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Trade variables and Current Account "reversals": Does the choice of definition matter? An application to Latin American countries*

Las variables comerciales y las "reversiones" de cuenta corriente: ¿La elección de la definición importa? Una aplicación para los países de América Latina

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Abstract

This paper demonstrates that the choice between alternative definitions of current account reversal suggested in the literature does matter for the identification of the frequency and dating of reversals. Using variables suggested by the solvency hypothesis three models of a random effect probity are estimated, and the results are compared to highlight the role of the statistical identification of "reversal" used in the exercise. Growth, exports, and changes in terms of trade, are significant, and have the expected signs. The results highlight both the critical role of trade variables in the genesis of reversals and that the choice of definition matters for the sign and significance of determinants.

Key Words: Current Account, Debt, Reversal, Probit, Comparison.

JEL Classification: F32 F34

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RESUMEN

Una reversión de la cuenta corriente es, en general, un cambio brusco, sustancial y sostenido del déficit, pero existen diversas propiedades estadísticas para su identificación empírica. En este trabajo se muestra que la elección entre definiciones específicas de reversión de la cuenta corriente usualmente utilizadas en la literatura modifica tanto el momento del tiempo en que se detecta la reversión, como el número de eventos en el período bajo estudio. Para mostrar de qué manera la definición afecta la identificación de las variables que causan la reversión, se estima un modelo probit de efectos aleatorios con tres definiciones alternativas y se comparan sus resultados.

Palabras clave: Cuenta Corriente, reversión, deuda externa, probit, comparación.

Clasificación JEL: F32 F34

I. ABOUT EXTERNAL SAVINGS AND REVERSALS

A reversal of the current account is in general a sudden, large and sustained adjustment in the current account. In this paper, the determinants of current account reversals (CARs) are examined, focusing on the circumstance that the economic concept, and statistical properties that define a CAR in the literature are not unique, a fact that deserves more attention than usually granted. This paper highlights the issue that a proper specification of the phenomenon of reversal is necessary for a correct diagnosis of the process driving to this type of CA crises.

The issue of reversals of external financial flows to an economy is critical when the capacity to grow is impaired by the difficulties to accumulate capital and improve productivity. Capital per capita in Argentina and the LACs not only is low by international standards, but also grows slowly. The costs of external crises indeed hinders gravely the potential benefits of using international capital flows to help overcome chronic difficulties to reach higher investment ratios and to allow low saving developing countries to emerge from poverty. Hence, the effects of reversals may be particularly costly for LACs.

Figure 1 provides a perspective for Argentina: a declining saving rate in the 1980s and 1990s is accompanying by a trend fall in the I/GDP ratio; on inspection, positive changes in the I/GDP rate appear associated to changes in external saving. Letters E and D, using the Edwards 2004a and Diaz Cafferata et al. 2005 definitions, represent how the sudden, large and sustained ad-

justments in the current account associated to CARs may create difficulties to maintain a previous level of expenditure and therefore to finance investment and eventually, though not necessarily, economic growth may be affected.

Financial globalization has both increased the magnitude, exacerbated fluctuations, and is associated to not well understood changes in direction, of external savings flows (Lucas 1990, Reinhart 2005). Understanding the channels of vulnerability to those shocks is clearly necessary for the analysis of the economic fluctuations and the irregular growth of LACs, and helps to evaluate the potential benefits of external financing.

In the rest of the paper, Section II addresses the economic phenomenon of CARs by sketching two theoretical models of current account reversals. The proposed scheme allows assessing the role of trade variable in the occurrence of external crises. Section III emphasizes how the particular statistical properties of the sign, the magnitude and the duration of changes in CA flows, bring in the literature different empirical definitions of "reversal". It also provides empirical estimations of the dates of reversals in Argentina and other LACs, when three definitions suggested by Díaz Cafferata et al. 2007, Milesi-Ferretti and Razin 1998, and Edwards 2007, are used. A random effects probit model in section IV estimates the parameters measuring the impact of selected variables on the probability of the event "reversal of the CA", using these three alternative definitions of CAR. We provide an answer to the question of how the choice of definition matters, in terms of the difference between those results. Section V concludes.

