



Mission Oriented investment

Igniting (not assuming) animal spirits in Europe

ISIGrowth Annual

Conference European

Commission, June 1, 2016

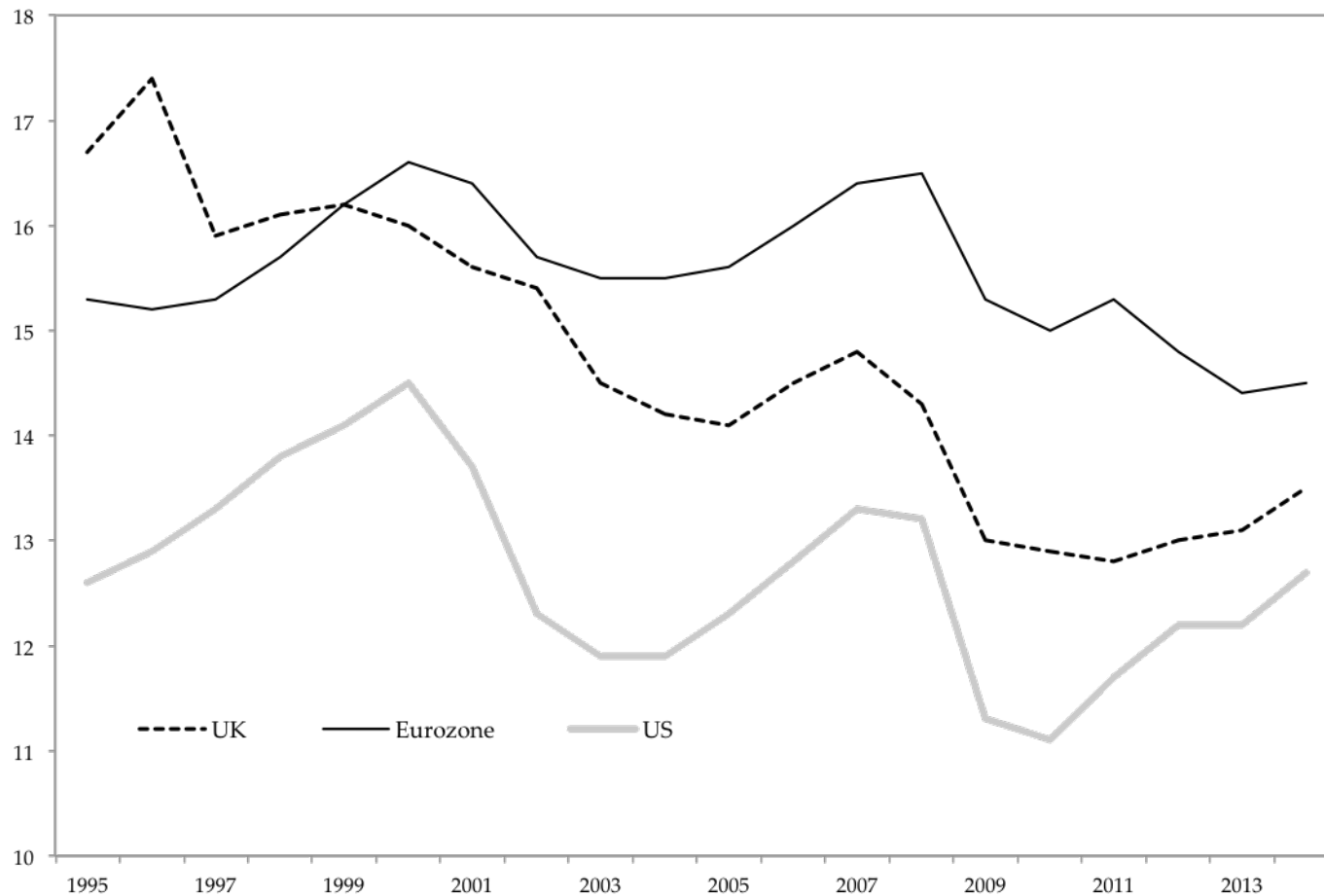
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Gross non-residential fixed capital (% GDP)



YOUR IPHONE OR YOUR TOILET: WHICH WOULD YOU PICK?



Secular stagnation? Nah.

Public sector?

- Austerity
- Lack of *mission oriented* investments

Private sector?

Record level 'hoarding'

Financialization

Horizon 2020

- Smart growth (more innovation)
- Sustainable growth (more green)
- Inclusive growth (less inequality)

But *what is State's role?*

Set 'level' playing field then *get out of the way*

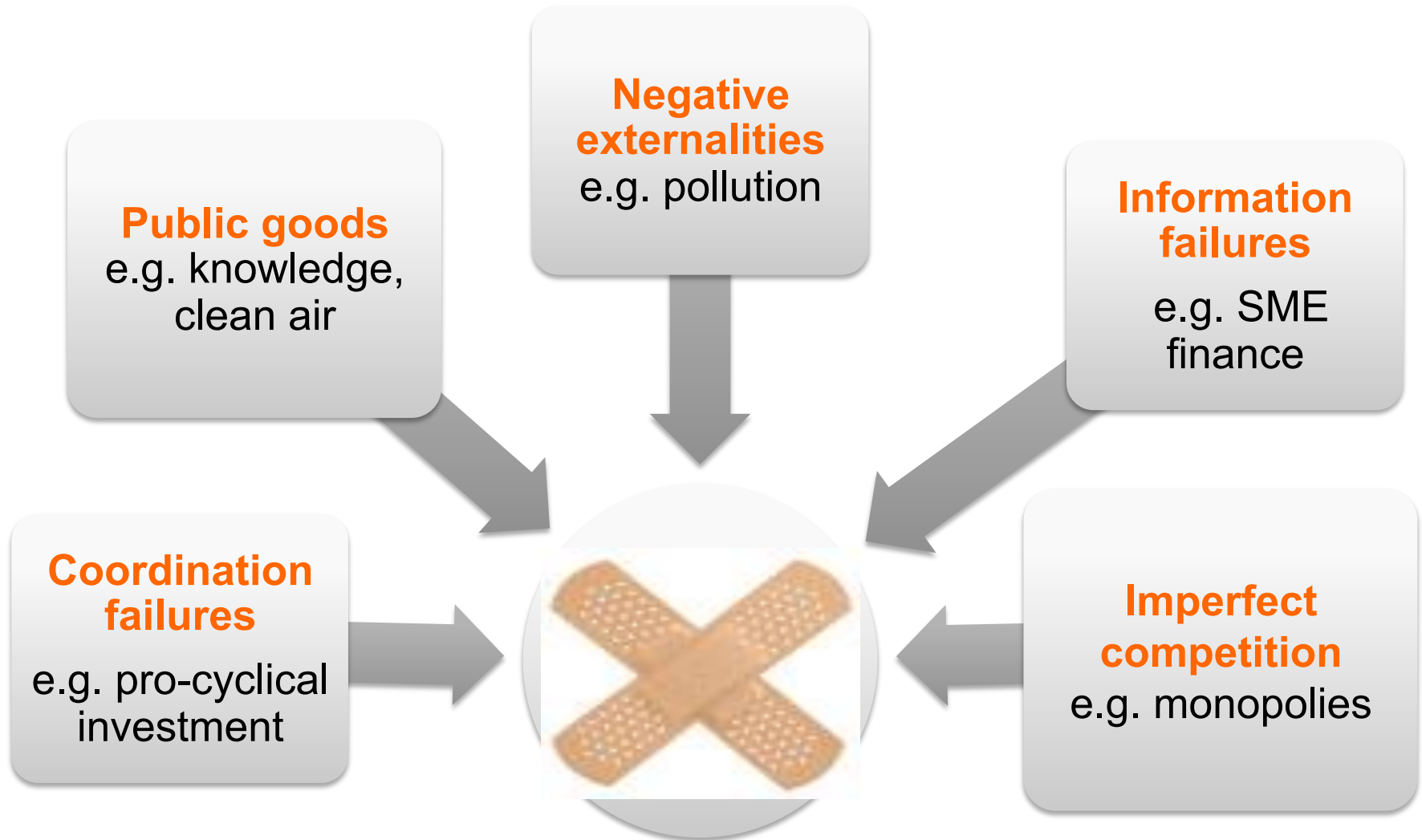
Framework conditions

Solve market 'failures'

De-risk (and 'facilitate') private sector

Something ... more interesting?

Policy as (just) fixing market failures?

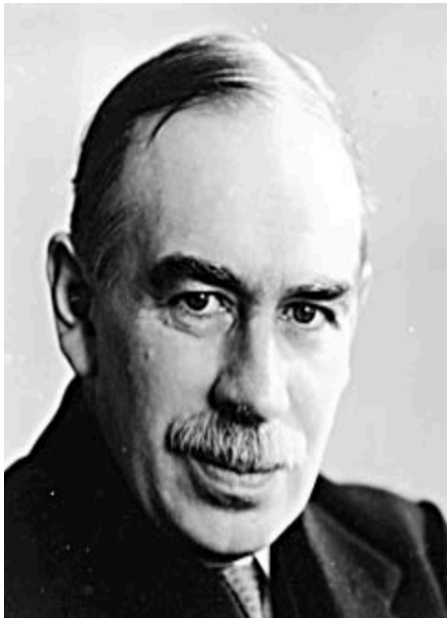


A different view: market *shaping* & creating



“The road to free markets was opened and kept open by an enormous increase in continuous, centrally organized and controlled interventionism... **Administrators had to be constantly on the watch to ensure the free working of the system.**”

Karl Polanyi, *The Great Transformation*, 1944



“The important thing for Government is not to do things which individuals are doing already, and to do them a little better or a little worse; but to **do those things which at present are not done at all.**”

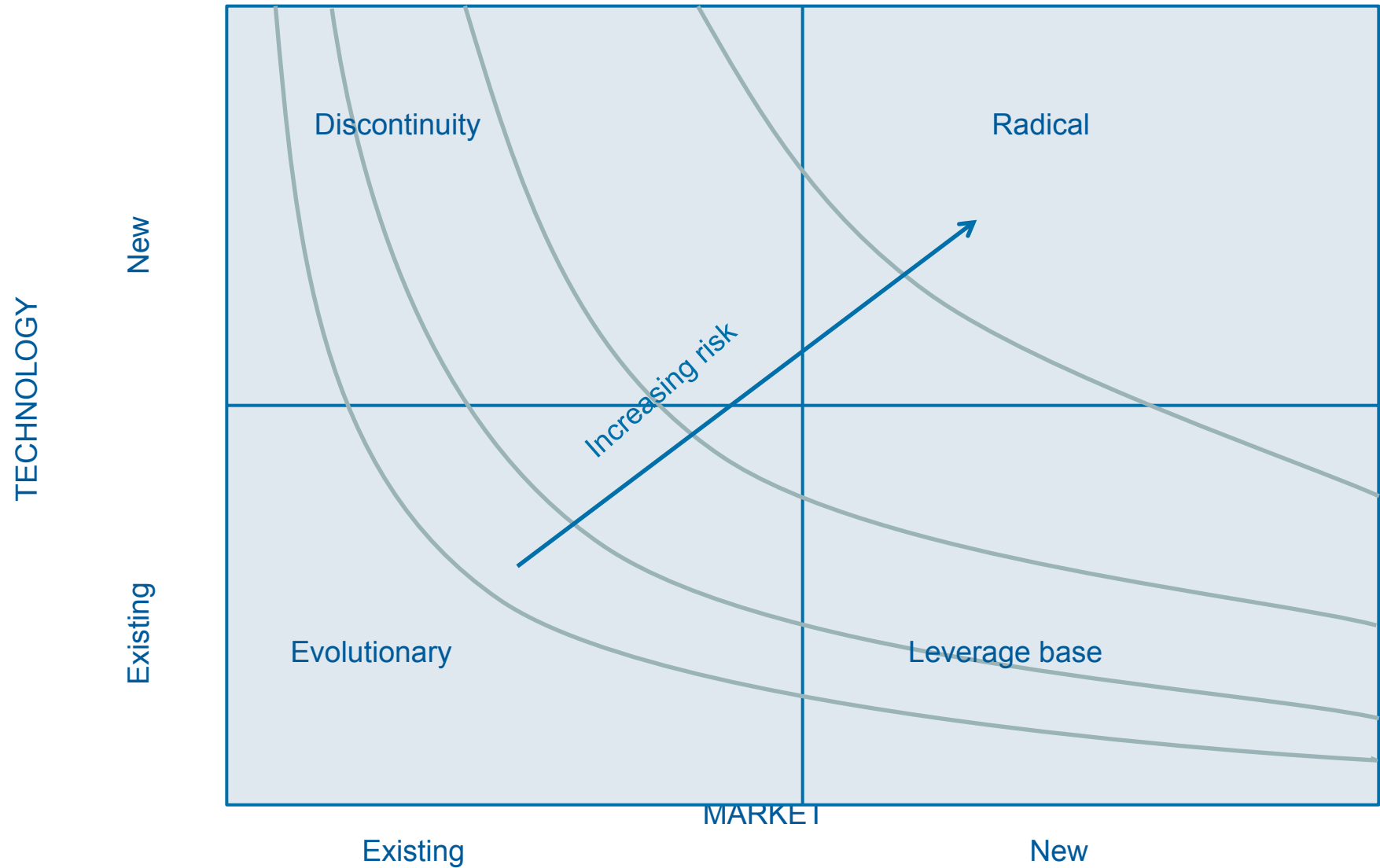
John M. Keynes, *The End of Laissez Faire*, 1926

