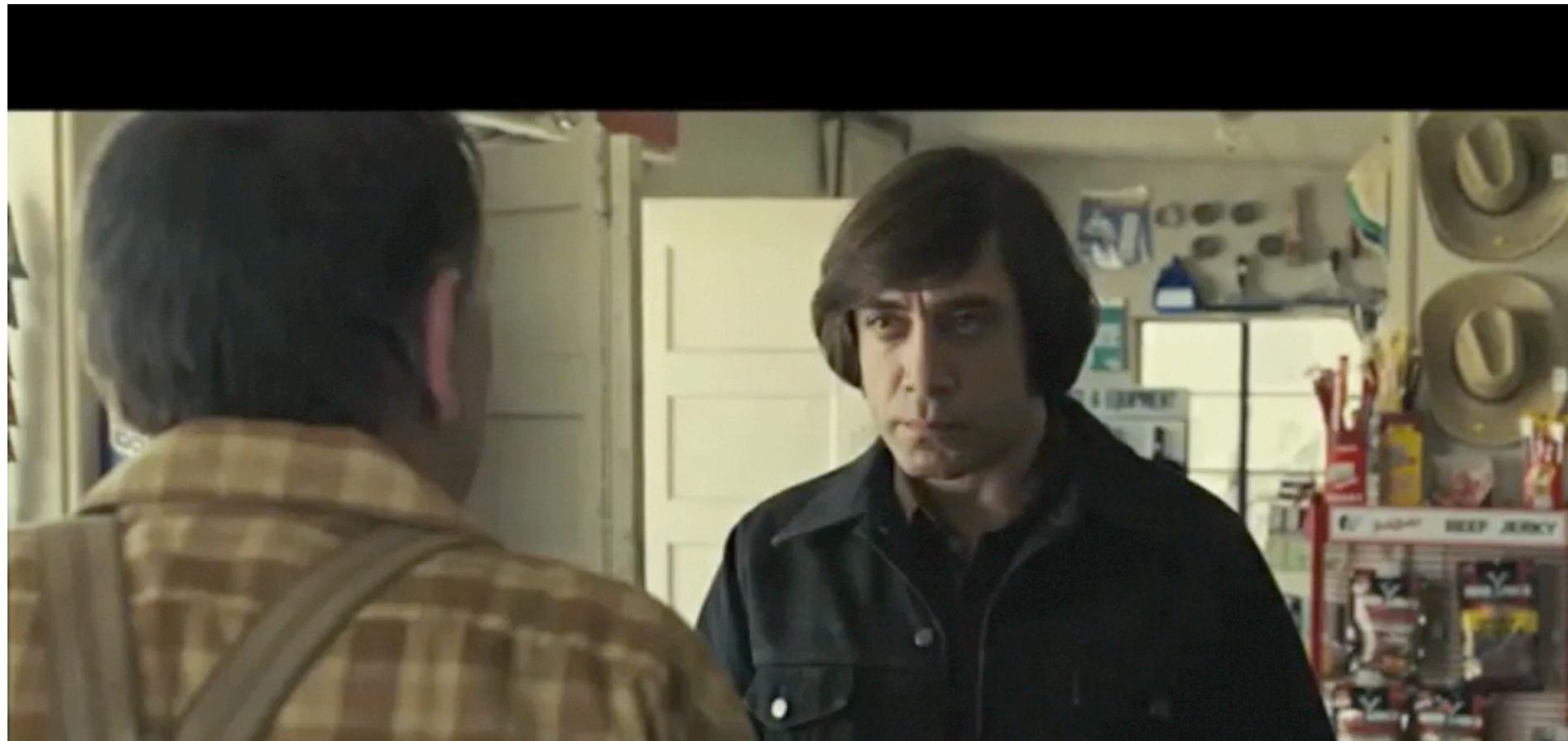


Table II.—Ordinary Joint Life and Last Survivor Annuities—Two Lives—Expected Return Multiples

