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When (where and why) forecasters get it wrong?

Zidong An[1], Umberto Collodel[2], Prakash Loungani[3]

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3 mars 2021

"There are two kinds of forecasters : those who don't know, and those who don't know they don't know."
John Kenneth Galbraith

Introduction

- Growth forecasts are the main product of leading institutional publications such as the IMF *World Economic Outlook* (WEO) and the World Bank *Global Economic Prospects* (GEP)

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- Forecasts of economic activity play a crucial role in shaping governments' policies and guiding investors' allocation of capital.

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- Their quality has, however, been repeatedly called into question by the academic world, specialized news agencies and individual governments alike.

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Finance & economics

Aug 4th 2020 edition ›

Abandoning hope

Official economic forecasts for poor countries are too rosy

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In this paper : a short roadmap

Take stock on all the main questions related to short-term growth forecasts quality

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In this paper : a short roadmap

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1. Comparison : Are forecasts produced by different institution any different ?
   Short answer : no...

In this paper : a short roadmap

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2. Bias : Are individual country forecasts optimistic or pessimistic on average ? Why ?
   Widespread optimism stems from asymmetry between recessions and non

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In this paper : a short roadmap

Take stock on all the main questions related to short-term growth forecasts quality

1. Comparison : Are forecasts produced by different institution any different ?
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2. Bias : Are individual country forecasts optimistic or pessimistic on average ? Why ?
   Widespread optimism stems from asymmetry between recessions and non

3. Programs : Do large programs correspond to larger forecast errors ? Is there evidence of a ~~deliberate~~ bias ?
   **Yes ! However, same relationship for private sector**

Section 1

Comparison

A large panel of growth forecasts

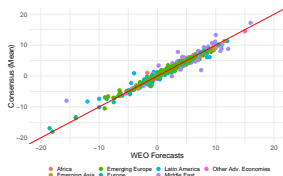| Forecaster	Release month	Availability
International Monetary Fund	April & October (Updates : January & June)	1990-2019 (Updates : 2010-2019)
Consensus	Every month	1990-2019
World Bank	January & July	2010-2019
European Commission	May & November	2010-2019

Perfect correlation among forecasters
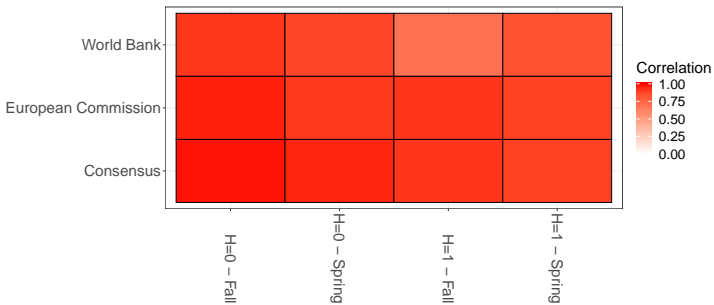

(a) World Bank and IMF
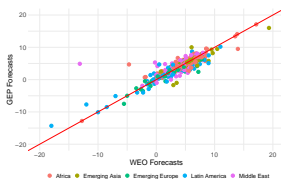
(b) European Commission and IMF
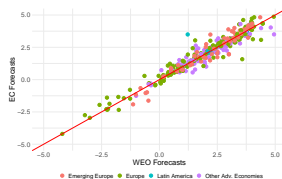
(c) Consensus and IMF

Note : Current year forecasts. Red line is 45 degrees line.

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Correlation robust to forecast horizon

Note : Each square of the heatmap represents the correlation between the forecasts of World Bank, European Commission or Consensus and the World Economic Outlook. Forecasts are matched to reduce any time difference.

Section 2

Bias

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How do we measure it ? Standard methodology

- Is there a systematic over/under prediction in WEO forecasts ?
- Actual growth : value reported in the following year Fall WEO publication
- Methodology : given

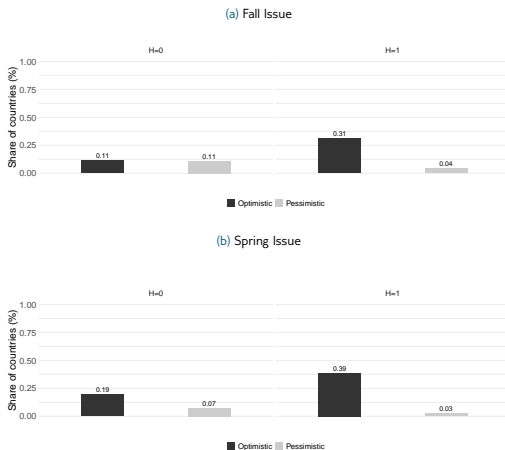$$e_{i,t|t-h} = y_{i,t} - \hat{y}_{it|t-h} \qquad (1)$$

