Toward a broader measure of savings

	Gross national savings	Consumption of fixed capital	Net national savings	Education expenditure	Energy depletion	Mineral depletion	Net forest depletion	Carbon dioxide damage	Particulate emission damage	Adjusted net savings
	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003
Afghanistan	..	..	..	..	..	..	..	..	..	..
Albania	18.2	9.6	8.6	2.8	0.9	0.0	0.0	0.3	0.1	10.2
Algeria	43.1	11.0	32.1	4.5	37.5	0.1	0.1	1.2	0.7	−2.9
Angola	22.2	11.0	11.2	4.4	43.6	0.0	0.0	0.5	..	−28.5[a]
Argentina	21.9	11.3	10.6	3.2	6.3	0.1	0.0	0.6	1.6	5.2
Armenia	17.2	8.6	8.6	1.8	0.0	0.1	0.0	1.1	2.0	7.3
Australia	19.7	16.1	3.6	4.5	1.3	1.4	0.0	0.5	0.1	4.9
Austria	22.7	14.5	8.2	5.6	0.1	0.0	0.0	0.2	0.2	13.3
Azerbaijan	22.2	15.0	7.2	3.0	45.4	0.0	0.0	5.0	1.0	−41.2
Bangladesh	28.4	5.8	22.6	1.3	2.0	0.0	0.8	0.4	0.3	20.5
Belarus	21.2	9.3	12.0	5.4	2.0	0.0	0.0	3.0	0.0	12.4
Belgium	24.0	14.4	9.6	3.0	0.0	0.0	0.0	0.2	0.2	12.2
Benin	4.8	8.2	−3.4	2.7	0.0	0.0	1.1	0.3	0.3	−2.4
Bolivia	12.0	9.2	2.8	4.8	8.7	0.9	0.0	1.2	0.7	−3.8
Bosnia and Herzegovina	10.3	9.3	1.0	..	0.1	0.0	0.0	2.0	0.4	..
Botswana	35.6	11.8	23.8	5.6	0.0	0.3	0.0	0.4	..	28.7[a]
Brazil	19.1	10.8	8.4	3.9	3.1	1.1	0.0	0.4	0.2	7.4
Bulgaria	13.3	10.5	2.8	3.0	0.1	0.4	0.0	1.8	2.1	1.3
Burkina Faso	6.6	7.6	−1.0	2.4	0.0	0.0	1.0	0.2	0.5	−0.2
Burundi	22.4	5.9	16.5	4.1	0.0	0.1	14.0	0.3	0.1	6.2
Cambodia	21.0	7.8	13.3	2.0	0.0	0.0	0.9	0.1	0.1	14.2
Cameroon	11.9	9.2	2.7	2.3	5.2	0.0	0.0	0.5	0.7	−1.4
Canada	20.5	13.0	7.5	6.9	4.7	0.1	0.0	0.4	0.2	9.0
Central African Republic	11.6	7.5	4.2	1.6	0.0	0.0	0.0	0.1	0.4	5.2
Chad	11.9	8.3	3.7	1.4	0.0	0.0	0.0	0.0	..	5.1[a]