- Smart growth (more innovation)
- Sustainable growth (more green)
- Inclusive growth (less inequality)

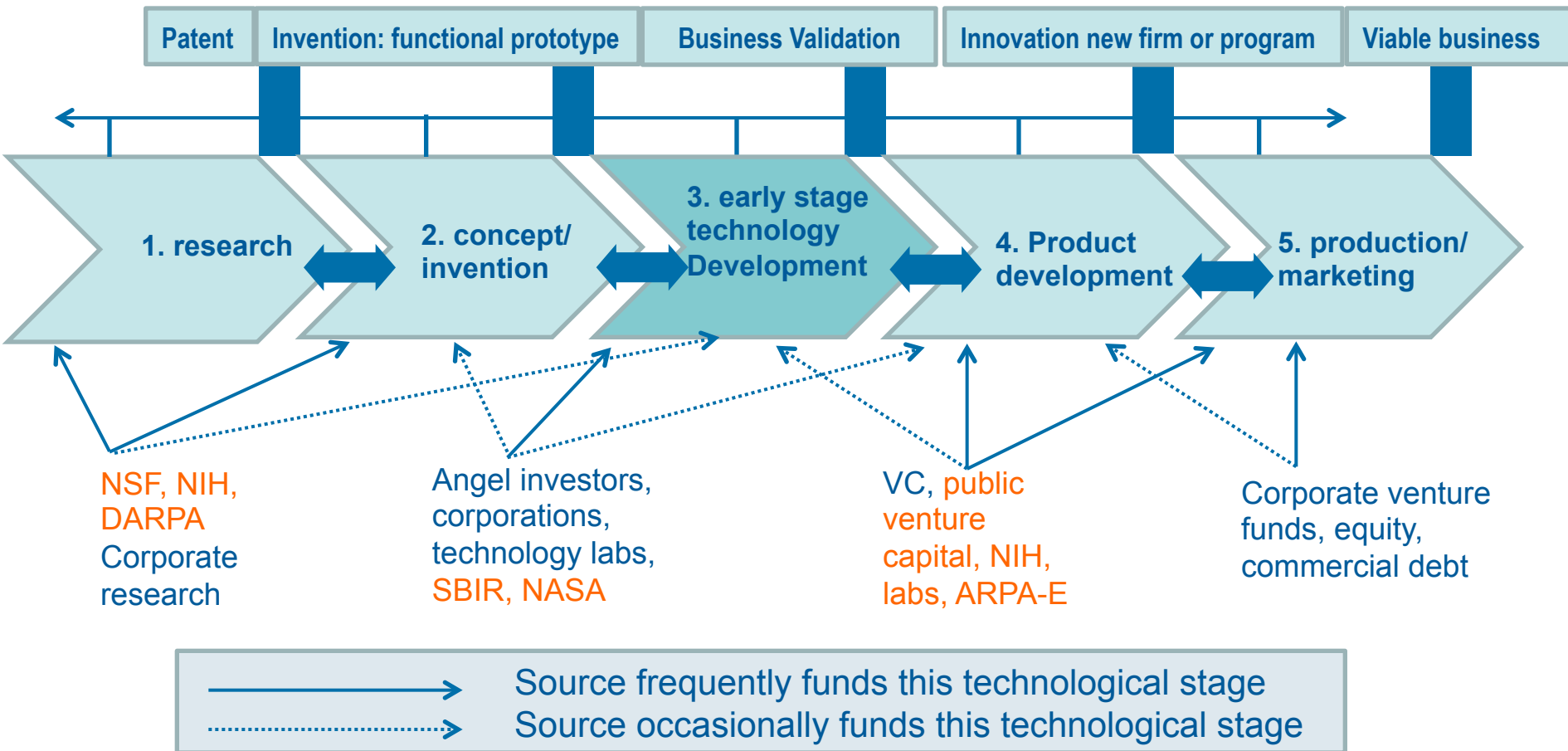
Market failure policies don't explain *General Purpose Technologies*

- 'mass production' system
- aviation technologies
- space technologies
- IT
- internet
- nuclear power
- nanotechnology
- green technology

Market and technology risk



Missions and risk-taking along entire innovation chain



Creating missions not fixing markets

NASA's mission is to “*Drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.*” NASA 2014 Strategic Plan

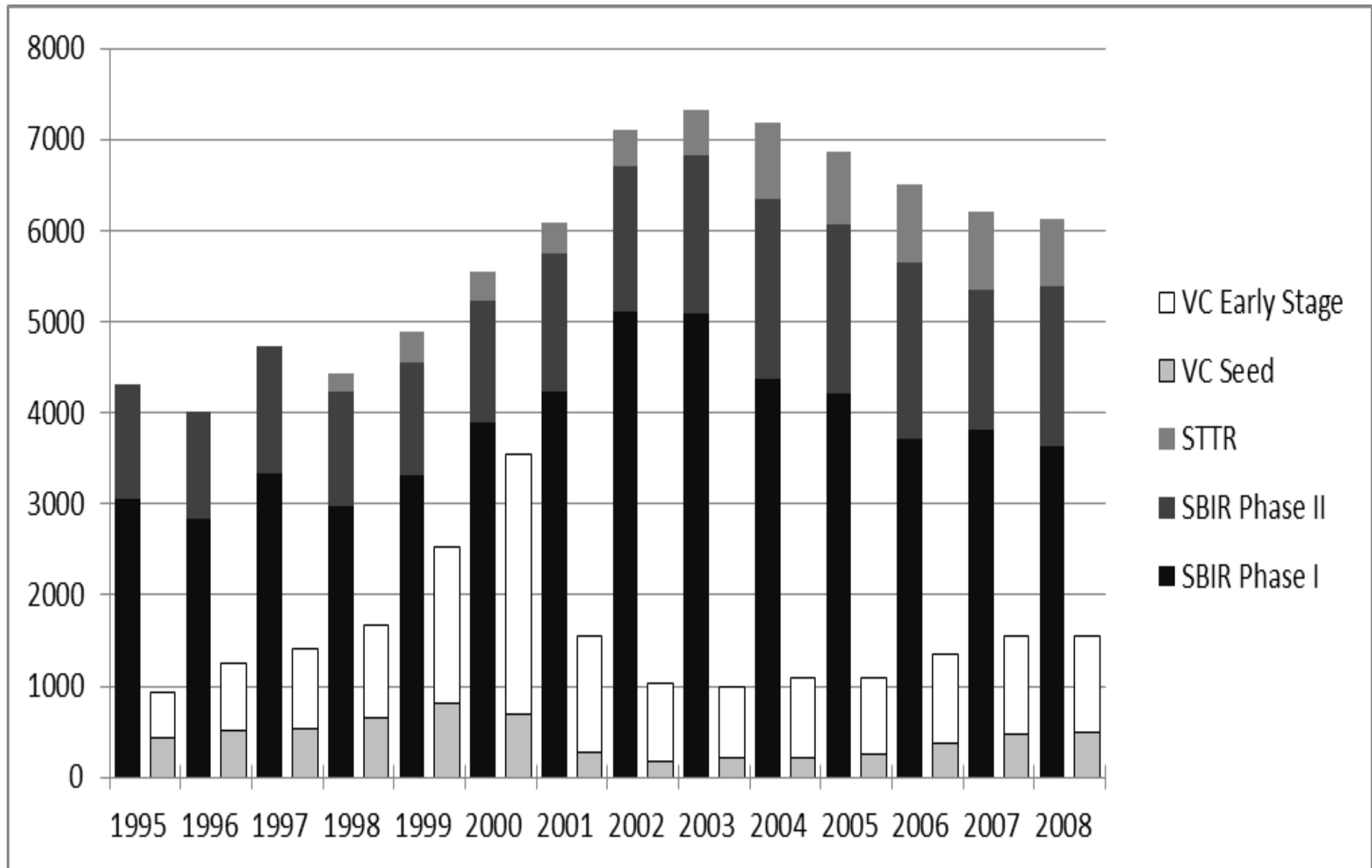
“*Creating breakthrough technologies for national security is the mission of the Defense Advanced Research Projects Agency (DARPA).*”

“The **ARPA-E mission** is to *catalyze* the development of transformational, high-impact energy technologies.”

“**NIH's mission** is to seek fundamental knowledge about the nature and behavior of living systems and the *application* of that knowledge to enhance health, lengthen life, and reduce illness and disability.”

“The **mission** of the **KfW Group** is to support change and encourage *forward-looking ideas* – in Germany, Europe and throughout the world.”

