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Patterns in IMF Growth Forecast Revisions: A Panel Study at Multiple Horizons

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JEL Classification: E17, E37, F47

Keywords: Economic forecasts, Forecast Revisions, Growth forecasts, WEO

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Patterns in IMF Growth Forecast Revisions:

A Panel Study at Multiple Horizons[*]

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Abstract

This paper investigates the performance of the IMF WEO growth forecast revisions across different horizons and country groups. We find that: (i) growth revisions in horizons closer to the actual are generally larger, more volatile, and more negative; (ii) on average, growth revisions are in the right direction, becoming progressively more responsive to the forecast error gap as horizons get closer to the actual year; (iii) growth revisions in systemic economies are relevant for growth revisions in all country groups; (iv) WEO and Consensus Forecast growth revisions are highly correlated; (v) fall-to-spring WEO revisions are more correlated with Consensus Forecasts revisions compared to spring-to-fall revisions; and (vi) across vintages, revisions for a given time horizon are not autocorrelated; within vintages, revisions tend to be positively correlated, suggesting perception of persistent short-term shocks.

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Contents

I. INTRODUCTION

How do growth forecast perform over time and across countries? To shed some light on this question, this paper evaluates the overall performance of the IMF World Economic Outlook (WEO) growth forecast revisions across different time horizons and country groups. The WEO database is a key reference for macroeconomic forecasts. It provides comprehensive global coverage of projections for the short and medium term prepared by IMF staff and is published biannually in Spring and Fall. This set of forecasts, especially those for real GDP growth, represents an essential component of the IMF macroeconomic policy advice, ground for discussions with country authorities, and a broad indicator of the future economic performance. The biannual revisions of these growth forecasts represent critical junctures in the forecasting process. Therefore, exploring the statitiscal properties (their patterns and underlying drivers) and the evolution of the forecast revisions offer an opportunity to gain deeper insights into the forecasting process and explore possible venues for improving their efficiency for different sets of countries. By focusing on forecast revisions, instead of the traditional forecast error approach, our analysis provides an alternative and complementary methodology to comprehend the properties and understand what drives the IMF growth forecasts.

More precisely, we investigate a broad set of questions to better understand the performance of WEO growth forecast revisions and shed light on the underlying factors that drive these revisions. Primarily, we focus on answering the following questions: First, are WEO growth revisions in the right direction? Second, what are the key drivers explaining the WEO growth revisions? Third, how do WEO revisions compare to Consensus Forecast revisions? Fourth, is there mean reversion/persistence in WEO growth forecasts? And lastly, how do theresults vary across time-horizons and country groupings?

Our empirical analysis offers several findings. First, growth revisions in vintages closer to the actual are generally larger, more volatile, and more negative. Second, on average, WEO growth revisions are in the right direction. Third, growth revisions in systemic economies are relevant for growth revisions (mainly in the last vintage), while the impact of terms-of-trade (ToT) revisions is weaker. Fourth, WEO and Consensus Forecast growth revisions move very closely together. Finally, revisions for a given time horizon are not autocorrelated across vintages; nonetheless, revisions tend to be positively correlated within vintages, suggesting a perception of short-term persistence of shocks.

The rest of the paper is organized as follows. Section 2 examines the literature that investigates the properties and performance forecasts from the IMF and other multilateral organizations. In Section 3, we summarize our data construction and methodology. Section 4 illustrates the descriptive findings of growth revisions across horizons and country groups. Section 5-7 presents the results of the formal econometric analysis. Lastly, Section 8 concludes.

II. MOTIVATION AND LITERATURE

While there has been a growing interest among the empirical literature to study the performance of growth projections, most papers focus on exploring the factors behind WEO growth forecast *errors* rather than growth forecast *revisions*. Among this literature, we identify three recurrent dimensions that are frequently investigated: forecast accuracy and presence of systematic forecast bias; forecast performance relative to comparators such as the Consensus Forecast; and how to incorporate available information to improve forecast efficiency.

These studies typically find scope for improving the accuracy and efficiency of WEO growth forecasts, and generally test their performance against other multilateral organizations. For instance, Timmermann (2006, 2007) finds that WEO forecasts for real GDP growth display systematic overprediction and could be improved by paying more attention to cross-country linkages. The paper also reports a similar performance between WEO forecasts and Consensus Forecast and discusses the possibility of improving efficiency. Genberg and Martinez (2014) find that WEO forecasts are not consistently biased, except in specific recessions. Their findings suggest that WEO forecasts perform similar to comparators, although efficiency could be improved by better taking account of developments in systemic economies. Celasun et al. (forthcoming) report that (absolute) forecast accuracy over the period 2004-2017 has improved compared to 1990-03, and conclude that forecasts could be improved for about 10-15 percent of the economies in the sample by taking into consideration growth forecasts of systemic economies and forecasts for the terms of trade. They also find that accuracy and bias of WEO forecasts are comparable to those of Consensus Forecast. On the other hand, Ismail, Perrelli, and Yang (2020) focus on growth forecasts for economies with stabilization programs and the role of planned policy adjustmends and find that large planned fiscal and external adjustments are associated with optimistic WEO growth projections, with significant non-linearities for both program and surveillance cases.

Our paper is also related to the strand of literature that studies the expectation formation process. We motivate part of our investigation on recent evidence on how economic agents form expectations, particularly how agents update their information sets and the effect on forecast revisions. For instance, Coibon and Gorodnichenki (2015) present a methodology to assess the degree of information stickiness and find that forecast-revisions made by professional forecasters are subject to significant informational rigidities. Similarly, Branch (2007) uses a maximum likelihood approach to compare the fit of different expectational models and finds evidence of sticky information in survey data. Moreover, his results suggest that the largest proportion of the Michigan survey update their beliefs every 3-6 months. Bordalo, Gennaioli, and Schleifer (2018) propose a model of credit cycles featuring diagnostic expectations (the notion that economic agents overweight future outcomes based on recent information) and show that the model can account for several empirical findings regarding credit cycles without the need for introducing financial frictions. Bluedorn and Leigh (2018) study the perceived persistence of output forecasts from advanced and emerging economies using data from Consensus Economics and show that professional forecasters expect output fluctuations to have permanent effects. Specifically, they find that a one percent surprise in current output is associated with an average adjustment of 2 percent for the 10-year-ahead output level in the same direction.

Against this background, our analysis aims to contribute in this literature by exploring the evolution and underlying factors that affect growth revisions. Centering our analysis on growth forecast *revisions*, instead of forecast *errors*, introduces an additional dynamic angle in the literature and provides novel complementary insights to understand the process behind the construction of growth forecasts.

III. Data and Methodology

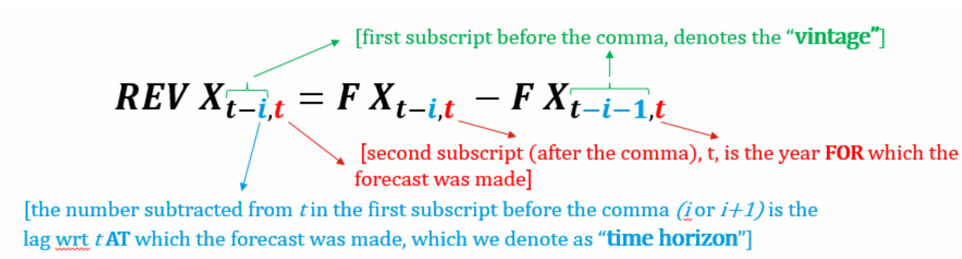
A. Dataset

We retrieved WEO growth and ToT ***forecasts*** from Celasun et al. (forthcoming), which includes Spring and Fall WEO vintages over the period 1990-2019 for 194 economies. For forecasts of year t, the dataset consists of 12 vintages in total from year t-5 to year t (Spring and Fall vintages for each of these six years). Hence, the dataset covers forecasts until 2024. Similarly, we retrieve WEO growth ***outturns*** from Spring and Fall WEO vintages. For outturn of year *t*, we collect data measured from year *t+1* to year *t+5*. For practical purposes, we focus our analysis mainly on outturns measured at *t+1* mainly to avoid a reduction in the number of observations. Still, we show robustness for the outturns measures at t+5. The dataset also includes growth forecasts from the Consensus Forecast, collected from March and September vintages to make them comparable to the Spring and Fall WEO vintages, respectively.

B. Methodology

Definitions and Notation

For every country, for each year (*t*), the forecast revisions (*REV*) of any variable *X* are defined as the forecast (*F*) made in (*t-i*) minus the forecast made in (*t-i-1*):



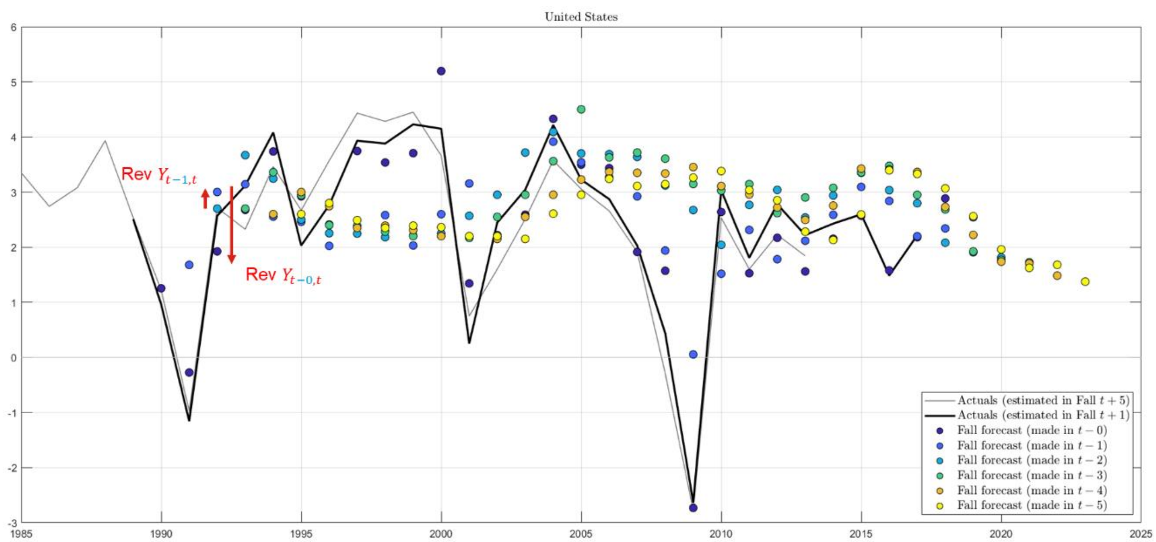
$$\forall\, i = 0,1,\dots,4$$
$$\forall\, t = 1990{:}2023$$

We denote with "*i*" the "time horizon" for different vintages, i.e. for how many years ahead the forecast is made. The "vintage" denotes the year when forecasts or revisions were made and is captured by the first subscript. The second subscript denotes the year for which the forecasts was made. We often focus on the revision vintages closest to the actual "$\boldsymbol{F}_{(\boldsymbol{t-0},\boldsymbol{t})} - \boldsymbol{F}_{(\boldsymbol{t-1},\boldsymbol{t})}$" or for brevity "*F0-F1*" (i.e., revisions to forecasts for the current year, as opposed to revisions to forecast made for outer years). Defined this way, growth forecasts, outcomes, and revisions are illustrated graphically in Figures 1 and 2 over the period 1990-2024 and using the US as an example[1].

Figure 1 focuses only on the Fall forecasts over the period 1990-2024 to provide a clean illustration of the adjustment in growth forecasts across vintages[2]. The solid black line represents the actual outcomes measures in year *t+1*, while the grey line measures the corresponding ones in year *t+5*. The earliest horizons are depicted by yellow circles (Fall forecasts made in *t-5*) and the color gets darker as one moves toward the more recent ones, with the blue circles refering the latest horizon, i.e. the Fall forecast in the corresponding year (*t-0*). Hence, the revisions are captured by the distance between the corresponding circles (growth forecasts).

For example, the figure illustrates the revisions for growth in year 1992 by the two red arrows: the upward arrow shows the revision from the forecast made in *t-2* (Fall 1990) to the revision made in *t-1* (Fall 1991) for growth of year *t* (1992). Similarly, the downward arrow depicts the revision from the forecase made in *t-1* (Fall 1991) to the revision made in *t-0* (Fall 1992) for growth of year *t* (1992).

Figure 1. Sample: US Growth Forecasts, Outcomes, and Revisions



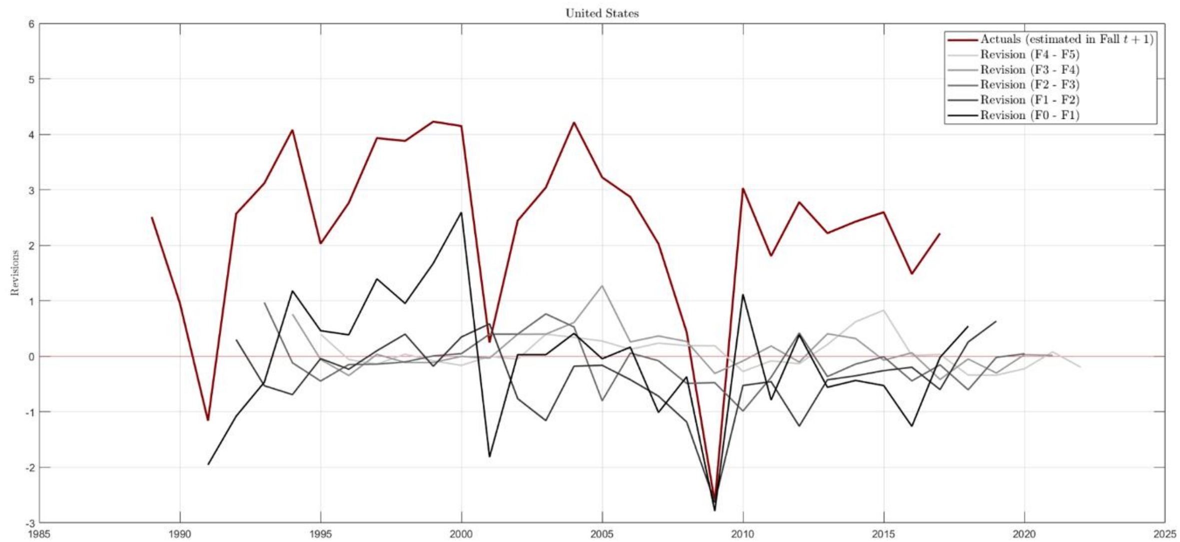
Source: WEO datbase and authors' calculations

Figure 2 shows the full set of revision series (fall to fall) together with the actual outcomes. Each black/gray line corresponds to the time series of vintages of revisions, for a given time horizon. The lines get darker as the revision horizons comes closer to the actual outcome, which is depicted by the black line. The red line serves as a reference for the actual outturns.