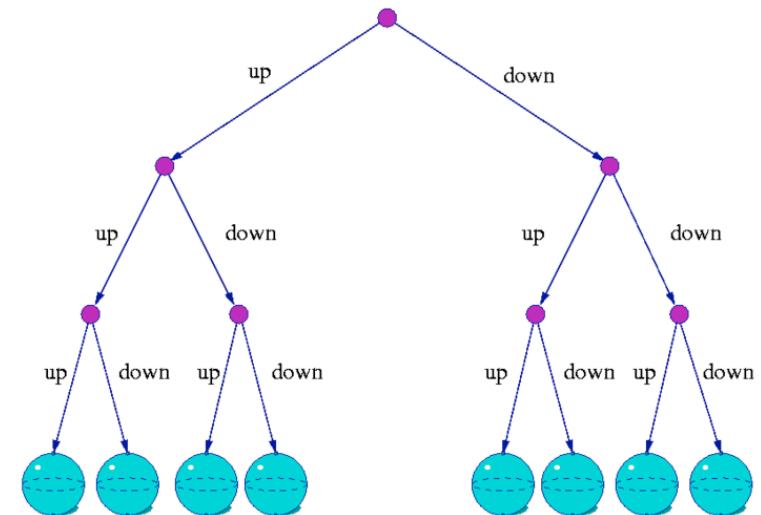
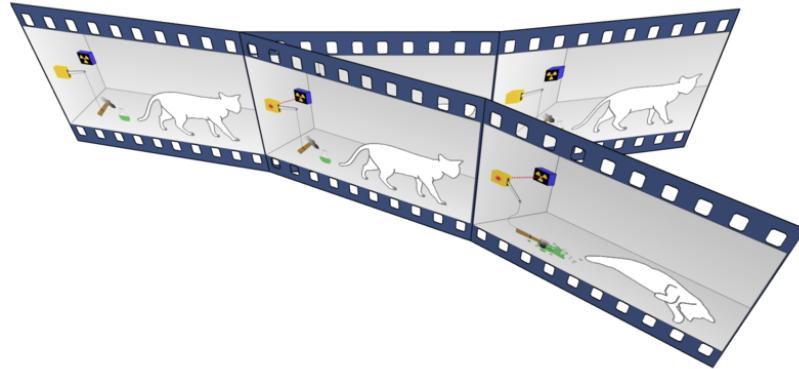
Ages		35	36	37	38	39	40	41	42	43	44	45	46	47
Male	Female	40	41	42	43	44	45	46	47	48	49	50	51	52
35	40	46.2	45.7	45.3	44.8	44.4	44.0	43.6	43.3	43.0	42.6	42.3	42.0	41.8
36	41	45.7	45.2	44.8	44.3	43.9	43.5	43.1	42.7	42.3	42.0	41.7	41.4	41.1
37	42	45.3	44.8	44.3	43.8	43.4	42.9	42.5	42.1	41.8	41.4	41.1	40.7	40.4
38	43	44.8	44.3	43.8	43.3	42.9	42.4	42.0	41.6	41.2	40.8	40.5	40.1	39.8
39	44	44.4	43.9	43.4	42.9	42.4	41.9	41.5	41.0	40.6	40.2	39.9	39.5	39.2
40	45	44.0	43.5	42.9	42.4	41.9	41.4	41.0	40.5	40.1	39.7	39.3	38.9	38.6
41	46	43.6	43.1	42.5	42.0	41.5	41.0	40.5	40.0	39.6	39.2	38.8	38.4	38.0
42	47	43.3	42.7	42.1	41.6	41.0	40.5	40.0	39.6	39.1	38.7	38.2	37.8	37.5
43	48	43.0	42.3	41.8	41.2	40.6	40.1	39.6	39.1	38.6	38.2	37.7	37.3	36.9
44	49	42.6	42.0	41.4	40.8	40.2	39.7	39.2	38.7	38.2	37.7	37.2	36.8	36.4
45	50	42.3	41.7	41.1	40.5	39.9	39.3	38.8	38.2	37.7	37.2	36.8	36.3	35.9
46	51	42.0	41.4	40.7	40.1	39.5	38.9	38.4	37.8	37.3	36.8	36.3	35.9	35.4
47	52	41.8	41.1	40.4	39.8	39.2	38.6	38.0	37.5	36.9	36.4	35.9	35.4	35.0
Ages		48	49	50	51	52	53	54	55	56	57	58	59	60
Male	Female	53	54	55	56	57	58	59	60	61	62	63	64	65
35	40	41.5	41.3	41.0	40.8	40.6	40.4	40.3	40.1	40.0	39.8	39.7	39.6	39.5
36	41	40.8	40.6	40.3	40.1	39.9	39.7	39.5	39.3	39.2	39.0	38.9	38.8	38.6
37	42	40.2	39.9	39.6	39.4	39.2	39.0	38.8	38.6	38.4	38.3	38.1	38.0	37.9
38	43	39.5	39.2	39.0	38.7	38.5	38.3	38.1	37.9	37.7	37.5	37.3	37.2	37.1
39	44	38.9	38.6	38.3	38.0	37.8	37.6	37.3	37.1	36.9	36.8	36.6	36.4	36.3
