Determinants of Savings in Latin American Countries

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Abstract:

This paper investigates the determinants of the Savings per capita in Latin American Countries during the years 2002 to 2005 and their significance. Using these years provides a look at how the Latin American Countries emerged from an inflation prone society in the 1990's to a diverse economic body according to Hernan Buchi the former finance minister of Chile. The study takes several models and applies them towards the Latin American Countries of Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Dominican Republic, Guatemala, Honduras, Mexico, Panama, Peru, Uruguay, and Venezuela. The study will use macro-level data to determine which of these factors are significant towards savings in Latin America.

JEL Classification: E21, E22, E24

Key words: Savings, Inflation, Unemployment Rate, Interest Rate

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1.0 INTRODUCTION

The focus of this study is an important macroeconomic topic due to the recent global economic crisis has brought the savings per capita or personal savings rate to the forefront of hot topics. Economists blame the recent hardship on a failure to save combined with a spending outside of their limits, and borrowing more than can be afforded. Finding the determinants of the savings rate or savings per capita of a country will allow the governments to change their policies to encourage savings. These policies will be instrumental in the advancement of developing Latin American countries.

Savings per capita is the amount of money that an average person in a country saves from their disposable income minus their consumption. Therefore, it is any income that is not consumed by immediately buying goods and services is saved. Disposable income is the money they have left after paying taxes. Recently, due to globalization data has become available in these Latin American countries that can help find the determinants of the saving rate. Each country has its own unique amount of savings due to their different economic entities that are distinct to it. Finding the major factors that affect the savings rate of the population in these countries will enable the governments which have struggled with economic problems in the past to create more effective policies for an increase in future savings.

This study's concentration is to enhance the understanding of not only what affects the savings per capita but also understand why these factors have the impact. This study is very relevant for the policy of these countries with the recent global economic crisis that has put more of an emphasis on saving for the future. The ability to control the savings rate is necessary so that in the future debt crisis that has plagued nations can be avoided. As well as not having to rely on

capital inflow from other nations to build the infrastructure of a growing economy, instead using home grow investments that make a country more self sufficient.

The rest of the paper is organized as follows: Section 2 tells of the previous trends in savings and the economies of the region. Section 3 gives a brief literature review, while section 4 outlines the factors and data used in the regress. Section 5 presents and discusses the empirical results. This is followed by a conclusion in the final section, 6. This paper provides an empirical assessment of the factors that contribute to the savings per capita with insight on why some of these factors vary from different countries over the years of 2002-2005 in Latin American countries.

2.0 TRENDS

Currently across the globe the common trend is to encourage savings in countries as to avoid another recession like the current one. Yet, in Latin American Countries during the 1990's preceding this paper this was not the case. Reinhart and Talvi (1997) wrote on how the foreign capital investment to help the Latin American Countries in fact reduced their savings rate. Although the capital flow lowered the savings rate it did increase the exports and better the economy as a whole.

However, during this time of economic change the savings rate of these countries did not improve with the rest of the economy. The common trend here was that the money they would receive would be used instantly with no thought of the future, creating economic turmoil in the future and a need for better policies. This was the complete opposite of the Asian market where capital flow had a positive correlation with savings. With the influx of capital into the countries

spending began to grow out of control making borrowing easier as well, this created the growth of a large deficit in many countries and also led to inflation. These problems weakened the savings in Latin America due to the compulsion to spend or pay back loans.

Typically these high levels of inflation allow for an increase in savings but again Latin American Countries defied the commonly held theory and savings remained extremely low. Once the early 2000's came and many countries had large account deficits abroad, new reforms came out to reduce the excess spending get rid of the inflation and grow a stable economy. Now that a more stable economy in most of the countries have emerged it is possible for to find a potentially unhampered correlation between these factors and savings.

3.0 LITERATURE REVIEW

In determining the factors that affect the savings per capita, different economists have shown various forms of thought. This paper uses several other papers to build the model for determining various economic factors that influence the savings in a country. The insight and conclusions of these papers will help explain the impact of some variables although the outcomes may differ.

A common factor that most of these papers have found to be influence to the savings of a country is the issue of inflation. Bulkley (1981) focused on anticipated inflation due to his belief that people will save more as the amount of income they have increases. This has been a proven correlation in which (Juster and Wachtel, 1972; Howard, 1978) have written about. All three of these studies have agreed that inflation is a major factor in the determination of a countries savings rate.

Howard (1978) wrote about the effect that inflation has upon the personal savings rate as well as other varying factors including per capita disposable income, unemployment, and interest rates across several well established countries. This model is the bases of the study conducted for the Latin American countries including all of its variables in addition to other significant factors. His use of only significant variables to each country in his study created a unique equation for each country involved. This showed him that each country reacts to different variables in its own way, although some consistent factors of savings rate could be discovered in all countries in the study.

