



# Finance and Innovation: creative destruction or destructive creation?

*The Science of Innovation*, ESF, Feb 28, 2012

Mariana Mazzucato

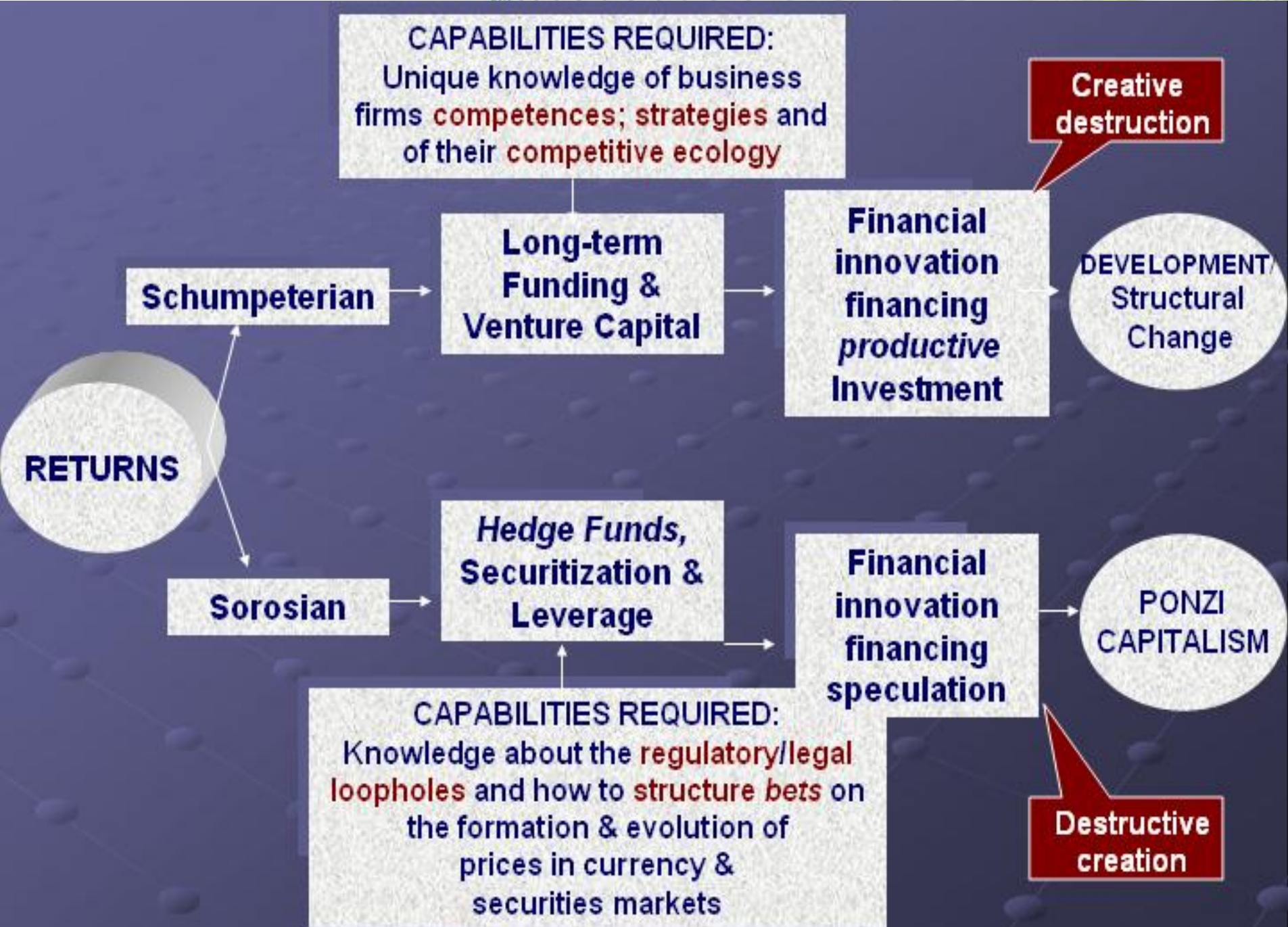
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Finance Innovation and Growth - FINNOV [www.finnov-fp7.eu](http://www.finnov-fp7.eu)



- Finance for **creative destruction** vs. **destructive creation**
- Lessons from the financial crisis: **rebalancing what?**
- Who takes the **risks** who gets the **rewards?**



## Not so simple though...

- Hedge funds now major investors in UK biotech with large liquid funds for very short term equity investments (>24months, seeking x3 money). **One large US hedge fund (i.e. ValueAct Capital) may have more funds for equity investments than entire EU early stage VC!**
- *Venture hedge funds emerging that exploit a) options to appropriate extra value from European innovation, b) private banking as sources for equity investment.*

## finance and the (innovation led) post-crisis recovery

rebalancing...what?