[1] For a graphical representation of the full set of revisions (Fall and Spring), please refer to the Annex.

[2] For clarity purposes, we only display two set of outturns.

Figure 2. Sample: US Growth Revisions (and Outcomes)



Source: WEO datbase and authors' calculations

Regression Specifications

The formal empirical analysis employs the following set of of regression specifications (1)-(5). Regression specification (1) explores whether the WEO growth forecast revisions are generally made in the right direction by looking at the relationship between the forecast error and the forecast revision in the following period. Specifications (2) and (3) investigate the impact of growth revisions for systemic economies and the impact of revisions to the terms-of-trade, respectively. Specification (4) checks the joint impact of both factors on individual countries' growth revisions. Finally, equation (5) checks the relationship between growth revisions from the WEO and the corresponding revisions from Consensus Forecast.

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ FE\ Y_{t-i-1,t} + \varepsilon_t \quad (1)$$

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^1_{t-i,t} + \varepsilon_t \quad (2)$$

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^2_{t-i,t} + \varepsilon_t \quad (3)$$

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^1_{t-i,t} + \beta_2\ REV\ X^2_{t-i,t} + \varepsilon_t \quad (4)$$

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ CF\ Y_{t-i,t} + \varepsilon_t \quad (5)$$

Where Y_t is the percentage change of real GDP at time *t*; $FE\ Y_{t-i-1,t}$ is the forecast error defined as $F_{t-i-1,\,t} - A_{t+1,\,t}$ (where $A_{t+1,\ t}$ is actual outturn for year *t* reported at *t+1*); $X^1_{t-i,t}$ is the percentage change of real GDP for one of the systemic economies considered in this analysis (US, China, Euro Area, G7, or the World); $X^2_{t-i,t}$ is the percentage change in the

WEO terms-of-trade; $REV\ Y_{t-i,t}$ is the WEO revision for real GDP; and $REV\ CF\ Y_{t-i,t}$ denotes the corresponding revision for real GDP from the Consensus Forecast.

We run panel data regressions for each horizon *i* (for simplicity we do not specify the country indicator *c* in the formula) allowing for random effects (RE) and country-specific fixed effects (FE). Our econometric exercise consists of running these regressions for the full sample as well as for country-group subsamples (Table 1). Appropriately, we also run Hausman specification tests to check which of the two methods (RE and FE) is the preferred one in each specification. In general, the coefficients from RE and FE are quite similar.

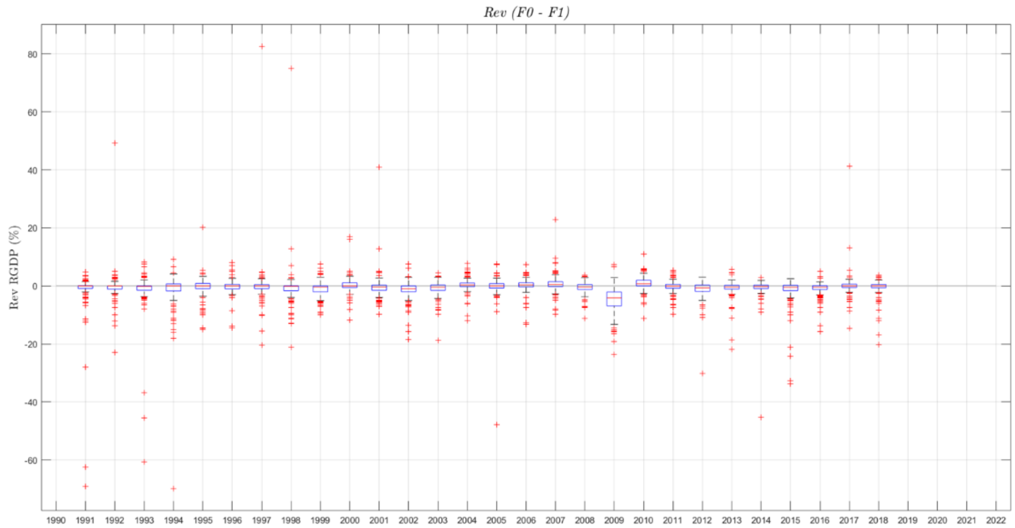
Table 1. Country-group Subsamples

	Label	Country group
1	All	All countries
2	AE	Advanced Economies
3	EMDE	Emerging Markets and Developing Economies
4	LICS	Low Income and Developing Economies
5	EEUR	Emerging and Developing Europe
6	DASIA	Emerging and Developing Asia
7	LAC	Latin America and the Caribbean
8	MENAP	Middle East, North Africa, Afghanistan, and Pakistan
9	SSA	Sub-Sahara Africa

IV. Descriptive Findings

Figure 3 shows a boxplot of the full sample of revisions for global (world) growth grouped by year and made in the latest horizon (F0-F1), i.e. between the Fall of the year for which the forecast is made and the Fall of the previous year. Specifically, the figure shows that growth revisions are sometimes massive, ranging from -70 percentage points to +80 percentage points (reflecting exceptional events). For practical purposes, our visual analysis in the subsequent three similar figures will zoom in the core segment of this distribution (i.e. the revisions for annual growth within the more moderate range of -10 to +10 percentage points).

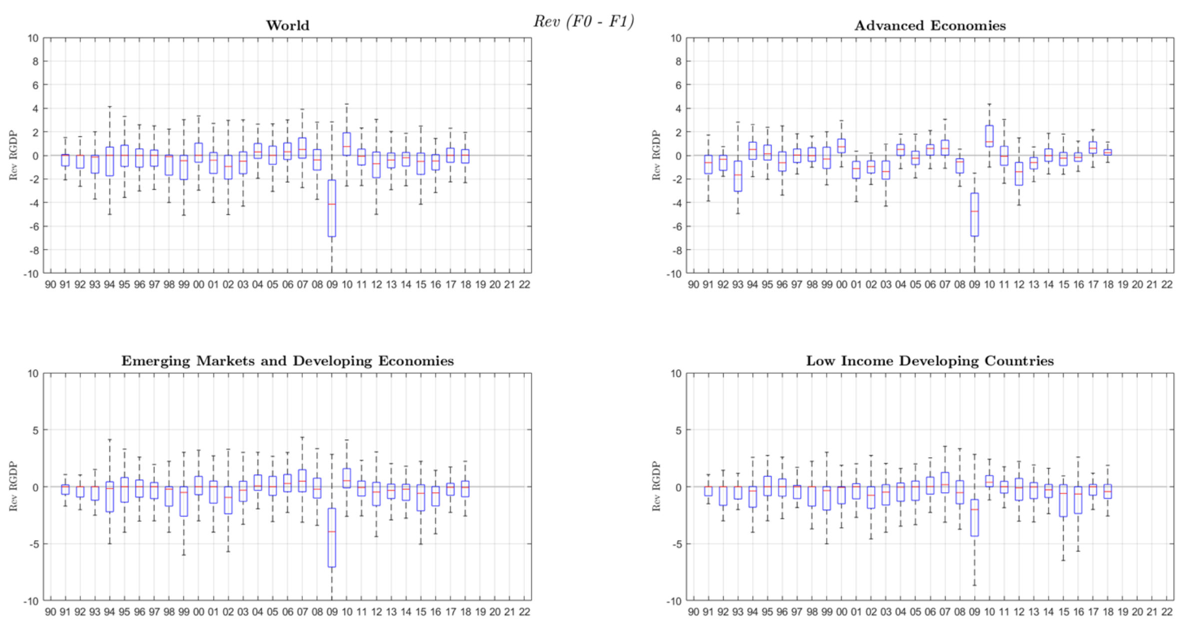
Figure 3. World Growth Revisions: Full Sample



Note: Growth revisions for the world in the latest revision horizon (F0-F1).
Source: WEO database and authors' calculations.

In Figure 4 we show the distribution of growth revisions (in the last horizon close to actual, i.e. F0-F1) for the world and different country groups. The key visual finding emerging from these charts is that growth revisions closest to the actual have often been negative, especially during GFC, and across income groups.

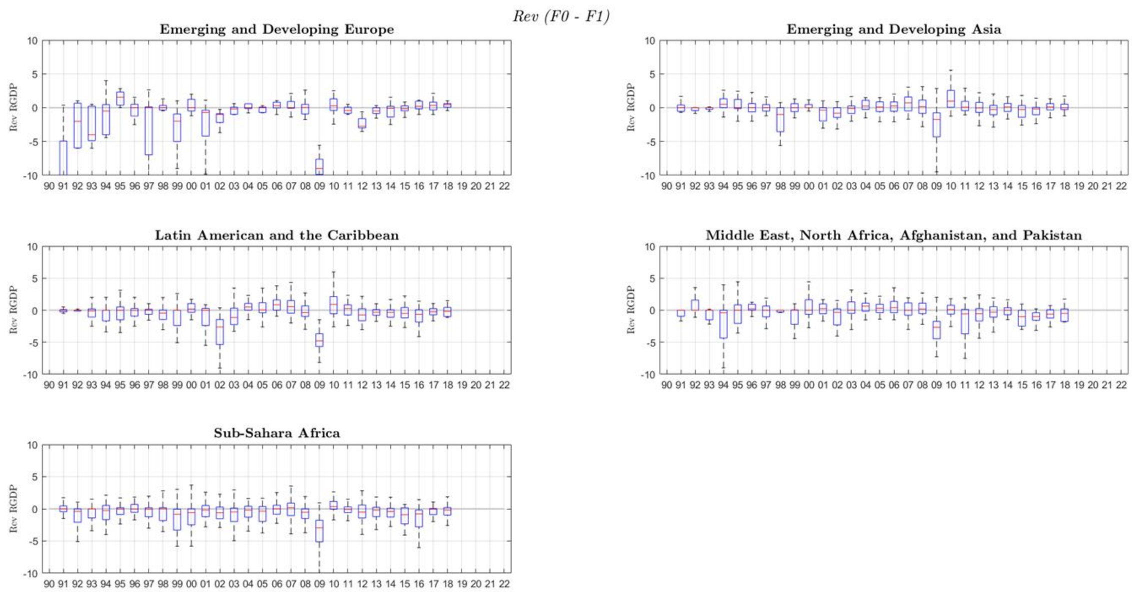
Figure 4. Growth Revisions for the World and Country Groups



Note: Growth revisions for the world in the latest revision horizon (F0-F1).
Source: WEO database and authors' calculations.

Figure 5 suggests that the picture seen for different income groups in Figure 5 also applies to the various regions of EMDEs: growth revisions are more likely to be negative in general across all regions. This tendency is especially visible during the transition in Eastern Europe in the early 1990s, the Asian Crisis in the late 1990s, and the Arab Spring in the 2010s, when growth revisions have been substantially adjusted to reflect large shocks.

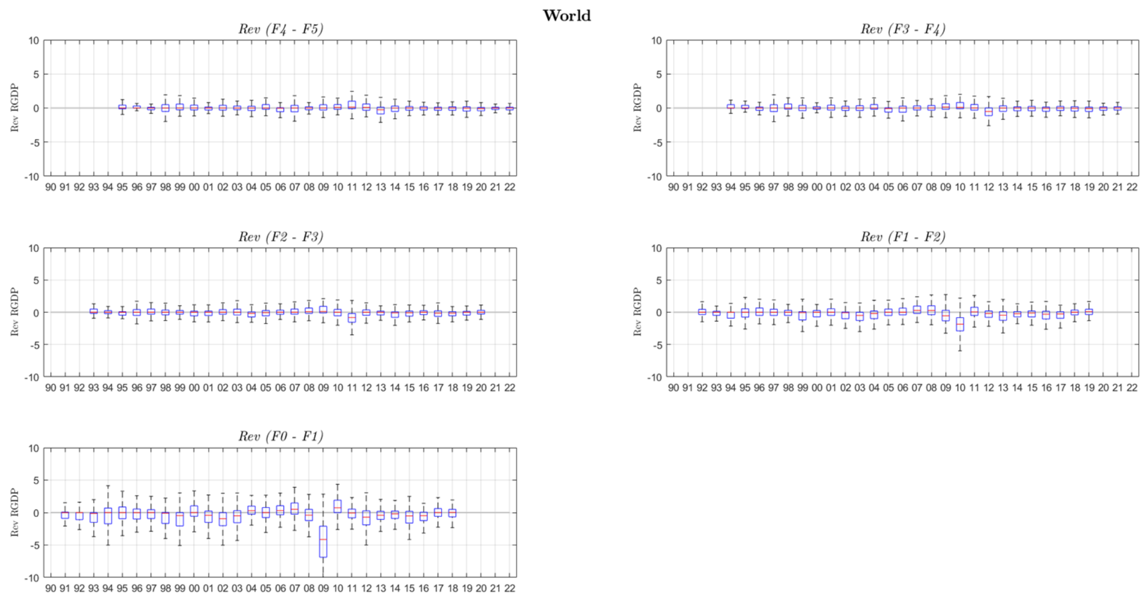
Figure 5. Growth Revisions for the World and EMDE Regions



Note: Growth revisions for the world in the latest revision horizon (F0-F1). For Emerging and Developing Europe the 25th percentile of the distribution of growth revisions is -28 ppts in 1991 and -11 ppts in 2009.
Source: WEO database and authors' calculations.

While Figures 3–5 presented the evolution of the growth revisions made in the latest horizon for different country groups and regions, Figure 6 shows growth revisions for the world made at the different horizons. The different panels suggest that, across time horizons, most action takes place during the latest revision, i.e. between the Fall WEO in the year for which the forecast is made and the Fall WEO of the previous year. In contrast, revisions in the earlier horizons seem considerably more stable.