Chile	24.5	10.1	14.4	3.8	0.4	5.9	0.0	0.6	1.0	10.3
China	47.9	9.2	38.7	2.0	2.9	0.2	0.0	2.2	1.0	34.5
Hong Kong, China	34.3	12.5	21.8	2.8	0.0	0.0	0.0	0.2	0.0	24.5
Colombia	14.6	10.2	4.4	3.1	7.7	0.3	0.0	0.6	0.1	−1.1
Congo, Dem. Rep.	..	6.6	..	0.9	2.2	0.0	0.0	0.3	0.0	..
Congo, Rep.	29.8	11.9	17.9	5.9	49.3	0.2	0.0	0.6	..	−26.3[a]
Costa Rica	15.3	6.0	9.3	4.9	0.0	0.0	0.3	0.3	0.3	13.4
Côte d'Ivoire	14.8	9.2	5.6	4.5	2.6	0.0	0.6	0.4	0.6	5.8
Croatia	22.2	12.0	10.2	..	1.1	0.0	0.0	0.6	0.3	..
Cuba	..	..	..	6.1	..	..	..	..	..	..
Czech Republic	22.4	12.5	9.9	4.0	0.1	0.0	0.0	0.9	0.1	12.8
Denmark	23.5	15.2	8.3	7.9	0.7	0.0	0.0	0.2	0.1	15.2
Dominican Republic	29.4	5.5	23.9	2.3	0.0	0.5	0.0	1.1	0.2	24.3
Ecuador	25.1	10.6	14.5	3.2	15.1	0.0	0.0	0.6	0.1	1.9
Egypt, Arab Rep.	20.1	9.3	10.9	4.4	7.7	0.1	0.2	1.1	1.4	4.8
El Salvador	16.4	9.8	6.6	2.4	0.0	0.0	0.5	0.3	0.2	8.0
Eritrea	3.0	5.6	−2.5	1.4	0.0	0.0	0.0	0.4	0.5	−2.0
Estonia	19.2	14.6	4.6	6.3	0.6	0.0	0.0	1.8	0.2	8.3
Ethiopia	18.4	5.9	12.5	4.0	0.0	0.1	12.6	0.5	0.3	2.9
Finland	24.5	16.2	8.2	7.0	0.0	0.0	0.0	0.3	0.1	14.8
France	20.0	12.7	7.3	5.2	0.0	0.0	0.0	0.2	0.0	12.3
Gabon	36.4	12.8	23.5	2.7	24.5	0.0	0.0	0.5	0.1	1.1
Gambia, The	8.8	7.8	1.0	3.4	0.0	0.0	0.6	0.5	0.7	2.5
Georgia	14.8	16.1	−1.3	4.3	0.4	0.0	0.0	1.0	2.5	−1.0
Germany	20.3	14.9	5.4	4.2	0.1	0.0	0.0	0.2	0.1	9.3
Ghana	..	7.2	..	2.8	0.0	1.1	2.3	0.6	0.2	..
Greece	20.3	8.8	11.5	3.1	0.1	0.1	0.0	0.4	0.7	13.5
Guatemala	13.9	10.1	3.8	1.6	0.9	0.0	0.9	0.3	0.2	3.1
Guinea	10.3	8.0	2.3	2.0	0.0	1.4	1.7	0.3	0.6	0.2
Guinea-Bissau	−5.7	6.9	−12.6	..	0.0	0.0	0.0	0.6	..	..
Haiti	..	1.8	..	1.5	0.0	0.0	1.3	0.3	0.2	..

