

# Fiscal Policies for Innovation and Growth



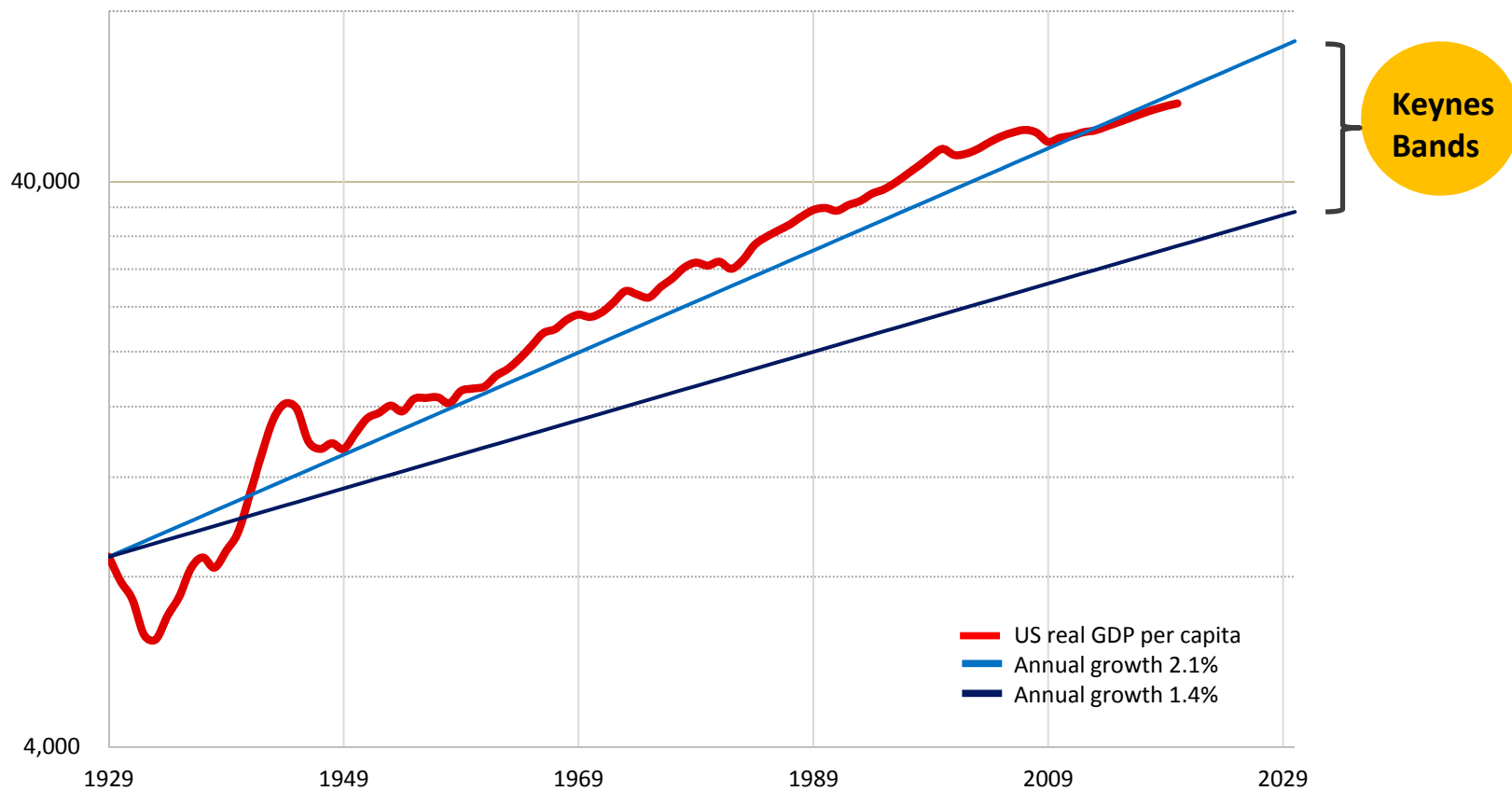
Chapter 2 of the April 2016 *Fiscal Monitor*

Peterson Institute  
March 31, 2016

# Growth at the frontier



United States Real GDP per Capita, 1929-2030 (2009 dollars, logarithmic scale)



Sources: US Bureau of Economic Analysis, US Census Bureau, January 2016 WEO. Forecast using January 2016 WEO projections for 2016-2021.

