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Summary

The cumulative effect of selected shocks on the probability of a Current Account Reversal is measured as a quantification of the external vulnerability of Latin American economies. In the framework of the intertemporal approach the explanation of reversals in the LACs is focused on external solvency as the restrictive determinant of the threshold of overborrowing –in contrast with perspectives stressing fiscal solvency-. Following the empirical strategy suggested by Milesi-Ferreti and Razin and others, a random effects probit panel model is run to find the probability of occurrence of CARs in LA countries. Relevant variables are GDP growth, changes in terms of trade and contagion. A statistical model is used to build a case of a representative LAC: simulations with estimated coefficients suggests that the presence of low growth and contagion may be absorbed by the economy when these factors operate individually, but their simultaneous occurrence drive the probability of reversals rapidly up above 40%. A policy implication is that solvency may vanish rapidly, out of control of domestic authorities, and that the limit of overborrowing is uncertain. Orders of magnitudes for *safe scenarios* may be quantitatively established providing a guide for limits in external indebtedness.

Key Words: Latin America, Current Account, Debt, Reversal, Probit

JEL Classification: F32 F34.

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I. Introduction about external savings and reversals

In this paper the probability of the occurrence of current account reversals CARs in Argentina and the other Latin American economies is assessed, and the external vulnerability of Latin American countries (LACs) is quantified in terms of the cumulative effect of selected shocks on the probability. The hypothesis that in the long-run the critical condition driving the occurrence of reversals is the loss of external solvency, is examined here in the particular perspective of the behavior of LACs as a group, for the period 1979 to 2004.

The subject matter is of primary interest because capital *per capita* in Argentina and the LACs not only is low by international standards but it also grows slowly. In consequence, the volatility of external savings flows, as shown by the frequency and magnitude of the reversals in the region, fails to finance long run investment and is a source of external vulnerability.

Milesi-Ferretti and Razin 1998 report that the median change in growth before and after reversals is zero. Also Adalet and Eichengreen 2006 conclude that in historical perspective the output response to CARs is quite heterogeneous and not necessarily negative. Until more precise evidence is available, it is advisable to recognize that external crises may hinder gravely the potential benefits of using international capital flows to help low saving developing countries to overcome chronic difficulties and emerge from poverty.

The sequence of external crises in emerging economies brings to the forefront their fragility to turmoil in international markets. Financial globalization has both increased the magnitude and fluctuations of the external savings flows, and is associated to not fully explained changes in their direction (Lucas 1990, Reinhart 2005). If reversals are caused by the international transmission of exogenous world shocks, external borrowing becomes more risky diminishing the potential benefits of financial openness. Changes of direction of financial flows are indeed usually beyond control of indebted countries, and in consequence cannot be completely avoided just by following sound domestic policies.

Four issues are raised in this paper as layers for building a simulation exercise of the probability of reversal of the CA in a typical LAC. One: what a reversal of the current account is. Two: how a reversal is empirically identified: i.e. when CARs occur under alternative definitions. Three: why CARs happen and if there is evidence of regional processes in Latin Americn countries. Four: how selected variables influence the probability of reversals in LACs.

Facts and importance of CA reversals in Latin American economies

Consider a rough perspective of the Argentine CA in the last quarter century as provided by Figure 1: there is a declining trend in the saving rate accompanied by a trend fall in the I/GDP ratio until 2001; investment is in general higher than savings, resulting in a negative current account balance. There are two instances of substantial improvement -and change of sign- in the CA in terms of GDP, the first one, at the end of the 1980s, was in three years from -3.81% in 1987 to +3.22% in 1990, and a second one a decade later from -3.16% in 2000 to +8.55 in 2002. Note that the changes in the CA are accompanied in both cases by a reduction in the investment to GDP ratio, from 19.55% to 14% in the former 16.19% to 11.96% in the latter.

Figure 1 illustrates the occurrence of large changes in the CA in a short period of time. For empirical work in order to estimate causality using functional relationships between selected variables and CARs, the date of occurrence of a reversal of the CA must be attributed at a certain precise moment in time. But there is neither a consensus on the definition nor a unique empirical statistical measure of a CAR. Rather, diverse types of reversal emerge from examination of how large, rapid and sustained are changes in the CA.

To contribute to an understanding of the issues at hand, **Figure 2**, and **Figure 3**, depict as another remarkable feature of the process, the common movements of the current account balance of Argentina and other Latin American economies, suggesting that the observed similarity of the ups and downs may recognize *common structural characteristics* and shocks. In other words, are there regional structural characteristics driving observed similar responses of the current accounts to common shocks in the LACs?

Figure 1. Argentina.
Current Account, Saving and Investment to GDP ratios. 1979-2004

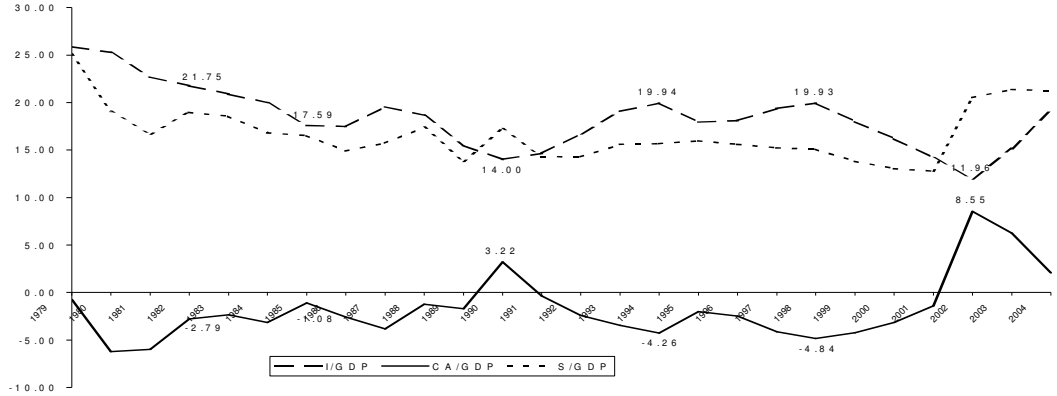


Figure 2. CA to GDP ratio:
Argentina and the simple average of the other LACs, 1979-2004. Correlation coefficient 0.62

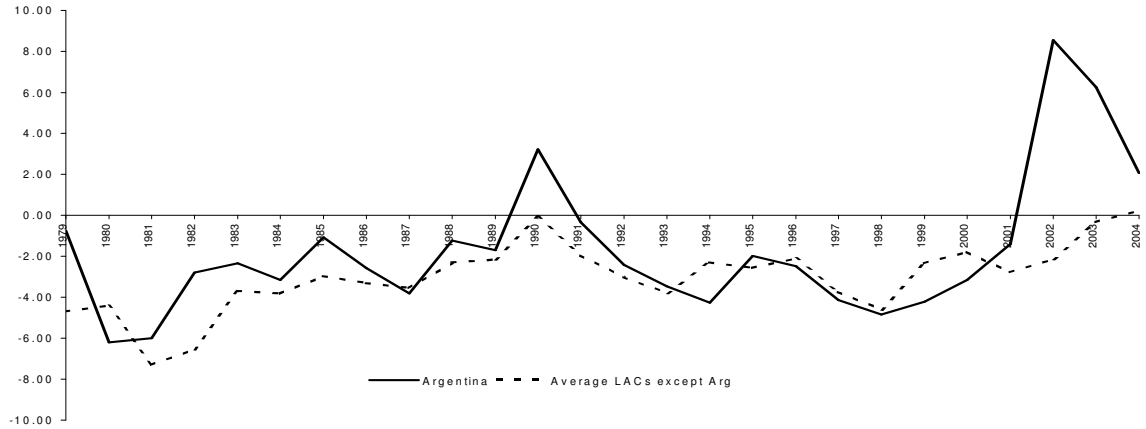
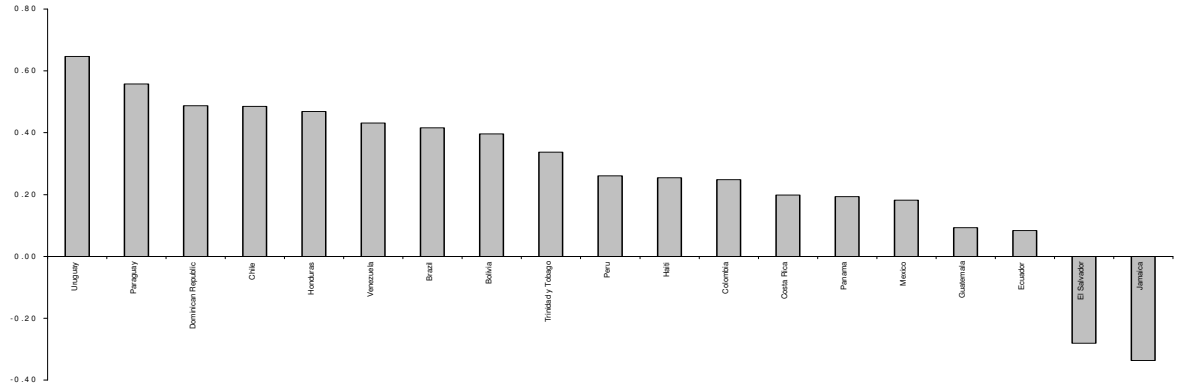


