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# Why do many resource-rich countries have negative genuine saving? Anticipation of better times or rapacious rent seeking<sup>☆</sup>

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## ABSTRACT

We investigate the Hartwick rule for saving of a nation necessary to sustain a constant level of private consumption for a small open economy with an exhaustible stock of natural resources. The amount by which a country saves and invests less than the marginal resource rents equals the expected capital gains on reserves of natural resources plus the expected increase in interest income on net foreign assets plus the expected fall in the cost of resource extraction due to expected improvements in extraction technology. Effectively, depletion is then postponed until better times. This suggests that it is not necessarily sub-optimal for resource-rich countries to have negative genuine saving. However, in countries with different groups with imperfectly defined property rights on natural resources, political distortions induce faster resource depletion than suggested by the Hotelling rule. Fractionalised societies with imperfect property rights build up more foreign assets than their marginal resource rents, but in the long run accumulate less foreign assets than homogenous societies. Hence, such societies end up with lower sustainable consumption and are worse off, especially if seepage is strong, the number of rival groups is large and the country does not enjoy much monopoly power on the resource market. Genuine saving is zero in such societies. However, World Bank genuine saving figures based on

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Property rights  
Voracity  
Fractionalisation  
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market rather than accounting prices will be negative, albeit less so in more fractionalised societies with less secure property rights.

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## 1. Introduction

Many economies endowed with an abundance of natural resources varying from oil, gas and diamond to copper and tin have poor growth performance even after controlling for the quality of institutions, openness, the investment rate and the initial level of income per capita (e.g., Sachs and Warner, 1997; Mehlum et al., 2006; Arezki and van der Ploeg, 2006; van der Ploeg and Poelhekke, in press). Despite advice from the World Bank and other supranational organisations and NGO's to save at least the rents from extracting and selling natural resources,<sup>1</sup> these resource-rich economies typically save less than that. If they were to save more, they might grow at a faster rate. To get a better understanding of sustainable development, it is useful to look at some numbers for *genuine saving* (e.g., Hamilton and Hartwick, 2005). Genuine savings is defined as public and private saving at home and abroad, net of depreciation, *plus* current spending of education to capture changes in intangible human capital *minus* depletion of natural exhaustible and renewable resources *minus* damage of stock pollutants (CO<sub>2</sub> and particulate matter). Since genuine saving thus defined corresponds to the increase in the wealth of the nation (Dasgupta and Mäler, 2000), the constant maxi-min level of consumption demands *zero* genuine saving.<sup>2,3</sup> It thus requires that any depletion of natural resources or damage done by stock pollutants must be compensated for by increases in non-human and/or human capital. Although this rule of zero genuine saving is often seen as a rule of thumb or motivated by maxi-min egalitarianism, it can be the outcome of maximising utilitarian utility in an open economy without resource exports if the rate of time preference equals the world rate of interest (e.g., Okumura and Cai, 2007).

Illustrative estimates of genuine saving are calculated in World Bank (2006) and presented in Fig. 1 (also Hamilton et al., 2005). They paint a rather gloomy picture. Countries with a large percentage of mineral and energy rents of GNI typically have *negative* genuine saving rates. This means that many countries become poorer each year despite have abundant natural resources. They effectively squander their natural resources at the expense of future generations without investing in other forms of intangible or productive wealth. Fig. 2 suggests that this may explain why Venezuela shows negative economic growth rates while countries such as Botswana, Ghana and China with positive genuine saving rates enjoy substantial growth rates. Highly resource-dependent Nigeria and Angola have genuine saving rates of minus 30 percent and future generations are clearly being impoverished. The oil/gas states of Azerbaijan, Kazakhstan, Uzbekistan, Turkmenistan and the Russian Federation also have negative genuine saving rates. They seem to consume or even waste their resource rents.

Fig. 3 reports the counterfactual experiment of calculating by how much productive capital would increase by 2000 if countries would have invested all their natural resource rents from crude oil, natural gas, coal, bauxite, copper, gold, iron, lead, nickel, phosphate, silver and zinc in productive capital from 1970 onwards. Unfortunately, the calculations only provide an upper bound as they

<sup>1</sup> This policy recommendation is based on the Hartwick rule, which is derived from maxi-min egalitarian considerations. The rule says that the marginal Hotelling rents on natural resources should be fully saved and reinvested in physical capital, infrastructure or education (e.g., Hartwick, 1977; Dixit et al., 1980; Dasgupta and Mitra, 1983; Solow, 1986). With a Cobb–Douglas production function, the saving rate then corresponds exactly to the constant production share of natural resources. Hartwick (1995) discusses the open economy version of the Hartwick rule.

<sup>2</sup> In fact, wealth per capita is the correct measure of social welfare if the population growth rate is constant, per capita consumption is independent of population size, production has constant returns to scale, and current saving is the present value of future changes in consumption (Dasgupta, 2001a).

<sup>3</sup> The Hartwick rule is related to the Hicksian definition of real income, i.e., the “maximum amount a man can spend and still be as well off at the end of the week as at the beginning”. The general equilibrium features of this ‘green’ definition of real income, which ensures no change in the present discounted value of current and future utility and requires use of the Divisia index of real consumption prices, are now well understood (Asheim and Weitzman, 2001; Sefton and Weale, 2006). The return on the increasingly scarce resource rises at the expense of the increasingly abundant production factors. Capital gains represent the capitalisation of the future changes in factor prices. They constitute a transfer from one factor to another, so in a closed economy net gains are zero and should not be included in the definition of real income.

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