WHY AREN'T SAVINGS RATES IN LATIN AMERICA PROCYCLICAL?

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ABSTRACT

We document a striking empirical regularity: Latin American savings rates are as a rule substantially less procyclical than for OECD countries and in some cases are actually countercyclical. We build a non-representative agent intertemporal macroeconomic model that rationalizes this phenomenon as the equilibrium outcome of interaction between multiple groups that have common access to aggregate income. We conclude by suggesting that institutional reform may hold the key to improving the cyclical behavior of savings in Latin America.

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1 Introduction

In this paper, we address a striking empirical regularity: savings rates in Latin America are as a rule not procyclical, and are actually countercyclical for a number of Latin American countries. This pattern stands in contrast with the OECD where savings rates are strongly procyclical. This phenomenon is difficult to explain within the paradigm of representative-agent macroeconomic models, given the force of the consumption-smoothing mechanism in such models. One reason why these models fail to explain this puzzle is that the representative-agent assumption rules out equilibria which may be individually rational but collectively inefficient.

Our insight is that many Latin American countries are plagued by a weak institutional environment. Allocation decisions often seem to be the result of deal-making within the politico-business elite and the violations of the formal laws and procedures — for example in the allocation of public contracts and subsidies, and the allocation of credit within the banking sector — are not infrequent. Under such circumstances, private property rights are insecure and a large fraction of the economy can be viewed as essentially common property in the sense of being vulnerable to appropriation by powerful groups in society. Such groups might include regional political leaders, provincial governments, labor unions, parastatal enterprises and the financial backers of the ruling government. The determination of macroeconomic quantities in such an economy depends on the interaction between these powerful groups. Unless these groups perfectly cooperate, this interaction need not produce collectively efficient outcomes.

In this paper we present a dynamic game where the equilibrium strategies of powerful groups can lead to a perverse cyclical pattern for the savings rate. The savings rate response to shocks will be muted relative to the first-best representative-agent case and may even be countercyclical. The latter possibility may be termed a voracity effect in the sense that consumption rises more than output. We show that this apparently surprising result is a natural feature of our model.

Previewing the rest of the paper, in section 2 we document the empirical regularity of a lack of procyclicality in Latin American savings rates, which is the stylized fact that we wish to rationalize. From the outset, we want to emphasize that our focus is on the cyclical (high frequency) component of savings. As such, our analysis has a different perspective and is complementary to studies that seek to explain the levels of savings rates in Latin American (see Edwards 1995, 1996). As a benchmark, we also examine the cyclical pattern of savings rates in the OECD set of countries. Our basic finding is that savings rates are typically procyclical in the OECD but not in Latin America.

We attempt to explain this empirical anomaly in section 3 of the paper by developing a simple theoretical macroeconomic model that replaces the representative agent by several powerful groups. Each group has common access to total national income, as it is able — for example, by influencing government regulations and taxation and expenditure policies — to appropriate resources from the other groups. In order to handle rate of return shocks (e.g. productivity shocks), as well as endowment shocks (e.g. oil discoveries), we consider a model where aggregate income is the sum of production in a sector that uses accumulable capital plus the output from a non-renewable natural resource sector.

Each group must make the trade-off between maximizing appropriations from the other groups and providing sufficient incentives for investment so that future output does not collapse. In response to a shock to output (of whatever variety), we show that the balance between these two factors shifts in favor of increasing current appropriation and consumption. As a result, the savings rate declines. By contrast, in the first-best solution, corresponding to the allocations chosen by a representative agent or social planning solution, savings respond procyclically to increases in output.

Finally, in section 4 of the paper, we offer some concluding comments and highlight future directions for research.

2 Empirics

In this section, we document the behavior of the savings rate over the economic cycle. According to the neoclassical representative agent model, we should expect the savings rate to be highly procyclical, as optimal consumption smoothing requires an increase in savings during good times in order to allow a decline in savings during bad times. In contrast, agents will be reluctant to save during a boom if assets are liable to be appropriated by others in a society.

