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On the empirical relations between producers expectations and economic growth

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Abstract

This study analyses the common trends between expectation indicators of producers of the manufacturing sector in Uruguay and its linkage with economic growth. To this end, four expectation indicators are constructed from qualitative data obtained using surveys collected by the "Cámara de Industrias del Uruguay" (CIU) for the period 1998- 2017. Common trends are identified by estimating Multivariate Structural Models on the expectations indicators (categorized in four groups according to the firm specialization and international insertion). Its dynamical linkage with Gross Domestic Product (GDP) growth is analyzed by applying non-parametric cointegration and causality tests. Results give evidence of bidirectional causality between expectations and GDP growth in the long, while in the short-run causality goes uniquely from the exporters' sentiment indicator trend to the GDP growth. The expectation trend of the more tradable and exposed to international competition sectors (exporter industries) is the one that drives overall industrials' expectations in Uruguay. More importantly, we cannot reject nonlinearity in the long-run relationship between the underlying trend of exporters' expectations and Uruguayan GDP growth, which shows that it may be a useful predictor of GDP growth provided that this nonlinearity is taken into account.

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1. Introduction

In recent years, a growing number of studies have been carried out on the link between sentiment indicators and the macroeconomic. Usually, these studies incorporate soft indicators developed from surveys among agents (entrepreneurs, consumers or experts) and use expectations series as components of those indicators[1]. The importance of expectations concerning economic fundamentals and cyclical fluctuations has been shown in both theory and applied research. According to these studies, macroeconomic fluctuations are not only a product of the current economic situation but are also very frequently influenced (and stressed) by agents' expectations. Several and recent empirical studies have shown this fact (see Karnizova, 2010; Leduc & Sill, 2013; Patel, 2011; Conrad & Loch, 2011; Aarle & Moons, 2017 and references therein). In line with this argument, recent studies have used soft indicators to forecast economic fluctuations (Cesaroni & Iezzi; 2017; Christiansen et al. 2014; Claveria et al. 2006; among others). Actually, there is a vast literature focused on studying the capacity of sentiment indicators to predict, improve the prediction and anticipate the current state of the main macroeconomic variables (Banbura & Ruenstler, 2011; Claveria et al. 2015, 2016, 2017; Alfarano & Milakovic, 2012; Basselier et al. 2018; Kitrar et al. 2020 as some examples). In their extensive review of this empirical literature, Pesaran & Weale (2006) show that different approaches have been used to address many of these issues.

The present paper analysis the role of expectations indicators (considered as a sentiment indicator) in predicting GDP growth, based on previous studies for Uruguay (Lanzilotta, 2014; 2015). The taken approach is predominantly empirical and exploratory, no assumption or model is assumed about the expectation formation process. The empirical analysis makes use of the expectation measurements collected by the CIU[2] and industrial production indicators from the Monthly Survey of Manufacturing Industry conducted by the National Institute of Statistics (INE, by its acronym in Spanish). Monthly data from January 1998 to July 2017 are considered. Although there is vast international empirical literature, little research has been done on this subject in Uruguay. Because it is a relatively small, open country, its economy has traditionally been subject to external shocks, particularly from its neighbours Argentina and Brazil. Those shocks have brought about strong cyclical fluctuations and episodes of crisis.

The influence of Uruguayan industrialists' expectations on economic performance is examined by breaking down the sector into four differentiated groups, which are determinate according to two criteria: trade participation and production specialization. To examine the relationship between the expectation indicators of these four industry groups we seek to identify common underlying trends between them. To this aim, following several studies (such as Carvalho & Harvey, 2005 and Carvalho et al., 2007) we estimate a multivariate structural time series model (Engle & Kozicki, 1993; Vahid & Engle, 1993) and identify the

[1] Literature does not clearly define the difference between sentiments and expectations. In this study, booth terms are considered as complements. In particular, we understand that sentiment indicators are incorporated to reflect perceptions of a certain group about a specific variable. These indicators are constructed using different types of data that can reflect the group position in relation to the future of the variable of interest; in particular, expectations series are always considered as a key variable in their construction. At this study, not other variables are considered in the construction of the sentiment indexes. Given that we understand that deeper research is necessary to identify a precise definition of these concepts, future investigations centered on this discussion are motivated.

