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# Savings in Latin America after the mid-1990's. Determinants, constraints and policies

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# Abstract

National savings and growth in Latin America have remained low in the 1990s and 2000s. The low level of national saving rates has forced Latin American countries to depend on foreign savings to finance investment and growth, which compounds the challenges for raising investment and growth prospects. This study extends the research on savings in three different dimensions: (1) in a time perspective, it extend the analysis on savings to the most recent years: we examine the period 1990-2003; (2) it examines the causality between savings, investment, and growth mostly uncovered in previous research on savings in Latin America; and (3) it examines the role of enterprises in the generation of national savings for several Latin American countries. We take a sample of nine Latin American countries.

Our evidence showed that the main results found in the 1970s, 1980s, and early 1990s regarding the factors associated with national savings also hold in the period 1990-2003. However, we found no evidence of association between national savings and the level of income (per capita GDP), dependency ratio, domestic interest rates, terms of trade, and income distribution. The relatively smaller size of our panel may explain the lack of correlation found in the cases of the income level and dependency ratio. The lack of correlation between national savings and the interest rates, terms of trade, and income distribution is in line with the ambiguous evidence found in the literature. Our evidence suggests a mutual causality between national savings and growth. Our results also suggest that households an the government appear to internalize the savings of enterprises. Further research aimed at compiling disaggregated series for the savings of households, enterprises, and the government would be required, however, to reach more definitive conclusions and policy implications.

# I. Introduction

National savings and growth in Latin America have remained low in the 1990s and 2000s despite the advanced progress of stabilization and reforms achieved after the recovery from 1980s "lost decade". The average national saving rate for the region as a whole has not surpassed the modest 20%-23% rates observed in the 1960s and 1970s and the divergence with more developed regions and East Asia has continued to widen. Investment rates and per capita GDP growth have mirrored the disappointed results exhibited by national savings. With some few exceptions, the low level of national saving rates has forced Latin American countries to depend on foreign savings to finance investment and growth. The increased volatility international capital flows and external financing conditions during this new globalization era have compounded the challenges for raising investment and growth prospects.[1]

Influential research on the subject of savings was produced in the context of two symposiums organized by the Inter-American Development Bank (IDB) and the World Bank (WB) during 1998-99. The WB research examined savings worldwide and was disseminated through the World Economic Review and the Review of Economics and Statistics in 2000. The IDB research focused on savings in Latin America and was published in an IDB book edited by Reinhart (1999). In both cases the work used data from the mid-1965's to the mid-1990s. Most of the research results agreed on some key determinants

[1] The high correlation of national investments and domestic savings in this new globalization era demonstrates that the financial markets are not more integrated today than during the "first wave of globalization" second half of the 1980s and up to The World War I), although a change occurred between the two periods in the composition of capital flows, especially an increase of the short-term capital flows relatively to long-term capital flows is observed in the current globalization wave (Solimano and Gutiérrez, 2006).

of national and private saving rates: the growth rate (of per capita GDP), the level of economic development (GDP level), the fiscal deficit, foreign savings, and economic stability. Interest rates, financial development, and income distribution were found to have ambiguous effects on savings. The bulk of the work looked at aggregate national, private savings, and household savings. On the issue of causality between savings and growth the literature has generally assumed that growth precedes savings as most of the econometric work use growth to explain national as well as private saving.[2] Most of the work has assumed that households "pierce the corporate veil" implying no independent role for enterprises as a source of national saving.

This study extends the research on savings in three different dimensions: (1) in a time perspective, it extend the analysis on savings to the most recent years: we examine the period 1990-2003; (2) it examines the causality between savings, investment, and growth mostly uncovered in previous research on savings in Latin America; and (3) it examines the role of enterprises in the generation of national savings for several Latin American countries. We take a sample of nine Latin American countries (three large, three medium size and three small countries in terms of GDP size (in 2000 US dollars), representing the spectrum of regional countries. The selection of countries was guided by the availability and quality of the raw data.

The study is organized as follows: In the second section, we present some key stylized facts for our sample of Latin American countries regarding savings, investment, and growth in the period 1990-2003. We show some summary descriptive statistics for the countries studies and compare them to other regions of the world. In the third section, we summarize some of the key findings of selected research on the determinants of savings up to the mid-1990s found in the WB and IDB mentioned research. In the fourth section, we provide some empirical evidence for the period 1990-2003. In the fifth section, we examine the interaction between national saving and growth and the issue of causality. In the sixth section, we review the role of firms as a source of national saving. In the seventh section we provide some key Policy Implications and in the last section we summarize the main Conclusions of our research.

[2] See also Schmidt-Hebbel, Serven, and Solimano (1996) for a comprehensive survey on research on savings summarizing the status of the literature prior to the IDB and WB research mentioned above.

# II. Stylized facts about savings, investment and growth

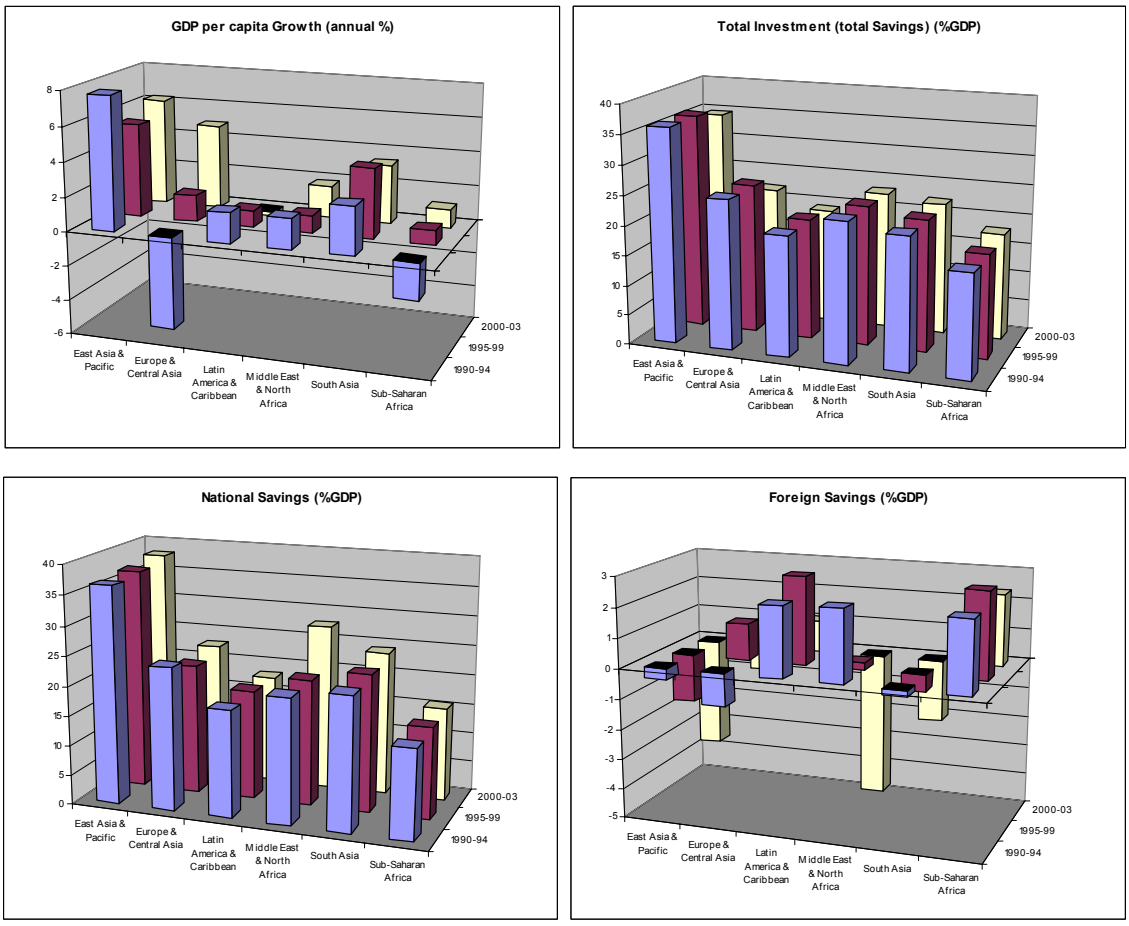
Comparing the data on savings, investment, and growth across regions since 1990 for our sample of Latin American countries we observe that the region has continued to exhibited low saving and investment rates, and low and volatile growth (Figure 1).

**Low National Savings:** Latin America was the only region that exhibited lower savings in the early 2000's as compared to the second half of the 1990's (Tables 1 and 2). The gap in national savings rates between Latin America and East Asia widened to about 20 percentage points during 2000-03 from about 18 points in 1990-1994. In 2000-03, the average national savings rate in East Asia was 38% compared to about 18% in Latin America. Low national saving has been a major constraint on investment and growth given the high correlation between national savings and investment in a context of imperfect capital movements (see for example Gavin, Haussmann, and Talvi, 1997; Loayza, Schmidt-Hebbel, and Serven, 2000a and 2000b); and Solimano and Gutiérrez, 2006). Fiscal imbalances have been a major source of low national saving in Latin America. Public savings can be a mechanism to spur national savings given the empirical evidence showing that an increase in public savings is less than fully offset by a decline in private savings (Tables 3 and 4). Low national saving has increased the vulnerability of the region to the swings of foreign capital flows as foreign saving is more volatile than national saving. Workers remittances help to attenuate the volatility of foreign savings as they are less affected by changes in international capital markets than other forms of foreign financing, which is the case of some countries in Central America (El Salvador, Guatemala, and Nicaragua).

**Low Investment:** Latin America, as most developing countries, has been subjected to foreign credit constraints, making investment highly dependent on national savings. Although investment is also financed with foreign savings, the contribution of foreign savings to total savings has been modest (below 3% of GDP during 1990-2003). Low investment has placed a constraint on growth as gross capital formation is a main source of productivity and economic growth in the region (see for example Haussmann, Rodrik, and Velasco, 2004; Gutiérrez, 2005; and Solimano ed., 2006). Physical investment, mainly in the form of machinery and equipment, provides a main channel for technological transfers. Investment rates in Latin America have been at the bottom when compared to other world regions. We also observe that the investment rates of Argentina, El Salvador, and Colombia, have been even below the mean and median investment rates of the Sub-Saharan African region (Table 1 and 2).

**Low Growth:** We observe low per capita GDP growth in Latin America during 1990-2003 and a negative trend for the region as a whole. The average growth rate for the region fell from 1.7% in 1990-94 to less than 1% in 1995-99, and below 0% during 2000-03. Growth has been on average below the rates observed in the 1960s and second half of the 1970s. In East Asia by contrast average growth was above 5% during the whole 1990-2003 period and accelerated in 2000-03 (Table 2). Low national saving has been mirrored by low investment, given the high association between both variables, limiting the scope for productivity and economic growth (see also Haussmann, Rodrik, and Velasco, 2004; and Solimano ed., 2006).