	Gross national savings	Consumption of fixed capital	Net national savings	Education expenditure	Energy depletion	Mineral depletion	Net forest depletion	Carbon dioxide damage	Particulate emission damage	Adjusted net savings
	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003
Honduras	23.6	5.6	18.0	3.5	0.0	0.1	0.0	0.5	0.2	20.8
Hungary	17.7	12.4	5.3	5.0	0.5	0.0	0.0	0.6	0.4	8.9
India	24.8	9.6	15.1	3.9	2.4	0.3	0.9	1.5	0.7	13.2
Indonesia	18.8	5.4	13.4	1.3	8.8	1.3	0.0	0.8	0.5	3.3
Iran, Islamic Rep.	42.7	10.0	32.8	4.6	33.2	0.1	0.0	1.7	0.7	1.7
Iraq	..	..	..	..	..	..	..	..	..	..
Ireland	26.4	12.6	13.8	5.7	0.0	0.1	0.0	0.3	0.1	19.0
Israel	14.2	14.7	−0.5	6.8	0.0	0.1	0.0	0.4	0.0	5.8
Italy	18.7	13.7	5.0	4.4	0.1	0.0	0.0	0.2	0.2	8.9
Jamaica	20.0	11.4	8.6	6.0	0.0	1.1	0.0	0.9	0.3	12.2
Japan	26.7	15.9	10.8	3.2	0.0	0.0	0.0	0.2	0.4	13.5
Jordan	28.1	10.6	17.5	4.4	0.4	1.0	0.0	1.2	0.7	18.6
Kazakhstan	28.1	10.5	17.5	4.4	38.9	0.6	0.0	4.1	0.4	−22.1
Kenya	13.1	8.0	5.1	6.1	0.0	0.0	0.6	0.4	0.2	9.9
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	31.5	12.4	19.2	3.0	0.0	0.0	0.0	0.5	0.8	20.9
Kuwait	24.8	7.2	17.6	5.0	50.8	0.0	0.0	0.7	2.0	−30.9
Kyrgyz Republic	15.1	8.0	7.1	3.2	1.2	0.0	0.0	2.3	0.2	6.5
Lao PDR	19.1	7.8	11.3	1.8	0.0	0.0	0.0	0.2	0.2	12.8
Latvia	20.5	10.8	9.7	5.1	0.0	0.0	0.0	0.6	0.3	13.8
Lebanon	−7.9	11.4	−18.4	2.5	0.0	0.0	0.0	0.6	0.6	−18.1
Lesotho	−2.4	6.9	−9.3	7.3	0.0	0.0	1.7	..	0.4	..
Liberia	0.6	7.4	−6.7	..	0.0	0.3	5.3	1.0	0.0	..
Libya	..	..	..	..	..	..	..	..	..	..
Lithuania	15.8	10.3	5.5	5.2	0.0	0.0	0.0	0.7	0.7	9.3
Macedonia, FYR	17.6	10.2	7.4	4.9	0.0	0.0	0.0	1.7	0.3	10.3
Madagascar	12.0	7.6	4.4	1.7	0.0	0.0	0.0	0.2	0.2	5.6
Malawi	−6.5	6.7	−13.2	4.4	0.0	0.0	2.3	0.3	0.2	−11.6
Malaysia	36.3	11.6	24.8	5.3	12.1	0.0	0.0	1.0	0.1	17.0
Mali	15.6	8.0	7.6	2.1	0.0	0.0	0.0	0.1	0.5	9.2
Mauritania	8.7	7.4	1.3	3.7	0.0	18.8	0.8	2.1	..	..
Mauritius	26.3	10.9	15.4	3.3	0.0	0.0	0.0	0.3	..	18.3ª
Mexico	18.7	10.5	8.2	5.1	6.2	0.1	0.0	0.5	0.5	6.0
Moldova	17.0	6.8	10.1	3.5	0.0	0.0	0.0	2.8	0.5	10.3
Mongolia	18.1	10.9	7.1	5.7	0.0	2.4	0.0	4.6	0.5	5.3
Morocco	27.9	9.7	18.2	4.8	0.0	0.3	0.1	0.6	0.2	21.8
Mozambique	12.6	7.4	5.2	3.8	0.0	0.0	0.0	0.3	0.4	8.3
Myanmar	..	..	..	0.9	..	..	..	..	..	..
Namibia	31.5	12.3	19.3	7.4	0.0	0.3	0.0	0.3	0.2	25.9
Nepal	31.6	2.4	29.2	3.2	0.0	0.0	4.2	0.4	0.1	27.7
Netherlands	23.3	15.2	8.1	4.9	0.7	0.0	0.0	0.2	0.4	11.7
New Zealand	21.9	10.8	11.1	6.9	0.9	0.1	0.0	0.3	0.0	16.6
Nicaragua	21.6	8.8	12.7	3.7	0.0	0.1	1.0	0.6	0.0	14.7
Niger	4.6	7.1	−2.5	2.3	0.0	0.0	3.1	0.3	0.4	−4.1
Nigeria	20.3	9.2	11.1	0.9	42.1	0.0	0.0	0.5	0.8	−31.4
Norway	30.3	15.9	14.4	6.1	6.9	0.0	0.0	0.2	0.1	13.3
Oman	..	..	..	3.7	..	..	..	..	..	..
Pakistan	22.7	7.8	14.9	2.3	3.7	0.0	0.9	0.9	1.0	10.7
Panama	24.0	8.0	15.9	4.3	0.0	0.0	0.0	0.4	0.3	19.5
Papua New Guinea	..	9.6	..	..	13.5	8.3	0.0	0.6	0.0	..
Paraguay	8.2	9.1	−0.9	3.9	0.0	0.0	0.0	0.4	0.4	2.2
Peru	18.1	10.4	7.6	2.6	1.1	1.5	0.0	0.3	0.6	6.6
Philippines	22.8	8.0	14.8	2.8	0.2	0.2	0.2	0.7	0.4	16.0
Poland	17.1	11.4	5.7	5.1	0.5	0.1	0.0	1.2	0.7	8.3
Portugal	..	15.3	..	5.7	0.0	0.0	0.0	0.3	0.4	..
Puerto Rico	..	..	..	..	..	..	..	..	..	..

