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ASSESSING THE IMPACT OF DIFFERENT NOMINAL ANCHORS ON THE CREDIBILITY OF STABILISATION PROGRAMMES

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The paper compares the impact of announcing exchange rate-based versus money-based stabilisation programmes in a time series cross-section of countries. The analysis finds that, on average, the effect of announcing exchange rate-based programmes is more credible, in terms of reducing inflation inertia, than the outcome associated with money-based programmes. The econometric analysis is robust to augmenting the benchmark inflation model with measures of the size of IMF-programme loans and the timing of government elections. The paper also finds that the gap between the magnitudes of the impacts from pursuing the different strategies has been falling since the 1970s. The trend seems compatible with the much debated Great Moderation in advanced economies and similar developments in economies around the world.

JEL classification codes: E31, E63, F41

Key words: inflation stabilisation, credibility, nominal anchors, IMF programmes

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I. Introduction

Deteriorating macroeconomic fundamentals lead governments to adopting formal stabilisation programmes. Credibility is important in designing and implementing macroeconomic policies, and particularly stabilisation programmes. The reason is that if stabilisation lacks credibility it is likely to fail in achieving the desired objectives. But deciding on the exact features of a plan to curtail weakening macroeconomic fundamentals is a difficult task for policymakers.

The paper focuses on determining the performance of economies adopting different stabilisation programmes. The investigation asks the following question: Are exchange rate-based stabilisation (ERBS) programmes more credible than money-based stabilisation (MBS) programmes?

The literature finds that exchange rate-based stabilizations tend to generate a boom followed by a bust. Programmes using money as the anchor, in contrast, tend to produce a bust followed by a boom. Calvo and Végh (1994) survey the theory and the empirical evidence on the topic; see also Rebelo and Végh (1995). The empirical regularity is the reason why the choice facing policymakers has been labelled the recession-now-versus-recession-later hypothesis. The rationale for why an exchange rate-based stabilisation produces different patterns than money-based stabilisation is complicated to establish but various authors advance ideas on the matter. The reasons for a boom-bust related to exchange rate-based stabilisation include sticky inflation, lack of credibility, durables consumption, and supply-side effects.

The pattern of recession followed by expansion observed under money-based programmes can be explained using sticky prices or inflation in benchmark models as discussed by Végh (2013). Assuming that the fiscal authorities are impatient, Tornell and Velasco (1998) show that MBS will yield better outcomes, in term of fiscal discipline and welfare, than ERBS programmes. However, the literature does not find a difference between fiscal discipline in ERBS versus MBS programmes. There is also evidence that political opportunism plays a role in the government's choice of nominal anchor (Aisen 2007). Other authors investigate the role for durables consumption in determining the macroeconomic dynamics in the adopting economies (e.g. Buffie and Atolia 2011).[1]

[1] Hamann and Prati (2002) discuss further factors of relevance for understanding inflation stabilisation episodes and their eventual success or failure.

The superior performance of ERBS could arise from their credibility-enhancing features or the direct boost to the supply side of the economy, which by construction are absent from money-based programmes. One could also argue that fixing the exchange rate is a policy that can be easily monitored whereas keeping track of developments in monetary aggregates demands a more sophisticated analysis. The exchange rate's advantages could help in convincing the public about a programme's potential and the commitment of the authorities.

Measuring a stabilisation programme's impact involves accounting for the announcement effect. The announcement effect measures the impact on inertia observed following the introduction of the programme and is expected to capture agents' perceptions about the authorities' ability to stabilize inflation. Depending on how people behave, various elements could determine the impact of announcing a programme, including the International Monetary Fund's (IMF) reputation with the public, the type of package being proposed, and the time remaining before the next political elections (Stein and Streb 2004).

The paper contributes by estimating the impact of ERBS versus MBS using a pooled time-series cross-section approach for a panel of 18 countries with a history of stabilisation episodes. The analysis pays particular attention to measuring the announcement effect and its impact on credibility as captured by inflation inertia.[2] Since inflation inertia is known to be closely related to the credibility of the stabilisation programme (Agénor and Taylor 1992), the paper uses the cross-section time-series data to assess the impact of each nominal anchor on inertia at the time of announcing the programme. The reduction in inertia is then compared among the different nominal anchors and the different regions to investigate the existence of regime-specific effects and region-specific characteristics linked to the stabilisation episodes.

The paper also tests the effects of loan amounts provided by the IMF in supporting the programmes. The results indicate that loan amounts complement the announcement of the programmes in reducing ex-post inflation. However, loans only have a significant effect when the exchange rate is used as the nominal anchor. The investigation also considers the timing of government elections and finds that programmes introduced around such processes generate larger credibility effects.

[2] The selection of countries follows from previous studies on stabilisation. In particular, Hamann (2001) and Easterly (1996) have used and extended the list of countries to compare the IMF-registered dates of stabilisation and programme announcement dates. The paper employs Hamann's (2001) criteria in selecting the stabilisation dates.