Figure 3. CA to GDP ratio:
Correlation coefficient between Argentina and each of the other 19 LACs, 1979-2004.



Annual data. Source: World Bank - World Developments Indicators.

Are these changes of the current account a “reversal”? When in time do they exactly occur? Answers to these questions are the subject matter of the next sections, but we can point out here that there is not a unique accepted technical definition of a CAR. **Table 1** provides a scheme of the issues on definitions and measurement, causes, and effects, of

CAR. Focuses in this paper are the concept and identification of reversals and the empirical examination of causes.

Table 1
Definition, causes and effects of CA reversals

Causes	Reversals	Effects
(Theoretical analysis under the intertemporal approach). Solvency approach: perceived impaired capacity to pay.	What is a CAR.	of large, sudden and permanent CA adjustments on economic variables
Domestic causes of lack of solvency: a) *Internal transfer*: fiscal solvency; b) *External transfer*. Hypothesis: the export gap is restrictive & determines the loss of international solvency.	Concept, definition and statistical properties: sharp, large and sustained improvement in the CA. → When do CARs occur.	Investment, income distribution, poverty, economic growth.
Global causes (transmission of world shocks and regional shocks). Hypothesis: shifts in world prices and total savings, contagion and regional effects cause reversion in direction of international financial flows.		Determinants of vulnerability (probability and magnitude of costs): openness, institutions.

↓

Policy implications
Policy problems: limits to beneficial external indebtedness.
Net benefits of external borrowing.
Degree of financial openness or type of control of financial flows.
Dealing with external shocks and uncertainty.
Degree of control of capital movements.

Alternative definitions are associated to different economic phenomena, and should not be seen as purely conventional. We shall in consequence discuss, in relation with our interest for the behavior of the flows of external savings, alternative properties of movements in the current account that are called in the literature a "reversal", and will proceed to identify empirically stylized facts of the reversals in Argentina and LACs under selected definitions.

Why? Hypotheses about determinants and mechanisms causing reversals. A solvency approach

Modeling and empirical identification of causality is a task in process. Under the solvency approach reversals are the consequence of *the forward looking* perception of the lack of capacity to pay.

Domestic causes of CAR are difficulties to effect the internal transfer, due to policy errors, or circumstances of the economic process, including the presence of uncertainty in economic variables. Global external causes are either the true loss of solvency related to large, unexpected, external shocks such as terms of trade deterioration or rising rate of interest. Or a change in the direction of international financial flows due to changes in the world markets.

Last, there may be a misperception of insolvency of a country that is solvent caused by contagion.

Argentina and the LACs. Economic structure and contagion

Relevant policy implications can be learned from the focus on the current account and in reversals of the CA as regards benefits from external financing.

Explaining the degree of vulnerability to external shocks is indeed necessary for the understanding of the economic fluctuations and the irregular growth of LACs.

Our results suggest that there are a small number of variables which determine scenarios with certain probability of reversal of the CA.

The varied historical experience concerning LR trends of the CA and external crises makes it difficult to formulate general policy recommendations based on theory and quantitative research, concerning the convenience and limits to borrow and the management of external flows to finance expenditure greater than current income[1]. Since the wide variety of structural conditions and historical experiences make it difficult to derive general rules, country and regional studies are useful.

The long-term *forward looking* exports performance seems to be the main domestic determinant of solvency, as reported in Barone and Díaz Cafferata 2006, 2007. Empirically the working hypothesis that CA reversals are determined by the export gap is examined using data for Argentina in the period 1949 to 2006.

In this regard, a literature has developed addressing the assessment of country risk, the emergence of sovereign risk, the identification of risk factors, and the compilation of risk ratings. Hoti and McAleer 2004 provide a recent survey of this literature, starting from the early contributions of Frank and Cline 1971 and Feder and Just 1977; the survey reports

[1] The recent Argentine “Plan Productivo” of the Ministry of Economics in June 2007, places as a central piece of the development strategy the financing of investment with domestic savings.

that in 50 studies probability-based models are the most frequently used. Other contributions to be mentioned are Obstfeld and Rogoff 1997, Milesi Ferretti and Razin 1996, 1998, and Edwards 2007.

In Section 2 the notion of a CAR is discussed and different definitions are compared. Section 3 moves to the empirical estimation of the time of occurrence, and periods with a concentration of CARs, in Argentina and other LACs. Section 4 contains a discussion about domestic and external causes and formal expressions for the intertemporal solvency. Section 5 presents the framework for the empirical estimations of the probit parameters and a simulation exercise to assess the order of magnitudes of the risk of CARs in South America as a stable function of a few selected (external) variables. Section 6 concludes.

II. A closer view of reversals

What is exactly a "reversal" of the CA? There is substantial agreement in a general notion of a reversal of the current account as the occurrence of a sudden, substantial and sustained improvement. (i.e. the simultaneous presence of a change of direction, magnitude of the change and, as regards the time dimension, that this swing is sharp and that changes are permanent, as distinguished from transitory adjustments[2]. In a long-run perspective, the recurrence of this phenomenon creates a problem of instability of external financing with effects on expenditure. Since the magnitude of the improvement in the current account, as well as the duration and other properties of the change that define a “reversal” differ across the authors, a brief revision of the literature is in order. The point is relevant because *different definitions may determine different dating of the reversals* and consequently *different stylized facts to be explained*. The results of testing hypotheses about causal relationships and correlation between countries are influenced by the identification of the number and dates of reversals.

To start, let´s consider as a CAR a *reduction of a certain magnitude in the CA deficit in a given year*, pointing out the lack of regularity of external savings flows, it provides the following six (non exhaustive) empirical definitions: a) Edwards 2004, 2005, Milessi Ferretti and Razin 1998, set the change in the CA/GDP ratio as "large" in a range between 2%-3%

[2] Also observed short-run fluctuations may be an outcome of desired (optimal) consumption smoothing Baxter 1995, Obstfeld and Rogoff 1997.

and 5%. It is understood that the “adjustment” is an “improvement” in the CA deficit. b) Since economies may differ in their capacity to adjust or the probability of occurrence, of a reversal, a “large” change may be determined by specific characteristics of the country, such as the average CA or the average CA deficit. Note also that since these parameters may change for a given country with the period of observation, the question of which is the appropriate span of time is brought to the forefront. In Díaz Cafferata, Berbotto and Kohn 2007, a reversal is a reduction equal to the average CA deficit in the period under examination, such that a benchmark for the change in the current account is related to the historical deficits of an economy rather than using the same percentage of change for all countries. c) Another country specific criterion is a threshold that takes into account the variability of the CA, which can be measured by the standard deviation of the country´s CA/GDP ratio, as in Algieri and Bracke 2007. d) Also the initial balance matters: Algieri and Bracke 2007 ask for a country´s CA deficit of at least 2% or 3% of GDP before the adjustment (leaving aside changes from a nearly balanced CA). e)The presence of a statistical structural change in the CA time series, is studied in detail in Bagnai and Mazocchi 1999. f)Those observed magnitudes of the change in the current account may be compared with the required adjustment in the trade balance or the reversal which would bring the economy to the fulfillment of the intertemporal solvency as suggested in Milesi-Ferretti and Razin 1998.

