Tax policy for innovation

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Introduction – questions asked

▶ *Very brief overview of innovation expenditure components*

▶ Do countries provide enough to support private R&D?

▶ Are patent boxes a good way to spur innovation?

▶ How should R&D tax credits be designed?

▶ Should there be coordination across countries?

As time permits, possibly for discussion:

▶ What about a super deduction scheme of 150% for R&D?

▶ How much extra growth could countries achieve if they were to expand support for private R&D? That is, what are the social returns?

▶

What does innovative activity consist of?

▶ R&D
  ▶ Research – basic and applied
  ▶ Development (sometimes modified by "experimental")
▶ Purchase of external IP (patents, knowhow, etc.)
▶ Purchase, installation, and use of new (technologically advanced) equipment
▶ Training of employees in new processes, or in supporting new products
▶ Marketing new goods and services
▶ Preparation for organizational innovations

The extent of spillovers clearly varies across these, as does patentability

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Rationale(s) for innovation support

- Innovative activity generates spillovers to other firms and the economy broadly
  - Some of these may be local to a region or economy
- Resources for innovation may be undersupplied because of
  - (relative) ease of imitation
  - high cost of financing (esp. for SMEs)
- Remedies
  - Property rights (at the cost of restricted output)
  - Subsidies (often targetted; high administration costs)
  - Tax credits of various kinds

Do countries provide enough support for R&D?

▸ Lots of evidence that social returns are much higher than private (Kao et al 1999, Keller 1998, Coe and Helpman 1995). Some nuances:

  ▸ Domestic spillovers larger than those from other countries (Branstetter 2001, Peri 2004)

  ▸ Spillovers from foreign R&D more important for smaller open economies than for countries like US, Japan, and Germany (Park 1995, van Pottelsberghe 1997)

  ▸ Absorptive capacity of recipient country important for making use of R&D spillovers (Guellec and van Pottelsberghe 2001)

  ▸ Typical social rates of return are quite large, but imprecise

▸ Jones and Williams (1998) – using endogenous growth model, argue that socially optimal R&D investment 2-4 times actual in US

▸

The financing channel

- **Hall (1993, 2002)** – reasons why equity is preferred to debt for intangible R&D investment
  - **Williamson (1988)** – assets not "redeployable" - lack of resale market, partly mitigated now by patents (but extent of that market questionable)
  - R&D and debt finance compete for smooth cash flow in firm
  - Leverage negatively correlated with R&D intensity in US
- **Brown & Martinsson (2016)** - empirical test
  - Taxes on corporate payouts (dividends & capital gains) raise the cost of equity financing
  - Investments that depend on equity finance (e.g., R&D) may suffer
  - 1990-2008, 29 industries in 21 countries – equity dependent industries reduce R&D more when payout tax rate high

R&D tax incentives & patent boxes

- Is the widespread adoption of patent or IP boxes in Europe a good development to spur innovation?

  NO

- Why not?
  - Better to subsidize expense directly rather than patented output (which may have cost almost nothing)
  - Incentives for cost-shifting between patent income and non-patent income would be large
  - Incentive to choose projects with high non-R&E expenses
  - Incentive to choose patentable projects, which are more easily appropriable anyway – targets strictly private returns, not social
  - A tax subsidy for patent trolling
  - An incentive to use zombie patents to reduce taxes
  - Arbitrage across firm country, size and profitability possible

Evidence on patent boxes *(Not much yet)*

▸ Alstadsaeter et al. 2015 – MNEs shift patents more than R&D in response

▸ Gaessler, Hall, & Harhoff (in process) – firms transfer patent ownership in response to corporate tax differentials as well as patent boxes, effects may be small

▸ Koethenbuerger et al. (2016) – profit rates at European subs that acquire patents after the patent box are 3% higher than at subs that do not have patents, or where the box limits the use of transferred patents

▸ Lots of evidence that patent location responds to corporate tax rates already (even before the boxes)