Private and Public (SBIR) Venture Capital



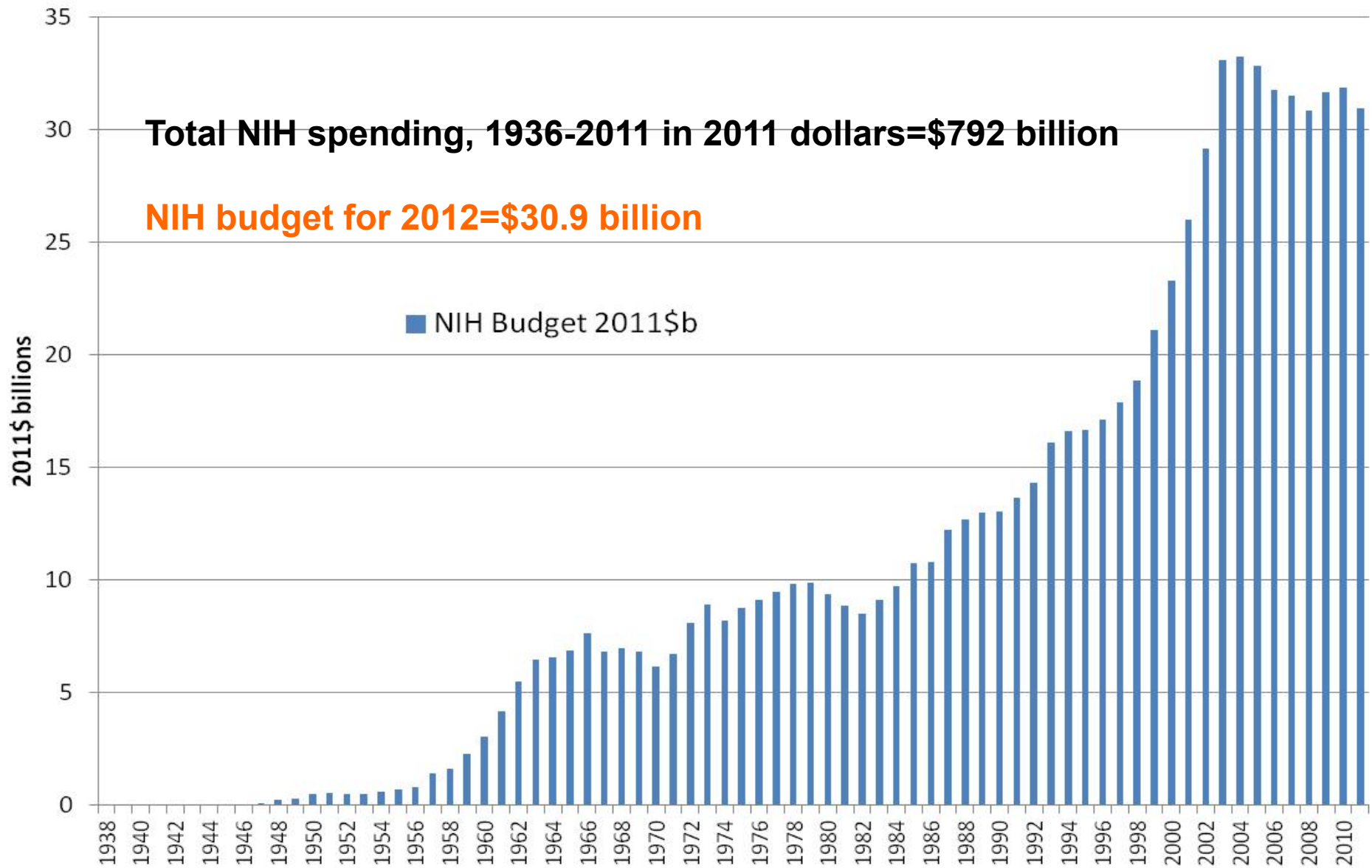
Source: Block and Keller, 2012



National Institutes of Health budgets 1936-2011

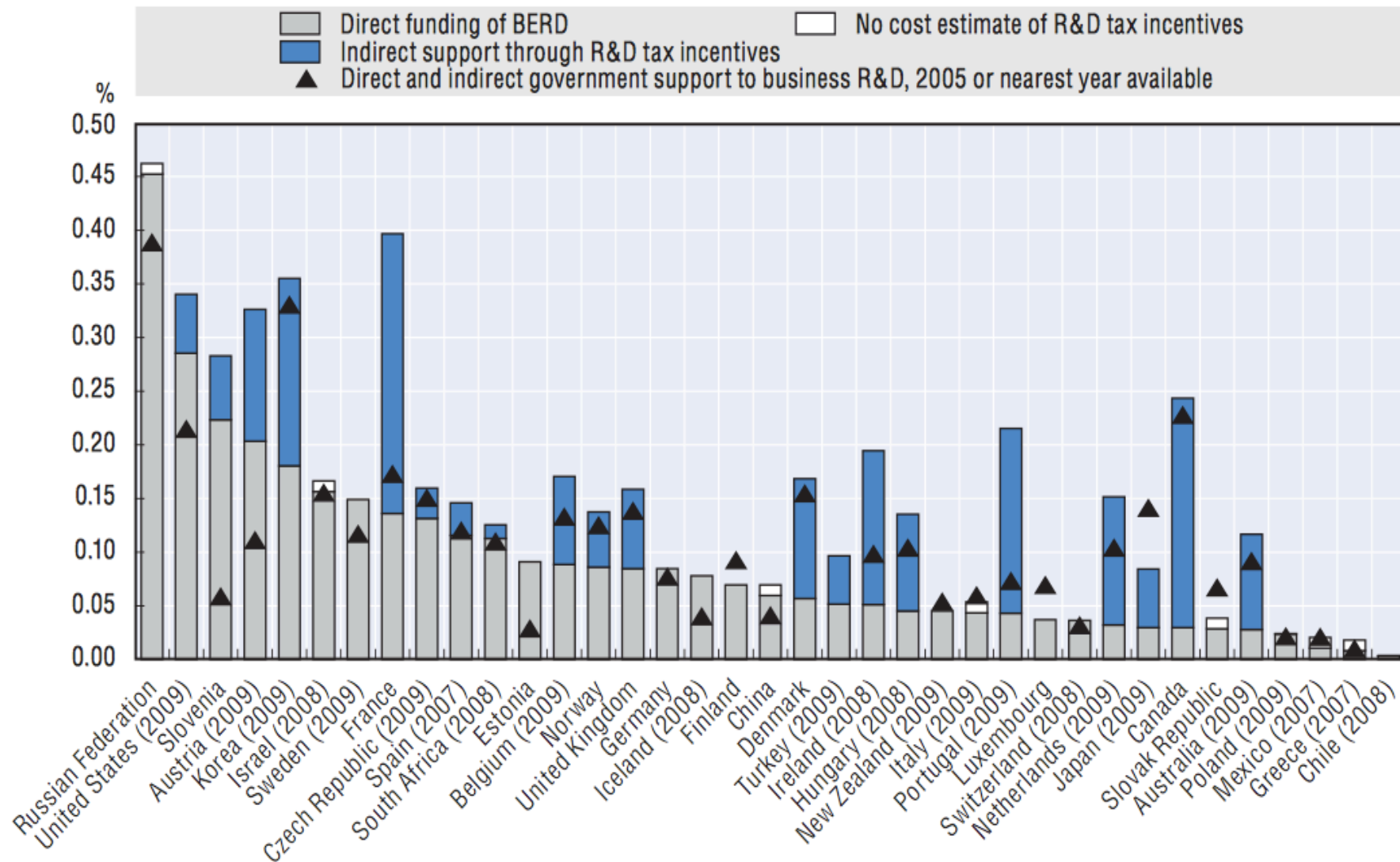
Total NIH spending, 1936-2011 in 2011 dollars=\$792 billion

NIH budget for 2012=\$30.9 billion

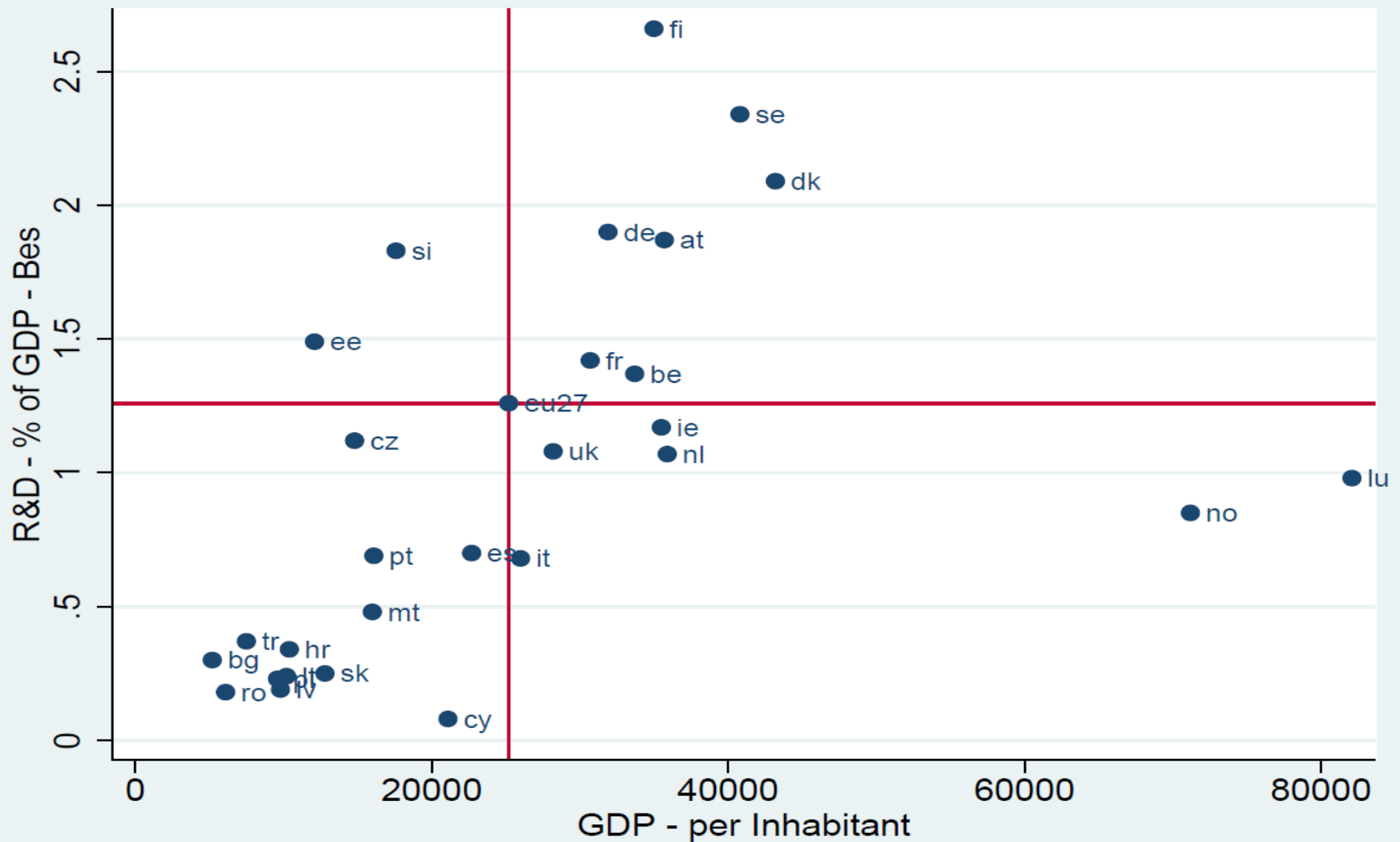


Direct government funding of business R&D and tax incentives for R&D, 2010

As a percentage of GDP



Business R&D spending (BERD)





Businessmen have a different set of delusions from politicians, and need, therefore, different handling. They are, however, much milder than politicians, at the same time allured and terrified by the glare of publicity, easily persuaded to be 'patriots', perplexed, bemused, indeed terrified, yet only too anxious to take a cheerful view, vain perhaps but very unsure of themselves, pathetically responsive to a kind word. You could do anything you liked with them, if you would treat them (even the big ones), **not as wolves or tigers, but as domestic animals** by nature, even though they have been badly brought up and not trained as you would wish....

John M. Keynes's private letter to **Franklin D. Roosevelt**
Feb 1, 1938



Source: <http://www.youtube.com/watch?v=x54bVuduggU>

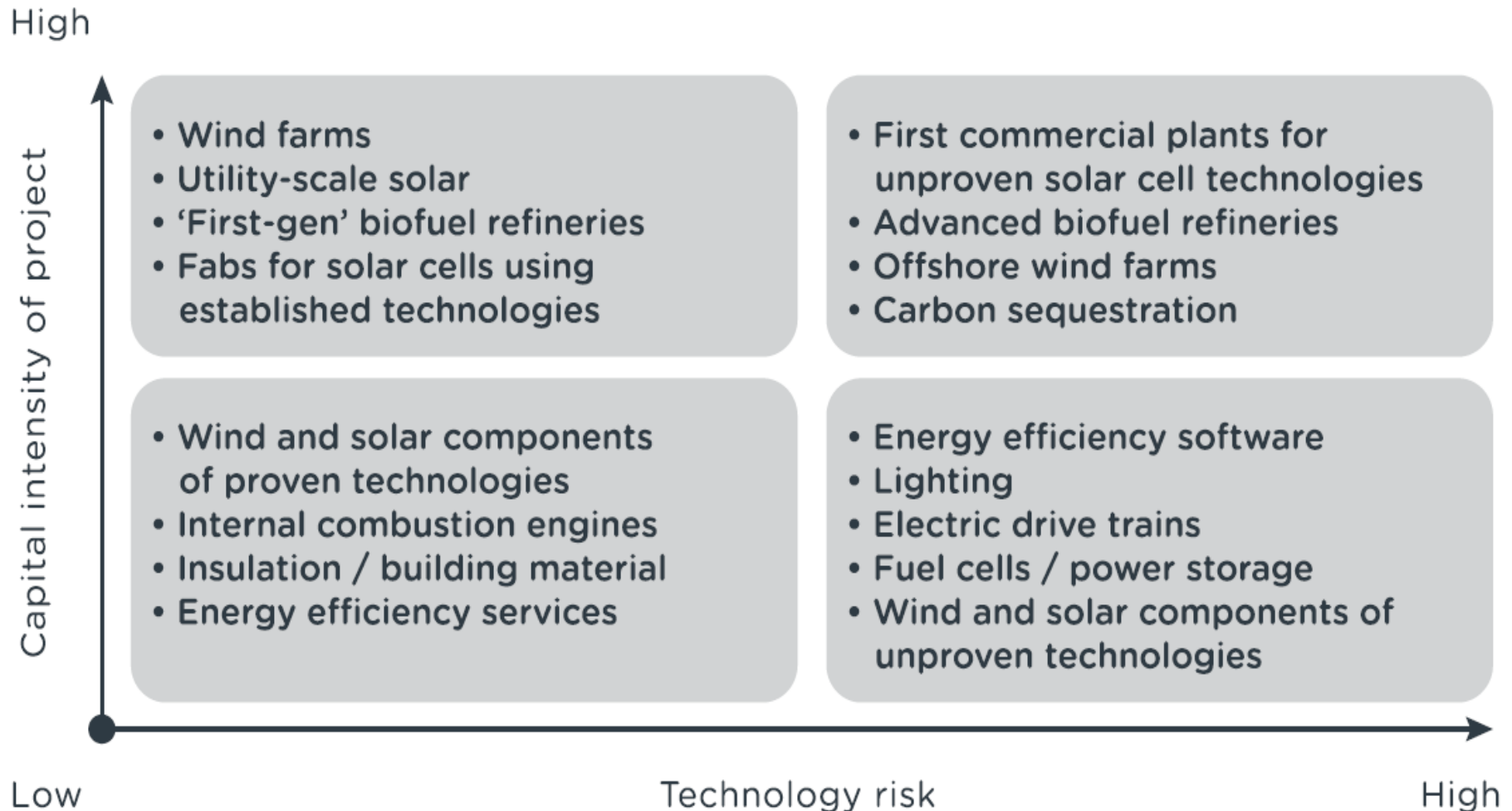
“A key element to get **an energy breakthrough** is more basic research. And that **requires the government to take the lead**. Only when that research is pointing towards a product **then we can expect the private sector to kick in.**” (Bill Gates, 2013, AEIC)