From this listing, using just the basic criterion of the magnitude of the adjustment in the CA in a given year to define a reversal, *when* an episode of reversal happens and the *frequency* and *magnitude* of the reversals can be determined.

Alternative definitions

To detect other characteristics of the CAR, further properties of the CA and of other variables of the economy in the pre and post-reversal shall be examined. In a precursor paper Milesi-Ferretti y Razin 1998 impose *three conditions to capture "large and persistent improvements in the CA balance"*. Two of these conditions are to select reductions in the deficit that are *sustained*, the third one is to determine when a change is *large*. First, an average reduction of 3% (or 5%) of GDP in the average CA deficit in three years after the reversal, compared to the (average CA in) the three years before the reversal. Second, the maximum deficit in any one of the three years after the event shall not be larger than the minimum deficit in the three years before the reversal. The third condition is that the

change is called *large* when the average deficit falls at least by one third[3]. In a set of 105 low and middle income countries in two decades between 1973 and 1994, and for a 3% average reduction in the CA deficit, they find 152 episodes of reversals in 69 countries (33 episodes in 26 LACs) as evidence that reversals are not a rare phenomenon. The median reversal for the whole sample is of 7.4 percentage points of GDP, meaning that in 50% of the reversals they found the CA changed 7,4% of GDP, or more, which is a sizeable adjustment. A multivariate Probit analysis is performed, to evaluate how selected macroeconomic variables affect the probability of a reversal. Without a formal theoretical framework, they mention that a match between the intertemporal model of the CA and the developing country data is desirable. The variables they identify as "predictors" of reversals are: large CA deficits, high interest rates, low reserves, higher GDPpc, worsened terms of trade and high investment; official international transfers and OECD growth are negatively related.

Freund 2005 poses four conditions: a) The CA to GDP ratio before the reversals that have to be at least 2%. b) A reduction of the average deficit in the three years after the reversal of at least 2%. c) The maximum deficit in the five years after the reversals shall not be greater than the minimum deficit in the three years before the reversal. d) The CA falls at least one third.

In Edwards 2004a, a CAR is a reduction in the CA deficit of at least 4% of GDP in one year. On turn, Edwards 2005 uses two conditions, one stronger than the other. a) A reduction of the current account deficit of 2% in one year, and accumulative reduction of 3% in three years. b) A reduction of the current account deficit of 2% in one year, and accumulative reduction of 4% in five years.

To determine the effects of reversals in the economic growth of Eastern and Central European countries, Komárek, Komarkova and Melecký 2005 define reversals as the phenomenon that occurs when, due to a convertibility crisis, a country is forced to abandon a fixed exchange rate. A large depreciation causes sharp reduction in the CA disequilibrium, and the reversal is associated to an economic depression.

Bagnai and Manzocchi 1999 ask why reversals occur, to what extent they are associated with shifts in fundamentals, and if the impact is the same in the case of positive and negative reversals. CA reversals are distinguished from temporary swings in the CA

[3] Reversals can occur in consecutive years.

balance: variations in the CA may be transitory fluctuations determined by consumption-smoothing or permanent changes in the CA caused by shifts in fundamentals. Positive reversals are improvements in terms of a reduction of the CA deficit or a movement from a deficit to a surplus, and a negative reversal is a permanent deterioration in the CA/GDP ratio. Formal tests for structural change are performed to define reversals, which are explained in terms of a structurally stable relationship between fundamentals (suggested by the intertemporal approach to the CA) and the CA balance around the time of reversal. An interesting result is that the different types of reversals are connected to different macroeconomics fundamentals. Positive reversals are associated with an improvement in terms of trade and fiscal balance; negative reversals are related to a worsening of the terms of trade and the fiscal balance as well as to higher growth rates and larger external debts.

III. Reversals in Argentina and other LACs under alternative criteria

Reversals in Argentina. Is there a preferred criterion?

Let's first provide some quantitative background information and interpretation of the Argentine long-run current account. Díaz Cafferata, Kohn and Resk 2005 found nine CARs between 1935 and 2002 –as shown in Table 2- when a reversal is defined as a reduction in the CA deficit of at least the average CA deficit in the period, 2.48% of GDP. The first reversal in the period was in 1939 and the last one in 2002. The following stylized facts are stated: a) the mean CA is close to zero; b) there are not persistent deficits: changes of sign are found every 3 years (3.35 on average); c) recurrent external crises and frequent reversals of the current account occur every 7.7 years between 1935 and 2004. Note that the number of reversals at first sight looks puzzling because frequent external crises have happened despite a moderate average CA deficit. Table 2 also highlights that stylized facts change with the definitions of "reversal" [4].

In Table 2 we compare the number of CARs under alternative definitions. The first row shows nine reversals, when a CAR is defined as an improvement of the CA equal to the

[4] The authors point out that these stylized facts do not seem consistent with a long-term regular path under the "stages of the balance of payments" SBP hypothesis, such that the sign of the CA would be negative in early stages to finance growth followed later, after a change of sign, by sustained surpluses when the debt is being paid. The SBP hypothesis in the intertemporal framework is however compatible with observed CA fluctuations in the presence of uncertainty and incomplete markets if: a) there is an additional consumption smoothing motive; b)new information in unstable international financial market drives domestic and foreign agents to jump frequently from one to another long-term path.

average CA deficit in 1935-2002. When, in the other two rows, standard magnitudes of 3% and 5%, as usually taken by the literature are considered, fewer reversals remain for Argentina. Then, how many reversals happened in this period? Nine, six, or two? An additional problem is that when a certain average of historical CA levels or fluctuations is taken as a benchmark to define a reversal, this value is in general influenced by the period of observation. In particular, in this paper we work with data from 1979-2004: in this case the average Argentine CA deficit is not 2.48, but 2.96. When looking backwards at different points in time fresh data may make a reversal disappear or new reversals may be added, a hardly desirable feature in empirical work.

Table 2
Reversals of the Current Account in Argentina 1935- 2002 .
Absolute magnitude of improvement in the CA ≥ 2.48%, 3%, 5%∗

ΔCA%	Year of Reversal								
	1939	**1950**	**1953**	**1963**	**1973**	**1976**	**1988**	**1995**	**2002**
-2.48	-4.51	-2.67	-6.64	-4.07	-3.02	-3.61	-2.82	-2.51	-7.67
-3	X		X	X	X	X			X
-5			X						X

Source: Díaz Cafferata, Kohn and Resk, 2005.
* -2.48 is the simple average of CA/GDP in Argentina in the deficit years

Reversals in other LACs: a regional phenomenon?

Let´s bring now the rest of LACs into the picture. It is to be noted that there is substantial evidence of regional behavior suggesting the presence of regional shocks. We shall now broaden the perspective to examine (in contrast with the hypothesis that the relevant framework is that of a small economy open to capital flows, in a world of certainty) the possible influence of uncertainty and common structural characteristics across LACs. To study the presence of transmission of global influences we shall take Latin America as a region. We seek both to identify common patterns *within the group* (i.e. the regional effects), and to learn from differences between the evolution of their current accounts (internal groups may be identified by cluster analysis) which may shed light on the role of structural characteristics.

Regional structural characteristics

Also, preliminary evidence from filtering suggests new elements regarding the long-run behaviour and cycles of the CA

LACs are frequently taken as a group as a focus of research or in comparison with other groups of countries[5]. The practice is partly based on geographic proximity. But we shall ask for specific analysis whether LACs are homogeneous to a degree that fits analytical criteria for aggregation and whether there are common explanations of their CAs.

A main economic characteristic of the LACs concerning reversals is the low saving rate, with the exception of Chile, in particular compared with Asian countries. Also, there is a low capital *per capita* and a slow rate of accumulation of capital. And a low degree of openness measured by the exports to GDP ratio. It may be argued that this combination of facts make a typical LACs government candidate to over-borrow abroad. The LACs have been absorbers of international financial flows in the period of observation along the last quarter century. More precisely, the simple average CA in LA was –2.94 between 1979 and 2004, and the average deficit was -4.48. These features, added to the instability brought about by reversals, are also candidates to explain a low long-term rate of growth.