# Outline



- The role of *fiscal policy* for innovation
- Three pillars of innovation – today we focus on two
  - Research & Development
  - Technology transfer
  - Entrepreneurship
- Key findings and policy recommendations



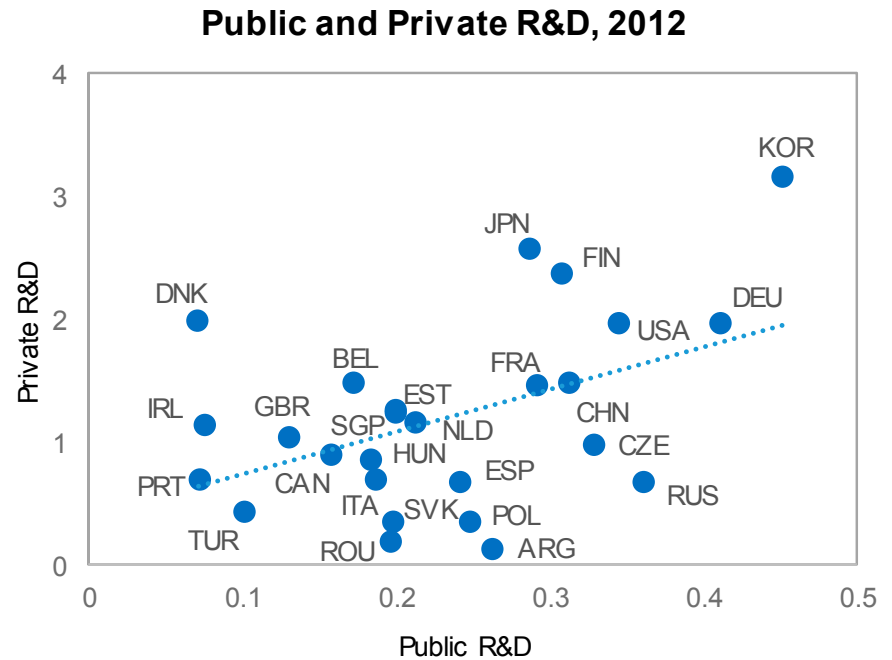
## Research & Development

*Scope to do more*

# Public R&D is important



- Basic research yield often high social returns – average  $\approx$  20 percent
- Should complement – not substitute for – private R&D
  - Encourage research collaboration between universities and private firms