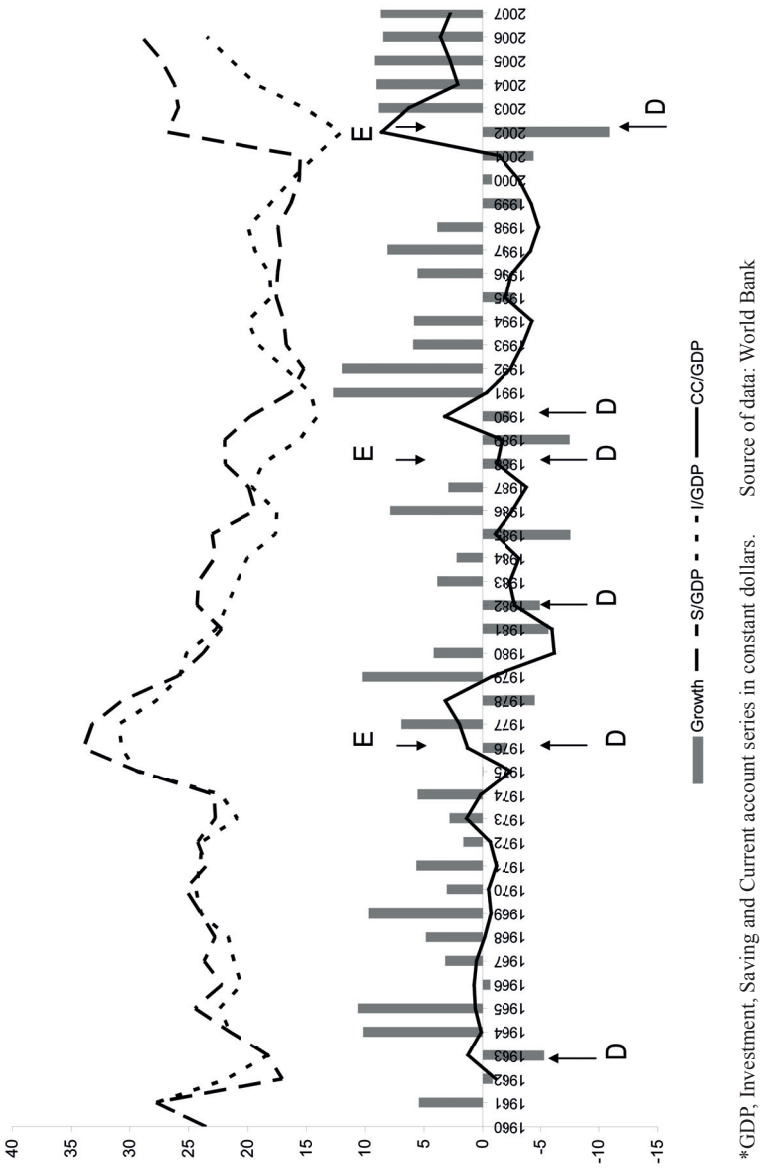
II. Models of current account reversals

In this section two current account reversal models are depicted. Firstly, following Milesi-Ferreti and Razin 1998 the basic approach is presented. Secondly, following Barone and Díaz Cafferata 2006 the standard approach is extended to consider the role that trade variables play in the occurrence of the CARs.

II.a A simple model of current account reversal

Consider an small open economy (SOE) that faces a fixed risk-free interest rate (r), with endowment. The supply of capital is perfectly elastic (the capital is perfectly mobile across countries). It is supposed that the economy grows continuously at a rate $g > 0$ such that $g < r$ (given the SOE

Figure 1
Argentina. Current Account, Saving and Investment and CARS under two definitions. 1960-2007



*GDP, Investment, Saving and Current account series in constant dollars. Source of data: World Bank

assumption). Under these circumstances the steady state current account-to-GDP ratio is (Obstfeld and Rogoff 1996):

$$ca_s = -\frac{g}{r-g}$$

where ca_s is the steady-state current account in terms of GDP. Thus, in the long run, the current account (as percentage of GDP) is negative. In this setting, the transversality condition (which implies the no ponzi game condition) is held (Obstfeld and Rogoff 1996).