	Gross national savings	Consumption of fixed capital	Net national savings	Education expenditure	Energy depletion	Mineral depletion	Net forest depletion	Carbon dioxide damage	Particulate emission damage	Adjusted net savings
	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003	% of GNI 2003
Romania	18.5	10.5	8.1	3.6	3.2	0.0	0.0	1.2	0.2	7.1
Russian Federation	29.8	10.8	19.0	3.5	29.6	0.3	0.0	2.8	0.6	−10.7
Rwanda	11.7	6.7	5.0	3.5	0.0	0.0	3.3	0.3	0.0	4.8
Saudi Arabia	35.3	10.0	25.3	7.2	49.2	0.0	0.0	1.1	1.0	−18.8
Senegal	13.9	8.5	5.4	3.7	0.0	0.1	0.3	0.5	..	8.2a
Serbia and Montenegro	−6.5	10.4	−16.9	..	1.0	0.1	0.0	1.6	0.2	..
Sierra Leone	1.6	6.7	−5.1	3.9	0.0	0.0	5.5	0.4	0.4	−7.6
Singapore	44.8	14.4	30.4	2.3	0.0	0.0	0.0	0.5	0.4	31.8
Slovak Republic	24.2	11.4	12.8	4.0	0.1	0.0	0.0	0.9	0.1	15.7
Slovenia	25.5	12.6	12.9	5.3	0.0	0.0	0.0	0.4	0.2	17.7
Somalia	..	..	..	..	..	..	..	..	..	..
South Africa	16.3	13.3	3.0	7.6	1.1	0.9	0.2	1.5	0.2	6.6
Spain	23.3	12.9	10.4	4.3	0.0	0.0	0.0	0.2	0.4	14.0
Sri Lanka	21.7	5.2	16.5	2.9	0.0	0.0	0.6	0.3	0.3	18.1
Sudan	22.4	8.9	13.5	0.9	0.0	0.0	0.0	0.2	0.6	13.6
Swaziland	14.2	9.4	4.8	5.1	0.0	0.0	0.0	0.2	0.1	9.7
Sweden	23.1	13.9	9.2	7.7	0.0	0.1	0.0	0.1	0.0	16.7
Switzerland	..	14.9	..	4.9	0.0	0.0	0.0	0.1	0.2	..
Syrian Arab Republic	28.0	9.7	18.3	3.5	33.1	0.1	0.0	1.7	0.8	−13.9
Tajikistan	−7.6	7.6	−15.2	2.0	0.2	0.0	0.0	3.4	0.2	−17.0
Tanzania	9.4	7.4	2.0	2.4	0.0	0.5	0.0	0.3	0.2	3.4
Thailand	31.1	15.0	16.2	3.6	2.0	0.0	0.3	1.0	0.4	16.1
Togo	2.0	7.9	−5.9	4.2	0.0	0.7	3.3	0.9	0.3	−6.9
Trinidad and Tobago	25.9	12.2	13.7	3.9	38.5	0.0	0.0	2.0	0.0	−22.8
Tunisia	22.9	10.0	12.9	6.4	3.7	0.4	0.1	0.6	0.3	14.1
Turkey	19.2	7.0	12.3	3.3	0.2	0.0	0.0	0.6	1.2	13.5
Turkmenistan	..	9.4	..	..	..	0.0	0.0	7.4	0.3	..
Uganda	17.6	7.3	10.3	1.9	0.0	0.0	5.9	0.2	0.0	6.2
Ukraine	26.6	19.0	7.5	6.4	6.4	0.0	0.0	5.9	1.0	0.6
United Arab Emirates	..	..	..	..	..	..	..	..	0.0	..
United Kingdom	14.3	11.4	2.9	5.3	0.9	0.0	0.0	0.2	0.1	7.0
United States	13.5	11.8	1.6	4.8	1.2	0.0	0.0	0.4	0.3	4.7
Uruguay	13.0	11.0	2.0	2.4	0.0	0.0	0.3	0.3	1.9	1.9
Uzbekistan	23.4	7.8	15.6	9.4	61.0	0.0	0.0	9.1	0.6	−45.7
Venezuela, RB	22.1	7.4	14.6	4.3	37.2	0.4	0.0	1.0	0.0	−19.6
Vietnam	27.1	8.0	19.1	2.8	8.1	0.0	0.7	1.0	0.4	11.6
West Bank and Gaza	−22.8	8.1	−31.0	..	0.0	0.0	0.0	..	..	..
Yemen, Rep.	19.2	8.9	10.3	..	37.6	0.0	0.0	1.2	0.0	..
Zambia	15.9	8.1	7.8	2.0	0.0	1.2	0.0	0.4	..	8.2a
Zimbabwe	..	..	..	6.9	..	..	..	..	0.5	..
World	**20.8 w**	**12.6 w**	**8.2 w**	**4.4 w**	**2.3 w**	**0.1 w**	**0.0 w**	**0.5 w**	**0.3**	**9.4 w**
Low income	23.1	8.9	14.2	3.4	5.8	0.3	0.9	1.2	0.6	8.7
Middle income	27.9	10.1	17.8	3.7	9.0	0.4	0.0	1.4	0.7	10.1
Lower middle income	30.7	9.8	20.9	3.2	7.9	0.4	0.0	1.6	0.7	13.4
Upper middle income	22.1	10.7	11.4	5.0	11.4	0.3	0.0	0.8	0.6	3.3
Low & middle income	27.2	9.9	17.3	3.7	8.5	0.4	0.2	1.3	0.6	10.0
East Asia & Pacific	41.8	9.2	32.6	2.3	3.9	0.3	0.1	1.8	0.8	28.1
Europe & Central Asia	21.9	10.7	11.2	4.1	11.2	0.1	0.0	1.9	0.6	1.5
Latin America & Carib.	19.5	10.3	9.2	4.2	6.4	0.7	0.0	0.5	0.5	5.3
Middle East & N. Africa	31.2	10.0	21.3	5.5	30.7	0.1	0.1	1.2	0.8	−6.2
South Asia	24.9	9.0	15.9	3.5	2.4	0.3	0.9	1.4	0.7	13.8
Sub-Saharan Africa	16.9	10.6	6.3	4.7	8.0	0.5	0.6	0.9	0.4	0.7
High income	19.3	13.2	6.1	4.6	0.8	0.0	0.0	0.3	0.3	9.3
Europe EMU	21.3	13.9	7.5	4.6	0.1	0.0	0.0	0.2	0.2	11.6