-size of financial sector

-indicators of performance

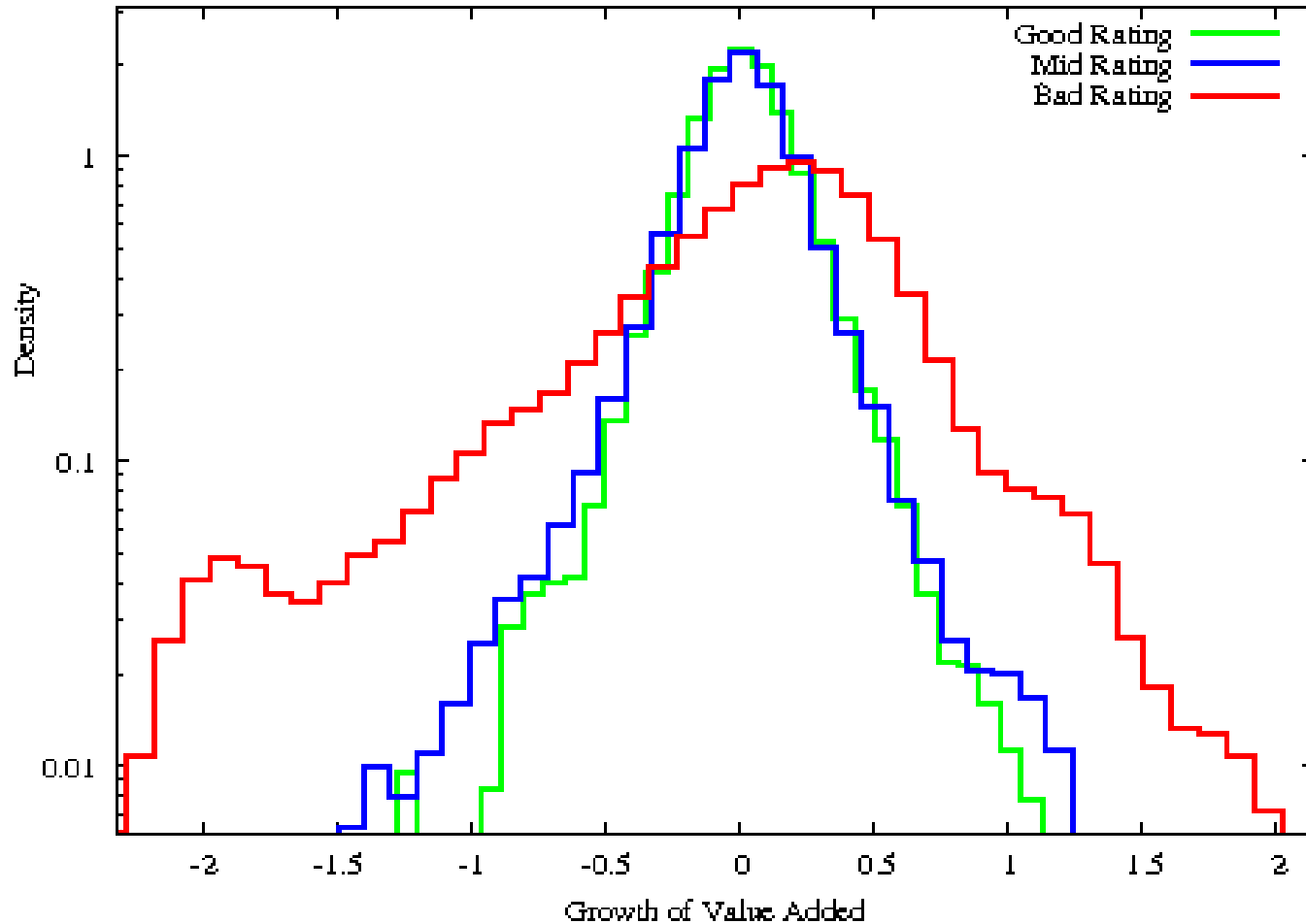
a. short termism

b. value creation vs. value extraction and ...destruction



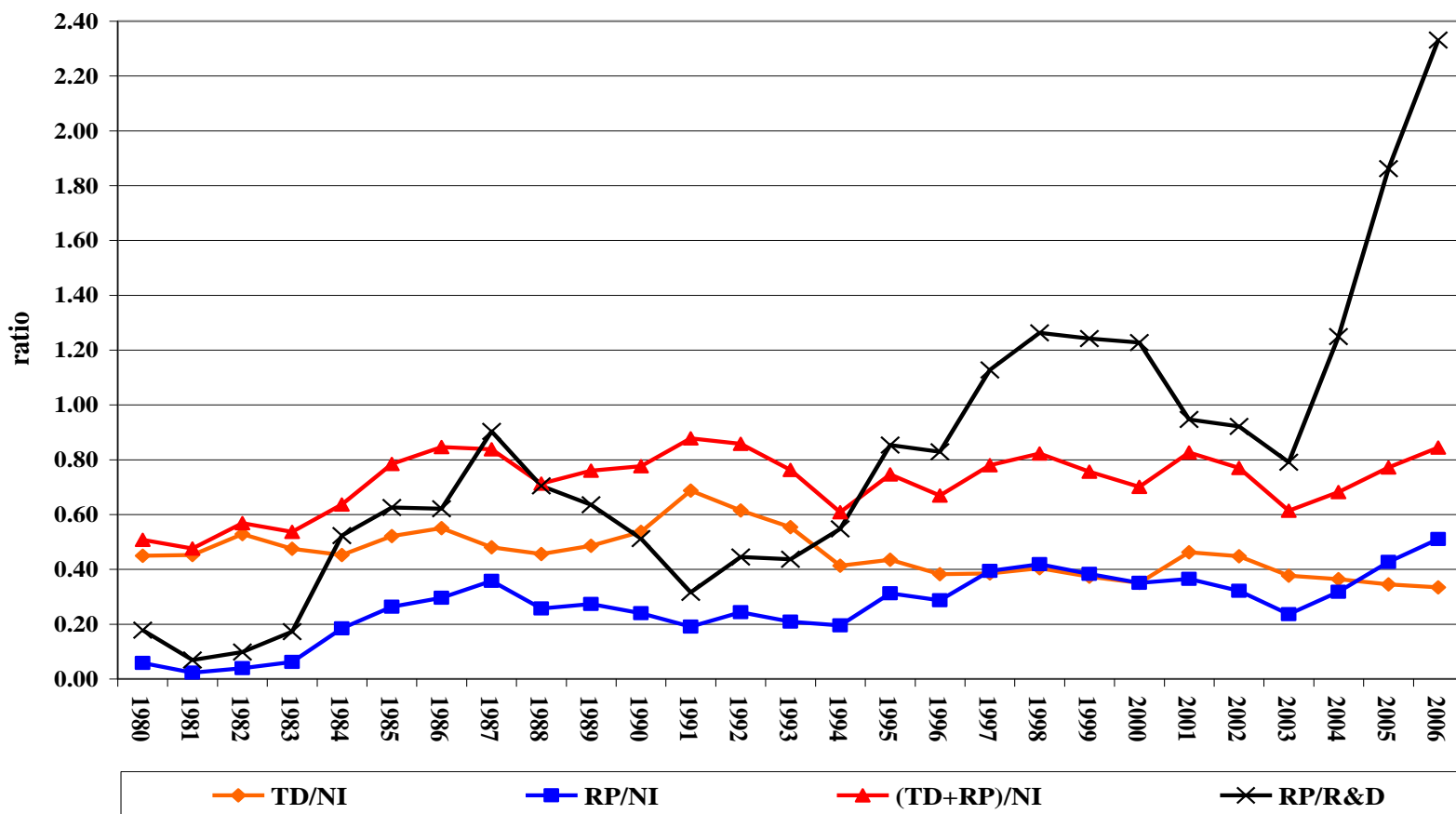


## a. credit scores vs. value added (2003)



## b. repurchases, dividends, net income, R&D 1980-2006

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

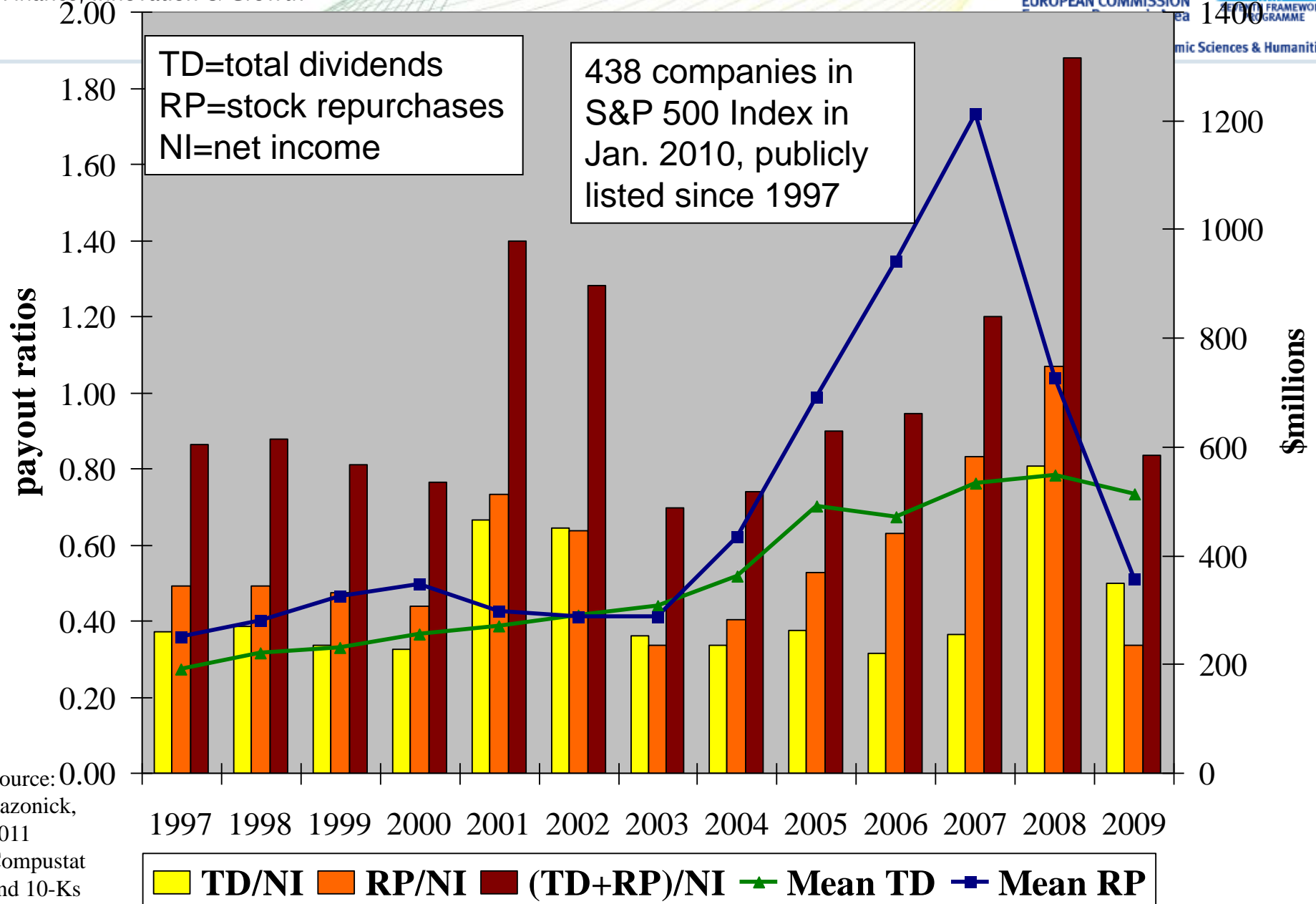




# Stock buybacks, 1997-2009

Finance, Innovation & Growth

EUROPEAN COMMISSION  
 2007-2013  
 FRAMEWORK PROGRAMME  
 Economic Sciences & Humanities



Source: Lazonick, 2011  
 Compustat and 10-Ks

## problem with stock buybacks (Lazonick, 2011)

- **Oil companies** do massive buybacks, while Americans pay high fuel prices and **lack adequate