THE PERFORMANCE OF DISCRETIONARY FISCAL POLICIES AND FISCAL RULES AT THE ARGENTINE SUBNATIONAL LEVEL

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VERSIÓN PRELIMINAR SUJETA A REVISIÓN

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1. INTRODUCTION

The analysis of discretionary fiscal policies and the question of whether their behaviour is finally pro or counter cyclical is a permanent motive of interest and research for economists and experts all over the world, as shown by H. Bohn (1998, 2005) for the United States, M. Gavin, and R. Perotti, R. (1997) for Latin America, R. Golinelli and and S. Momigliano (2009) and M. Larch et al (2020) for the European Union, not to mention A. Alesina and G. Tabellini´s concern (2005) for the marked recurrence of pro-cyclical fiscal policies[1]. In relation to this, efforts were also devoted to empirically verifying if fiscal rules including provisions limiting public deficit, spending and debt induced or may induce a virtuous behaviour on the part of policy makers and in relation to discretionary fiscal policies.

Nevertheless, concerns for pro-cyclicity of fiscal policies are uttered not only with reference to the highest government level of countries due to evidences of subnational policy makers very often undertaking pro-cyclical discretionary fiscal policies, as hipotheses suggest in the relevant literature. In this connection, it has been argued that this feature might respond to difficulties to acceding to credit markets during contractionary phases of the economic cycle, to political considerations whereby policymakers tend to run deficits whichever the phase of the cycle might be or to subnational governments´ strategies leading to pro-cyclical tax reductions during boom times instead of generating surpluses in anticipation of economic recessions.

For those and other reasons, the scrutiny of subnational governments´ fiscal scenarios. as well as the role and performance of fiscal rules aroused the interest of researchers all over the world, as shown for example by A. Melamud´s contribution (2010) on the design, institutional framework and enforcement of fiscal rules in Argentina (including all government levels) and the recent paper by B. K. Pradhan (2019), in which the empowered fiscal management in India is highlighted and carefully

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[1] Suffice it to mention to Balassone and Kumar (2007, p. 32) who contended that 'There is clear evidence that discretionary fiscal policy tended to be procyclical in both industrial and developing countries´.

analyzed since the Fiscal Responsibility and Budgetary Administration Law came into force and set rules to strengthen fiscal prudence via ceilings to public deficit and indebtedness of the central government and of sub national states, in line with the consolidated general budgetary balance framework which acknowledges both the responsibility of national and subnational discretionary fiscal policies for the changes in the balance.

In following the storyline so far developed, the study of the 23[2] Argentine provinces´ fiscal behaviour in their relation to the economic cycle stands as a highly relevant task in so far as it may shed light over the design of provincial budgetary policies and also on the motivations of provincial policymakers when taking tax and spending decisions. Likewise, the relevance of the analysis explains itself if one considers that:

● Argentina is a federal country whose Constitution recognizes provinces´ political autonomy and economic autarchy; that is to say, they are endowed with original power to raising taxes (except those expressly delegated to the Nation by means of the Revenue Sharing Law), carrying out their own public spending programmes and directly acceding to domestic and international credit markets.

· At present, provincial tax revenues (plus those of local governments) amount on average to 20% of the consolidated Argentine tax collection[3] the main taxes being the Turnover or Transaction Tax, Stamps and Automobile and Real Estate Taxes.

● As a result of decentralization processes occurring in the nineties, provinces were made responsible for the provision of the main services: Education (except for Universities), Health, Social Welfare and Pension Systems (this service only in 14 provinces) for provincial and municipal civil servants, as well as members and employees of provincial legislative and judiciary powers and for an ample spectrum of Public Works including Construction, Roads, Electricity, Water and Gas networks,

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[2] There are also the Autonomous City of Buenos Aires, with a status similar to a province and more than 2000 local governments, whose fiscal performance is not studied here.

[3] This percentage averages between 30% and 45% if the 4 more important provinces are considered: Buenos Aires, Córdoba, Santa Fe and Mendoza and even more if the Autonomous City of Buenos Aires were included.

among the main ones, All in all, provinces´ spending accounts today for roughly 50% of the consolidated public spending and this also in part explain debt to GGP ratios in some jurisdictions.

●   In short, the above paragraphs permit one realize the magnitude of subnational fiscal policies in the country and the importance of their study in order to investigate not only their mechanics but also how pro cyclical sub national fiscal policies impact in a hypothetic context of national counter cyclical fiscal policies. It is here worthwhile to point out that, due to the latter reason, the National Government resorted, at least twice in this century, to Fiscal Responsibility Laws and to Fiscal Covenants with provinces.

In the light of preceding considerations, and based on the growing subnational public finances´ role and importance all over the world, and in particular in Argentina, it is here argued that the field of subnational discretionary fiscal policies deserves extensive research efforts aimed not only at assessing their behaviour in relation to economic cycles (that is, their pro or counter cyclical patterns as determined by the conventional reaction functions) but also to undertaking further investigations on what Larch et al (2020)[4] called the drivers of pro or countercyclical policies. In this connection, the present research faces a twofold objective: on the one hand to show, by the recourse to an enlarged variant of the 'CAPB model' fiscal rule[5] in which dynamic panels including data for the 23 Argentine provinces are econometrically estimated for the period 2005-2019 and, in the second hand to investigate, following Larch et al´s (2020) suggestion, whether the inclusion of the so called ´interaction terms´, may in the Argentine case enrich results of analyses of stabilization properties of subnational discretionary fiscal policies achieved by means of the classical reaction function approach.

The remainder of the paper is organized as follows: Section 2 includes a brief survey of the relevant literature on the fiscal response to economic cycles and the role of fiscal rules. Section 3 describes the methodology for the assessment of counter or pro cyclical responses of subnational fiscal policies in Argentine. Section

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[4] M. Larch et al (2020), p. 9.
[5] Denomination used by Golinelli and Momigliano (2009).

4 presents the empi0rical findings on pro cyclicality achieved from the estimation of dynamic panels and Section 5 concludes.

2.   A BRIEF SURVEY OF THE RELEVANT LITERATURE

As highlighted in Section 1, concern with pro cyclical policy is not new in the literature since Gavin and Perotti (1997) were already writing about this problem in Latin America many years ago. For them, and resorting to neoclassical arguments, "favourable shocks to the tax base should be accompanied by increases in the surplus (the optimal magnitude of which would depend primarily upon the persistence of the shock), and viceversa". Nevertheless, they found at least three reasons explaining higher pro cyclicality in the area: in the first place, a wrong causality whereby fiscal contractions aggravated the economic downturn in a sort of ´reverse Keynesian mechanism´ revealing the impact of fiscal policy upon the level of economic activity, rather than the reverse. Secondly, the authors identified the so called ´voracity effects´ when explaining overspending of transitory shocks to fiscal revenue. These effects arise if various interest groups competing for a share of tax revenue view fiscal resources as a common pool and neither of them accept to moderate their claim following a surge on tax incomes. Finally, Gavin and Perotti mentioned the precarious creditworthiness (loss of confidence) affecting policy makers in Latin America for what they faced borrowing constraints (loss of credit market access) during bad macroeconomic times which prevents in turn to run counter cyclical fiscal policy.

A final worth stressing conclusion is here mentioned in relation to Latin American subnational governments, as Gavin and Perotti acknowledged that, apart from some specific incidents in which local governments created fiscal disruption there was not evidence in the Region pointing them as causing important deficits in comparison to industrialized countries[6].

In order to analyze procyclicality, Alesina and Tabellini (2005) resorted to a model with which they explained suboptimal fiscal policy as based on political distortions and incentives for less than benevolent governments to appropriate rents.

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[6] On the contrary, their evidence pointed in the opposite direction.

They found that many countries ()articularly the developing ones, followed a pro cyclical fiscal policy charecterized by increasing spending (reducing taxes) in booms and behaving in an oppposite way during economic downturns. Based on achieved empirical evidence from their model, the authors explain pro cyclicity by argueing that voters do not trust corrupt governments which experimented with resources and demand tax cuts (or increases in productive government spending or transfers) when positive shocks hit the economy, fearing otherwise that the available resources would be wasted in rents. For similar reasons, voters do not "allow" government to accumulate reserves of assets, demanding in change a level of government debt forceing the government to use resources to pay debt´s services rather than steal them.

Needless to emphasize, the mentioned political distortion[7] leads to a higher-non optimal stock of government debt and procyclical fiscal policy. As easily noticeable credit constraints soon appear as governments may be pushed to levels of debt at the limit of what they can repay and also to what borrowers can lend.