Following a similar approach to the different effects that the same variables may have, Reinhart and Talvi (1997) wrote on how capital flow into Latin America had in fact hurt the savings rate whereas in Asia had prompted the savings rate. These differences in effects must be shown in the correlation of the variable capital flow and its effect on savings. This piece also brings into focus that not all of the countries will be affect equally by the same factors for various reasons that must be highlighted with research into their individual economy. To replace capital flow, this paper will use external debt to show the amount borrowed by the countries that they have to repay. Feldstein and Horioka (1980) also looked at the importance of the capital flow in and out of a country and its impact on that countries domestic savings. They found that if a country had a large amount of capital flow into it that the countries domestic savings or in relationship to this study savings per capita would increase as well. They used OECD countries in their study which may differ from the developing Latin American countries in relationship to this study according to Reinhart and Tavli (1997) study.

Taking a deeper look into the unemployment factor, Berloffa and Simmons (2003) found that there is a relationship between savings and unemployment but varies based on the persons' personal wealth. This precautionary savings is described as the need to save in case someone faces

unemployment and must rely on savings for income. The variation of wealth will not affect our study though, since we are using the per capita savings of the population and individual wealth will be averaged in as well as the relatively high poverty rate in these countries.

Juster and Wachtel (1972) take into effect the tax rate on personal income in their study as well as two other common factors. Tax rates are important to this equation due to their ability to reduce personal income therefore directly impacting savings was the outlook on it as a factor. They found that the tax rate has no significant relationship with savings per capita due to an offset of tax rates and transfers and therefore will not be used in this model.

The outcomes of all preceding papers have been taking into account for this paper and combined to take significant factors and combine them into an effective equation for showing the determinants of the savings rate in Latin American countries. Running a regression will show the significance of each factor in various combinations until the best combination for a given result is established.

4.0 BASIC MODEL

$$S = \beta_0 + \beta_1 P - \beta_2 U + \beta_3 R + \beta_4 IFP + \beta_5 IFC + \beta_6 GDPD + \beta_7 GDP\Delta - \beta_8 DEBT + \beta_9 EXPT + \beta_{10} GDPCAP + E$$

4.1 REGRESSION MODEL

$$S = \beta_0 + \beta_1 P - \beta_2 U - \beta_3 R + \beta_5 IFC + \beta_6 GDPCAP + E$$

4.2 DEFINITIONS OF VARIABLES

S is the savings rate of the Latin American country and is the dependent or endogenous variable in the equations. The determinants of ***S*** are known as the independent variables that have been researched for this paper. They consist of a constant term, followed by ***P*** which is the population for that year from the country. ***U*** is the unemployment rate that each of these countries face. ***R*** is the interest rate on 90 day bonds to show how appealing investing and savings are in the countries year to year. ***IFP*** is the similar producer price inflation for the year; these first two most likely will have some co linearity and will be interchanged. ***IFC*** represents the consumer price inflation for the year. ***GDPD*** is the GDP deflator with the base year being 2005 gives a look at the productivity of the countries yet may skew the numbers with the base year included in the data. Δ***GDP*** is the change in GDP each year to show how the economy is doing year to year i.e. a growing or shrinking economy. ***DEBTF*** is the external deficit each of these countries faces providing that they have external debt it should reduce savings in the need to reduce that debt. ***EXPT*** is the amount of exports the country send out in U.S. dollars showing that in a predominant exporting economy the greater the exports the higher savings should be due to the stimulus in the economy. ***GDPCAP*** is the last variable showing the Gross Domestic Product per capita which should increase savings as the economy grows as well. These variables will be interchanged to see which ones produce a significant impact on savings and avoid multi co linearity.

4.3 DATA

The data in this research came from a variety of international sources and databases. Annual data was collected about the fourteen countries mainly from Latin Focus an economic website dedicated to collecting and informing users about the Latin American Countries. Several variables were taken from this database including External Debt, Change in GDP %, Unemployment Rate, Inflation PPI, and Inflation CPI. The remaining data was collected from Nation Master, the World Bank, and CEPAL(ECLA). The source of each data reference can be found in Table 1.

Table 1: Variable, Description, Source, Expected Sign

Acronym	Description	Source	Expected Sign
P	Population of country at given time	Nation Master	(-)
U	Percent of workers unemployed	Latin Focus	(-)
R	Interest rate on 90 day bond	Latin Focus	(+)
IFP	Producer Price Inflation captures the effect of inflation on Producers	Latin Focus	(+)
IFC	Consumer Price Inflation captures inflation of product prices to the consumers	Latin Focus	(+)
GDPD	Gross Domestic Product Deflator puts GDP into real terms	CEPAL	(+)
GDPΔ	Gross Domestic Product change in percent shows the growth of an economy	Latin Focus	(+)

DEBT	External Debt shows how much a country is in Debt to others and must pay	Latin Focus	(-)
EXPT	Exports show how a country economy is growing	Latin Focus	(+)
GDPCAP	Gross Domestic Product per Capita shows the growth per person of the economy	Nation Master	(+)

5.0 EMPIRICAL RESULTS

The purpose of this paper was to determine the factors of savings in Latin American Countries. Using a simple least square regression model, data of various factors were entered to obtain results. Each regression took into consideration the impact that was expected from the factors and the similarity between these factors to avoid skewed results. Fourteen countries were examined through the 2002 - 2005 time frames showing significant impact of some factors.