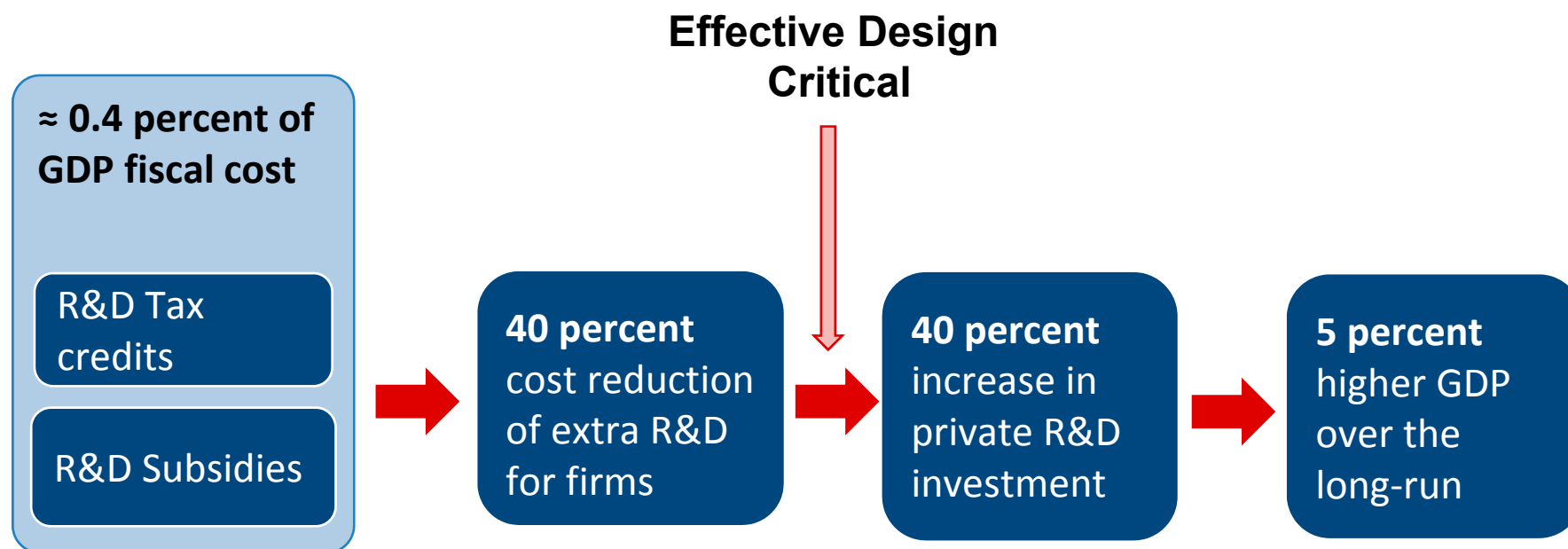
# Private R&D is too low



Two reasons for “underinvestment” in private R&D

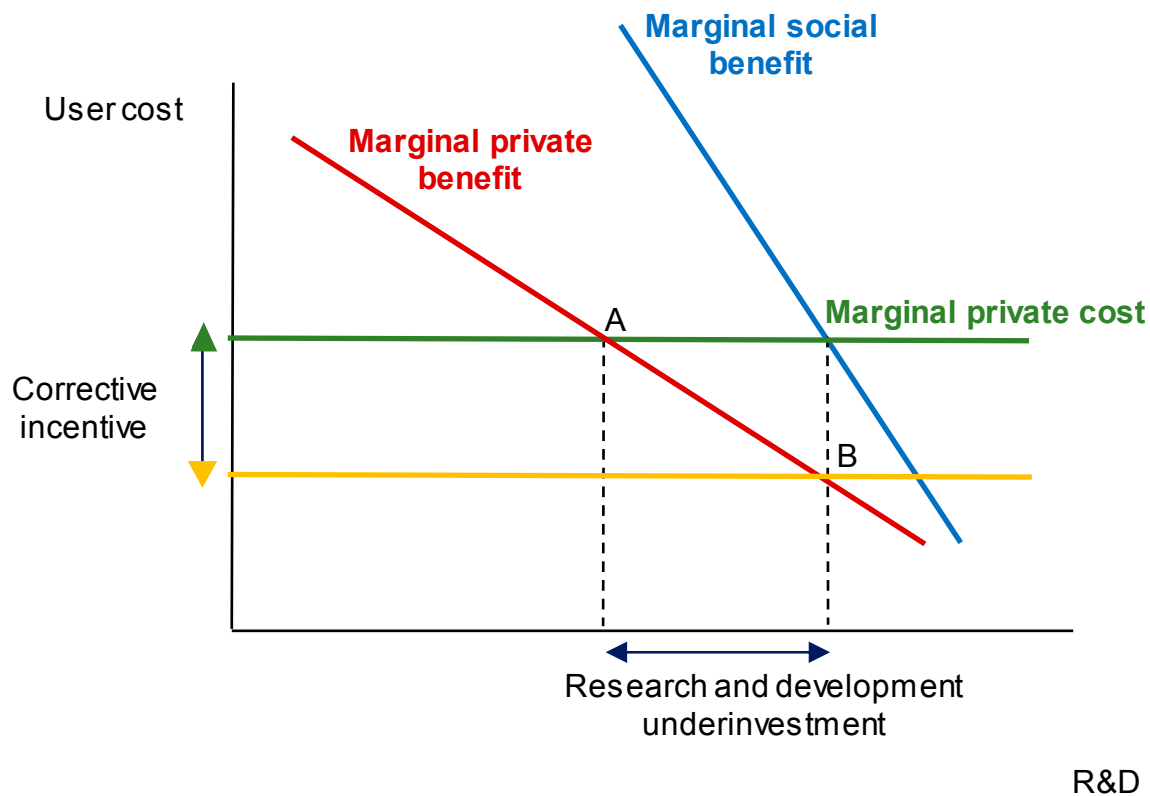
- Credit constraints – especially prevalent during recessions
  - *Fiscal Monitor* finds that fiscal stabilization policies have strong implications for R&D and TFP growth
- Spillovers to the wider economy – two solutions
  - Coase’s property rights – but the market for technology is small relative to the size of R&D spillovers
  - Pigou’s price correction: fiscal incentives to efficiently address externalities