where $e_{i,t|t-h}$ is the h steps ahead forecast error

$$e_{i,t|t-h} = \hat{\alpha}_i + \upsilon_{i,t} \qquad (2)$$

we compute $\hat{\alpha}_i$ the mean of the forecast error

More optimism than pessimism

(a) Fall Issue

(b) Spring Issue

Note : The figure shows the share of countries for each forecast horizon and issue of the World Economic Outlook (Fall or Spring) with a 5% statistically significant negative or positive bias. Test of statistical significance is run individually with country-by-country regressions.

An idea of magnitudes : roughly 1% on average

(a) Current year
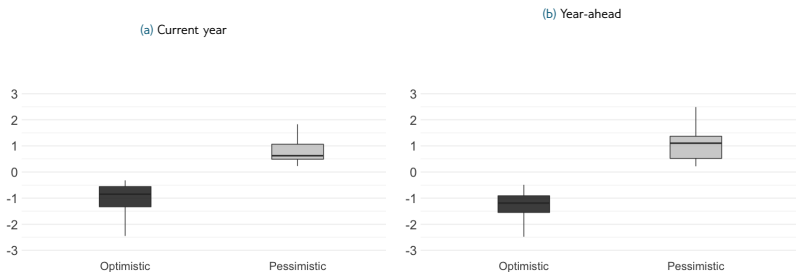
(b) Year-ahead

Note : The figure shows the distribution of 5% statistically significant negative or positive biases for the current year and year-ahead horizon in the World Economic Outlook. Test of statistical significance is run individually with country-by-country regressions

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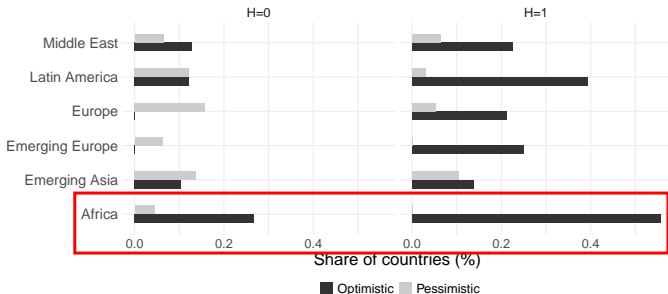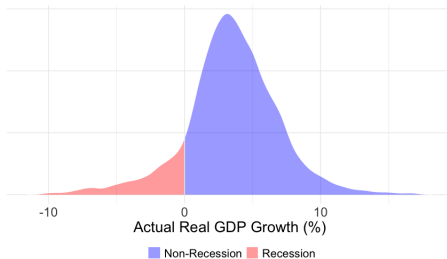# Growth optimism concentrated in African continent

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Preamble : recessions are not black swans

Figure – Real GDP Growth - Actuals

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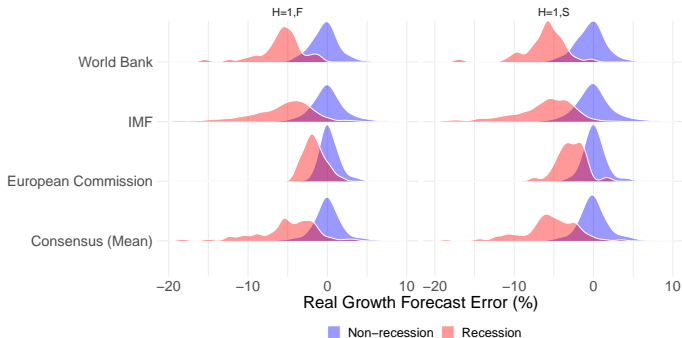○○○○○○○●○○○○

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Difference forecast errors during recessions and non

Note : Distribution of real GDP growth forecast errors at the Fall year-ahead horizon during recessions and non-recessions years. Recessions are periods of negative growth.

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Record of failure in predicting recessions
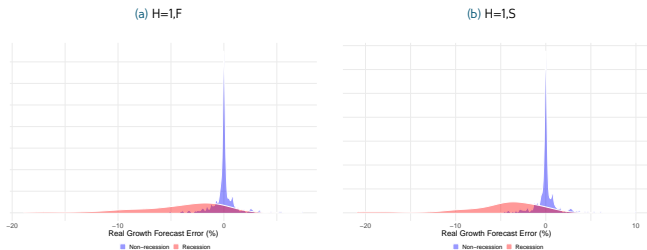

Note : Distribution of real GDP growth forecast errors during recessions and non-recessions years. Recessions are periods of negative growth.