[Insert Table 1]

In evaluating the cyclical properties of savings rates in Latin America, we use a set of OECD economies as a benchmark. (Table 1 lists the countries in the study.) We study annual observations on savings over the period 1971-1993.[1] To capture high frequency fluctuations, we initially employ the first-difference filter. (An alternative filter is used below.) The rationale for this measure is that the annual change in output has a substantial temporary component and hence can be employed as a proxy for cyclical variation. In the estimation, we allow an AR(1) process for the residual term. (Quite similar results are obtained if a lagged dependent variable is included in the specification as a further control for autocorrelation or if the lagged level of the dependent variable is included as an "error correction mechanism.")

[Insert Tables 2-3]

In Tables 2-3, the results for the first-difference filter are presented for the OECD and Latin American samples respectively. For the OECD, the picture generally resembles the results predicted by the neoclassical representative-agent model. In 21 of the 24 country regressions, the savings response to the cyclical variation in output is positive; in nine of these cases, the coefficient is significant at the 1% level, five further cases, it is significant at the 10%

[1]The source for the data is the World Bank's *World Tables*.

level (in addition, the Netherlands lies just outside the 10% critical value). In no case is the relationship between savings and the cycle significantly negative. Moreover, for the set of countries that display a significant positive relationship between output and savings, the size of the savings response is quite large, with the coefficient on output in the range (.162, .891).

The picture is quite different for the Latin American sample in Table 3. In no case is there a positive relationship between output and savings over the economic cycle that is significant at the 1% level. Just three countries have a procyclical savings rate that is significant at the 10% level (Bolivia, Haiti and Panama) but even for these countries the response of savings to output is smaller than for the OECD countries, with a coefficient in the range (.128, .169). Moreover, nine countries exhibit a negative relationship between savings and output and this negative effect is significant at the 10% level for Argentina, Chile, and Jamaica.

[Insert Tables 4-5]

The Hodrick-Prescott filter is employed in Tables 4-5 as an alternative method of extracting the cyclical components of savings and output. In the OECD sample in Table 4, twenty countries have a procyclical savings rate by this measure and the relationship is significant at the 1% level for twelve countries and at the 10% level for two further cases. In the Latin American sample in Table 5, five countries have countercyclical savings rates that are significant at the 5% level (Chile at the 1% level). Only five countries have significantly procyclical savings rates (El Salvador, Guyana, and Panama at the 1% level, Haiti at the 5% level and Bolivia at the 10% level). However, even for these countries, the magnitude of the procyclical response of savings is typically lower than for the OECD set of countries, with the exception of Guyana.

In Tables 6-8, we turn to panel estimation. To increase efficiency, the coefficient on the cyclical component of output is constrained to be the same within the Latin American and OECD subgroups. In Table 6, variables are in first differences. In columns (1)-(4), the panel is the LAM set of countries; in columns (5)-(8), it is the OECD. We run pooled regressions [columns (1) and (5)]; with country fixed effects [columns (2) and (6)]; with time fixed effects [columns (3) and (7)]; and with both country and time fixed effects [columns (4)-(8)]. Estimation is by GLS, with cross-sectional weights. The results for the LAM and OECD panels do not vary much across these specifications: the LAM panel generates a negative coefficient on output in changes in the savings rate while the OECD panel generates a significantly positive coefficient. The exercise is repeated in Table 7 but now the data are passed through the Hodrick-Prescott filter. The change in the filtering method makes little difference to the results. Finally, in Table 8, we run a related specification by including all the countries in the panel but interacting the output measure with a LAM dummy variable for the Latin American countries. In line with the results from the separate sub-panels in Tables 6-7, the savings rate is significantly procyclical in the OECD but not in Latin America.

[Insert Tables 6-8]

The broad message from this regression analysis is that the savings rates are not, as a rule, procyclical in Latin America, and is even in some cases countercyclical, in contrast to the typical OECD country. The obverse of this is that consumption in Latin America is highly procyclical, which would be in violation of the consumption-smoothing hypothesis. In our model below, we provide a rationale for procyclical consumption: the payoff to savings in a boom is low as other groups become more voracious during good times.