In this connection Alesina and Tabellini criticized The literature on credit constrains as it suggested that the "malfunctioning" of credit markets made it hard or impossible for developing countries to borrow exactly when they needed in bad times, although at the same time failed to explain why welfare maximizing governments did not build up reserves in good times, in order to avoid credit constrains recessions.

Curiously enough, the authors finally pointing to their own empirical evidence suggesting that that procyclicality was more often driven by a distorted policy reaction to booms, rather than to recessions, whereas that procyclical policy responses to recessions, did not seem to be explained by credit constraints

In reviewing next those contributions that helped to analyze the pro or counter cyclicality of fiscal policy, the pioneer paper by Bohn (1998) deserves to be quoted in the first place. By attempting to ascertain the behaviour of the US public debt and deficits, Bohn´s equation gave the guidelines of what is known now as the fiscal reaction function approach, with which he sought for a systematic relationship between

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[7] The authors calls it "to starve the Leviathan" argument.

the debt to income ratio and the primary surplus. The runned equation also included a set of other determinants of the primary surplus[8].

Referring to Bohns´ most interesting findings from his empirical work, the author concluded that the U.S. government had historically responded to increases in the debt-GDP ratio by raising the primary surplus[9], or by reducing the primary deficit. Bohn also showed that the debt-GDP ratio displayed mean-reversion if controls were resorted to for war-time spending and for cyclical fluctuations. Finally, his empirical work also pointed out that the positive response of the primary surplus to changes in debt reasserted that U.S. fiscal policy was satisfying an intertemporal budget constraint.

Similarly significant are contributions by Golinelli and Momigliano to the analysis of fiscal policy pro or counter ciclicality as the ensuing review of their 2009 paper on the cyclical responses of fiscal policies in the euro area makes it clear.

In their paper, the authors make reference to basically two models of fiscal behaviour: in the first case the so called ´CAPB Model´ fiscal rule in which the discretionary fiscal action (as measured by the change in the cyclically adjusted primary balance) is in turn explained by the latter variable and debt (both lagged) and the level of the output gap as a measure of the cyclical conditions. In this case, positive or negative values of the CAPB´ coefficient will respectively indicate a counter or a pro-cyclical fiscal policy. In the second case, called the Primary Balance (rather focusing on the asymmetry of budgetary reactions) follows a fiscal rule in which the primary balance is now the dependent variable and its lagged value enters the equation as an explanatory variable. As pointed out by Golinelli and Momigliano, a key difference between the two models is that in the second one the policy decision or dependent variable includes the effects of both discretionary actions and automatic stabilizers.

Concerning results from their empirical estimations, a first important conclusion

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[8] The author specifically acknowledged that the empirical analysis was based on an explicit theoretical model of fiscal policy, Barro's [1979] tax-smoothing model.
[9] That is, the U.S. primary surplus was an increasing function of the debt-GDP ratio.

derived by Golinelli and Momigliano was that large differences found in the recent literature related to the cyclical response of fiscal policies in the euro area were somehow influenced by choices made for modelling fiscal behaviour. Thus, when PB models were directly estimated including an overall reaction to the cycle (effects of both discretionary actions and automatic stabilisers) they tended to suggest either strong pro-cyclical or strong counter-cyclical discretionary reactions.

Another important conclusion stemmed in turn from the standard modelling choice where the discretionary reaction of fiscal policy was directly estimated. In this connection the authors checked that data vintage (ex post or real-time) mattered, as unambiguous indications of a-cyclicality were found when using ex post date whereas the output gap mattered when real-time data were used for the estimations[10].

Larch et all (2020) also provided a particularly valuable empirical contribution to the study of Fiscal Policy Cyclicality, in their case focused not only on the analysis of [11]discretionary fiscal policy performance in the EU but also in non EU countries. For their analysis of stabilization properties of fiscal policy, the authors first resorted to the conventional fiscal reaction function approach and set a linear equation in which the dependent variable was the cyclically adjusted primary balance, whereas the lagged dependent variable, as well as cycle and control variables and a number of dummies accounted for the explanatory variables. Dynamic panels were in turn regressed with a variety of econometric estimators such as IV-GMM, LSDVC and IV-2SLS as they sought for checking the so called Nickell-bias.

With relation to the use of the output gap as the cycle variable, the regressions showed a pro-cyclical orientation of discretionary fiscal policy, as implied by the

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[10] In relation to this, the paper by Orfanides and Norden (2002) is worth quoting for what they found when examined the reliability of alternative output detrending methods, with special attention to the accuracy of real-time estimates of the output gap. They showed that ex post revisions of the estimated gap were of the same order of magnitude as the estimated gap itself and that these revisions were highly persistent. Neverthelesst, they insisted in that the revision of published data was not the primary source of revisions in measured output gaps; the bulk of the problem is due to the pervasive unreliability of end-of-sample estimates of the trend in output. Multivariate methods that incorporate information from inflation to estimate the output gap are not more reliable than their univariate counterparts.

[11] As highlighted by the authors, this result fell in line with that of the dummy standing for the EU Programmes.

variable´s negative coefficient causing CAPB to shrink. Curiously enough, they could not confirm previous hypotheses related to other cycle variables, as for instance the unemployment rate, Δ Industrial Production and Δ OECD Composite Leading Indicator whose positive coefficients, notwithstanding their scarce statistical significance, indicated in turn a clear fiscal tightening. The counter cyclical behaviour exhibited by debt to GDP ratio as a sign of sustainability might in turn be understood as countries not reaching yet dangerous threshold for the mentioned ratio[12]. As for the impact of dummies pro and counter cyclical results were respectively found for the Election Year and the Age Dependency dummies whereas positive and highly significant coefficients for the EU programme dummy (capturing the effect of EU financial assistance programmes) were associated with an improvement in the fiscal position.

In addition to what has so far being reviewed Larch et al brought about an important novelty by extending the conventional fiscal reaction function searching for not only assessing the partial correlation between discretionary fiscal policy and cyclical changes in output but also to finding out for instance why and how frequent these episodes occurred or –as they put it- to investigating what drove pro or counter cyclical stances. For that, they introduced non linearities in the classical approach to introducing term allowing cycle variables to interact with other variables of interest[13]. The authors complement their empirical extension by asserting also binary-logit models are also a perhaps and more perceptive alternative to ascertaining drivers of pro or counter cyclicality.

In a paper devoted to analyzing the impact of the developed countries´ crises of 2009-2011 upon domestic economic sectors, Rezk, Ricca and Lafit (2010) concluded that although the international crises partially accounted for the weaker Argentine economic performance, main causes had to be sought in domestic economic and fiscal policies adding uncertainty to the decision process of economic sectors and amplifying the effect of crises. In relation to discretionary fiscal policies exhibit a positive though

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[12] As highlighted by the authors, this result fell in line with that of the dummy standing for the EU Assistance Programmes.

[13] In Larch et al´s words (2020, page 9) "such interaction terms can provide and indication of whether and to what extent the stabilization properties of discretionary fiscal policy are influenced by factors such as the level of government debt or by the presence or design of fiscal rules."

decreasing evolution explained by a contraction of tax revenues despite transfers from the eliminated private capitalization system and IMF´s special draw rights.

However, public spending was, for Rezk et al, in the root of the government fiscal strain as it growth rate outweighed that of revenues and caused an erosion of the primary surplus whose level artificially stemmed from revenue flows and the mentioned discretionary seizing of pension funds. Finally, the authors emphasized that the overall cyclical sensitivity of tax revenues increased, budget balance´s response to GDP did not suffice to check cycles´ impact and active fiscal policy had to strengthen stabilizing actions.

In a valuable paper on fiscal rules A. Melamud (2010) pointed out that severe pressure upon wages occurred as of 2005 that also impacted upon public spending and fiscal outcomes, particularly of provinces given their important percentage participation in wages and services production. In such a context, characterized by strong social and distributive pressures, the author claimed that the main challenges faced by Fiscal Responsibility Laws and Financial Assistance Programmes were how to achieve Argentine provinces´ containment of current spending and indebtedness.

Given the existing context Melamud purported to ascertain whether fiscal rules contribute to improve Argentine provinces´ fiscal situation by acknowledging achievements from as well as challenges placed to the existing legal and financial framework. In this context the author characterized the theoretical framework that enabled the working of fiscal rules and reviewed also contributions from the public finances, the political economy and macroeconomics. In doing so, Melamud analyzed fiscal rules applied to national and subnational governments with the purpose of counting with a diagnosis from the national experience based on normative aspects and impact upon fiscal policy.