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Robustness to "rockin' the boat"

(a) H=1,F

(b) H=1,S

Note : Distribution of real GDP growth forecast errors for a subsample of individual private forecasters. The subsample is composed by forecasters that for each country, year and horizon produce the forecast closest to the actual value. Recessions are periods of negative growth.

Possible explanations for this failure

- Poor modelling or data :

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Possible explanations for this failure

- Poor modelling or data : *Big Data and Machine Learning*

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Possible explanations for this failure

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Possible explanations for this failure

- Poor modelling or data : *Big Data and Machine Learning*
- Lack of incentives : *asymmetry between Type 1 and Type 2 errors*
- Behavioral reasons : *break down bad news gradually*
- Underlying process affected by random shock impossible to forecast

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Rule out the random shock hypothesis with Early Warnings
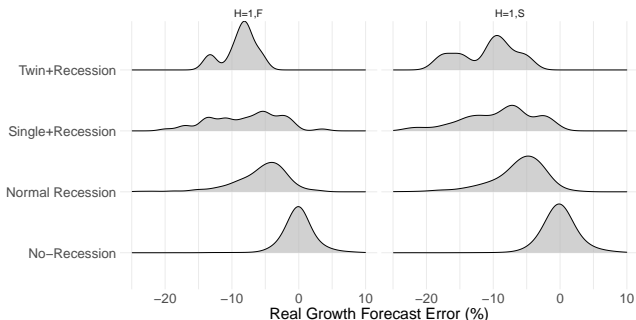
Note : Distribution of real GDP growth WEO forecast errors for episodes of no-recession, only recession and recession accompanied by a single or twin financial crises. Financial crises correspond to currency, banking and sovereign debt crises. The corresponding dummy is from Laeven & Valencia (2018).

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Section 3

Programs

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Programs and "big" programs : why this focus ?

Considerable controversy for three reasons :

Programs and "big" programs : why this focus ?

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- Justify higher credit with more optimistic forecasts

Programs and "big" programs : why this focus ?

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- Justify higher credit with more optimistic forecasts
- Fund becomes "de facto" creditor with a program : higher forecasts increases the chances of repayment

Programs and "big" programs : why this focus ?

Considerable controversy for three reasons :

- Justify higher credit with more optimistic forecasts
- Fund becomes "de facto" creditor with a program : higher forecasts increases the chances of repayment
- Forecasts are the result of discussions and a subsequent agreement between Fund officials and country authorities (Luna, 2014)

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Programs and "big" programs : why this focus ?

Considerable controversy for three reasons :

- Justify higher credit with more optimistic forecasts
- Fund becomes "de facto" creditor with a program : higher forecasts increases the chances of repayment
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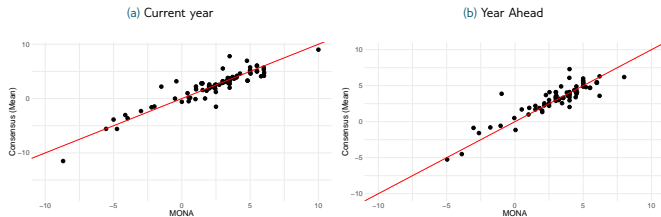
Data from Monitoring of Fund Arrangements (MONA) : 214 Programs approved in the period 2002-2019

Larger programs correspond to larger errors ...

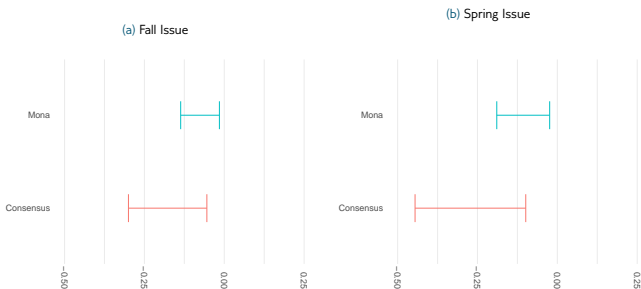|										
	Dependent variable :									
	GDP forecast error (current year)					GDP forecast error (year ahead)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post-GFC		0.340					−0.275			
		(0.225)					(0.314)			
Total amount (% quota)			−0.001**	−0.001**	−0.001*			−0.001**	−0.001**	−0.001***
			(0.0003)	(0.0003)	(0.0003)			(0.0004)	(0.0004)	(0.0005)
Remaining months				0.024					0.034	
				(0.033)					(0.046)	
Non-Concessional					0.211					−0.563*
					(0.250)					(0.340)
Constant	−0.348***	−0.525***	−0.174	−0.303	−0.323	−0.665***	−0.504**	−0.425**	−0.610**	−0.026
	(0.113)	(0.162)	(0.132)	(0.219)	(0.221)	(0.154)	(0.240)	(0.179)	(0.303)	(0.300)
Observations	225	225	225	225	225	216	216	216	216	216
F Statistic		2.282	6.081**	3.305**	3.394**		0.767	6.467**	3.514**	4.635**