40	45	38.3	38.0	37.7	37.4	37.1	36.9	36.6	36.4	36.2	36.0	35.9	35.7	35.5
41	46	37.7	37.3	37.0	36.7	36.5	36.2	36.0	35.7	35.5	35.3	35.1	35.0	34.8
42	47	37.1	36.8	36.4	36.1	35.8	35.6	35.3	35.1	34.8	34.6	34.4	34.2	34.1
43	48	36.5	36.2	35.8	35.5	35.2	34.9	34.7	34.4	34.2	33.9	33.7	33.5	33.3
44	49	36.0	35.6	35.3	34.9	34.6	34.3	34.0	33.8	33.5	33.3	33.0	32.8	32.6
45	50	35.5	35.1	34.7	34.4	34.0	33.7	33.4	33.1	32.9	32.6	32.4	32.2	31.9
46	51	35.0	34.6	34.2	33.8	33.5	33.1	32.8	32.5	32.2	32.0	31.7	31.5	31.3
47	52	34.5	34.1	33.7	33.3	32.9	32.6	32.2	31.9	31.6	31.4	31.1	30.9	30.6
48	53	34.0	33.6	33.2	32.8	32.4	32.0	31.7	31.4	31.1	30.8	30.5	30.2	30.0
49	54	33.6	33.1	32.7	32.3	31.9	31.5	31.2	30.8	30.5	30.2	29.9	29.6	29.4
50	55	33.2	32.7	32.3	31.8	31.4	31.0	30.6	30.3	29.9	29.6	29.3	29.0	28.8
51	56	32.8	32.3	31.8	31.4	30.9	30.5	30.1	29.8	29.4	29.1	28.8	28.5	28.2
52	57	32.4	31.9	31.4	30.9	30.5	30.1	29.7	29.3	28.9	28.6	28.2	27.9	27.6
53	58	32.0	31.5	31.0	30.5	30.1	29.6	29.2	28.8	28.4	28.1	27.7	27.4	27.1
54	59	31.7	31.2	30.6	30.1	29.7	29.2	28.8	28.3	27.9	27.6	27.2	26.9	26.5
55	60	31.4	30.8	30.3	29.8	29.3	28.8	28.3	27.9	27.5	27.1	26.7	26.4	26.0
56	61	31.1	30.5	29.9	29.4	28.9	28.4	27.9	27.5	27.1	26.7	26.3	25.9	25.5
57	62	30.8	30.2	29.6	29.1	28.6	28.1	27.6	27.1	26.7	26.2	25.8	25.4	25.1
58	63	30.5	29.9	29.3	28.8	28.2	27.7	27.2	26.7	26.3	25.8	25.4	25.0	24.6
59	64	30.2	29.6	29.0	28.5	27.9	27.4	26.9	26.4	25.9	25.4	25.0	24.6	24.2
60	65	30.0	29.4	28.8	28.2	27.6	27.1	26.5	26.0	25.5	25.1	24.6	24.2	23.8