The rest of the paper proceeds as follows. Section II explains the analytical framework for empirically measuring credibility in the context of stabilisation programmes. Section III discusses the dating of the stabilisation programmes and section IV runs econometric exercises for determining the impact of ERBS and MBS in a pooled time-series cross-section of countries. Section V estimates the impact of government elections and IMF-programme loan amounts on the benchmark model. Section VI concludes.

II. Measuring credibility

This section extends Edwards (1998) using interaction dummy variables for measuring the impact of credibility on inflation inertia in a panel of countries. In a pooled time-series cross-section, inflation can be represented by the following stacked stochastic process:

$$X_{it} = \alpha + {X_{it-1}}'\beta_{it} + {Y_{it}}'\gamma_{it} + \varepsilon_{it}, \tag{1}$$

where X_{it} represents inflation, Y_{it} is nominal GDP growth and ε_{it} is the error term capturing supply side shocks for $i = 1, 2, \ldots, M$ cross-sectional units observed for periods $t = 1, 2, \ldots, T$. The α parameter represents the overall constant in the model, while the β_{it} and γ_{it} represent inflation inertia and the impact of nominal GDP growth.[3] Employing a stacked representation of the equations and organizing the model as a set of cross-section equations implies that $\varepsilon \sim N(0, \Omega)$ and the general form of the unconditional error covariance matrix is:

$$\Omega = E(\epsilon\epsilon') = E\begin{pmatrix} \epsilon_1{\epsilon_1}' & \epsilon_1{\epsilon_2}' & \ldots & \epsilon_1{\epsilon_M}' \\ \epsilon_2{\epsilon_1}' & \epsilon_2{\epsilon_2}' & & \vdots \\ \vdots & & \ddots & \\ \epsilon_M{\epsilon_1}' & \ldots & & \epsilon_M{\epsilon_M}' \end{pmatrix}. \tag{2}$$

[3] Equation (1) follows from standard definitions of inflation (e.g., Dornbusch 1976).

According to the literature, credibility on a stabilisation attempt can be approximated by changes in β_{it} at the time stabilisation is announced (e.g., Agénor and Taylor 1992). So the measure is an approximation of the probable success agents' attribute to the stabilisation programme (Edwards 1996). The argument, pioneered by Sargent (1982), suggests that the effectiveness and cost of disinflation will depend on the credibility in the stabilisation policies.

Therefore, if stabilisation is credible, persistence will fall and β_{it} will drop when the programme is announced. In contrast, if stabilisation lacks credibility, β_{it} will not respond to the announcement of the programme. Consequently, changes in β_{it} can offer relevant information about the performance and success of stabilisation.[4]

The announcement effect of stabilisation can then be measured by using an impact dummy variable on inflation persistence:[5]

$$X_{it} = \alpha + X_{it-1}'\beta_{it} + D_{it}X_{it-1}'\delta_{it} + Y_{it}'\gamma_{it} + \varepsilon_{it}\,, \tag{3}$$

where D_{it} are dummy variables taking the value of one in the year a specific country enters a stabilisation programme and zero otherwise. So the δ_{it} coefficients measure the change in inflation persistence, which are expected to capture stabilisation's impact on credibility. The impact of announcing a programme is significant when $\delta_{it} < 0$.

The modelling framework also allows measuring the credibility of alternative nominal anchors within specific regions. For example, the cross-sectional unit M can be limited to include selected countries within a region and the dummy variables can be restricted to a specific type of anchor.

Measuring the credibility of ERBS and MBS programmes involves extending the model as follows:

$$X_{it} = \alpha + X_{it-1}'\beta_{it} + D_{it}X_{it-1}'\delta_{it}^{j} + Y_{it}'\gamma_{it} + \varepsilon_{it}\,, \tag{4}$$

[4] It is worth noting that β_{it} could also be affected by institutional rigidities, such as labor contracts' indexation, which may lead to different degrees of flexibility in the response of inflation when a programme is announced.

[5] See Obstfeld (1995) for a discussion on inflation persistence and the use of dummy variables in evaluating the impact of regime changes on inflation inertia.

where the subscript j represents the type of anchor being evaluated. Therefore δ_{it}^{ERBS} measures the impact of ERBS programmes on inertia whereas δ_{it}^{MBS} measures the impact of MBS programmes. For example, if δ_{it}^{ERBS} is statistically larger than δ_{it}^{MBS}, this would imply that ERBS programmes are more credible than MBS programmes. If one of the coefficients is not statistically significant, however, the credibility impact of that specific anchor is negligible. If both coefficients were significant but not statistically different from each other, no additional impact can be attributed to a specific nominal anchor.