Figure 6. Growth Revisions for the World Across Time Horizons

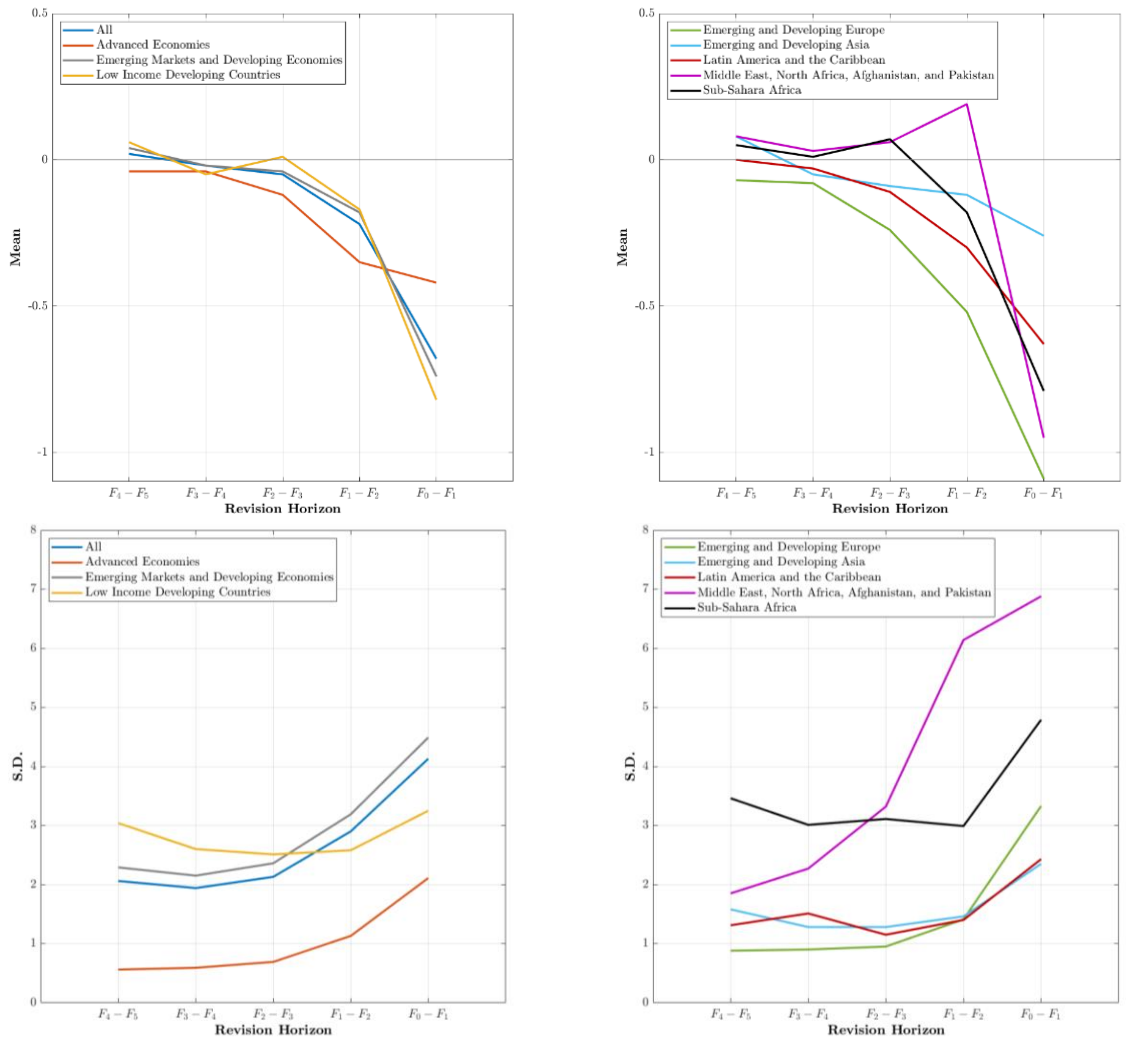


Note: Growth revisions for the world in different horizons.
Source: WEO database and authors' calculations.

Figure 7 summarizes the visual findings regarding the WEO revisions. The upper charts show the mean revisions for different country groups and regions across all five time horizons (starting from the most distant F4-F5 at the left to the latest horizon F0-F1 at the right in each chart), while the lower charts show the corresponding standard deviations.

Overall, the main finding from Figure 7 is that most recent growth revisions are generally larger, more volatile, and more negative. The fact that recent growth revisions are larger and more volatile imply that most action happens in the latest vintage. In addition, the finding that the revisions are more negative means that either forecast teams have been generally optimistic in their forecast or that growth shocks tend to be negative on average.

Figure 7. Summary: Visual Evidence About Growth Revisions



Note: The upper charts show mean revisions for different country groups and regions across five time horizons. The lower charts show the corresponding standard deviations.

Source: WEO database and authors' calculations.

V. Understanding Growth Revisions

In this section, we shift our focus to a formal regression analysis aimed at understanding the evolution of growth revisions. In particular, we study if growth forecasts are revised in the right direction, on average. We then center our analysis on exploring the factors that drive growth revisions over time.

A. Are Revisions in the Right Direction?

We run panel regressions given by specification (1) to investigate whether WEO growth revisions are generally in the right direction:

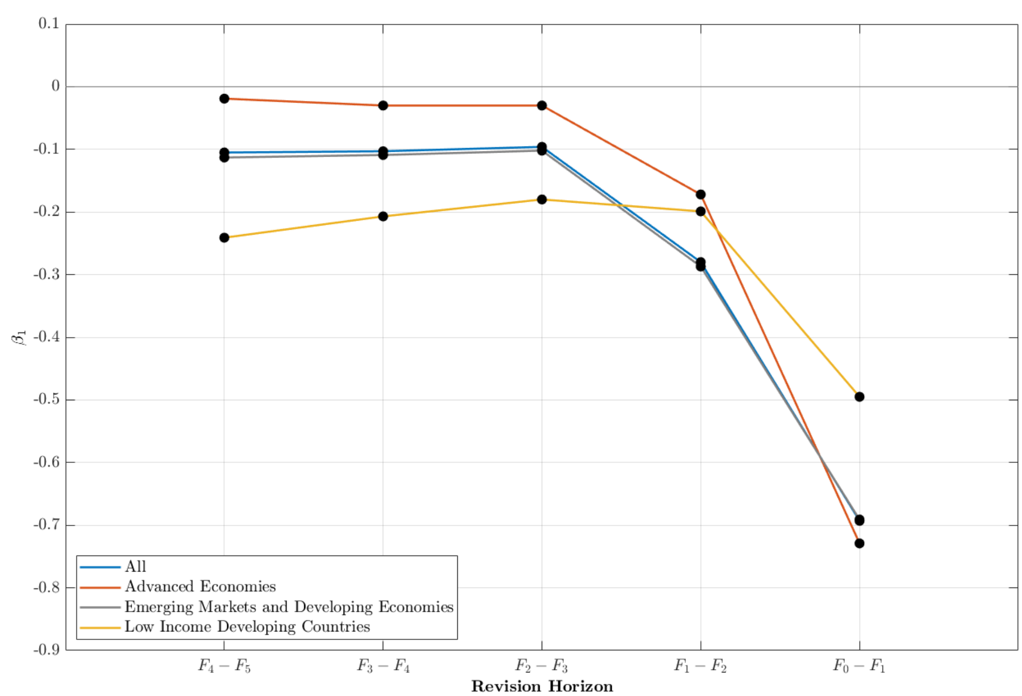
$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ FE\ Y_{t-i-1,t} + \varepsilon_t \qquad (1)$$

For this purpose, we focus on the slope coefficient β_1, which captures the co-movement between the growth forecast errors for year *t* (imbedded in the forecasts done *i+1* years ahead and calculated relative to the ex-post growth outturns of year *t*) and the growth forecast revisions done in the subsequent period (hence the difference between the *i* years ahead forecast and the *i+1* years ahead forecast). If this slope coefficient is negative, then the revisions are done in such a way as to narrow the forecast error from the previous period. In other words, when the forecast was higher than what the actual will turn out to be ($FE\ Y_{t-i-1,t} > 0$), then the following year forecast was revised down ($REV\ Y_{t-i,t} < 0$).

The estimation results from the set of regressions are presented in Figure 8. The negative results found for the slope coefficient β_1 suggest that—on average—when the forecast was higher than what the actual will turn out to be, then the forecast was revised down. Hence, on average, the revisions narrow/close the forecast error gap, implying that revisions were generally in the right direction. This finding applies to all revision horizons and all country groups.

The second important result from Figure 8 refers to the change in the estimated slope coefficients across revision vintages—the coefficients become more negative for vintages closer to the actual. Such findings suggest that forecast revisions become progressively more related to the forecast error gap as horizons get closer to the actual outturn (β_1 increase in absolute value), i.e. corrections are stronger for forecasts which are made closer to the actual year.

Figure 8. Relationship Between Forecast Errors and Revisions

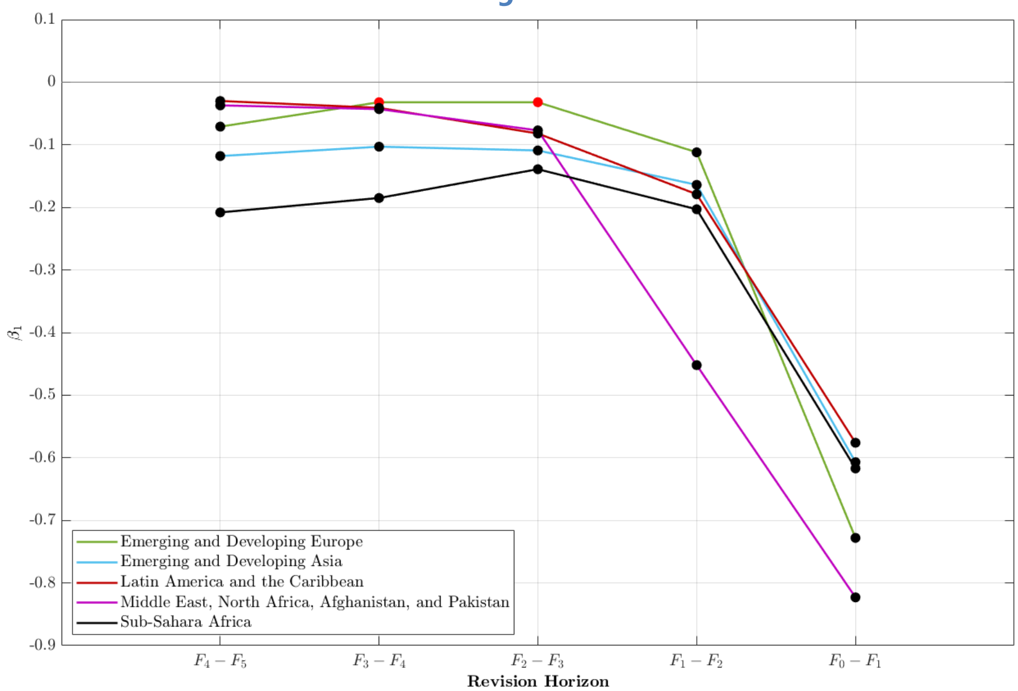


Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

Figure 9 presents the estimation results different EMDE regions. The results are similar to those reported in Figure 8. All estimated slope coefficients are negative, suggesting that revisions across EMDE regions are generally in the right direction; and slope coefficients decrease as one moves towards more recent horizons, implying that forecast revisions become progressively more related to the forecast error gap as forecasts horizons are closer to the actual.

There are two additional region-specific findings from Figure 9 worth noting. First, LAC is persistently one of the least responsive groups (one of the lowest coefficients in absolute value), in terms of adjusting the revision towards narrowing the forecast error gap. Second, MENAP becomes especially responsive in the last two revision horizons, while Emerging Europe in the last one.

Figure 9. Relationship Between Forecast Errors and Revisions Across EMDE Regions



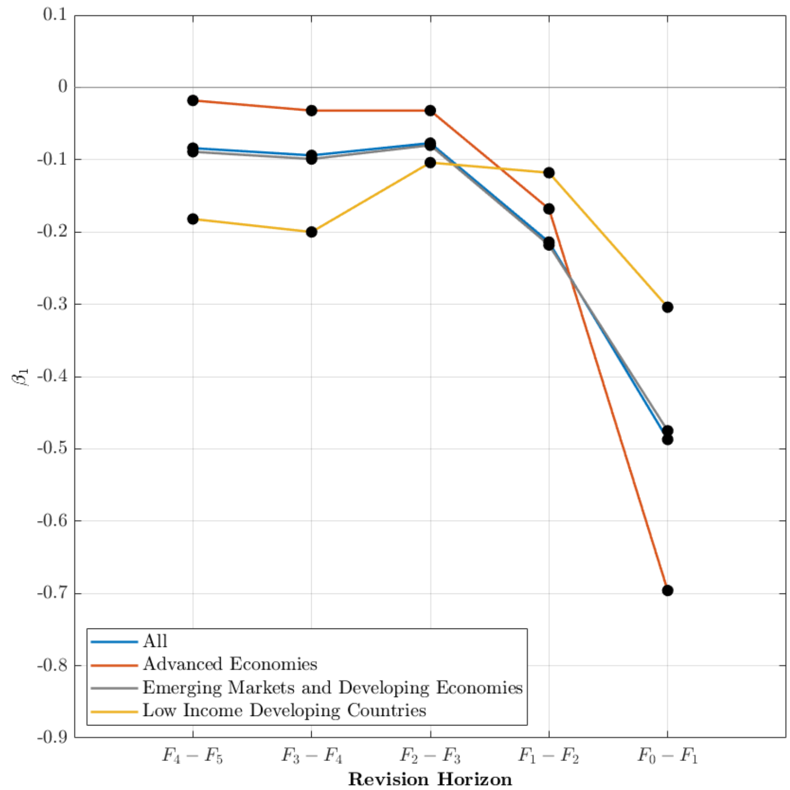
Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

Robustness to Outturn Updates

The estimation results previously presented were based on specifications that calculated the forecast errors as the difference between the growth forecast for year *t* and the actual ex-post growth outturn for year *t* reported in the following year *t+1*. However, the actual outturns are often updated in subsequent years, and it is essential to check if the results are sensitive to the outturn measurement used.

Figures 10 and 11 report estimation results based on forecast errors calculated as the difference between the growth forecast for year *t* and the actual ex-post growth outturn for year *t* reported at *t+5* (instead of actual outturns from year *t+1* as employed in the specifications reported previously).