the flip of a coin



MOVIECLIPS.com

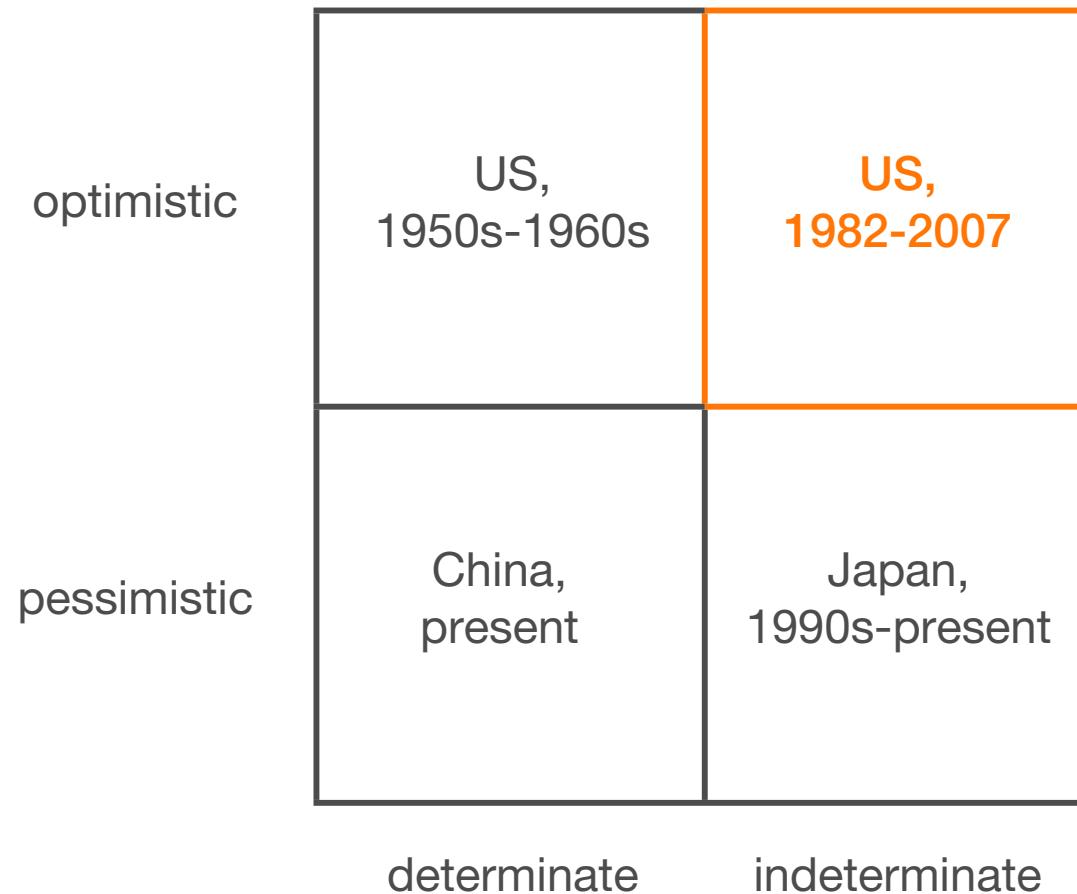
The Rise of the Many Worlds Theory



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4. the return of design

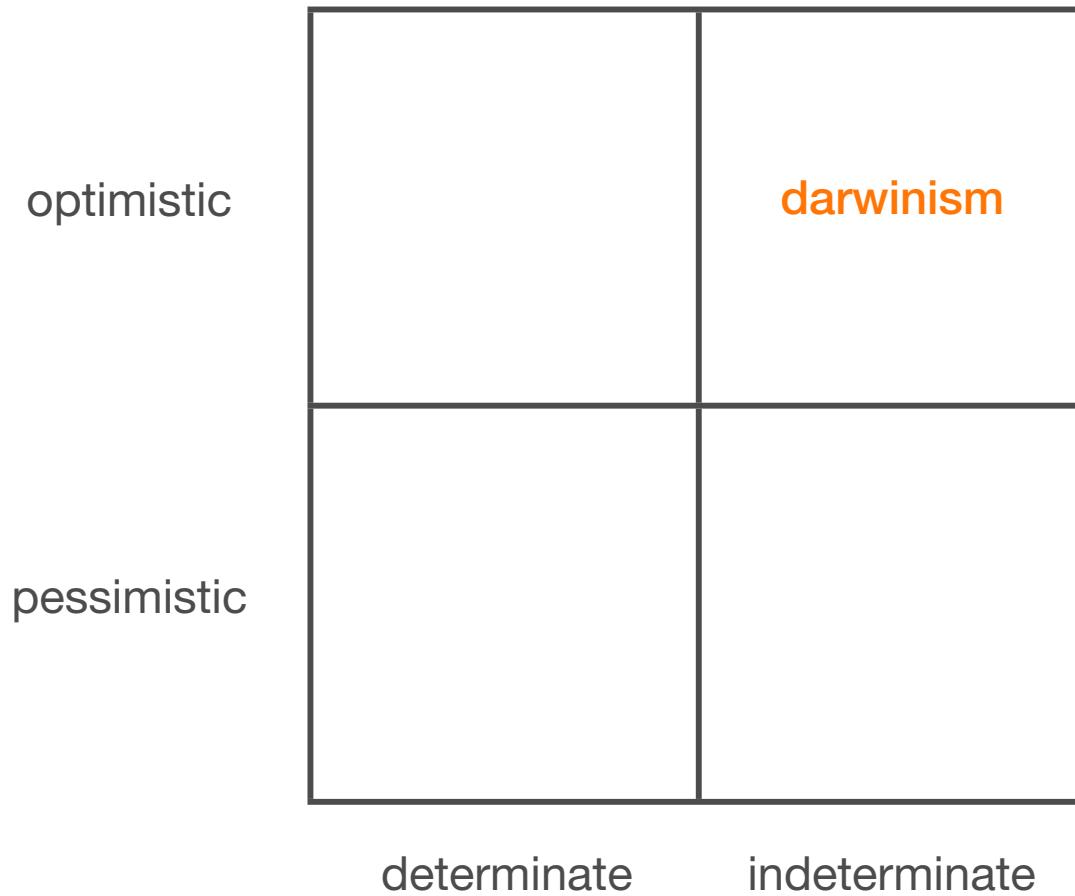
where to go next?