“Yes the government will be somewhat inept, but **the private sector is generally inept**. How many companies do venture capitalists invest in that go poorly? By far most of them.”
(Bill Gates, *The Atlantic*, interview Nov. 2015)

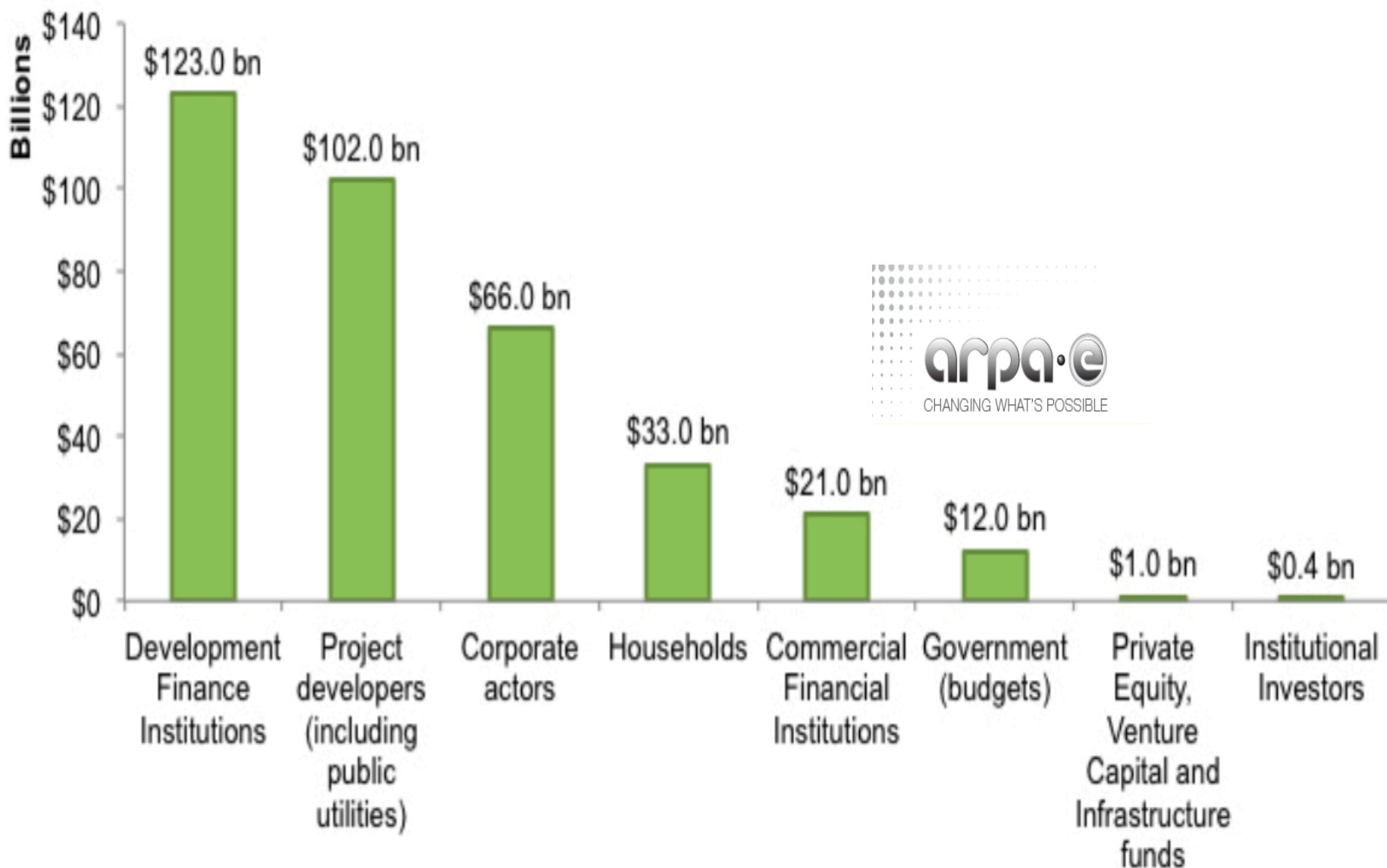
- Smart growth (more innovation)
- Sustainable growth (more green)
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Technology risk in clean tech

(venture capital will ride the wave, who will kick/push?)

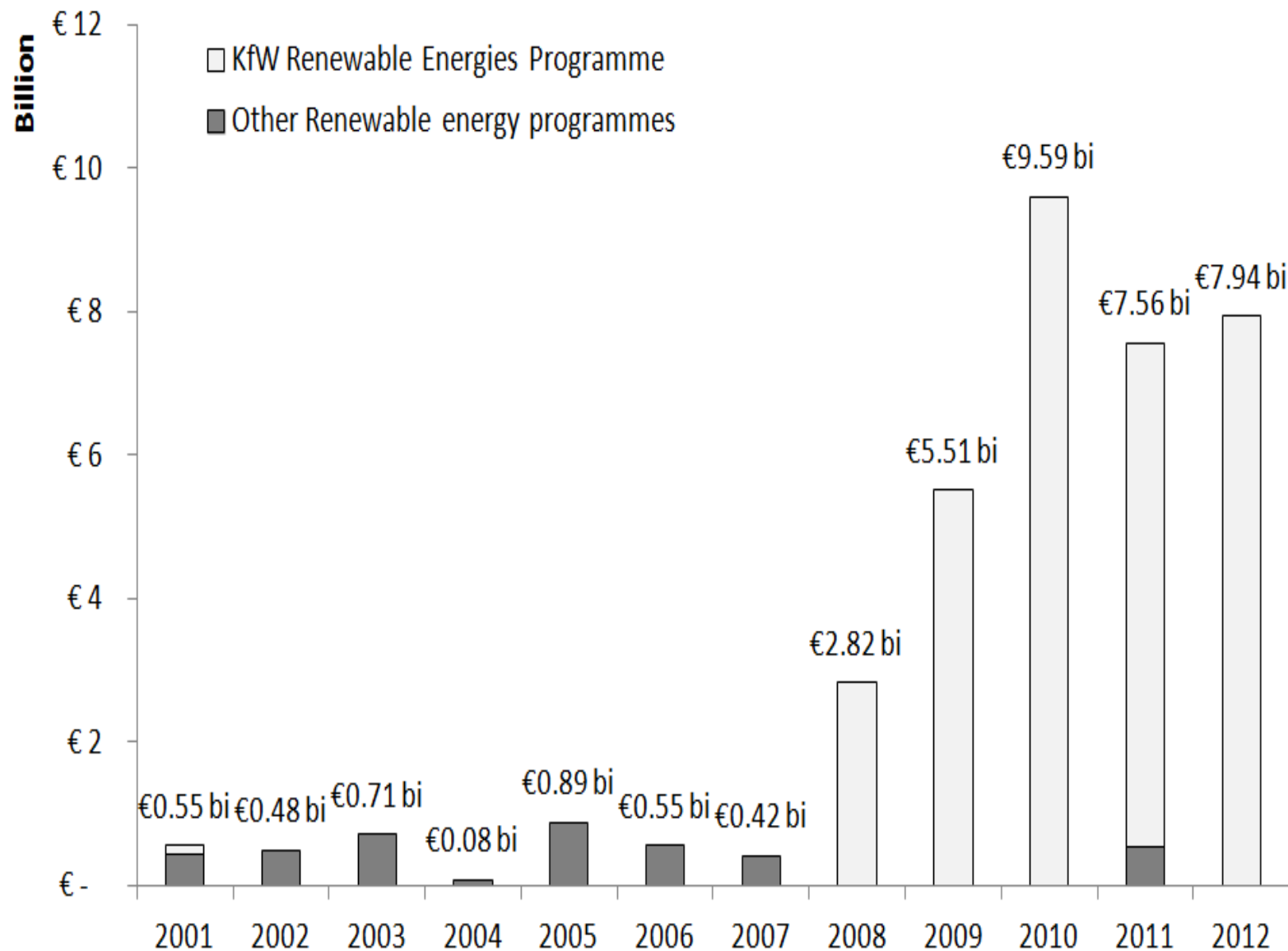


Green tech public & private investments (2011)

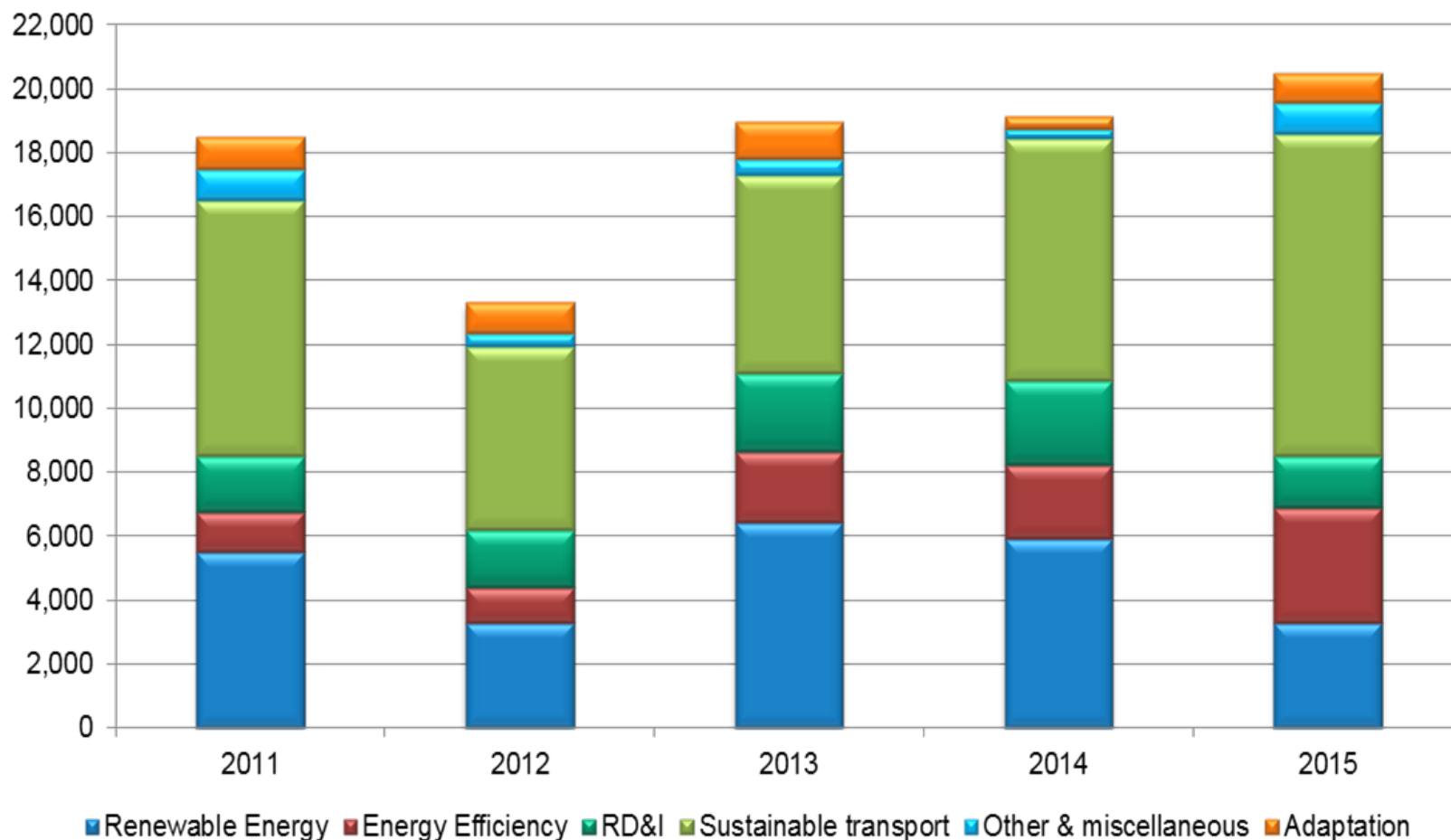


Source: Climate Finance Initiative

KfW funding for industrial environmental and climate protection projects in Germany 2001-2012