investment in alternative energy** – from 2000-2009 Exxon Mobil repurchased \$163.7b., including \$31.8b. in 2007, \$35.7b. in 2007, and, \$19.7b. in 2009
- Leading **pharmaceutical companies** keep US drug prices at least double the prices in other advanced countries – they argue in Congress that high US drug prices are needed to fund drug research – yet many do buybacks equal to **50-100% of R&D expenditures**

# Pharma: buybacks as % of net income and R&D

Fin	RP/NI%	TD/NI%	(RP+TD)/NI%	RP/R&D%
<b>Pfizer</b>				
<b>1996-1999</b>	<b>54</b>	<b>45</b>	<b>99</b>	<b>58</b>
<b>2000-2003</b>	<b>102</b>	<b>61</b>	<b>163</b>	<b>85</b>
<b>2004-2007</b>	<b>71</b>	<b>69</b>	<b>140</b>	<b>80</b>
<b>J&amp;J</b>				
<b>1996-1999</b>	<b>21</b>	<b>36</b>	<b>57</b>	<b>31</b>
<b>2000-2003</b>	<b>46</b>	<b>37</b>	<b>83</b>	<b>69</b>
<b>2004-2007</b>	<b>45</b>	<b>46</b>	<b>91</b>	<b>55</b>
<b>Amgen</b>				
<b>1996-1999</b>	<b>95</b>	<b>0</b>	<b>95</b>	<b>118</b>
<b>2000-2003</b>	<b>152</b>	<b>0</b>	<b>152</b>	<b>63</b>
<b>2004-2007</b>	<b>128</b>	<b>0</b>	<b>128</b>	<b>122</b>
<b>Merck</b>				
<b>1996-1999</b>	<b>63</b>	<b>45</b>	<b>108</b>	<b>151</b>
<b>2000-2003</b>	<b>42</b>	<b>45</b>	<b>87</b>	<b>107</b>
<b>2004-2007</b>	<b>24</b>	<b>73</b>	<b>98</b>	<b>25</b>



problem with **shareholder value** perspective

underlying notion of value and risk

## NewStatesman

PRINT  CLOSE 

# Explaining rising income inequality

Mariana Mazzucato and William Lazonick

Published 01 February 2012

Or, how to get paid a bonus for *not* doing your job.