**FIGURE 1**
**GROWTH, INVESTMENT AND SAVING INDICATORS: COMPARISON ACROSS REGIONS**




**Source:** Own elaboration (Raw data from WDI, World Bank).

**TABLE 1**

**SAVINGS: DESCRIPTIVE INDICATORS LATIN AMERICA**

| | Total Savings | | | National Savings | | | Foreign Savings | | | GDPpc growth | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 |
| **Argentina** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 16.87 | 18.67 | 14.36 | 14.89 | 15.11 | 16.88 | 1.97 | 3.56 | -2.51 | 5.64 | 1.20 | -2.65 |
| Median | 16.70 | 18.08 | 14.65 | 15.61 | 15.18 | 16.85 | 3.06 | 4.19 | -2.05 | 4.75 | 2.83 | -3.46 |
| Std. Deviation | 2.62 | 0.92 | 1.80 | 1.19 | 0.80 | 4.58 | 2.54 | 1.22 | 5.76 | 6.00 | 5.07 | 8.20 |
| Var. Coefficient | 0.16 | 0.05 | 0.12 | 0.08 | 0.05 | 0.27 | 0.83 | 0.29 | -2.81 | 1.26 | 1.79 | -2.37 |
| Min | 14.00 | 17.94 | 11.96 | 13.56 | 13.80 | 12.77 | -2.05 | 2.02 | -9.08 | -3.43 | -4.29 | -11.66 |
| Max | 19.94 | 19.93 | 16.19 | 16.04 | 15.91 | 21.04 | 4.33 | 4.86 | 3.14 | 11.47 | 7.00 | 7.97 |
| **Brazil** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 20.37 | 21.25 | 20.12 | 19.83 | 17.51 | 17.80 | 0.55 | 3.75 | 2.32 | -0.11 | 0.88 | 0.59 |
| Median | 20.17 | 21.12 | 20.58 | 20.09 | 17.10 | 17.88 | 0.87 | 3.44 | 2.76 | -0.32 | 1.32 | 0.32 |
| Std. Deviation | 1.21 | 0.70 | 1.71 | 1.06 | 1.18 | 0.91 | 0.98 | 0.81 | 2.46 | 4.16 | 1.65 | 1.90 |
| Var. Coefficient | 0.06 | 0.03 | 0.08 | 0.05 | 0.07 | 0.05 | 1.12 | 0.23 | 0.89 | -12.82 | 1.25 | 6.01 |
| Min | 18.93 | 20.43 | 17.77 | 18.66 | 16.35 | 16.76 | -1.16 | 2.82 | -0.68 | -5.89 | -1.18 | -1.39 |
| Max | 22.15 | 22.29 | 21.54 | 21.27 | 19.47 | 18.67 | 1.25 | 4.76 | 4.44 | 4.38 | 2.77 | 3.13 |
| **Chile** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 24.41 | 25.73 | 22.32 | 21.80 | 21.79 | 21.05 | 2.62 | 3.95 | 1.28 | 5.55 | 4.16 | 1.92 |
| Median | 24.10 | 26.88 | 22.21 | 21.49 | 21.55 | 20.81 | 2.32 | 5.31 | 1.15 | 5.23 | 5.86 | 1.81 |
| Std. Deviation | 1.48 | 2.54 | 1.45 | 0.96 | 1.26 | 1.74 | 1.93 | 2.88 | 0.57 | 3.15 | 4.33 | 0.90 |
| Var. Coefficient | 0.06 | 0.09 | 0.07 | 0.04 | 0.06 | 0.08 | 0.83 | 0.54 | 0.49 | 0.60 | 0.74 | 0.50 |
| Min | 22.55 | 21.34 | 20.69 | 20.94 | 20.57 | 19.20 | 0.29 | 0.02 | 0.82 | 1.92 | -2.43 | 0.97 |
| Max | 26.50 | 27.43 | 24.18 | 23.23 | 23.93 | 23.36 | 5.56 | 6.86 | 1.99 | 10.41 | 8.95 | 3.07 |
| **Colombia** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 19.60 | 20.30 | 14.83 | 20.03 | 14.65 | 14.19 | -0.43 | 5.64 | 0.64 | 2.30 | -0.51 | 0.76 |
| Median | 18.50 | 20.92 | 15.17 | 19.18 | 13.46 | 14.04 | -1.68 | 7.03 | 1.13 | 3.01 | 0.10 | 0.61 |
| Std. Deviation | 3.90 | 4.73 | 0.76 | 2.23 | 2.33 | 0.59 | 5.35 | 3.43 | 1.34 | 1.82 | 3.47 | 1.15 |
| Var. Coefficient | 0.21 | 0.23 | 0.05 | 0.12 | 0.17 | 0.04 | -3.18 | 0.49 | 1.19 | 0.60 | 35.50 | 1.89 |
| Min | 15.95 | 12.88 | 13.69 | 17.86 | 12.81 | 13.65 | -7.11 | -0.47 | -1.34 | 0.30 | -5.96 | -0.38 |
| Max | 25.54 | 25.80 | 15.29 | 23.06 | 18.53 | 15.03 | 6.36 | 7.47 | 1.64 | 3.98 | 3.17 | 2.20 |
| **Costa Rica** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 21.28 | 17.99 | 19.96 | 15.13 | 13.47 | 13.85 | 6.16 | 4.52 | 6.11 | 2.83 | 3.21 | 1.25 |
| Median | 20.24 | 18.08 | 20.31 | 14.70 | 13.28 | 13.96 | 5.35 | 4.80 | 6.34 | 2.43 | 3.39 | 0.40 |
| Std. Deviation | 3.55 | 1.69 | 2.17 | 2.60 | 1.46 | 1.14 | 1.37 | 0.79 | 1.28 | 2.85 | 3.07 | 2.49 |
| Var. Coefficient | 0.18 | 0.09 | 0.11 | 0.18 | 0.11 | 0.08 | 0.26 | 0.16 | 0.20 | 1.17 | 0.91 | 6.23 |
| Min | 17.94 | 15.96 | 17.01 | 12.90 | 11.98 | 12.50 | 5.04 | 3.59 | 4.51 | -0.38 | -1.20 | -0.60 |
| Max | 27.31 | 20.54 | 22.23 | 19.49 | 15.27 | 14.99 | 7.83 | 5.27 | 7.24 | 6.47 | 6.14 | 4.81 |

**Table 1** (continued)

| | | Total Savings | | | National Savings | | | Foreign Savings | | | GDPpc growth | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 |
| | Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| **Ecuador** | Mean | 20.09 | 20.54 | 25.29 | 14.52 | 18.49 | 23.40 | 5.57 | 2.05 | 1.89 | 0.67 | -1.00 | 1.92 |
| | Median | 20.43 | 21.46 | 26.66 | 14.82 | 19.50 | 23.05 | 5.50 | 1.80 | 3.61 | 0.36 | 0.38 | 1.54 |
| | Std. Deviation | 1.47 | 3.83 | 3.58 | 2.24 | 1.69 | 1.81 | 2.72 | 5.20 | 5.19 | 2.03 | 3.91 | 1.11 |
| | Var. Coefficient | 0.07 | 0.18 | 0.13 | 0.15 | 0.09 | 0.08 | 0.49 | 2.88 | 1.44 | 5.56 | 10.16 | 0.72 |
| | Min | 18.24 | 14.73 | 20.11 | 11.24 | 16.64 | 21.69 | 2.03 | -5.27 | -5.70 | -1.80 | -7.80 | 1.08 |
| | Max | 21.87 | 25.27 | 27.72 | 16.83 | 19.99 | 25.81 | 9.67 | 8.61 | 6.03 | 2.88 | 2.20 | 3.52 |
| | Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| **Mexico** | Mean | 22.50 | 23.28 | 21.37 | 17.04 | 21.24 | 18.87 | 5.45 | 2.04 | 2.50 | 1.96 | 1.34 | 0.67 |
| | Median | 23.14 | 23.42 | 20.96 | 16.55 | 20.45 | 18.40 | 5.86 | 1.99 | 2.61 | 2.30 | 3.45 | -0.43 |
| | Std. Deviation | 1.07 | 2.23 | 1.68 | 2.35 | 1.83 | 1.06 | 1.69 | 1.41 | 0.81 | 1.14 | 5.22 | 2.99 |
| | Var. Coefficient | 0.05 | 0.10 | 0.08 | 0.14 | 0.09 | 0.06 | 0.29 | 0.71 | 0.31 | 0.50 | 1.51 | -6.89 |
| | Min | 21.00 | 19.78 | 19.83 | 14.70 | 19.19 | 18.21 | 2.87 | 0.60 | 1.50 | 0.11 | -7.81 | -1.54 |
| | Max | 23.33 | 25.82 | 23.73 | 20.27 | 23.84 | 20.45 | 7.02 | 3.86 | 3.29 | 3.10 | 5.22 | 5.07 |
| | Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| **Peru** | Mean | 18.53 | 23.36 | 19.13 | 13.79 | 17.74 | 17.25 | 4.74 | 5.62 | 1.88 | 0.82 | 1.78 | 1.38 |
| | Median | 17.31 | 23.57 | 18.80 | 13.30 | 17.42 | 17.33 | 5.23 | 5.89 | 1.73 | 0.18 | 0.55 | 1.78 |
| | Std. Deviation | 2.33 | 1.27 | 0.76 | 2.95 | 0.81 | 0.36 | 2.77 | 1.46 | 0.58 | 6.52 | 3.73 | 1.97 |
| | Var. Coefficient | 0.13 | 0.05 | 0.04 | 0.22 | 0.05 | 0.02 | 0.53 | 0.25 | 0.34 | 36.68 | 6.83 | 1.10 |
| | Min | 16.48 | 21.48 | 18.64 | 9.88 | 16.95 | 16.77 | 0.09 | 3.51 | 1.36 | -6.97 | -2.31 | -1.32 |
| | Max | 22.25 | 24.83 | 20.26 | 17.02 | 19.03 | 17.58 | 7.41 | 7.41 | 2.69 | 10.57 | 6.40 | 3.28 |
| | Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| **El Salvador** | Mean | 17.23 | 16.85 | 16.60 | 15.75 | 16.03 | 14.84 | 1.49 | 0.82 | 1.76 | 3.81 | 1.87 | 0.31 |
| | Median | 18.53 | 16.44 | 16.59 | 16.96 | 16.21 | 14.62 | 1.57 | 0.93 | 2.16 | 3.76 | 1.88 | 0.30 |
| | Std. Deviation | 2.49 | 2.23 | 0.27 | 3.50 | 1.32 | 1.68 | 1.11 | 1.54 | 1.84 | 1.56 | 1.58 | 0.30 |
| | Var. Coefficient | 0.13 | 0.14 | 0.02 | 0.21 | 0.08 | 0.11 | 0.70 | 1.65 | 0.85 | 0.42 | 0.84 | 0.99 |
| | Min | 13.86 | 14.81 | 16.30 | 11.36 | 14.53 | 13.28 | 0.24 | -1.40 | -0.55 | 1.66 | -0.44 | 0.02 |
| | Max | 19.80 | 20.32 | 16.93 | 19.31 | 17.82 | 16.85 | 2.63 | 2.51 | 3.27 | 5.45 | 3.99 | 0.63 |

**Source:** Own elaboration (Raw data from WDI, World Bank).

**TABLE 2**

**SAVINGS: DESCRIPTIVE INDICATORS WORLD REGIONS**

| | Total savings | | | National Savings | | | Foreign Savings | | | GDPpc growth | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 |
| **East Asia & Pacific** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 36.12 | 35.43 | 34.54 | 36.49 | 37.02 | 38.12 | -0.37 | -1.59 | -3.58 | 7.74 | 5.41 | 6.20 |
| Median | 34.52 | 36.31 | 34.23 | 35.48 | 36.97 | 37.89 | -0.53 | -1.84 | -3.66 | 9.29 | 5.65 | 6.27 |
| Std. Deviation | 2.96 | 3.12 | 2.46 | 1.90 | 1.14 | 2.75 | 1.57 | 2.42 | 0.38 | 2.50 | 2.86 | 0.91 |
| Var. Coefficient | 0.09 | 0.09 | 0.07 | 0.05 | 0.03 | 0.07 | -2.94 | -1.32 | -0.10 | 0.27 | 0.51 | 0.14 |
| Min | 33.54 | 31.69 | 31.95 | 34.88 | 35.25 | 35.04 | -1.94 | -4.31 | -3.92 | 3.84 | 0.94 | 5.02 |
| Max | 39.90 | 38.76 | 37.75 | 39.24 | 38.15 | 41.68 | 2.20 | 0.88 | -3.09 | 9.50 | 8.25 | 7.23 |
| **Europe & Central Asia** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 1 | 5 | 4 | 1 | 5 | 4 | 5 | 5 | 4 |
| Mean | 25.14 | 22.99 | 22.01 | 23.94 | 21.78 | 22.80 | -1.06 | 1.21 | -0.79 | -5.38 | 1.54 | 4.88 |
| Median | 25.33 | 23.78 | 21.87 | 23.94 | 22.02 | 22.62 | -1.06 | 1.61 | -0.82 | -6.31 | 1.61 | 5.52 |
| Std. Deviation | 1.70 | 1.42 | 0.44 | . | 1.29 | 1.21 | . | 1.69 | 0.98 | 2.19 | 1.22 | 2.00 |
| Var. Coefficient | 0.07 | 0.06 | 0.02 | . | 0.06 | 0.05 | . | 1.05 | -1.19 | -0.35 | 0.76 | 0.36 |
| Min | 22.87 | 21.08 | 21.66 | 23.94 | 20.25 | 21.70 | -1.06 | -1.38 | -1.67 | -7.43 | 0.41 | 1.98 |
| Max | 27.14 | 24.15 | 22.65 | 23.94 | 23.43 | 24.25 | -1.06 | 3.06 | 0.17 | -2.39 | 3.42 | 6.53 |
| **Latin America & Caribbean** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 20.21 | 21.31 | 19.19 | 17.89 | 18.42 | 18.17 | 2.32 | 2.89 | 1.02 | 1.72 | 0.94 | -0.23 |
| Median | 20.13 | 20.92 | 19.15 | 17.75 | 18.84 | 18.48 | 2.78 | 2.68 | 1.07 | 2.12 | 0.99 | -0.56 |
| Std. Deviation | 0.74 | 0.86 | 1.21 | 0.78 | 0.82 | 0.95 | 1.32 | 1.18 | 1.94 | 1.77 | 2.19 | 2.04 |
| Var. Coefficient | 0.04 | 0.04 | 0.06 | 0.04 | 0.04 | 0.05 | 0.48 | 0.44 | 1.81 | 0.83 | 2.21 | -3.66 |
| Min | 19.39 | 20.36 | 17.88 | 17.21 | 17.38 | 16.84 | 0.22 | 1.77 | -0.95 | -1.32 | -1.22 | -2.27 |
| Max | 21.19 | 22.36 | 20.59 | 19.17 | 19.15 | 18.87 | 3.47 | 4.69 | 2.90 | 3.11 | 3.93 | 2.45 |