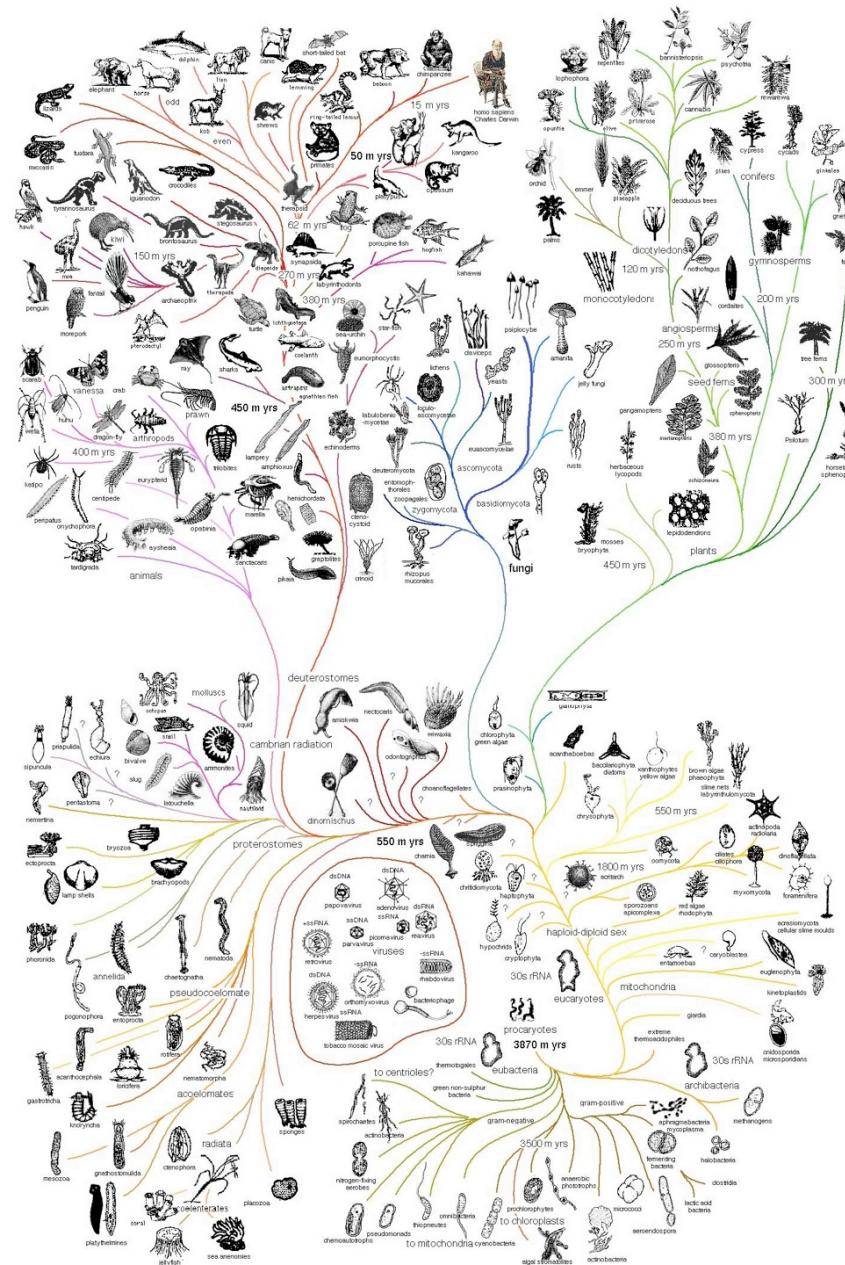
how powerful is iteration?