[2] http://www.ciu.com.uy/innovaportal/v/15128/9/innova.front/expectativas-empresariales-industriales.html

driver within these indexes. Finally, by applying the procedure proposed by Breitung (2001) and Holmes & Hutton (1990) we test the existence of a long-run relationship between agent expectations and the Uruguayan GDP growth.

The findings show that there is a common trend between the four expectation indicators. This common trend is identified with the one of the export-oriented group and the trend of the indexes for others groups depend on it. Additionally, this trend has a nonlinear cointegrated relationship with the Uruguayan GDP growth, which confirms the important role of expectations of industrialists most exposed to international competition in the forecasting of economic growth. Therefore, the study revealed the influence of producers' sentiment indicators on overall economic activity, showing that the information they provided could be useful for predicting and anticipating cyclical fluctuations in Uruguay and are a valuable input for predicting the overall activity growth.

The remainder of the document is organized as follow. The next section describes the data and the methodological framework. Section three shows the empirical results, and in the final section, we conclude and discuss some policy implications.

2. Data and methodological framework

The four sentiment indicators involved in the present research were constructed in base of the monthly industrial surveys conducted by the CIU since 1997. Among other dimensions this survey asks manufacture producers about their expectations on the national economy for the next 6 month. They are asked to state whether they expect the situation to improve, worsen or remain the same.[3] Results of the expectation survey are public available 45 days after the reference month of the survey.

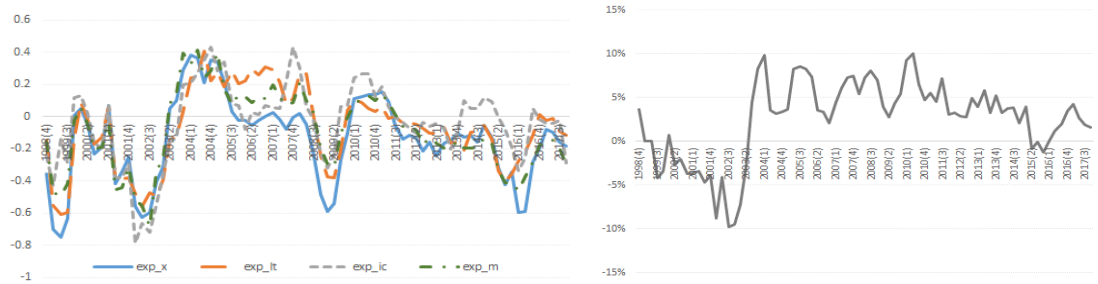
In their review of the literature on the use of expectations data, Pesaran & Weale (2006) stress two crucial aspects: the way that responses are gathered and the way that they are converted into aggregate quantitative data. Examples of other studies that have interesting discussions on this issue are: Nardo (2003), Remond-Tiedrez (2005), Dillman & Christian (2005), Claveria (2010) and Sorić et al. (2016). Even so, this matter is still an open discussion. In the monthly CIU survey, respondents from each company are asked the following question: "In view of the current situation, how do you expect the national economy, your sector and your company to perform in the next six months?" In this paper, expectation indicators are constructed by the balance statistic method, which is used to aggregate responses[4]. Even if there are other possible methods of aggregation, the balance statistic has the advantage of being simple and easy to interpret. Moreover, the method is chosen by the CIU for reports elaboration. This procedure is employed by Eurostat and is routinely used in applied studies on the subject, in some cases, as an intermediate step in the construction of the indexes (Bruno & Lupi, 2004; Croux et al. 2005; Kangasniemi, et al., 2010; Kangasniemi & Takala, 2012; Bruno et al. 2019; Grech & Ellul, 2020; Campelo et al. 2020). This methodology involves the construction of aggregate indicators of expectations by subtracting the number of negative responses from the number of positive responses, then dividing by the total number of responses. Each response is accorded equal weight in the indicator regardless of the size of the company or the branch of activity in which it operates.

[3]The good fit between the CIU and official data of manufacturing sales provides reassurance that there are no serious sampling errors. Nonetheless, problems of framing or strategic bias could in principle be an issue.

[4] Studies that compare different aggregation methods are not abundant, and their conclusions are not decisive about which is the best (see Nardo, 2003).