**Table 2** (continued)

| | Total savings | | | National Savings | | | Foreign Savings | | | GDPpc growth | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 | 1990-94 | 1995-99 | 2000-03 |
| **Middle East & North Africa** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 23.41 | 21.47 | 23.12 | 21.03 | 21.24 | 27.85 | 2.39 | 0.23 | -4.73 | 1.75 | 1.01 | 1.85 |
| Median | 23.58 | 21.57 | 22.86 | 20.44 | 20.86 | 27.18 | 2.54 | -1.03 | -4.62 | 2.15 | 1.41 | 1.48 |
| Std. Deviation | 1.18 | 1.32 | 1.20 | 1.98 | 1.89 | 1.88 | 1.76 | 2.12 | 0.98 | 2.14 | 1.11 | 1.41 |
| Min | 21.89 | 19.83 | 22.10 | 19.10 | 18.62 | 26.44 | -0.14 | -1.48 | -5.95 | -0.99 | -0.20 | 0.73 |
| Max | 25.08 | 23.42 | 24.67 | 23.31 | 23.13 | 30.62 | 4.62 | 2.87 | -3.73 | 3.85 | 2.23 | 3.70 |
| **South Asia** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 22.13 | 22.49 | 22.16 | 22.34 | 23.02 | 24.19 | -0.21 | -0.53 | -2.03 | 2.75 | 3.98 | 3.38 |
| Median | 22.66 | 22.01 | 22.06 | 21.87 | 23.14 | 24.19 | -0.48 | -0.42 | -1.93 | 3.44 | 4.50 | 2.71 |
| Std. Deviation | 0.90 | 1.55 | 0.51 | 0.98 | 1.46 | 0.70 | 0.91 | 0.34 | 0.55 | 1.82 | 1.11 | 1.58 |
| Var. Coefficient | 0.04 | 0.07 | 0.02 | 0.04 | 0.06 | 0.03 | -1.90 | -0.82 | -0.29 | 0.53 | 0.25 | 0.58 |
| Min | 21.08 | 21.16 | 21.68 | 21.56 | 21.58 | 23.54 | -1.17 | -1.12 | -2.79 | -0.21 | 2.24 | 2.37 |
| Max | 22.86 | 25.04 | 22.86 | 23.83 | 25.27 | 24.86 | 1.23 | -0.24 | -1.48 | 4.58 | 4.92 | 5.74 |
| **Sub-Saharan Africa** | | | | | | | | | | | | |
| Obs | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 4 |
| Mean | 17.40 | 18.22 | 18.05 | 15.05 | 15.39 | 15.71 | 2.35 | 2.83 | 2.35 | -2.07 | 0.83 | 1.11 |
| Median | 17.40 | 18.24 | 18.04 | 15.13 | 15.32 | 15.55 | 2.77 | 2.75 | 2.32 | -2.09 | 0.82 | 0.97 |
| Std. Deviation | 0.67 | 0.43 | 0.71 | 1.46 | 1.79 | 0.71 | 1.21 | 1.93 | 0.50 | 1.25 | 0.92 | 0.37 |
| Var. Coefficient | 0.04 | 0.02 | 0.04 | 0.10 | 0.12 | 0.05 | 0.44 | 0.70 | 0.21 | -0.60 | 1.12 | 0.38 |
| Min | 16.37 | 17.71 | 17.28 | 13.55 | 13.77 | 15.11 | 0.81 | -0.04 | 1.80 | -3.85 | -0.07 | 0.83 |
| Max | 18.14 | 18.88 | 18.86 | 16.60 | 18.29 | 16.61 | 3.76 | 5.11 | 2.94 | -0.38 | 2.26 | 1.64 |

**Source:** WDI, World Bank.

# III. Factors associated with national savings

The research on savings has identified some key factors associated with the low and high national savings. Tables 3 and 4 summarize the key results from a selected literature. There is relative consensus about the positive association between national savings (and private savings) and income (level and growth rate),[3] macroeconomic stability, foreign borrowing constraints, and working age population. Consensus has also been built regarding the negative partial offset between public and private savings, and thus a positive correlation between public and national savings (evidence of partial Ricardian equivalence).

No consensus has been reached regarding the association between savings (national and private) and financial development (generally measured by the degree of monetization and credit to GDP ratios), savings and domestic real interest rates), and between savings and the distribution of income (and wealth). The association between savings and a private pension system has also been found controversial as it depends largely on fiscal policy developments and consumers' reaction. A move to a private funded pension system opens the road for the creation of institutional investors helping to enhance the availability of financial savings into domestic capital markets, but the evolution of the government budget and consumers' attitudes are key factors affecting national (and private) savings (Schmidt-Hebbel, 1998).

[3] Empirical estimates use the level and growth of GDP as proxy for the level and growth of national income in good part the availability and quality of GDP series are better than for national income data and because GDP and national income are generally highly correlated for developing countries.

**Savings and Income:** A positive association between national savings and current income levels is observed both in time series and cross section data (micro and aggregate) as savings (as a proportion of GDP) rises with the level of income per capita. The evidence has found a type of inverted "U" relation between savings and the level of income per capita (Masson, Bayoumi, and Samiei, 1998). It has become an accepted stylized fact that savings rates rise at the initial stages of development (although not at very low per capita income levels) and declines as the countries reach higher per capita income and more mature development levels (see also Ogaki, Ostry, and Reinhart 1995). In low-income countries that are closer to subsistence levels we may expect that most income be consumed (with little left for savings). Higher income levels make it possible to save more; however, the size of the effect declines as income raises, in line with a decline of investment and growth opportunities, the aging of the population, and lower fertility rates are features that tend to be observed in countries that approach higher per capita income levels.

Evidence is also extensive on the positive association between savings and growth (see Carrrol and Weil, 1994; Edwards, 1996); and Loayza, Schmidt-Hebbel, and Serven, 2000). The permanent income theory implies that consumption is determined by permanent (long run) income, implying that savings follows current (transitory) growth. The life-cycle model, first developed by Franco Modigliani, argues that productivity growth makes the working young richer than the old, and the young will be saving more than the old are dis-saving. Aggregate income growth would follow from increasing the lifetime profiles for succeeding generations.[4] In turn, habit formation in consumption is a factor that helps to rationalize the positive correlation between savings and growth. Carroll and Weil (1994) argued that people adjust consumption habits slowly, which makes savings positively related with current growth of income.

**Foreign Credit Constraints:** Theory says that one of the purposes of borrowing is to allow people to smooth consumption in face of shocks. However, consumption will follow more closely current income at low-income because credit constraints are more binding at those income levels. In contrast, consumption is expected to follow more closely permanent (or expected income) at higher income levels. Foreign credit restrictions are more relevant for low income and financially distressed middle-income countries; in those cases we should expect that consumption would adjust more to shocks, as smoothing is more difficult. In the context of foreign borrowing constraints, additional foreign savings is likely to lead to higher consumption and, ceteris paribus, lower national savings. There is evidence about a *negative* relationship between national and foreign savings, with the offsetting effect ranging between 50% and 70% (see Schmidt-Hebbel and Serven, 1999).

**Financial Development, Domestic Credit Constraints, and Interest Rates:** The research on financial development has found an ambiguous effect of financial variables on national savings. Deeper financial markets and strengthened prudential regulation of financial institutions help to enhance saving (and investment) opportunities by offering a wider variety of financial instruments to channel savings and also by providing more security (in the case of effective regulation) to investors. However, financial development is also often associated with an increased availability of credit for consumption relaxing domestic liquidity constraints. Savings can be discouraged as more credit becomes available, particularly credit for consumption.[5]

The association between interest rates and savings is also ambiguous theoretically (income and substitution effects may work in opposite directions) (Tables 3 and 4). The income effect produced by higher interest rates may be positive or negative depending whether the saver is a net wealth holder or a net debtor. The (positive) income effect of an increase in interest rates for a net wealth-holder may run in opposite direction than the substitution effect that induces a cut in current consumption (substituting for future consumption). The empirical evidence on the effects of interest

[4] In more extensive models of consumer behavior the relationship is theoretically ambiguous (Carroll and Weil, 1994).
[5] Most likely both effects interact affecting the results of the effects of financial development on savings (Piles and Reinhart, 1999).

rates on savings has proven to be inconclusive (see Schmidt-Hebbel and Serven, 1999). Some have explored the sensitivity of savings to the rate of interest as a function of income levels. Ogaki, Ostry, and Reinhart (1995) provided evidence showing that savings are more responsive to rates of return at higher income levels. At lower income levels people cannot smooth consumption over time. At higher income levels it is possible to save and dis-save. Thus, according to this evidence the inter-temporal elasticity of substitution between present and current consumption varies with the level of wealth. They concluded that saving rate and its sensitivity to the interest rate are a rising function of income.

**Macroeconomic Uncertainty:** Macroeconomic uncertainty is expected to have an ambiguous effect on savings. In the literature an important reason to save is the precautionary motive, as people would save more at times of uncertainty to anticipate the possibility of difficult times. One such a source of uncertainty is of macroeconomic nature. This can be reflected in high and erratic inflation, exchange rate volatility, cycles of boom and contraction, and instability in the financial system introducing uncertainty in the anticipation and appropriability of future cash flows and the opportunity cost of funds. One response to these uncertainties is capital flight as people leave domestic assets and it discourage savers as the returns and prospects for recovering their savings weakens due to this uncertainty (Edwards, 1996; and Taylor, 1996 and 1999).[6]

High inflation has been a factor strongly associated with macroeconomic instability, financial crisis, episodes that have depressed growth and savings. The relationship appears to be non-linear; however. The effects of low to moderate inflation on savings is bound to be very different from the impact of high or even explosive inflation of the type that destroys the payments and banking systems and financial savings along the way. The classic example is the hyperinflation of Germany in 1923 although there are more recent cases such as Argentina during the hyperinflation of the late 1980s and Brazil in the early 1990s. In 2001-2002 Argentina suffered a banking crises following the abandonment of the currency board adopted in 1991. In this later banking crisis, people (mainly from the middle class) --that believed in the system-- and had deposits in the banks experienced the loss of good part of their financial savings.

**Fiscal Policy:** Fiscal policy has been found to play a key role in the building of national savings, especially in developing countries. One channel is the size of the fiscal deficit or surpluses that has been found to affect the level of national saving rates. Low fiscal deficits or surpluses contribute to national savings, as complete Ricardian equivalence has been refuted empirically (i.e. an increase in public savings is not fully offset by a decline in private savings). This effect is stronger in developing countries subjected to subsistence consumption and liquidity constraints (see also Corbo and Schmidt-Hebbel, 1991). The evidence confirms the partial offset between government and private savings around (with the offset coefficient in the range 40%-70% (Tables 5 and 6). This means that 1% of additional government savings (in terms of GDP) adds about 0.5% of GDP to national savings. Another channel is the level of taxation on factors that affect savings as interest rates, dividends of firms or other variables.

**Demographics:** The age structure of population is another determinant of national savings. According to the life-cycle hypothesis a larger working population relative to the older population (or young family dependents) contributes to raise national savings. The working young are net savers and the retired old have often-negative savings. In economies with higher proportions of working populations the national savings rates would be higher than in ageing economies with higher shares of old people in their populations. Studies using cross-country data have been more successful in confirming the negative effect of dependency ratios (say the share of population below 15 and above 65) on saving, probably because demographic variables change slowly over time

[6] Precautionary motives may help to explain the positive association between saving and consumption of young consumers (who expect positive but uncertain future income growth) and the positive saving of retired people (Loayza, Schmidt-Hebbel, and Serven, 2000a and 2000b).

(Masson, Bayoumi, and Samiei, 1998). Some microeconomic studies conflict with the findings at country levels, which maybe partly due the aggregation of cohorts of different ages in macro studies. Bequests may also contribute to reduce aggregate savings even if the old do not dis-save (Carroll and Weil, 1994 and Deaton and Paxson, 2000). The literature mostly agrees on a negative correlation between age dependency ratios and national savings confirming the theory and empirical evidence (Tables 3 and 4).

**Additional Factors:** Richer people are expected to save more as a proportion of their income than poor people (savings is, in a way, a superior good). Some formulations make savings depending upon *functional* income distribution (i.e. Nicholas Kaldor who assumed that capitalists have a higher propensity to save than workers) whereas others make a link between *personal* income distribution and saving. While for the most part, the empirical literature based on cross-section micro-data suggest a positive relation between *personal* income inequality and overall personal savings, the evidence on this issue is more mixed at aggregate, country level. Empirical studies as Schmidt-Hebbel and Serven (1998 and 2000) indicate that cross-country data do not reveal a strong association between personal income distribution and aggregate saving. The authors show that this relation holds for samples of developing and developed countries, and is robust to alternative saving measures, income distribution indicators and functional forms.

New political economy literature emphasizes that regressive income distributions are a factor contributing to political instability and through this channel they may depress both growth and savings. Lower growth contributes to reduce savings through the growth-savings link but also political instability may discourage savings because of the uncertainties about saving prospects.

The terms of trade effect has been another factor frequently examined in the literature. The terms of trade effect is viewed as a transitory deviation of national income from its trend. The permanent income school built from Milton Friedman's consumption hypothesis would therefore argue that the additional income resulting from a terms of trade improvement would be mostly saved. The implied relaxation of the foreign credit constraints run against that effect, however, (see above). The evidence on the incidence of the terms most trade on national savings is inconclusive.

