



How to turn on the innovation growth machine in Europe?

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Outline

- Europe's Deficit in Innovation Performance
 - Europe's Persistent Business R&D Deficit as a symptom, rather than a cause
- Europe's Persistent Business R&D Performance Deficit Related to Age & Sector Composition Effects:
 - Missing Yollies in Innovation based Growth sectors
- Barriers for Yollies in Innovation-based Growth sectors in Europe
- Recommendations for Innovation-Based Growth Policy Making in Europe

Diagnosing EU's innovation deficit

Europe's gap relative to the US holds across almost all components of innovation capacity (systemic deficit)

There is substantial and persistent heterogeneity in innovation potential across EU countries

Persistent Business R&D EU-US gap

Diagnosing EU's private R&D deficit

- The nature of EU's industrial structure is a major reason for the persistent business R&D investment deficit: a deficit in the capacity for creative destruction
 - EU is specialized in « ollies » in medium-tech sectors,
 - EU misses « yollies » in new high-tech, high-growth sectors

Innovation Based Growth Sectors: sectors which (i) have an R&D intensity above average, (ii) an R&D growth rate above average and/or (iii) an above average share of young companies among its leading innovators.

aerospace, biotech, computer hardware&services, health care equipment & services, internet, pharmaceuticals, semiconductors, software, telecom equipment.

Yollies: companies born since 1975 who have made it into the R&D scoreboard of world leading innovators

Amazon, Google, Microsoft, Qualcomm, Amgen...

What the US has but the EU lacks: Yollies

Share of Yollies in number of World Leading Innovators, their R&D, sales and employment

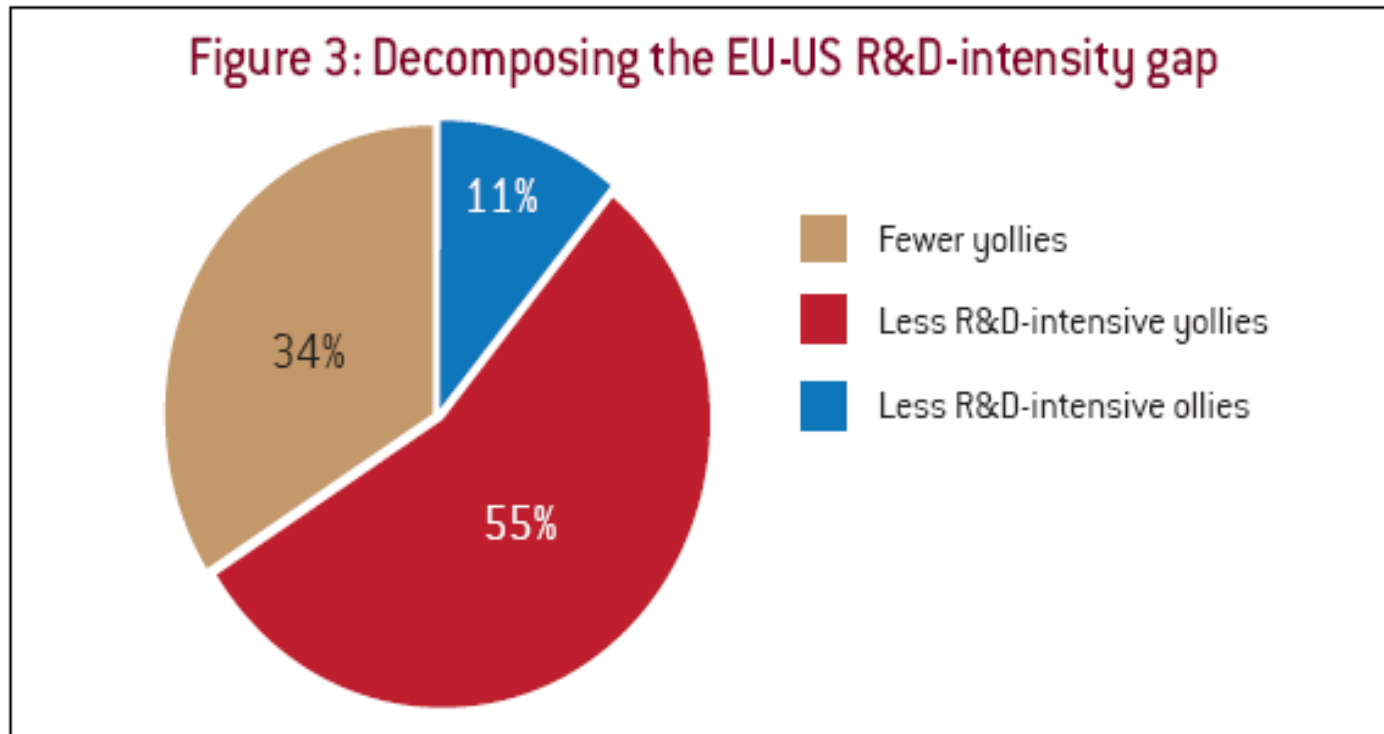
by region (2007) (in %)