Can an iterative process lead, if not to the best of all possible worlds, at least to a world where there is a path of monotonic and potentially never-ending improvement?

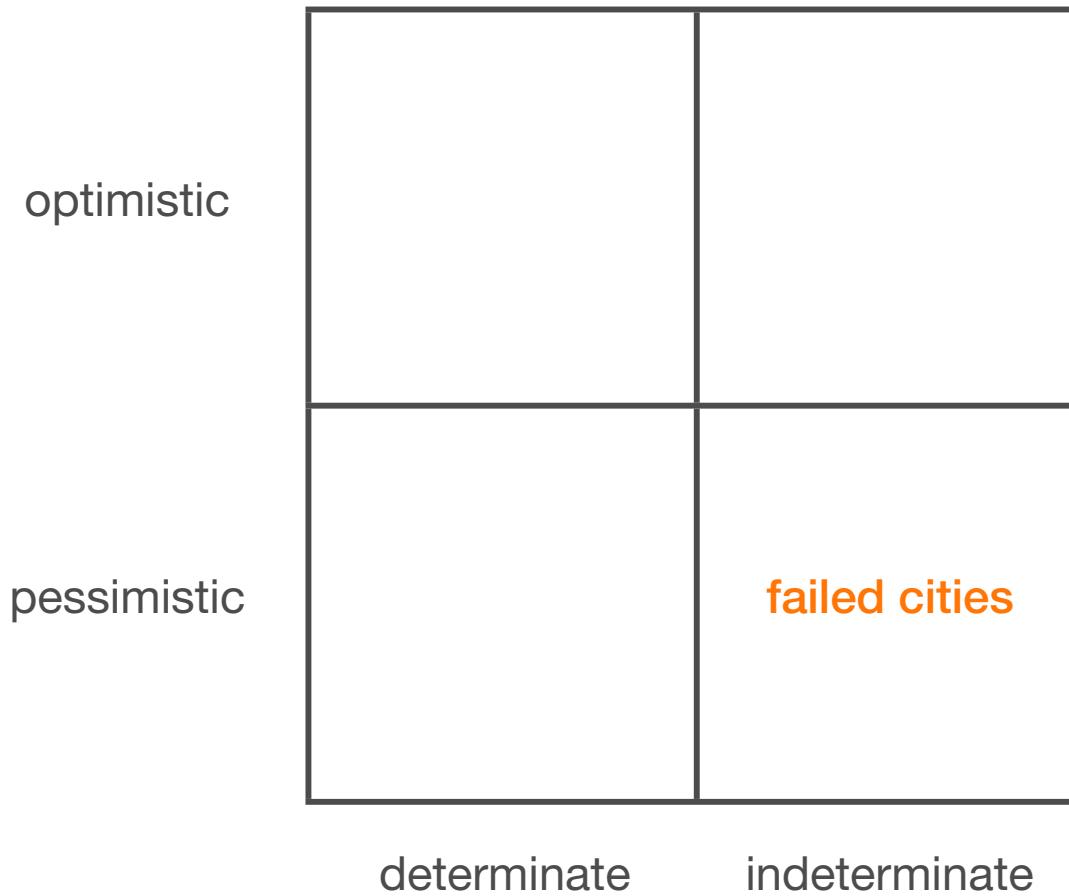
the paradigmatic example



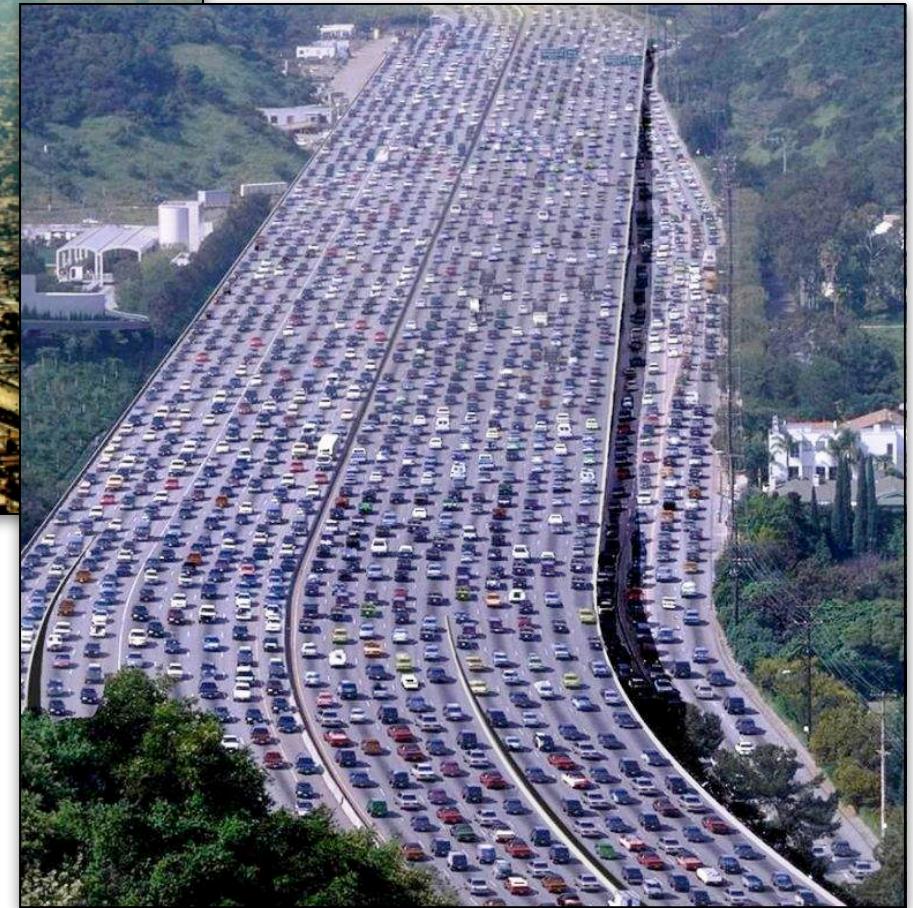
the tree of life



the paradigmatic counterexample



the end of planning



the third world