**TABLE 3**
**NATIONAL SAVINGS: DETERMINANTS**

| Variable Category | Specific Variable | Expected Sign | Empirical Findings |
|---|---|---|---|
| Income | Terms of trade: actual | 0 or + | + (1) |
| | Growth rate: actual | Ambiguous | + (1, 2, 3, 4) |
| | GDP percapita | Ambiguous | + (1, 4) |
| Rates of return | Interest rate | Ambiguous | |
| Uncertainty | Inflation or other measures of macro instability | Ambiguous | −(1) |
| Foreign borrowing constraints | Capital Flows / FDI | − | - (1) |
| Fiscal policy | Public saving | + | +(2) |
| | Public surplus | + | +(3) |
| Demographics | Old and/or young-age population dependency | − | −(4) |
| Income and wealth distribution | Income concentration | + | +/- (4) |
| | Gini coefficient | + | + (4) |

| | Research | Sample | Estimation procedure |
|---|---|---|---|
| 1. | Gavin, M.; Hausmann, R.; Talvi, E. (1997). "Saving Behavior in Latin America: Overview and Policy Issues". Inter-American Development Bank, Working Paper R-346. | 6 East asian countries, 20 Latinamerican countries | Panel: GLS |
| 2. | Jappelli, T. and Pagano, M. (1996): "The Determinats of Savings : Lessons From Italy". Inter-American Development Bank, Research Department, Working Paper R-313. | G-10 countries (1960-94) | Panel: OLS |
| 3. | Jappelli, T. and Pagano, M. (1995): "Saving, Growth, and Liquidity Constraints", Quarterly. Journal of Economics 109: 83-109. | 22 OECD countries, 8 non-OECD countries (1960-87) | Panel: OLS, IV |
| 4. | Schmidt-Hebbel, K. and Serven, L. (2000). "Does Income Inequality raise Aggregate Saving?" Journal of Development Economics, 61: 417-46. | 20 Industrial countries, 62 Developing countries (1965-94 ; 5 year averages) | Panel: OLS, GMM |

**Source:** author elaboration.

**TABLE 4**
**PRIVATE SAVINGS: DETERMINANTS**

| | Variable | Expected Sign | Empirical Findings |
|---|---|---|---|
| Persistence | Lagged private saving rate | Ambiguous | +(6, 2) |
| Income | Income level | | |
| | Actual | 0 or + | + (3, 9, 5, 1, 2) 0 (1, 7) |
| | Temporary/permanent | + / 0 or + | 0 / 0 (2) |
| | Terms of trade | | |
| | Actual | 0 or + | + (9, 1, 7, 2) |
| | Temporary/permanent | + / 0 or + | + / + (2) |
| | Growth rate: actual | Ambiguous | + (9, 5, 2) 0 (1, 1, 7) |
| Rates of return | Real interest rate | Ambiguous | –(2) 0 (3, 5, 1, 7) + (9, 10) |
| Uncertainty | Variance of innovations to saving determinants | + | |
| | Inflation or other measures of macroeconomic instability | Ambiguous | –(1) 0 (3, 9, 5, 7), + (2, 2) |
| | Measures of political instability | + | |
| Domestic borrowing constraints | Private credit flows | – | + (5) –(2) |
| | Broad money flows | – | |
| | Income | – | |
| Foreign borrowing constraints | Foreign lending | – | |
| | Capital Flows / FDI | – | -(2, 6, 10) |
| | Current account deficit | – | –(3, 9, 5, 2) |
| Financial depth | Private or domestic credit stocks | Ambiguous | –(1) |
| | Money stocks | Ambiguous | + (3, 5, 1) 0 (2) |
| Fiscal policy | Public saving | – | –(2, 3, 5, 6, 2, 10) |
| | Public surplus | – | –(9, 1, 7) 0 (1) |
| | Public consumption | Ambiguous | –(9, 7) |
| Pension system | Pay-as-you-go pension transfers | 0 or – | –(5, 1, 1) |
| | Mandatory fully funded pension contributions | 0 or + | + (1) |
| | Fully funded pension assets | Ambiguous | 0 / + (1) |
| Demographics | Old- and/or young-age dependency | – | –(9, 5, 1, 2) 0 (1, 7) |
| | Urbanization | Ambiguous | –(5, 2) |
| Distribution of income and wealth | Income concentration | Ambiguous | 0 (5) |
| | Wealth concentration | Ambiguous | |
| | Capital income share | + | |

| Research | Sample | Estimation procedure |
|---|---|---|
| 1. Bailliu, J. and H. Reisen (1998): "Do Funded Pensions contribute to Higher Savings? A Cross-Country Analysis", OECD Development Centre manuscript, Paris. | 11 OECD and non-OECD countries (1982-93) | PANEL: OLS, IV |
| 2. Cardenas, M., and Escobar, A. (1997): "Determinats of Savings in Colombia: 1924-1994". Inter-American Development Bank, Research Department, Working R-Paper 310. | Colombia (1965-94) | VAR |
| 3. Corbo, V. and Schmidt-Hebbel, K. (1991). "Public Policies and Saving in Developing Countries". Journal of Development Economics, Vol. 36 (1): 89-115. | 13 Developing countries (1980-87) | Panel: OLS |
| 4. Dayal-Ghulati, A. and C. Thimann (1997): "Saving in Southeast Asia and Latin America compared: Searching for Policy Lessons", IMF Working Paper WP/97/110. | 5 Southeast Asian countries, 9 Latin American countries (1970-95) | Panel: OLS |
| 5. Edwards, S. (1996). "Why are Latin America's savings rates so low? An international comparative analysis". Journal of Development Economics, Vol. 51 (1) 5-44. | 36 countries (1970-92) | Panel: IV |
| 6. Gonzales, E.; Levano,C; and LLontop, P.: "Determinantes del Ahorro Interno y Ajuste Estructural en el Peri, 1990-1995. Inter-American Development Bank, Research Department, Working R-Paper 327. | Peru (1950-94) | VAR |

**Table 4** (continued)

| Variable | Expected Sign | Empirical Findings |
|---|---|---|
| 7. Haque, N.U., M.H. Pesaran, and S. Sharma (1999): "Neglected Heterogeneity and Dynamics in Cross-Country Savings Regressions", IMF Working Paper, International Monetary Fund, Washington, DC, May. | 20 OECD countries (1972-1993) | Panel: OLS, GLS |
| 8. Loayza N., Schmidt-Hebbel K., Serven L. (2000). "What Drives Private Saving Across the World?", Review of Economics and Statistics, MIT Press, Vol. 82 (2), pages 165-181. | 150 countries (1950-1994) | Panel: GMM-IV |
| 9. Masson, P.; Bayoumi, T. and Samiei, H. (1998): "International Evidence on the Determinants of Private Saving", World Bank Economic Review, Vol. 12 (3): 483-501. | 21 Industrial countries (1971-93), 40 Developing countries (1982-93) | Panel: OLS, GLS, IV |
| 10. Vergara, Rodrigo (2001): "Determinantes del ahorro privado en Chile", in Morande Felipe; Vergara, Rodrigo (eds.) "Análisis empírico del ahorro en Chile", Serie Banca Central, Análisis y Políticas Económicas. Vol. 1. Banco Central de Chile. | Chile (1988 - 2000) | OLS |

**Source**: author elaboration.

# IV. Estimation

In this section we use regression analysis to obtain empirical evidence about key factors associated with national using panel data for the nine selected Latin American countries for the period 1990-2003. We selected nine Latin American countries based on the quality and availability of the data required. We selected three large, three medium, and three small-size countries (in terms of US dollars 2000 GDP form the WDI) to better represent the variety of country sizes in Latin America. The countries selected in this study are: Argentina, Brazil, Mexico (large-size); Colombia, Chile, Peru (medium-size); and Costa Rica, Ecuador, and El Salvador (small-size).

## 4.1 Methodological note

In order to examine a wide variety of saving "determinants" we estimated reduced-form linear specifications rather than a specific model.[7] We used the stylized facts and selected research (summarized in Tables 3 and 4) to select the exogenous variables to use in the estimations. We run panel regressions using three methods: pool OLS, fixed affects and random effects. In Table 5 we show the results for the selected equations highlighting the regressions that we consider the most acceptable in terms of the econometric results. We also used Hausman and Breusch-Pagan tests for selecting the highlighted equations.[8]

[7] Mutual causality is likely to be present in the interaction between savings and growth, however.

[8] We considered working with dynamic panel and co-integration techniques, but we declined because of the small relative size of our panel.

The dependent variable we used in the regressions is the national savings rate. The independent variables include: GDP per capita growth, GDP, foreign saving (current account balance with opposite sign), investment, government balance (central or general government balance, which ever was available, as published in the International Financial Statistics (IFS) by the International Monetary Fund (IMF) the annual inflation rate, real deposit interest rate, aggregate money: M2 (current deposits plus saving deposits) and M3 (M2 plus other financial instruments considered proxies for money), terms of trade (relative price of goods exports to goods imports), openness (proportion of exports plus imports in total GDP in US dollars), the GINI index of income distribution, the dependency ratio (proportion of the he population below 15 and above 64 years old in total population), and foreign direct investment net inflows (FDI). Most of the data was obtained from the World Development Indicators (WDI) of the World Bank (WB) and updated from national sources. We generated panels ranging from 99 to 128 observations.

We used three types of specifications based on pooled OLS, fixed and random models.[9] The OLS pooled basic model ignores the panel structure of the data, treating observations as being serially uncorrelated for a given country. In the fixed effects model, the individual intercepts are free to take any value whereas in the random model, the individual effects become part of the error term. The fixed and random models take advantage of the panel structure and correct for the potential systematic tendencies of the error terms across countries. The fixed effect model considered in this study has constant slopes and intercepts differing across countries. In the random model the intercepts take the form of a random variable with a mean value and a random error, which is country specific and constant over time.[10]

We used the Hausman (H) and Breusch-Pagan (B-P) tests to discriminate between fixed and random estimated equations.[11] The fixed and random effects models were also tested for heterocedasticity and residual autocorrelation.[12]

## 4.2 Results

The main results obtained from our estimates are reported in Table 5. The evidence verified a positive association between savings and growth (growth of per capita GDP) (equations 3, 5, 6, 7, 8, and 9). As the countries growth faster their saving rates increase. We tried some equations decomposing growth of GDP between a transitory and an expected or permanent component. We used a three year moving average as a proxy for the expected component and obtained transitory growth as the difference between the actual and expected and transitory components. The conclusions did not change regarding the positive association between growth and the savings but the positive association became significant only for the expected component (equations 10 and 12). Carroll and Weil (2004) rationalizes a similar finding arguing that people adjust consumption habits slowly, which makes savings positively related to current growth of income (even if it is expected) (see also Carroll, 1994).

Our evidence does not support a correlation between saving and the level of income (GDP per capita). Richer countries have not saved more than the poorer countries in our sample. Argentina's GDP per capita (measured in 2000 US dollars; WDI) has been above the GDP per capita of Brazil, Chile, and Ecuador, but its national savings rates ha been on average below the

[9] While the fixed effects model cannot estimate a coefficient on any time-variant regressor in the random model the individual effects become part of the error terms, which may be exposed to bias due to correlation between the errors and the regressors.

[10] The error term $\mu_i$ has mean value of zero and a variance of $\sigma_\mu$. For $\mu_i$ to be properly specified, it must be orthogonal to the individual effects.

[11] The H test compares the difference between the two estimators of the coefficient vectors. The random effects estimator is efficient and consistent under the null hypothesis and inconsistent under the alternative hypothesis. The fixed effect estimator is consistent under both hypotheses. The B-P test is basically a Lagrange multiplier test for the variance of the random error $\mu_i$ in random effects estimates.

[12] We applied the White's diagonal method that proves to be robust to observation specific heterocedasticity in the residuals

rates of these three countries. It is likely that the "development" effect on savings takes longer to develop and, therefore, could not be captured in our estimates. Across regions we can also observe in Table 2 that Latin America has shown higher GDP per capita than Asia but the national saving rates have lower in Latin America than in Asia. Although evidence with larger samples and longer time periods shows a positive association between income levels and national saving rates (see Tables 3 and 4), our estimates could not confirm this observation during the period 1990-2003 in Latin America. Richer countries (and regions) in per capita GDP terms have not saved more (and invested more) than poorer countries (and regions).

Our evidence also confirms a partial negative association between national and foreign savings. Foreign savings depress national savings (equations 2, 5, 6, 7, 8, and 9). This partial offset implies that foreign savings contribute by about one-half to investment and one-half to consumption.

We also found a positive association between financial sector development as measured by M3 as a percent of GDP and the national saving rates (equations 3 through 9). The potential negative effect of relaxing domestic credit constraints through financial development seems to be less important than the positive effects resulting from financial depth (enhancement of saving opportunities and strengthened financial sophistication and supervision).

We obtained a positive association between inflation and national savings. Considering inflation as a measuring macroeconomics uncertainty the result suggests that a precautionary motive dominates over the negative influence that inflation induces on macroeconomic stability and savings. We produced estimates decomposing the annual rate of inflation between a transitory and an expected component but the conclusions did not change regarding the positive sign of the inflation coefficient (equations 11 and 12).[13] A we indicated in section 3 It is likely that the relation between national saving and inflation be of a non-linear type and that at very high inflation rates the association becomes negative. The classic example is the hyperinflation of Germany in 1923 although we find more recent cases in Latin America such as Argentina during the hyperinflation of the late 1980s and Brazil in the early 1990s. In all these periods, growth, investment, and savings fell.

Fiscal policy as measured by the government balance (reported in the IFS-IMF statistics) showed a positive association with national savings. Our estimates confirm rejection of a full Ricardian equivalence found in the literature. We obtained lower offsetting coefficients than other research studies, however (between 20% and 50% compared to about 50% found in other studies) (equations 3 through 9). Our finding implies that fiscal policy becomes an effective instrument for raising national savings.

Our study did not confirm a negative association between age dependency ratios and national savings, however, found in other research (Tables 5 and 6). We believe that our results are likely to be influenced by the relatively small size of our panel compared to other studies that tested this factor. Mason, Bayoumi, and Samiei (1998) showed in their research that the results would depend on the sample size, frequency, and estimation technique.

As for the additional factors associated with national savings only the inequality of income distributions (measured by the Gini index) showed some statistical significance of a positive influence of inequality on national savings (equations 6 and 7). As for the dependency ratio we believe that testing with a longer time period and wider sample would be required to reach more solid conclusions. As indicated in section 3, inequality could become a source of social conflicts and economic instability curbing growth and savings. Schmidt-Hebbel and Serven (2000) using panel data for 1965-94 for a larger sample of countries across various regions found no evidence of

[13] As for growth we generated a three moving average as proxy for expected inflation and obtained the transitory component as the difference between the actual and expected inflation components.

any systematic effect of income inequality on national savings (see also Edwards, 1996). In the case of the terms of trade and openness we found no evidence of association with savings during 1990-2004. Latin American countries include gainers and losers from terms of trade changes from oil and other commodity price changes (Ecuador and Colombia are net exporters while Chile and Costa Rica are net importers of oil). In a study including industrial and developing countries Mason, Bayoumi, and Samiei (1998) for the period 1971-93 found the 1990s found the terms of trade to become only significantly positive for industrial countries.