More precisely, four sentiment indicators are constructed by the balance statistic method, one per defined group of manufacturing firms. The classification in four groups follows Osimani & Laens (2001), who propose to classify manufacturing industries according to the patterns of trade and production specialization of the firms, considering the import and export flows and domestic production.[5] They classified 73 sectors (disaggregated at the four-digit level of ISIC revision 2) into four groups: exporter industries, low-trade industries, import-substitution industries and intra-sectoral trade industries. This classification criterion ensures that growth determinants act in a reasonably homogeneous way within each group. As Lorenzo et al. (2003) state, breaking industry down into homogeneous groups enhances the diagnosis since sectoral specificities are manifested in clearly differentiated patterns of behaviour. In addition to the sentiment indicators discussed above, this paper also considers Real Gross Domestic Product (GDP) of the Uruguayan economy. The data analysed in this study refers to the period January 1998 -December 2017 and it is measured in quarterly frequency (see Figure 1).

Figure 1. Expectation indicators (left panel) and Uruguayan GDP growth (right panel). 1998.Q1-2017.Q4



Source: based on CIU and BCU.Note: exp_x= exporter industries' expectations, exp_lt=low-trade sector' expectations, exp_ic=intra sectorial commerce industries' expectations, exp_m=import substitution industry' expectations.

The methodological framework for the empirical analysis is based on the estimation of structural time series models (Koopman et al., 2009) and cointegration analysis. The basis for identifying common trends between time series is the application of multivariate structural models. The econometric tools for identifying common factors was developed by Engle & Kozicki (1993) and Vahid & Engle (1993) and applied in several studies, such as Carvalho & Harvey (2005) and Carvalho, et al. (2007). The tests for identifying common trends (level and/ir slope) in a multivariate structural model were developed by Nyblom & Harvey (2001).

In addition, in order to analyse whether the expectatioon indicators have a relevant role in GDP forecasting we study the existence of a cointegration relationship between the underlying trend (underlying level) of the indexes and the Uruguayan GDP growth ($\Delta_4 \ln GDP$) by applying a set of 'free models' (following Breitung, 2001; Bruno et al., 2019; and Ye Lim et al., 2011). This procedure allows testing the existence of cointegration

[5] Sectors with an openness ratio (exports plus imports as a share of overall output) of under 5% are categorized as a *low-trade* group. Sectors with an openness ratio of over 5% are then analysed for intra-industry trade using the relevant Grubel-Lloyd indices. Industries with a Grubel-Lloyd index value of over 0.50 are classified as an intra-industry trade group. Those with Grubel-Lloyd scores of less than 0.50 are then separated according to whether their sectoral trade balance is positive or negative, sectors with a positive trade balance being classed as exporters and those with a negative balance as import-substitution industries.

and also the linearity of the underlying relationship between the cointegrated variables. Specifically, Breitung (2001) proposed a rank transformation for the variables involved and checks whether the ranked series move together over time towards a linear or nonlinear long-term cointegrating equilibrium. The procedure starts checking the cointegration by using the rank test. If cointegration is accepted, the technique follows with examining linearity in the cointegration relationship, by using a *score statistic* ($T \cdot R^2$). [6]

3. Empirical results

As previously stated, the empirical strategy has two steps. In the first place, the testing of the common levels between the expectations indicators, and, in the second place, the analysis of cointegration with the Uruguayan economic growth. The results are presented in the following subtitles.

3.1 Common factors in expectation indicators

The graphical analysis of the expectation indicators (Figure 1, left panel) of the four industry groups evidences that they have a parallel evolution, and suggest the existence of a common trend between them. In order to identify this common factor we estimate a multivariate structural model (Engle & Kozicki, 1993; Vahid & Engle, 1993). In accordance with the characteristics of the four series, we initially formulate an unrestricted specification of a local level model with drift:

$$\begin{aligned} \exp\_i_t &= \alpha_i + \mu_{it} + \epsilon_{it},\ \epsilon_{it} \sim \text{NIID}\ (0, \sigma^2_{i\epsilon}), \quad t = 1, \ldots..T, i = x, lt, ic, m \\ \mu_{it} &= \mu_{it-1} + \eta_{it}, \qquad \eta_{it} \sim \text{NIID}\left(0, \sigma^2_{i\eta}\right), \end{aligned} \tag{1}$$

where μ_t is the underlying level, and ϵ_t and η_t are white noise disturbances, both normally distributed and independent of each other. Additionally the model presents an autoregressive component in order to correct for autocorrelation of the process and qualitative variables were also included for outliers' correction. Results are presented in Table I.