It is important to note that the differences between the OECD and Latin America cannot be attributed to differences in the persistence of output in the two samples: Gavin et al. (1996) find that the persistence properties of output are very similar across the two samples. Moreover, Gavin and Hausmann (1995) and Agenor, McDermott and Prasad (1997) document that output is considerably more volatile in Latin American than in the OECD. By itself, this document would predict that savings are even more procyclical in Latin America than in the OECD as the precautionary motive for savings would lead to an even greater reluctance to consume any increase in output (Ghosh and Ostry 1994), deepening the puzzle of the lack of procyclicality in Latin American savings rates.

Our findings are also supported by the empirical evidence provided by Gavin et al. (1996) and Talvi and Vegh (1997) that fiscal policy in Latin America is significantly procyclical. Another piece of supporting evidence is detailed by Videgaray (1997). In a careful econometric study of the Mexican economy, Videgaray shows that government spending rose more than increases in oil revenues during the 1970s.

We now develop a theoretical framework that can account for this pattern in the data.

3 The Model

We consider an economy that is populated by two infinitely-lived groups. The valuation function of each group is

$$U_i(t) = \int_t^\infty e^{-\delta t} \frac{\sigma - 1}{\sigma} c_i(t)^{\frac{\sigma}{\sigma-1}}, \qquad \sigma \neq 1, \ \delta > 0 \tag{1}$$

where σ is the elasticity of intertemporal substitution.

To capture the different sources of income shocks, we assume that income consists of an exogenous endowment β plus the amount of the consumption good produced with a linear technology using the economy's capital stock. Therefore income is given by

$$y(t) = \beta + \alpha k(t) \tag{2}$$

The endowment β can be interpreted as the flow income from ownership of a natural resource. Shocks to β capture movements in commodity prices or discoveries of extra natural resources, while shocks to α capture productivity shocks.[2]

The two groups control allocation in the economy and can be interpreted as representing powerful organizations, such as provincial governments, large

[2]As such, this is a more general production function than in the one-sector model developed in Lane and Tornell (1996).

unions or favored business conglomerates. To formalize the fact that these groups have the power to appropriate resources in the economy, we assume that they have common access to the aggregate capital stock. Thus the accumulation equation for aggregate capital is

$$\dot{k}(t) = \beta + \alpha k(t) - c_1(t) - c_2(t) \tag{3}$$

where $c_1(t)$ and $c_2(t)$ are the consumption rates of groups 1 and 2 at date t. We assume that each group can set its appropriation up to an upper limit given by

$$c(t) < \bar{c}(k(t)), \qquad \bar{c}(k(t)) \in \left(\frac{\beta(1-\sigma)}{2-\sigma} + \frac{[\alpha(1-\sigma)+\delta\sigma]}{2-\sigma}k(t), \infty\right) \tag{4}$$

We have set the upper appropriation limit sufficiently high, so that it is not binding in equilibrium (see (9)). In order to close the model we impose the following non-negativity constraints

$$c(t) > 0, \qquad k(t) > 0 \tag{5}$$

3.1 The First Best

The first best allocation is the one chosen by a central planner that maximizes (1) subject to (3), (4), and (5). It also corresponds to the case when both groups act cooperatively. The solution to this problem is standard (see Barro and Sala-i-Martin (1995), and Lane and Tornell (1996)). It is given by $C_i(t) = [(1-\sigma)RoR + \delta\sigma]\,\frac{k(t)}{2}$, where RoR is the aggregate rate of return of the reproducible asset. Since in the case we are considering $RoR = \alpha + \frac{\beta}{k(t)}$, we have that

$$c_i^{fb}(t) = \left[(1-\sigma)(\alpha + \tfrac{\beta}{k(t)}) + \delta\sigma\right]\frac{k(t)}{2} \tag{6}$$

As in standard models, an increase in the rate of return — a rise in α or β — induces a fall in consumption (a rise in savings) when the substitution effect dominates the income effect ($\sigma > 1$) and a fall if $\sigma < 1$.