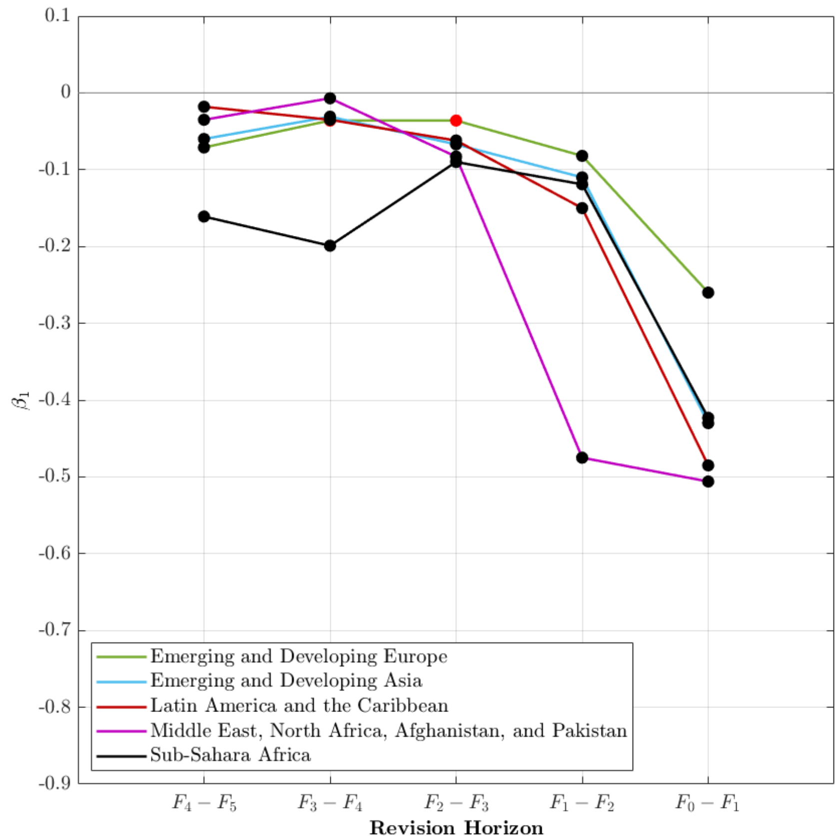
Figure 10. Relationship Between Forecast Errors and Revisions: Robustness to Outturn Updates



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

The estimation results reported in Figures 10 and 11 suggest that the relationship is robust when using outturns revised at *t+5* (albeit leaving less observations). In addition, the relationship weakens somewhat for EMDEs. In fact, for these economies, it seems easier to forecast the actual as it will be measured at *t+1* than at *t+5*, suggesting that subsequent revisions may incorporate factors that were not visible in real time.

Figure 11. Relationship Between Forecast Errors and Revisions Across EMDE Regions: Robustness to Outturn Updates



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

B. What Factors Drive Growth Revisions?

Role of Systemic Economies' GDP Revisions

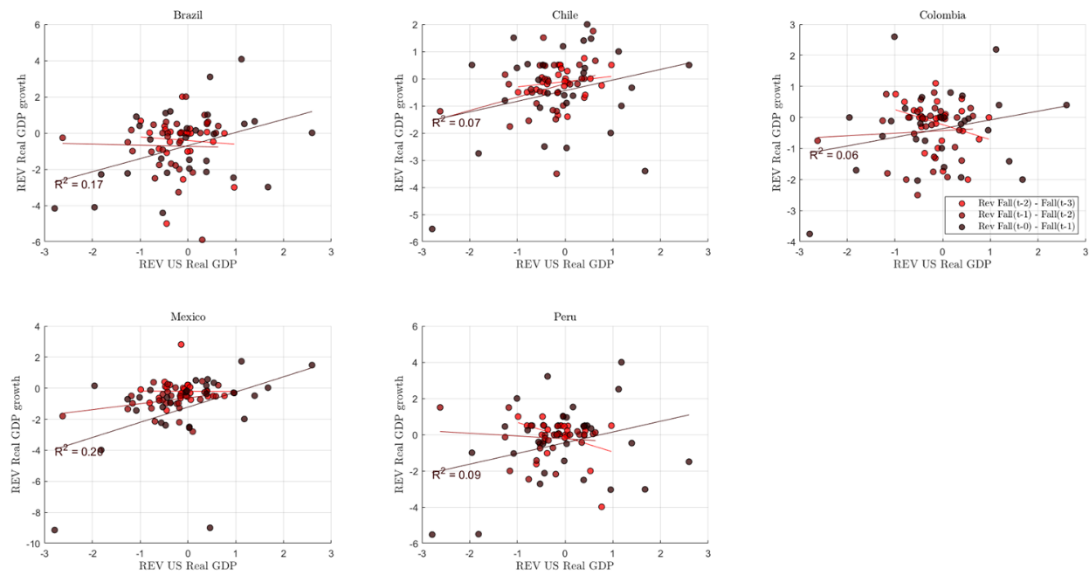
Growth revision for systemic economies may have an impact on growth revisions for economies across the world, via cross-country trade and financial linkages. For instance, upward growth revision in the US may lead to upward revisions in economies that maintain strong trade linkages with the US, such as Mexico. To investigate the relevance of this factor, we first present correlation evidence and later switch to formal regression analysis.

As an example, Figure 12 depicts the relationship between the growth revisions for the US and the corresponding growth revisions for five large economies in Latin America (LA5).[3] The visual evidence suggests that the impact of growth revisions in the US (systemic economies) upon growth revisions in individual LA5 economies increases as the time horizon gets closer to the actual, i.e. the relationship steepens for vintages closer to the

[3] Similar descriptive findings for the impact of US growth revisions in other groups of economies (G7, Euro Area, Asian, African, and Middle East) are presented in the Annex.

actual, which are depicted by darker lines. In turn, such findings suggest that growth revisions for systemic economies are especially taken into account by forecast teams when they forecast for the near future.

Figure 12. Relationship Between Growth Revisions in the US and in LA5



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.
Source: WEO database and authors' calculations.

After presenting indicative sample evidence of the revisions' relationship across time-horizons, we turn our discussion to a formal regression analysis and explore the impact of growth revisions in systemic economies upon growth revisions for individual economies. In particular, we investigate the slope coefficient of the systemic economies' growth revision (β_1) from the following univariate and multivariate specifications:

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^1_{t-i,t} + \varepsilon_t \quad (2)$$

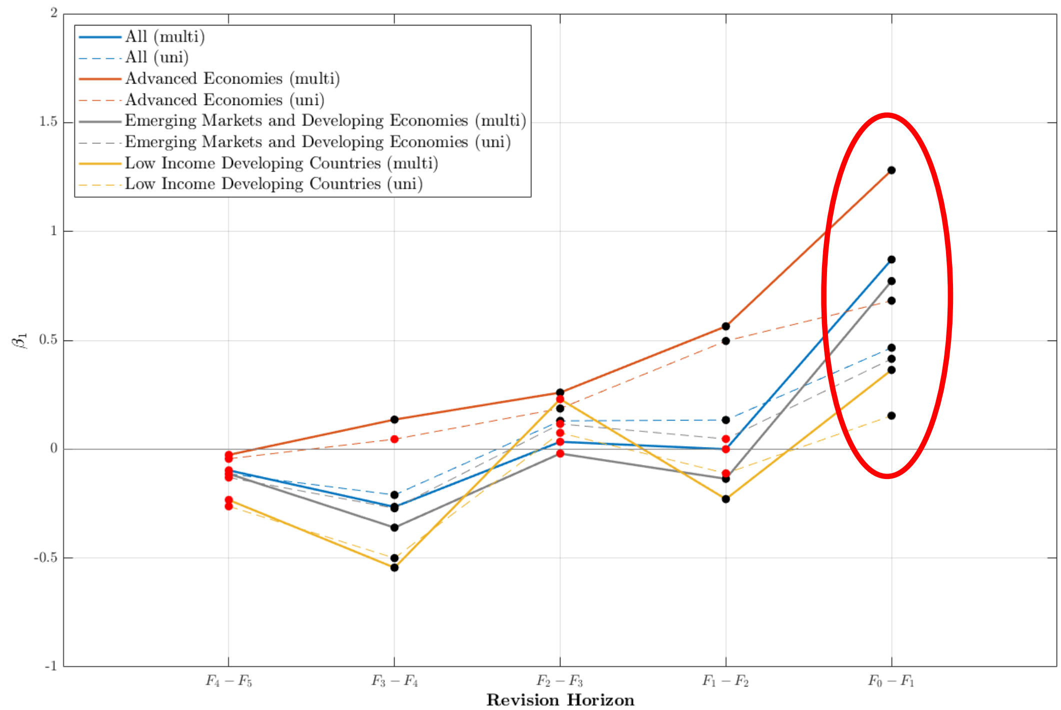
$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^1_{t-i,t} + \beta_2\ REV\ X^2_{t-i,t} + \varepsilon_t \quad (4)$$

Figure 13 presents the estimation results for the slope coefficient β_1 across different horizons, taking the US as an example for systemic economy.[4] Overall, the panel regressions confirm the descriptive analysis. Growth revisions in the US influence growth revisions across the world: for advanced economies across all time horizons; and for other countries in later horizons.

Moreover, the impact is more relevant for the revisions closest to the actual as shown by the higher value for β_1 in the latest horizons. The figure depicts results from univariate (dotted) and multivariate (solid) regressions that also include ToT showing a similar picture of the role of growth revisions in the US upon growth revisions in individual economies across the world.

[4] We present similar results for the other systemic economies (China, Euro Area, G7, World) later in the analysis.

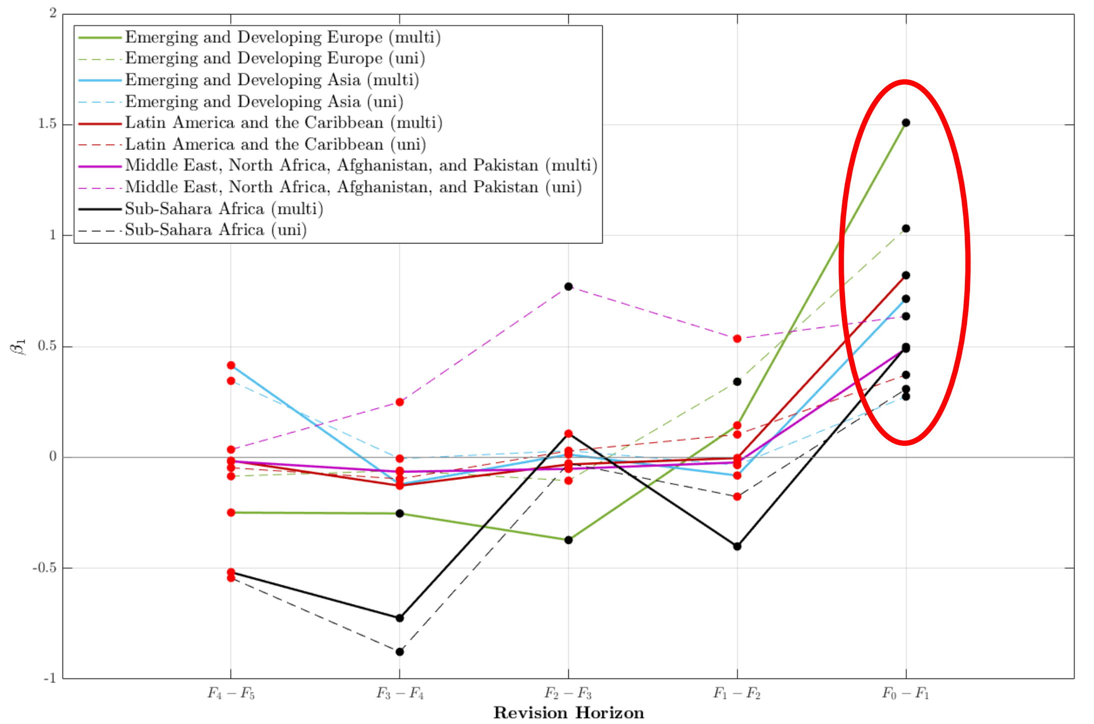
Figure 13. Impact of Growth Revisions in Systemic Economies



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Dotted lines refer to results from univariate regressions, while solid lines depict results from multivariate regressions.
Source: WEO database and authors' calculations.

Similar conclusions apply when looking at the estimation results for different EMDE regions. As such, Figure 14 shows that growth revisions in the US are relevant for growth revisions in countries from all EMDE regions. Moreover, the impact is again larger for revisions closer to the actual (steeper lines across horizons) for both univariate and multivariate specifications.

Figure 14. Impact of Growth Revisions in Systemic Economies Across EMDE Regions



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Dotted lines refer to results from univariate regressions, while solid lines depict results from multivariate regressions.
Source: WEO database and authors' calculations.

Table 2 presents the regression results about the impact of the US growth revisions upon individual economies in the latest revision horizon. The top panel shows that the impact of US growth revisions is significant in the univariate specifications for all country groups and regions. In contrats, the bottom panel shows that the impact of the revisions is robust to the inclusion of ToT revisions and remains significant in the multivariate specifications for all country groups and regions.