Photograph: Getty Images

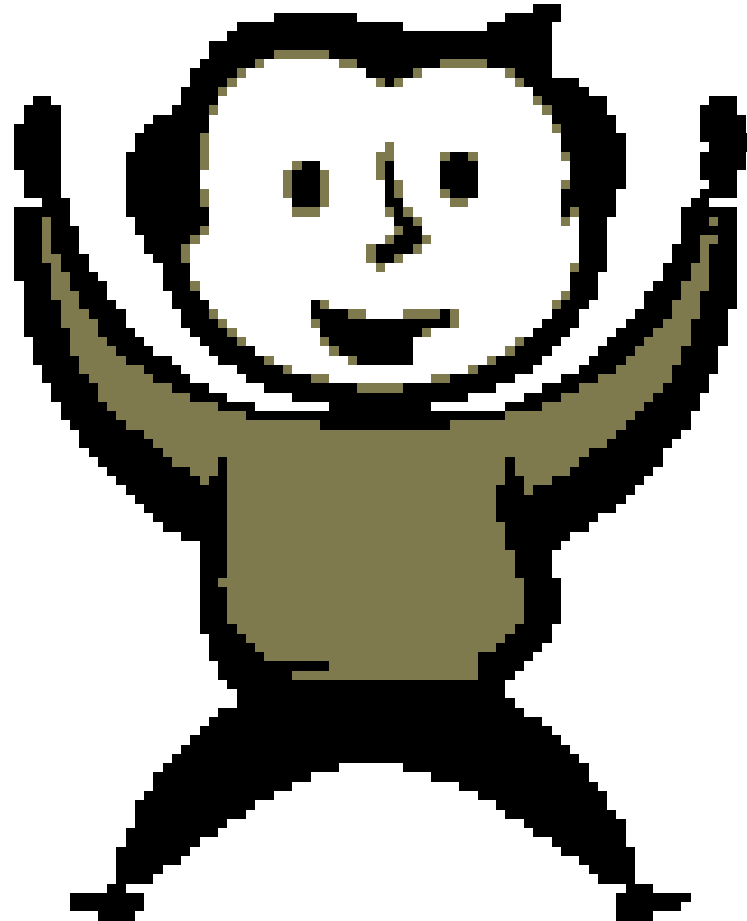
The ongoing crisis of the major Western capitalist economies has citizens on both sides of the Atlantic asking why the incomes of the business elite keeps rising even as companies cut jobs, banks foreclose homes, and the threat of penury faces many families who thought they were solidly middle class.



## Innovation

- **Collective:** NSI  $\longrightarrow$  'ecosystems'  $\longrightarrow$  'open' innovation
- **Uncertain:** requires courageous, bold risk-taking. Wide range of risk-takers: State, workers, VC, large/small firms.
- **Cumulative:** allows certain actors to position themselves along the curve and capture the integral (under the curve) rather than their marginal contribution. VC, shareholders...

*EU: let's copy **Silicon Valley**....venture capital !!*



## c. VC: value creation vs. value extraction

Short-termism: VC funds invest in projects where the commercial viability is established within a 3-5 year period.

Although this is sometimes possible (eg Google) it is often not.

In emerging sectors like biotech or green tech, where the underlying knowledge base is still highly uncertain and exploratory, such a short term bias is damaging to the scientific exploration process, which requires long time horizons and more willingness to risk failure.

Produces **PLIPOs** = product-less IPOs

VC tends to 'ride the waves' created by major State investments in the knowledge base.

Capital gains taxes (lobbied by NVCA) favor value extraction over value creation.

## Mythical heroes

- **VC MYTH** Why?
- **SME MYTH.** Less than 10% of all new firms produce 50% and 75% of all new jobs by new firms. Yet SME sector in the UK gets £7-8 billion/year, more than the entire police and university system in the UK (Storey, 1994). Why?
- **STATE MYTH.** Most radical innovations trace their early high risk funding to the State. Yet in the name of 'entrepreneurship' EU MS are cutting the State. Why?

## Ecosystems...reality or a scam?

Network of innovators (from NSI to Eco-Systems)

large and small firms

banks, VC, business angels

education and universities

State (federal, state, local)



## The State in the Economy

### correcting:

1. Keynesian output failure
2. Market failure
3. System failure



### creating:

4. Something better...



## Market failure policies

- Change **incentive structures** (e.g. R&D subsidies, environmental taxes, feed-in tariffs).
- **Nudge** private sector in the right direction (e.g. Green Investment Bank).