3.   THE ASSESSMENT OF COUNTER OR PRO CYCLICALITY OF SUBNATIONAL FISCAL POLICIES IN ARGENTINA

As mentioned in Section 1, this matter aroused the interest of many an important economist devoting research efforts to this field as well as those of experts professionally engaged in the assessment of countries´ fiscal performance, particularly in economic unions; nevertheless, it is necessary in this matter to point out that, similarly to other cases in which empirical evidence is assessed, large differences found in results may be due, as Golinelli and Momigliano (2009) suggested, to the choices made in modelling fiscal behaviour. In this case, and as anticipated above, the following analytical framework mainly draws on contributions by Bohn (1998), Golinelli and Momigliano (2006, 2007, 2009) and Larch et al (2020), although other not less important ones will also be mentioned in due course.

The adopted framework is the so called "CAPB Model" fiscal rule, as stated in Golinelli and Momigliano (2009) which assumes that the change in the cyclically adjusted primary balance (Δ CAPB), as a measure of the discretionary fiscal action, is in turn explained by the lagged values of the dependent variable[14], the output gap (reflecting cyclical conditions) and the level of public debt. It is to be noticed however that the specification of equation (1) departs from the one resorted to by M. Larch et al (2020) in that a simultaneous value is not taken for the output gap. Nevertheless, in drawing equation (1) Larch´s specification is followed when diverse dummies are included, as well as when alternatives to the output gap are used in estimations in order to capture the impact of cycles.

Thus, in drawing the equation (1) the idea consisted in resorting to a number of variables which could help to explain the pattern of Argentine subnational governments´ discretionary fiscal policies as regards stabilization objectives:

(1) $\quad \Delta \textbf{CAPB}_{i,t} = \alpha_1 + \alpha_2 \Delta \textbf{CAPB}_{i,t\text{-}1} + \alpha_3 \Delta \textbf{OG}_{i,t\text{-}1} + \alpha_4 \textbf{DR}_{,i,t\text{-}1} + \alpha_5 \textbf{EY} +$
$\quad\quad\quad \alpha_6 \quad \textbf{CR} + \mu_{i,t}$

The dependent variable in equation (1), standing for the change of the cyclically adjusted primary balance (in percentage of the geographical gross product) is computed as follows, in line with IMF procedures:

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[14] As Golinelli and Momigliano (2009, p. 45) highlight, this lagged variable and debt represent the initial state of public finances

(2) $CAPB = R(GGP^p/GGP^a)^{\epsilon_R} - S(GGP^p/GGP^a)^{\epsilon_S}$

where:

R = provinces´ total receipts
S = provinces´ total expenditures
GGP^{pn} = provinces´ potential geographic gross products
GGP^a = provinces´ actual geographic gross products
ϵ_R and ϵ_S = provinces´ elasticities of receipts and expenditures

The lagged dependent variable is in turn included in the right side of equation (1) whereas the explanatory variable used to catch the effect of the economic cycle is:

Δ OG (t-1) = first difference of the GGP Gap, in percentage of GGP and lagged one period.

Let it be noted here that, in standing as an appropriate framework[15] to ascertaining the cyclical orientation of discretionary fiscal policies, linear equation (1) also adheres to the widespread criterium of resorting to the ex post output gap as the key explanatory variable although, and as shown by Table 1, another variant for the Output Gap is also used for estimating the equation (1), that is:

GGP OG ((t-1) = variable in levels representing the percentage difference between actual and potential GGP, lagged one period.

In seeking to counteract usual objections[16,17] to the use of the Output Gap as the main explanatory variable, variants were also explored for capturing tue effect of cyclical conditions, as was the case with the following two unemployment variables:

UNEMPLOYMENT RATE (t-1)
Δ UNEMPLOYMENT RATE (t-1)

The linear equation (1) is completed with the following set of interesting control and dummy variables:

DR(t-1), standing for the lagged Public Debt/GGP ratio.

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[15] Larch (2020), as many other researchers, calls equation (1) the "conventional fiscal reaction function approach".

[16] As for instance discrepancies between ex ante and ex post figures if the variable is subject to permanent revisions and new information is available, let alone difficulties in computing output gaps.

[17] See also Orphanides and van Norden (2002).

EY, taking value 1 in election years and 0 in the rest of the period.
CR, taking value 1 from 2009 through 2011 (years of the developed countries´ crises) and 0 in the rest of years.
HIGH INFLATION (-1) is also used in place of CR (see results in Table 1) whereby the dummy takes value 1 when inflation in Argentina peaked over 20% and 0 in the rest of the period.
FRL v1, aimed at catching the impact of Argentine Fiscal Responsibility Laws during the period considered. Dummy´s assigned values are 1 for years 2017 through 2019 and 0 for the rest.
FRL v2, aimed at catching the impact of Argentine Fiscal Responsibility Laws during the period considered. Dummy´s assigned values equal to 1 from 2005 through 2007 and for 2017 through 2019 and 0 for the rest.

As usual, μ_{it} stands for the random error term, including individual, time and error components as the average of the 23 provinces estimates.

The estimation of Equation (1) by IV-GMM[18], in most of cases (see table 1), over the period (2005-2019) and for the 23 provinces[19], responds to the estimator´s good econometric performance in the particular case of dynamic panels, and when (and as is usual) the time span is short and smaller than the number of cross section units (situation in which the so called the Nickell-bias may turn up)[20], let alone the fact that the IV-GMM estimator is particularly adequate in cases in which ´endogeneity´ can pose a problem to the validity of results due to the inclusion of the lagged dependent variable. Likewise, IV-GMM is well known for controlling the omitted variable bias, unobserved panel heterogeneity, heteroskedasticity and autocorrelation within panels.

As for data source, most of series were taken from the Dirección Nacional de Asuntos Provinciales (Subsecretaría de Relaciones con Provincias), except for figures of geographic gross products and unemployment rates respectively taken from INDEC and those for output gaps taken from Baumann & Cohan[21]. Likewise, current values were used for provincial GGP, public income and expenditures.

[18] Blundell, R. W. and S, Bond (1998), Initial conditions and moment restrictions in dynamic panel data models, Journal of Econometrics, 87(1), pp. 115-143.
[19] The Autonomous City of Buenos Aires is not included.
[20] As S. Nickel, S (1981) showed, the bias arises in the context of a dynamic panel data model, particularly in the "small T, large N" context. This happens because the within (or demeaning) transformation, which subtracts the individual's mean value of *y* and each *X* from the respective variable, creates new regressors that are correlated with the error term. The resulting correlation leads to a bias in the estimate of the coefficient of the lagged dependent variable of order 1/T, which may be quite sizable in a "small T" context.
[21] Baumannn F. I and L, Cohan (2018), Crecimiento Económico PTF y PIB potencial en Argentina, Subsecretaría de Programación Económica, Ministerio de Hacienda, Argentina.

4. EMPIRICAL FINDINGS ON PRO CYCLICALLITY AT THE ARGENTINE SUBNATIONAL LEVEL.

Results of econometric estimations for Equation (1) are shown by the Table 1, in which the GMM-IV (vce)[22] estimator was used in the first 10 columns whereas least square dummy variable corrected (LSDVC) were resorted to in estimations 12 to 18 and fixed effect linear models (FELM) in columns 19 to 22. A first worth mentioning feature is that, except for a few isolated cases, the statistical significance of all lagged variables´ estimated coefficients was confirmed. An explanation for lagged variables´ good econometric performance may be sought at the fact that provinces (and not countries) are here the cross section units; in being provinces partly dependent on national transfers (e.g. shared tax revenues and other tax and no tax transfers) which are normally subject to a time lag, it is possible to expect that provinces´ fiscal variables will not react as quickly as countries to cycles condition, although the point cannot be ruled out of a theirs managing their fiscal policies and resources with a higher level of inefficiency.

Negative coefficients for both versions of the ex post output gap lagged variable confirm their pro cyclical impact[23] on the discretionary fiscal policy of Argentine provinces, whereas negative coefficients ranging between – 0.17 and – 0,22 across different specifications and estimations show that this cycle variable accounted on average –on average- for a reduction of one fifth in the cyclically adjusted primary balance in percentage of GGP. Of note, the rise of the deficit was smaller (- 0.17) when the cycle variable was the GGP Output Gap (t-1).

How would the stabilization performance be when the cycle variable was replaced by a different one, in this case, by two variants of the lagged unemployment rates? Though not surprising both variants hold positive and statistically significant

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[22]- Robust standard errors are used to correct problems of heteroskedasticity; that is, the situation prevailing when the assumption of similar variances is violated, In this case, non-robust standard errors are generally smaller than the robust ones.