Table 2. Regression Results: Impact of Growth Revisions in Systemic Economies (Latest Vintage)

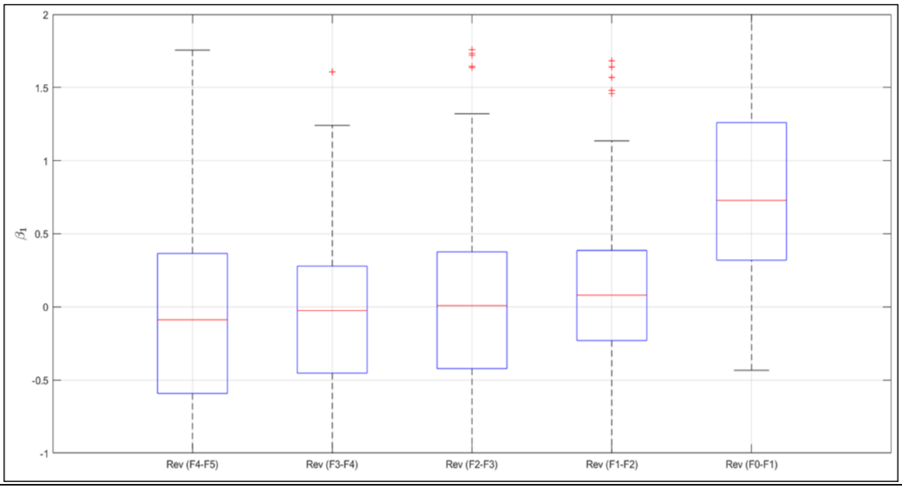
Y Var Rev0 RGDP	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev US RGDP	0.466	0.682	0.415	0.154	1.032	0.274	0.372	0.636	0.308
	(0.05)	(0.06)	(0.06)	(0.07)	(0.17)	(0.08)	(0.07)	(0.24)	(0.12)
	[0.000]	[0.000]	[0.000]	[0.029]	[0.000]	[0.000]	[0.000]	[0.008]	[0.009]
Observations	4968	961	4007	1578	267	704	896	621	1219
Countries	192	38	154	59	12	30	32	23	45
R-squared	0.02	0.14	0.01	0.00	0.12	0.02	0.03	0.01	0.01
Adjusted R-squared	-0.02	0.10	-0.03	-0.04	0.08	-0.03	0.00	-0.03	-0.03
Y Var Rev0 RGDP	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev dToT	0.002	-0.024	0.003	-0.006	-0.075	0.012	0.027	0.013	0.001
	(0.00)	(0.02)	(0.00)	(0.00)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)
	[0.469]	[0.180]	[0.449]	[0.152]	[0.059]	[0.223]	[0.012]	[0.319]	[0.858]
Rev US RGDP	0.871	1.281	0.772	0.364	1.509	0.715	0.821	0.49	0.498
	(0.06)	(0.09)	(0.07)	(0.11)	(0.17)	(0.13)	(0.12)	(0.24)	(0.15)
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.039]	[0.001]
Observations	3071	595	2476	982	179	381	565	364	778
Countries	183	35	148	58	11	26	32	23	44
R-squared	0.07	0.27	0.05	0.02	0.34	0.08	0.09	0.02	0.02
Adjusted R-squared	0.01	0.22	-0.01	-0.05	0.29	0.01	0.03	-0.05	-0.05
Standard errors in parenthesis p-values in brackets									

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
The top panel reports results from univariate specifications given by equation (2), and the bottom panel from multivariate specifications given by equation (4).

Furthermore, we also verify the above results running individual country regressions and inspect the distribution of the coefficients. In Figure 15 we shows the slope coefficients estimated from individual-country regression specifications. With this regression exercise, we find that the impact of US growth revisions are in line with the panel results, mainly that the entire distribution of estimated slope coefficients for individual countries shifts upwards in the last horizon.[5]

[5] The vertical axis in Figure 15 has been truncated to be consistent with the previous charts. The full distribution of slope coefficient estimates is available in the Annex.

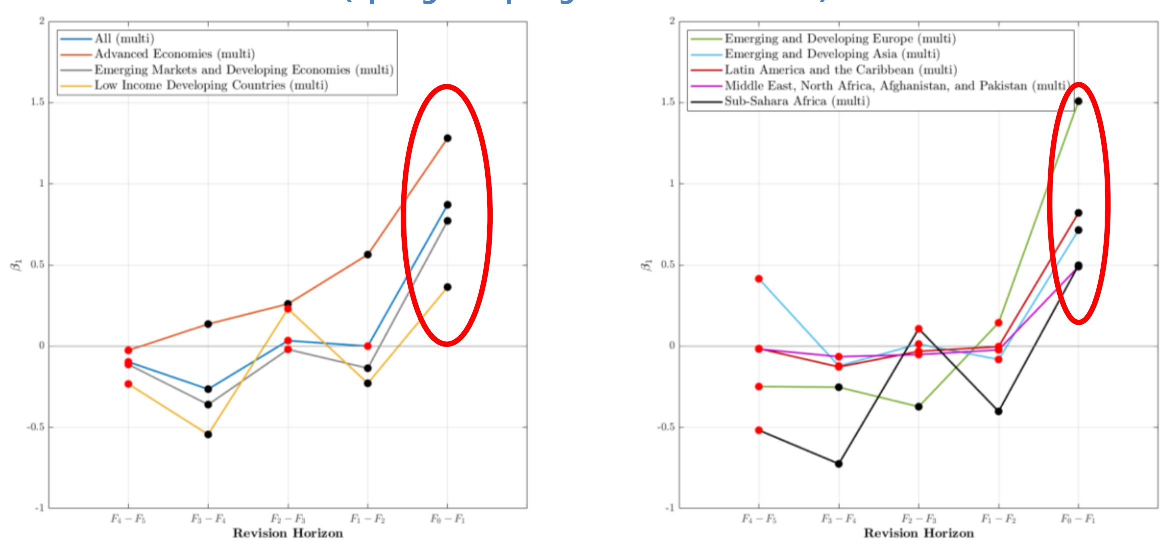
Figure 15. Impact of US Growth Revisions on Growth Revisions in Individual Economies



Note: The boxplots depict the interquartile range of the distribution of estimated slope coefficients from individual-country regression specifications.
Vertical axis truncated to be consistent with the previous charts. Full distribution is available in the Annex.
Source: WEO database and authors' calculations.

We also verify if the same findings apply when using Spring-to-Spring revisions (instead of Fall-to-Fall as in the previous exercises). Figure 16 reports a summary of the regression results employing the Spring-to-Spring revision horizons. All previous conclusions hold.

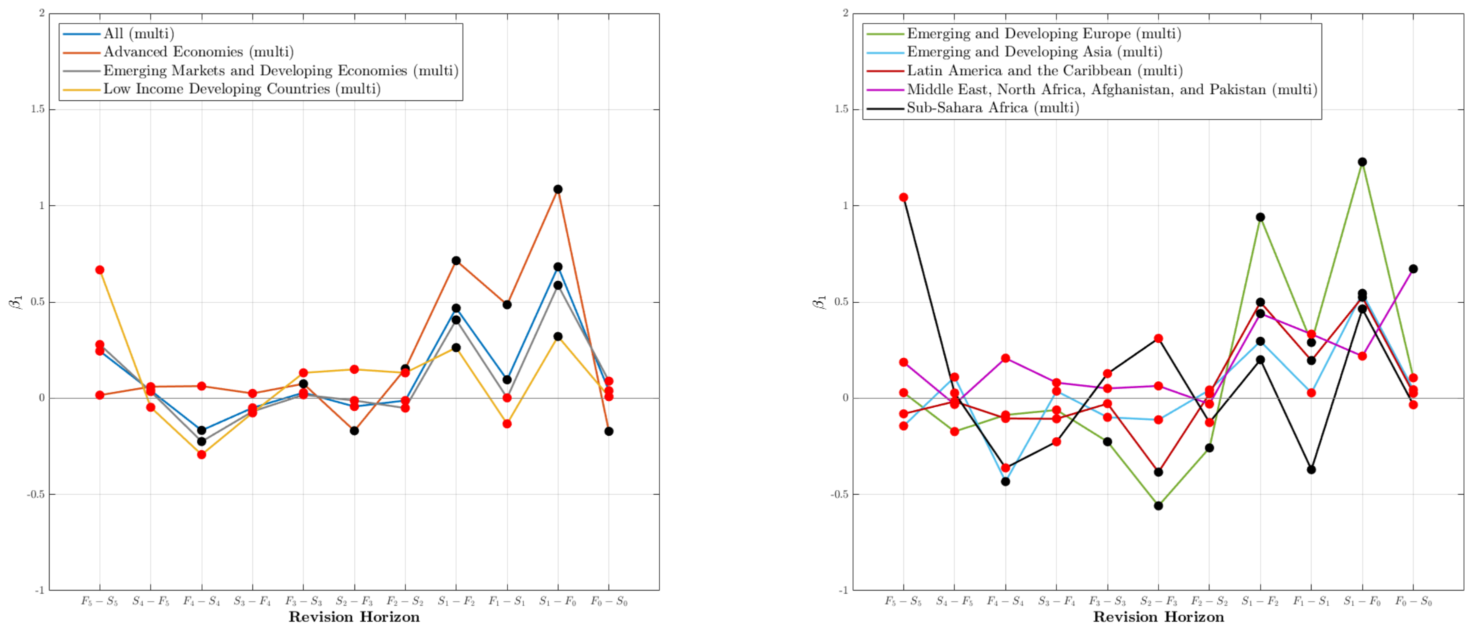
Figure 16. Impact of Growth Revisions in Systemic Economies (Spring-to-Spring Revision Horizons)



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

The main results presented in this section can be subject to an additional robustness check – instead of focusing on annual revisions (either Fall-to-Fall or Spring-to-Spring), we re-estimate the panel data regressions using semi-annual revision data (Spring-to-Fall and Fall-to-Spring). Figure 17 presents results from such regressions based on the semi-annual revisions, which again suggest that the main results are robust. However, these results also reveal a puzzling regularity: in the latest two years, the impact is especially important for the Fall-to-Spring revisions, while Spring-to-Fall revisions seem to have almost no impact (with an oscillating pattern in the last horizons). While the underlying reasons are not clear, this finding implies that forecast teams better reflect systemic economies' revisions when updating their forecasts in Spring rather than in Fall.

Figure 17. Impact of Growth Revisions in Systemic Economies (Semi-Annual Revisions)



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

Asymmetric Impact of Systemic GDP Revisions

Do positive and negative revisions for systemic economies have the same impact on individual economies' growth revisions? What about small versus large revisions or crisis episodes? While the results so far considered all observations available in the dataset (or the specific country subsamples), here we explicitly differentiate between the impact of: positive vs negative revisions; large vs small revisions; and a sample with the peak of the GFC vs a sample without the peak of the GFC (year 2009).

The regression results reported in Table 3 make such differentiation. For reference, the top panel of Table 3 repeats the baseline results for the slope coefficient in front of the systemic (US) growth revisions from the multivariate regression in Table 2. The following three panels of Table 3 reveal some asymmetric effects of GDP revisions. First, the second panel distinguishes between positive and negative revisions for US growth, showing that the impact of negative revisions is generally more important than the impact of positive revisions. Second, the third panel shows that relatively larger US revisions in absolute value have a stronger impact on growth revisions for other economies.[6] Third, the last panel shows that the year 2009 (the peak of the GFC) is a key driver of the results, especially for LICs and some EMDE regions. Excluding the revisions for 2009 turns the results for five country groups insignificant.

Table 3. Regression Results: Asymmetric Impact of Systemic GDP Revisions

	Y Var Rev_rGDP_0	All *F.E*	ae *F.E*	emde *F.E*	lics *F.E*	eeur *F.E*	dasia *F.E*	lac *F.E*	menap *F.E*	ssa *F.E*
Reference →	Rev_US_rgdp	0.871	1.281	0.772	0.364	1.509	0.715	0.821	0.49	0.498
		(0.06)	(0.09)	(0.07)	(0.11)	(0.17)	(0.13)	(0.12)	(0.24)	(0.15)
		[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.039]	[0.001]
	R-squared	0.07	0.27	0.05	0.02	0.34	0.08	0.09	0.02	0.02
Positive/Negative →	Rev_US_rgdp_pos	0.663	0.889	0.615	0.242	-0.76	0.898	0.72	0.929	0.765
		(0.20)	(0.30)	(0.24)	(0.36)	(0.52)	(0.44)	(0.39)	(0.79)	(0.51)
		[0.001]	[0.003]	[0.011]	[0.506]	[0.149]	[0.043]	[0.067]	[0.239]	[0.133]
	Rev_US_rgdp_neg	0.923	1.379	0.812	0.394	2.142	0.67	0.847	0.378	0.43
		(0.08)	(0.12)	(0.09)	(0.14)	(0.21)	(0.17)	(0.15)	(0.30)	(0.20)
		[0.000]	[0.000]	[0.000]	[0.005]	[0.000]	[0.000]	[0.000]	[0.213]	[0.029]
	R-squared	0.07	0.27	0.05	0.02	0.41	0.08	0.09	0.02	0.02
Large/Small →	Rev_US_rgdp_large	0.931	1.388	0.82	0.409	1.758	0.779	0.94	0.39	0.545
		(0.06)	(0.09)	(0.08)	(0.12)	(0.17)	(0.14)	(0.12)	(0.25)	(0.16)
		[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.115]	[0.001]
	Rev_US_rgdp_small	0.428	0.492	0.412	0.035	-0.152	0.212	-0.089	1.289	0.157
		(0.16)	(0.23)	(0.19)	(0.29)	(0.41)	(0.36)	(0.31)	(0.63)	(0.40)
		[0.008]	[0.036]	[0.031]	[0.904]	[0.714]	[0.552]	[0.774]	[0.043]	[0.694]
	R-squared	0.07	0.29	0.05	0.02	0.40	0.09	0.11	0.02	0.02
	Observations	3071	595	2476	982	179	381	565	364	778
	Countries	183	35	148	58	11	26	32	23	44
Excluding 2009 →	Rev_US_rgdp	0.233	0.561	0.156	0.024	0.266	0.312	0.177	0.182	-0.034
		(0.08)	(0.09)	(0.09)	(0.14)	(0.16)	(0.16)	(0.15)	(0.31)	(0.20)
		[0.002]	[0.000]	[0.090]	[0.867]	[0.103]	[0.055]	[0.232]	[0.562]	[0.863]
	R-squared	0.01	0.07	0.00	0.00	0.02	0.01	0.05	0.00	0.00
	Observations	2902	562	2340	929	169	359	534	344	736
	Countries	183	41	154	66	15	29	33	27	48
	Standard errors in parenthesis p-values in brackets									

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Regression specifications are multivariate including ToT (percentage change) revisions.

