R&D Accounting and Innovation Signaling: Insights from Japan's Pre-Regulation Era

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What Does the Paper Do?

Exploits an **interesting policy shift** in Japan from discretionary R&D accounting **to mandatory R&D expensing**.

Uses **rich data on Japanese firms'** financing choices, accounting choices, R&D inputs, and innovation outcomes.

Argues using a **sophisticated diff-in-diff strategy** that:

- Discretionary R&D capitalization was useful as a credible **signal of project quality** to equity investors.
- Mandatory expensing **reduced innovation quality** and shifted financing choices towards **more debt use**.

There's a lot of **richness and subtlety** in the paper that my short, one-slide summary here leaves out.

Why I Really Like the Paper

The authors exploit a **very rarely observed policy shift** in a world drifting towards IFRS: discretion $\rightarrow$ mandatory R&D expensing.

The Japanese empirical context is natural given **Japan's huge, innovative economy** with great data on innovation inputs & outputs.

Japanese firms use a very rich but also **distinctive mix of equity and debt financing**, making the choice of financing mode a very interesting one.

The paper's results relate to **accounting, finance, and economics**, always a fascinating combination from my perspective as an economist.

Some context on aggregate R&D productivity

A model interpretation of the empirics

Wrapping up

Innovation Production Function

In the endogenous growth literature in macroeconomics, models almost always feature some **key equation** that has the rough form

$$\text{Innovation Output}_t \quad = \quad \text{Research Productivity}_t \quad \times \quad \text{R\&D Input}_t.$$

Ex-ante, **all three objects are of high interest**. But this paper chooses to focus on innovation output conditional on R&D input, i.e., on the **efficiency or productivity** of the innovation function.

Is their focus on research productivity a **reasonable choice?**

In US Data We See Increased R&D but Flat Growth Rates

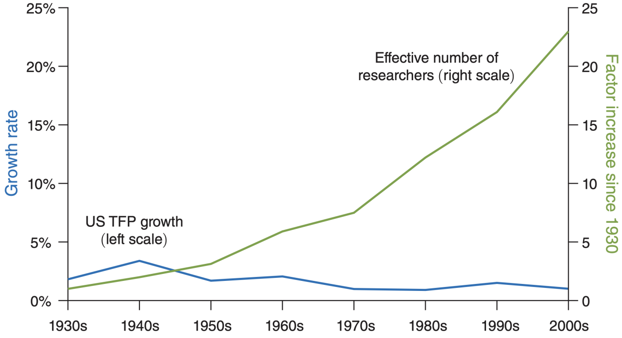

Figure 1 copied from Bloom, Jones, Van Reenen, and Webb (2020).

In the data we see **flat or declining growth in innovation outcomes**, despite **increased R&D input** over time.

So "Research Productivity" Seems Like the Right Measure

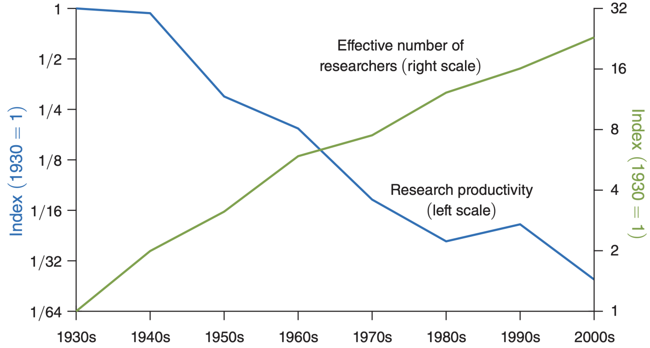

Figure 2 copied from Bloom, Jones, Van Reenen, and Webb (2020).

In my view, using patent-based innovation outcomes while holding fixed R&D levels seems like **a very reasonable empirical strategy.**

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I Have a Terrible Habit

Because of my background as a quantitative macroeconomist, I like to **build models of everything**. To interpret the results in this paper, I think I would build a dynamic firm model with:

- Lots of heterogeneity across firms in their **profitability**.
- Heterogeneity across firms in **R&D project quality**.
- Some sort of **financial friction** at firms.
- **Info asymmetries** among firms, lenders, equity investors.
- A choice of R&D **capitalization versus expensing**.

The treated group of firms, those previously voluntarily choosing capitalization, would be a subset with **endogenously selected** values of unobservable state variables, i.e., those firms needing equity financing but possessing strong R&D projects for capitalization.

Does Selection on Unobservables of the Treatment Firms Matter?

No, not necessarily, for at least two important reasons.

1. Regardless of causality, the behavior of the previously capitalizing firms is **highly informative** as an outcome for a model to match.
2. In some models, the treated or capitalizing subset may definitely still satisfy a parallel trends assumption, leading to a fact which is both **informative for the model and fully causal**.

However, to distinguish these two cases, I'd love to learn more about the nature of the **underlying identifying assumptions**, i.e., what parallel trends means intuitively for this particular empirical strategy.

The **authors are in an extremely strong position**, as accounting experts with rich institutional knowledge and very interesting policy variation, to strengthen this portion of their analysis even further.

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