Suppose now that suddenly in t the economy is expected to grow at a lower rate $g' < g$. Then, a current account reversal could be defined as:

$$Reversal = -\frac{g'}{r'-g'} - \left(-\frac{g}{r-g}\right) > 0$$

This equation indicates the positive change in the current account in terms of the output needed to restablish the long run equilibrium: when the expected permanent output diminishes, the domestic economy can not longer sustain in the long run a high level of indebtedness. Actually, in this model the stock of debt (as percentage of output) depends on the growth rate: the greater the growth rate the higher the debt stock that the SOE can bear to smooth consumption. Thus, a current account reversal can be seen as the required adjustment in the the steady state current account-to-GDP ratio in order that the economy could sustain a lower steady state debt burden (as percentage of GDP) because the *expected* growth rate has decreased. Some remarks should be done. First, as defined, a current account reversal represents a change between two different steady states values: the definition does not depict the values of ca across the adjustment process but rather captures changes between two long-run equilibrium values. Second, the current account balances (and thus reversals) depend upon the *expected* growth rate; past values of economic variables does not matter to define CARs.

II.b Highlighting the role of exports

To drive attention specifically towards the importance and the role of exports performance, the equation that represent ca_s is rewritten in terms of the trade balance consistent with the long-run equilibrium:

$$Tb_s = (r-g)\,d_s$$

where, again, s denotes steady state values and the equation provides the trade balance to output ratio (Tb_s) required to maintain constant the ratio of debt to output (d_s). Given d and g, the required trade surplus ratio is an increasing function of the rate of interest. Barone and Díaz Cafferata 2006 rewritte this expression in terms of the required exports to output ratio (x^r) that maintains stable the ratio of debt to GDP; assume at this point for simplicity that imports (m) are a constant fraction of the GDP, as follows.

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

Or, 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^r ratio provides a limit of the debt to GDP ratio or an admissible debt-to-GDP ratio $d = (x - m)/(r - g)$.

This solvency approach suggests that the structural exports performance sets admissible levels of external debt through the intertemporal budget constraint of the economy, given a long-run growth rate g. In this sense, in countries that exhibit a weak growth trend in the long run, 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 CA deficits as the casual observation suggests: Argentine has recurrently reached the "rigid" long run export constraint even with relatively low debt ratios.

As a consequence, this hypothesis suggests that exports are the main drivers of the CARs: as the exports decline in the long run, the expected growth rate decreases, and finally, the economy experiences a current account reversal in order to remain solvent. Conversely, a permanent increase in exports reduces de probability of going through a CAR. In section IV a probit analysis is run to test whether the exports performance explain CARs. Before doing that, we analyze in the next section how to construct measures of CARs according to the exposed theoretical framework.

III. Measuring Current Account reversals: Does the definition matter?

In this section we review the most widespread statistical methods in the relevant literature to measure current reversals. We identify differences between them. Secondly, we choose three of them to be applied to detect CARs in a sample of 20 Latin American countries.

III.a Multiple statistical criteria to define a CA reversal

Researchers agree in a general notion of a reversal of the current account as the occurrence of a sudden, substantial and sustained change in its magnitude, and is a relevant indicator of the degree of instability of external financing.

This basic criterion leads us to determine the *magnitude* of the adjustment in the CA in a year to define a reversal, *when* in time an episode of reversal happens, and finally the *frequency* of the CARs. The following six (non exhaustive) properties examine only the magnitude of the adjustment in a point of time:

a) The conventional magnitude of the adjustment in the ratio: a usual magnitude to label a change "large" is in a range between 2%-3% and 5% as in Edwards 2004a, 2005, Milessi Ferretti and Razin 1998. It is usually understood that the "adjustment" is an "improvement" in the CA deficit.

b) A reversal occurs when the reduction is equal to the average CA deficit in the period, as used in Díaz Cafferata, Berbotto and Kohn 2007. This criterion provides a benchmark for the change in the CA that is related to the historical deficits of a specific country, compared to the alternative of using a same percentage change for all countries to be compared. Note that since those averages correspond to a particular period on time, the question of which is the appropriate length of the period of reference is brought to the forefront.

c) Another country specific criterion is a threshold that accounts for the variability of the CA, which can be measured by the standard deviation of the country´s CA/GDP ratio as used in Algieri and Bracke 2007.

d) Also the initial balance matters: the country´s CA deficit is at least 2% or 3% of GDP before the adjustment (leaving aside changes from a nearly balanced CA) Algieri and Bracke 2007.

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 a precursor paper by Milesi-Ferretti and Razin 1998.

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 episodes of reduction 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.[1]

Freund 2005 poses four conditions: a) The CA-to-GDP ratio before the reversals is 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.