Gavin, Hausmann and Leiderman 1996 extract as a teaching of experience, that the capital flows to Latin America are highly volatile; and that the events in the world economy have a central role in the explanation of capital flows to the area.

Calvo, Fernández-Arias, Reinhart and Talvi 2001 point out that the growth rates in individual LACs have a very large degree of co-movement, and in consequence the simple average of country growth rates over time exhibits very ample swings, significantly deviating from the stable growth rate that would be expected if they were uncorrelated. This pattern of economic growth across countries in Latin America suggests that common factors external to the region are very important for growth. In particular, large net influx of capital from abroad allows economies to finance large current account deficits and therefore to invest domestically beyond their national savings. Regional output growth and private net flows, measured as a proportion of GDP, are positively correlated (34%). The notorious volatility of these net flows is associated with the high growth volatility of the region. Regarding the presence of “sudden stops” they estimate that the difference in average growth between years with open access to financial markets and with closed access to them is more than two percentage points.

[5] Not only in economics, but also in other social sciences.

Evidence of the particular characteristics of Latin American economies are provided by Edwards 2007. He estimates that the effect of the reversal on the rate of growth of LACs are negative and larger in absolute value than worldwide.

Guidotti, Sturzenegger and Villar 2003[6] find that sudden stops have been particularly prevalent in both Asia and Latin America, but also significant differences in the pattern of adjustment in episodes of reversal in Asia and Latin America. Asian countries adjust through export growth and Latin America through import contraction, and these differences can be explaind by the degree of openness and financial dollarization.

Even when there is, in a substantial degree, common structural features and regularities in the group of LACs, there is also a diversity which is necessary to recognize when the phenomena of specific countries need to be explained. Without digging further on the matter, it is pertinent to mention the study by ECLAC 2001, which distinguishes as a source of differentiation the GDPpc in 1998. Three groups are: A first one of 10 countries with less than 2000dls: Bolivia, Ecuador, El Salvador, Guatemala, Guyana, Haití, Honduras, Nicaragua, Paraguay and República Dominicana. A second group with a GDPpc between 2000dls and 4000dls in 1997 are Colombia, Costa Rica, Jamaica, Panamá and Perú. A third group of eight countries in the upper level with a GDPpc higher than 4000 includes Argentina, Barbados, Brazil, Chile, Mexico, Trinidad y Tobago, Uruguay and Venezuela.

Let´s go back to Figure 2 which portrays the comparative evolution of the Argentine CA and a simple average of LACs current accounts excluding Argentina. A substantial co-movement is apparent, with a correlation coefficient of 0.62 for the period 1979-2004. When a Hodrick-Prescott filter with a standard Lambda equal to 100 is used to smooth the series (not showed in the graph), the correlation rises to 0.79. Note the larger changes for Argentina in 1980, 1990 and 2002. Focusing on common regional behavior, we ask: a) Which are the stylized facts at the regional LACs level? b) Is the presence within the group of different types of countries as regards behavior of the CA and reversals observed? In this case, we have a hint about which interplay of regional determinants, and individual structural characteristics or policies, may lay behind particular countries behavior. c) Are there coincidences with Argentina, and what can be said about the additional explanatory

[6] They identified a country suffering a CA crisis when its capital account closes by 5% of GDP or more in particular year and the current account improves by more the 2% of GDP during that year, the following, or over those two years. they find 70 episodes of reversals between 1974 and 2000

power of regional phenomena over domestic causes of reversals in Argentina? Finally, we are interested in the policy implications.

Table 3 provides additional information regarding the consequence of using alternative definitions of CARs. The columns are for twenty Latin American countries, and the first three lines report the average deficit of the CA in the period 1979 to 2004, the standard deviation and the mean current account. Forty seven episodes of reversals in the current account are found when the Edwards 2004 definition is used; there are forty three cases with the Díaz Cafferata *et. al*. criterion, and thirty six following Milesi- Ferretti and Razin 1998. Table 3 concerning LACs, as well as Table 2 for Argentine, make clear that the definition used matter for the empirical examination of causes. In Table 3 there are 17 cases in which the three criteria point out a CAR for a given country in a particular year: six of them in 1982-1984, four in 1986-1987, four in 1989-1990 two in 1999 and one in 2002. In section V the Milesi- Ferretti and Razin definition is used for the exercise on the probability of CARs, but further effort should be devoted to determine how robust are the results to the choice of definition.

Table 3. Dates of CA reversals in LACs under alternative definitions.

Country	Hon	Bol	Jam	Cos R.	Peru	Gua	Chi	Ecu	Rdom	Hai	Para	Pana	Mex	Col	Bra	Arg	Sal	Uru	Tri	Vene
Av deficit	6.18	6.70	6.54	5.40	4.98	4.24	4.49	4.91	3.91	3.38	5.36	5.46	3.27	3.61	2.85	2.93	2.46	2.38	5.36	5.29
Standar deviation	2.72	4.18	4.34	3.82	3.81	1.67	3.82	4.23	3.58	2.57	4.84	6.21	2.85	3.33	2.30	3.42	2.37	2.13	6.56	6.97
Mean ca	-6.18	-6.00	-5.64	-5.40	-4.39	-4.24	-4.06	-3.92	-3.15	-3.08	-3.07	-2.59	-2.39	-1.95	-1.87	-1.70	-1.64	-1.45	0.27	3.70
1979																				
1980		**A**																	**A**	
1981									**A, C**									**A, C**		
1982		**A, C**		**A, B,C**			**A**			**A**		**A, B, C**				**A**		**B**		
1983								**A, B, C**					**A, B, C**				**A**			**A, C**
1984					**B, C**				**B, C**					**A, B, C**	**A, B, C**				**A**	
1985																			**C**	
1986	**B, C**		**A, B, C**							**B, C**				**A, B, C**			**A, B, C**	**A, C**		
1987							**B, C**					**A, B, C**	**A**							
1988		**B, C**						**A**	**A**							**C**		**C**	**C**	
1989					**A, B, C**						**A, B , C**									**A, B, C**
1990								**B, C**						**B**		**A**			**A, B, C**	
1991																				
1992			**C**					**A**												
1993																				
1994		**A, C**							**C**											**A, C**
1995									**B**				**A, B, C**							
1996																				
1997	**B, C**																			
1998											**C**									
1999					**B, C**		**A, B, C**	**A, B**						**A, B, C**					**A**	**A**
2000																			**B, C**	
2001		**B**										**B, C**								
2002											**A, B, C**				**B, C**	**A, C**		**A, B, C**		
2003									**A, C**											
2004																				

* Source of data: World Bank

** **A** Defines a reversal as a reduction of the current account deficit bigger than the average of the deficits. Diaz Cafferata et al. (2005); **B** is the criterion proposed by Milesi-Ferreti and Razin (1998); **C** is the one defined by Edwards (2004).

IV. A solvency approach explanation of the causes of reversals

To explain the shifts in the current accounts of the LACs we adopt in this paper a solvency approach. The hypothesis is that there are a reduced number of variables that influence the perception of the degree of solvency of a country; the loss of solvency is captured empirically by an increasing probability of reversal of the current account.

The key restriction in the intertemporal approach to the current account is the intertemporal budget constraint. Admissible combinations of income and expenditure flows along time define solvency. Under the solvency approach when, at a point in time, an economy with a negative net asset position bears a debt that is seen as exceeding the present value of the expected future flows of the capacity to pay, the price of the debt is expected to fall. When creditors perceive that the economy is losing solvency, by following a path that will eventually end with a lack of capacity to fulfill all the payments on interest and principal of the debt, the risk premium rises and further lending to the economy becomes more restricted. In other words, the current account deficit is expected to diminish.

The intertemporal optimization and the dynamic current account is frequently used as setup in the literature to analyze the behavior of the stock of international debt and to discuss under which conditions a country's intertemporal budget constraint is satisfied. One issue in this framework is the magnitude of trade surpluses the economy must generate to pay, i.e. the "burden" of the debt for the economy (Husted, 1992; Obstfeld and Rogoff, 1997; Milesi-Ferretti and Razin, 1996,1998). An alternative way to pose the question is to ask when the CA deficits become "excessive" (Milesi- Ferretti and Razin, 1996; Lanteri,2006; Saksonovs, 2006).

