

A DISCOUNTED RATE? The Impact of Discount Rates on Infrastructure

by Melissa Pogue

As part of our study of the infrastructure of democratic capitalism, we are exploring different themes associated with physical infrastructure (buildings, roads, sewers and other constructed resources that we share across a society), transactional infrastructure (the set of rules, decision-making institutions and mechanisms that allow a society to exchange goods and services and to interact effectively) and knowledge infrastructure (the set of systems and institutions—including education, media, and the Internet—that enable the creation and sharing of ideas and the reliable transfer of information). These short articles represent our early thoughts on these themes. We welcome your thoughts and reactions. Email us at assistant@martinprosperity.org.

When someone says the word “infrastructure,” we might think of the bridges and roads we drive to work on, or the public utilities that power our houses, or maybe even the schools our children attend. These bricks-and-mortar entities are incredibly important to our daily lives and, accordingly, many of us follow their fortunes closely. If decisions were being made about the future of these infrastructure pieces, we may well be interested enough to listen to a news story, talk with our neighbours, or maybe even contact our local political representative to advocate for our own views on the subject. But few of us think about the invisible pieces of *transactional infrastructure* that affect our lives just as deeply,

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and that shape the future of all of these more familiar forms of infrastructure.

Like one key feature of our transactional infrastructure: discount rates. A discount rate is a constructed number used by our governments to make decisions about what gets built, what doesn't, and what decisions get kicked down the road. Discount rates determine how long-term projects are valued and funded. They affect all investment decisions, from government budgets, to environmental investments, to regional development choices, and the size of government. And while its cousin, the interest rate, is reported and examined extensively, the general public hardly ever hears about the discount rate.

People value costs and benefits differently over time. There are both human and economic justifications for this. People's preferences for the short term were first described by the neoclassical economists, most notably Irving Fisher, Alfred Marshall, A. C. Pigou, and William Stanley.¹ They believed that individuals had an "irrational" preference for their own present consumption at the cost of consumption by future generations. They "discount" future earnings, returns and costs relative to current ones. While discounting future consumption may be partly rational due to the "uncertainty and brevity of life," neoclassical economists believed that consumer foresight, or our will power, was defective.² Pigou labelled this our "faulty telescopic faculty." He believed that it was this social irrationality that caused reckless decision making.

More recently, behavioral economists have studied human biases towards the short-term. They have shown that people are biased towards benefits that accrue sooner, while benefits accruing further are less valued. This means that, while we all value our future health, we often value it less than the consumption of a cupcake or a cigarette today.

Whether it is our faulty telescopic faculty, our biases, or the opportunity cost of capital, people value tomorrow's dollar less than today's. This becomes important when making decisions about when to spend or invest those dollars. Investment is primarily about choosing to forgo current spending in anticipation of future rewards. Intertemporal choice is the term often used to describe the relative values that people place on two or more investment decisions over time. These choices often require decision makers to make tradeoffs between costs and benefits.

An entity's discount rate reflects its willingness to substitute the present and future consumption over time and allows for these figures to be easily compared. Since resources invested today are assumed to be transformed into more resources later, the discount rate is generally positive.

The choice of discount rate is important. A high discount rate will discount future benefits and costs to a higher degree. This will mean that future investments with a long-term horizon for payoff will be worth less today and will have a harder time being approved by decision

1 See Pigou, Arthur Cecil. *The economics of welfare*. Transaction Publishers, 1924, p. 27; William Stanley, *Theory of Political Economy*, (4th ed.; London: Macmillan, 1911); Fisher Irving, *Elementary Principles of Economics*, (New York: Macmillan, 1913); Marshall, Alfred, *Principles of Economics*, (8th ed. London: Macmillan, 1930)

2 Peart, Sandra J. "Irrationality and intertemporal choice in early neoclassical thought." *Canadian Journal of Economics/Revue canadienne d'économique* 33.1, 2000, p. 176.

making bodies. Conversely, applying a low discount rate will result in high future investment, which might crowd out better current uses of resources. These consequences were highlighted in a recent study, the Stern Review on the Economics of Climate Change, which showed that current public discount rate choices could lead to a loss of up to 5% of global GDP due to climate change and long-term investments not made to support the environment.³ That's just the effect on the environment. Imagine the costs attributed to public transit and affordable housing underinvestment.

In the private sector, the discount rate is fairly straightforward. It is based on the cost of capital used for the investment, determined by the weighted average cost of the debt and equity used for financing. In the public sector, however, the discount rate is more complicated. The cost of capital is the cost for the government to borrow funds, but this doesn't translate directly to the public discount rate, often referred to as the social discount rate. The social discount rate is the rate at which the entire region is willing to trade current prosperity for future prosperity.⁴ There is great debate by economists over the right choice here. It could be social opportunity cost (SOC), the social time preference (STP), or it could incorporate the capital asset pricing model (CAPM). Perhaps the rates could be increasing over time, or risk should be incorporated.

Beyond the theoretical and philosophical arguments pertaining to social welfare, there are also practical questions related to the setting of a discount rate. Many countries employ an overseeing agency to dictate a discount factor

to be used by all agencies. This can be accomplished at both a local, national and international level. These rates may reflect individual preferences for time horizons and investment priorities, and may vary dramatically. For example, in Canada the Treasury Board Secretariat has set the real discount rate to 10% since 1976, though recent interim guidelines recommended that this should be decreased to 8%.⁵ This is compared to Germany, whose Federal finance ministry sets a 3% real discount rate.⁶ In 2003, the United Kingdom moved from a 6% to a 3.5% real rate, and France has recommended theirs be reduced from 8% to 4%.⁷

While the reduction of national discount rates is welcomed by many, it is concerning that these discount rates are not continuously being tested for their impairment. Another area of concern for discount rates is in the realm of Public-Private Partnerships, a financial vehicle currently in vogue with governments around the world. Public discount rates are lower than private discount rates; governments should and do operate with different time horizons, different investment objectives and different risk profiles than do private companies. Since the public and private sector use different discount rates, assets will have different values to each player. In Public-Private Partnerships, then, it is important to accurately price the costs and benefits for projects. Otherwise, when assets are transferred between the public and private realms, the value each party ascribes to the asset could make deals untenable. Without choosing the accurate discount rate for the public, some project costs may be unduly placed on the shoulders of governments.

3 Stern, Nicholas Herbert. *Stern Review: The economics of climate change*. Vol. 30. London: HM treasury, 2006.

4 Spackman, Michael, "Time Preference, the Cost of Capital, and PPPs," in *Discount Rates for the Evaluation of Public Private Partnerships*, eds. David F. Burgess and Glenn P. Jenkins, John Deutsch Institute for the Study of Economic Policy, 2010, p. 84.

5 Boardman, Anthony E., Mark A. Moore, and Aidan R. Vining. "Social discount rates for Canada." *John Deutsch Institute Conference: Discount Rates for the Evaluation of Public-Private Partnerships*. Kingston, ON. Accessed September. Vol. 22. 2008, p. 3.

6 Spackman, p. 96.

7 Boardman, p. 3.

Why aren't more people aware of the choices made by our governments regarding discount rates applied to long-term investments? Given our bias towards the short term, perhaps we should be knowingly decreasing the discount rates to incentivize future-oriented investments. Regardless, governments need to continually test our systems of infrastructure, both seen and not seen, for deficiency to ensure that they accurately meet our needs for long-term prosperity.

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