## System failure policies

### e.g. *Innovation Union*

### Strengthening the knowledge base & reducing fragmentation

- Education and skills
- European Research Area
- EU financing instruments

### Getting good ideas to market

- Access to finance
- Single innovation market
- Openness and creative potential

### Social and territorial cohesion

### European Innovation Partnerships

### International cooperation

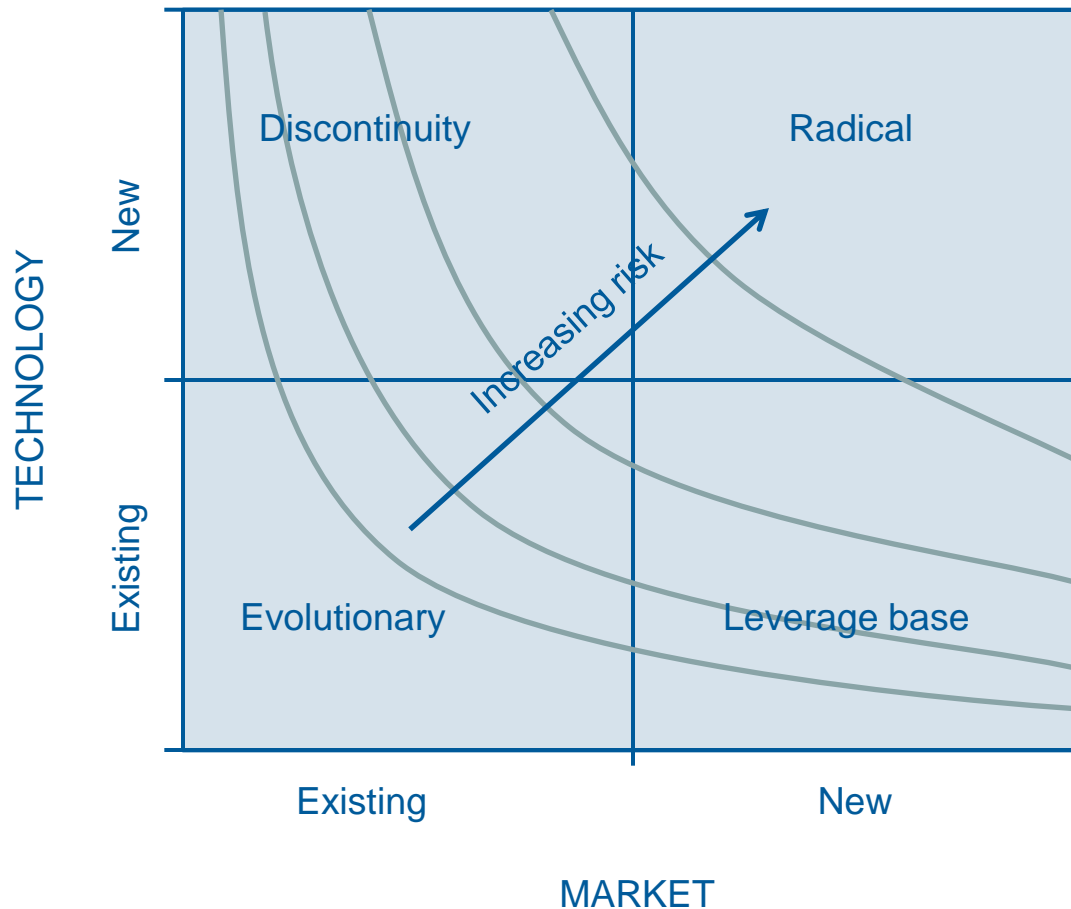




*The important thing for Government is not to do things which individuals are doing already, and to do them **a little better** or a **little worse**; but to do those things which at present are **not done at all**.*