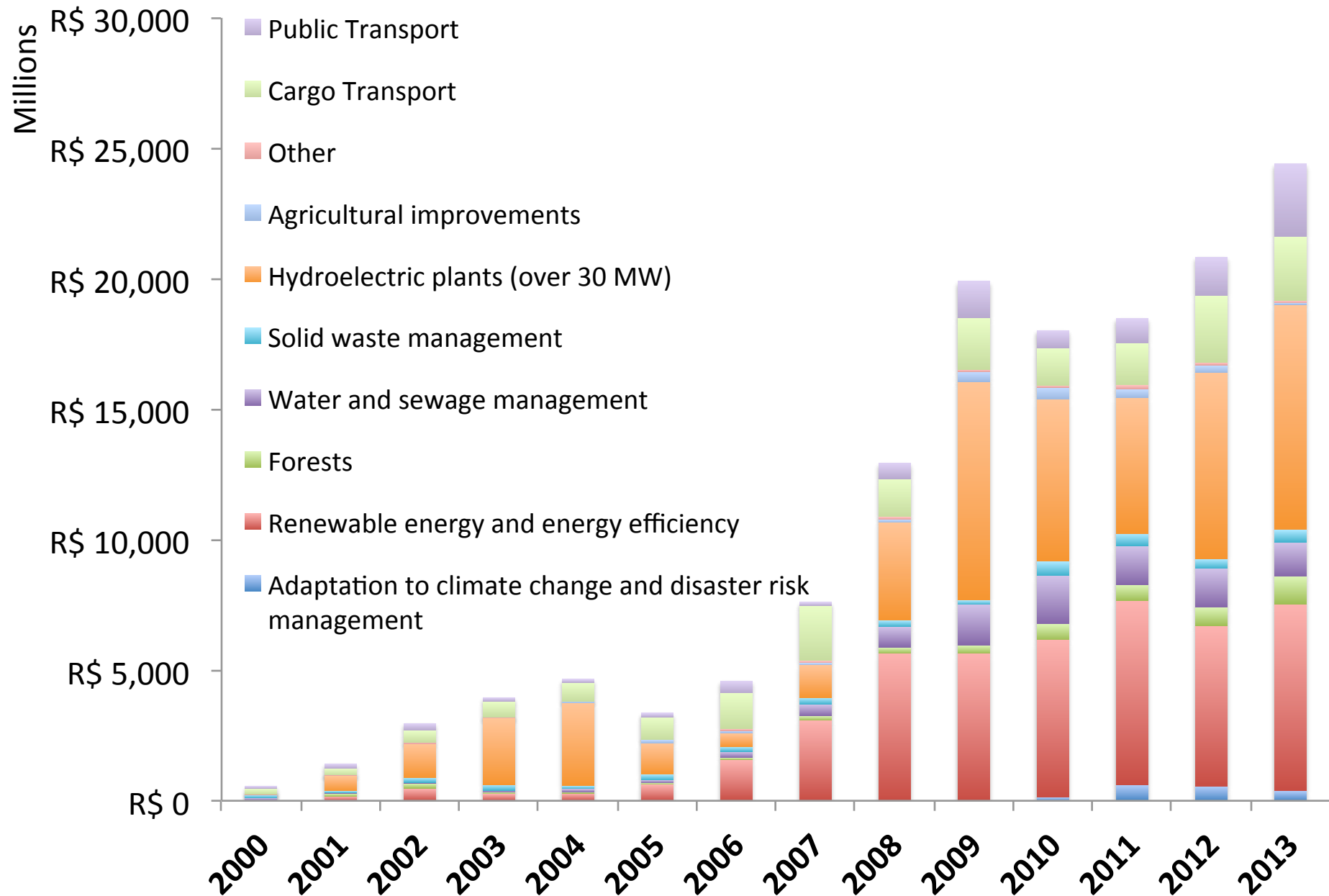


EIB Climate Action financing 2011-2015 (M EUR)



- More than 25% of total EIB lending goes towards Climate Action
- Over USD 100bn of financing worldwide during the last five years

BNDES' disbursements for the green economy and climate change



China Development Bank

China's 2020 goal of producing 20% energy from renewables.

5 year plan includes \$1.7 trillion dollars in 5 new (green) sectors.

CDB founded **CDB Capital**, a 'public equity' fund with **\$US 5.76 bn to finance innovative start-ups** from the energy and telecom sectors.

Yingli Green Energy received **\$1.7 bn** from 2008 through 2012 with a **\$5.3 bn line of credit** opened for it. **LDK Solar (\$9.1 bn)**; **Sinovel Wind (\$6.5 bn)**; **Suntech Power (\$7.6 bn)**; and Trina Solar (**\$4.6 bn**),

Patient committed finance has “allowed Chinese companies to further ramp up production and drive down costs” of renewable energy technologies

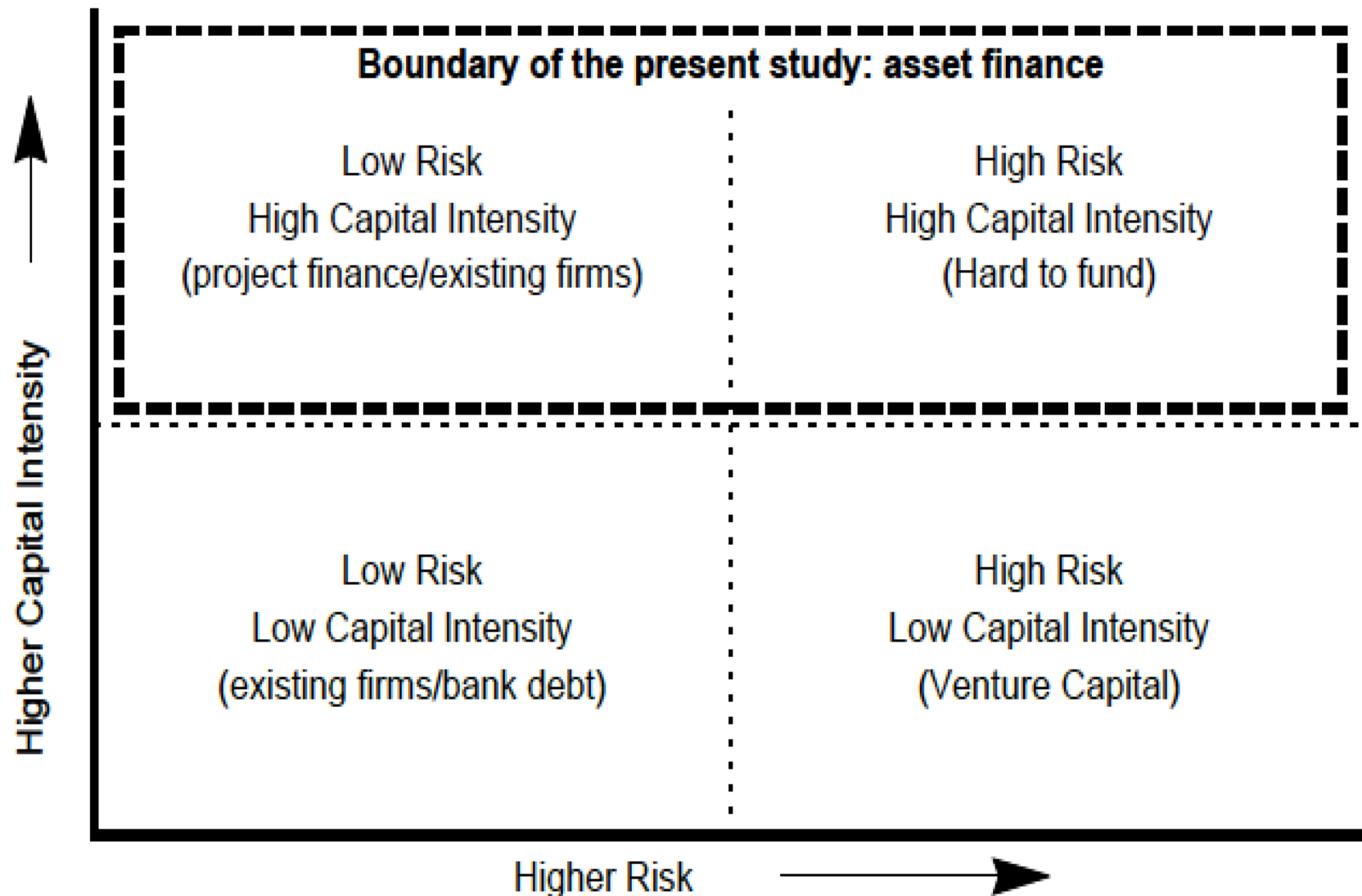
ISIG Workpackage 4

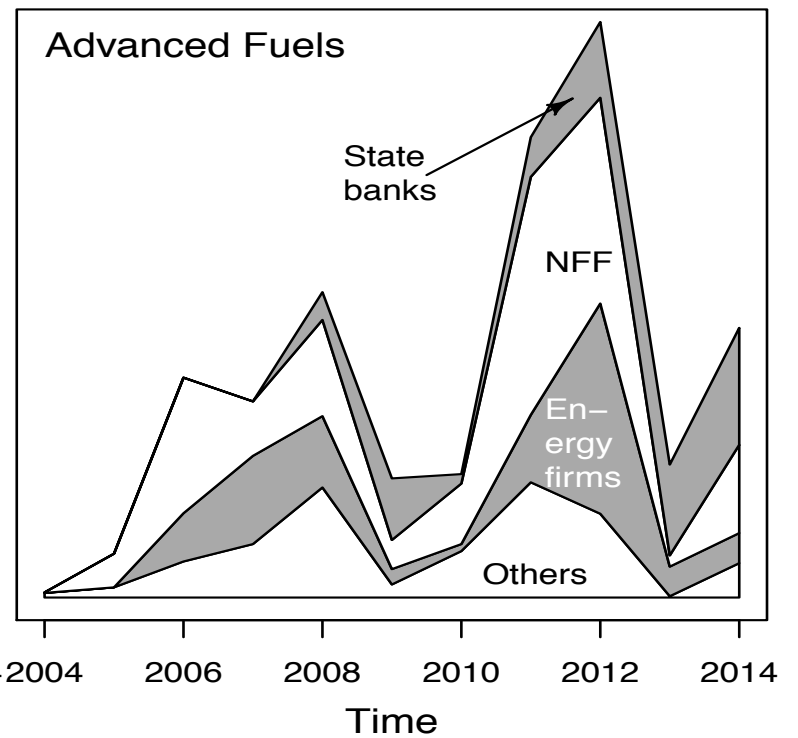
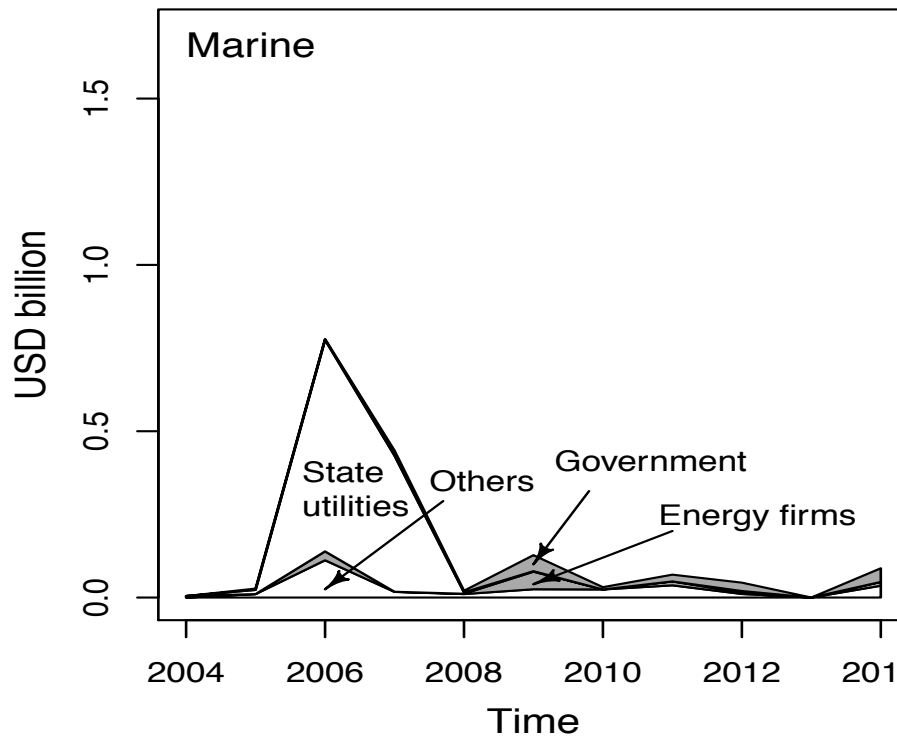
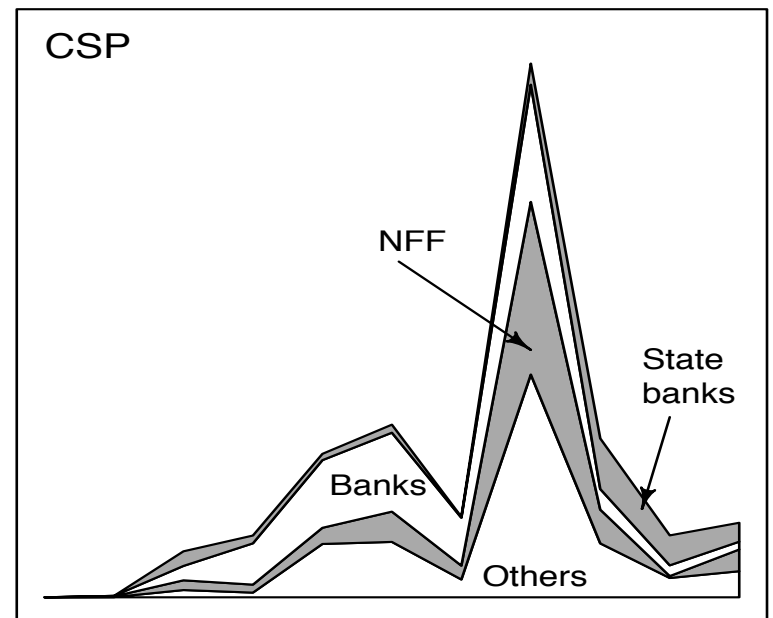
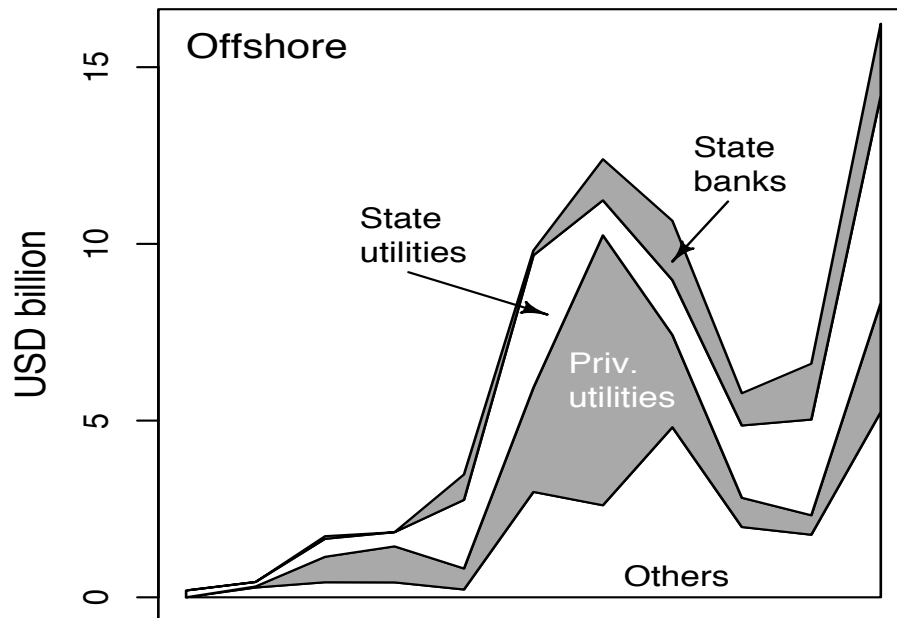
Finance and Innovation