Table I. Unrestricted multivariate structural model (UnModel).
Vector of endogenous variables: [*exp_x, exp_lt, exp_ic, exp_m*].
Quarterly data, 1998QI – 2017Q.IV

Model estimated: Y = Level + Irregular + Cycle + AR(1) (strong convergence)	***exp_x***	***exp_lt***	***exp_ic***	***exp_m***
I. Standard deviations of the component residues:				
Irregular	0.0183213	0.0168855	0.03906136	0.0315031
Level	0.1435112	0.1253643	0.11070953	0.1072958
Cycle	-	-	-	-
AR(1)	0.0442764	0.04725177	0.09790924	1.02441375
AR coefficient	0.61585	0.86513	0.56430	0.12878
II. Model diagnostic statistics:				
Normality (Bowman-Shenton)	5.8586	7.4957	2.5458	7.6502
T	72	73	70	73
Rd^2	0.27656	0.21453	0.27642	0.34623

Source: own processing. A full list of outputs is available from the author on request.
Note: exp_*x*: sentiment indicator of export industries; exp_*m*: sentiment indicator of import-substitution industries; exp_*ic*: sentiment indicator of intra-sectoral trade industries; *iec_lt*: sentiment indicator of low-trade industries. AR(1): autoregressive process (order = 1).

[6] For further details on the methodology see Breitung (2001, 2002).

The model's variance-covariance matrix shows a high correlation between the levels of the sentiment indicators (Table II) which suggests the existence of common trends.

Table II. Variance-covariance matrix of the residuals of the unrestricted multivariate model

	exp_x	***exp_lt***	***exp_ic***	***exp_m***
exp_x	0.0206	0.9724	0.9053	0.9823
exp_lt	0.0175	0.01572	0.9495	0.9951
exp_ic	0.01438	0.01318	0.01226	0.9631
exp_m	0.01513	0.01339	0.01144	0.01151

Source: prepared by the author.

Note: exp_*x*: sentiment indicatorof export industries; exp_*m*: sentiment indicator of import-substitution industries; exp_*ic*: sentiment indicator of intra-sectoral trade industries; *iec_lt*: sentiment indicator of low-trade industries. Grey shading denotes significant values.

The analysis of variance/correlation matrix suggests that the matrix rank is 1 (2, at a lower significance level).This justifies the restriction of common levels between the series which is consistent with the preliminary graphical analysis. In accordance with the eigenvalues of the matrix of variances, the indexes for intra-sectoral trade, low-trade and import-substitution industries were specified as dependent. The results are presented in Table III and Figure 2.

Table III. Restricted multivariate structural model with common trends.

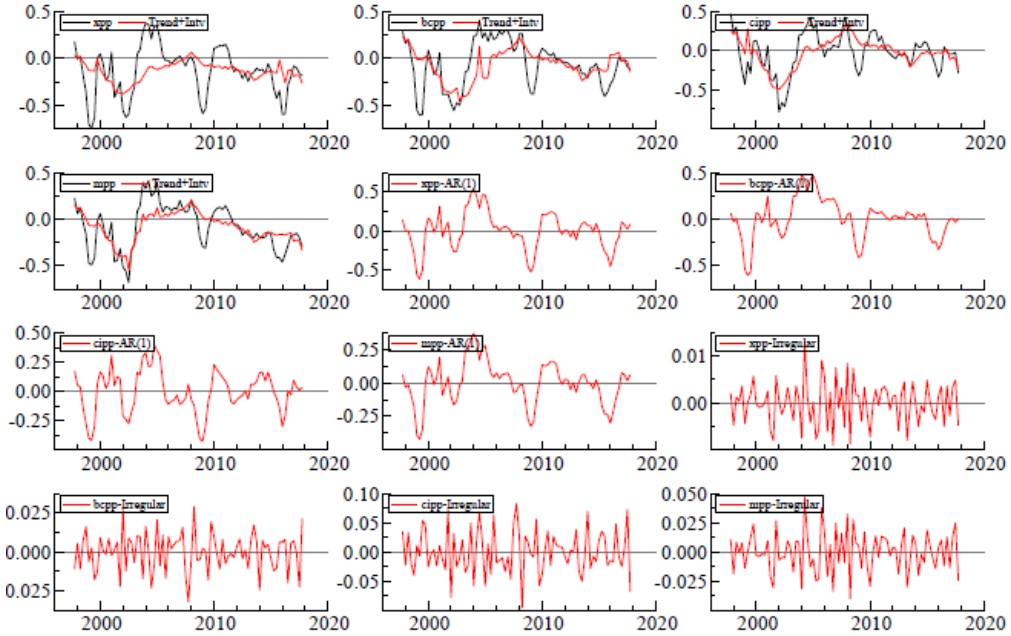
Vector of endogenous variables: [*exp_x, exp_lt, exp_ic, exp_m*].
Quarterly data, 1998.I – 2017.IV