**TABLE 5**

**NATIONAL SAVINGS, % OF GDP**

| | Regression 1 | | | Regression 2 | | | Regression 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** |
| GDPpc_growth | 0.1204 | 0.0977 | 0.1002 | | | | 0.1617** | 0.1544** | 0.1510** |
| | (1.50) | (1.51) | (1.56) | | | | (2.09) | (2.30) | (2.31) |
| ln_GDPpc_const_US | 0.283 | -1.2508 | -0.1328 | | | | -0.7488 | -9.7579** | -5.4264 |
| | (0.52) | (0.51) | (0.10) | | | | (0.97) | (2.50) | (1.86) |
| foreign_savings | | | | -0.4193* | -0.4566* | -0.4540* | | | |
| | | | | (4.92) | (6.74) | (6.77) | | | |
| inflation_ma | | | | | | | | | |
| inflation_tr | | | | | | | | | |
| GDPpc_growth_tr | | | | | | | | | |
| GDPpc_growth_ma | | | | | | | | | |
| ln_GDPpc_const_US (t-1) | | | | | | | | | |
| GDPpc_growth (t-1) | | | | | | | | | |
| op_surplus | | | | | | | | | |
| pop_0_14 | | | | | | | -0.3203 | -1.7217 | -0.4612 |
| | | | | | | | (1.81) | (1.12) | (1.88) |
| pop_65 | | | | | | | -0.3796 | 0 | 0.3513 |
| | | | | | | | (1.08) | | (0.29) |
| m2 | | | | | | | 0.064 | -0.1016 | -0.0802 |
| | | | | | | | (1.57) | (1.29) | (1.09) |
| m3 | | | | | | | 0.0429 | 0.1455* | 0.1269* |
| | | | | | | | (1.37) | (3.06) | (2.83) |
| inflation | | | | | | | 0.0005 | 0.0002 | 0.0003 |
| | | | | | | | (1.37) | (0.53) | (0.85) |
| gov_balance | | | | | | | | | |
| gini_ma | | | | | | | | | |
| trade_terms | | | | | | | | | |
| openness | | | | | | | | | |
| pop_15_64 | | | | | | | | -1.2804 | |
| | | | | | | | | (0.73) | |
| fdi | | | | | | | | | |
| Number of observations | 126 | 126 | 126 | 126 | 126 | 126 | 126 | 126 | 126 |
| R sq | 0.0218 | 0.0216 | 0.0198 | 0.1633 | 0.2815 | 0.2815 | 0.1881 | 0.1874 | 0.1779 |
| F stat | 1.25 | 1.74 | - | 24.21 | 45.46 | - | 3.91 | 3.62 | - |
| Wald (Chi²) | - | - | 2.43 | - | - | 45.82 | - | - | 22.6 |
| Hausman (Chi²) | - | 0.33 | | - | 0.08 | | - | - | |
| BP (Chi²) | - | - | 121.5 | - | - | 183.31 | - | - | 84.4 |

**Table 5** (continued)

| | Regression 4 | | | Regression 5 | | | Regression 6 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** |
| GDPpc_growth | 0.0357 | 0.1349 | 0.0357 | 0.1587** | 0.1900* | 0.1587** | 0.2035* | 0.2129* | 0.2035* |
| | (0.49) | (1.90) | (0.49) | (2.56) | (3.11) | (2.56) | (3.48) | (3.46) | (3.48) |
| ln_GDPpc_const_US | 0.0374 | -10.8773* | 0.0374 | 0.2442 | 0.1418 | 0.2442 | 0.0282 | 0.3299 | 0.0282 |
| | (0.05) | (2.66) | (0.05) | (0.42) | (0.04) | (0.42) | (0.05) | (0.08) | (0.05) |
| foreign_savings | | | | -0.5210* | -0.4773* | -0.5210* | -0.5267* | -0.5011* | -0.5267* |
| | | | | (7.07) | (6.01) | (7.07) | (7.32) | (6.23) | (7.32) |
| inflation_ma | | | | | | | | | |
| inflation_tr | | | | | | | | | |
| GDPpc_growth_tr | | | | | | | | | |
| GDPpc_growth_ma | | | | | | | | | |
| ln_GDPpc_const_US (t-1) | | | | | | | | | |
| GDPpc_growth (t-1) | | | | | | | | | |
| op_surplus | | | | | | | | | |
| pop_0_14 | -1.0022* | -0.8553** | -1.0022* | -0.7319* | -0.7274** | -0.7319* | -0.3626 | -0.5381 | -0.3626 |
| | (4.40) | (2.46) | (4.40) | (3.84) | (2.45) | (3.84) | (1.68) | (1.73) | (1.68) |
| pop_65 | -1.6284* | 0.3335 | -1.6284* | -1.5805* | -1.9206 | -1.5805* | -0.8874** | -1.8722 | -0.8874** |
| | (3.89) | (0.18) | (3.89) | (4.60) | (1.16) | (4.60) | (2.34) | (1.11) | (2.34) |
| m2 | -0.0615 | -0.0342 | -0.0615 | 0.0275 | -0.0245 | 0.0275 | 0.0808** | 0.0961 | 0.0808** |
| | (1.34) | (0.38) | (1.34) | (0.69) | (0.32) | (0.69) | (2.10) | (1.22) | (2.10) |
| m3 | 0.0835* | 0.1213** | 0.0835* | 0.0384 | 0.0869 | 0.0384 | 0.03 | 0.0432 | 0.03 |
| | (2.75) | (2.19) | (2.75) | (1.49) | (1.83) | (1.49) | (1.22) | (0.92) | (1.22) |
| inflation | 0.0011* | 0.0008 | 0.0011* | 0.0009* | 0.0005 | 0.0009* | 0.0008* | 0.0007** | 0.0008* |
| | (3.28) | (1.94) | (3.28) | (3.16) | (1.37) | (3.16) | (3.35) | (2.04) | (3.35) |
| gov_balance | 0.8130* | 0.5076* | 0.8130* | 0.7194* | 0.4041* | 0.7194* | 0.6551* | 0.4960* | 0.6551* |
| | (6.37) | (2.96) | (6.37) | (6.82) | (2.75) | (6.82) | (6.69) | (3.21) | (6.69) |
| gini_ma | | | | | | | 0.1477** | 0.0032 | 0.1477** |
| | | | | | | | (2.49) | (0.04) | (2.49) |
| trade_terms | | | | | | | | | |
| openness | | | | | | | | | |
| pop_15_64 | | | | | | | | | |
| fdi | | | | | | | | | |
| Number of observations | 110 | 110 | 110 | 110 | 110 | 110 | 99 | 99 | 99 |
| R sq | 0.4205 | 0.2675 | 0.1795 | 0.6137 | 0.474 | 0.4460 | 0.6933 | 0.5055 | 0.4746 |
| F stat | 9.16 | 4.25 | - | 17.65 | 9.21 | - | 19.9 | 8.18 | - |
| Wald (Chi²) | - | - | 73.28 | - | - | 158.89 | - | - | 198.95 |
| Hausman (Chi²) | - | - | | - | 34.2(*) | | - | 6.15 (*) | |
| BP (Chi²) | - | - | 5.21 | - | - | 3.46 | - | - | 0.03 |

**Table 5** (continued)

| | Regression 7 | | | Regression 8 | | | Regression 9 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** |
| GDPpc_growth | 0.2054* | 0.2160* | 0.2160* | 0.2067* | 0.2268* | 0.2067* | 0.2107* | 0.2177* | 0.2107* |
| | (3.50) | (3.50) | (3.50) | (3.51) | (3.64) | (3.51) | (3.63) | (3.49) | (3.63) |
| ln_GDPpc_const_US | 0.0893 | -1.0928 | -1.0928 | 0.015 | 1.1573 | 0.0149 | 0.0855 | 2.1447 | 0.0855 |
| | (0.15) | (0.26) | (0.26) | (0.03) | (0.29) | (0.03) | (0.15) | (0.52) | (0.15) |
| foreign_savings | -0.5344* | -0.4989* | -0.4989* | -0.5226* | -0.5080* | -0.5226* | -0.5394* | -0.4846* | -0.5394* |
| | (7.30) | (6.19) | (6.19) | (7.20) | (6.32) | (7.20) | (7.50) | (5.90) | (7.50) |
| inflation_ma | | | | | | | | | |
| inflation_tr | | | | | | | | | |
| GDPpc_growth_tr | | | | | | | | | |
| GDPpc_growth_ma | | | | | | | | | |
| ln_GDPpc_const_US (t-1) | | | | | | | | | |
| GDPpc_growth (t-1) | | | | | | | | | |
| op_surplus | | | | | | | | | |
| pop_0_14 | -0.3269 | 1.1273 | 1.1273 | -0.418 | -0.7089** | -0.4177 | -0.4202 | -0.5743 | -0.4202 |
| | (1.47) | (0.74) | (0.74) | (1.78) | (2.10) | (1.78) | (1.82) | (1.63) | (1.82) |
| pop_65 | -0.8554** | | | -0.9680** | -2.2369 | -0.9680** | -1.1070* | -2.6682 | -1.1070* |
| | (2.23) | | | (2.40) | (1.31) | (2.40) | (2.75) | (1.53) | (2.75) |
| m2 | 0.0786** | 0.0975 | 0.0975 | 0.0758 | 0.0757 | 0.0758 | 0.0877** | 0.0828 | 0.0877** |
| | (2.03) | (1.23) | (1.23) | (1.92) | (0.94) | (1.92) | (2.23) | (1.03) | (2.23) |
| m3 | 0.0299 | 0.0454 | 0.0454 | 0.032 | 0.0456 | 0.0322 | 0.0426 | 0.0372 | 0.0426 |
| | (1.21) | (0.96) | (0.96) | (1.29) | (0.97) | (1.29) | (1.70) | (0.79) | (1.70) |
| inflation | 0.0009* | 0.0007** | 0.0007** | 0.0009* | 0.0007** | 0.0009* | 0.0008* | 0.0007 | 0.0008* |
| | (3.38) | (2.10) | (2.10) | (3.39) | (1.99) | (3.39) | (2.98) | (1.85) | (2.98) |
| gov_balance | 0.6408* | 0.4937* | 0.4937* | 0.6690* | 0.4986* | 0.6690* | 0.6887* | 0.4751* | 0.6887* |
| | (6.37) | (3.19) | (3.19) | (6.64) | (3.24) | (6.64) | (6.90) | (3.07) | (6.90) |
| gini_ma | 0.1501** | -0.0019 | -0.0019 | 0.1347** | 0.0121 | 0.1347** | 0.1036 | 0.0012 | 0.1036 |
| | (2.52) | (0.02) | (0.02) | (2.13) | (0.13) | (2.13) | (1.62) | (0.01) | (1.62) |
| trade_terms | | | | -0.011 | -0.0298 | -0.0107 | -0.0106 | -0.0325 | -0.0106 |
| | | | | (0.61) | (1.28) | (0.61) | (0.61) | (1.40) | (0.61) |
| openness | | | | | | | -0.0227 | 0.053 | -0.0227 |
| | | | | | | | (1.96) | (1.26) | (1.96) |
| pop_15_64 | | 1.61 | 1.61 | | | | | | |
| | | (0.93) | (0.93) | | | | | | |
| fdi | 0.07 | 0.12 | 0.12 | | | | | | |
| | (0.65) | (0.96) | (0.96) | | | | | | |
| Number of observations | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| R sq | 0.6948 | 0.5112 | 0.5112 | 0.695 | 0.5156 | 0.4819 | 0.7076 | 0.5253 | 0.4795 |
| F stat | 18.01 | 7.51 | - | 17.99 | 7.54 | - | 17.35 | 7.19 | - |
| Wald (Chi²) | - | - | 198.06 | - | - | 197.91 | - | - | 208.17 |
| Hausman (Chi²) | - | 45.01 (*) | | - | 20.51 (*) | | - | 13.13 (*) | |
| BP (Chi²) | - | - | 0.05 | - | - | 0.2 | - | - | 0.54 |