Edwards 2004a defines a current account reversal as the reduction in the CA deficit of at least 4% of GDP in one year. Edwards 2005 uses two definitions, 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 fix exchange rate. A large depreciation causes a sharp reduction in the CA disequilibrium, and the reversal is associated to an economic depression. Finally, Bagnai and Manzocchi 1999 distinguish CA reversals from temporary swings in the CA balance, and ask to what extent CARs are associated with shifts in fundamentals, and whether the impact is the same in the case of positive and negative reversals.

Note that the presence of these multiple criteria brings as a consequence that there is not a unique answer to the question of when reversals happen.

1. Reversals can occur in consecutive years.

III.b An application to 20 Latin American Countries

Let´s see, in Table 1, how the definition matters in the sample of 20 countries and 26 years, a total of 520 possible combinations of reversals under a given criterion. For the sage of the argument, note that a possible outcome would be that there were coincidences in every year of reversals when reversals occur, for each country, under all three criteria. This doesn´t happen.

Between 1979 and 1981 there were not CARs in the sample of twenty LACs following the Milesi-Ferreti and Razin criteria (criterion "B"); the simple criterion of a change in the CA equal to the average deficit (criterion "A") picks four reversals, in Bolivia and Trinidad-Tobago in 1980; in the Dominican Republic and Uruguay in 1981. The Edward´s definition (criterion "C") finds two, coincidently, in 1981. Ecuador in 1999 is the only year in which criteria A and B but not C coincide in the whole sample. On time, there is a total of 18 coincidences of the three criteria.

Table 1: Reversals of the Current Account in Argentina and other LACs under alternative definitions, 1979- 2004

Type of CAR	1979-1981	1982- 1990	1991-1998	1999- 2004
A	4	25	4	9
B	0	23	3	9
C	2	28	7	10
Number of coincidences between:				
A and B	0	0	0	1
A and C	2	3	2	2
B and C	0	7	1	4
A, B and C	0	13	1	4

A Defines a reversal as a reduction of the CA deficit larger than the average (Díaz Caffe-rata et al. 2005); B is the criterion proposed by Milesi-Ferreti and Razin 1998; C is the one defined by Edwards 2004a. Please see details in Annex A.

The pattern of reversals in LACs shows additional interesting features which may be examined in more detail in Annex A. The first one is that there are periods with a higher number of reversal per year using any of the definitions, meaning that all the three definitions identifies periods when the flows of external financing change. For estimation of cause-effect relationship be-

tween given variables and reversals, the alternative definitions sometimes coincide, but other times they do not, in determining the occurrence of a reversal in a given year.

A general implication emerges from casual observation, namely, that if a functional relationship exists between some variables and the occurrence of a reversal, the empirical estimation of this link is expected to provide different values of the parameters when different definitions of reversals are used.

IV. DOES THE DEFINITION MATTER? EVIDENCE FROM THE STATISTICAL PROBIT MODEL

The objective in this section is to compare the probit estimators obtained considering three different definitions of current account reversal. This task appears to be important because each definition is aimed to consider a particular characteristic of the economic phenomenon under study as stated previously. Table A in the appendix shows in what year each definition alerts on the presence of reversal. Overall the three methods looks quite similar, even though several differences appear.

To analyze the variables that affect de 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 follow a similar strategy to study the theoretical causes of "sudden stops".

In contrast with this literature that works with extended samples of countries in the world economy, the focus is placed on LACs. We will compare our results on causality, and current account adjustment process, with those found in the research for the rest of the world. The statistical model is:[2]

$$P(y_{it} = 1|\mathbf{x}_i, c_i) = P(y_{it} = 1|\mathbf{x}_{it}, c_i) = \Phi(\mathbf{x}_{it}\boldsymbol{\beta} + c_i)$$

where:

t=1,...T i=1,...N

$y_{i1},\ldots,y_{iT}$ are independent conditional on $(\mathbf{x}_i, c_i)$

$c_i|\mathbf{x}_i \sim Normal(0, \sigma_c^2)$

2. The description of the Probit model follows Wooldridge 2002, page 470 and 485.

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. T=25 years and the number of LACs is N=20. The log-likelihood function for the entire sample of size N can be maximized with respect to $\boldsymbol{\beta}$ and σ^2_c to obtain $\sqrt{N}$ consistent asymptotically normal estimators. The relative importance of the unobserved effect is measured by $\rho = (\sigma^2_c/\sigma^2_c+1)$, where σ^2_c 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.