III. Dating inflation-stabilisation programmes

The exercises employ a pooled time series cross-section using annual data ranging from 1960 to 2004 for a panel of 18 countries involving 16 ERBS and 23 MBS episodes. The data set comprises 43 time series observations and 18 cross sections for a total of 616 unbalanced pooled observations. Note, however, that the set is unbalanced as countries like Brazil, Nicaragua, and Zambia have samples of different spans. Inflation is approximated by the change in the log of the consumer price index (CPI), and aggregate demand is approximated by the change in the log of nominal gross domestic product (GDP). The source for the data on CPI and nominal GDP is the World Bank's *World Development Indicators*. Data on loan amounts is collected from the International Monetary Fund's online database on lending arrangements. The type of nominal anchor used in the analysis follows from the IMF's classification within a stand-by agreement or structural adjustment programme.[6] Additional forms of stabilisation, including unorthodox programmes, were disregarded.

Establishing the dates of stabilisation is challenging. The literature considers two methods for defining a stabilisation attempt: the mechanical approach and the episodic approach. The mechanical approach uses a rule in defining a stabilisation episode, whereas the episodic approach uses case studies from the literature (see Hamann 2001; Easterly 1996). For example, Hamann (2001) uses the mechanical

[6] Reported stabilisation dates are from the IMF's website, and are cross-referenced with Tornell and Velasco's (1998) and Aisen's (2007) samples.

approach and tests three different criteria. The rules are based on the requirement that, prior to stabilisation, inflation remains at or above 40 percent for at least two years. In the first criterion, stabilisation occurs when inflation is brought down below 40 percent and remains at that level for at least another year. In the second criterion, stabilisation occurs when the inflation rate is below 40 percent for at least one quarter in the first year and remains below the pre-stabilisation level for at least another year. In the third criterion, stabilisation occurs when the inflation rate is below 40 percent for at least six months in the first year and remains below the pre-stabilisation level for at least another year. Hamann (2001) found 34 stabilisation episodes under the first criteria, out of which 22 coincide with those in Easterly's (1996) sample, which uses a similar, but more restrictive criteria. The timing of stabilisation tends to be delayed by a year in most cases, reflecting the fact that Easterly's sample was based on end-of-period inflation whereas Hamann's used average inflation.

The main shortcoming of the mechanical approach is that the episodes identified do not always correspond with full-fledged stabilisation attempts. Therefore, mechanical rules tend to be biased towards selecting successful stabilisations and, consequently, excluding failed attempts. In contrast, Calvo and Végh (1999) and Veiga (1999) adopt the episodic approach in determining the samples of stabilisation programmes. The main shortcoming of the episodic method, however, is that it may fail to include genuine stabilisations that get little attention in the literature.

Since the objective of the present investigation is comparing the credibility effect of successful programmes, the mechanical approach appears to be the ideal strategy for selecting the stabilisation dates. As indicated by Easterly (1996), the IMF-reported dates of a stabilisation programme tend to differ from the dates inflation actually stabilizes. Table 1 displays the actual dates of stabilisation, as reported by the IMF, alongside those of Hamann's (2001) and Easterly's (1996). The data confirms an average delay of one year for stabilisation to bring down inflation when the programme is regarded as successful. This paper uses Hamann's (2001) first criterion as the reference for selecting stabilisation dates.[7]

[7] This paper extends the sample to include the following episodes: the Dominican Republic 1985 and 1991; Chile 1964; Ecuador 1983 and 1984; Mexico 1995; Nigeria 1993; and Turkey 1999.

Table 1. Stabilisation and election dates

Country	Region	Stabilisation date IMF	Stabilisation date Easterly	Stabilisation date Hamman	Exchange rate anchor	Elections before	Elections after
Argentina 1	Latin America	1976	1976	1977			
Argentina 2	Latin America	1980	1980		Yes		1983
Argentina 3	Latin America	1985	1985	1986	Yes	1985	1987
Argentina 4	Latin America	1990	1991	1991	Yes	1989	1991
Bolivia	Latin America	1985	1985	1986		1980	1985
Brazil 1	Latin America	1965	1965	1966	Yes	1964	1967
Brazil 2	Latin America	1990	1990	1991		1986	1989
Chile 1	Latin America	1964	1964	1965		1964	1970
Chile 2	Latin America	1974	1974	1976		1973	1980
Chile 3	Latin America	1977	1977	1978	Yes	1980	1989
Costa Rica	Latin America	1982	1982	1983			
Dominican Republic 1	Caribbean	1985	1985	1986		1982	1986
Dominican Republic 2	Caribbean	1991	1991	1992		1990	1994
Ecuador 1	Latin America	1983	1983			1979	1984
Ecuador 2	Latin America	1984	1984	1984		1984	1988
Ecuador 3	Latin America	1988	1988	1990		1988	1992
Ecuador 4	Latin America	1992	1992	1994	Yes	1992	1995
Iceland 1	Other	1976	1976	1976		1944	1988
Iceland 2	Other	1983	1983	1984	Yes	1983	1987
Israel	Other	1985	1985	1986	Yes	1984	1988
Jamaica	Caribbean	1992	1992	1993		1993	1997
Mexico 1	Latin America	1983	1983				
Mexico 2	Latin America	1987	1987	1989	Yes	1985	1988
Mexico 3	Latin America	1995	1995	1997	Yes		
Nicaragua	Latin America	1991	1991	1992	Yes	1990	1996
Nigeria 1	Other	1990	1990				
Nigeria 2	Other	1993	1993	1994			
Peru 1	Latin America	1985	1985	1986	Yes	1985	1990
Peru 2	Latin America	1990	1990	1991		1990	1995
Turkey 1	Other	1980	1980	1981			
Turkey 2	Other	1999	1999	2000	Yes	1999	2002
Uganda 1	Other	1981	1981			1980	1986
Uganda 2	Other	1988	1988	1989		1986	2000
Uruguay 1	Latin America	1969	1969	1969	Yes	1966	1973
Uruguay 2	Latin America	1975	1975	1978		1973	1980
Uruguay 3	Latin America	1980	1980		Yes	1980	1984
Uruguay 4	Latin America	1990	1990		Yes	1989	1994
Zambia	Other	1993	1993	1994		1991	1996