Of the ten variables used, a combination of five gave the most promising results shown in Table 2. During this regression Unemployment, Consumer Price Inflation, Interest Rates, and GDP per capita all had been found to be significant. They varied at levels of significance having GDP per capita and Consumer Price Inflation at 1% level, Interest Rates at the 5% level, and Unemployment rate at the 10% level. Also, a high R squared shows that these numbers are a good fit for the outcome for the Savings during the period at .79.

Table 2: Empirical Results

	Coefficients
CONSTANT	-432.4434

U	13.73230*
P	5.36E-07
R	-12.93587**
IFC	12.03195***
GDPCAP	0.295263***
R^2	0.790523
F-statistics	37.73798
Number of obs.	56

Note: ***, **, and * denotes significance at the 1%, 5%, and 10% respectively. Standard errors in parentheses

In this regression Unemployment was included due to previous models showing its impact on savings being that of a negative relationship. Since when high unemployment occurs few can afford to save what money they have. Surprisingly it had a positive coefficient which indicates as unemployment increases so will the savings rate. This is unlike other models and should be looked at further on a country by country basis due to previous result contradicting it from other authors. For unemployment to have a positive correlation there may have false data used due to the strongly held belief that unemployment should negatively affect the savings of a country. The Interest Rate was to prove how a more lucrative rate should encourage savings to increase. Yet it had a negative coefficient showing that the increase in the percent for interest bonds will reduce the savings. These two results contradicting other studies were alarming, since they went in the opposite direction then as expected yet were also statistically significant. Inflation and GDP per Capita

were the only two variables of significance that followed the expected thought. They were both significant at the 1% level and increased along with savings as expected. For inflation this follows the same thought in the literature review with its impact on savings. GDP per Capita is a variable only used in this model but shows the pattern of as the per capita productivity grows the excess income will increase therefore increasing savings with respect to it.

The remaining variables were either excluded from the study due to the possibility of multi co - linearity or were otherwise not statistically significant including GDP percent change, GDP deflator, External Debt, Exports, and Produce Price Inflation.

6.0 CONCLUSION

Savings is a very important statistic to monitor in forecasting a countries economic outlook. The empirical results show that several economic factors influence the savings in the Latin American Countries that both benefit and abate it. Being aware of these factors influence will allow the governments of these countries to create policies that may benefit themselves with their ability to control some of these factors and therefore control savings. Hopefully, countries will be able to see that savings is a key figure in the quality of life that their people live, allowing them to have more flexibility in a fairly unstable economies.

However this study is limited due to the availability of data, there may be several more factors that the data does not show which makes the need for deeper research into this topic even more important. Not only is more data required, a look into why the coefficients of Unemployment and Interest Rate have the reverse signs of what was expected should be made a priority from this

paper. This diversion from the other papers is hard to rationalize and may be explained by the unstable economies of the countries included in this study during the time interval.

Appendix A : Variable, Description, Source, Expected Sign

Acronym	Description	Source	Expected Sign
P	Population of country at given time	Nation Master	(-)
U	Percent of workers unemployed	Latin Focus	(-)
R	Interest rate on 90 day bond	Latin Focus	(+)
IFP	Producer Price Inflation captures the effect of inflation on Producers	Latin Focus	(+)
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DEBT	External Debt shows how much a country is in Debt to others and must pay	Latin Focus	(-)
EXPT	Exports show how a country economy is growing	Latin Focus	(+)
GDPCAP	Gross Domestic Product per Capita shows the growth per person of the economy	Nation Master	(+)

Appendix B: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
S	56	751	497	100	2211
P	56	34833060	48434051	3062835	186404900
U	56	11.59	6.13	2.1	28
R	56	11.2	8.65	0.5	45
IFP	56	15.7	18.46	-2.2	118
IFC	56	9.85	10.01	1.1	42.7
GDPD	56	88.33	12.6	43.77	100
GDP	56	4.07	4.65	-10.9	18.3
DEF	56	56639	54990	40	214930
EXPT	56	27305625000	47329416539	1300000000	186404900
GDPCAP	56	3495	15878	966	7447

Appendix C : Regression Results

	Savings
CONSTANT	-432.4434 (152.0805)
U	13.73230* (7.136733)
P	5.36E-07 (7.35E-07)
R	-12.93587** (5.532466)
IFC	12.03195*** (4.460184)
GDPCAP	0.295263*** (0.025248)
R^2	0.790523
F-statistics	37.73798
Number of obs.	56

Note: *** , **, and * denotes significance at the 1%, 5%, and 10% respectively. Standard errors in parentheses

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