

ENVIRONMENTAL ECONOMICS IN ACTION 7.2 The Costs of Not Following the Hartwick Rule

The Hartwick Rule states that a country can maintain non-declining consumption over time if it re-invests rents from non-renewable resource extraction (calculated as the volume of annual production, valued using the difference between price and marginal cost) in other forms of capital. This allows the total value of the capital stock to be maintained in terms of its ability to generate future well-being. An exercise in the World Bank's *Where is the Wealth of Nations?* report reports on how much richer a range of countries would be in 2000 if they had followed the Hartwick Rule over the period 1970-2000. The test of 'how much richer?' involves comparing the measured (estimated) capital stock in 2000 with calculations of what the capital stock would have been had each country followed the Hartwick Rule.

In the Hartwick Rule scenario, it is assumed that all resource rents were re-invested in produced capital: investment is set equal to this amount in each year over the period 1970-2000. For resource dependent countries such as Bolivia, Algeria and Nigeria, the actual capital stock in 2000 was much lower than it could have been, had these countries followed the Hartwick Rule. No countries with resource rents higher than 15% of GDP has followed the Hartwick Rule—all are now poorer in 2000 than they could have been, had they followed this rule.

We can also look at the evidence for a specific country. Australia in 1870 had one of the world's highest levels of per capita consumption, for example being 35% higher than the USA. It also had very abundant natural resources such as coal and iron ore, along with vast tracts of land which could be converted to pastoral (grazing) farmland. However, by the end of the 20th century its per capita consumption had been overtaken by many countries including the USA. Greasley et al. (2017) test whether this relative decline in Australian living standards over time was due to the country not re-investing enough of its natural resource rents in total capital. They construct a time series for Genuine Savings since 1860, noting that although the mean value is +5.3%, there are several periods of time



Figure 1 Consumption per capita in Australia compared to three other leading economies, 1870-2010.

where GS is negative. The three comparator countries' GS ratio averaged 9.9% between 1946-2000, which is much higher than Australia's ratio.

Using this mean GS level attained by the UK, USA and Germany over the same period (1861-2011) and allowing for population growth, they ask how much richer Australia could have been today if it had matched this genuine savings level. The answer is quite surprising. Australia's consumption per capita would have been around 28% higher by 2010 had its GS level been equal to that of the comparator countries. This shows a potential for Australia's consumption to have *sustained* the distinct lead it had in 1860 over the leading European economies, an opportunity which was forgone because of Australia's relatively low level of investment in its total capital stock.