[23] As the literature very often reports for the performance of national discretionary fiscal policy at countries´ national government levels.

coefficients[24] the result being a fiscal tightening increasing the cyclically adjusted primary balance and therefore supporting a pro cyclical fiscal policy. This somehow odd pro cyclical behaviour shown, when unemployment rates grow, would not be supporting prior and classical arguments asserting or rather expecting that, in so far as employment falls were viewed as a signal of a contractionary or recessive phase of the cycle, the government´s fiscal policy should go in the opposite direction, following a Keynesian expenditure pattern and causing CAPB to shrink. Should this be the case, the increase of primary balances could be understood as the subnational discretionary fiscal policy not having in fact tools to effectively counteract unemployment at the provincial level and therefore policymakers prefer in change to strengthen their public finances.

The following variable included in estimations is a control one standing for the provincial lagged Public Debt/GGP ratio. As emphasized by Larch et al (2020)[25], Public Debt should be regarded as an indicator of sustainability, particularly in this case in which coefficients hold a positive sign and are highly significant, which implies in turn a reinforcement of the provincial budget constraint. Nevertheless, the analysis of the behaviour and performance of the provincial debt ratio (as that of national governments) deserves caution and particular scrutiny for the reason that follows: notwithstanding the above argument associating debt with sustainability, it is convenient to cite here Larch et all (2020) mentioning that policy makers do not in general react reducing fiscal activism (in terms of spending) in boom times for what the continuous increase of public debt should be regarded as a necessary shock absorber expected to perform a stabilizing role when downturns occur. But, in this context, the question of whether high debt ratios may endanger the stabilization role of fiscal policies, by increasing pro-GDP cyclicality is referenced in the empirical literature by voices tending to affirm that this possibility exists when the debt in terms of GDP (GGP in this case) exceeds a given high threshold.

In this connection and observing the state of the Argentine subnational debt, an inspection of data shows that at least 9 provinces out of 23 exhibited (at the beginning of the period considered) debt levels ranging between 32% and 100% of their GGP. This

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[24] When estimations were run using variants of unemployment (t) results did not result particularly satisfactory in terms of coefficients´ significance.
[25] Larch et al (2020), page12.

situation was reverted by the end of the period considered due both to national and subnational efforts to reduce indebtment ratios, as a result of what 10 provinces (Catamarca, Corrientes, Chaco, Entre Ríos, Formosa, Misiones, Río Negro, San Juan, Santiago del Estero and Tucumán) drastically reduced their debt stocks to 10-12% of GGP[26]. Another set of provinces showed in general lower debt degrees averaging close to 10%-12% as for instance Buenos Aires, Córdoba, Chubut, Mendoza, Neuquén, Salta and Tierra del Fuego whereas La Pampa, San Luis, Santa Cruz, Santa Fe on the one side and Jujuy and La Rioja, on the other, stood as polar cases as their debt stocks reached 2%- 0.5% of and 35%-41% of GGP respectively. In the light of just mentioned values, and except for the single cases of Jujuy and La Rioja, it can be asserted that the Argentine provinces tended to walk away from high threshold limits and that estimations´ results for the variable in Table 1 are yet far from depicting a pro-cyclical performance for this control variable.

It is however worth mentioning here that efforts to reduce provinces´ debt stocks seemed to be the result of the Fiscal Responsibility Federal Regime, created by the Law 25917 (enacted in August 2004) through which compulsory rules of fiscal behaviour and transparency were imposed over the three levels of government in Argentina, as the mentioned legal instrument clearly set limits to indebtedness by obliging provinces to make quarterly public their debt stocks and debt service payments, on the one hand and also prescribing on the other that debt stocks be instrumented in each province in a way that yearly debt services should not exceed 15% of their net current income[27], A point deserving also to be mentioned, in connection to provinces´ behaviour quoted in the preceding paragraph, is that the referred to legal instrument also mandated that provinces had to resort to ´transition´ programmes aimed at adapting their debt profiles. Last but not least, taking into consideration the recent economic history, subnational governments were banned from issuing debt which in practice may be used as a substitute for the national currency, as recent experiences at the beginning of the millennium showed.

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[26] In some cases, as for instance Catamarca and Misiones, the reduction was still greater.
[27] Violation of this limit would cause provinces´ impossibility to acceding to new debt. The latter becomes operative particularly in cases in which guarantees and endorsements from the National Ministry of Economics are necessary.

In resorting next to the econometric performance of dummies included in equation (1), figures in table 1 clearly show that Election years impair stabilization chances of discretionary fiscal policies since, and as expected, policymakers tend to privilege expansion rather contraction of public spending and this will in turn reduce the primary balance and subsequently put at stake meeting projected budgetary provisions. This gloomy outcome is somehow confirmed by the negative and statistically significant values the dummy holds. Curiously enough was the performance of the next dummy CR mainly aimed at capturing the negative fiscal impact of developed countries´ crises of years 2009-2011 which seemed no to have had an important negative impact on provincial public finances as notwithstanding the fact that the dummy´ values held the expected negative signs, the former did not prove –safe for a single case- to be different from 0. However, a different performance was found in relation to the lagged High Inflation dummy whose positive[28] and generally significant values depicted a counter cyclical behaviour only explained by inflation increasing provinces´ nominal tax incomes and reduction in turn of public spending in constant terms in cases where their monetary correction was either nil or smaller than actual inflation rates.

Contrariwise to the performance of the abovementioned dummies (except for the high inflation one), as just described in the preceding paragraph, the role of Argentine Fiscal Responsibility Laws, in so far as mandatory limits were imposed, helped to enhance countercyclical features in subnational discretionary policies as is clearly shown in table 1 by the dummy´s (in their two variants used) both positive signs and statistical significance. In recalling Larch et al´s[29] assertion on that many assistance programmes (in the case of the EU) were launched seeking to address the matter of macro financial imbalances which may in turn be later conducive to disproportionate increases in the debt ratio during contractive phases of the cycle, let it be said that this reasoning can also be applied to Argentine Fiscal Responsibility laws. In relation to the period being considered (2005-20), it is again quoted that the first one (Law 25917) was enacted in 2004 and the second one (Law 27428) in January 2018, following the 2017 Fiscal Covenant signed by the National Government and the provincial Governors.

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[28] Except for one case.
[29] Larch et al (2020), page 12.

It is here important to emphasize that the second legal instrument did not supersede the first one; on the contrary, the Law 27428 –in seeking to highlight the importance of counting with adequate macro-fiscal frameworks- strongly reinforced the former´s reach by enriching, slightly modifying or adapting its articulate. Apart from what has been already mentioned regarding limits to provincial debt stocks and to service payments, compulsory fiscal rules for all the three government levels boosted by both legal instruments are particularly worth mentioning, as for instance: requirements of planned primary and financial results on an accrual basis, resources projections concerning mainly to those shared with provinces and quarterly information over the budget execution (both on an accrual and cash basis). As a clear signal to the financial and budgetary administration it was legally mandated that the annual increase of the budgeted primary public spending (including current and capital expenditure net of interests) could not exceed the nominal rate of increase of gross domestic product referred to in the macro fiscal framework[30] [31]. Another outstanding feature consisted in the banning of carrying out budgetary modifications implying current spending increases to the detriment of capital spending or financial applications. Finally, and related to what should be considered the basal stone upon which laws are based, two features are here mentioned: the exigency that government levels, in running their budgets, must preserve their financial balance, defined as received current and capital resources being equal to accrued expenditure included net current[32] and capital spending[33] and foreseen sanctions for government levels not observing the laws of Fiscal Responsibility, ranging from restrictions to national grants and tax benefits aimed at the private sector located at the defaulted jurisdiction, limits on guarantees and endorsements on the part of the national government, limits on national budget transfers (except for the automatic ones as for instance shared revenues), denials of authorizations in the case of new debt requiring national approval, just to mention the main ones.

Let it here be stressed in short that the positive impact of the Fiscal Responsibility Laws in Argentina, in terms of favouring counter cyclical behaviour of

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[30] The mentioned limit to public spending does not reach to capital spending intended for basic social infrastructure needed for social and economic development.

[31] This was changed by the Law 27428, as the nominal rate of increase of public spending would in the future be the rate of increase of the National Consumer Index.

[32] That is, excluding those financed with loans from international organisms.

[33] That is, excluding those meant for basic social infrastructure.

provincial public finances is not only highlighted by the econometric performance of both variants of dummy variables, which hold positive values and exhibit also statistical significance, but also by empirical evidence asserting that in spite of a marked procyclical feature of provincial discretionary policies, explained in this research by the possible impact of cycle variables such as the output gap or the unemployment rate, voices are now more often heard of provinces showing, on average and at least as of 2015, fiscal stances of primary balance and financial equilibrium in relation to which Fiscal Responsibility Laws played an important role.

Table 1: Baseline specifications (period 2005-2019) - Dependent variable: Δ Cyclically adjusted primary balance.