As regards this matter it has been argued that the difference between countries that are able to run persistent deficits in contrast with other countries that fall in crisis is whether the economy is able to generate enough trade surpluses, i.e. whose present value is enough to repay the debt in the future[7]. Milesi-Ferretti and Razin (1996) call

[7] Let us remark at this point the constraint for a country of being unable to issue international bonds in their own currency, named in the literature the "original sin". This economy is in consequence subject to two budget constraints, because additional to required taxing, debt payments need to be done in external currency, such that exports in relation to the external debt or to the flow of interest payments is a signal of the capacity to obtain needed foreign currency to make those payments

this condition “solvency”; but crises develop not only because of solvency problems. Consider the issue of sustainability: if the current policy stance is maintained, and the turning point from trade deficit to trade surpluses is likely to occur smoothly, without drastic change in consumption and economic activity, these authors define the current policy as “sustainable”. In contrast, “unsustainability” appears when an event triggers a "drastic" policy shift, showing external vulnerability or some lack of capacity to undertake adjustment policies.

If the *binding constraint for admissible debt* (ie. consistent with solvency) is the *capacity to fulfill the external transfer* -rather than the fiscal transfer - a structural rigidity in the exports to GDP ratio is consistent, *ceteris paribus*, with an also rigid debt to exports ratio and with small and transitory current account deficits as the casual observation suggests.

A related point is that an economy at a certain moment may be solvent, in the sense that the intertemporal condition is fulfilled, but its payment ability be temporarily impaired by liquidity problems. Even when solvency at a point in time is determined by the discounted value of future trade surpluses exceeding the stock of net external debt, flow imbalances also matter. A distinction between liquidity and solvency helps to identify the role of exports. For example, the debt-to-GDP ratio is a measure of solvency and the same happens with the long run expected path of exports compared with interest payments in the future; on the contrary, short-term debt over exports and debt service over exports are liquidity measures[8]. Shifting attention from liquidity towards solvency implies also focusing in longer run determinants rather than on immediate causes. Note that a liquidity problem can be generally solved by rollover or issuing bonds, but an economy must be solvent to have this solution open; and, on turn, solvency depends –among a set of determinants- on exports.

We have discussed earlier (Barone and Díaz Cafferata, 2008) that historically external crises in Argentina have been related to the difficulties to export enough in the long run to keep external solvency.

Therefore, only with a structural change in the export ratio the economy might bear a higher long-run debt ratio.

[8] Manasse and Roubini (2005).

In synthesis, we are interested in: Firstly. The relevant mechanisms linking exports and solvency and the identification of empirical magnitudes, helping understand in which theoretical cases, and when in practice, export is the relevant variable among the determinants of solvency, and among the predictors of CA reversal, in terms of the long-run perspective. Secondly. Are the sustainable current account deficits related to some specific structural characteristics of the particular economy? More punctually, is there a structural degree of openness that can be related to the size of long-run sustainable current account deficits? Is the exports to GDP ratio a relevant variable regarding the sustainability of current account deficit? Thirdly. Does a comparison with other LACs help answer the question of the weight of domestic versus external causes?

The intertemporal constraint and the steady state solvency condition: highlighting the role of exports.

Writing variables as ratios of GDP with lower case letters, the trade balance consistent with solvency is[9]:

$$tb = (r - g)d$$

Where variables are *steady state* values and the equation provides the trade balance to output ratio (tb) required to maintain constant the debt to output ratio (d). Given (d) and (g), the required trade surplus ratio is an increasing function of the rate of interest. To drive attention specifically towards the importance and the role of exports performance, Barone and Díaz Cafferata 2008, rewrite the equation in terms of the required exports to output ratio (x^r) that maintains stable the ratio of debt to GDP as follows:

$$x^r = (r - g)d + m$$

For simplicity imports are assumed to be a constant fraction of the GDP.

Allowing for country risk (φ), $x^r = (r^* + \varphi - g).d + m$ where the rate of interest paid by country is the international free risk (r^*), plus a risk premium (φ).

A structural long-run X/GDP ratio provides a limit of the debt or a maximum admissible D/GDP ratio $d = (x - m)/(r - g)$.

[9] Cfr. Obstfeld and Rogoff, 1995, 1997; Milesi-Ferreti and Razin, 1996.

Borrowing beyond that limit breaks the long-run solvency condition. Hence, only transitory, shock absorbing, additional debt is allowed for this country[10].

The export gap and reversals, the case of Argentina

The lack of solvency may be measured by expected exports lower than exports required in the future. Barone and Díaz Cafferata 2008 define a variable "export gap" as the difference between forward looking (expected) exports and the required exports to fulfill payments given the debt, as:

$$Export.gap = x^e - [(r^* + \varphi - g).d + m]$$

The export gap may thus be driven closer or apart from the values consistent with the solvency condition. Note that the export gap is just an expression of the forward looking solvency condition as a function of variables which determine the burden in terms of the export ratio and the variables influencing export performance.

This argument is the basis for the empirical analysis as follows.

$$x^e(tt, \hat{y}, \tau, E_r, d, dem, cadv, ...)$$

Where tt are the terms of trade, $\hat{y}$ represents the world income, τ is the anti-export bias, E_r is the real exchange rate, d the distance, dem represents demographic factors and $cadv$ represents comparative advantage.

Then the export gap shows negative values when

$$x^e(tt, \hat{y}, \tau, E_r, d, dem, cadv, ...) < [(r^* + \varphi - g).d + m]$$

The next step is to evaluate the actual influence of these variables under different circumstances, and for different countries, which needs undergo empirical analysis.

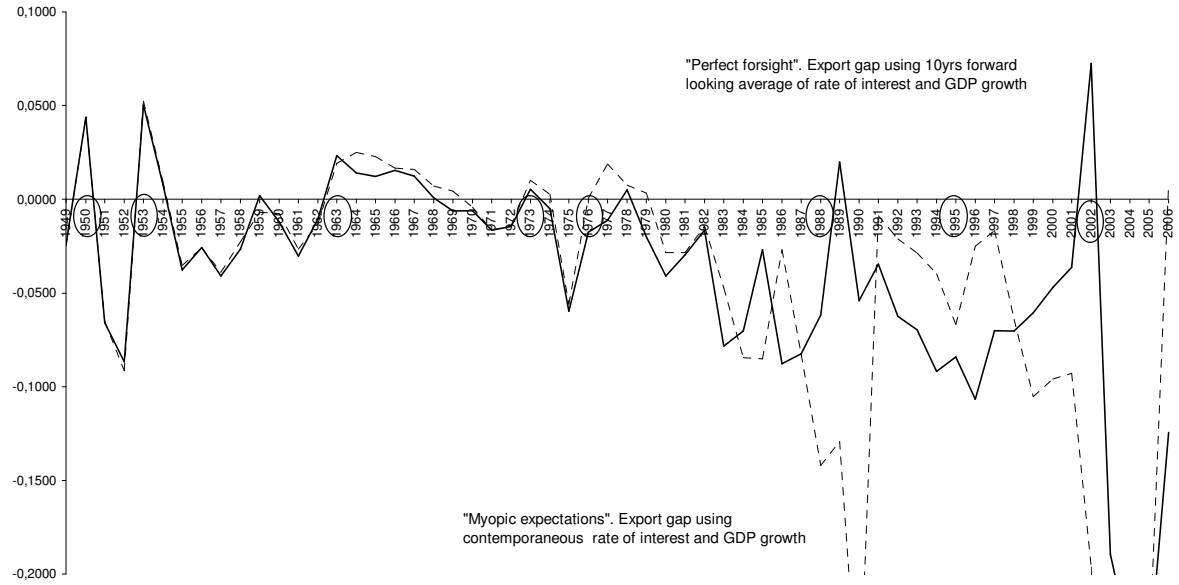
Figure 4 shows an empirical application for Argentina of the hypothesis that the perception of loss of solvency is determined by an exports performance that its below the requirement to fulfill debt payments. For this purpose Barone and Díaz Cafferata, 2007 use the equation:

$$Export.gap = x^e - [(r^* + \varphi - g).d + m]$$

[10] To highlight these relationships, variables may be written in terms of the, unobserved, permanent (trend: T) and transitory (cyclical, C) components. $x = x_T + x_C$; $d = d_T + d_C$ from equation

to find how gaps are related with reversals estimated using the average deficit of -2.48 (Table 2). A practical difficulty for the empirical application is that solvency (or the loss of solvency) at a point in time is determined by the unobservable forward looking values of variables. Consider two extreme assumptions about expectations. In a "myopic expectations" scenario current values of the variables are assumed to prevail in the future; in this case the evolution of the estimated exports gap for Argentina in Figure 4 is the dotted line. The other case was built by taking for each point in time the ten years forward average of the variables, intended to represent perfect expectations about the future. The importance of this figure is that it places in the center of the stage the exports performance as the critical variables for external solvency.