The (binary) dependent variable y_{it} is the reversal measure estimated on the different definition of a CAR. A set of independent variables is considered: a) $growth$ is the rate of growth of GDP in each country; b) $fdi(-1)$ is the foreign direct investment to GDP ratio lagged one period; c) $res(-1)$ ratio of reserves to total debt lagged one period; d) $short(-1)$ is percentage of short-term debt to total debt, lagged one period; e) $debt(-1)$ is the total debt to GDP ratio lagged; f) $dinrate$ is the annual change in the international interest rate; g) con is an index of contagion; h) $x(-1)$ is the exports to GDP ratio lagged one period; i) $m(-1)$ is the imports to GDP ratio lagged; j) dti is the annual change in terms of trade. Details on sources and the definition of the variables are included in the Appendix.

To assess whether the reversal in country i depends on the reversals occurred in the same year in other LA countries, the contagion variable (con_{it}) is defined as the number of total reversals occurred in year t less the reversal in country i scaled to total reversals in the sample. Since different definitions of reversal alter the sequence of reversals in LACs in the period of observation, the contagion estimate differs across the three estimated equations.

Table 2 presents the random-effects probit estimators. It shows three alternative specifications for the statistical model. Equation 1 includes reversals according to Díaz Cafferata et al. 2005, in which a reversal is characterized by a change in CA deficit that is greater than the 1979-2004 average. Equation 2 adjusts the regression equation on the basis of Milesi-Ferretti and Razin 1998 definition. Finally, equation 3 uses Edwards 2004a criterion. The statistical significance of the estimated coefficients is examined in the following paragraphs.

The coefficient of $growth$ is, in all equations, highly significant at 1% level, and in the three cases with a negative sign, as expected, since the higher is the growth rate the lowest is the probability of a reversal. It means that the small open economy may reduce its net external position (increasing her borrowing) when the expected growth rate rises, because it is expected to enhance its capacity to pay. This result is in line with theoretical predictions connected to the intertemporal approach as in Obstfeld and Rogoff 1996, and is similar to the results found in Milesi-Ferretti and Razin 1998.

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 three estimations the variable lagged one period $fdi(-1)$ has a positive sign, but it was not found to be significant in any of the equations.

The coefficient of $res(-1)$ is found significant at the 5% level only in the second equation when the Milesi-Ferretti and Razin 1998 definition is used.[3] In this case the coefficient has the expected sign: countries with higher level of reserves have lower probability of suffering a current account reversal.

Does the accumulation of external indebtedness increase the probability of suffering a reversal of external saving flows? The coefficients that indicate the role of country debt in the probability of CAR, $short(-1)$ and $debt(-1)$,[4] 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 et. al. 2004, analyzing sudden stops, concludes that the control variables that considers country debt are not statistically significant.

3. Edwards 2004a 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 of high level of international reserves is seen as an insurance policy.

4. These variables are used by Edwards 2007.

$dinrate$ is not significant at the conventional statistical levels. It would be consistent with the intertemporal approach: if world interest rate changes are caused by global shocks, there is not impact on the small open economy current account.[5] 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 evidence does not acknoledge the role of the international interest rate in determining 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 reversals.

The coefficient of con is significant at 10% only in equation 2, but in all other cases has the expected sign. This result provides (weak) 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 regional financial assets as identical across countries, such that each country in LA region suffers the international broker's portfolio adjustment (to reduce the risk in the case of an emerging market crisis) in the same way.[6]

The lagged exports $x(\text{-}1)$ have the negative expected sign, and it is significant at 1% in equations 1 and 3, and at 5% in equation 2. It is key variable to understand the current account adjustment process in LACs. Economies with high exports performance has a low probability of experimenting reversal events. This result is consistent with the hypothesis explained by Barone and Díaz Cafferatta 2007, where the (lagged) negative export gap between observed exports and expected exports explains the reversals for Argentina. A high exports to GDP ratio is expected to strengthen the possibilities of paying the external debt, and allowing higher external borrowing.

The coefficient of $m(\text{-}1)$ has the expected positive sign, and is significant at 1% in equations 1 and 3, and at 5% in equation 2. A country with high imports to GDP ratio is expected to have greater chances of suffering current account adjustment. This type of evidence points out the importance of the trade channel in the transmission of aggregate shocks in the LACs.

5. 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, an in consequence CA in al Countries are unaltered (Glick and Rogoff 1995).

6. 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 2004a, 2007.

Table 2: Probability of a Current Account Reversal. Random-effects probit regression. 1979-2004.