Note : Dependent variable winsorized at the 10% level. Heteroskedasticity robust standard errors in parentheses. *** : significant at 1% level, ** : significant at 5% level, * : significant at 10% level.

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... but the forecasts of the private sector are comparable ...

(a) Current year

(b) Year Ahead

Note : Red line is 45 degrees line.

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... and the statistical relationship the same


(a) Fall Issue

(b) Spring Issue

Note : The figure shows 95% confidence intervals obtained regressing the forecast errors for programs on the amount of the program (in % of country quota). Data for forecasts are, respectively, from MONA and Consensus. The sample of programs corresponds to data availability for Consensus.
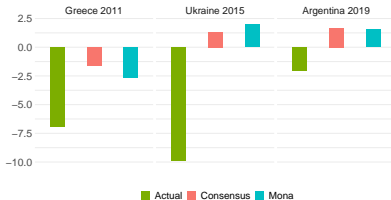
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You can have a look yourself!

(a) Current year forecasts
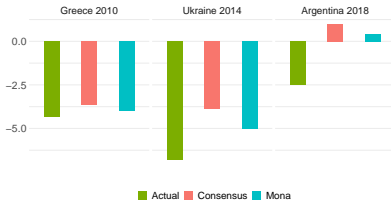
(b) Year-ahead forecasts

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Conclusion

Broad view on short-term growth forecasts combining large panel of projections

Conclusion

Broad view on short-term growth forecasts combining large panel of projections

- **Forecasts across different institutions and private sector are the same**

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Broad view on short-term growth forecasts combining large panel of projections

- **Forecasts across different institutions and private sector are the same**
- **Asymmetry between errors during recessions and expansions**
  Can be avoided ? Complementary role for Early Warning Systems

Conclusion

Broad view on short-term growth forecasts combining large panel of projections

- **Forecasts across different institutions and private sector are the same**
- **Asymmetry between errors during recessions and expansions**
  Can be avoided? Complementary role for Early Warning Systems
- **Large programs exhibit larger optimistic errors...**
  but the same relationship holds for the private sector.

Section 5

Preliminary Work

Larger forecast erros during Covid crisis than GFC
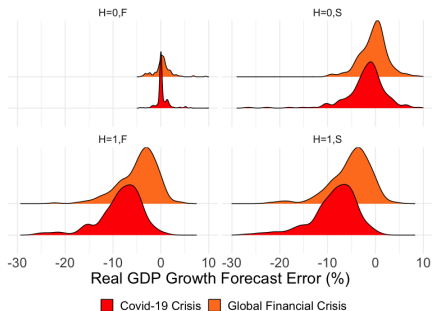
Horizon	Mean (GFC)	Mean (Covid-19)
H=0,F	0.37	0.2
H=0,S	-0.24	-1.57***
H=1,F	-4.04	-7.99***
H=1,S	-4.54	-8.04***

Note : The figure on the left side shows the distribution of real GDP growth forecast errors at different horizons for the Global Financial Crisis (GFC) (2009) and the Covid-19 crisis (2020). Actuals are from the January WEO of the following year. The table on the right side shows the results for a t-test of equal means between the two distributions.

However, some mitigating factors

- Difference at year-ahead horizon is justifiable : Covid-19 foremost example of completely exogenous shock

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- More optimism during the Spring of same year for Covid crisis compared to GFC can be result of time discrepancy

However, some mitigating factors

- Difference at year-ahead horizon is justifiable : Covid-19 foremost example of completely exogenous shock
- More optimism during the Spring of same year for Covid crisis compared to GFC can be result of time discrepancy
- Current year Fall forecasts quite accurate in both cases

Ideas for analysis

- Quality of medium-term forecasts (biasedness, accuracy and efficiency)
- The role of medium-run structural fiscal balance assumptions
- The role of long run assumptions in potential output IMF forecasts
- Sensitivity analysis for EBA and DSA
- Volatility from climate change and medium-term forecasts