Model estimated: Y = Level + Irregular + Cycle + AR(1) (strong convergence) *exp_lt, exp_ic, exp_m: dependent*	***exp_x***	***exp_lt***	***exp_ic***	***exp_m***
I. Standard deviations of the component residues:				
Irregular	0.0075090	0.0180425	0.0511940	0.0249947
Level	0.0399903	-	-	-
Cycle	-	-	-	-
AR(1)	0.1406744	0.1179466	0.1192950	0.09542264
II. Model diagnostic statistics:				
Normality (Bowman-Shenton)	3.6559	6.4634	1.5909	5.4138
T	72	73	70	73
Rd^2	0.33485	0.26135	0.2985	0.42233

Source: own processing. A full list of outputs is available from the author on request in the Complementary Material document. Note: exp_*x*: sentiment indicator of export industries; exp_*m*: sentiment indicatorof import-substitution industries; exp_*ic*: sentiment indicatorof intra-sectoral trade industries; *iec_lt*: sentiment indicator of low-trade industries. AR(1): autoregressive process (order = 1).

Figure 2. Components of the multivariate structural model with common trends, 1998Q1-2017Q4

(Index values)



Source: own processing.

The estimated model (ignoring cyclical and autoregressive components) can be written as:

$$\begin{aligned} \exp\_x_t &= \mu^*_{t,} + \epsilon_{\exp\_xt}, \\ \exp\_lt_t &= 1.384\mu^*_{t,} + 0.03994 + \epsilon_{\exp\_ltt}, \\ \exp\_ic_t &= 1.865\mu^*_{t,} + 0.2439 + \epsilon_{\exp\_ict}, \\ \exp\_m_t &= 1.215\mu^*_{t,} - 0.1556 + \epsilon_{\exp\_mt}, \end{aligned} \tag{2}$$

where μ^*_t is a univariate random walk with drift. Therefore the level components have the following relationship:

$$\begin{aligned} \mu_{\exp\_lt_t} &= 1.384\,\mu_{\exp\_x_{t,}} + 0.03994, \\ \mu_{\exp\_ic_t} &= 1.865\mu_{\exp\_x_{t,}} + 0.2439, \\ \mu_{\exp\_m_t} &= 1.215\mu_{\exp\_x_{t,}} - 0.1556, \end{aligned} \tag{3}$$

where the common trend is the one estimated for export industries: $\mu_{\exp\_x_t}$

3.2 Cointegration analysis

As we stated, previous international (Kangasniemi et al. (2010); Kangasniemi & Takala, 2012) and local research (Lanzilotta, 2015) allows as hypothesizing that sentiment indicators based on expectations series have a relevant role in GDP forecasting. To show this, we analyse the existence of a cointegration relationship between the underlying trend of industrial expectations ($\exp\_x_t$) and the Uruguayan GDP growth ($\Delta_4 \ln GDP$) by applying a set of 'free models' (following Breitung, 2001, and Ye Lim et al., 2011). Both variables are

non-stationary (of order 1, I(1))[7]. Note that in the case of exp_x_t, this result is congruent with the best representation found for this variable within the framework of structural time series models (a *local level model*, as is shown in equation (1)).