3.2 The Non-Cooperative Equilibrium

As in the first best case, the appropriation of each group is a function of the rate of return it receives. The difference with respect to the first best case is that since both groups have common access to the capital stock, the return received by one group is determined by the appropriation rate of the other group. Thus, to find an equilibrium, we need to find two appropriation policies that are best responses to each other. To do so we need to specify the class of functions over which a group can choose its appropriation. We will follow the standard procedure used in aggregate macroeconomic models and restrict strategies to be Markov, that is, only functions of the state ($k(t)$). In particular, we will allow groups to choose their appropriation policy from the class of linear functions of the capital stock

$$c_i(t) = x_i + z_i k(t), \qquad i = 1,2 \tag{7}$$

where x_1, x_2, z_1 and z_2 are arbitrary constants that will be determined endogenously. The strategies defined by (7) rule out history-dependent strategies such as trigger strategies.

There are two types of equilibria: interior and extreme. In an interior equilibrium at all times both groups set their appropriation at levels lower than the maximum permissible (given by (5)). This is not true along an extreme equilibrium. In this paper we will characterize the interior equilibrium. (Extreme equilibria are not interesting for our purposes because they not do not generate anticyclical savings rates. This is because consumption rates are always at their maximum.)

The constant in production function (2) makes quite complicated the derivation of the interior equilibrium using the Hamiltonian method, along the lines of Lane and Tornell (1996). Note, however, that we can derive the interior equilibrium appropriation policies by noting that they are given by the first best consumption policy (6) replacing the rate of return received by the group in question. In the game the rate of return received by group 1 is $\alpha + \frac{\beta}{k(t)} - \frac{x_2}{k(t)} - z_2$, and the rate received by group 2 is $\alpha + \frac{\beta}{k(t)} - \frac{x_1}{k(t)} - z_1$. Replacing these expressions in (6) we have that the best responses are

$$\begin{aligned} \hat{c}_1(k) &= \left[(1-\sigma)(\alpha + \tfrac{\beta}{k(t)} - \hat{c}_2(k)) + \delta\sigma\right] k \\ \hat{c}_2(k) &= \left[(1-\sigma)(\alpha + \tfrac{\beta}{k(t)} - \hat{c}_1(k)) + \delta\sigma\right] k \end{aligned} \tag{8}$$

These simultaneous equations have a unique solution. Thus, setting $c_1 = x_1 + z_1 k$ and $c_2 = x_2 + z_2 k$, and equalizing coefficients with (7) we have that the unique interior Markov perfect equilibrium in the class of linear functions of k is

$$\hat{c}(k) = \frac{\beta(1-\sigma)}{2-\sigma} + \frac{\alpha(1-\sigma) + \delta\sigma}{2-\sigma} k \tag{9}$$

3.3 Cyclicality of Savings

In this subsection we show that our model rationalizes the stylized facts of section 2, namely that in OECD countries national savings are procyclical, while in Latin American countries the savings rate is not procyclical and in some cases is countercyclical. Since our model is not stochastic, we will represent an income shock by an unexpected once-and-for-all change in α or β. As indicated above, a shock to β can be interpreted as an increase in the commodity price or a discovery of a natural resource, such as oil, and a shock to α as a productivity or technology shock.

If we consider that in the OECD there typically exist institutional barriers to discretionary appropriations, then the first-best consumption policy (6) is a good approximation to the determination of savings rates in that group of countries. In deriving the equilibrium savings-output ratio, note that since the economy is closed, savings is equal to investment. Furthermore, since there is no depreciation, investment is equal to $\dot{k}$. Thus, substituting (6) in (3) we have that the first best savings-to-output ratio is

$$s^{fb} = \frac{S^{fb}(t)}{y^{fb}(t)} = \frac{\dot{k}^{fb}(t)}{y^{fb}(t)} = \sigma - \frac{\delta\sigma k^{fb}(t)}{\beta + \alpha k^{fb}(t)} \tag{10}$$