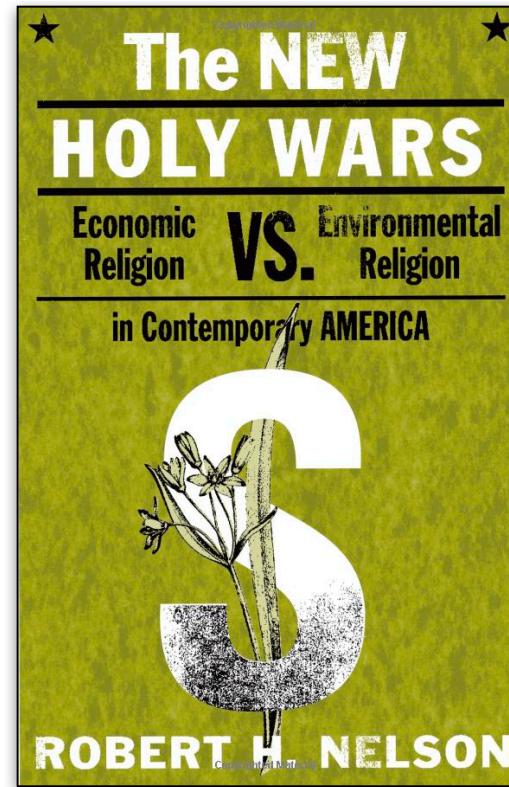


the world's biggest cities

Tokyo	34.4M	Calcutta	15.0M
Jakarta	21.8M	Los Angeles	14.7M
New York	20.1M	Shanghai	14.5M
Seoul	20.0M	Moscow	13.3M
Manila	19.6M	Beijing	12.8M
Mumbai	19.5M	Buenos Aires	12.4M
Sao Paulo	19.1M	Guangzhou	11.8M
Mexico City	18.4M	Shenzhen	11.7M
Delhi	18.0M	Istanbul	11.2M
Osaka	17.3M	Rio de Janeiro	11.2M
Cairo	16.8M	Paris	10.4M