Breitung (2001) introduces a procedure to test the hypothesis of a cointegration relationship and, in a second step, to identify whether this link is nonlinear. Breitung proposes a rank transformation for the series involved (x_t, y_t) and proves whether the ranked series ($R_T(x_t)$, $R_T(y_t)$) move together over time towards a linear or nonlinear long-term cointegrating equilibrium. The procedure starts testing the null-hypothesis of non-cointegration, by using the rank test. This test is based on two "distance measures" between the sequences of $R_T(x_t)$ and $R_T(y_t)$, that can be detected by the bivariate statistics K_T^*: and ξ_T^*:,

$$K_T^* = T^{-1} \max_t |d_t| / \hat{\sigma}_{\Delta d} \tag{4}$$

$$\xi_T^* = T^{-3} \sum_{t=1}^{T} d_t^2 / \hat{\sigma}_{\Delta d}^2, \tag{5}$$

where

$$d_t = R_T(y_t) - R_T(x_t), \tag{6}$$

for $R_T(y_t)$ = Rank [of $y_t$among$y_1, \ldots, y_T$] and $R_T(x_t)$ = Rank [of $x_t$among $x_1, \ldots, x_T$]. The $\max_t |d_t|$ is the maximum value of $|d_t|$ over t=1,2, …, T and

$$\hat{\sigma}_{\Delta d}^2 = T^{-2} \sum_{t=2}^{T} (d_t - d_{t-1})^2 \tag{7}$$

adjusts for possible correlation between the series of interest.

If no-cointegration is rejected, the technique follows with examining linearity in the cointegration relationship. Breitung (2001) generalizes the score test for the ECM representation to contrast the null hypothesis of linear cointegration against the alternative of nonlinear cointegration. To compute the score statistic, the following regressions are run, consecutively:

$$y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} y_{t-i} + \alpha_2 x_t + \sum_{i=-p}^{p} \alpha_{3i} \Delta x_{t-i} + u_t \tag{8}$$

$$\tilde{u}_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} y_{t-i} + \beta_2 x_t + \sum_{i=-p}^{p} \beta_{3i} \Delta x_{t-i} + \cdots + \theta_1 R_T(x_t) + .. + \tilde{v}_t, \tag{9}$$

where $\beta_0 + \sum_{i=1}^{p} \beta_{1i} y_{t-i} + \beta_2 x_t + \sum_{i=-p}^{p} \beta_{3i} \Delta x_{t-i}$ is the linear part of the relationship and it involves the ranked series $R_T(x_{jt})$.

Under the null hypothesis, it is assumed that the coefficients for the ranked series are equal to zero, $\theta_1 = 0$.[8] The *score statistic* $T \cdot R^2$, is distributed asymptotically as a χ^2 distribution. The null hypothesis may be rejected in favour of nonlinear relationship if the score statistic value exceeds the χ^2 critical values. Table IV shows the results of the cointegration test and non-linearity test.

[7] Unit Roots test are reported in Complementary Material document (3).

[8] The appropriate value of p is selected based on Akaike Information Criterion, such that serial correlation $\tilde{u}_t$ and possible endogeneity are adjusted based on Stock & Watson (1993).

Table IV. Results of nonparametric cointegration test and linearity test

	Test Statistics	
	$\Xi_T^*[1]$	$T \cdot R^2$
$[\mu_{\exp\_x_t}, \Delta_4 \ln GDP]$	0.0175**	7.4689***
Significance Level	**Critical values**	
10%	0.025	2.706
5%	0.020	3.841
1%	0.014	6.635

Notes: The hypothesis of no cointegration is rejected if the rank statistic, $\Xi_T^*[1]$ is below the respective critical value and the hypothesis of linearity is rejected if the score statistic, $T \cdot R^2$, exceeds the χ^2 critical values. *, ** and *** denote significance at 10%, 5%, according with the grades of freedom of each estimation.

According to the results, non-cointegration hypothesis and linearity are rejected. Therefore, results suggest that nonlinear a long-run relationship between Uruguayan GDP growth and expectations (the underlying trend of industrial sentiment indicators constructed in base of expectations series), exists.