It follows that a positive shock to α or β increases unambiguously the savings rate in the first-best case

$$\frac{\partial s^{fb}(t)}{\partial \alpha} = \frac{\delta\sigma k^{fb}(t)^2}{y^{fb}(t)^2} > 0, \qquad \frac{\partial s(t)^{fb}}{\partial \beta} = \frac{\delta\sigma k^{fb}(t)}{y^{fb}(t)^2} > 0 \tag{11}$$

The non-cooperative equilibrium (8) is the relevant case when there are no well-established limits to what powerful groups can appropriate. This is an approximation of the environment in many Latin American countries. Substituting (9) in accumulation equation (3) we have in this case the equilibrium aggregate savings rate

$$\hat{s}(t) \equiv \frac{\hat{S}(t)}{\hat{y}(t)} = \frac{\dot{k}(t)}{\beta + \alpha\hat{k}(t)} = \left[\sigma - \frac{2\delta\hat{k}(t)}{\beta + \alpha\hat{k}(t)}\right]\frac{1}{2-\sigma} \tag{12}$$

When there is common access to the aggregate capital stock the savings rate is not unambiguously procyclical

$$\frac{\partial\hat{s}(t)}{\partial\alpha} = \frac{\sigma\delta\hat{k}^2}{\hat{y}(t)^2}\frac{2}{2-\sigma} = \begin{cases} > 0 & \text{if } \sigma < 2 \\ \\ < 0 & \text{if } \sigma > 2 \end{cases} \tag{13}$$

$$\frac{\partial\hat{s}(t)}{\partial\beta} = \frac{\sigma\delta\hat{k}}{\hat{y}(t)^2}\frac{2}{2-\sigma} = \begin{cases} > 0 & \text{if } \sigma < 2 \\ \\ < 0 & \text{if } \sigma > 2 \end{cases}$$

Comparing (11) and (13) it follows that in this equilibrium the savings rate response to a shock is always less procyclical than in the first-best case. First, the capital-output ratio is always smaller than in the first-best case (given the same initial capital stock) as the level of the savings rate is lower. Second, even for a given capital-output ratio, the savings rate response is less procyclical as $\frac{2}{2-\sigma} < 1$.

The savings rate is actually countercyclical in the case $\sigma > 2$.[3] In other words, consumption actually rises more than income in response to a positive

[3]Since the first term in (9) is positive for $\sigma > 2$, a sufficient condition for consumption to be positive when $\sigma > 2$ is that the discount rate be sufficiently smaller than the marginal product of capital. That is, $\delta < \frac{\sigma-1}{\sigma}\alpha$.

shock, which is the voracity effect outlined in the introduction. To illustrate the intuition for this result, consider an increase in α and let $\sigma > 2$. The increase in the physical marginal product of capital has a direct effect that increases the savings rate, and an indirect effect that increases the appropriation of both groups

$$\frac{\partial \hat{s}}{\partial \alpha} = \left[1 - \frac{\partial \hat{c}_1}{\partial \alpha} - \frac{\partial \hat{c}_2}{\partial \alpha}\right] \frac{\hat{k}}{\hat{y}}$$

The indirect appropriation effect $\left(\frac{\partial \hat{c}_1}{\partial \alpha} + \frac{\partial \hat{c}_2}{\partial \alpha}\right)$in turn has two components: the standard income-substitution effect and a new rate-of-return effect

$$\frac{\partial \hat{c}_1}{\partial \alpha} = \frac{\partial RoR_1}{\partial \alpha}[1 - \sigma] = \left[1 - \frac{\partial \hat{c}_2}{\partial \alpha}\frac{1}{\hat{k}}\right][1 - \sigma]$$