**John Maynard Keynes**, *The End of Laissez Faire*, 1926

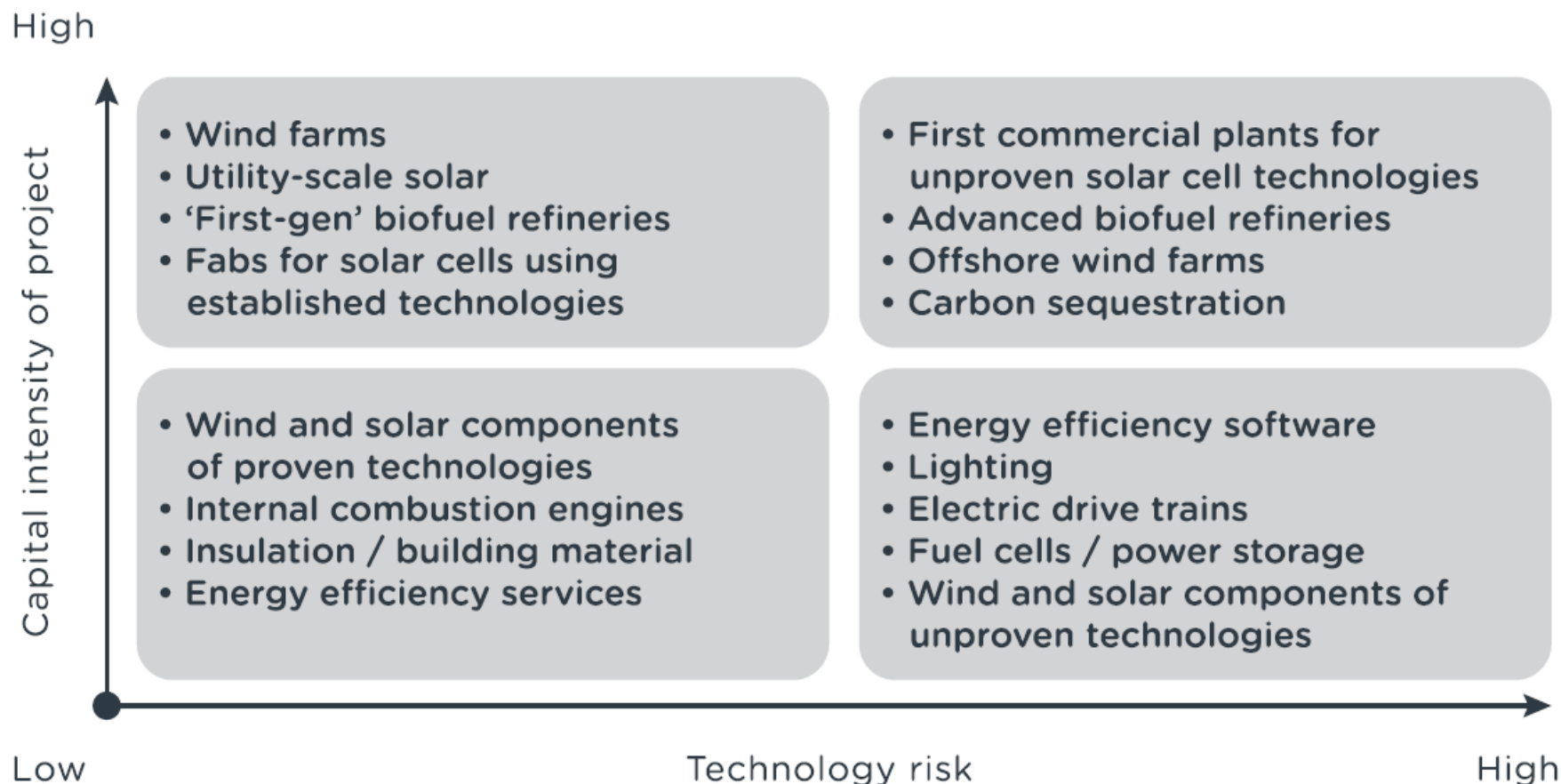
## Market and technology risk



Source: Hartman and Myers (2001)



## Sub-sectors within clean energy



## False contrast

**Private sector** = fast, innovative, dynamic, entrepreneurial...



**Public sector** = slow, bureaucratic, inertial...or even worse:  
*'enemies of enterprise'* (David Cameron, 2011)



## The Entrepreneurial State

- Government doesn't 'fix' market but does what private sector not willing to do.
- Catalyst, and lead investor, sparking the initial reaction in a network. *Creator* not facilitator of knowledge economy.
- Engaging with very high risk, uncertainty, radical change.



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“The State has not  
just fixed markets,  
but actively created  
them...”

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## THE ENTREPRENEURIAL STATE

Mariana Mazzucato



## ...State has funded the most uncertainty

- In **immature phase** of sectoral development (e.g. **Nanotech**)
- In **seed stage** of firm development (e.g. **Google**)
- In **early stage** of product development (e.g. **Block buster drugs**)