Finally, we examine causality between the variables applying the nonparametric procedure proposed in Holmes & Hutton (1990). They proposed a multiple rank F-test, more robust than the standard Granger causality test. In case that the conditions of Granger estimations are satisfied, the multiple rank F-test results are alike the Granger results. The Holmes and Hutton multiple rank F-test is based on rank ordering of each variable. The causal relationship between y_t and x_t involves a test of a subset of q coefficients in the Autoregressive Distributed Lag (ARDL) model. As in Granger causality test, the null hypothesis is non-causality.

Table V. Results of Holmes & Hutton causality test

H-H causality test, H0= non-causality	**Uruguay**	
	Probability	**NC**
d(exp)-->d2(lGDP)	**0.000**	**A**
d2(lGDP)-->d(exp)	**0.143**	**R**
exp-->d4lGDP	**0**	**A**
d4lGDP-->exp	**0**	**A**

Notes: F-statistic, NC: H0: non-causality

Results (Table V) confirm the bidirectional causality between Uruguayan GDP growth and expectations (the underlying trend of industrial sentiment indicators constructed in base of expectations series) when the test is performed in levels (i.e. for the long run).However, in the short-run (that is when the H-H causality test is run in first differences of the variables) the evidence uniquely allows accepting causality from expectation to GDP growth.

4. Main conclusions

This paper provides evidence on the capacity of soft indicators to forecast GDP growth in a small and open economy like the Uruguayan (in line with previous studies for Uruguay: Lanzilotta, 2014; 2015). Moreover, it inquires on the way this variables are related, founding that there exists a non-linear fitting between them. This is a first step on stating the relationship between the variables. Future research includes the specification of the underlying non-linear model, a topic that opens a variety of possible models. Given the fact that the constructed sentiment indicators are based in series of expectations collected through surveys, main results shed light on some aspects of the formation of industrialists' expectations and sheds how these ultimately relates to GDP growth. More precisely, results indicate that Industrialists' expectation indicators (grouped into four classes according to their specialization and international insertion) follow a single common trajectory, which is determined by the trend of the export group index. This finding shows the importance of export industries in spreading macroeconomic expectations shocks.

The key role played by the most trade-oriented industries is associated with the importance of this group in the Uruguayan manufactured production. Export industries account for over 50% of industrial production (excluding the oil refinery) and have significantly backward spillover effects (because production inputs are primarily national). Besides their representativeness, their exposure to international trade makes them more competitive and provides them with access to extensive and complete information on the relevant macroeconomic and international context. Learning hypothesis postulated by Eusepi & Preston (2008) to explain the transmission of expectations to economic fluctuations, may also explain the findings of this research. This learning takes place among agents who do not receive information directly.

Additionally, by founding evidence in favour that sentiment indicators provide valuable information for anticipating and predicting the future of the economy, this document becomes part of a growing literature group (among the most recent, Kangasniemiet al., 2010; Kangasniemi & Takala, 2012; Claveria et al. 2016; Basselier et al. 2018; Kitrar et al. 2020). However, this work point out that the relationship is non-linear, so changes in expectations should not be taken in a direct way in the prediction of GDP growth.

The identification of a common trend in industrialists' sentiment indicators (based on expectations about the future of the economy), guided by the export group index reveals the production structure of what is an open economy whose dynamics are highly dependent on the long-term performance of the external sector. In line with these founding and following Juriová (2015), studding whether soft indicators of the main trading partners are relevant in the Uruguayan GDP growth forecasting would be interesting for future research. In addition, the results show that the opinions manifested by economic agents are partly driven by news prevailing at the time. This is in line with the results for Malta in Grech & Ellul, 2020. Future research that incorporates alternative aggregation methods for the construction of sentiment indexes should be done in order to check the robustness of these results.

Although this study is exploratory, and no assumption or model is assumed about the expectation formation process nor about the data generating process, its findings have potentially important implications for economic policy. The influence of the most trade-oriented industries on expectations and then on GDP growth is a signal for policymakers

seeking to mould expectations and create a climate of optimism during recessions so that their duration is lessened. The question of which factors ultimately determine expectations is still an open discussion in economic literature. Future exploratory research that helps to understand the expectations generating process in these key sectors can contribute in this subject and is certainly part of the agenda.

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