In standard representative agent models $\frac{\partial RoR_1}{\partial \alpha} = 1$. Thus, consumption falls if the substitution effect dominates the income effect ($\sigma > 1$). However, with several powerful groups the rate of return received by one group is also affected by the responses of the other groups. Recall that in this case group 1's rate of return is $\alpha + \frac{\beta}{k} - \frac{c_2}{k}$. Therefore, group 1's rate of return changes by $1 - \frac{\partial \hat{c}_2}{\partial \alpha}\frac{1}{k}. = 1 - \frac{1-\sigma}{2-\sigma} = \frac{1}{2-\sigma}$. It follows that if $\sigma > 2$, group 1's rate of return actually falls after α increases. Since the substitution effect dominates the income effect, $\hat{c}_1$ increases by $\frac{1-\sigma}{2-\sigma}$. Note that since the increase in $\hat{c}_1$ reduces group 2's rate of return, the increase in consumption by both groups is mutually consistent. Applying the same argument to group 2, we have that aggregate consumption increases by $\frac{\partial(\hat{c}_1+\hat{c}_2)}{\partial \alpha} = 2\frac{1-\sigma}{2-\sigma}$. Since this expression is greater than one, aggregate savings fall as shown in the top row in (13).

One should note that the condition $\sigma > 2$ is just an artifact of our assumption that there are only two powerful groups. As discussed in Lane and Tornell (1996), the more groups there are, the weaker is the condition on σ required to generate the voracity effect. Furthermore, as σ is the collective intertemporal elasticity of substitution of a group, it may well be larger than the estimates found for individuals: cross-insurance within a group may make the group more willing to accept a fluctuating path for consumption.

4 Conclusions

We have provided an explanation for the lack of procyclicality of savings rates in Latin America, relative to the OECD. The difference is in the institutional setting. If institutions enforce private property rights or provide a cooperative mechanism by which multiple powerful groups are able to act in their collective self-interest, the representative-agent model applies and consumption will be optimally smoothed. If such institutions are absent, individually rational behavior by each group translates into an inefficient equilibrium in which the savings-to-income ratio is lower than in the first best, and it can even decline in response to a positive income shock.

In this paper, we have focused on the implications of the voracity effect for the cyclical behavior of savings rates. In other work, we demonstrate that the voracity effect can also alter the current account response to shocks and equilibrium growth rates (Tornell and Lane 1997, Lane and Tornell 1996, 1997). The general message is that macroeconomic behavior can be quite different in economies populated by several powerful groups than in economies that can be characterized by a representative agent.

A pressing item for future research is to investigate how countries can build institutions to ameliorate the common pool problem. Cardenas and Partow (1997) have taken an important first step in addressing this question by examining Colombia's management of its coffee and oil endowments, but much remains to be done.

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Table 1: List of Countries

LAM		OECD	
ARG	Argentina	AUS	Australia
BOL	Bolivia	AUT	Austria
BRA	Brazil	BEL	Belgium
CHL	Chile	CAN	Canada
COL	Colombia	DEN	Denmark
CRI	Costa Rica	FIN	Finland
DOMR	Dominican Republic	FRA	France
ECU	Ecuador	GER	Germany
EL	EL Salvador	GRE	Greece
GUAT	Guatemala	ICE	Iceland
GUY	Guyana	IRE	Ireland
HAI	Haiti	ISR	Israel
HON	Honduras	ITA	Italy
JAM	Jamaica	JAP	Japan
MEX	Mexico	NET	Netherlands
NIC	Nicaragua	NOR	Norway
PAN	Panama	NZ	New Zealand
PAR	Paraguay	PO	Portugal
PER	Peru	SP	Spain
TTO	Trinidad&Tobago	SWE	Sweden
URY	Uruguay	SWI	Switzerland
VEN	Venezuela	TUR	Turkey
		UK	United Kingdom
		US	United States