Figure 4.
Argentina 1949-2006. Exports gap: forward looking exports minus required exports. Negative exports gaps are followed by a current account reversals (years in a circle)



Up to this point we have argued that CA reversals may be explained as a consequence of the loss of solvency, and shown for Argentina casual evidence of this hypothesis. Our next step follows the intuition that solvency may be better understood as a continuum rather than a dichotomy. In this sense a gradual loss of solvency may be postulated as measured by a rising probability of insolvency. In the

$d = h \cdot x_T + h \cdot x_C - h \cdot m_T - h \cdot m_C$ and the "admissible" trend debt is: $d_T = h \cdot x_T - h \cdot m_T$

next sections these probabilities are calculated for Latin American economies using a probit model.

V. Application of the statistical Probit model

To analyze the variables that affect the probability of occurrence of CAR, a random effects (RE) Probit model is run. This methodology is found early in the seminal work of Milesi-Ferretti and Razin 1998, and was later applied by Freund and Warnock 2005 and Edwards 2007, among others, to analyze current account reversals. Calvo *et al*. 2004 follows a similar strategy to study the causes of "sudden stops".

In contrast with this literature that works with extended samples of countries around the world, focus is placed here on the variables that affect the capacity to pay in LACs.

The statistical model is:[11]

$$P\left(y_{it}=1\left|\mathbf{x}_i,c_i\right.\right)=P\left(y_{it}=1\left|\mathbf{x}_{it},c_i\right.\right)=\Phi\left(\mathbf{x}_{it}\boldsymbol{\beta}+c_i\right),\ t=1,...,T\ ,\ i=1,...,N \quad (1)$$

where:

$y_{i1},...,y_{iT}$ are independent conditional on $\left(\mathbf{x}_i,c_i\right)$ (2)

$$c_i\left|\mathbf{x}_i\right. \sim Normal\left(0,\sigma_c^2\right) \quad (3)$$

In the equation (1) the probability of a CAR is represented by a normal cumulative distribution function that depends on $\mathbf{x}_{it}\boldsymbol{\beta}+c_i$. The vector $\mathbf{x}_{it}$ contains the variables that explain the CAR ; $\boldsymbol{\beta}$ is the vector of parameters to estimate; and c_i reflects the unobserved time-invariant specific shock that affects country i. In this case $T=25$ years and the number of LACs is $N=19$. The log-likelihood function for the entire sample of size N can be maximized with respect to $\boldsymbol{\beta}$ and σ_c^2 to obtain $\sqrt{N}$ consistent asymptotically normal estimators. The relative importance of the unobserved effect is measured by $\rho=\sigma_c^2/\left(\sigma_c^2+1\right)$, where σ_c^2 is the variance of c_i. Many random effect probit routines report $\hat{\rho}$, together with its standard error. These statistics lead to an easy test for the presence of the unobserved effect.

[11] The description of the Probit model follows Wooldridge 2002, page 470 and 485.

The (binary) dependent variable y_{it} is the reversal measure estimated on the basis of Milesi-Ferretti and Razin 1998 definition of a CAR. A set of independent variables is considered: a) $cc(-1)$ is the lagged current account to GDP ratio; b) $growth$ is the rate of growth of GDP in each country; c) $inrate(-1)$ is the lagged annual international interest rate; d) $debt(-1)$ is the lagged total debt to GDP ratio; e) $short(-1)$ is the percentage of short debt to total debt lagged one period; f) $xd(-1)$ is the export to debt ratio lagged one period; g) dtt is the annual change in terms of trade; h) con is an index of contagion, that is, contagion con_{it} is the number of total reversals occurred in year t less the reversal in country i scaled to total reversals in the sample; i) $res(-1)$ ratio of reserves to total debt lagged one period; j) $fdi(-1)$ is the foreign direct investment to GDP ratio lagged one period. Details on sources and the definition of the variables are included in the Appendix.

Table 4 presents the random-effects probit estimators. It shows five alternative specifications for the statistical model. The coefficient of $growth$ is, in all equations, highly significant at 1% level, and is accompained, in all cases, by a negative sign as expected. The higher is the growth rate, the lowest is the probability of a reversal. What means that the small open economy may borrow more when the expected growth rate rises because it is expected to enhance its capacity to pay. This result is in line with theoretical suggestions associated with the intertemporal approach as in Obstfeld and Rogoff 1995, 1997, and is similar to the results found in Milesi-Ferretti and Razin 1998.

$inrate$ is not significant at the conventional statistical levels. It would be consistent with the intertemporal approach in the sense that if world interest rate changes are caused by global shocks, there is not impact on the small open economy current account.[12] Other authors, like Milesi-Ferretti and Razin 1998 and Edwards 2007 suggest that the probability of reversal may be positively correlated with the international interest rate, because the higher global cost of capital reduces the flow of capital to developing countries explaining the observed reversals. The empirical literature does not recognize a central role of international interest rate in determining

[12] If all economies in the world face the same change in the rate of interest, all of them try to adjust their Net Financial Asset position in the same direction, and in consequence CA in all countries are expected to remain unaltered (Cfr. Glick and Rogoff 1995).

current account reversals. Thus, Milesi-Ferretti and Razin 1998 find for a sample that includes middle income countries that this variable is not significant to explain the probability of a CA reversal.

Table 4
Probability of a Current Account Reversal in LACs
Random-effects probit regression. 1979-2004.

Dependent variable	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)
$cc(-1)$	**-0.0707** (0.016)	**-0.0643** (0.013)	**-0.0685** (0.012)	**-0.0643** (0.012)	**-0.0669** (0.009)
$growth$	**-0.0589** (0.006)	**-0.0557** (0.010)	**-0.0574** (0.007)	**-0.0640** (0.004)	**-0.0574** (0.007)
$inrate(-1)$	**-0.0262** (0.453)				
$debt(-1)$	**0.0005** (0.868)				
$short(-1)$	**0.0221** (0.079)	**0.0210** (0.085)	**0.0205** (0.095)	**0.0206** (0.093)	**0.0202** (0.097)
$xd(-1)$		**-0.0022** (0.470)			
dtt	**0.0260** (0.005)	**0.0258** (0.004)	**0.0263** (0.004)	**0.0265** (0.004)	**0.0263** (0.004)
con	**0.0618** (0.012)	**0.0568** (0.018)	**0.0578** (0.017)	**0.0608** (0.012)	**0.0582** (0.016)
$res(-1)$	**-0.0162** (0.026)	**-0.0143** (0.050)	**-0.0161** (0.019)	**-0.0187** (0.011)	**-0.0162** (0.018)
$i(-1)$			**-0.0033** (0.865)		
$fdi(-1)$				**0.0623** (0.110)	
σ_c^2	**0.1212**	**0.1185**	**0.1197**	**0.1113**	**0.1198**
ρ (*)	**0.0145** (0.265)	**0.0139** (0.254)	**0.0141** (0.265)	**0.0122** (0.274)	**0.0141** (0.265)
Number of observations	**475**	**475**	**475**	**475**	**475**
Number of groups (countries)	**19**	**19**	**19**	**19**	**19**
Number of reversals	**38**	**38**	**38**	**38**	**38**

Notes: $p > |z|$ in parenthesis. z has a standard normal distribution. (*) In parenthesis p-value corresponding to Likelihood-ratio test of $\rho = 0$.

Source: Own calculations.