Note: The cutoff date for data in the table is February 2005; later revisions are not captured in this table.
a. Adjusted net savings do not include particulate emission damage.

Adjusted net savings measure the change in value of a specified set of assets, excluding capital gains. If a country's net savings are positive and the accounting includes a sufficiently broad range of assets, economic theory suggests that the present value of social welfare is increasing. Conversely, persistently negative adjusted net savings indicate that an economy is on an unsustainable path.

The table provides a test to check the extent to which today's rents from a number of natural resources and changes in human capital are balanced by net savings, that is, this generation's bequest to future generations.

Adjusted net savings are derived from standard national accounting measures of gross national savings by making four adjustments. First, estimates of capital consumption of produced assets are deducted to obtain net national savings. Second, current public expenditures on education are added to net national savings (in standard national accounting these expenditures are treated as consumption). Third, estimates of the depletion of a variety of natural resources are deducted to reflect the decline in asset values associated with their extraction and harvest. And fourth, deductions are made for damages from carbon dioxide and particulate emissions.

The exercise treats public education expenditures as an addition to savings effort. The adjustment made to savings goes in the right direction. However, because of the wide variability in the effectiveness of government education expenditures, these figures cannot be construed as the value of investments in human capital. The reader should bear in mind that current expenditure of $1 on education does not necessarily yield $1 of human capital. The calculation should also consider private education expenditure, but data are not available for a large number of countries.