ESTIMATOR	GMM-IV (1)	GMM-IV (2)	GMM-IV (3)	GMM-IV (4)	GMM-IV (5)	GMM-IV (6)	GMM-IV (7)	GMM-IV (8)	GMM-IV (9)	GMM-IV (10)
Constant	-.00134	-.00277	-.00501	-.00550	-.00717	-.00532	-.00593	-.02030	-.00198	-.00489
	(.00275)	(.00229)	(.00257)	(.00258)	(.00245)	(.00232)	(.00185)	(.00486)	(.00314)	(.00244)
Δ Ciclically-adjusted primary balance (t-1)	-.06936	-.15993	-.16746	-.17908	-.18772	-.22433	-.22988	-.22943	-.21972	-.18029
	(.07279)	(.06146)	(.06114)	(.06600)	(.06708)	(.06694)	(.06354)	(.06345)	(.06274)	(.06513)
Δ Output Gap (t-1)	-.17477			-.17876	-.17434					
	(.03143)			(.03088)	(.03144)					
GGP Output Gap (t-1)		-.21668	-.20841						-.20428	-.19037
		(.03487)	(.03187)						(.03281)	(.02668)
Δ Unemployment rate (t-1)						.44453	.44758			
						(.09396)	(.09324)			
Unemployment rate (t-1)								.23592		
								(.08505)		
Public Debt to GGP (t-1)	.07228	.05891	.06601	.06036	.06609	.04966	.05010	.044798	.04064	.05815
	(.02741)	(.02311)	(.02548)	(.02242)	(.02400)	(.01595)	(.01570)	(.01554)	(.02039)	(.02543)
Election Year Dummy	-.01311	-.01052	-.01219	-.01042	-.01192	-.00812	-.00799	-.00982	-.01115	-.01213
	(.00292)	(.00214)	(.00252)	(.00233)	(.00252)	(.00167)	(.00162)	(.00189)	(.00265)	(.00240)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Systemic Crises Dummy (t-1)	-.00683	-.00395		-.00254		-.00127				
	(.00215)	(.00219)		(.00252)		(.00273)				
High Inflation Dummy (t-1)			.00475		.00429			.00637	-.00750	.00473
			(.00278)		(.00282)			(.00313)	(.00265)	(.00274)
FRL v.1				.01681	.01693	.01346	.01404	.01418	.01735	
				(.00462)	(.00410)	(.00443)	(.00383)	(.00405)	(.00481)	
FRL v.2										.00323
										(.00310)
Goodness of Fit										
No. of Observations	299	299	299	299	299	299	299	299	299	299
No. of Provinces	23	23	23	23	23	23	23	23	23	23
No. of Instruments	95	95	95	96	96	96	96	96	96	96

1. TOTAL CURRENT INCOME AND SPENDING CONSIDERED.
2. TOTAL CURRENT INCOME AND SPENDING AND LAGGED OUTPUT GAP IN LEVELS ARE CONSIDERED.
3. TOTAL CURRENT INCOME AND SPENDING, LAGGED OUTPUT GAP AND HIGH INFLATION DUMMY ARE CONSIDERED.
4. TOTAL CURRENT INCOME AND SPENDING, OUTPUT GAP IN DIFFERENCES AND FRL v1 ARE CONSIDERED.
5. TOTAL CURRENT INCOME AND SPENDING AND HIGH INFLATION DUMMY CONSIDERED.
6. TOTAL CURRENT INCOME AND SPENDING AND LAGGED UNEMPLOYMENT RATE CONSIDERED.
7. TOTAL CURRENT INCOME AND SPENDING CONSIDERED. SYSTEMIC CRISES DUMMY EXCLUDED.
8. TOTAL CURRENT INCOME AND SPENDING AND LAGGED UNEMPLOYMENT RATE IN LEVELS ARE CONSIDERED.
9. TOTAL CURRENT INCOME AND SPENDING AND LAGGED OUTPUT GAP IN LEVELS ARE CONSIDERED.
10. TOTAL CURRENT INCOME AND SPENDING.

Table 1 (continuation): Baseline specifications (period 2005-2019) - Dependent variable: Δ Cyclically adjusted primary balance.

ESTIMATOR	LSDVC (11)	LSDVC (12)	LSDVC (13)	LSDVC (14)	LSDVC (15)	LSDVC (16)	LSDVC (17)	FELM (18)	FELM (19)	FELM (20)	FELM (21)
Constant								.00037	-.00247	.00121	-.00763
								(.00265)	(.00246)	(.00253)	(.00522)
△ Ciclically-adjusted primary balance (t-1)	-.21511	-.17317	-.12054	-.08568	-.17518	-.21389	-.22039	-.28276	-.35054	-.14044	-.29182
	(.05436)	(.04934)	(.04939)	(.05077)	(.05381)	(.05487)	(.05288)	(.06138)	(.05785)	(.05690)	(.06311)
△ Output Gap (t-1)		-.16143	-.14773	-.14444						-.14644	
		(.02096)	(.02111)	(.02129)						(.02424)	
GGP Output Gap (t-1)	-.15017								-.23929		
	(.03246)								(.03856)		
△ Unemployment rate (t-1)					.33822		.35017	.36715			
					(.07885)		(.07597)	(.09179)			
Unemployment rate (t-1)						.10436					.12419
						(.08079)					(.08944)
Public Debt to GGP (t-1)	.00185	.01417	.01237	.02005	.00436	-.00434	.00575	.00306	.03576	.02574	.00163
	(.01417)	(.01417)	(.01570)	(.01554)	(.01595)	(.01546)	(.01407)	(.01835)	(.02002)	(.01783)	(.01971)
Election Year Dummy	-.01040	-.01156	-.01587	-.01590	-.01346	-.00901	-.00951	-.00840	-.00561	-.01361	-.00999
	(.00210)	(.00201)	(.00269)	(.00272)	(.00277)	(.00206)	(.00197)	(.00231)	(.00265)	(.00274)	(.00290)

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Systemic Crises Dummy (t-1)							.00188				
							(.00275)				
High Inflation Dummy (t-1)			.00690	.00794	.006001				-.00361	.00613	.00548
			(.00600)	(.00302)	(.00329)				(.00351)	(.00322)	(.00349)
FRL v.1	.00895	.01418				.01243	.01124	.01050			
	(.00282)	(.00261)				(.00278)	(.00314)	(.00335)			
FRL v.2			.00604		.00499				.00812		.01105
			(.00259)		(.00271)				(.00342)		(.00356)
Goodness of Fit											
No. of Observations	299	299	299	299	299	299	299	276	276	276	276
No. of Provinces	23	23	23	23	23	23	23	23	23	23	23

11. TOTAL CURRENT INCOME AND SPENDING, LAGGED OUTPUT GAP IN LEVELS AND FRL v1 CONSIDERED.
12. TOTAL CURRENT INCOME AND SPENDING AND OUTPUT GAP IN DIFFERENCES CONSIDERED.
13. TOTAL CURRENT INCOME AND SPENDING, HIGH INFLATION DUMMY AND FRL v2 CONSIDERED.
14. TOTAL CURRENT INCOME AND SPENDING.
15. TOTAL CURRENT INCOME AND SPENDING, LAGGED UNEMPLOYMENT RATE IN DIFFERENCES AND FRL v2 CONSIDERED.
16. TOTAL CURRENT INCOME AND SPENDING, LAGGED UNEMPLOYMENT RATE IN LEVELS AND FRL v1 CONSIDERED.
17. TOTAL CURRENT INCOME AND SPENDING, LAGGED UNEMPLOYMENT RATE IN DIFFERENCES AND SYSTEMIC CRISES CONSIDERED.
18. TOTAL CURRENT INCOME AND SPENDING.
19. TOTAL CURRENT INCOME AND SPENDING, LAGGED OUTPUT GAP IN LEVELS, HIGH INFLATION DUMMY AND FRL v2 CONSIDERED.
20. TOTAL CURRENT INCOME AND SPENDING AND LAGGED OUTPUT GAP IN DIFFERENCES CONSIDERED.
21. TOTAL CURRENT INCOME AND SPENDING, LAGGED UNEMPLOYMENT RATE IN LEVELS AND FRL v2 CONSIDERED.

The preceding analysis of variables´ results, shown in Table 1 above, were achieved by running econometric regressions of the linear equation (1) which – as already stated - reflected the conventional fiscal reaction function approach normally resorted to for ascertaining whether discretionary fiscal policies followed counter or a pro cyclical patterns. Although conclusive evidences were already found that both variants of the output gap induced a pro cyclical behaviour and that this agreed with the same pro cyclical performance when the cycle variables were variants of the unemployment rate, these conclusions can also be confirmed for provinces individually taken by the graphs shown in the charts I and II included in the Appendix; in this regard, procyclical patterns responding to the output gap prevailed in 15 provinces out of 23 whereas pro cyclicality was milder in two provinces (Formosa and Santa Fe) and noteworthy not the case in 5 provinces (Buenos, Aires, Córdoba, San Juan, San Luis and Santiago del Estero).