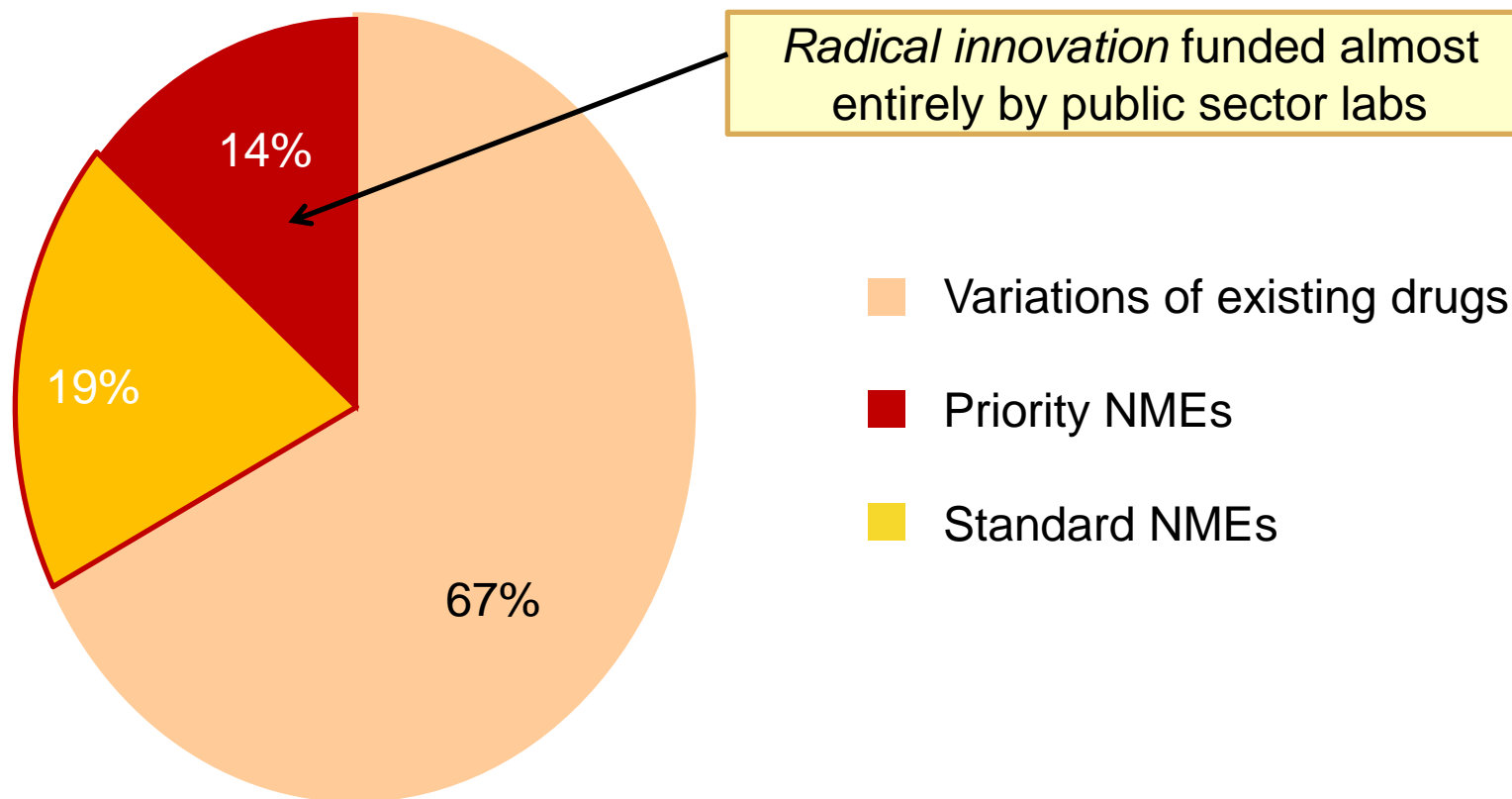
In each case it was not just basic research, but also envisioning the opportunity space, engaging in the most risky and uncertain early research, and sometimes overseeing the commercialisation process.



## iPhone

All of the key platform technologies the iPhone is built upon (including GPS) were developed by govt or in partnership with the government, through taxpayer funding for communications and information technologies.

## new vs. 'me too' in pharma (1993-94)



## Irony: USA = very interventionist

- Myth of **US market** approach vs. **EU State** led approach.
- **Visible hand** of US government present in computer revolution, biotech, nanotech, and green-tech today.
- Active though *decentralised* State agencies (NSF, NNI, SBIR, DARPA..). ‘Hidden’ industrial policy (**Block and Keller, 2011; Mazzucato, 2011**)
- SECRET: **Willingness to fail**, and expertise within Govt.



Back to finance:  
who takes the risks, who gets the rewards?

## Risks and Rewards

A new pharmaceutical that brings in more than \$1 billion per year in revenue is a drug marketed by Genzyme. It is a drug for a rare disease that was initially developed by scientists at the National Institutes of Health. The firm set the price for a year's dosage at upward of \$350,000. While legislation gives the government the right to sell such government-developed drugs at 'reasonable' prices, policymakers have not exercised this right.

**The result is an extreme instance where the costs of developing this drug were socialized, while the profits were privatized.**

Moreover, some of the taxpayers who financed the development of the drug cannot obtain it for their family members because they cannot afford it. (Vallas et al. 2011).



## Tools to claim back return (and reinvest)

- IPR golden share
- Income contingent loans
- Public VC
- Equity
- National Investment Bank (and EIB)

## Nokia vs. Google

When **SITRA**, the Finnish government's public innovation fund, provided the early stage funding for **Nokia**, it later reaped a significant return on this investment – a fact accepted by the Finnish business community and politicians.

The reason why the US government has not reaped a return from its early stage investments in companies like **Google** (which benefitted from a state-funded grant for its early algorithm) and other such success stories including Apple, Intel and Compaq (which received public SBIR funding) is due to the lack of understanding in the USA, and many other economies, of state-led growth-inducing investments, which allow conservative forces to portray the state as only a menace in the economy.

# Knowledge Governance vs. Market Failure

Knowledge governance policies should **shape markets** and drive firms toward establishing research coordination and patent pools, pushing common standards, preserving multiple sources of experimentation, establishing differentiated patent and copyrights terms and severely punishing both “**unproductive patenting**” behavior and attempts by firms to seize markets through creating their own proprietary closed systems.

A possible “tool” for dealing with that would be for the government to claim a **golden share in the IPR system** (especially patents and copyrights), by which it would be able to convert a property right previously granted into a general public license, should the owner refuse, after establishing his first-mover advantage, to behave cooperatively and to license broadly and fairly.