While extensive, the accounting of natural resource depletion and pollution costs still has some gaps. Key estimates missing on the resource side include the value of fossil water extracted from aquifers, net depletion of fish stocks, and depletion and degradation of soils. Important pollutants affecting human health and economic assets are excluded because no internationally comparable data are widely available on damage from ground-level ozone or from sulfur oxides.

Estimates of resource depletion are based on the calculation of unit resource rents. An economic rent represents an excess return to a given factor of production—in this case the returns from resource extraction or harvest are higher than the normal rate of return on capital. Natural resources give rise to rents because they are not produced; in contrast, for produced goods and services competitive forces will expand supply until economic profits are driven to zero. For each type of resource and each country, unit resource rents are derived by taking the difference between world prices and the average unit extraction or harvest costs (including a "normal" return on capital). Unit rents are then multiplied by the physical quantity extracted or harvested in order to arrive at a depletion figure. This figure is one of a range of depletion estimates that are possible, depending on the assumptions made about future quantities, prices, and costs, and there is reason to believe that it is at the high end of the range. World prices are used in order to reflect the social opportunity cost of depleting minerals and energy. Researchers should keep this in mind when using the depletion estimates. In general, the data on energy and mineral depletion should not be considered a substitute for energy and mineral gross domestic product.

A positive net depletion figure for forest resources implies that the harvest rate exceeds the rate of natural growth; this is not the same as deforestation, which represents a change in land use (see Definitions for table 3.4). In principle, there should be an addition to savings in countries where growth exceeds harvest, but empirical estimates suggest that most of this net growth is in forested areas that cannot be exploited economically at present. Because the depletion estimates reflect only timber values, they ignore all the external and nontimber benefits associated with standing forests.

Pollution damage from emissions of carbon dioxide is calculated as the marginal social cost per unit multiplied by the increase in the stock of carbon dioxide. The unit damage figure represents the present value of global damage to economic assets and to human welfare over the time the unit of pollution remains in the atmosphere.

Pollution damage from particulate emissions is estimated by valuing the human health effects from exposure to particulate matter less than 10 microns in diameter. The estimates are calculated as willingness to pay to avoid mortality attributable to particulate emissions (in particular, mortality relating to cardiopulmonary disease in adults, lung cancer in adults, and acute respiratory infections in children).

For a detailed methodological note see www.worldbank.org/data.

• Gross national savings are calculated as the difference between gross national income and public and private consumption, plus net current transfers. • Consumption of fixed capital represents the replacement value of capital used up in the process of production. • Net national savings are equal to gross national savings less the value of consumption of fixed capital. • Education expenditure refers to public current operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment. • Energy depletion is equal to the product of unit resource rents and the physical quantities of energy extracted. It covers coal, crude oil, and natural gas. • Mineral depletion is equal to the product of unit resource rents and the physical quantities of minerals extracted. It refers to tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate. • Net forest depletion is calculated as the product of unit resource rents and the excess of roundwood harvest over natural growth. • Carbon dioxide emissions damage is estimated to be $20 per ton of carbon (the unit damage in 1995 U.S. dollars) times the number of tons of carbon emitted. • Particulate emissions damage is calculated as the willingness to pay to avoid mortality attributable to particulate emissions. • Adjusted net savings are equal to net national savings plus education expenditure and minus energy depletion, mineral depletion, net forest depletion, and carbon dioxide and particulate emissions damage.

Gross national savings are derived from the World Bank's national accounts data files, described in the Economy section. Consumption of fixed capital is from the United Nations Statistics Division's National Accounts Statistics: Main Aggregates and Detailed Tables, 1997, extrapolated to 2003. The education expenditure data are from the United Nations Statistics Division's Statistical Yearbook 1997 and from the UNESCO Institute for Statistics online database. Missing data are estimated. The wide range of data sources and estimation methods used to arrive at resource depletion estimates are described in a World Bank working paper, "Estimating National Wealth" (Kunte and others 1998). The unit damage figure for carbon dioxide emissions is from Fankhauser (1995). The estimates of damage from particulate emissions are from Pandey and others (2003). The conceptual underpinnings of the savings measure appear in Hamilton and Clemens (1999).