Explanations given above for the results achieved when the unemployment rate was used as the cycle variable can also be confirmed by Chart II. Surprising as it may appear graphics per province show a fiscal tightening following increases in the cycle variable which can be visualized (except for a few exceptional cases) by the lack of correlation between the ΔCAPB and unemployment rate paths, not to mention the fact that in many a province the former variable´s opposite reaction to movements of the unemployment rate is visible denoting thus a pro cyclical behaviour of discretionary fiscal policies.

By assessing in turn the response of the dependent variable to the used control variable, two features are at least worth emphasizing: first, previous considerations related to the performance of Debt to GGP ratio paths were graphically confirmed by the swift contraction in the levels of provincial debt stocks[34] very much reduced at the end of the period considered; In this connection, Chart III shows that only in four provinces (Chubut, La Rioja, Mendoza and Neuquen) the debt to GGP ratios reached similar or greater percentages than those exhibited in 2005; likewise, the debt to GGP ratio took figures averaging 10% to 15% in 9 provinces and less than 5% in other 9 while only in the remaining 5 jurisdictions the ratio climbed to 30% or more . Second, the process whereby the debt to GGP ratios got widely reduced led to a situation in which the risks that would have pose to stabilization the occurrence of very high thresholds seemed to have been somehow averted. This behaviour of the ratio, associated in the existing literature with an improvement of the fiscal position, was also reflected by ΔCAPB´s diagrammes generally showing constant or increasing plots and rare evidences of pro cyclical evidences caused by the performance of the control variable.

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[34] It is recalled that, in seeking to explain this, Responsibility Laws enacted in 2005 and 2018, setting limits to debt were mainly accounted for.

As anticipated in Section 1, the research to be carried on in the paper would not be limited to the analysis of discretionary fiscal policies of Argentine subnational governments estimating econometric regressions of the linear equation specified in (1) but would rather advance to what Larch et al (2020) defined as a deeper look over determinants of discretionary fiscal policies; that is, an investigation on the so called ´drivers´ of pro and counter cyclical fiscal policies which required in turn to include non- linearities in the previous conventional fiscal reaction approach, whose reach does not go beyond of revealing partial correlations between discretional fiscal measures and cyclical fluctuations , in this case of the Gross Geographic Product.

As highlighted by Larch et al (2020), the use of the so called drivers permits in addition to shed light on why and how frequents procyclical episodes occur or, as we will show in the research, how province relative fiscal sizes impact upon the mentioned episodes; these goals are achieved by using terms interacting with the cycle[35]. The following non-linear Equation (3), in which the cycle variable is the Output Gap, shows now how equation (1) will look like once interaction terms are included:

$$(3) \quad \Delta CAPB_{i,t} = \alpha_1 + \alpha_2 \, \Delta CAPB_{i,t-1} + \alpha_3 \, \Delta OG_{i,t-1} + \alpha_4 \, F_{,i,t-1} + \alpha_5 \, (\Delta OG_{i,t-1} \, F_{,i,t-1})$$
$$+ \, \alpha_6 \, \textbf{(Vector of control and other dummy variables)} + \mu_{i,t}$$

Factor F in equation (3) stands for the dummy used as the vehicle by which drivers will be enabled to provide additional useful information on stabilization properties, as shown in the fifth term (called interaction term) in which F interacts with the cycle variable (in this case the output gap[36]). Conclusions here can easily be drawn departing from the statistical significance of the two possible values for F: that is, if 0 were the proven value for F, the interaction term would vanish and the situation would go back to the scenario depicted by equation (1). In contrast, if value 1 were proven for the F dummy, the coefficient of the cycle variable α_5 would increase or decrease by α_5 and this will supply in turn important new information over the stabilization properties of the subnational discretionary fiscal policies of the Argentina subnational governments. It goes also without saying that while a positive α_5 implies that factor F

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[35] In analyzing advantages of including interacting terms, Larch et all (2020, page 9) mentioned that they can provide hints of whether, or to what extent stabilization properties of discretionary fiscal policies are influenced, for instance, by the level of government debt or by the existence or design of existing fiscal rules.

[36] Similar procedure could have been followed by allowing F to interact with other cycle and control variables, as for instance the stock level of subnational debt.

amplifies the impact of the cycle on subnational discretionary fiscal policies, a negative α_5 would in turn dampen this effect.

The ensuing Table 2 reports results from econometric regressions run for variants of Equation (3), including either the output gap or the unemployment rate, as well as the inclusion of the interacting factor F and the interaction term purporting to firstly verify (as Larch et al held) that the consequence of theirs being included may cause an economic cycle´s actual amplifying or dampening impact upon subnational public finances, as illustrated by estimations 1 through 3 in the Table. Secondly, results are also shown when a second variant of factor F is resorted to and standing for provinces´ fiscal size[37]. Their actual impact upon counter or pro discretionary fiscal policies is hereby highlighted by estimations 4 and 5 where 6 considered the joint effect of both interaction terms; that is. the variant analyzed by Larch et al (2020) and the one added in this paper and aimed at capturing of impact upon stabilization of provinces with greater fiscal size.

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[37] The following 5 provinces were here considered regarding fiscal size: Buenos Aires, Córdoba, Mendoza, Misiones and Santa Fe.

Table 2: Baseline Specifications (period 2005-2019) - Non linearities - Dummies for the signs of the Output Gap, the Unemployment Rate and Fiscal Size

ESTIMATOR	GMM-IV (1)	GMM-IV (2)	GMM-IV (3)	GMM-IV (4)	GMM-IV (5)	GMM-IV (6)
CONSTANT	.00069	-.01690	-.00769	-.00522	-.00778	-.0.1664
	(.00254)	(.00515)	(.00306)	(.00290)	(.00397)	(.00419)
△ Ciclically-adjusted primary balance (t-1)	-.25420	-.21676	-.20369	-.08419	-.22346	-.21819
	(.07033)	(.06349)	(0.06097)	(.07272)	(.05886)	(.06128)
△ Output Gap (t-1)	.13694		-.17972	-.18186		-.18874
	(.07033)		(.03341)	(.03398)		(.03630)
GGP Output Gap (t-1)					-.23487	
					(.03738)	
Unemployment rate (t-1)		.29029				
		(.07805)				
Public Debt to GGP (t-1)	.03067	.05104	.08417	.08402	.06768	.09149
	(.02757)	(.01935)	(.03421)	(.02937)	(.02655)	(.03503)
Election Year Dummy	-.01076	-.00782	-.01747	-.01624	-.01230	-.01594
	(.00223)	(.00160)	(.00315)	(.00344)	(.00245)	(.00278)
Systemic Crises Dummy (t-1)	.00624	-.00090	-.00612			-.00527
	(.00338)	(.00269)	(.00221)			(.00246)
High Inflation Dummy (t-1)				.00885	.00454	
				(.00314)	(.00276)	
FRL v.1	.01229	.00916				.01214
	(.00456)	(.00489)				(.00460)
FRL v.2			.00805			
			(.00402)			
OG Sign Dummy	-.00723	-.00486				
	(.00229)	(.00233)				

	(1)	(2)	(3)	(4)	(5)	(6)
△ OG Sign Dummy					.01858	.01661
					(.00323)	(.00297)
Fiscal Size Dummy					.01242	.03185
					(.01277)	(.01719)
OG Sign*△OG (t-1)	-.14707					
	(.04617)					
OG Sign*Unemployment rate (t-1)	-.12881					
	(.02981)					
△ OG Sign*△OG (t)			-.26912			-.21059
			(.05956)			(.06401)
Size Dummy*△OG (t-1)				.09054		.06531
				(.03382)		(.03008)
Size Dummy*OG (t-1)					.14745	
					(.04486)	
Goodness of Fit						
No. of Observations	299	299	299	299	299	299
No. of Provinces	23	23	23	23	23	23
No. of Instruments	98	98	98	96	96	99

1. TOTAL CURRENT INCOME AND SPENDING, OUTPUT GAP IN DIFFERENCES, SYSTEMIC CRISES DUMMY, FRL v.1 DUMMY, OUTPUT GAP SIGN DUMMY AND INTERACTION TERM INCLUDED.
2. TOTAL CURRENT INCOME AND SPENDING AND UNEMPLOYMENT RATE IN LEVELS CONSIDERED.
3. TOTAL CURRENT INCOME AND SPENDING, OUTPUT GAP IN DIFFERENCES, FRL v.2 DUMMY AND SIGN OF THE OUTPUT GAP IN DIFFERENCES DUMMY CONSIDERED.
4. TOTAL CURRENT INCOME AND SPENDING AND HIGH INFLATION DUMMY CONSIDERED.
5. TOTAL CURRENT INCOME AND SPENDING, OUTPUT GAP IN LEVELS AND FISCAL SIZE DUMMY CONSIDERED.
6. TOTAL CURRENT INCOME AND SPENDING, SYSTEMIC CRISES DUMMY, FRL v.1 DUMMY, SIGN OF THE OUTPUT GAP IN DIFFERENCES DUMMY AND TWO INTERACTION TERMS CONSIDERED.