**Table 5** (continued)

| | Regression 10 | | | Regression 11 | | | Regression 12 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** | **Pooled** | **Fixed** | **Random** |
| GDPpc_growth | | | | | | | | | |
| ln_GDPpc_const_US | | | | | | | | | |
| foreign_savings | | | | | | | | | |
| inflation_ma | | | | -0.0006 | -0.0006 | -0.0006 | -0.0003 | -0.0005 | -0.0004 |
| | | | | (0.91) | (1.19) | (1.19) | (0.47) | (0.88) | (0.84) |
| inflation_tr | | | | 0.001 | 0.0011 | 0.0011 | 0.0011 | 0.0012** | 0.0012** |
| | | | | (1.40) | (1.93) | (1.93) | (1.44) | (2.07) | (2.04) |
| GDPpc_growth_tr | -0.0027 | 0.0209 | 0.0118 | | | | 0.0547 | 0.0741 | 0.0719 |
| | (0.02) | (0.22) | (0.13) | | | | (0.45) | (0.78) | (0.75) |
| GDPpc_growth_ma | 0.2535** | 0.2671** | 0.2428** | | | | 0.2342 | 0.1773 | 0.1844 |
| | (2.12) | (2.36) | (2.42) | | | | (1.96) | (1.75) | (1.82) |
| ln_GDPpc_const_US (t-1) | 0.0357 | 1.7727 | 0.5168 | | | | | | |
| | (0.06) | (0.62) | (0.34) | | | | | | |
| GDPpc_growth (t-1) | | | | | | | | | |
| op_surplus | | | | | | | | | |
| pop_0_14 | | | | | | | | | |
| pop_65 | | | | | | | | | |
| m2 | | | | | | | | | |
| m3 | | | | | | | | | |
| inflation | | | | | | | | | |
| gov_balance | | | | | | | | | |
| gini_ma | | | | | | | | | |
| trade_terms | | | | | | | | | |
| openness | | | | | | | | | |
| pop_15_64 | | | | | | | | | |
| fdi | | | | | | | | | |
| Number of observations | 117 | 117 | 117 | 126 | 126 | 126 | 126 | 126 | 126 |
| R sq | 0.0387 | 0.0547 | 0.0529 | 0.0172 | 0.0335 | 0.0335 | 0.0502 | 0.0661 | 0.0661 |
| F stat | 1.52 | 2.02 | - | 1.08 | 1.99 | | 1.6 | 2 | |
| Wald (Chi²) | - | - | 6.06 | - | - | 4 | - | - | 8.14 |
| Hausman (Chi²) | - | 0.28 | | - | 0.01 | | - | 0.9068 | |
| BP (Chi²) | - | | 137.86 | - | - | 129.75 | - | - | 128.55 |

**Source:** author elaboration.

**Note:** Absolute value of t statistics in parentheses: ** significant at 5%; * significant at 1%.

# V. National savings and growth

Empirically, national savings and growth are positively associated, especially in the case of developing countries.[14] The evidence on the association of GDP growth and foreign savings is mixed: there are episodes of *high* growth with relatively *low* levels of foreign saving rates (i.e. some East Asian economies) and episodes of *low* growth episodes and *high* foreign savings (i.e. low income countries in Africa and Latin America that receive sizeable levels of foreign aid).[15]

To add evidence about the association between national savings and growth of per capita GDP for the countries and period studied we calculated the averages and medians of the ten highest and ten lowest annual growth rates for the countries studied during the following three sub periods: 1990-94, 1995-99, and 2000-03.[16] Then, we calculated for each sub period the means and medians for the selected highest and lowest growth rates and the means and medians for the total saving rates, national saving rates, and foreign saving rates associated with the highest and lowest growth rates, respectively. The results are shown in Table 6 for the selected nine Latin American countries and for the other world regions.

The results show that the highest growth episodes have been associated with national saving rates that are higher than those prevailing in the lowest growth episodes. This observation holds for

[14] The evidence also shows that investment and national savings are positively related, reflecting the existence of foreign borrowing constraints.

[15] See Gutiérrez 2005 for Latin America 1990-2003.

[16] The last sub period extends up to 2003 as some country data was not yet available for 2004 at the time of our compilations.

our Latin American sample and also for other world regions. The results for total savings (which is equal to total investment) and foreign savings are mixed, however. In Latin America, the highest growth episodes are associated with total savings (investment) rates that are higher than those in the lowest growth episodes. In other regions, the association is mixed, however. The means and medians of the total saving rates are higher in the highest than in the lowest growth episodes in all regions, except in Europe and Central Asia where the association is mixed. As for foreign savings, there is not a clear pattern of association in the case of Latin America and other world regions. We observe episodes of highest growth co-existing with foreign savings that are lower compared to those in the lowest growth episodes. But, we also observe episodes of lowest growth co-existing with foreign saving rates higher than those in the highest growth episodes. In summary, high national savings seems to be required for high growth, but high investment or high foreign savings do not guarantee high growth.[17]

[17] Further evidence on these links are presented in Gutiérrez (2005); and Solimano and Gutiérrez (2006).

**TABLE 6**

**HIGHS AND LOWS GDP PER CAPITA GROWTH: TOTAL SAVING, NATIONAL SAVING, AND FOREIGN SAVING**

| | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Latin America** | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 7.66 | 6.07 | 3.74 | 20.47 | 22.97 | 20.57 | 17.28 | 18.53 | 18.78 | 3.19 | 4.44 | 1.79 |
| Median | 6.32 | 5.93 | 3.20 | 20.56 | 24.44 | 20.88 | 16.99 | 18.22 | 18.95 | 2.69 | 5.08 | 1.79 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | -2.38 | -3.82 | -2.48 | 18.43 | 18.51 | 17.32 | 16.15 | 16.22 | 15.87 | 2.27 | 2.28 | 1.45 |
| Median | -1.92 | -3.19 | -1.36 | 18.59 | 18.87 | 17.39 | 16.13 | 16.13 | 15.45 | 1.64 | 2.90 | 2.04 |
| Difference in Means | 10.03 | 9.90 | 6.22 | 2.04 | 4.47 | 3.25 | 1.12 | 2.31 | 2.91 | 0.92 | 2.16 | 0.34 |
| Difference in Medians | 8.24 | 9.12 | 4.56 | 1.97 | 5.57 | 3.49 | 0.86 | 2.09 | 3.50 | 1.05 | 2.19 | -0.25 |

**Source:** Own elaboration.

**Note:** Based on a sample of nine countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, México, and Perú.

**Table 6** (continued)

| East Asia & Pacific | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 8.98 | 7.77 | 6.40 | 37.85 | 35.74 | 33.01 | 34.64 | 32.55 | 36.22 | 3.21 | 3.19 | -3.21 |
| Median | 7.91 | 7.54 | 6.21 | 39.60 | 38.90 | 32.20 | 34.82 | 35.53 | 35.46 | 3.53 | 4.11 | -2.26 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | -3.19 | -6.28 | 1.23 | 25.21 | 20.20 | 22.21 | 21.82 | 23.74 | 26.72 | 3.40 | -3.54 | -4.51 |
| Median | -2.35 | -2.43 | 1.70 | 24.07 | 19.38 | 22.21 | 19.51 | 23.51 | 27.49 | 3.88 | -3.60 | -4.78 |
| Difference in Means | 12.17 | 14.06 | 5.16 | 12.63 | 15.54 | 10.81 | 12.82 | 8.81 | 9.51 | -0.19 | 6.73 | 1.30 |
| Difference in Medians | 10.26 | 9.97 | 4.51 | 15.53 | 19.52 | 9.99 | 15.30 | 12.02 | 7.97 | -0.34 | 7.71 | 2.52 |

**Source:** Own elaboration.

**Note:** Based on a sample of nine countries: Cambodia, Vietnam, Mongolia, Indonesia, China, Philippines, Thailand, Fiji, Malaysia.

**Table 6** (continued)

| | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Europe & Central Asia** | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 3.94 | 6.29 | 6.48 | 21.04 | 24.77 | 21.64 | 19.60 | 19.28 | 18.18 | 1.44 | 5.50 | 3.46 |
| Median | 3.76 | 5.96 | 6.26 | 23.02 | 24.69 | 21.49 | 20.89 | 19.71 | 19.72 | 0.65 | 3.46 | 2.67 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | -9.34 | -5.34 | 0.67 | 22.86 | 19.59 | 22.89 | 18.02 | 13.24 | 18.81 | 4.84 | 6.36 | 4.09 |
| Median | -7.38 | -5.72 | 1.89 | 22.04 | 21.76 | 22.34 | 17.82 | 13.26 | 18.46 | 4.81 | 7.30 | 4.72 |
| Difference in Means | 13.28 | 11.63 | 5.81 | -1.82 | 5.18 | -1.26 | 1.58 | 6.04 | -0.63 | -3.40 | -0.86 | -0.63 |
| Difference in Medians | 11.14 | 11.68 | 4.36 | 0.99 | 2.94 | -0.85 | 3.07 | 6.44 | 1.26 | -4.16 | -3.84 | -2.04 |

**Source:** Own elaboration.

**Notes:** Based on a sample of nine countries: Tajikistan, Kyrgyz Rep., Moldova, Romania, Turkey, Bulgaria, Poland, Hungary, Czech Rep.

**Table 6** (continued)

| | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Middle East & North Africa** | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 12.50 | 5.27 | 4.24 | 25.78 | 24.69 | 24.13 | 12.99 | 18.85 | 31.74 | 12.79 | 5.84 | -7.61 |
| Median | 8.86 | 4.38 | 3.86 | 25.90 | 22.01 | 21.15 | 14.01 | 19.31 | 30.17 | 10.71 | 1.31 | -4.86 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | -3.74 | -2.74 | -0.90 | 22.96 | 21.34 | 18.99 | 17.78 | 18.69 | 19.85 | 5.18 | 2.64 | -0.86 |
| Median | -2.61 | -2.30 | -1.25 | 22.83 | 20.91 | 18.94 | 18.23 | 19.20 | 23.43 | 6.74 | 1.85 | -5.40 |
| Difference in Means | 16.25 | 8.01 | 5.14 | 2.82 | 3.35 | 5.14 | -4.79 | 0.16 | 11.89 | 7.61 | 3.19 | -6.74 |
| Difference in Medians | 11.46 | 6.69 | 5.10 | 3.07 | 1.10 | 2.21 | -4.22 | 0.11 | 6.74 | 3.97 | -0.54 | 0.54 |

**Source:** Own elaboration.

**Notes:** Based on a sample of nine countries: Yemen, Morocco, Syria, Iran, Egypt, Jordan, Lebanon, Oman, Saudi Arabia.

**Table 6** (continued)

| | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **South Asia** | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 4.97 | 5.77 | 4.33 | 26.50 | 28.36 | 31.61 | 21.31 | 30.20 | 28.83 | 5.19 | -1.84 | 2.79 |
| Median | 5.18 | 5.42 | 3.86 | 23.72 | 28.29 | 24.92 | 21.63 | 28.03 | 27.84 | 5.32 | -0.37 | -1.14 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | 0.98 | 1.30 | 0.46 | 23.82 | 22.82 | 21.81 | 17.41 | 22.17 | 26.35 | 6.41 | 0.65 | -4.55 |
| Median | 1.24 | 1.60 | 0.89 | 20.76 | 19.74 | 22.75 | 18.07 | 20.46 | 24.28 | 3.16 | 0.14 | -5.67 |
| Difference in Means | 4.00 | 4.47 | 3.87 | 2.67 | 5.54 | 9.81 | 3.89 | 8.03 | 2.47 | -1.22 | -2.49 | 7.33 |
| Difference in Medians | 3.94 | 3.82 | 2.97 | 2.96 | 8.55 | 2.17 | 3.56 | 7.56 | 3.56 | 2.16 | -0.51 | 4.53 |

**Source:** Own elaboration.

**Notes:** Based on a sample of seven countries: Nepal, Bangladesh, India, Pakistan, Bhutan, Sri Lanka, Maldives.

**Table 6** (continued)

| | GDP growth | | | Total Saving | | | National Saving | | | Foreign Saving | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sub-Saharan Africa** | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 | 1990-1994 | 1995-1999 | 2000-2003 |
| **10 highest GDP growth rates** | | | | | | | | | | | | |
| Mean | 6.62 | 6.51 | 4.23 | 24.26 | 25.72 | 20.41 | 20.42 | 20.17 | 17.20 | 3.84 | 5.55 | 3.21 |
| Median | 5.41 | 4.80 | 3.91 | 26.48 | 26.59 | 18.87 | 20.57 | 22.96 | 15.09 | 2.88 | 3.17 | 4.43 |
| **10 lowest GDP growth rates** | | | | | | | | | | | | |
| Mean | -6.99 | -3.49 | -3.26 | 16.75 | 15.22 | 17.62 | 11.04 | 12.56 | 11.52 | 5.71 | 2.67 | 6.11 |
| Median | -7.00 | -2.16 | -2.59 | 15.54 | 16.02 | 15.34 | 10.46 | 14.12 | 13.45 | 2.52 | 1.56 | 5.08 |
| Difference in Means | 13.61 | 10.00 | 7.49 | 7.51 | 10.49 | 2.78 | 9.39 | 7.61 | 5.68 | -1.87 | 2.88 | -2.90 |
| Difference in Medians | 12.40 | 6.96 | 6.50 | 10.95 | 10.57 | 3.53 | 10.11 | 8.84 | 1.63 | 0.36 | 1.61 | -0.65 |

**Source:** Own elaboration.

**Notes:** Based on a sample of nine countries: Malawi, Burundi, Ethiopia, Tanzania, Guinea, Kenya, Mauritius, Gabon, Seychelles.

In terms of causality, the research on the determinants of savings has generally considered growth as a "determinant" of national savings, suggesting that the causality runs from growth to national savings (the typical regression is one in which national savings is the dependent variable of the regression and GDP growth is a right-hand side explanatory variable).[18] In the neoclassical growth model a la Solow saving is exogenously given. In contrast, in the Keynesian school saving is endogenously determined as a result of the interactions between income and consumption. Higher growth generates higher incomes that lead, in turn, to higher savings (as the propensity to consume out of income is less than one). Carroll and Weil (1994) provided strong evidence that growth causes saving (Granger causality), but Attanasio, Picci, and Scorcu (2000) questioned Carroll and Weil results, showing that the causality may go both ways depending on the data (sample and frequency of the data) and the econometric technique used to estimate the relationship between both variables.

We examined the causality issue using the Granger causality technique applied for the whole panel data and also the individual country data.[19] The results for the whole panel are inconclusive regarding the causality between growth and savings (Table 7). Although growth is associated with national savings as shown earlier it is unclear that growth "determines" savings in the sense of "causing" savings. Some of the results in Table 7 are showing the opposite, that it is savings causes growth. The results by countries (Table 8) are also mixed. In cases of Argentina and Mexico national savings causes growth, but for Ecuador, it is growth that causes national savings. And, for the remainder six countries it is not possible to conclude causality between growth and national savings.