Source: http://www.mongabay.com/cities_pop_01.htm

indefinite optimism vs. indefinite pessimism



the impact on startups

Darwinistic A-B testing

iterative process

machine learning

no thinking about the future

short time horizons

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the failure of finance

2007: the peak of indeterminate optimism

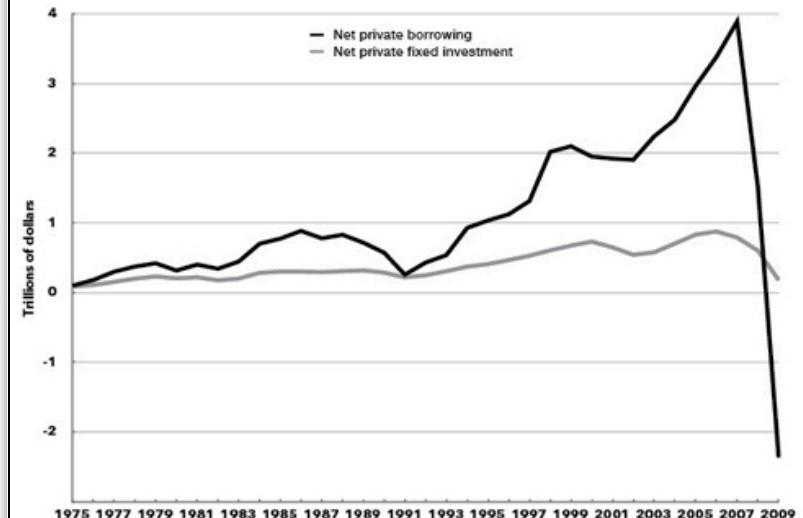
A History of Home Values

The Yale economist Robert J. Shiller created an index of American housing prices going back to 1890. It is based on sale prices of standard existing houses, not new construction, to track the value of housing as an investment over time. It presents housing values in consistent terms over 116 years, factoring out the effects of inflation.

The 1890 benchmark is 100 on the chart. If a standard house sold in 1890 for \$100,000 (inflation-adjusted to today's dollars), an equivalent standard house would have sold for \$66,000 in 1920 (66 on the index scale) and \$199,000 in 2006 (199 on the index scale, or 99 percent higher than 1890).



Chart 1. Net Private Borrowing and Net Private Fixed Investment 1975-2009 (in Current Dollars)



Sources: Federal Reserve Board, Flow of Funds Accounts of the United States, Table D.2; Bureau of Economic Analysis, National Income and Product Accounts, Table 5.2.5, Line 9.

the return of apple



2007: peak of
indeterminism

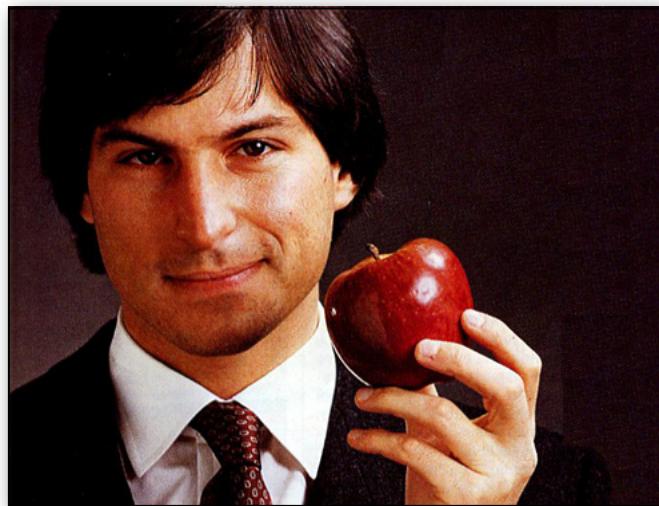


Pinterest



Path

companies with a plan do not sell



the value of a plan

In a determinate world, one of the most important metrics is the robustness of the secret plan

CS as the starting point

deterministic systems