When reporting results of baseline regressions 1 through 3 in the above Table 2, sound and worth stressing conclusions arise from the analysis. In the first and the third cases, in which interaction terms respectively include $\Delta\ OG_{t-1}$ and $\Delta\ OG_t$ as the cycle variables, coefficients are negative and statistically significant. In recalling that negative signs for $\boldsymbol{\alpha_5}$ were above interpreted as evidence of its yielding evidences of marginal support to more pro-cyclical subnational fiscal policies just as Larch et al (2020) found in their own research for the EU; in asserting that this conclusion also stands for Argentine provinces´ public finances just notice what figures show for the above mentioned estimations: the additional fall in CAPB induced by interaction terms clearly amounts here to counteracting the effects of better cyclical conditions; that is, instead of taking benefit from an improvement in the fiscal balance by drawing public resources, so far being used ´a la Keynes´ to boost shrank aggregate demand levels, subnational policymakers seemed not to have taken benefit from cycle´ recovery phases by building up something like stabilization funds. As it may easily be noted, the persistence in sustaining high public expenditures levels even during economic recoveries, particularly if this were accompanied by parallel increases in debt stock levels, may also entail serious future threats vis-a-vis provinces´ stabilization chances during economic downturns.

The pro cyclical pattern of the unemployment rate, shown in Table 1 when Equation (1) included it as the cycle variable, turns now to a counter cyclical one; the change of the pattern reflects thus the marginal effects of the interaction term when the unemployment rate is used instead of the output gap. It goes without saying that the counter cyclical bias is in estimation 2 is in turn backed by the negative sign and statistical significance of the coefficient $\boldsymbol{\alpha_5}$. In terms of the stabilization properties of subnational discretionary fiscal policies the counter cyclical bias is self- explained if the persistence of unemployment rates takes place alongside economic downturns; in such a case, reduced tax incomes and increased public expenditures aimed at sustaining aggregate demand will work together as the CAPB shrinkage[38] will be followed by a greater strain on provincial public finances.

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[38] Another possible explanation could be that when the economy is in expansion it would be easier for provincial policymakers to carry out programmes for the inclusion of workers in formal labour markets and this could somehow lead to a small contraction in CAPB.

Econometric regressions in columns 4 and 5 of Table 2 show results when provinces´ fiscal size was tested via the interacting factor dummy[39], under the hypothesis that marginal effects promoting pro or counter cyclical patterns at the Argentine subnational level would depend to a large extent on bigger provinces´ fiscal stances. Letting apart the fact that coefficients´ sign and statistical significance clearly endorsed the stated hypothesis, it is also worth mentioning here that this noticeable counter cyclical bias of provinces´ fiscal discretionary policy in the period considered was the result of what seemed to have been a greater degree of fiscal discipline on the part of the main subnational jurisdictions. Finally, the column 6 of Table 2, reports econometric estimations´ results when Equation (3) carries two interaction terms –instead of a single one- in which both dummies (for output gap and fiscal size) are added with the object of capturing the joint impact of the cycle variable and the fiscal size of provinces. In this case, results deserve a more careful analysis for reasons that follow. In analyzing the marginal cyclical impact of dummies over the cycle variable (measured by the sign of coefficients accompanying both interaction terms) the assumption is held that both dummies are equal to 1[40]. As this will mean that cases are considered in which provinces are fiscally large and the sign of the output gap coefficient positive, the latter meaning that that the economy is in the expansive phase of the business cycle given that the actual output is greater than the potential one. Taking this into account and adding up coefficients corresponding to these two dummies (Table 2)[41] the rendered final figure indicating the impact of the lagged output gap will now be - .33402. As this result is still negative (and higher in absolute values), results support a pro cyclical behaviour of fiscal policy.

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[39] The dummy includes Buenos Aires, Córdoba, Mendoza, Misiones and Santa Fe as the 5 biggest provinces in fiscal term.

[40] Otherwise, the impact will be nil and equation 3 will again be linear.

[41] The figure .14528 is obtained by adding up the coefficients associated to both interaction terms (-.21059 for the interaction between the sign of the output gap in differences and the cycle variable; and .06531 for the the interaction between the size dummy and the cycle variable). The result of that sum would be the joint impact of both dummy variables on the output gap in differences, which, in turn, has an impact on the dependent variable (CAPB).

5. CONCLUSIONS

This research sought to investigate the stabilization properties of discretionary fiscal policies of Argentine provinces during the period 2005-2019, and also assess whether fiscal responsibility laws -enacted during the same period- played any significant role in promoting subnational fiscal discipline. For that, a two-step methodology was used including in the first place running and analyzing econometric regressions of dynamic panel data models standing for the classical linear fiscal reaction function, whereas marginal effects of interacting factors (drivers in Larch et al, 2020) upon fiscal policy´s pro or counter cyclicality were secondly analyzed by resorting to a modified nonlinear equation in respect of which the novelty was the inclusion of the so called interaction terms.

Main results stemming from the econometric regressions of the linear equation enabled interesting and sound conclusions to be achieved, as for instance that increased fiscal pro cyclicality had to be expected would the output gap be used as the cycle variable. It goes without saying that this result fell completely in line with usual findings in the standing literature.

This bias towards increased pro cyclicality was also noticeable in the case of the election year dummy, explained by subnational governments´ marked propensity to increase public spending seeking to strengthen their electoral chances at the cost of endangering also fiscal discipline and stabilization objectives.

Other cycle variables also showed a pro cyclical behaviour, as the case was when the output gap was replaced by the unemployment rate. As mentioned above, It could implicitly be assumed that when increases in the unemployment rate go hand in hand with an economic downturn, a negative impact on CAPB should occur (for instance by devoting public resources to boost aggregate demand) seeking to counteract the recession, in which case fiscal policy would be countercyclical. If, in change, policymakers reacted provoking a fiscal tightening (as results showed) fiscal policy would be procyclical in so far as it did not counteract the negative phase of the economic cycle.

In this case, a possible explanation for this odd result could be that subnational levels, contrary to national or central governments, did not generally count with the needed tools or sufficient budgetary resources that might enable them to check severe labour market problems during an economic downturn; for this reason, the pressure over provincial fiscal finance was in that case lower.

The counter cyclical pattern of the High Inflation Dummy is also easy to explain owing to the fact that whereas subnational jurisdictions naturally increase their nominal tax receipts during inflationary periods, the same does not necessary occurs with relation to their expenditure dues, especially when the latter fall short of accompanying the inflation rate path[42].

Another instance of contribution to counter cyclicality worth pointing out sprung from Fiscal Responsibility Laws enacted during the period considered by placing, among other things, limits to the budgetary increase of Primary Public Spending and to overall indebtedness. Likewise, the mandate that national and subnational governments must run financial balance preserving budgets (measured as the difference between really perceived current and capital resources and current and capital accrued expenditures) played an important role in disciplining provincial public finances. Let it be emphasized that this and the mandate that both governments levels should restructure their debt stocks in line with their capacity to meet limits on annual debt services permitted these fiscal rules to be credited for the betterment of provinces´ fiscal stances during the period.

The counter cyclical pattern shown by the Debt to GGP ratio control variable deserves to also be highlighted in relation to what Larch et al (2020, p. 29) suggested when they argued how the trade-off between stabilization and sustainability should be dealt with, that is, not always evenly but according to standing debt levels. In this case, subnational compliance with Fiscal Responsibility Laws in relation to debt limits seemed to have been ample since the majority of provinces swiftly reduced their initial high debt stocks in term the GGP getting thus away from the risk that dangerously high thresholds could have imposed regarding stabilization objectives. This conclusion also

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[42] Such a situation often happens when wages are a major part of provincial spending. In this case, failure in catching up with inflation rates may cause a budget surplus enhancing thus the CAPB.

backs the initial assertion of this paragraph related to the counter cyclical pattern of the control variable as well as the role played by fiscal rules.