Sources: Aisen (2007), Haman (2001), Easterly (1996), Tornell and Velasco (1998), IFS, National Sources and authors' calculations. Data for elections can be found in the Lijphart Elections Archives

IV. Estimating the benchmark inflation model

The exercises estimate equation (4), which is a pooled time series cross-section, using instrumental variables two-stage least squares (IV-2SLS). Table 2 presents the results of estimating equation (4) for the selected sample. The instruments for the IV-2SLS estimation include lagged values of inflation, GDP growth rates and the amount of loan arrangements made by the IMF during the stabilisations. The estimations apply Whites' cross-section robust covariance method to account for any potential cross-equation correlations or cross-region heteroskedasticity in the data.[8]

There are three regression groups based on the different regions and two regressions per group relating to ERBS and MBS programmes. The full sample includes ALL countries in the set. The Latin American (LATAM) sample includes Argentina, Bolivia, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, Jamaica, Mexico, Nicaragua, Peru, and Uruguay. The NONLATAM sample includes Iceland, Israel, Nigeria, Turkey, Uganda and Zambia.

In the ALL sample, the regressions include 43 observations, 18 cross-sections and 616 pooled unbalanced observations after adjustments.[9] The LATAM sample contains 43 observations, 12 cross-sections and 441 pooled unbalanced observations. Finally, the NONLATAM regressions comprise 42 observations, 6 cross-sections and 175 pooled unbalanced observations. All the pooled regressions show adequate diagnostic statistics and significant coefficients with the correct signs. The *J* statistics, rank and second-stage SSR also confirmed the relevance of the IV-2SLS estimation. In particular, lagged inflation and GDP growth variables are expected to be positive, while the interaction dummy variables on lagged inflation are expected to be zero or negative.

Focusing on inflation inertia alone, a Wald test on the coefficients of lagged inflation indicates that there are no significant differences in the level of average inertia among countries or nominal anchors.[10] For the ALL

[8] The results did not change after using other robust covariance methods (see Wooldridge, 2002).

[9] The full sample has a total of 45 time series observations that get adjusted both by the degrees of freedom when running the regressions, and by the number of data points available when a particular country has a shorter time series set.

[10] The Wald test computes a test statistic that is distributed Chi-square, based on the unrestricted regression and measures how close the unrestricted estimates come to satisfying the restrictions under the null hypothesis. If the restrictions are in fact true, then the unrestricted estimates should come close to satisfying the restrictions (see Davidson and MacKinnon, 1993).

sample, the test cannot reject the null of equal inertial coefficients between ERBS and MBS ($\chi^2(1) = 2.42, p = 0.12$). Similarly, for the LATAM and NONLATAM samples the test cannot reject the null of equal coefficients ($\chi^2(1) = 1.61, p = 0.20$ and $\chi^2(1) = 0.51, p = 0.47$) .

Table 2. Rate of inflation: regressions for selected regions and stabilisation anchors

	ALL		LATAM		NON-LATAM	
	ERBS	MBS	ERBS	MBS	ERBS	MBS
Constant	-0.029 *	-0.031 *	-0.024 *	-0.026 *	-0.031 *	-0.031 *
	(0.005)	(0.005)	(0.007)	(0.006)	(0.009)	(0.009)
Lagged inflation (LI)	0.114 *	0.136 *	0.098 *	0.117 *	0.316 *	0.288 *
	(0.014)	(0.017)	(0.014)	(0.021)	(0.041)	(0.040)
GDP growth	0.911 *	0.897 *	0.926 *	0.915 *	0.700 *	0.724 *
	(0.013)	(0.015)	(0.014)	(0.018)	(0.039)	(0.039)
LI x ALL Dummy	-0.080 *	-0.061 *				
	(0.024)	(0.018)				
LI x LATAM Dummy			-0.073 *	-0.049 *		
			(0.027)	(0.020)		
LI x NON-LATAM Dummy					-0.203 *	-0.135 *
					(0.058)	(0.057)
Relative LI drop	-0.706 *	-0.448 *	-0.745 *	-0.423 *	-0.643 *	-0.471 *
	(0.219)	(0.139)	(0.277)	(0.177)	(0.198)	(0.206)
Obs	43	43	43	43	42	42
Cross-sections	18	18	12	12	6	6
Pool Obs	616	616	441	441	175	175
R2	0.960	0.960	0.965	0.965	0.915	0.912
F-statistic	4948 *	4952 *	4101 *	4091 *	629 *	604 *
DW	1.146	1.141	0.973	0.971	1.848	1.835
SE	0.106	0.106	0.111	0.111	0.082	0.084
Second-stage SSR	6.827	6.821	5.408	5.422	1.158	1.201
Instrument Rank	4.000	4.000	4.000	4.000	4.000	4.000