(being presented *tomorrow*)

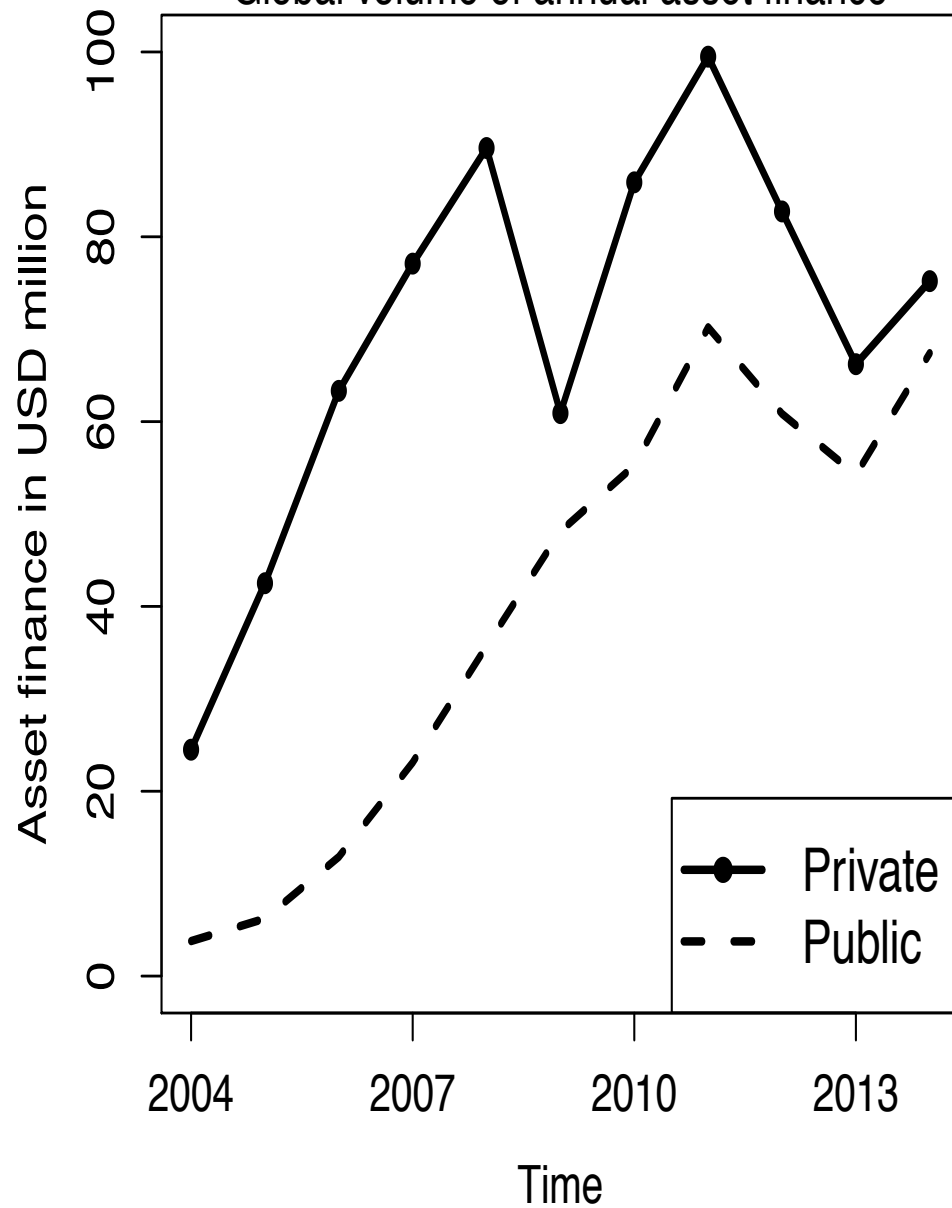
Mazzucato, M. and Semieniuk, G. (2016) “Financing Renewable Energy: Who is financing what and why it matters” forthcoming *Technological Forecasting and Social Change*