Dependent variable	Eq. (1)	Eq. (2)	Eq. (3)
$growth$	-0.088	-0.064	-0.070
	(0.000)	(0.003)	(0.000)
fdi(-1)	0.022	0.058	0.039
	(0.630)	(0.124)	(0.278)
res(-1)	0.004	-0.015	-0.004
	(0.181)	(0.048)	(0.402)
$short$(-1)	0.015	0.014	0.014
	(0.214)	(0.218)	(0.190)
$debt$(-1)	0.005	0.001	0.002
	(0.217)	(0.758)	(0.513)
$dinrate$	0.000	-0.005	0.001
	(0.924)	(0.126)	(0.534)
con	0.027	0.042	0.026
	(0.285)	(0.082)	(0.378)
x(-1)	-0.113	-0.046	-0.075
	(0.000)	(0.044)	(0.005)
m(-1)	0.114	0.046	0.077
	(0.000)	(0.044)	(0.004)
dti	0.021	0.024	0.025
	(0.024)	(0.010)	(0.004)
σ_c^2	0.499	0.063	0.228
ρ^*	0.199	0.004	0.049
	(0.049)	(0.173)	(0.272)
Number of observations	520	520	520
Number of groups (countries)	20	20	20
Number of reversals	43	38	51

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.

The change in terms of trade (dti) 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 2004b; 2007. A possible interpretation is that the changes in the terms of trade are perceived as transitory; then, a positive terms-of-trade shock would trigger a transitory increase in the current income, which would improve the current account balance.

In summary, all the three strategies for calculating CARs stress the importance of $growth$, x(-1), m(-1) and dti in the explanation of external crises. This means that, despite the problems in defining and meassuring reversals, the stylized facts appear as sustantially stable across the different excercises. The relevance of the others variables depends on the selected method.

V. Synthesis and policy implications

Why do current account "reversals" occur? Current events around the world suggest the presence of both international factors and domestic components in the external crises and the phenomenon of reversals of the current account. 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).

This paper points out that the empirical work and comparison of results in research is complicated by the lack of an agreed definition of reversals. It is shown that the choice between alternative definitions of CAR suggested in the literature matters for the identification of the frequency and dating of reversals. Using variables suggested by the solvency hypothesis three models of a random effect probit were estimated for LACs, and the results were compared to highlight the role of the statistical identification of "reversal" used in the exercise. Growth, exports, and changes in terms of trade, are significant, and have the expected signs. The results highlight both the critical role of trade variables in the genesis of reversals in LACs and that the choice of definition matters for the sign and significance of determinants.

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Dates of CA reversals in LACs under alternative definitions

Country	HON	BOL	JAM	CRI	PER	GUA	CHI	ECU	RDO	HTI	PAR	PAN	MEX	COL	BRA	ARG	SVA	URU	TRI	VEN
Av def	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
St. Dev	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 CA deficit larger than the average (Díaz Cafferata et al. 2005);
B is the criterion proposed by Milesi-Ferreti and Razin 1998; C is the one defined by Edwards 2004a.

VIII. Annex B

Data and variable definitions

Variable	Description	Source
Current account	Current Account balance (% of GDP). Lagged one period.	Global Development Indicators (GDI). World Bank.
Current account Reversal	Reduction in current account deficit. Constructed on the basis of (i) Díaz Cafferata *et al*. 2007; (ii) Milesi-Ferretti and Razin 1998, and (iii) Edwards 2007.	Based on GDI current account data.
$growth$	GDP growth (annual %)	Global Development Indicators (GDI). World Bank.
$debt$(-1)	Total Debt (EDT)/GNI (%). Lagged one period	Global Development Finance (GDF). World Bank.
res(-1)	Reserves (RES)/Total debt (EDT) (%)	Global Development Finance (GDF). World Bank.
$short$(-1)	Short-term debt/Total debt (EDT) (%)	Global Development Finance (GDF). World Bank.
def(-1)	Cash surplus/deficit (% of GDP)	Global Development Indicators (GDI). World Bank.
fdi(-1)	Foreign direct investment, net inflows (% of GDP)	Global Development Indicators (GDI). World Bank.
$dinrate$	Annual change in the international interest rate.	Global Development Indicators (GDI). World Bank.
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.
dti	Annual change in terms of trade.	International Monetary Fund.
x(-1)	Exports of goods, services and income (XGS) (US$)	Global Development Indicators (GDI). World Bank.
m(-1)	Imports of goods, services and income (MGS) (US$)	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.

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