Notes: Pooled instrumental variables two-stages least squares estimates. Standard errors in parenthesis. * and ** denote significance at the 5% and 10% levels. Relative LI drop is the relative impact on inertial inflation calculated as the ratio of the coefficient on the stabilisation dummy variable to the coefficient on inflation inertia, and is distributed as c2(1). Obs is the number of adjusted time series observations. Cross-sections is the number of countries in the sample. Pool Obs is the number of pooled time series cross-section observations. R2 is the coefficient of autocorrelation. DW is the Durbin-Watson statistic. SE is the standard error of the regression. Second-stage SSR is the sum of square of the residuals for the second-stage IV estimation. Instrument Rank is the rank of the instrument matrix and is equal to the number of instruments used in the estimation.

There are, however, significant differences among levels of inertia between regions. For example, the NONLATAM have higher levels than the LATAM and the ALL sample regressions regardless of the choice of nominal anchor. The results imply that the choice of nominal anchor in not associated with the level of inflation persistence prior to launching the stabilisation programme.

There are also significant regional differences when measuring the impact of GDP growth on inflation. The impact is lower in the NONLATAM region compared to the ALL sample and the LATAM region. The Wald test rejects the null of equal coefficients when comparing the coefficients of GDP growth among the NONLATAM and the ALL sample within the EBRS ($\chi^2(1) = 28.42$, $p < 0.01$) and the MBS ($\chi^2(1) = 22.91$, $p < 0.01$) groups. However, there is no significant difference between the LATAM group and the ALL sample and there are no differences regarding the impact of GDP growth rates among nominal anchors. Inflation appears to be more sensitive to demand pressures in the LATAM countries than in the rest of the regions and, more interestingly, the relationship is unrelated to the type of nominal anchor.

The analysis moves on to analysing credibility as measured by an impact dummy variable on lagged inflation. According to the literature, if inflation inertia drops when stabilisation is announced the programme can be classified as credible. The impact dummy measures the credibility effect resulting from stabilisation and allows comparing different nominal anchors and different regions.

Looking at the ALL sample, the impact dummies on ERBS and MBS are negative and statistically significant, indicating that both types of nominal anchors have a meaningful credibility effect. Comparing the credibility impact in absolute terms indicates that the Wald test cannot reject the null of equal coefficients among nominal anchors ($\chi^2(1) = 0.69$, $p < 0.41$). However, a more precise way of comparing programmes involves evaluating a stabilisation programme's relative impact on inertia. The impact can be measured by dividing the coefficient of the impact dummy by the coefficient of lagged inflation, which provides a measure of how much inflation inertia drops relative to its average level.

Table 2 presents the corresponding calculations in the row labelled relative LI drop.[11] In the ALL sample, the Wald test shows that ERBS produces a larger drop in inertia than MBS ($\chi^2(1) = 5.83, p = 0.016$). The drop is substantial with a 71% under ERBS and 44% under MBS.[12] The estimation confirms the conventional wisdom that ERBS is more credible than MBS at the time of announcement.

The modelling yields similar results for the LATAM group in which the drop in inertia is significant but similar in magnitude when comparing the anchors in absolute terms. In relative terms, however, the Wald test rejected the null of equal coefficients ($\chi^2(1) = 7.13, p > 0.01$), indicating that ERBS has a higher credibility impact than MBS, with a relative drop of 74% vs. 42%. For the NONLATAM countries, however, the inertia effect is significant but the Wald test cannot reject the null of equal coefficient among both anchors in either absolute nor relative terms ($\chi^2(1) = 0.86, p = 0.35$). It appears that the stylized facts, suggesting that ERBS are more credible than MBS, do not hold for the NONLATAM region.[13]

Table 3 shows the announcement effect relative to average persistence in both ERBS and MBS for the full sample over ten year windows.[14] The results indicate, in accordance with the literature, that ERBS have historically been more credible than MBS programmes. However, the impact was substantially higher in the 1970s than in the 1980s and the 1990s. The biggest jump happened between the 1970s and the 1980s. The results suggest that the credibility gap related to the announcement effect associated with ERBS and MBS programmes has gradually disappeared. The results could be revealing the fact that the design and implementation of

[11] The standard errors for these relative coefficients can be obtained using Bårdsen's (1989) formulae for calculating the variance ratio of coefficients in standard LS and IV regressions $var(RC) \cong \left(\frac{1}{y}\right)^2 var(x) + \left(\frac{x}{y}\right)^2 var(y) + 2\left(\frac{1}{y}\right)\left(\frac{x}{y}\right) cov(x, y)$, where $RC = x/y$ is the ratio coefficient for the variables x and y. In this setup, x is the dummy-variable coefficient on lagged inflation and y is the coefficient on lagged inflation.