# Scaling up fiscal incentives can yield a major growth dividend



Note: estimates are averages across OECD countries

# ... “major growth dividend”



1. Domestic: social returns 2 to 3 x private returns
  - Correction  $\geq 50\%$
  - Subsidies  $\approx 10\%$
2. Price response R&D  $\approx -1$ 
  - Underinvestment 40%
3. GDP elasticity R&D  $\approx .13$ 
  - GDP effect of R&D underinvestment 5%
4. International spillovers
  - GDP effect of 8%



# “Effective Design Critical”

## Some examples of corrective incentives

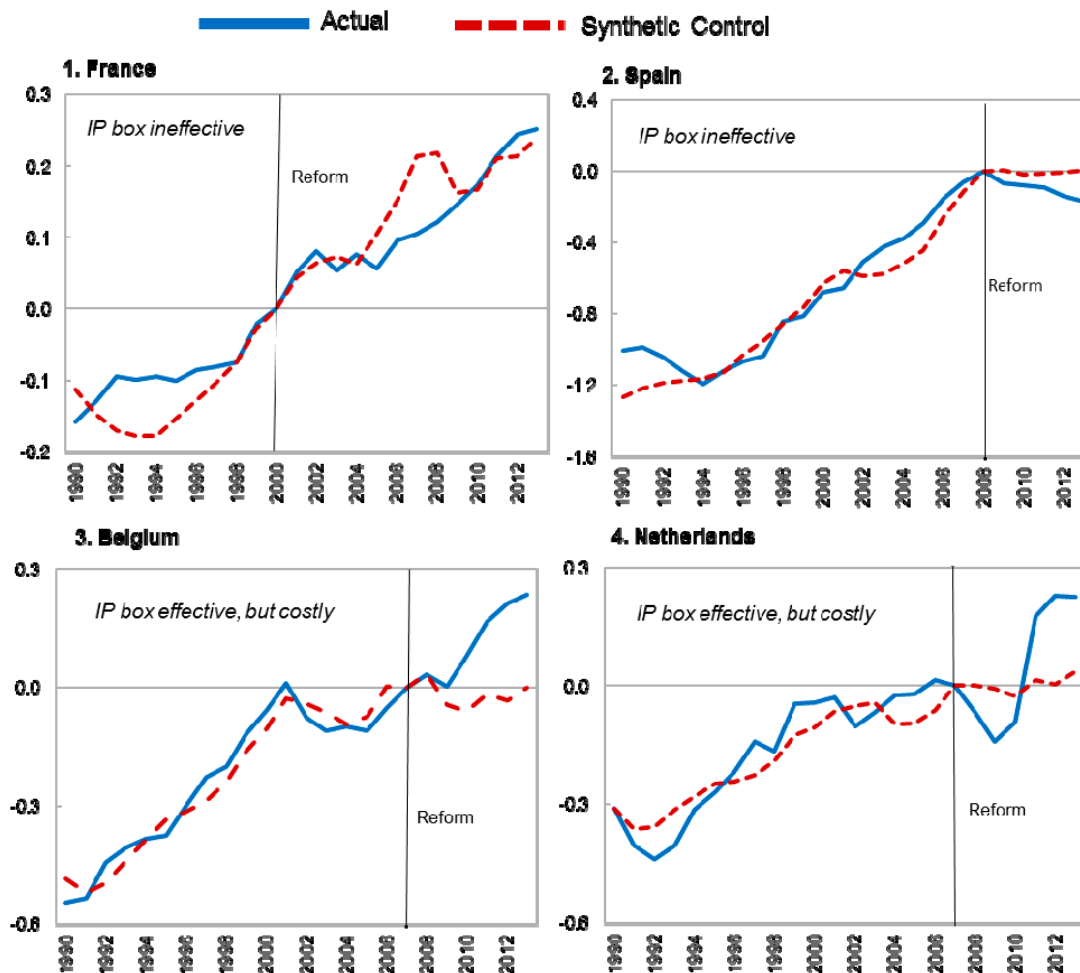


Australia	<b>Small</b> firms: 45% <b>refundable</b> R&D tax credit Large firms: 40% non-refundable R&D tax credit (capped)
US	Regular: 20% R&D tax credit on <b>increment</b> <b>Simplified</b> : 14% R&D tax credit on increment
China	150% R&D super deduction 15% reduced CIT rate for high-tech firms
Germany	No tax incentives <b>R&amp;D subsidies</b> : can be 25 -50 percent of R&D costs