Does the accumulation of external indebtedness increase the probability of suffering a reversal of external saving flows?, $debt(-1)$, $short(-1)$ and $xd(-1)$[13] are the coefficients that indicate the role of country debt in the probability of CAR. These variables measure the effort of the economy to pay (the "debt burden"). They are *a*

priory expected to increase the probability of a reversal (Obstfeld and Rogoff, 1997). The argument here is that the operative borrowing restriction for economies with a low degree of openness, like the LACs, is the external transfer[14]. The greater is the debt burden, the easier is the process of adjustment of the economy to recover the solvency stance after shocks such as the fall in the rate of growth or a rising rate of interest.

$debt(-1)$ and $xd(-1)$ are not statistically significant even though they have the expected sign. The expected sign of the burden of the debt is positive because it is assumed that a higher level of debt to GDP increases the probability of reversal, as far as the external agents perceive that the capacity of the domestic economy to fulfill its debts payments is reduced. This result is consistent with an increasing external debt without reversals according to the results of Milesi-Ferretti and Razin 1998. Overall, the empirical evidence is mixed; Edwards 2007 finds that only the total external debt is significant (and not the temporal profile); Calvo 2004, analyzing sudden stops, concludes that the control variables that considers country debt are not statistically significant. However, the coeficient of $short(-1)$ is significant at 10% in all equations for the sample.

The change in terms of trade (dtt) is highly significant in all equations, but the sign is not the expected. Actually, if the terms of trade increase, the probability of reversal should decrease because there is a positive wealth effect and solvency increases. Milesi-Ferreti and Razin 1998 obtain evidence in this direction. However, the present result is consistent with the findings of Edwards 2004, 2007. A possible interpretation is that the changes in the terms of trade are perceived as transitory; then, the positive change in the terms of trade simply generates a (transitory) increase in current income reflected in a reduced deficit of the current account.

Is there evidence of contagion?

The coefficient of the independent variable con is significant at 5% in all estimations and it has the expected sign. This result provides evidence that there is a regional component behind the reversals consistent with a contagion hypothesis. The positive value of the coefficient implies that the international financing market perceives

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[13] $debt(-1)$ and $short(-1)$ are used by Edwards 2007.

[14] Cfr. Barone and Dìaz Cafferata, 2008. Published in Tondl (Ed) 2008.

regional financial assets as substitutes, such that each country in LA region suffers the international broker's portfolio adjustment (to reduce risk in case of in emerging market crisis) in the same way.[15]

A similar result arises with the coefficient of $res(-1)$, wich is found significant at the 5% level[16] and has the expected sign: countries with higher level of reserves have lower probability of suffering a current account reversal.

Edwards 2007 expect FDI flows to reduce the probability of reversal because it represents long term commitments. It could also be argued that this type of external investment has a positive effect on growth and in consequence, in the future capacity to pay. In the estimation the variable lagged one period $fdi(-1)$ has a positive sign, but it was not found to be significant in any of the equations.

Estimations do not reject the null hypotesis of $\rho = 0$ at the usual significance level (p - value of the likelihood ratio test of $\rho = 0$ is higher than 0.10 in all equations). Evidence that unobserved country (time invariant) specific shocks cause reversals is not found.

In summary, all specifications stress the importance of $growth$, con, $cc(1)$, $short(1)$ and dtt in the explanation of external crises. This variables affect the short term dynamics of current account and may cause complicated adjustment episodies depending on different scenarios. In the following we characterize these events according different values of $growth$, con and $short(1)$ in order to determine sustainable levels of indebtness for LACs.

Probabilities of CARs associated to scenarios with alternative values of main variables

Once the sign and magnitude of the parameters of the normal cumulative distribution function from the panel of LACs are estimated, the statistical model is used to provide estimations of the impact of several shocks in the probability of CARs. The

[15] The papers that include a broader sample with countries of other world regions employ an index defined as the relative occurrence of capital flow contractions in each country´s references group. That coefficient is expected to be positive as in Edwards 2004, 2007.

[16] Edwards 2004 uses net international reserves to GDP, while Edwards 2007 utilizes the international reserves as a proportion of the country's total external liabilities based on the indicator constructed from the data provided by Lane and Milesi-Ferreti (2006). The coefficient of this variable is expected to be negative because a high level of international reserves is seen as an "insurance policy".

prediction of the probability of a CAR is calculated using the variables from Table 4 and the coefficients of eq (5).

Table 6 shows the outcome of a particular exercise, providing a suggestive quantitative image of these relations for LACs scenarios, on three steps.

First. The parameters estimation, using a Probit model in the panel of annual data in LACs, between 1979 and 2004, which provide the sign and, through marginal effects, the expected magnitude of reaction to shocks.

Second. A *basic scenario* providing a reference probability of CAR is calculated giving the variables a value equal to the average of the LACs in the panel sample.

Third. To replicate the possible emergence of situations where the occurrence of a reversal is more probable, different exercises are performed comparing the basic scenario with others created by replacing the average values for others likely to prevail in a crisis. Either one of the variables is changed at a time or, even more interestingly, more than one variable adopts simultaneously "crisis values". A property of the model is its capacity to handle the effect of more complex situations, where the non-linearity compounds the practical consequence of negative developments in key variables. Note also that the exercise below has been devised to reflect the key role we assign to the external variables that belong to the solvency condition. In particular, in Table 5 three additional scenarios were constructed considering values $growth$ and con that are associated with "crisis" situations.

Table 5
How the $growth$ and con affect the probability of reversals in LACs

Scenarios	$growth$	con	**Probability of CAR in LACs.** $short(-1)$.		
			7.44	**15.71**	**24.39**
Base: Variables are valued at the sample average.	2.51	3.66	0.029	0.042	0.06
Virulent Contagion	2.51	10.52	0.067	0.091	0.124
Growth Crisis	-5.71	3.66	0.077	0.104	0.139
Growth Crisis and Virulent Contagion	-5.71	10.52	0.152	0.195	0.247

Source: Own calculations.

Figure 5 depicts the anatomy of a typical current account crisis in the LACs. The vertical axis shows the predicted probability of CAR according to different values of $short$ (hirzontal axis). This exercise is developed using coefficients in eq (5).

The more general observation about the “Scenario 1: Base” is that, the positive sign of the coefficient of the short term to total debt ratio $short$, together with the non-linearity, makes the probability of default raise when the short term indebtedness increases. The base scenario (lower normal c.d.f.) corresponds to the combinations of $short$ and probability of reversal if all the variables in the panel have their average values. When the short term debt is more than one quarter of total debt, the probability of a CAR approches 10% in the scenario 1.

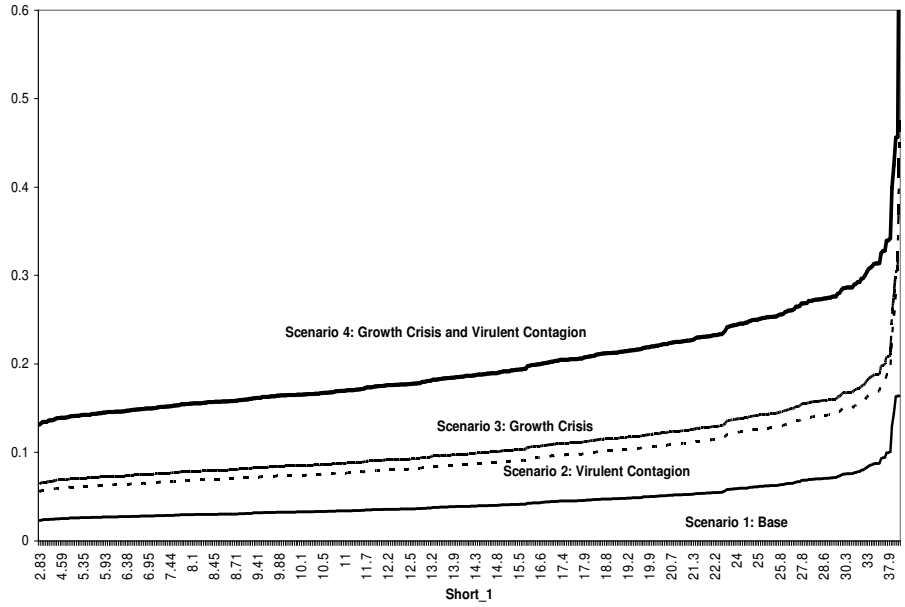
The vertical distance between the two lower lines in figure 5 represents the quantitative incidence of the contagion phenomenon (con) in the probability of CAR. The vertical distance for every point in $short$ is the change in probability when the average value of contagion index in the panel ($con = 3.66$) is replaced by a higher contagion such as $con = 10.52$.