[12] The Wald test is performed on the ratio of the impact dummy coefficient to the coefficient of lagged inflation. This is a measure of the percentage drop in inertia at the time of announcement, relative to average inertia. Average inertia in this case is measured by the coefficient on lagged inflation alone.

[13] The stylized facts appear more relevant to the LATAM countries which are coincidentally the ones receiving most of the attention in the literature. Perhaps, research should focus on revising the episodes of those countries in the NONLATAM group provided that the level of development and exposure to stabilisation may differ substantially from the rest of the world.

[14] Table 3 uses the relative impact on inertial inflation calculated as the ratio of the coefficient on the stabilisation dummy variable to the coefficient on inflation inertia. The first estimation restricts the sample to a range from 1960 up to 1979, and adds 10-year windows to each subsequent calculation until the complete set is used.

stabilisation strategies have improved over time. They could also be reflecting the fact that inflation inertia is often associated with a country's past inflation rates, and as a consequence, could also explain why the credibility effect has become gradually weaker as global inflation has declined – the so-called Great Moderation (e.g., Bernanke 2004).[15]

Table 3. Announcement effect relative to average inertia

Sample	ERBS*	≤≥	MBS*	Gap**	$c^2(1)$†
70's	-1.547	>	-0.533	1.015	62.30
	(0.12)		(0.04)	(62.30)	(0.00)
80's	-0.944	>	-0.038	0.906	4.25
	(0.05)		(0.04)	(4.25)	(0.03)
90's	-0.521	>	-0.436	0.084	3.34
	(0.04)		(0.03)	(3.34)	(0.08)
Full	-0.706	>	-0.448	0.258	3.94
	(1.80)		(1.06)	(3.94)	(0.04)

Notes: Estimation of the authors. * Figures in parentheses are t-statistics. ** Figures in parentheses are c2 statistics. † figures in parenthesis are p-values.

V. Impact of IMF-programme-loan amounts and government elections

The paper moves on to investigating the impact of IMF lending arrangements on countries implementing stabilisation programmes. The analysis employs data on IMF loans including the total amount of resources available at the time of stabilisation.[16] Table 4 shows the results of including IMF loan amounts for the ALL sample, in both ERBS and MBS programmes.

The results indicate that IMF loans complement the announcement effect of the programmes in reducing ex-post inflation. The effect is captured by the

[15] We are grateful to a referee for pointing out this potential mechanism.

[16] The analysis filters the IMF loan data using the dummy variable matrix (ALL ERBS + MBS dummy) showing ERBS (ALL ERBS dummy) and MBS (ALL MBS dummy) episodes to account for the timing effect found by Hamann (2001) and Easterly (1996) in which stabilisation is usually delayed by about a year.

significant negative coefficient of 0.18 on the amount of IMF loans for the (ALL) full sample of countries that includes both ERBS and MBS programmes. However, loan amounts are only significant when the exchange rate is used as the nominal anchor. For example, the results indicate that when analysing ERBS programmes, the amount of IMF loans produces a 0.14 drop in inertia. In contrast, the coefficient on IMF loans for MBS programmes is negative but not statistically significant.

The results are consistent with the stylized facts in the literature, indicating that ERBS programmes depend on the strength of international reserves in supporting the nominal anchor. On the contrary, MBS programmes, which depend on monetary aggregates and not on reserves for achieving stabilisation, appear less sensitive to the levels of IMF loan amounts.

The paper also tries to understand if government elections are relevant in explaining the nominal anchor's impact on credibility. The literature on political opportunism argues that elections may affect the choice of the stabilisation strategy. In particular, Aisen (2007) argues that because of the early boom produced by ERBS programmes they have become the preferred strategy of newly elected governments, whereas MBS programmes are more popular when there are no elections.

This section tackles two questions: (1) Are programmes introduced near government elections more credible than programmes introduced at other times? (2) Is the type of stabilisation strategy relevant in this context? In trying to answer the questions, the investigation collects government election dates for the countries in the sample (see Table 1) and creates a matrix with dummies taking the value of one if the stabilisation episode, as measured by Hamann (2001), is within one year of elections and zero otherwise.[17] The matrix is then divided according to ERBS and MBS programmes and applied to lagged inflation to capture the credibility impact of elections according to each stabilisation strategy. A second matrix was also constructed for non-election periods and the same exercise was applied to lagged inflation. Table 1 indicates that out of the 38 stabilisation episodes, 14 occurred within one year of elections. Also, out of the 14 taking place near election dates, 8 were ERBS and 6 MBS.

