

Measuring R&D Capital Services and the Production Account

- **Net Rates of Return:** The average real net rate of return on all business-owned assets is estimated at 10.7 percent for 1959-2002. The 2006 R&DSA added a risk premium for R&D and assumed a 15 percent real rate of return.
 - Adding R&D assets to the total reduces earnings for other assets, as business earnings are assumed complete, but the effect is slight since current-cost R&D assets average about 3.6 percent of total assets.
 - For BEA to develop a production account and include R&D, it will need capital user-costs, e.g.:

$$u_k = p_k(r + \delta - E \hat{p}_k)$$

with p_k the purchase price of new (R&D) investment and $E \hat{p}_k$ its expected inflation rate, r the nominal discount rate, and δ the depreciation rate.

- The scenarios of the 2006 round took several approaches to p_k and δ but mixed the treatment of $r - E \hat{p}_k$: the 15 percent assigned to R&D was a real ex ante approach; letting other assets share residual earnings in proportion to current-cost net stocks was a *real* ex post approach.
 - Shortcomings: Claiming a risk premium for ex-ante returns to R&D raises the specter of ex ante risk adjustments for other assets. Ex ante methods also put BEA in the position of claiming abnormal profits or losses. On the other hand, ex-post r , which appeals to arbitrage, misses risk differentials and abnormal returns where they do exist.
- **Asset boundaries, Double counting:** For the SNA update, BEA has urged that R&D be counted as an asset if it has direct economic benefits to its legal owners, but not if the only benefits are external or social effects.
 - The 2006 R&DSA counted all of NSF's surveyed "R&D" but did not assess how much of it would qualify as having direct economic benefits.
 - Shortcomings: The scope of R&D that BEA would recognize as an asset may exclude some basic R&D that could impact productivity. The 2006 R&DSA may also have included R&D for new software; since software is already capitalized, the investment may have been double-counted.
- **Ownership:** NSF surveys are performer-based, as was the 1994 R&D Account, but funders of any investment typically bear the risks and claim residual rewards, so the 2006 round assigned R&D ownership to funders.
 - Government-funded R&D conducted by private performers is treated as the creation of a government-owned asset, the services of which are part of Government Consumption.
 - Shortcomings: A production account would need to track capital users apart from owners. Government funded R&D for which performers claim the residual rewards, and thus ownership, entails an element of subsidy, but identifying and tracking such subsidies may be impossible.