Firm Home Production

Discussant Comments

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Quick Summary

Goal: Estimate unobserved ('intangible') firm capital in Canadian economy; compare with U.S.

Approach: Hall (2001) meets new Canadian data

Result: $\approx$ 20% of Cdn firm's capital is intangible & steady over time. Much less than in U.S.

Ambitious Research Area

$$Y = AF(K_{Tang}, \underbrace{K_{Intang}}_{Nazim}, \underbrace{K_{Home}}_{Fisher}, L)$$

Problem: K_{Home} poorly measured; K_{Intang} unobservable.

- Interesting question & challenging issue to tackle.
- New literature.

About the Main Result

Is the answer ($\approx$20% of K stock) "reasonable"?

Are the dynamics "reasonable"? Cdn results remarkably stable.

How would we know? Can this result be verified or rejected?

Maybe more convincing if alternative approaches give similar answers

Alternative Approaches: 1

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U.S. $\frac{R\&D}{GDP}$ grew from 2.3% in 1980-89 to 2.9% in 1990-97. Nakamura(1999)

U.S. $\frac{Advertising}{GDP}$ grew from 3.9% in 1980-89 to 4.1% in 1990-97.

$\Rightarrow$ Cost method unlikely to corroborate Hall's (2001) U.S. estimates.

Alternative Approaches: 2

2) **Production Function**: Firm's choose optimal investment in tangible & intangible K.

If same cost applies to both investments (interest + possible 'adjustment' cost, prices assumed identical?):

Optimality: $MC = MB \Rightarrow \frac{\partial Y}{\partial K_{Tang}} = \frac{\partial Y}{\partial K_{Intang}} \quad \Rightarrow K_{Tang} \approx K_{Intang}$

But paper finds: $K_{Tang} \approx 4 \times K_{Intang}$

Broader Issues

- Maybe the results are reasonable.
- Do firm's have same incentives to invest in intangibles?
- May under-invest because:
  - difficult to directly connect profit to intangibles.
  - unlike physical K, firms can't re-sell intangibles.

Do we learn about intangible K or asset valuations?

- Implicitly assumes mkt value is always ‘correct/rational’
- Many believe U.S. “irrationally exuberant” in late 1990s Greenspan (1996)
- Mkt valuation method will over-estimate intangibles during “bubbles”

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  "We may learn in coming years (for example, through a stock market crash) that the high stock market valuations were a mistake and that corporations had not accumulated capital" (Hall 2000)

  $\Rightarrow$ Extending sample may literally imply firms stopped R&D, 'untrained' employees, 'disorganized' firms (shouldn't we constrain $K_{intang} \geq 0$?)

Refine Results

- Given intangibles aren't observed, what insights does this give over the Solow residual?

  $\Rightarrow$ push results further, what is this new measure correlated with?

- Can this Euler equation be estimated by GMM to get standard errors?

Tiny Quibbles

Terminology: “Corporate Home Production” phrase confusing

Where’s the “puzzle”?

Notation: Some notation undefined; time subscript s later becomes t.

Why are depreciation rates and price indexes for aggregate tangible & intangible K the same?

Why do the adjustment costs arise? What’s the friction?