Policy implications of econometric regressions´ results when linearities were introduced was also analyzed. In that case, the process consisted (as Larch et al. suggested) in extending the previously linear equation by introducing dummies that interacted with other already used variables. In this case, the procedure first entailed to introduce one interaction term at a time (one accounting for drivers[43] interacting various variables and the second for the impact of the per province fiscal size dummy to respectively assess how much they impacted upon stabilization properties of discretionary fiscal policy at the Argentine subnational level. Secondly, their joint impact on cycle variables was also evaluated including the two interaction term for the fiscal size and the sign of the output in differences dummy, respectively. This methodology allowed to deepen the analysis by observing the impact on the CAPB when the province fiscally large, or when the output gap had a positive sign, or when both were true.

Finally, when both interaction terms were added dummies´ marginal impact over the cycle variable, in terms of what analyzed in the previous Section still supported pro cyclical fiscal policy thus countervailing the counter cyclical impact of bigger provinces´ higher fiscal discipline.

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[43] The name followed Larch et al. (2020) terminology for this dummy.

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Chart I

CAPB (black) and Output_Gap (orange) in levels per province
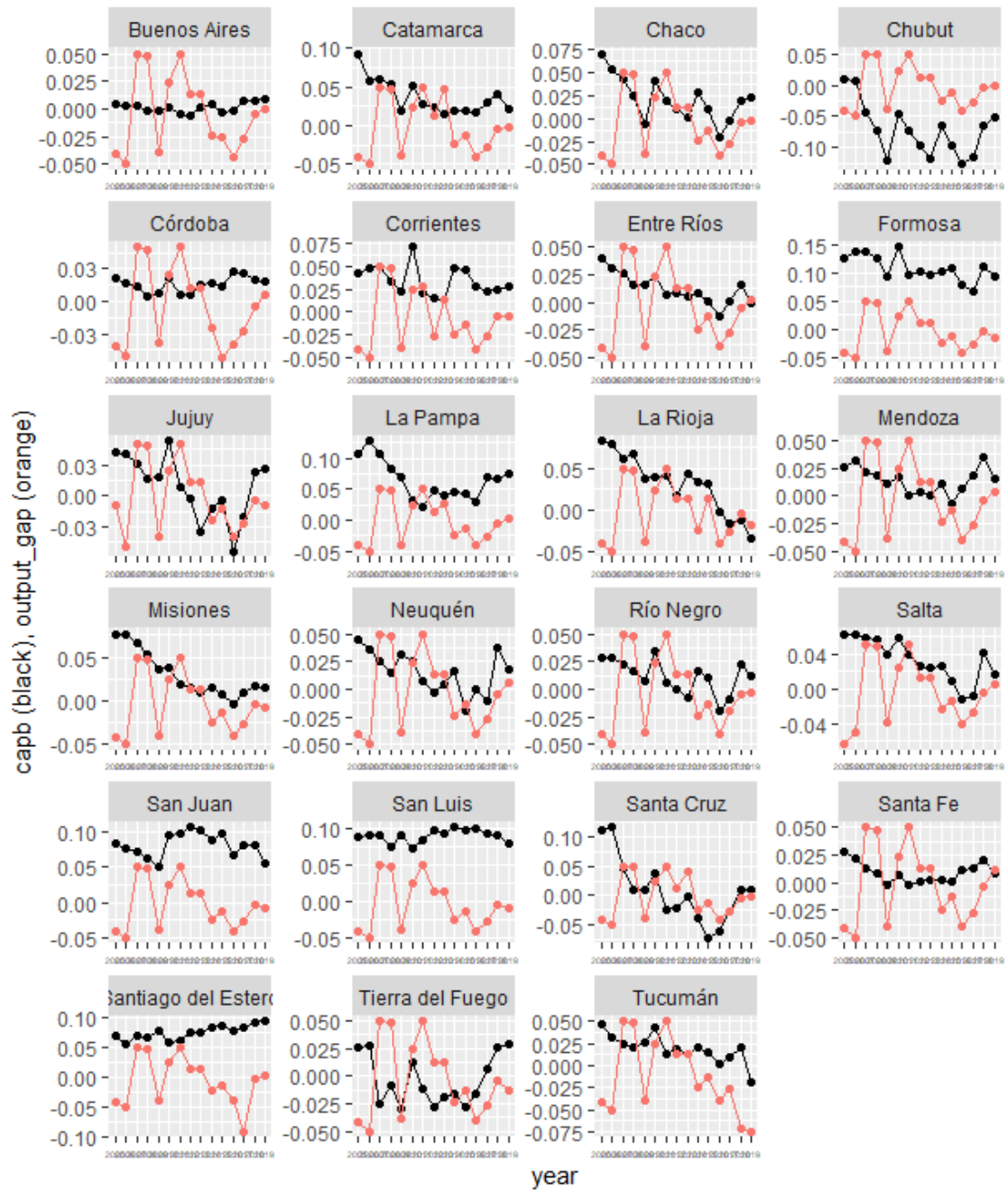
Chart II

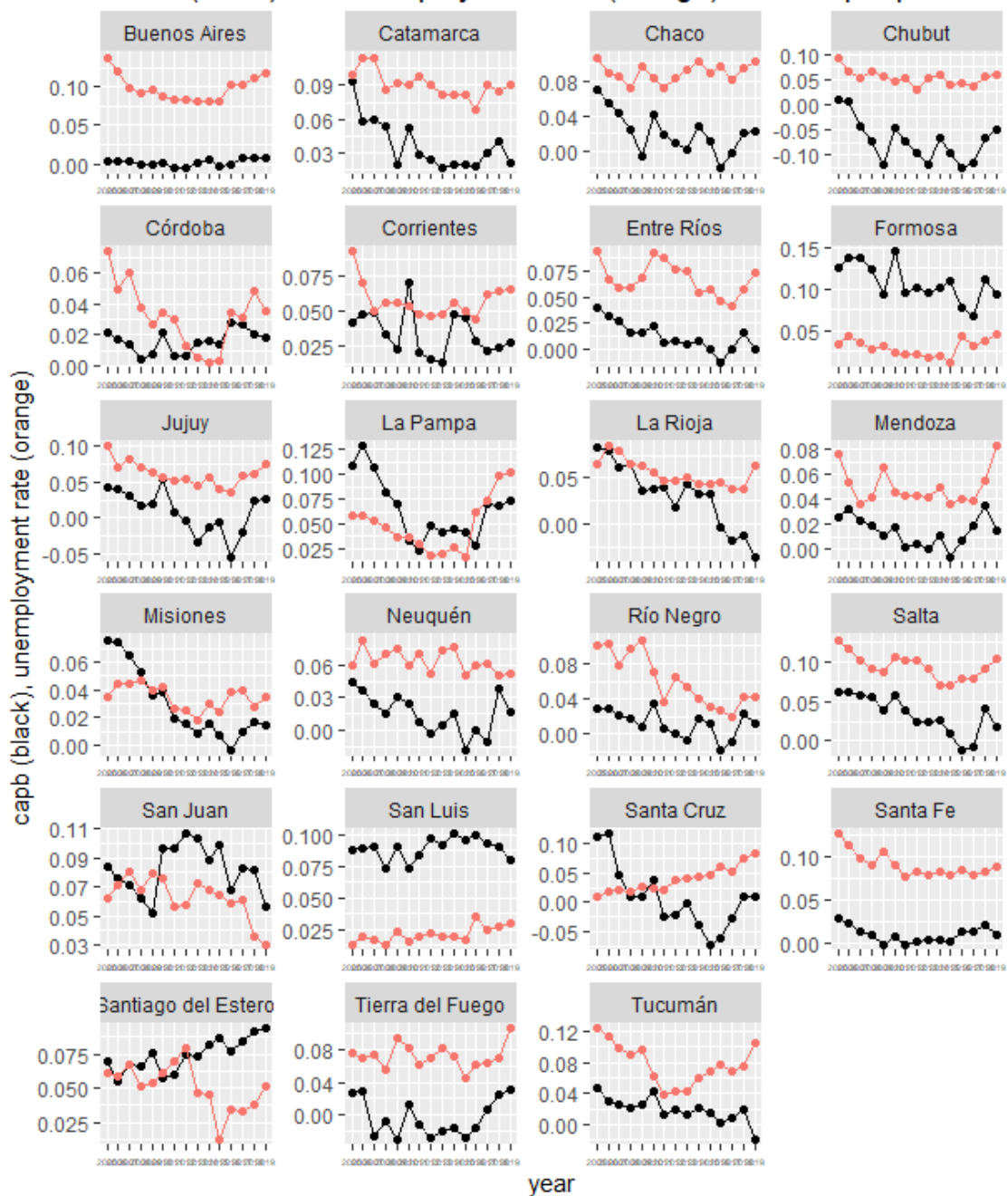CAPB (black) and unemployment rate (orange) in levels per province

Chart III

CAPB (black) and debt ggp ratio (orange) in levels per province