▸

International coordination

▸ Should these policies be better coordinated between countries

  ▸ To exploit cross-border spillovers? Maybe

  ▸ To avoid wasteful tax competition? YES

▸ Evidence

  ▸ Bloom & Griffith (2001) find domestic R&D responds to foreign cost of R&D with an elasticity of ~unity (roughly equal and opposite to domestic cost response) – 8 large OECD economies, 1981-1999

  ▸ Corrado et al. (2016) find similar results for 10 EU countries, 1995-2007

  ▸ Wilson (2009) finds similar, but even larger, results for US states

▸ Implication: R&D moves in response to differential incentives, however, note that equal and opposite elasticities does not imply zero-sum

▸

R&D tax incentive design

- Incremental schemes are cheaper but more difficut to design and administer
  - Avoid basing on recent firm R&D spending
- If they are targeted, should be towards larger spillovers or credit constraints:
  - Small or new firms
  - Collaboration with universities or non-profit research institutions
- Loss carry-forwards, esp. for new firms
- Debt vs equity taxation?
- Why a ceiling?

For discussion

- What do you think of the R&D incentive included in the recent EU proposal for a common corporate tax base in Europe - super deduction of 150 percent, to replace patent boxes and existing R&D tax credit schemes

  - Good idea but effectivness depends on corporate tax rate

  B-index for R&D deduction versus corporate tax rate

  150%
  200%
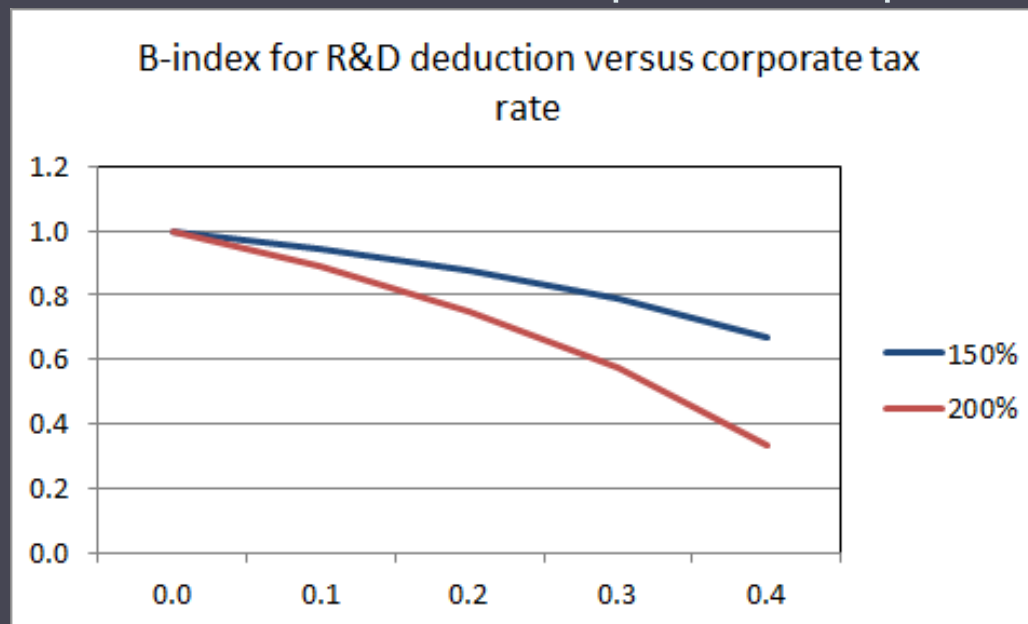
  - One caveat: costs of adjustment of supply of S&Es; wage impacts

For discussion

- How much extra growth could countries achieve if they were to expand support for private R&D?
  - Very difficult to answer, especially given the other factors that influence growth
  - Typical numbers for "back of envelope" computation:
    - elasticity of R&D wrt cost about 1.0
    - Elasticity of output wrt R&D about 0.1
    - => 20% fall cost => 2% larger output
  - Partial equilibrium, not general