The results may suggest that mutual reinforcing forces develop between growth and national savings, which may also change depending on the circumstances. In some cases, it could be growth that picks up first because of a discovery or well managed reforms. In other cases, it maybe savings that contributes to growth such as result of a successful fiscal stabilization which encourages investment and growth. In the first case investment returns rise pulling out savings. In the second case savings rise pulling out investment. Hausmann, Pritchett, and Rodrik (2004) examining a large sample of growth accelerations periods across developing countries concluded that growth accelerations result after the alleviation of some "key" constraints limiting growth. Growth may be primarily constrained by: (1) the lack of productive investment opportunities; or (2) by the lack of investment financing. In the first case expanding potential growth would pull out investment and savings. In the second case, expanding savings would pull out investment and growth (see also Hausmann, Rodrik, and Velasco, 2004).

From a policy stand view the issue of causality between growth and savings (and investment) should matter less than the likely existence of mutual reinforcing effects between among growth, investment, and savings. As we showed previously, low national savings have been associated with high current account deficits (high foreign savings) contributing to trigger currency and financial crisis such as those seen in Argentina (2001) and Ecuador (2000). Brazil was also close to a major financial crisis in early 2000 triggered by the maintenance of a large current account deficit. In all cases the large current account deficits reflected the existence of low national savings, which is most cases are induced by low public savings reflecting or large fiscal deficits.

Effective growth policies should cover both productivity and saving issues. The evidence shows that both growth and savings matter for sustainable growth. Although foreign savings is

[18] In the case of the link between investment and growth, growth in most cases is regressed against investment, therefore, implicitly assuming that investment causes growth. A mutual reinforcing process between national savings and growth, and investment and growth has been found, however, in the literature (see for example Attanasio, Picci, and Scorcu, 2000, Solimano ed., 2006, Hausmann, Pritchett and Rodrik, 2004, and Gutiérrez, 2005).

[19] The introduction of a panel data dimension allows using both cross-sectional and time series to test causality relationships. In particular, it makes possible to use a larger number of observations (compared to pure time series), increasing the degree of freedoms and reducing the collinearity among explanatory variables.

theoretically always available to finance investment, the Latin American experience shows that access to foreign savings is limited and that excessive reliance on foreign capital makes countries vulnerable to the swings of international markets.

**TABLE 7**

**SAVINGS-GROWTH CAUSALITY ALL COUNTRIES**

**Causality between GDP per capita growth and National Saving (Pooled OLS regression)**

| Direction of causality | | Number of lags | F-value | Significance Level | Decision |
|---|---|---|---|---|---|
| GDPpc_growth nat_savings | -> | 1 | 0.15 | 0.6957 | Do not reject |
| nat_savings GDPpc_growth | -> | 1 | 1.03 | 0.3110 | Do not reject |
| GDPpc_growth nat_savings | -> | 2 | 0.67 | 0.5133 | Do not reject |
| nat_savings GDPpc_growth | -> | 2 | 4.87 | 0.0085 | Reject |
| GDPpc_growth nat_savings | -> | 3 | 0.35 | 0.7887 | Do not reject |
| nat_savings GDPpc_growth | -> | 3 | 3.29 | 0.0215 | Reject |

**Causality between GDP per capita growth and National Saving (Random Effects)**

| Direction of causality | | Number of lags | Chi-Square | Significance Level | Decision |
|---|---|---|---|---|---|
| GDPpc_growth nat_savings | -> | 1 | 0.15 | 0.6954 | Do not reject |
| nat_savings GDPpc_growth | -> | 1 | 1.03 | 0.3100 | Do not reject |
| GDPpc_growth nat_savings | -> | 2 | 1.34 | 0.5123 | Do not reject |
| nat_savings GDPpc_growth | -> | 2 | 9.74 | 0.0077 | Reject |
| GDPpc_growth nat_savings | -> | 3 | 1.05 | 0.7886 | Do not reject |
| nat_savings GDPpc_growth | -> | 3 | 9.87 | 0.0197 | Reject |

**Causality between GDP per capita growth and National Saving (Fixed Effects)**

| Direction of causality | | Number of lags | F-value | Significance Level | Decision |
|---|---|---|---|---|---|
| GDPpc_growth nat_savings | -> | 1 | 0.15 | 0.7013 | Do not reject |
| nat_savings GDPpc_growth | -> | 1 | 1.31 | 0.2530 | Do not reject |
| GDPpc_growth nat_savings | -> | 2 | 0.61 | 0.5447 | Do not reject |
| nat_savings GDPpc_growth | -> | 2 | 4.77 | 0.0093 | Reject |
| GDPpc_growth nat_savings | -> | 3 | 0.29 | 0.8357 | Do not reject |
| nat_savings GDPpc_growth | -> | 3 | 3.43 | 0.0180 | Reject |

**Source:** Own elaboration.

**TABLE 8**

**SAVINGS-GROWTH CAUSALITY COUNTRIES**

| **Argentina** | Number of lags | F-value | Significance Level | Decision |
|---|---|---|---|---|
| GDPpc_growth -> nat_savings | 1 | 1.05 | 0.3307 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 6.99 | 0.0245 | Reject |
| GDPpc_growth -> nat_savings | 2 | 0.19 | 0.8301 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 4.01 | 0.069 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 2.79 | 0.1737 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 4.89 | 0.0796 | Do not reject |
| **Brazil** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 1.01 | 0.3378 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 2.14 | 0.1744 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 2.74 | 0.1319 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 1.09 | 0.3858 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 0.75 | 0.5774 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 1.49 | 0.3443 | Do not reject |
| **Chile** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 0.22 | 0.6465 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 2.81 | 0.1248 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 0.51 | 0.6193 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 1.05 | 0.4007 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 1.57 | 0.329 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 0.18 | 0.9044 | Do not reject |
| **Colombia** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 0.04 | 0.8536 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 3.6 | 0.0872 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 0.36 | 0.7102 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 1.63 | 0.2628 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 1.84 | 0.281 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 0.83 | 0.5446 | Do not reject |
| **Costa Rica** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 0.97 | 0.3478 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 0.15 | 0.7074 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 1.01 | 0.4121 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 0.62 | 0.5634 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 0.11 | 0.9504 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 0.67 | 0.6119 | Do not reject |

**Table 8** (continued)

| **Ecuador** | Number of lags | F-value | Significance Level | Decision |
|---|---|---|---|---|
| GDPpc_growth -> nat_savings | 1 | 6.16 | 0.0325 | Reject |
| nat_savings -> GDPpc_growth | 1 | 0.68 | 0.4277 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 3.55 | 0.0863 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 0.5 | 0.6272 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 5.6 | 0.0648 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 0.24 | 0.8676 | Do not reject |
| **El Salvador** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 2.53 | 0.143 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 0 | 0.965 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 3.9 | 0.0727 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 4.14 | 0.0651 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 0.63 | 0.6308 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 0.92 | 0.5073 | Do not reject |
| **Mexico** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 2.24 | 0.1651 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 9.2 | 0.0126 | Reject |
| GDPpc_growth -> nat_savings | 2 | 0.32 | 0.736 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 3.66 | 0.0817 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 0.53 | 0.6853 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 1.6 | 0.3215 | Do not reject |
| **Peru** | Number of lags | F-value | Significance Level | Decision |
| GDPpc_growth -> nat_savings | 1 | 3.55 | 0.089 | Do not reject |
| nat_savings -> GDPpc_growth | 1 | 0.48 | 0.5051 | Do not reject |
| GDPpc_growth -> nat_savings | 2 | 0.17 | 0.8492 | Do not reject |
| nat_savings -> GDPpc_growth | 2 | 1.78 | 0.2376 | Do not reject |
| GDPpc_growth -> nat_savings | 3 | 1.53 | 0.3368 | Do not reject |
| nat_savings -> GDPpc_growth | 3 | 3.63 | 0.1223 | Do not reject |

**Source:** Own elaboration.

# VI. A note on the role of enterprises in the savings process

In this section we examine the role of enterprises in the generation of national savings in Latin America. We want to examine the factors associated with enterprises' savings and the association between enterprises' savings and national savings. It is widely recognized that the savings of enterprises (private and public) is a very important component of national savings. The literature has paid less attention to this component of national savings as compared to government or household savings in good part due to the lack and poor quality of the data on national savings disaggregated by economic agents. Long series on enterprises savings (retained profits) are not available for Latin American countries.

Some authors have examined the role of enterprises in the saving process in Latin America using partial data for the 1970s, 1980s and the early 1990s. Agosin, Crespi, and Letelier (1997) studied for the case of Chile during 1975-94 the savings of private enterprises and found that they played an important and independent role in the generation of national savings. They concluded that households internalize about half of the changes in enterprises' savings, with households' savings reacting to variables distinct to those affecting the savings of enterprises.

Cardenas and Escobar (1997) found evidence for the case of Colombia for the period 1985-1993 of an important contribution of firms to savings in Colombia. These authors concluded that the relaxation of domestic and external credit constraints in the 1990s

contributed to reduce national savings, as external borrowing by large nterprises and domestic borrowing by medium-sized enterprises increased. Fiscal policy also appears to be a main factor affecting enterprises' savings (Cardenas and Escobar, 1997; and Bennett et. al., 2001). Table 9 summarizes some key results from selected literature on the factors associated enterprises' savings.

**TABLE 9**
**FIRMS SAVINGS: FACTORS ASSOCIATED**

| Variable Category | Specific Variable | Expected Sign | Empirical Findings |
|---|---|---|---|
| Financial Indicators | Net profits | + | + (3) |
| | Cash Flow | - | +/- (3) |
| | Sales change | + | + (1) |
| | Op. Profit over sales ratio | + | - (1) |
| Borrowing constraints | Borrowing | - | - (3) |
| | Indebtedness | + | + (3) |
| | Short term debt over sales ratio | - | 0 (1) |
| | Long term debt over sales ratio | Ambiguous | 0 (1) |
| Fiscal Policy | Corporate Taxes | - | - (2, 3) |
| Size | Total Assets | Ambiguous | - (1) |
| Ownership concentration | Participation of the 12 major stockholders | Ambiguous | |
| Persistence | Lagged firm savings rate | Ambiguous | + (1) |

| | Study | Sample | Estimation procedure |
|---|---|---|---|
| 1. | Agosin, M.; Crespi, G.; Letelier, L. (1997). "Análisis Sobre el Aumento del Ahorro en Chile". Inter-American Development Bank, Research Department, Working Paper R-309. | Chile, 196 firms (1985-94) | OLS, GLS |
| 2. | Bennett, Herman; Loayza, Norman; Schmidt-Hebbel, Klaus (2001). "Un estudio del ahorro agregado por agentes económicos en Chile", in Morande Felipe; Vergara, Rodrigo (eds.) "Análisis empírico del ahorro en Chile", Serie Banca Central, Análisis y Políticas Económicas – Vol. I. Banco Central de Chile. | Chile (1960-97) | ARDL (Autoregressive Distributed Lag) |
| 3. | Cardenas, M., and Escobar, A. (1997): "Determinants of Savings in Colombia: 1924-1994". Inter-American Development Bank, Research Department, Working R-Paper 310. | Colombia, 397 firms (1985-93) | OLS |

**Source:** Own elaboration.

Because of data limitations, we decided to use data on the operating surplus published in the national accounts as *proxy* for the gross earnings (profits) of enterprises. Gross earnings could be distributed or retained and invested internally. The distributed part of operating surplus go to the households (as distributed earnings) and to the government (as distributed earnings and taxes), which, in turn, would be saved or consumed by these agents. The retained part constitutes enterprises savings.

Data on operating surplus exclude rental income, but it represents the main source of enterprises' gross earnings.[20] Operating surplus is also a main item in the range of 40%-50% of national income. Then, if the operating surplus and national savings are positively correlated it would be an indication that enterprises play an active role in contributing to national savings.[21]

Data limitations also led us to restrict our panel shortened the period of analysis to 1994-2003 and to reduce the sample of countries to six Latin America countries: Brazil, Chile, Colombia, Costa Rica, México, and Perú. Data on operating surplus was obtained from the national accounts statistics and the most recent years updated from direct national sources (see Appendix on Variables Description and Sources).

To examine the association between the operating surplus and national saving we calculated the national savings rates associated with the highest and lowest operating surplus rates (as % of GDP), following the same methodology used in section 5.[22] We calculated the means and medians of the highest and lowest operating surplus rates (as % of GDP; current prices) for three sub periods 1994-97, 1998-2000, and 2001-03. Then, we calculated the means and medians for the national saving rates and growth rates associated with those highest and lowest operating surpluses, respectively.[23]

The results in Table 10 show that for our panel the highest operating surplus rates are not associated with either higher savings rates or higher growth rates compared to those associated with the lowest operating surplus rates. On the contrary, the results suggest that the highest operating surplus rates are associated with national saving rates and growth rates lower than those associated with the lowest operating surplus rates. Table 10 shows that national savings and growth appear positively associated, however, confirming the evidence shown of section V.

The results suggest that households and the government internalize the income generated by enterprises in their saving decisions. High (low) profits would induce low (high) savings by households and/or the government, as profits are ultimately owned by households and the government. To the extent that profits raise the value of enterprises a negative wealth effect would reduce national savings. Poterba (2000) and Poterba and Samwick (1995) showed that the rise of the stock market in the United Sates (US) in the 1990s contributed to fall of household savings. Although stock markets are less developed in Latin America a negative wealth effect is still present as private enterprises are ultimately owned by households.