# “Patent box”? No!



## Synthetic Control Estimation Results: Intellectual Property Box and Private R&D (Log of real R&D spending)



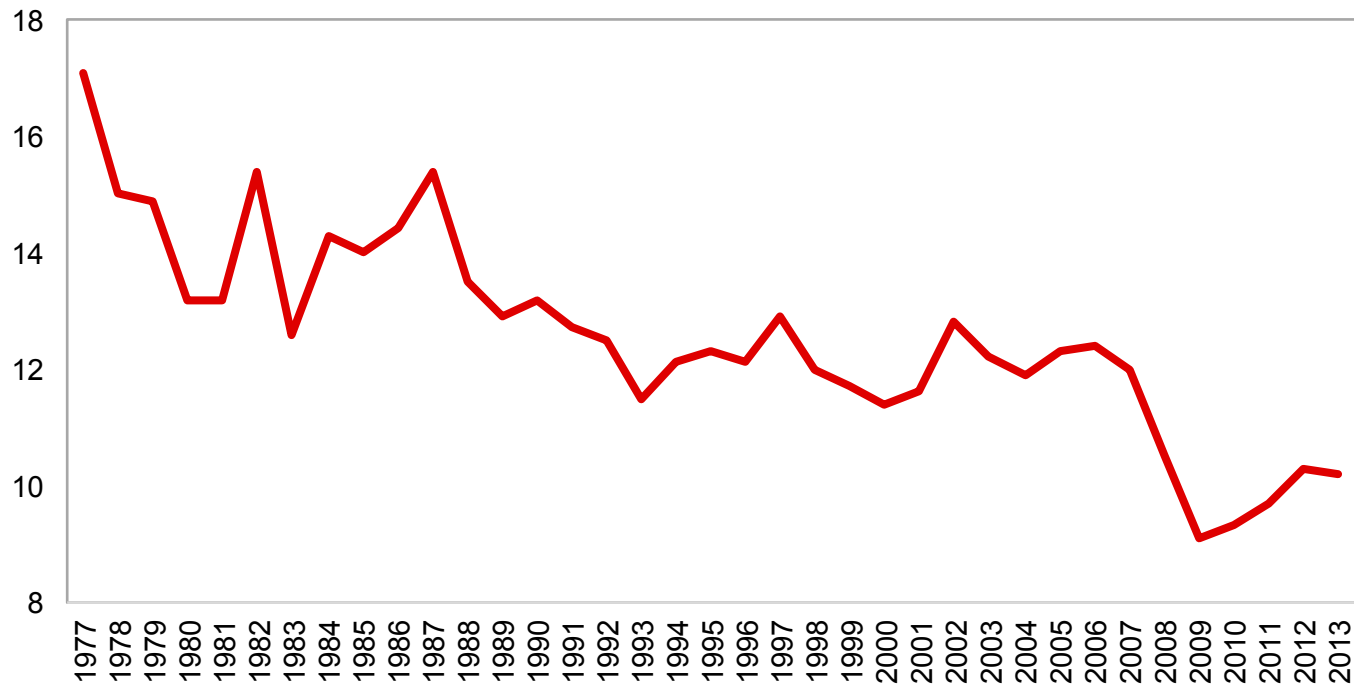
- *Ineffective* – no effect at all in two countries
  - Only effective where tax relief is large and link with R&D strong
- *Inefficient* – as relief depends on income, not R&D
- *Negative international spillovers* – focus is on attracting mobile IP income (aggressive tax competition)