	Europe	US	Japan	World
Number of Leading Innovators	357	425	207	1111
Number of Young Leading Innovators	74	219	4	368
Share of Young Companies in Region's Leading companies	21	52	1.9	33
Share of Young Companies in Region's Leading R&D	7	35	0.5	19
Share of Young Companies in Region's Leading Net sales	5	16	1.9	10
R&D intensity of Ollies	2.8	3.5	3.7	3.1
R&D intensity of Yollies	4.4	10.2	1.1	6.3

Sources: Bruegel/European Commission JRC-IPTS on the basis of the EU Industrial R&D Investment Scoreboard (European Commission, 2008).

Missing the right Yollies matters critically for closing EU's business R&D gap

The lower R&D intensity of EU Yollies is the largest factor responsible for the total EU-US R&D intensity gap



Sources: Bruegel/European Commission JRC-IPTS on the basis of the EU Industrial R&D Investment Scoreboard (European Commission, 2008).

What the US has and the EU misses: specialisation in Innovation Based Growth Sectors

Technology Specialisation in Innovation Based Growth Sectors

RTA	EU	US
Aerospace	1,5	1,13
Biotechnology	0,32	2,2
Computer hardware+Computer services	0.08	1,39
Internet	0	2,54
Pharmaceuticals	1,27	1,16
Semiconductors	0,5	1,72
Software	0,51	2,05
Telecommunications equipment	1,38	1,09
All IBG sectors	0,89	1,43

Note: RTA are calculated as the share of the region in total sectoral R&D relative to the share of the region in overall R&D. A RTA value higher than 1 reflects that the region is technology specialized in this sector.

Source: Own calculations on the basis of IPTS R&D Scoreboard data

What the US has and EU misses: Yollies in the IBG sectors

Yollies in Innovation Based Growth sectors

	Europe	US	Japan	RoW
Share of Regions Yollies in IBG sectors	62	84	0	69
RDI of Regions Yollies in IBG sectors	13.9	12.6	0	5.3
RDI of Region in IBG sectors	12.0	10.0	3.7	5.4

Source: Own calculations on the basis of IPTS R&D Scoreboard data

Why Europe is missing Yollies in new sectors (compared to US)?

- More financially constrained
 - EU Yollies almost 4 times more cash constrained than US Yollies

Source: Cincera, Ravet & Veugelers (2014); R&D financing constraints of young and old innovation leaders in the EU and the US; *Economics of Innovation and New Technology*, forthcoming

- Lower rates of return from Innovation
 - For every one euro invested in R&D, a US High Tech Yollie receives 20 cents in terms of additional generated output, c.p.
 - For EU Yollies: 4 cents, non-significantly different from 0

Source: Cincera & Veugelers (2014); **Exploring Europe's R&D deficit relative to the US: differences in the rates of return to R&D of young leading R&D firms**, *Research Policy*, forthcoming

- Risk-taking financial markets
- Higher (Re-)entry & exit costs
- Inflexible labour markets
- Segmented product markets
- Insufficient linking in “innovation system”
 - Industry science links
 - Large incumbents and small new entrants
 - Public Private partnerships
- Government policy
- ...

How to design policy for aspiring Yollies: some principles

Given that we still know very little of the causes of the problems, more emphasis should be put on data & indicator collection and analysis

Given that we still know very little on which cures' work, and the high risk of "government failure", more emphasis should be put on evaluation of policy initiatives.

How to design policy for aspiring Yollies: some principles

- Since aspiring Yollies need to find a symbiotic overall innovative environment to interact with in ‘co-optition’, a specific policy must be part of an **overall innovation and growth policy**.
- A **specific policy** approach should tackle the specific barriers faced by young innovators, at least those rooted in market failure and where governments can redress these without inflicting new barriers
 - Getting the **target** right: Yollies are not the same as “Innovative SMEs” or “gazelles”
 - A specific policy implies first and foremost dealing with the **financial constraints**.
 - Supporting the development of **private risk capital markets**, especially the high-risk, early- stage segments
 - **Subsidy programmes** for young radical innovators must be carefully designed in order to **reward the risk-taking** inherent in radical innovations and provide **certification**.