Table 2: Cyclicality of Savings in the OECD I, 1971-93

	YD	DW	adj.R^2
AUS	0.55 (.1)	1.76	0.579
AUT	0.241 (.125)	2.01	0.087
BEL	0.442 (.1)	2.02	0.011
CAN	0.365 (.09)	1.97	0.41
DEN	0.327 (.112)	1.19	0.369
FIN	0.276 (.094)	2.18	0.244
FRA	0.414 (.1)	2.18	0.475
GER	-0.059 (.124)	1.98	-0.096
GRE	0.624 (.169)	1.89	0.4
ICE	-0.055 (.06)	1.78	0.254
IRE	0.135 (.2)	1.78	-0.066
ISR	-0.362 (.28)	0.89	0.021
ITA	0.162 (.081)	1.85	0.037
JAP	0.239 (.13)	2.07	0.211
NET	0.278 (.163)	2.05	0.075
NOR	0.11 (.39)	1.73	-0.031
NZ	0.525 (.21)	1.81	0.156
PO	0.891 (.189)	0.93	0.552
SP	0.076 (.131)	1.99	-0.056
SWE	0.456 (.138)	1.98	0.308
SWI	0.164 (.088)	1.96	0.103
TUR	0.052 (.011)	1.86	-0.076
UK	0.181 (.1)	2.07	0.025
US	0.481 (.052)	2.1	0.746

Dependent variable is ratio of gross domestic savings to GDP, first differenced. OLS estimation. YD is first difference of log of output.

Table 3: Cyclicality of Savings in Latin America I, 1971-93

	YD	DW	adj.R^2
ARG	-0.072 (.035)	1.79	0.198
BOL	0.169 (.088)	1.72	0.136
BRA	0.036 (.041)	2.02	-0.043
CHL	-0.192 (.091)	2.3	0.196
COL	-0.05 (.07)	2.06	-0.047
CRI	0.006 (.049)	2.17	0.019
DOMR	-0.016 (.095)	1.96	0.117
ECU	0.066 (.11)	1.98	-0.082
EL	0.134 (.1)	2.37	0.112
GUAT	-0.024 (.063)	2.15	0.057
GUY	0.604 (.453)	2.17	0.008
HAI	0.166 (.077)	1.78	0.07
HON	0.051 (.09)	1.82	0.03
JAM	-0.122 (.06)	1.65	0.467
MEX	0.037 (.062)	2.01	-0.087
NIC	0.053 (.062)	2.17	-0.004
PAN	0.128 (.063)	1.96	0.266
PAR	-0.12 (.1)	2.07	-0.026
PER	0.023 (.064)	1.54	-0.013
TTO	0.194 (.164)	2.05	-0.016
URY	-0.004 (.049)	1.38	-0.072
VEN	-0.162 (.14)	2.2	-0.001

Dependent variable is ratio of gross domestic savings to GDP, first differenced. OLS estimation. YD is first difference of log of output.

Table 4: Cyclicality of Savings in the OECD II, 1971-93

	HPLY	adj.R^2	DW
AUS	0.538 (.095)	1.5	0.6
AUT	0.338 (.11)	2.08	0.386
BEL	0.351 (.121)	1.6	0.47
CAN	0.303 (.09)	1.59	0.368
DEN	0.486 (.106)	1.28	0.593
FIN	0.242 (.061)	1.98	0.35
FRA	0.47 (.091)	1.61	0.707
GER	-0.068 (.123)	1.7	0.158
GRE	0.666 (.169)	1.75	0.456
ICE	0.004 (.098)	1.26	-0.065
IRE	-0.053 (.17)	1.43	0.016
ISR	-0.099 (.258)	1.63	-0.069
ITA	0.152 (.08)	1.71	0.206
JAP	0.301 (.108)	1.81	0.487
NET	0.262 (.155)	1.54	0.251
NOR	-0.289 (.382)	1.46	0.295
NZ	0.41 (.181)	1.55	0.16
PO	0.841 (.224)	0.88	0.577
SP	0.162 (.11)	1.77	0.302
SWE	0.539 (.096)	1.97	0.683
SWI	0.18 (.075)	1.85	0.437
TUR	0.064 (.097)	1.9	-0.008
UK	0.08 (.089)	1.5	0.075
US	0.4 (.056)	1.43	0.623

Dependent variable is ratio of gross domestic savings to GDP, Hodrick-Prescott filtered. OLS estimation. HPLY is Hodrick-Prescott filtered log of output. OECD sample.