## Entrepreneurship

*New, not small, is beautiful*

# Downward trend in US business entry (and elsewhere)

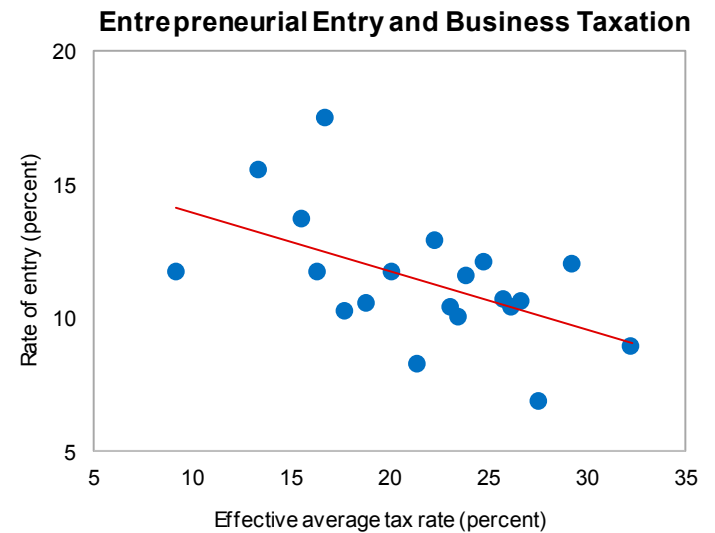


Source: U.S. Census Bureau Business Dynamics Statistics (BDS).

# Income taxes may deter business entry



- Income taxation – theory
  - ‘Success taxes’ hurt experimentation
  - But: ‘tax insurance’ (if losses can be offset) encourages risk taking
- Empirics: new panel-data analysis
  - Effects of PIT robustly insignificant
  - Effect of CIT significant, but modest size

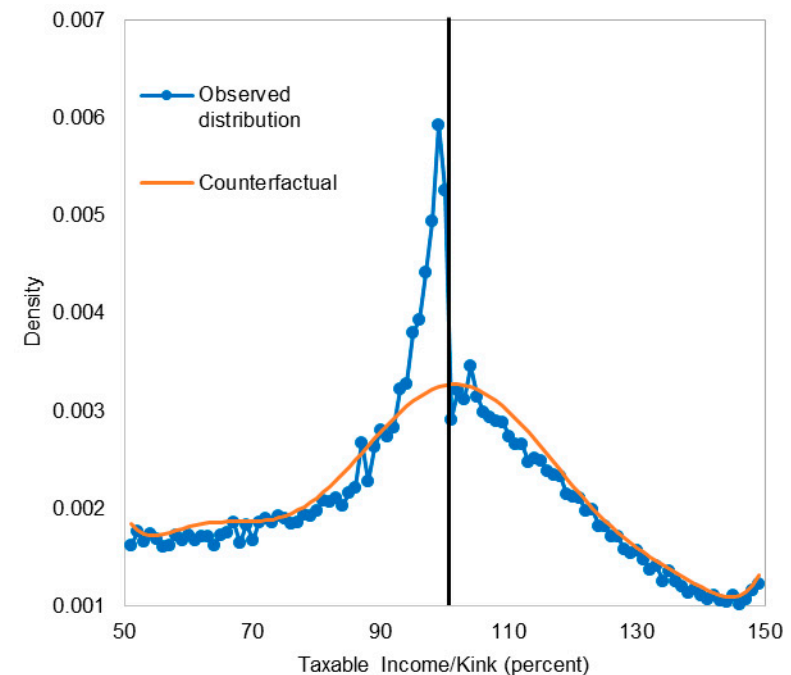


# Beware of 'small business trap'



- Tax incentives small firms
  - Most small firms are not new or innovative
  - 'Small-business-trap': bunching at kinks and notches
- Schemes better favor new firms
  - Focus on innovation
  - Refundable schemes
  - Simplified schemes

**Bunching at a Kink – Evidence for Costa Rica 2006–13**  
(Density of taxpayers along the income distribution)



Source: Brockmeyer and Hernandez (2016).

Note: The kink refers to the income level at the exemption threshold for self-employed taxpayers for the years 2006-13. 100 on the horizontal axis denotes that taxable income is precisely equal to the threshold. The tax rate above the threshold is 10 percent.

# Key findings and policy recommendations



- R&D – scope to do more and better
  - Fiscal stabilization matters, also for long-run growth
  - **R&D incentives: GDP could rise by 5 percent; impact can be 8 percent if international spillovers are taken into account**
  - Design matters: e.g. no patent box
- Entrepreneurship
  - ‘New’, not ‘small’ is beautiful