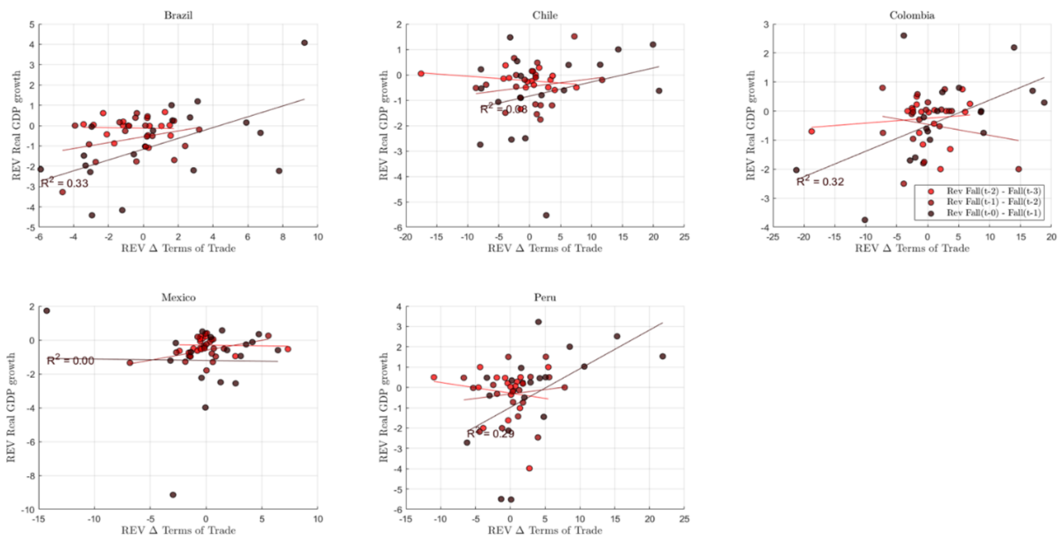
Role of Terms of Trade Revisions

Revisions to the individual economies' terms-of-trade could also play an important role in affecting the revisions to those economies' growth forecasts. For instance, an upward revision in an economy's ToT could imply higher income, and therefore, an upward revision to its growth forecast. However, this factor may be more generally captured by the overall growth forecast. Hence, in this section we consider ToT as a potentially relevant factor for growth revisions.

Figure 18 provides some preliminary descriptive evidence about the relationship between ToT revisions and growth revisions in LA5. Similar to the case of systemic economies' revisions (in Figure 13), this relationship steepens for horizons closer to the actual (darker lines), suggesting that ToT revisions generally have a positive impact on growth revisions in LA5, at least in the latest horizon. As these figures provide preliminary indications, we now turn to a formal regression analysis.

[6] We define large (small) deviations as the revisions that are, in absolute value, above (below) one standard deviation from the sample mean.

Figure 18. Relationship Between ToT Revisions and Growth Revisions in LA5



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.
Source: WEO database and authors' calculations.

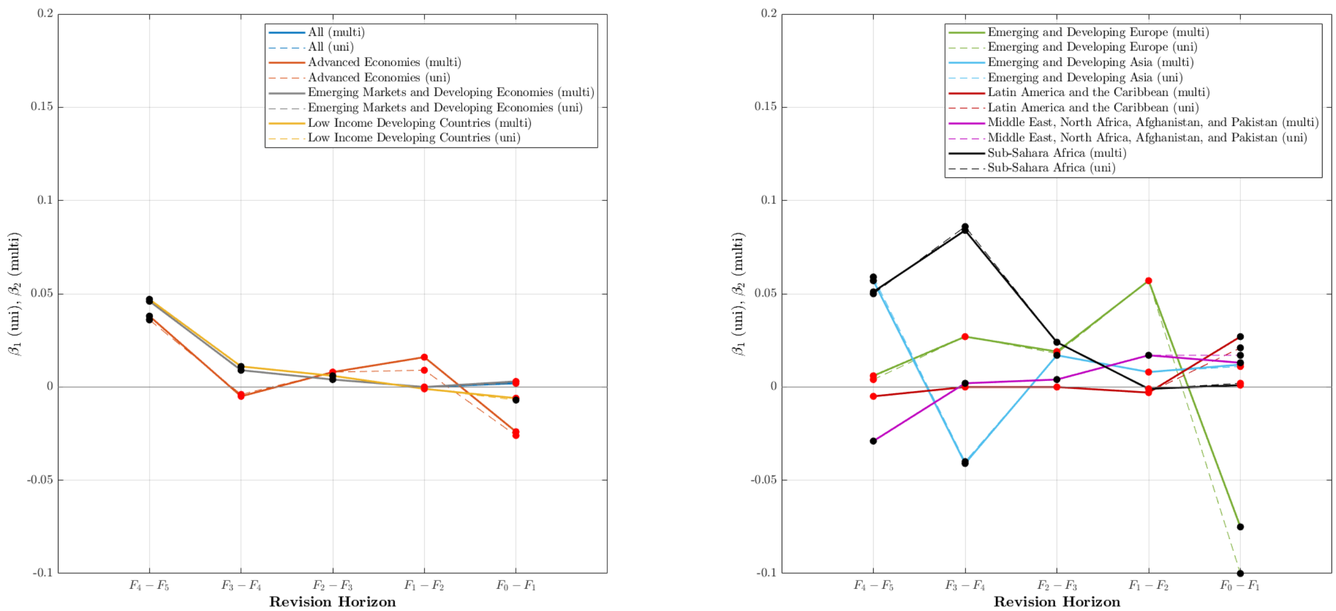
The impact of ToT revisions is examined using the following specifications:

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^2_{t-i,t} + \varepsilon_t \tag{3}$$

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ X^1_{t-i,t} + \beta_2\ REV\ X^2_{t-i,t} + \varepsilon_t \tag{4}$$

Where the multivariate specification (4) adds a terms for the systemic economies' growth revisions ($REV\ X^1_{t-i,t}$) to the univariate specification (3). The results from these panel regressions for different country groups and EMDE regions are reported in Figure 19. For most time horizons, the impact from ToT revisions is generally positive but weakly associated with the growth revisions, with limited significance. The broad conclusion from these findings is that ToT revisions point towards a weaker role in affecting growth revisions relative to the revisions to systemic economies' growth studied earlier.

Figure 19. Impact of ToT Revisions on Growth Revisions



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Dotted lines refer to results from univariate regressions, while solid lines depict results from multivariate regressions.
Source: WEO database and authors' calculations.

In Table 4 we show the regression results for the latest horizon. The impact of ToT revisions is significant and important for LAC, albeit it is also positive for most other EM groups. Nonetheless, the multivariate results confirm the predominance of growth revisions in systemic economies (relative to ToT revisions) as explanatory factor of revisions for individual economies. An interesting finding is the negative coefficient for Emerging Europe, which may be due to their ToT being negatively influenced by a positive revision to Advanced Europe growth, the latter acting as an important positive factor for growth in Emerging Europe. Indeed, the coefficient in front of ToT for Emerging Europe becomes insignificant when controlling for Advanced Europe growth.

Table 4. Regression Results: Impact of ToT Revisions (Latest Vintage)

Univariate →

Y Var / Rev0 RGDP	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev dToT	0.002	-0.026	0.002	-0.007	-0.1	0.011	0.021	0.017	0.002
	(0.00)	(0.02)	(0.00)	(0.00)	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)
	[0.639]	[0.215]	[0.582]	[0.084]	[0.038]	[0.288]	[0.062]	[0.186]	[0.803]
Observations	3089	613	2476	982	179	381	565	364	778
Countries	184	36	148	58	11	26	32	23	44
R-squared	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.01	0.00
Adjusted R-squared	-0.06	-0.06	-0.06	-0.06	-0.04	-0.07	-0.05	-0.06	-0.06

Multivariate →

Y Var / Rev0 RGDP	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev dToT	0.002	-0.024	0.003	-0.006	-0.075	0.012	0.027	0.013	0.001
	(0.00)	(0.02)	(0.00)	(0.00)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)
	[0.469]	[0.180]	[0.449]	[0.152]	[0.059]	[0.223]	[0.012]	[0.319]	[0.858]
Rev US RGDP	0.871	1.281	0.772	0.364	1.509	0.715	0.821	0.49	0.498
	(0.06)	(0.09)	(0.07)	(0.11)	(0.17)	(0.13)	(0.12)	(0.24)	(0.15)
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.039]	[0.001]
Observations	3071	595	2476	982	179	381	565	364	778
Countries	183	35	148	58	11	26	32	23	44
R-squared	0.07	0.27	0.05	0.02	0.34	0.08	0.09	0.02	0.02
Adjusted R-squared	0.01	0.22	-0.01	-0.05	0.29	0.01	0.03	-0.05	-0.05

Standard errors in parenthesis
p-values in brackets

Note: Figures highlighted in red depict lack of significance at the 10 percent level.

Role of Alternative Measures of Systemic Growth Revisions

The analysis so far has been using US growth revisions as a benchmark for systemic economies' growth revisions. Table 5 presents results for alternative classifications of systemic economies—such as China, Euro Area, G7, and the World aggregate—when measuring systemic growth revisions. In general, the impact of systemic economies is robust to these alternative measures, remaining positive and strongly significant in almost all specifications. Nonetheless, one caveat to keep in mind is that the impact of G7, Euro Area and the World aggregate is overstated in most specifications, as (some) economies appear on both sides of the regression equation. Regressions using US or China for systemic economy revisions are immune to this issue as they exclude these countries from the left-hand side.

Table 5. Regression Results: Alternative Measures of Systemic Growth Revisions

Y Var Rev_rGDP_0		All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev US RGDP		0.466	0.682	0.415	0.154	1.032	0.274	0.372	0.636	0.308
	p-value	[0.000]	[0.000]	[0.000]	[0.029]	[0.000]	[0.000]	[0.000]	[0.008]	[0.009]
	R-squared	0.02	0.14	0.01	0.00	0.12	0.02	0.03	0.01	0.01
Rev CH RGDP		0.077	0.205	0.046	0.07	0.091	0.307	0.204	-0.333	0.027
	p-value	[0.034]	[0.000]	[0.294]	[0.152]	[0.525]	[0.000]	[0.000]	[0.043]	[0.742]
	R-squared	0.00	0.02	0.00	0.00	0.00	0.04	0.02	0.01	0.00
Rev EU RGDP		0.86	1.218	0.772	0.419	1.478	0.549	0.861	0.293	0.672
	p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.149]	[0.000]
	R-squared	0.13	0.49	0.09	0.03	0.64	0.10	0.21	0.01	0.06
Rev G7 RGDP		0.781	1.156	0.69	0.316	1.517	0.52	0.694	0.781	0.433
	p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.004]	[0.001]
	R-squared	0.04	0.31	0.03	0.01	0.22	0.05	0.09	0.01	0.01
Rev W RGDP		0.748	1.051	0.674	0.366	1.41	0.664	0.702	0.597	0.361
	p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.014]	[0.003]
	R-squared	0.04	0.32	0.03	0.02	0.24	0.11	0.11	0.01	0.01

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
All regression results are from univariate specifications given by equation (2).

Could more than one systemic economy simultaneously affect growth revisions in individual economies? Table 6 reports correlation coefficients for different pairs of growth revisions in systemic economies. In general, the results suggest that there is high correlation among most pairs of systemic economies, with the exception of China-US and China-G7 pairs that show very low correlations. In Table 7, we use these results to further explore the joint impact of China and US growth revisions by including them simultaneously in the regression specifications.

Table 6. Correlations of Growth Revisions

Corr	Rev0_US_rgdp	Rev0_CH_rgdp	Rev0_EU_rgdp	Rev0_G7_rgdp	Rev0_W_rgdp
Rev0_US_rgdp	1.00	0.04	0.62	0.86	0.68
Rev0_CH_rgdp	0.04	1.00	0.57	0.03	0.32
Rev0_EU_rgdp	0.62	0.57	1.00	0.86	0.90
Rev0_G7_rgdp	0.86	0.03	0.86	1.00	0.89
Rev0_W_rgdp	0.68	0.32	0.90	0.89	1.00

Note: The table reports pairwise correlation coefficients for growth revisions in systemic economies over the perod 1990-2019. Correlations below 0.15 are shaded in grey.

The results suggest that both US and China growth revisions are relevant for individual economies' growth revisions in the latest vintage. Nonetheless, the "incremental gain" relative to specifications that include them separately seems rather small.

Table 7. Regression Results: Joint Impact of China and US Growth Revisions (Latest Vintage)

Y Var Rev_rGDP_0	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev_dToT	0.001	-0.034	0.002	-0.006	-0.071	0.012	0.02	0.009	0.001
	(0.00)	(0.02)	(0.00)	(0.00)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)
	[0.751]	[0.047]	[0.670]	[0.124]	[0.065]	[0.245]	[0.059]	[0.498]	[0.925]
Rev_US_rgdp	0.644	0.992	0.558	0.188	1.281	0.535	0.579	0.234	0.379
	(0.07)	(0.09)	(0.08)	(0.12)	(0.18)	(0.15)	(0.13)	(0.25)	(0.16)
	[0.000]	[0.000]	[0.000]	[0.106]	[0.000]	[0.000]	[0.000]	[0.353]	[0.021]
Rev_CH_rgdp	0.656	0.841	0.615	0.5	0.66	0.54	0.663	0.739	0.345
	(0.07)	(0.10)	(0.08)	(0.12)	(0.19)	(0.16)	(0.13)	(0.27)	(0.17)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.006]	[0.045]
Observations	3053	595	2458	982	179	363	565	364	778
Countries	182	35	147	58	11	25	32	23	44
R-squared	0.10	0.36	0.07	0.03	0.38	0.12	0.13	0.04	0.02
Adjusted R-squared	0.04	0.32	0.01	-0.03	0.33	0.04	0.08	-0.03	-0.04
Standard errors in parenthesis p-values in brackets									

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Regressions exclude US and China GDP growth revisions from the left-hand side.

VI. ARE WEO AND CONSENSUS FORECAST GROWTH REVISIONS MOVING TOGETHER?

How do WEO growth revisions compare to growth revisions obtained from other sources? The closest comparator to WEO in terms of country and time coverage is the Consensus Forecast. Hence, this section explores the similarities and differences between growth revisions obtained from these two sources.

The regression analysis is based on the following specification:

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ CF\ Y_{t-i,t} + \varepsilon_t \quad (5)$$

and the focus of interest is the estimates slope coefficient β_1 that captures the co-movement between the growth revisions from the two sources.

Table 8 shows the findings for the relationship between annual growth revisions from the WEO and from Consensus Forecast in the latest horizon. The top panel refers to Fall-to-Fall growth revisions, while the bottom panel refers to Spring-to-Spring growth revisions. The regression results suggest the WEO and Consensus Forecast annual growth revisions move very closely together for both Fall-to-Fall (default horizon in this study) and Spring-to-Spring revisions. This strong correlation between the two sources applies to all country groups and regions with reasonable data coverage.[7]

[7] MENAP and SSA are based on 3 and 3 countries only, respectively, hence results for these groups are to be ignored.