Table 5: Cyclicality of Savings in Latin America II, 1971-93

	HPLY	adj. R^2	DW
ARG	-0.083 (.032)	1.52	0.364
BOL	0.165 (.092)	1.97	0.215
BRA	0.019 (.044)	1.94	0.043
CHL	-0.18 (.057)	2.02	0.262
COL	-0.123 (.062)	1.99	0.177
CRI	0.005 (.038)	1.98	-0.097
DOMR	-0.104 (.085)	2.1	-0.007
ECU	0.008 (.118)	1.85	-0.031
EL	0.202 (.07)	2.07	0.188
GUAT	-0.03 (.057)	2.02	-0.085
GUY	0.833 (.324)	1.96	0.161
HAI	0.166 (.073)	1.87	0.24
HON	0.088 (.084)	1.36	0.389
JAM	-0.094 (.039)	1.74	0.282
MEX	0.048 (.058)	2.01	0.249
NIC	0.078 (.057)	1.98	0.028
PAN	0.167 (.048)	1.88	0.273
PAR	-0.195 (.071)	1.91	0.28
PER	0.001 (.069)	1.32	0.275
TTO	0.179 (.195)	1.8	0.026
URY	-0.007 (.03)	2.19	-0.095
VEN	-0.133 (.13)	1.81	-0.05

Dependent variable is ratio of gross domestic savings to GDP, Hodrick-Prescott filtered. OLS estimation. HPLY is Hodrick-Prescott filtered log of output. LAM sample.

Table 6: Cyclicality of Savings: Panel I, 1971-93

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
YD	0.001	-0.0004	-0.02	-0.022	0.287	0.295	0.228	0.225
	(.015)	(.015)	(.017)	(.017)	(.024)	(.024)	(.027)	(.025)
Country Dummies?	No	Yes	No	Yes	No	Yes	No	Yes
Year Dummies?	No	No	Yes	Yes	No	No	Yes	Yes
adj.R^2	0.042	0.026	0.115	0.106	0.222	0.215	0.556	0.558
N	459	459	459	459	483	483	483	483

Dependent variable is ratio of gross domestic savings to GDP, first differenced. GLS (cross-section weights). YD is first difference of log of output. Columns (1)-(4) LAM countries; Columns (5)-(8) OECD countries.

Table 7: Cyclicality of Savings: Panel II, 1971-93

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
YD	-0.015	-0.015	-0.01	-0.01	0.284	0.284	0.189	0.189
	(.013)	(.013)	(.014)	(.015)	(.022)	(.022)	(.025)	(.025)
Country Dummies?	No	Yes	No	Yes	No	Yes	No	Yes
Year Dummies?	No	No	Yes	Yes	No	No	Yes	Yes
adj.R^2	0.083	0.041	0.161	0.12	0.361	0.332	0.545	0.524
N	481	481	481	481	506	506	506	506

Dependent variable is ratio of gross domestic savings to GDP, Hodrick-Prescott filtered. GLS (cross-section weights). $HPLY$ is Hodrick-Prescott filtered log of output. Columns (1)-(4) LAM countries; Columns (5)-(8) OECD countries.

Table 8: Cyclicality of Savings: Panel III, 1971-93

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
YD	0.265	0.295	0.164	0.204	0.284	0.284	0.185	0.186
	(.023)	(.024)	(.024)	(.026)	(.022)	(.022)	(.024)	(.025)
LAM*YD	-0.262	-0.295	-0.15	-0.192	-0.298	-0.299	-0.193	-0.195
	(.028)	(.029)	(.028)	(.03)	(.025)	(.026)	(.027)	(.028)
Country Dummies?	No	Yes	No	Yes	No	Yes	No	Yes
Year Dummies?	No	No	Yes	Yes	No	No	Yes	Yes
adj.R^2	0.135	0.133	0.266	0.254	0.25	0.215	0.403	0.376
N	942	942	942	942	987	987	987	987

Columns (1)-(4), dependent variable is ratio of gross domestic savings to GDP, first differenced; columns (5)-(8), variables are Hodrick-Prescott filtered. LAM is a 0-1 dummy variable where LAM countries score 1. Full panel.