[17] The rationale for selecting a one-year threshold in screening the stabilisation episodes that occur near lections is that programmes may fall within a year of the election date given yearly data and it usually takes that much time for the IMF and the governments to design and announce the programme. In any case, it has to be acknowledged that this is a mechanical rule that can change the results if a longer threshold is selected. However, and provided that an announcement effect is been evaluated, it would not seem sensible to select a longer threshold.

Table 4. Rate of inflation: regressions by anchor type and IMF lending amounts

	ALL	ERBS	MBS
Constant	-0.020*	-0.017*	-0.039*
	(0.005)	(0.006)	(0.009)
Lagged inflation (LI)	0.137*	0.087*	0.190*
	(0.064)	(0.026)	(0.075)
GDP growth	0.907*	0.940*	0.879*
	(0.049)	(0.028)	(0.053)
LI x ALL (ERBS+MBS) dummy	-0.073*		
	(0.048)		
LI x ERBS ALL dummy		-0.063*	
		(0.024)	
LI x MBS ALL Dummy			-0.103**
			(0.066)
IMFL x ALL (ERBS+MBS) dummy	-0.188*		
	(0.128)		
IMFL x ALL ERBS dummy		-0.141*	
		(0.056)	
IMFL x ALL MBS dummy			-0.080
			(0.217)
Relative LI drop	-0.529**	-0.732*	-0.543**
	(0.386)	(0.295)	(0.387)
Obs	21	21	20
Cross-sections	18	18	19
Pool obs	326	326	354
R2	0.969	0.969	0.951
F-statistic	2573*	2534*	1698*
DW	0.936	0.931	1.258
SE	0.116	0.117	0.147
Second-stage SSR	4.335	4.399	7.592
Instrument Rank	25	25	25

Notes: Pooled instrumental variables two-stages least squares estimates. Standard errors in parenthesis. * and ** denote significance at the 5% and 10% levels. Relative LI drop is the relative impact on inertial inflation calculated as the ratio of the coefficient on the stabilisation dummy variable to the coefficient on inflation inertia, and is distributed as c2(1). Obs is the number of adjusted time series observations. Cross-sections is the number of countries in the sample. Pool Obs is the number of pooled time series cross-section observations. R2 is the coefficient of autocorrelation. DW is the Durbin-Watson statistic. SE is the standard error of the regression. Second-stage SSR is the sum of square of the residuals for the second-stage IV estimation. Instrument Rank is the rank of the instrument matrix and is equal to the number of instruments used in the estimation.

However, before proceeding with the formal econometric exercise it is interesting to review the dates when the stabilisation programmes were actually launched, according to the IMF, and if they happened before, during or after political elections.[18]

Looking at Table 1, out of the 38 stabilisation programmes lunched on the dates reported by the IMF, 4 occurred before elections, 12 occurred during elections, and 8 occurred after elections. Out of those occurring before elections, 3 were ERBS and 1 MBS. Those that occurred during elections, 8 were ERBS and 4 MBS. Finally, out of those occurring after elections, 4 were ERBS and 4 MBS. In this regard, one limitation in using annual data is that those stabilisation programmes that may seem to occur during an election year may have actually been occurring before or after elections if we look at the events in a monthly frequency (Stein and Streb 2004).[19]

For example, the 1991 stabilisation plan in Argentina (Argentina 4) was launched by Cavallo before the mid-term Congressional elections of 1991. The same holds for the 1985 stabilization plan (Argentina 3), which is dated 1985 by Easterly and 1986 by Hamman. The plan was launched before the elections, in mid-year 1985, when monthly inflation went down from 30% per month to levels below 3%; however, the biggest effects on annual inflation rates surely showed up only the following year.[20]

The Mexican programme (Mexico 2) is an example in which elections occurred after the plan was launched in December of 1987. In July 1988 Carlos Salinas was elected President and the move to stabilize the economy using a formal programme was supported by voters enthusiastic about the ongoing consumption boom following the stabilisation policies.

The Bonex plan in Argentina (Argentina 4), the Collor (Brazil 2) plan in Brazil, and Peru's 1985 and 1990 programmes (Peru 1 and 2), all occurred after the countries implemented failed stabilisation attempts followed by changes in

[18] It is important to remember that the actual date the programme was implemented has a delayed effect on inertia as indicated in Easterly (1996) and Hamann (2001).
[19] The exercise can also be carried out on a higher frequency set that can enrich the conclusions derived from the results.
[20] We thank the editor/referees for pointing out Argentina's case.

government.[21] For example, the Bonex plan in Argentina was launched by the newly elected government headed by Carlos Menem, and the Collor in Brazil was launched in March 1990 right after Fernando Collor de Melo was elected President.