From a policy perspective the lack of direct correlation between national savings and operating surplus is, however, less relevant and certainly would not imply that enterprises profits do not matter for national savings. Profits are part of GDP and national income and sustained growth would not be possible if the *expectations* of higher profits were nil or were not fulfilled. Further research aimed at compiling disaggregated series for the savings of households, enterprises, and the government for Latin American countries would be required to reach more definitive conclusions and policy implications, however.

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[20] The magnitude of operating surplus in terms of national savings is also quite important (ranging from about 40% in the case of Chile to near 60 % in the case of Perú on average during 1994-2003.

[21] In a perfect capital market model changes in dividends will not affect savings as long as lower retained earnings (higher dividends) are replaced by debt. In practice, capital markets are less than perfect and perfect foresight by consumers does not exist in the real world. In particular, liquidity constraints and uncertainties imply that dividends and debt are not perfect substitutes.

[22] We also conducted a regression analysis but the reduced size of the panel did not allow us to obtain sound or meaningful statistical estimates.

[23] We reduced the calculations of highs and lows to eight observations, compared to ten used in section V, because the period was shortened.

**TABLE 10**

**HIGHS AND LOWS GDP PER CAPITA GROWTH: TOTAL SAVING, NATIONAL SAVING AND FOREIGN SAVING**

| | Operating Surplus | | | National Savings | | | GDP growth | | |
|---|---|---|---|---|---|---|---|---|---|
| **Latin America** | 1994-1997 | 1998-2000 | 2001-2003 | 1994-1997 | 1998-2000 | 2001-2003 | 1994-1997 | 1998-2000 | 2001-2003 |
| **8 highest GDP growth rates** | | | | | | | | | |
| Mean | 56.29 | 54.86 | 54.44 | 17.09 | 16.87 | 16.79 | 3.87 | -0.25 | 0.03 |
| Median | 56.59 | 54.37 | 55.09 | 17.22 | 17.44 | 17.33 | 3.48 | 0.24 | -0.55 |
| **8 lowest GDP growth rates** | | | | | | | | | |
| Mean | 41.95 | 41.21 | 39.66 | 17.86 | 17.05 | 17.75 | 3.89 | 2.20 | 1.32 |
| Median | 42.61 | 44.05 | 40.45 | 17.87 | 17.15 | 17.72 | 3.70 | 2.80 | 1.05 |
| Difference in Means | 14.34 | 13.65 | 14.77 | -0.78 | -0.19 | -0.96 | -0.02 | -2.46 | -1.29 |
| Difference in Medians | 13.98 | 10.32 | 14.64 | -0.66 | 0.29 | -0.39 | -0.22 | -2.56 | -1.60 |

**Source:** Own elaboration.

**Note:** Based on a sample of six countries: Brazil, Chile, Colombia, Costa Rica, México, and Perú.

# VII. Policy implications

Our study suggests five set of guidelines for the design of policies and instruments aimed at the promotion of a high saving-high growth agenda:

## 7.1 Both national savings and productivity policies matter for growth

Our evidence showed that national savings and economic growth are positively associated. The evidence did not show that growth causes (or determines) savings, however. We found mixed evidence about the causality between national savings and growth. In some cases growth could stimulate savings and, in others, savings could trigger a rise of growth. These results suggest that comprehensive growth policies should embrace both saving and growth policies. A mutual reinforcing process is likely to develop between national savings and growth.

Pro-growth policies that encourage efficiency and innovation by improving the working of markets and efficiency of government policies would also help stimulate savings and growth. And, policies that encouraging households and government savings, would help rise growth and savings. Savings policies should embrace the promotion of macroeconomic stability and public savings become key instruments for stimulating national savings.

## 7.2. National savings and growth policies reinforce each other

Our results suggest that national savings and (current) growth seem to reinforce each other. This helps to explain the formation of vicious and virtuous cycles. It makes saving policies the main force driving sustainable growth when the availability of investment financing becomes a binding restriction for investment and growth. And, it makes growth policies the driving force for raising national savings and to sustain growth when productivity and investment incentives (for example, because of low expected returns or weak governance) become the binding constraint for growth. Assessing the specific growth binding constraints seems adequate to help design an appropriate pro-growth agenda (see also Hausmann, Prichett, and Rodrick, 2004; and Haussmann, Rodrik, and Velasco, 2004) The authors argue that the key binding restriction may lie on productivity and investment returns and in others on insufficient savings to finance investment.

## 7.3. Raising national savings reduces external vulnerability

We found that the promotion of national savings should also be part of the economic policy agenda in Latin America not only because in some cases it is saving that constraint growth but because the evidence shows that national savings national savings and foreign savings are negatively correlated. Moreover, the evidence also shows that national savings and investment are positively correlated. Foreign savings are more volatile than national savings and Latin American countries are subjected to external borrowing constraints. We found that about half of foreign savings goes to finance consumption and half to finance investment. The Latin America experience has shown that that excessive reliance on foreign savings (large current account deficits) has been at the center of currency and financial crisis. The increasing globalization path developed since the 1990s has exposed the countries to high volatility of capital flows and increased contagion from external shocks. Reducing the dependence on foreign savings seems an essential ingredient for prudent pro-growth economic policies.

## 7.4. Financial sector development helps stimulate growth

We found a positive association between financial depth and national savings. Enhancing the savings and investment opportunities through financial instruments and intermediaries helps boost growth. Financial intermediaries are also essential in the assessing and sharing of savings and investment risks. However, as the Latin American experience shows it seem essential that financial depth incorporates adequate elements of regulation and supervision. In more general terms public policies promoting sound corporate governance would be essential elements to stimulate savings.

# VIII. Final remarks

Our study contributed to the understanding of national savings in Latin America from three perspectives: (1) we provided a survey of main studies and evidence regarding the factors associated or with national and private savings through the 1990s; (2) we extended our evidence of the association of national savings and other macroeconomic variables to the second half of the 1990s and first half of the 2000s; (3) we examined the causality between growth and national savings; (4) we examined the role of enterprises in the generation of national savings; and (4) we provide some key policy elements for a pro- growth agenda.

Our evidence showed that the main results found in the 1970s, 1980s, and early 1990s regarding the factors associated with national savings also hold in the period 1990-2003. However, we found no evidence of association between national savings and the level of income (per capita GDP), dependency ratio, domestic interest rates, terms of trade, and income distribution. The relatively smaller size of our panel may explain the lack of correlation found in the cases of the income level and dependency ratio. The lack of correlation between national savings and the interest rates, terms of trade, and income distribution is in line with the ambiguous evidence found in the literature.

We found a positive relationship between the national savings rate and inflation, also found in other studies, and rationalized as a precautionary savings motive. We notice, however, that this correlation is likely to be non-linear. Inflation declined substantially in the region in the 1990s and 2000. However, in periods of very high inflations, like the 1980s, growth, investment, and savings have fallen.

We found that the national savings were positively associated with per capita GDP growth, the government balance, and financial depth; and negatively associated with foreign savings. We found no evidence that growth "causes" national savings, however. Our evidence suggests that a mutual causality is likely between national savings and growth. The interaction between growth and savings being most like shaped by the specific circumstances and type of events affecting growth and savings. In cases of productivity constraints growth (through the enhancing of investment returns) would drive savings, as distortions affecting productivity growth make additional savings little effective for accelerating growth. In cases of investment financing constraints savings would drive growth, as alleviating borrowing constraints would increase the financing required for raising investment. Sustained growth seems to require raising productivity and national savings.

We examined the role of enterprises and our results suggest that households an the government appear to internalize the savings of enterprises. Further research aimed at compiling disaggregated series for the savings of households, enterprises, and the government for Latin American countries would be required, however, to reach more definitive conclusions and policy implications.

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# Annex

# Annex 1

# Variables: description and sources

| Concept | Names | Variable | Abbreviated Names | Description | Source |
|---|---|---|---|---|---|
| GDP | GDP (constant 2000 US$) | | GDP_const_US, ln_GDP_const_US | Annual growth and level of Gross domestic product (current and constant prices) | WDI |
| | GDP (constant LCU) | | GDP_const_LCU, ln_GDP_const_LCU | | WDI |
| | GDP (current LCU) | | GDP_curr_LCU, ln_GDP_curr_LCU | | WDI |
| | GDP (current US$) | | GDP_curr_US, ln_GDP_curr_US | | WDI |
| | GDP growth (annual %) | | GDP_growth | | WDI |
| | GDP per capita (constant 2000 US$) | | GDPpc_const, ln_GDPpc_const | Annual growth and level of GDP per capita. | WDI |
| | GDP per capita growth (annual %) | | GDPpc_growth | | WDI |
| Debt | External Debt %GDP | | ext_debt | | WDI |
| | External debt, total (DOD, current US$) | | - | Level and % ratio of debt owed to nonresidents repayable in foreign currency, goods, or services on GDP. | WDI |
| | Public and publicly guaranteed debt service (% of GNI) | | public_debt | % ratio of public debt over GNI | WDI |
| Education | School enrollment, primary (% net) | | school_prim | % ratio of children of official school age who are enrolled in school to the population of the corresponding official school age (ISCED97). | WDI |
| | School enrollment, secondary (% net) | | school_dec | | WDI |
| Saving and Capital Formation | Foreign Savings (%GDP) | | foreign_savings | % ratio of saving / capital / operating surplus on GDP. Operating surplus and Operating % of GDP based on data at current prices. | WDI and own |
| | Gross capital formation (%GDP) | | tot_savings | | WDI |
| | Gross domestic savings (%GDP) | | - | | WDI |
| | National Savings (%GDP) | | nat_savings, nat_savings_ma, nat_savings_tr | | WDI |

**Annex 1** (continued)

| Concept | Names | Variable | Abbreviated Names | Description | Source |
|---|---|---|---|---|---|
| | Total Savings (%GDP) | tot_savings | | | WDI |
| | Operanting Surplus (%GDP) | op_surplus | | | ECLAC, INEI, CBCH, CBCR |
| Financial Depth | M3 (% GDP) | m3 | | % ratio of liquid liabilities (M3) / money and quasi money (M2) / market capitalization of listed companies / on GDP | WDI |
| | Market capitalization of listed companies (% of GDP) | mkt_cap | | | WDI |
| | M2 (% GDP) | m2 | | | WDI |
| | Domestic credit to private sector (% of GDP) | credit_priv | | | WDI |
| Fiscal policy | Governement Balance % GDP | gov_balance | | % share of government balance / tax revenue on GDP | IFS |
| | Tax revenue (% of GDP) | tax_revenue | | | WDI |
| Demographics | Population ages 0-14 (% of total) | pop_0_14 | | % ratio of the total population that is in specific age groups | WDI |
| | Population ages 15-64 (% of total) | pop_15_64 | | | WDI |
| | Population ages 65 and above (% of total) | pop_65 | | | WDI |
| Distribution of income and wealth | Poverty headcount ratio (% population) | poverty_ratio | | % ratio of the population living below the national poverty line. | WDI |

**Annex 1** (continued)

| Concept | Names | Variable | Abbreviated Names | Description | Source |
|---|---|---|---|---|---|
| | GINI | | gini, gini_ma, ln_gini | a measure of the extent to which the distribution of income among individuals within an economy deviates from a perfectly equal distribution (0 = perfect equality, 100 = perfect inequality) | WIID |
| Uncertainty | | | | | |
| | Policy uncertainty | | policy_uncert | % share of senior managers who ranked economic and regulatory policy uncertainty as a major or very severe constraint. | WDI |
| | Inflation, consumer prices (annual %) | | inflation, inflation_ma, inflation_tr | % annual change in the consumer price index | WDI |
| Rate of returns | Lending interest rate (%) | | lend_int_rate | % rate charged by banks on loans to prime customers. | WDI |
| | Real interest rate (%) | | real_int_rate | % lending interest rate adjusted for inflation as measured by the GDP deflator | WDI |
| | Deposit interest rate (%) | | dep_int_rate | % rate paid by commercial or similar banks for demand, time, or savings deposits. | WDI |
| Consumption | | | | | |
| | Household final consumption expenditure (% GDP) | | household_cons | % ratio of market value of all goods and services, purchased by households, on GDP | WDI |
| | Final consumption expenditure (% of GDP) | | cons_expen | % ratio of the sum of private consumption general government consumption on GDP | WDI |
| Foreign borrowing constraints and trade | FDI net inflows (% GDP) | | fdi | % ratio of FDI / current and external balance on GDP. | WDI |

**Annex 1** (continued)

| Concept | Names | Variable | Abbreviated Names | Description | Source |
|---|---|---|---|---|---|
| | Current account balance (% of GDP) | curr_acc_bal | | | WDI |
| | External balance on goods and services (% of GDP) | ext_balance | | | WDI |
| | Net barter terms of trade (2000 = 100) | trade_terms | | % ratio of the export price index to the corresponding import price index (base year: 2000) | WDI |
| Openness (exports+imports) | | openness | | % ratio of exports+ imports on GDP | WDI |

WDI: World Development Indicators. World Bank.

IFS: International Finance Statistics, International Monetary Fund.

WIID: World Income Inequality Database, United Nations University.

ECLAC: Statistical yearbook for Latin America and the Caribbean, 2004. Economic Commission for Latin America and the Caribbean.
INEI: Instituto Nacional de Estadistica e Informatica, Peru.

CBCH: Central Bank of Chile.

CBCR: Central Bank of Costa Rica.

ISCE97: International Standard Classification of Education 1997

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