Figure 4: Risk-capital intensity classification of RE finance

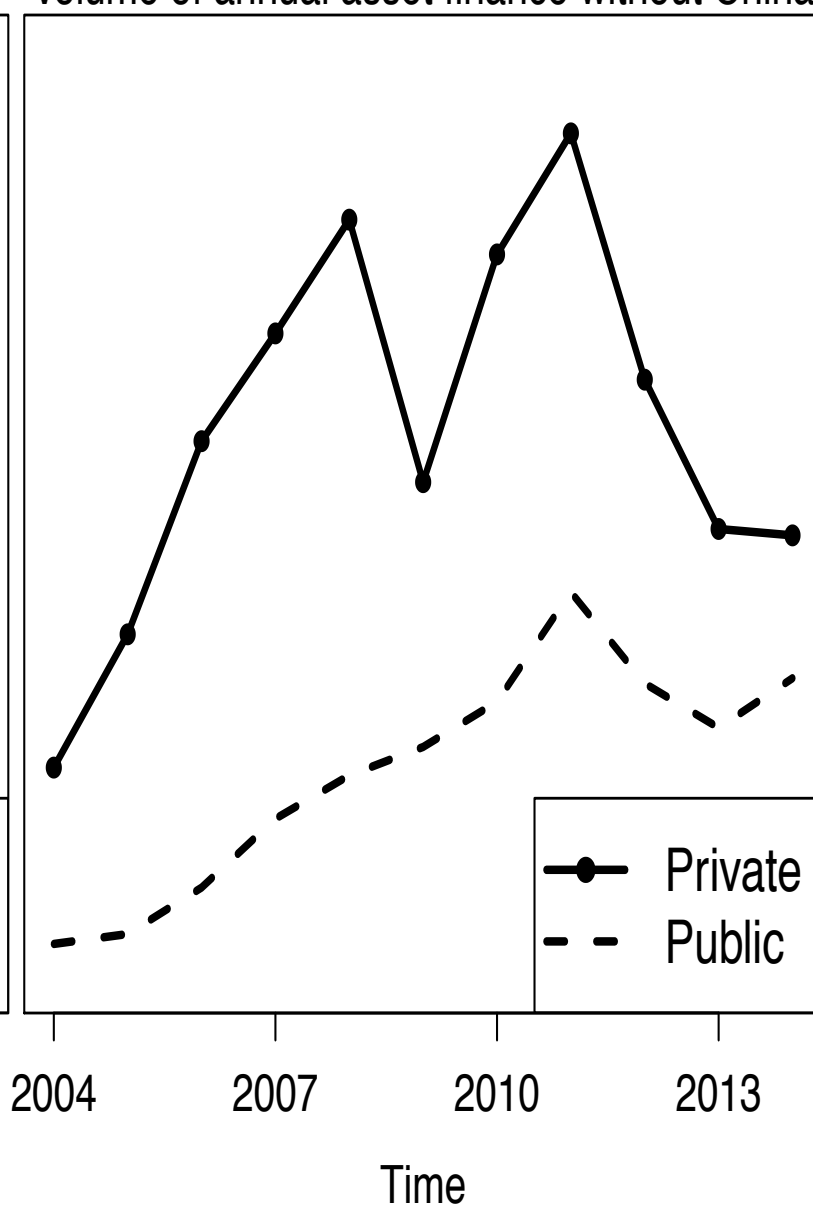




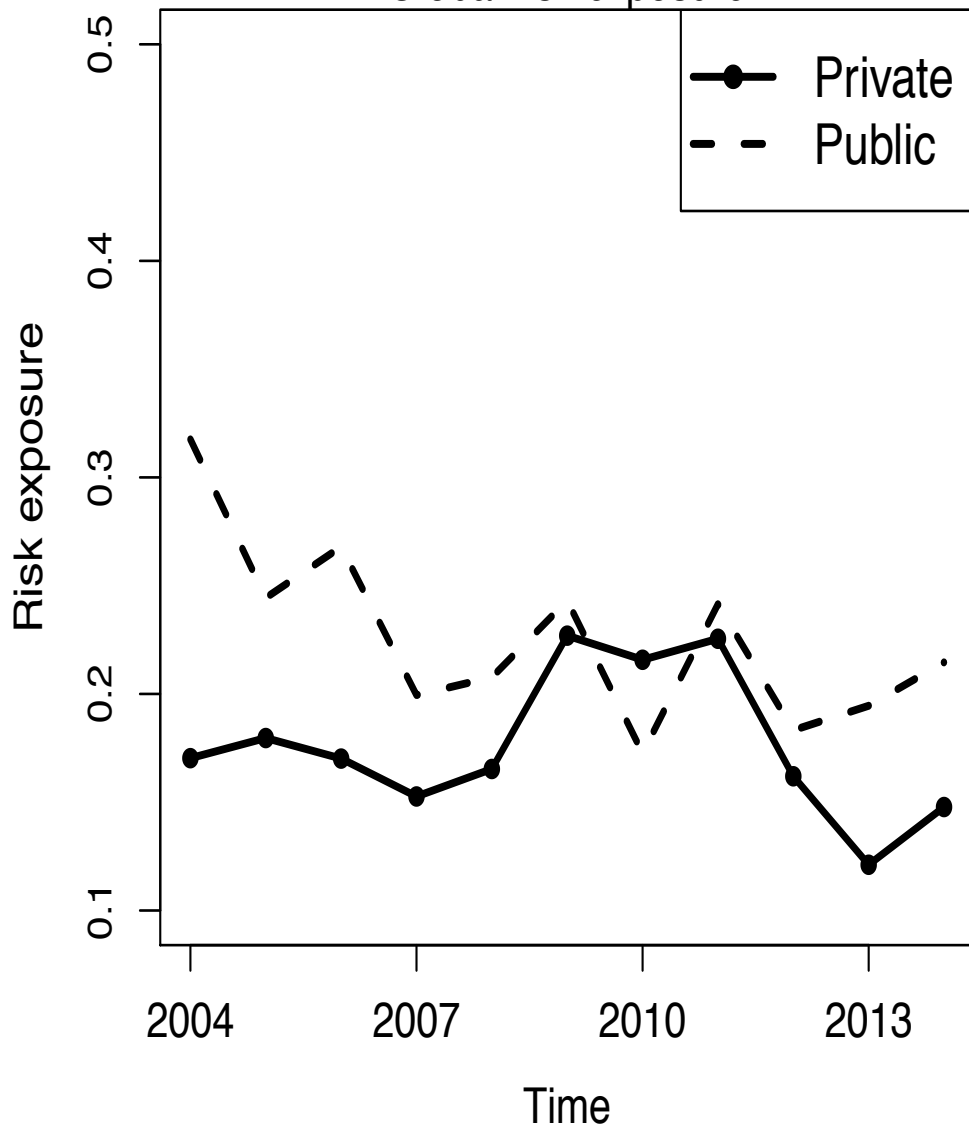
Global volume of annual asset finance



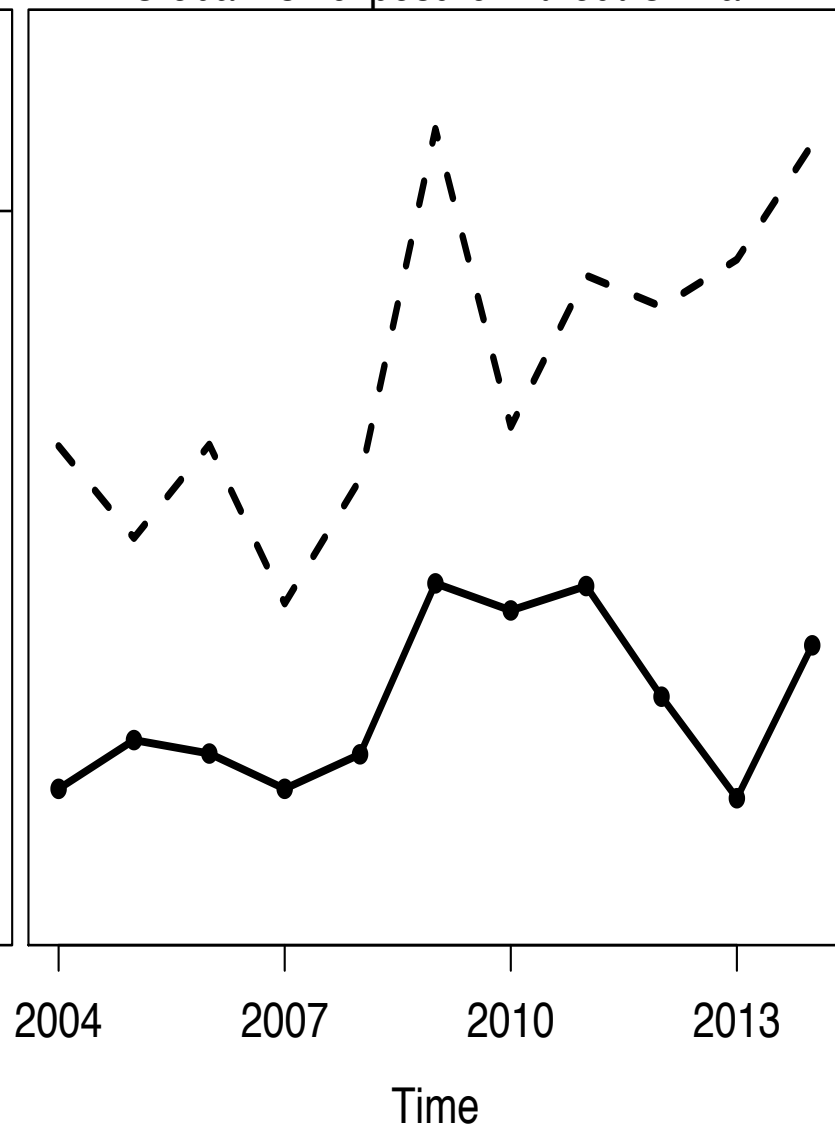
Volume of annual asset finance without China



Global risk exposure



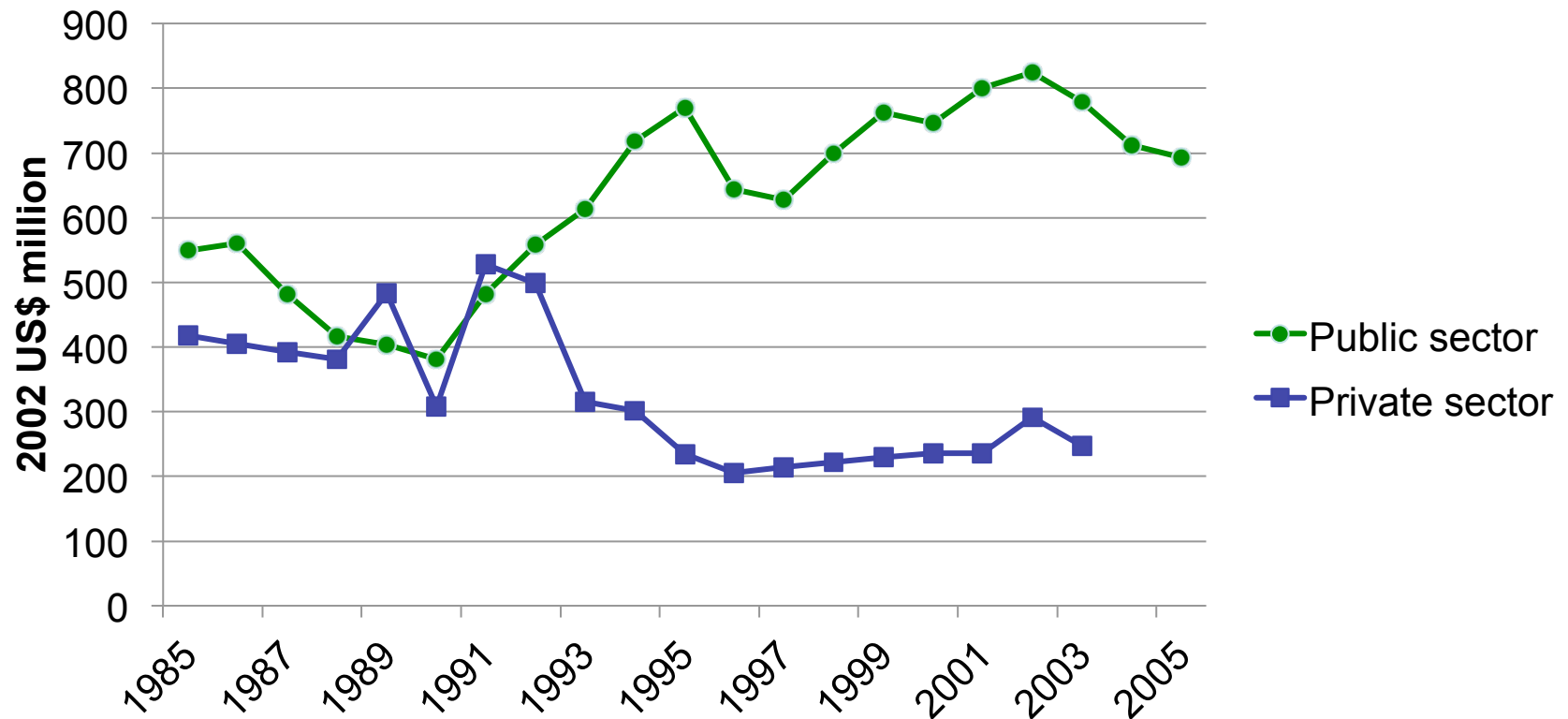
Global risk exposure without China



- Smart growth (more innovation)
- Sustainable growth (more green)
- **Inclusive** growth (less inequality)

Where are energy's Xerox Parcs & Bell Labs?

Renewable energy R&D investments in the U.S.
in million 2002 dollars



Source: Nemet and Kammen (2007), "U.S. energy research and development: Declining investment, increasing need, and the feasibility of expansion", *Energy Policy*, 35 (1), 746-755

Share Buybacks (financialization)

THE BIG IDEA PROFITS WITHOUT PROSPERITY

THE TOP 10 STOCK REPURCHASERS

2003-2012

Fortune 500 companies have spent **\$2.3 trillion** on **buybacks** from 2003-2012 (54% of their earnings), with another 37% on dividends.

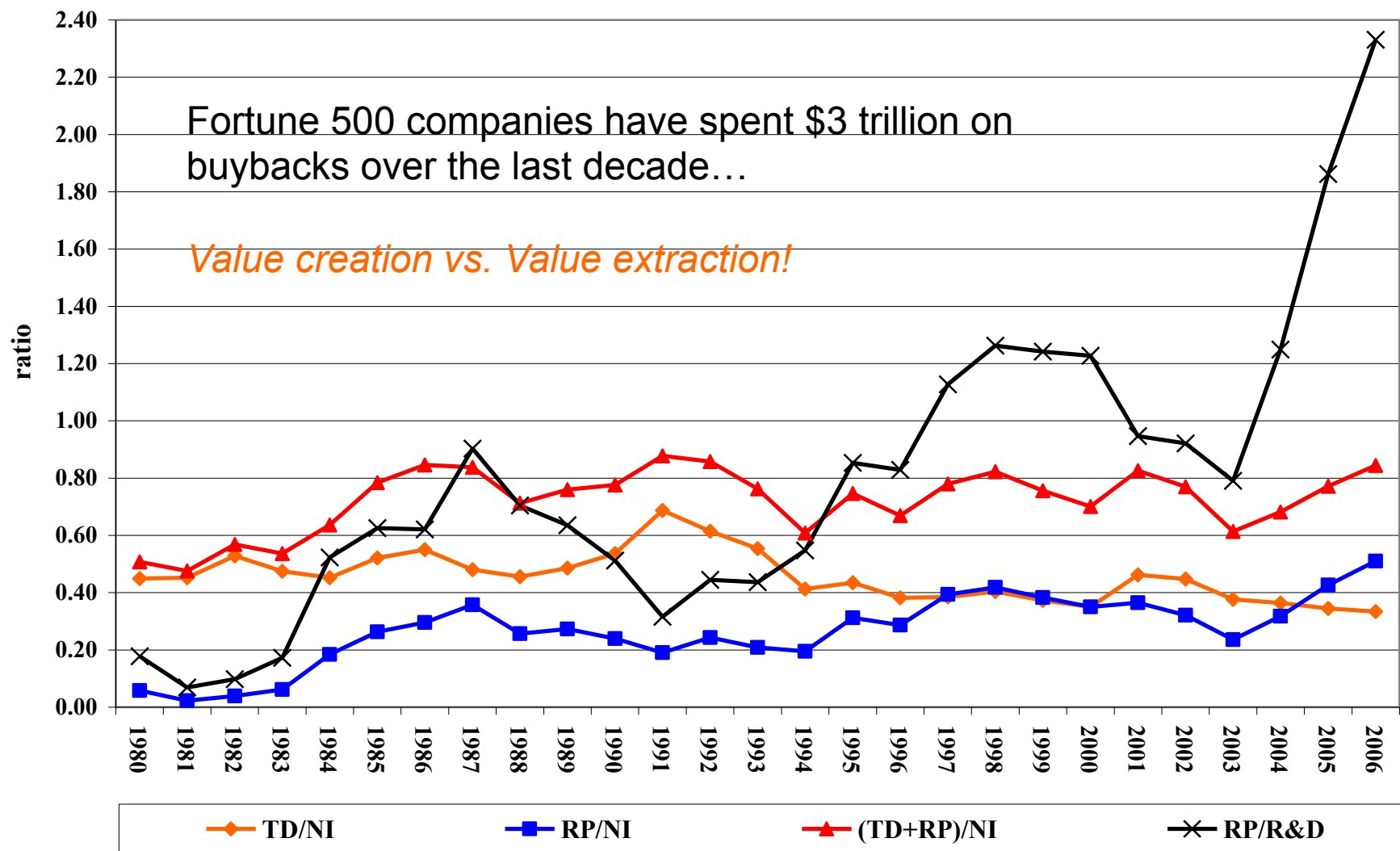
(William Lazonick, HBR 2014)

At most of the leading U.S. companies below, distributions to shareholders were well in excess of net income. These distributions came at great cost to innovation, employment, and—in cases such as oil refining and pharmaceuticals—customers who had to pay higher prices for products.