Table 8. Regression Results: Relationship Between Annual Growth Revisions from WEO and Consensus Forecast (Latest Vintage)

Y Var Rev_rgdp_F0_F1	All *F.E*	ae *F.E*	emde *F.E*	lics *F.E*	eeur *F.E*	dasia *F.E*	lac *F.E*	menap *F.E*	ssa *F.E*
CF_Rev_F0_F1	0.945	0.944	0.946	1.097	0.938	0.965	1.058	0.779	0.896
	(0.01)	(0.01)	(0.02)	(0.08)	(0.03)	(0.02)	(0.03)	(0.08)	(0.13)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	1824	858	966	117	187	219	274	69	44
Countries	85	33	52	7	10	9	18	3	2
R-squared	0.83	0.93	0.79	0.64	0.89	0.89	0.87	0.61	0.54
Adjusted R-squared	0.82	0.92	0.78	0.62	0.88	0.88	0.86	0.59	0.51
Standard errors in parenthesis p-values in brackets									

Y Var Rev_rgdp_S0_S1	All *F.E*	ae *F.E*	emde *F.E*	lics *F.E*	eeur *F.E*	dasia *F.E*	lac *F.E*	menap *F.E*	ssa *F.E*
CF_Rev_S0_S1	0.994	1.063	0.949	0.996	1.073	1.057	1.026	0.95	1.039
	(0.02)	(0.02)	(0.03)	(0.11)	(0.05)	(0.03)	(0.03)	(0.10)	(0.18)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	1788	852	936	115	182	219	260	69	43
Countries	85	33	52	7	10	9	18	3	2
R-squared	0.70	0.87	0.60	0.45	0.70	0.85	0.80	0.60	0.46
Adjusted R-squared	0.68	0.86	0.58	0.41	0.68	0.85	0.79	0.59	0.43
Standard errors in parenthesis p-values in brackets									

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Top panel refers to Fall-to-Fall growth revisions, while bottom panel refers to Spring-to-Spring growth revisions.

Table 9 shows that similar conclusions apply to the relationship between the semi-annual growth revisions as well—again WEO and Consensus Forecast revisions move very closely together.[8] The first two panels break F0-F1 into two semi-annual horizons (F0-S0 and S0-F1). Surprisingly, the correlation is stronger for the Fall-to-Spring revision (S0-F1, which correspond to the revisions made in the Spring of the current year versus the Fall of the previous year, i.e. the more distant of the two) has a correlation of about 1, while the correlation for the revisions made between Spring and Fall of the current year is about 0.8. As expected, the revisions made between Spring and Fall of the previous year have a smaller correlation of about 0.6, as they belong to the more distant horizon (F1-F2).

[8] The time horizon of Consensus Forecast allows for comparison with the WEO of up to 3 vintages of semi-annual revisions.

Table 9. Regression Results: Relationship Between Semi-Annual Growth Revisions from WEO and Consensus Forecast

F0-F1

Y Var Rev rgdp (F0-S0)	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
CF_Rev_F0_S0	0.785	0.854	0.748	0.877	0.665	0.869	0.9	0.342	0.867
	(0.02)	(0.02)	(0.03)	(0.10)	(0.07)	(0.04)	(0.04)	(0.11)	(0.22)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.003]	[0.000]
Observations	1876	886	990	123	192	228	278	72	45
Countries	85	33	52	7	10	9	18	3	2
R-squared	0.55	0.73	0.47	0.40	0.32	0.74	0.67	0.12	0.27
Adjusted R-squared	0.53	0.72	0.44	0.37	0.28	0.73	0.65	0.08	0.23

Y Var Rev rgdp (S0 - F1)	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
CF_Rev_S0_F1	1.04	1.067	1.025	1.01	1.149	1.018	1.098	0.638	0.997
	(0.02)	(0.02)	(0.03)	(0.11)	(0.05)	(0.04)	(0.03)	(0.12)	(0.19)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	1824	858	966	118	187	219	274	69	44
Countries	85	33	52	7	10	9	18	3	2
R-squared	0.72	0.85	0.65	0.43	0.74	0.76	0.84	0.30	0.39
Adjusted R-squared	0.70	0.84	0.63	0.39	0.73	0.75	0.83	0.27	0.36

Y Var Rev rgdp (F1 - S1)	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
CF_Rev_F1_S1	0.644	0.863	0.537	0.387	0.477	0.863	0.703	0.723	0.441
	(0.03)	(0.03)	(0.04)	(0.13)	(0.08)	(0.06)	(0.08)	(0.17)	(0.19)
	[0.000]	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]	[0.000]	[0.000]	[0.023]
Observations	1876	886	990	123	192	228	278	72	45
Countries	85	33	52	7	10	9	18	3	2
R-squared	0.24	0.49	0.16	0.07	0.17	0.46	0.22	0.20	0.12
Adjusted R-squared	0.20	0.47	0.11	0.01	0.12	0.43	0.17	0.17	0.08

Standard errors in parenthesis
p-values in brackets

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
The first two panels break F0-F1 into two semi-annual vintages (F0-S0 and S0-F1).

VII. Is There Mean Reversion and Persistence in WEO Growth Forecasts?

In this section we leverage on our previous results and explore the mean reversion and persistence properties of WEO forecasts to get a better understanding of the behavior of revisions.

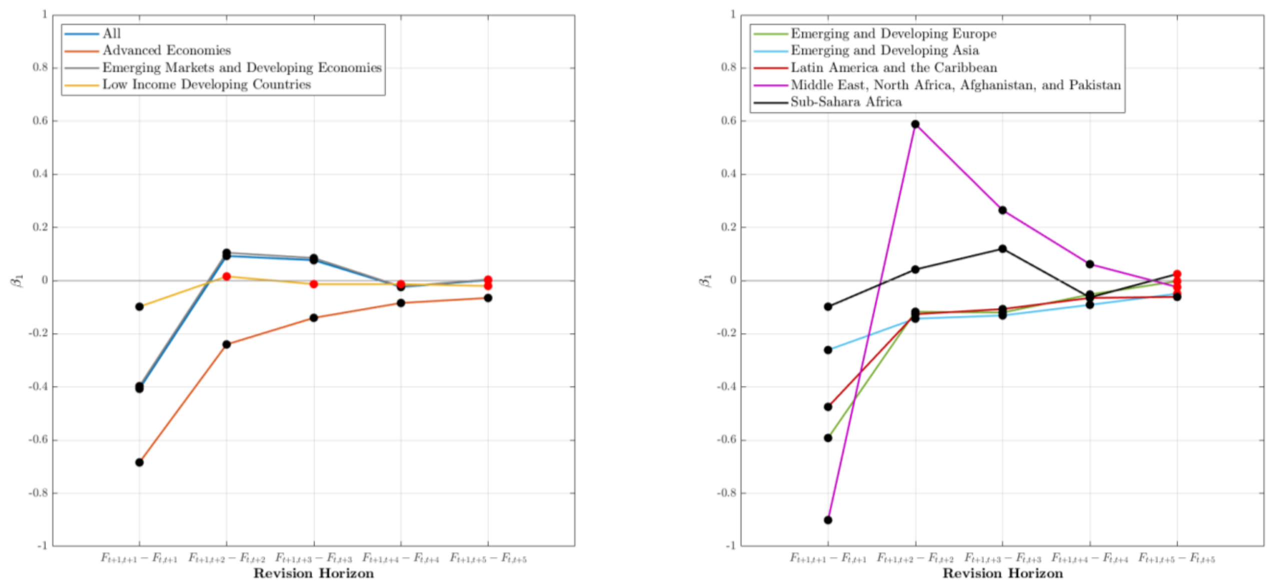
Relationship between Forecast Errors and Forthcoming Revisions

We begin our analysis by investigating whether the discovery of a forecast mistake would drive forecast revisions. More precisely, whether the current-year forecast error (i.e. the latest forecast error) influences future growth forecasts made in the current year for coming years. To answer this question, we implement the following econometric specification:

$$REV\ Y_{t+1,t+j} = \beta_0 + \beta_1\ FE\ Y_{t,t} + \varepsilon_t; \forall i = 1,2,3,4,5 \quad (6)$$

In contrast to our previous definition of Forecast Error, an important remark here is that we denote it as the difference between the current year Forecast for the current year and the current actual estimated next period (i.e., $F\ Y_{(t,t)}\ -\ A\ Y_{(t+1,t)}$). In the previous exercise we were calculating the forecast error related to forecast for tuture horizons, hence an error that one can only learn in the future. In this section instead, we employ this new definition to expose how possible inaccuracies in growth forecasts learned today may determine the path for future projections. The estimated regression coefficients are depicted in Figure 20.

Figure 20. Regression Results: Relationship between Forecast Errors and forthcoming Revisions



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

Overall, the results suggest a negative effect for the following year (i.e., the horizon closest to the actual) and a null one for the medium term. This implies that a discovery of an overestimation (under) of forecasts tends to correlate with a negative (positive) growth forecast revision for the next years. Namely, the negative coefficient for the first revision horizon suggests that if projections were optimistic this year in forecasting growth for this year (i.e., a negative forecast error), then next year forecasters will revise down forecasts for next year (i.e., forecast for next year done next year will be lower than forecast for next year done this year). However, coefficients for future horizons are closer to zero, suggesting that learning about a forecast mistake has virtually no impact on medium-term forecast revision.

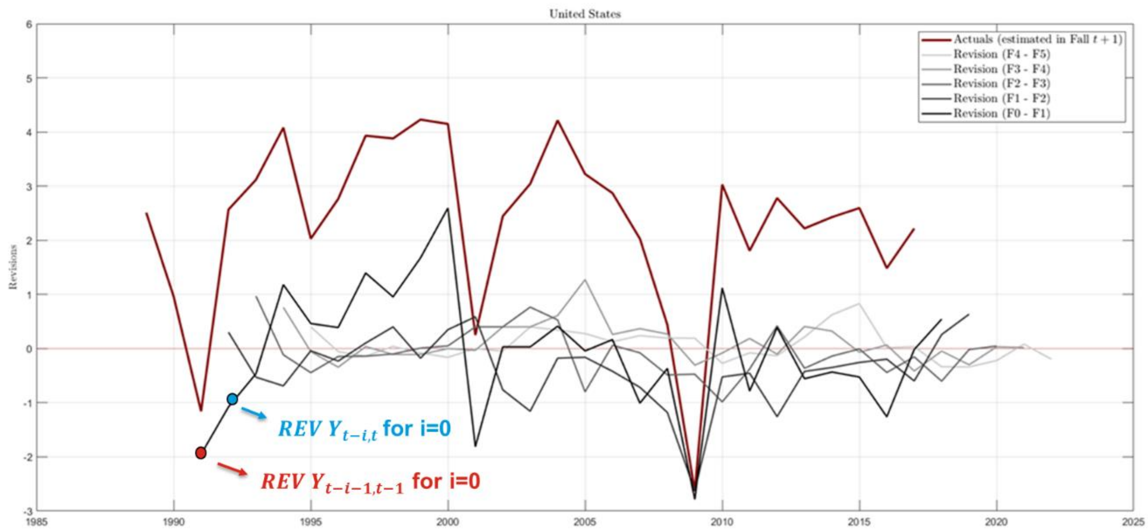
Serial Autocorrelation of Revisions Across Vintages

A key indicator about the efficiency and quality of revisions is the extent to which revisions are autocorrelated across different vintages (for the same time horizon). We explore this issue using the following empirical specification:

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ Y_{t-i-1,t-1} + \varepsilon_t; \forall i = 0,1,2,3,4 \qquad (7)$$

which explores whether the revision done at *t-i* for forecasting *t* depend on the corresponding revision in the previous vintage (i.e., the revision done at *t-i-1* for forecasting *t-1*).
Figure 21 helps illustrate this econometric exercise.

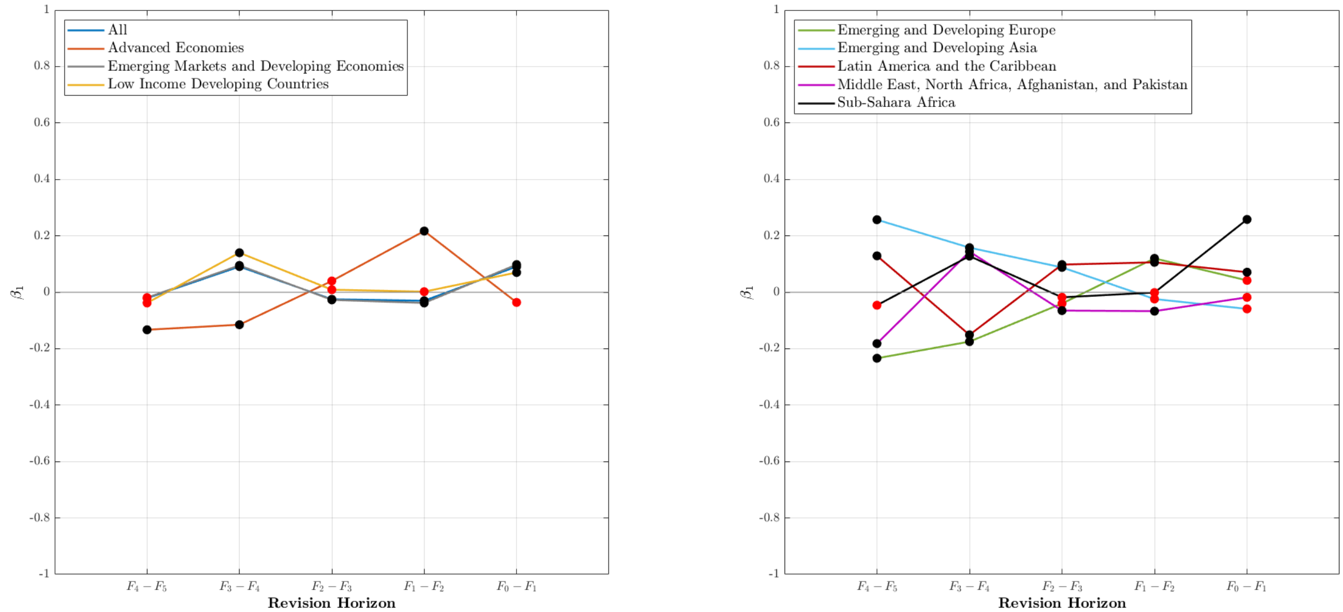
Figure 21. Serial Autocorrelation of Growth Revisions Across Vintages



Note: Each black/gray line corresponds to the time series of vintages of revisions, for a given time horizon.
Dark red line corresponds to the actual outcomes estimated at time t+1.
Source: WEO datbase and authors' calculations

The regression results in Figure 22 imply that revisions do not appear to be serially autocorrelated, which is a good result about quality of revisions. In other words, forecast revisions do not seem to be persistent (small coefficients, both positive and negative, and significant only half of the time) in the sense that the revision done this year for forecasting (for example) this year is not related to the revision done last year for forecasting last year such that the former cannot improve the forecast accuracy of the latter. For instance, if in 2021 the forecast team revises growth for 2023 down, it does not mean that this team will necessarily revise growth for 2024 in 2022 in one direction or the other.

