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Discount rates and public infrastructure investments

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TODAY'S LOW INTEREST RATES have raised new issues for both economists and decision makers. A question that is now frequently asked in the policy debate (for example, Edlund et al., 2016) is, »Why not invest in infrastructure when interest rates are low?« To answer this question in a rigorous way, one must look to the cost-benefit analyses for public investment, and to the interest rates used.

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Today's low interest rates have raised new issues for both economists and decision makers. A question that is now frequently asked in the policy debate (for example, Edlund et al., 2016) is, »Why not invest in infrastructure when interest rates are low?« To answer this question in a rigorous way, one must look to the cost-benefit analyses for public investment, and to the interest rates used.

The cost-benefit analysis is a tool for systematically comparing the social benefits and costs of, for example, infrastructure projects, and offers guidance in the decision-making process for major projects. The idea is that all effects that a project gives rise to (for example, investment cost, travel time gains, road safety effects, noise and environmental impact) should be quantified and evaluated, to best extent possible, and then incorporated into the analysis. In this context, a socio-economic gain means that a project's societal benefits exceed its costs. The social discount rate can generally be seen as society's valuation of a one-year delay in the realization of costs or benefits for public investment.

The arguments of Edlund et al. (2016) — that current risk-free market rates should be used in infrastructure calculations — do not consider that the project risk is borne by the state, not by the lender. Arrow and Lind's (1970) analysis that remains quite influential today. They showed that under certain assumptions, the socio-economic cost of project risk goes to zero when the population size goes to infinity, so projects can be evaluated strictly on the basis of the expected value of net profit. In other words, uncertainty need not be taken into account.

However, Arrow and Lind's application of this insight is based on an important additional assumption: that the expected returns from public projects do not coincide at all with general economic development. However, according to Baumstark and Gollier (2014), there is no reason to believe that this assumption holds in reality. Swedish estimates from Hultkrantz and colleagues (2014) rather indicate that the socio-economic return from transport infrastructure, in the form of travel time gains, largely follows GDP development. This means that the project risk for transport infrastructure investment is of the same order of magnitude as for investment in share index funds, where returns also largely coincide with GDP development.

In this report, risk-adjusted social discount rates for Swedish transport infrastructure investments are estimated, using two methods. The social time preference method indicates that the proper (real) discount rate is 2.5 percent annually, while the social opportunity cost method indicate instead suggests about 7 percent. Despite this considerable discrepancy between these two results, both are considerably higher than current risk-free interest rates.

So, why not invest in infrastructure when interest rates are low? There are three reasons to bear in mind:

1. Infrastructure investments are not risk free, and it is the state — not the lender — who is responsible for the risk. Overall macroeconomic risk cannot be diversified, and Hultkrantz and others (2014) show that transport infrastructure investments in Sweden have historically been almost as risky as investments in well-diversified stock portfolios.
2. Infrastructure investments are long-term. A sensible decision must therefore be based on forecasts for interest rates throughout the loan period, not only on the current interest rate at the time of the decision. Jordà et al. (2019) show that the (real) risk-free interest rate has fluctuated quite a bit over the past 150 years, but most often in the 1–3 percent range.
3. If a government still wants to use loans to finance investments, it can reap a significantly higher return if it invests in stock markets than in infrastructure, with the corresponding level of macroeconomic risk. In addition, investments in stock markets have the advantage that returns can be distributed evenly across the country, while profitable infrastructure investments are concentrated in specific geographical areas.

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