However, one of the merits of the present investigation is not necessarily in correlating the actual date a programme was lunched against elections dates, but to understand if programmes that are implemented near elections, either before, during or after, have a larger credibility effect that those implemented off an election cycle, and if such credibility effects are different among the type of programmes being implemented.

Table 5 shows the time series cross-section regressions using the matrix of election and non-election dummies over inertial inflation. The analysis focuses on the full sample with ALL regions included.[22] The results indicate that regardless of the nominal anchor being pursued, the credibility impact of stabilisation is larger when the programmes are introduced around elections times than otherwise. This is consistent with the literature on political opportunism indicating that programmes also complement the political campaign of governments during elections, either because governments want to use the programme as part of their canvass if they are introduced prior to elections, or to reinforce the credentials of a newly elected government if the programme is introduced after elections.[23]

The elections filter does not affect the conventional finding showing that ERBS are more credible than MBS, but actually enhances the effect. ERBS programmes show a substantial drop of about 1.72 in inertial inflation, whereas MBS produce a drop of only 0.82 when they are introduced around elections ($\chi^2(1) = 10.54$, $p < 0.01$). Comparing the effects of ERBS around elections with those of Table 2, reveal that the drop in inertia is also higher when compared within ERBS programmes in general.

[21] There were many stabilisation programmes such as the Tablita of 1976 in Argentina (Argentina 1), Uruguay 2 and 3, and Chile 2 and 3, that occurred during dictatorial regimes.
[22] The analysis was also carried out for the LATAM and NONLATAM regions yielding similar results.
[23] The exercise can also be extended to analyse if there are changes in announcement effects when programmes accompany changes of government or whether an elected government can enhance its credibility by implementing a stabilisation programme.

Table 5. Rate of inflation: regressions for different anchors adjusted by proximity to elections

	ALL		ERBS		MBS	
	ELEC	NON-ELEC	ELEC	NON-ELEC	ELEC	NON-ELEC
Constant	-0.029 *	-0.031 *	-0.029 *	-0.030 *	-0.030 *	-0.031 *
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Lagged inflation (LI)	0.102 *	0.140 *	0.098 *	0.108 *	0.101 *	0.116 *
	(0.013)	(0.018)	(0.025)	(0.014)	(0.013)	(0.016)
GDP growth	0.920 *	0.893 *	0.921 *	0.914 *	0.921 *	0.909 *
	(0.013)	(0.015)	(0.028)	(0.013)	(0.013)	(0.015)
LI x ELEC	-0.091 *		-0.169 *		-0.084 *	
	(0.039)		(0.018)		(0.041)	
LI x NON-ELEC		-0.067 *		-0.065 *		-0.040 *
		(0.019)		(0.028)		(0.021)
Relative LI drop	-0.890 *	-0.482 *	-1.722 *	-0.604 *	-0.828 *	-0.343 *
	(0.382)	(0.144)	(0.225)	(0.261)	(0.405)	(0.181)
Obs	43	43	43	43	43	43
Cross-sections	18	18	18	18	18	18
Pool Obs	616	616	616	616	616	616
R2	0.960	0.960	0.960	0.960	0.960	0.960
F-statistic	4904 *	4960 *	4873 *	4904 *	4894 *	4890 *
DW	1.135	1.151	1.146	1.145	1.138	1.152
SE	0.106	0.105	0.106	0.106	0.106	0.106
Second-stage SSR	6.885	6.812	6.928	6.885	6.899	6.905
Instrument Rank	4	4	4	4	4	4

Notes: Pooled instrumental variables two-stages least squares estimates. Standard errors in parenthesis. * and ** denote significance at the 5% and 10% levels. Relative LI drop is the relative impact on inertial inflation calculated as the ratio of the coefficient on the stabilisation dummy variable to the coefficient on inflation inertia, and is distributed as c2(1). Obs is the number of adjusted time series observations. Cross-sections is the number of countries in the sample. Pool Obs is the number of pooled time series cross-section observations. R2 is the coefficient of autocorrelation. DW is the Durbin-Watson statistic. SE is the standard error of the regression. Second-stage SSR is the sum of square of the residuals for the second-stage IV estimation. Instrument Rank is the rank of the instrument matrix and is equal to the number of instruments used in the estimation.

VI. Conclusion

The paper compares the impact of announcing exchange rate-based versus money-based stabilisation programmes in a pooled time series cross-section of countries. The analysis shows that ERBS is, on average, more credible than MBS. The result confirms the conventional wisdom at least when evaluating the announcement effect of the programmes over inflation inertia. The credibility gap is substantial among nominal anchors and between regions.

The results are robust to controlling for other crucial factors. The analysis shows that IMF loans complement the announcement effect of the stabilisation programmes. But the amounts of the loans are only significant when implementing ERBS programmes. Finally, considering government elections periods is relevant. The results reveal that programmes introduced near elections produce a larger credibility effect regardless of the nominal anchor.

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