#1 EXXON MOBIL <hr/> NET INCOME \$347B REPURCHASES \$207B DIVIDENDS \$80B <hr/> TOTAL \$287B 83% of NI <hr/> CEO PAY \$289M % STOCK BASED 73% \$211M <hr/>	#2 MICROSOFT <hr/> NET INCOME \$148B REPURCHASES \$114B DIVIDENDS \$71B <hr/> TOTAL \$185B 125% of NI <hr/> CEO PAY \$12M % STOCK BASED 0% \$0* <hr/>	#3 IBM <hr/> NET INCOME \$117B REPURCHASES \$107B DIVIDENDS \$23B <hr/> TOTAL \$130B 111% of NI <hr/> CEO PAY \$247M % STOCK BASED 64% \$158M <hr/>	#4 CISCO SYSTEMS <hr/> NET INCOME \$64B REPURCHASES \$75B DIVIDENDS \$2B <hr/> TOTAL \$77B 121% of NI <hr/> CEO PAY \$297M % STOCK BASED 92% \$273M <hr/>	#5 PROCTER & GAMBLE <hr/> NET INCOME \$93B REPURCHASES \$66B DIVIDENDS \$42B <hr/> TOTAL \$108B 116% of NI <hr/> CEO PAY \$90M % STOCK BASED 16% \$14M <hr/>
#6 HEWLETT-PACKARD <hr/> NET INCOME \$41B REPURCHASES \$64B DIVIDENDS \$9B <hr/> TOTAL \$73B 177% of NI <hr/> CEO PAY \$210M % STOCK BASED 37% \$78M <hr/>	#7 WALMART <hr/> NET INCOME \$134B REPURCHASES \$62B DIVIDENDS \$35B <hr/> TOTAL \$97B 73% of NI <hr/> CEO PAY \$189M % STOCK BASED 62% \$117M <hr/>	#8 INTEL <hr/> NET INCOME \$79B REPURCHASES \$60B DIVIDENDS \$27B <hr/> TOTAL \$87B 109% of NI <hr/> CEO PAY \$127M % STOCK BASED 62% \$79M <hr/>	#9 PFIZER <hr/> NET INCOME \$84B REPURCHASES \$59B DIVIDENDS \$63B <hr/> TOTAL \$122B 146% of NI <hr/> CEO PAY \$91M % STOCK BASED 25% \$23M <hr/>	#10 GENERAL ELECTRIC <hr/> NET INCOME \$165B REPURCHASES \$45B DIVIDENDS \$87B <hr/> TOTAL \$132B 81% of NI <hr/> CEO PAY \$126M % STOCK BASED 25% \$32M <hr/>

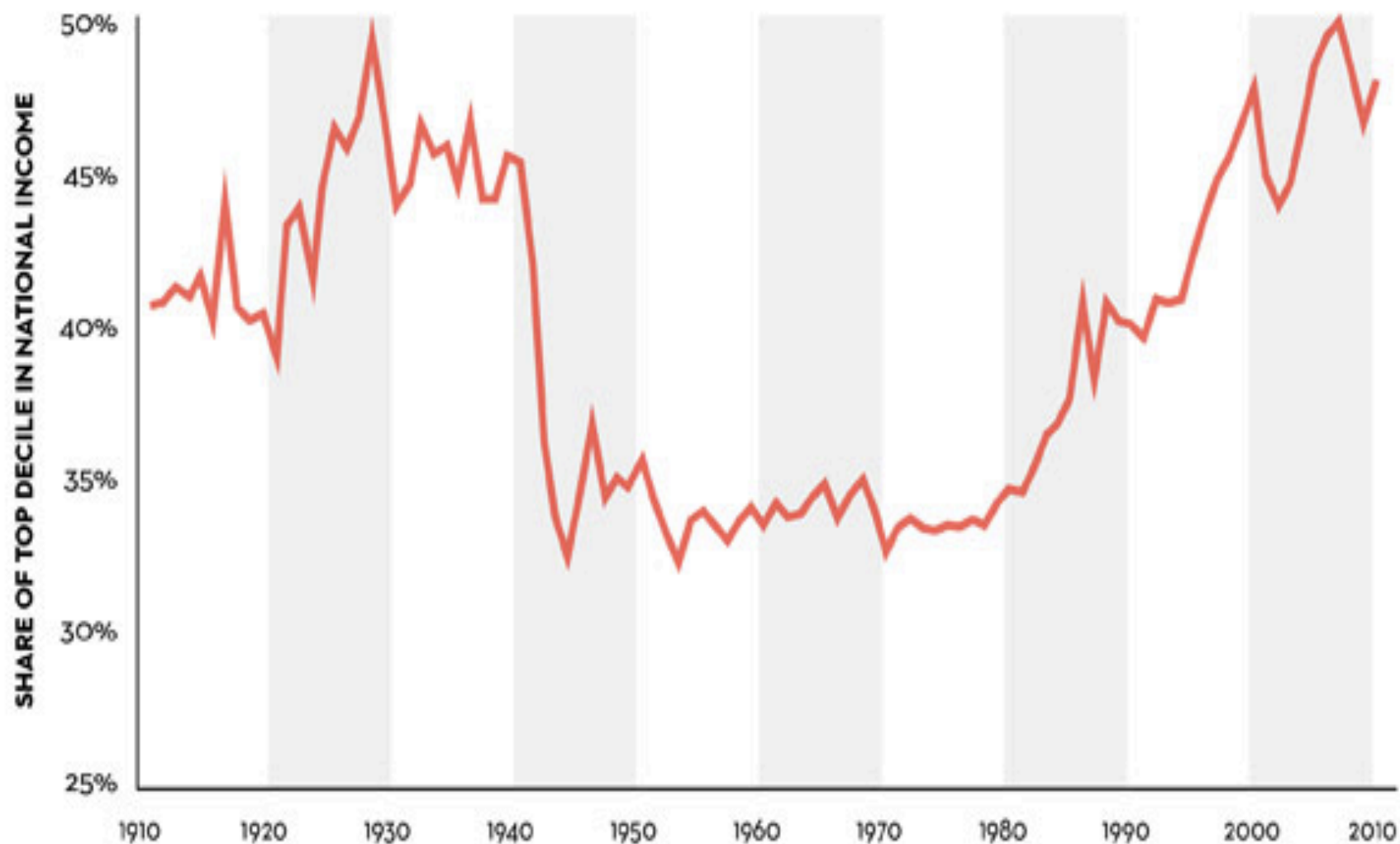
Repurchases, dividends, net income, R&D 1980-2006

(293 corporations in the S&P500 in October 2007 in operation in 1980)



Source: Lazonick & Mazzucato, 2013; Lazonick, 2014

INCOME INEQUALITY IN THE UNITED STATES, 1910-2010



Source: Piketty, 2013

Warren Buffett

“I have worked with investors for 60 years and I have yet to see anyone — not even when capital gains rates were 39.9 percent in 1976-77 — shy away from a sensible investment because of the tax rate on the potential gain. People invest to make money, and potential taxes have never scared them off. And to those who argue that higher rates hurt job creation, I would note that a net of nearly 40 million jobs were added between 1980 and 2000. You know what’s happened since then: lower tax rates and far lower job creation.”

And....why did capital gains fall in 1976?

Meanwhile, back to Gates...

AEIC IN 2010:

Asked US government to spend
\$16 billion/yr. in clean tech

Plus an additional \$1 billion to ARPA-E

Between 2001-2010:

The 7 companies that form AEIC
spent \$237 billion on stock repurchases

*“I expect to see the State...taking an ever greater responsibility for directly organizing investment’ and ‘I conceive, therefore, that a somewhat comprehensive **socialisation of investment** will prove the only means of securing an approximation to full employment”*

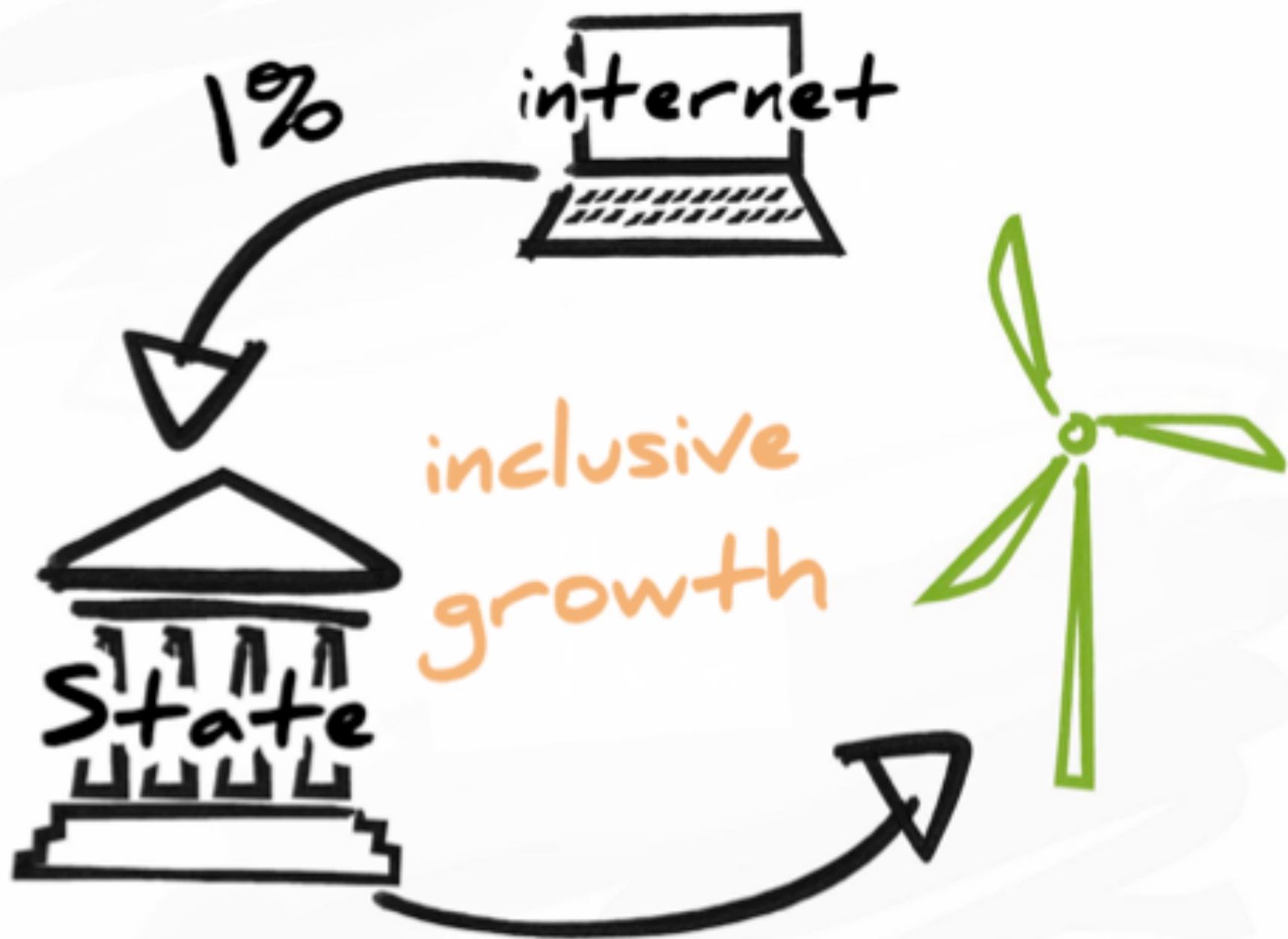
John Maynard Keynes, 1936

Conclusion of The General Theory: “liquidity” “euthanizing the rentiers” & “socializing investment”

Better 'deal' between public & private (building symbiotic not parasitic ecosystems)

- reforming tax system
- reinvestment agreements
- limiting share buybacks
- retaining golden share of IPR
- capping prices (Bayh Dole act allows it)
- income contingent loans
- retain some equity (Tesla & Solyndra lesson)
- % payback into an 'innovation fund'
- State investment banks

(discussed in Mazzucato, 2013; 2015; 2016)



New questions for economic policy

- ◆ **DIRECTIONS.** Policy as actively setting direction of change. How to foster a more dynamic debate about possible directions (and stop useless worry about ‘picking winners’).
- ◆ **EVALUATION.** How to evaluate public sector market creating investments (pushing market frontiers)?
- ◆ **EXPLORATIVE ORGANIZATIONS.** How to build explorative public sector organizations that welcome trial and error?
- ◆ **RISKS AND REWARDS.** How to socialize both risks and rewards, with revolving fund for future innovation and welfare.

(discussed in Mazzucato, 2015; 2016)

The German lessons for Greece!

- Middle sized firms (small is NOT beautiful)
- Patient long-term finance (e.g. KfW)
- Strong well funded science-industry links (e.g. Fraunhofer) – & not just pushing on a string.
- High R&D/GDP
- ‘Mission oriented’ R&D (e.g. *Energiewende*)

Secular stagnation?

Economics and Policy
for Sustainable and
Inclusive Growth

RETHINKING CAPITALISM

Edited by
MICHAEL JACOBS and
MARIANA MAZZUCATO

WILEY Blackwell

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