Consider the consequence of stronger contagion, with an increase in con from 3.66 to 10.52 as shown in Table 6, which is represented by the vertical distance between Scenario 1 and Scenario 2, measured at the panel average short debt ratio ($short = 15.71$): the probability of reversal goes up from about 4.2% to 9.1%.

What is the effect of a fall in GDP growth? . For example, when the growth rate lowers from the average of 2.51% to the fifth percentil of the panel sample, a negative growth of -5.71%. Mantaining the others variables in the average value, the probability of CAR raises for every value of $short$ as shown in Figure 5. The probability of reversals increases from 4.2% to 10.4% given that an average value of 15.71% for the short debt ratio.

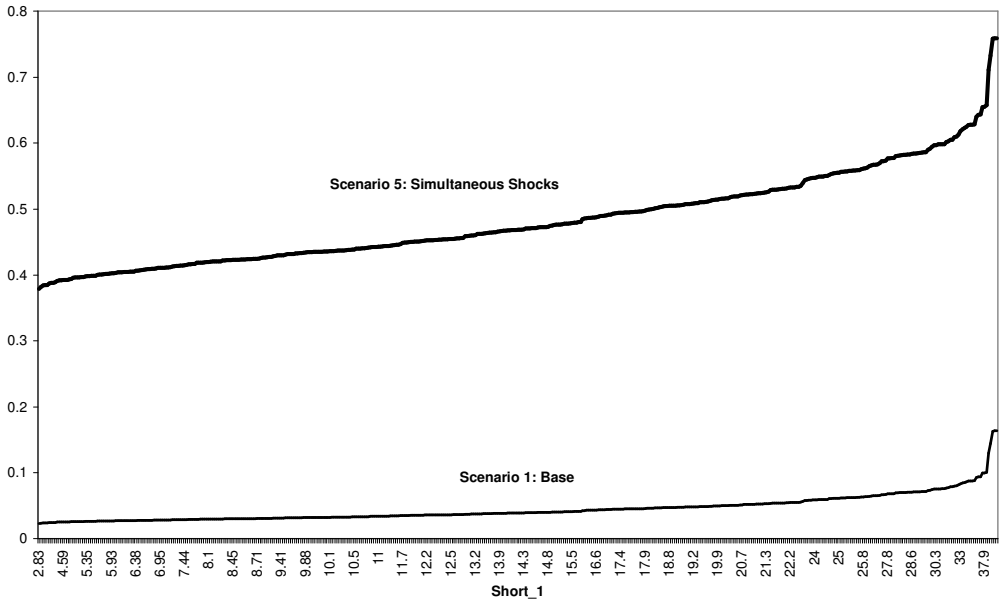
The upper line reflects the impact of simultaneous change of $growth$ and con above the average panel values. Table 5 shows that the probability of CAR is sustancially increased under scenario 4. When the short debt ratio is equal to average value the probability of CAR is close to 20%, wich is considered as a dangerous landmark that reflect that short term debt is reaching a “*safe indebtness limits”*.

Figure 5
Probability of a CAR in the average LAC.
Different values of $short(-1)$, $growth$ **and** con



Source: Own calculations.

Figure 6
Probability of a CAR in the average LAC.
Different values of independent variables



Source: Own calculations.

Finally, Figure 6 shows the probability of a CAR when all independent variables are set at their critical values ($growth = -5.71$ $dtt = 16.79$ $con = 10.52$ and $res = 3.54$). These results highlight a remarkable policy implication. An economy may be resilient to different shocks one at the time. But our simulations show that when the key

variables reach simultaneously at a certain point in time, critical limits, the economy is driven to risky scenarios.

This situation is perceived by external agents owners of the country´s assets as announcing the danger of a crisis and increasing probability of the loss in their values, precipitating a reversal.

VI Synthesis and policy implications

Since the mid-nineties a body of literature has developed on the issue of CARs and, given the continued contemporaneous evolution of the volume and volatility of financial markets, the current research on the area is likely to continue being of central interest in the agenda. Relevant topics include the identification of reversals useful for economic analysis, causes, consequences and policy recommendations.

The temporal coincidence of events around the world suggests that there is an international component in the external crises, and the need to integrate domestic and global conditions in the explanations and policy recommendation.

Regarding the critical Current Account (CA) reversal, Reinhart (2005) argues that the surge of capital inflows to emerging economies was encouraged by the sustained decline of interest rates in the industrial world and the direction reversed with the tightening of monetary policy in the USA. She points out that "it certainly seems a mystery why these wide swings in capital flows recur," and that "even the best policy mix cannot altogether avoid the eventual reverse of capital." There was also a negative impact of the devaluation by Argentina´s major trading partners which reduced profitability in the tradeable sector; and of the Russian crisis of August 1998 that contributed to the unexpected halt in capital flows to emerging markets (Izquierdo, 2002).

Solvency problems in LACs are partially explained by the unsatisfactory long-run performance of exports. There are two external forces that trigger difficulties for these countries. One of them is the presence of external global shocks like the rise of interest rates in the early 80s, or the mounting difficulties caused by the fall in terms of trade and the deceleration of world income and trade growth in the second half of the 1990s. Last, there are contagion effects, as those caused by the financial turmoil in the same decade.

In an earlier contribution (Barone and Díaz Cafferata 2006) emphasis was placed on the links between exports and external solvency, and the application to Argentina pointing out that the long-run evolution of exports determine through the solvency condition an "admissible level" of the long-run debt, a restriction which is only broken at the cost of an external crisis.

Our results from the probit estimation are in line with others in the literature as regards the role of reserves, the share of short-term debt, GDP growth and contagion. The simulation exercise shows that low growth rate or contractions increase substantially the probability of CARs. Also contagion matters, pointing out that LACs belong to a “club” rather than facing independent borrowing restrictions.

A first approximation to testing this hypothesis of "domestic structural determinants of the export gap" as the cause of the reversals, against the alternative that the dominant causes are related to the presence of exogenous international developments can be performed by comparing for a group of "similar" countries if domestic conditions or external factors as those just mentioned are the causes of external crises.

If purely domestic causes determine current account reversals, other countries´ CA should be found to exhibit independent behaviour. In this case, focus on domestic conditions may provide full explanation for external crises. If on the contrary evidence is found that all countries in a group suffer external crises simultaneously, a presumption of common external causes became plausible.

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APPENDIX. Data and variable definitions

Table 6
Data definitions and sources

Variable	Description	Source
Current account Reversal	Reduction in current account deficit. Constructed on the basis of Milesi-Ferretti and Razin 1998.	Based on GDI current account data.
$cc(-1)$	Current Account balance (% of GDP). Lagged one period.	Global Development Indicators (GDI). World Bank.
$growth$	GDP growth (annual %)	Global Development Indicators (GDI). World Bank.
$dinrate$	Annual change in the international interest rate.	Global Development Indicators (GDI). World Bank.
$debt(-1)$	Total Debt (EDT)/GNI (%). Lagged one period	Global Development Finance (GDF). World Bank.
$short(-1)$	Short-term debt/Total debt (EDT) (%)	Global Development Finance (GDF). World Bank.
$xd(-1)$	Export to debt ratio.	Global Development Indicators (GDI). World Bank.
dtt	Annual change in terms of trade.	International Monetary Fund.
con	Contagion index for country i defined as number of total reversal occurred in year t less the reversal in country i scaled to total reversal of the sample	Based on GDI current account data.
$res(-1)$	Reserves (RES)/Total debt (EDT) (%)	Global Development Finance (GDF). World Bank.
$i(-1)$	Gross capital formation (% of GDP).	Global Development Indicators (GDI). World Bank.
$fdi(-1)$	Foreign direct investment, net inflows (% of GDP)	Global Development Indicators (GDI). World Bank.

Selected Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haití, Honduras, Jamaica, México, Panamá, Paraguay, Perú, Trinidad y Tobago, Uruguay y Venezuela.