Figure 22. Regression Results: Serial Autocorrelation of Growth Revisions Across Vintages



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

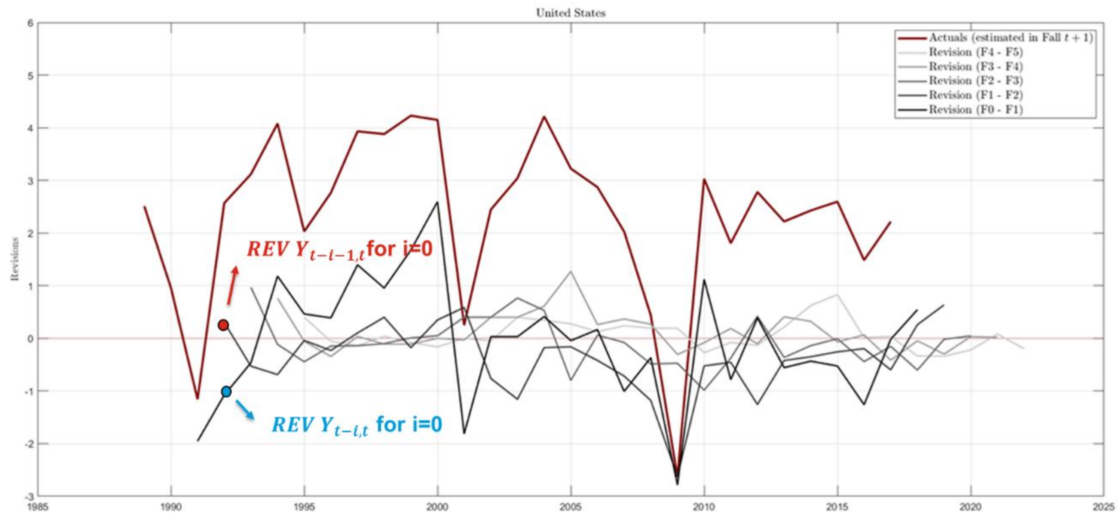
Relationship of Revisions for a Given Year Across Vintages and Horizons

Another important consideration is the relationship of different revisions across vintages and horizons for a given year *t*. For instance, does the revision done at *t-i* for forecasting *t* depend on the revision done the previous year (i.e., *t-i-1*) still for forecasting the same *t*? We explore this issue using the following empirical specification:

$$REV\ Y_{t-i,t} = \beta_0 + \beta_1\ REV\ Y_{t-i-1,t} + \varepsilon_t; \forall i = 0,1,2,3,4 \quad (8)$$

Figure 23 offers a visualization of the data input into the specification of regression (8).

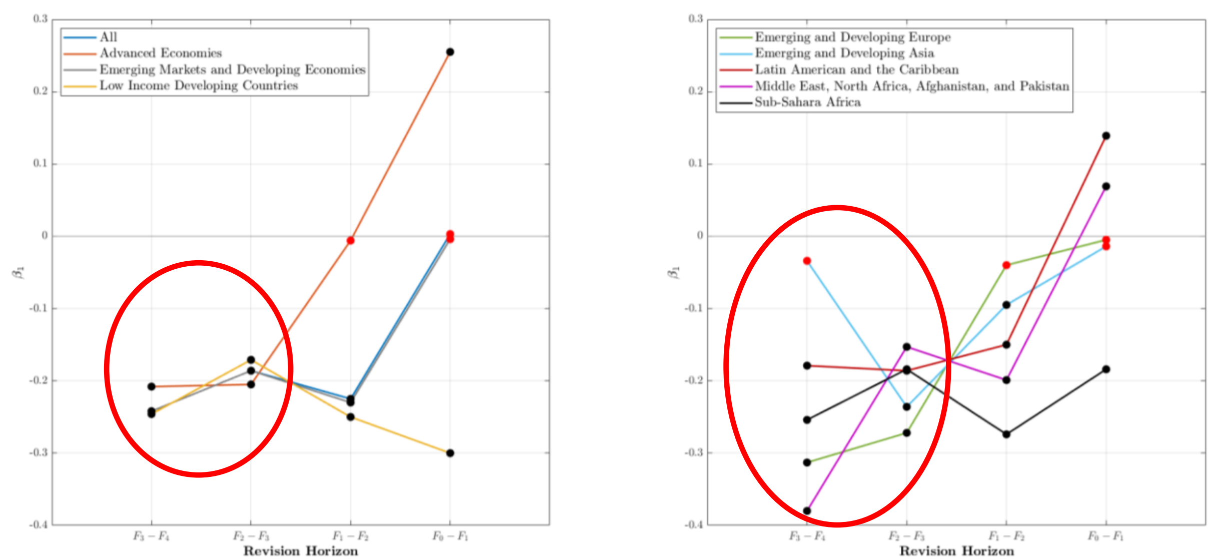
Figure 23. Relationship Between Growth Revisions for a Given Year



Note: Each black/gray line corresponds to the time series of vintages of revisions, for a given time horizon. Dark red line corresponds to the actual outcomes estimated at time t+1.
Source: WEO datbase and authors' calculations

The regression results in Figure 24 suggest that revisions to forecasts for a given year show a negative correlation across vintages (for earlier horizons). For the earlier horizons, coefficients are negative, implying that revisions to forecasts for a given year done several years ago tend to be updated with negative correlation over time, suggesting a back-and-forth pattern. However, as one gets closer to the actual year (latest horizons), some groups of countries (AE, LAC, and MENAP) show an opposite pattern suggesting that revisions are sequenced in the same direction (possibly due to more confidence or better information). Consequently, these findings suggest that if in 2021 the forecasters revise growth for 2023 down, in 2022 they are more likely to revise growth for 2023 up, thereby pointing at the existence of opportunity for improving forecast efficiency.

Figure 24. Regression Results: Relationship of Revisions Across Vintages and Horizons



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

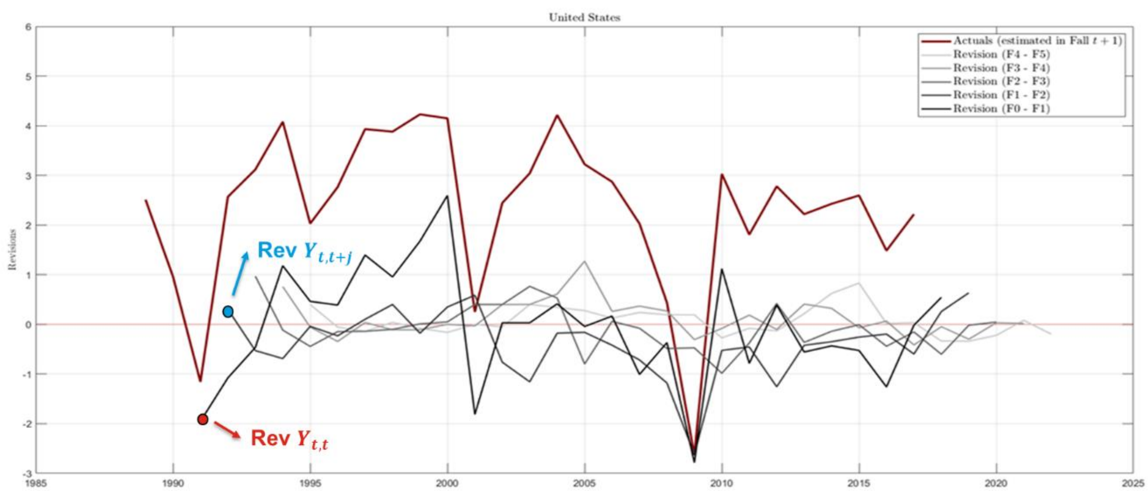
Persistence of Growth Shocks

Finally, we test if shocks perceived (and incorporated) as temporary or as persistent (within forecast vintages). For instance, a growth shock that affects the revision done in year *t* for growth in year *t* may not affect revisions done in the same year *t* for any outer year (hence, perceived as fully temporary) or it may affect revisions for *t+1* and later years (hence, perceived as persistent). Formally, we explore this question using the following empirical specification:

$$REV\ Y_{t,t+j} = \beta_0 + \beta_1\ REV\ Y_{t,t} + \varepsilon_t; \forall j = 1,2,3,4 \qquad (9)$$

which explores how revisions done this year (*t*) for forecasting growth this year (*t*) affect the revision done this year (*t*) for growth in the next and the following years (*t+j*). Figure 25 offers a visualization of the data input into the specification of regression (8).

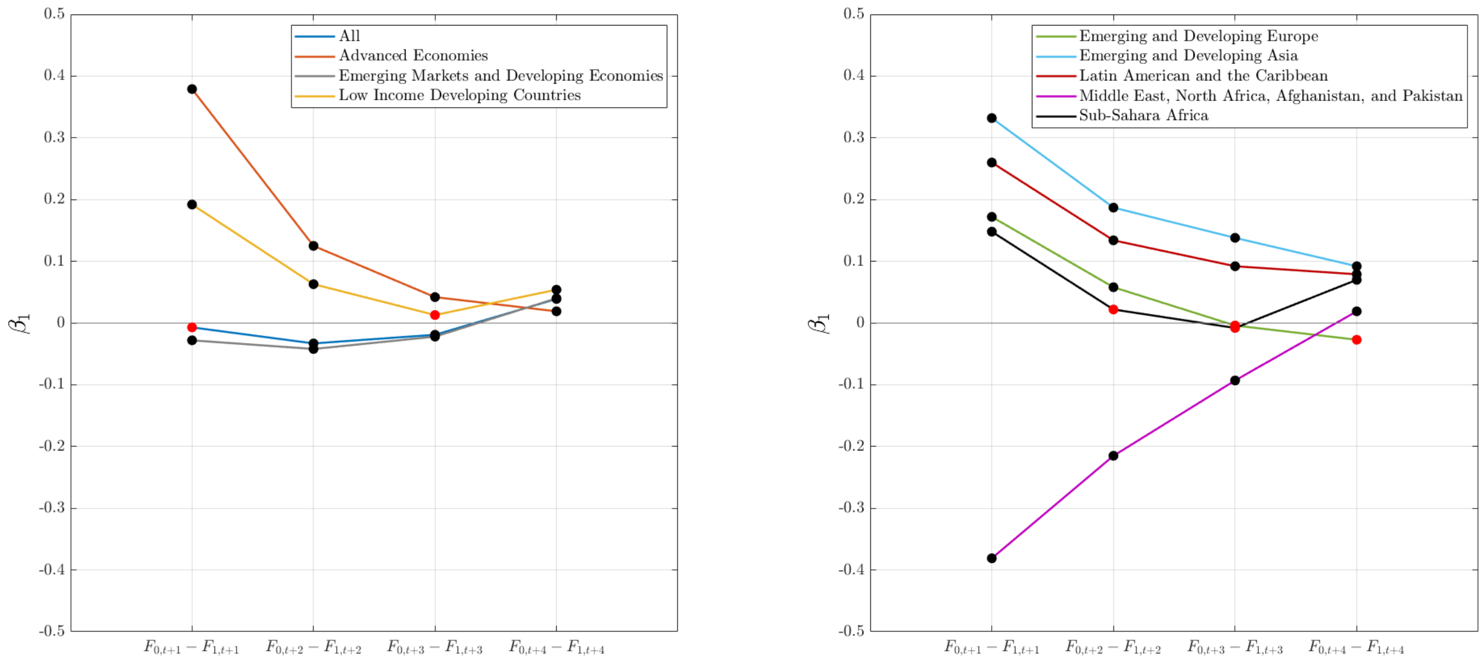
Figure 25. Persistence of Growth Shocks



Note: Each black/gray line corresponds to the time series of vintages of revisions, for a given time horizon.
Dark red line corresponds to the actual outcomes estimated at time t+1.
Source: WEO datbase and authors' calculations

The regression results in Figure 26 suggest that shocks are generally perceived as persistent, especially for LAC and Emerging Asia, and for closest time horizons. In fact, for all country groups except MENAP, the positive coefficients imply that positive growth revisions for the current year are associated with positive growth revisions for the next 1 or 2 years, consistent with the persistence story. In practical terms, these results suggest that if this year the forecasters revise growth for 2021 up, they are likely to revise at the same time growth up for 2022 as well.

Figure 26. Regression Results: Persistence of Growth Shocks



Note: Black dots denote significance at 10 percent level. Red dots indicate lack thereof.
Source: WEO database and authors' calculations.

VIII. Concluding Remarks

In this paper we have investigated a broad set of questions to understand the quality and evolution of WEO growth forecast revisions and shed light on the underlying factors that drive these revisions. The analysis provides an alternative to the traditional foreacast error approach and presents a set of novel empirical findings.

First, descriptive evidence suggests that growth revisions in horizons closer to the actual are generally larger, more volatile, and more negative. In other words, most action in terms of forecast revisions happens not for forecast far into the future, but for those related to next year. In addition, the finding that such revisions for the following year are more negative implies that forecasters enter into the latest horizons with generally optimistic growth forecasts, and subsequently revise downwards.

Second, WEO growth revisions are found to be in the right direction (on average)—in the sense that revisions are done in such a way so as to narrow the forecast error from the previous period—, which is true at any revision horizon and for any country region. In fact, forecast revisions become progressively more responsive to the forecast error gap as revision horizons get closer to the actual. In other words, in line with what would be logical to expect, as forecasters get closer to the year they are forecasting, they get better at guessing the final outturn, presumably because they learn relevant information.

Third, growth revisions in systemic economies are relevant for growth revisions in countries from all regions, reflecting the important cross-country trade and financial linkages of systemic economies with individual countries across the world. For instance, an upward (downward) revision of growth for the US is typically associated with an upward (downward) revision of growth for countries in all major country groups (the estimated coefficient is between 0.2 and 1—see upper panel in Table 2). Moreover, revisions in systemic economies are mainly relevant for the forecast horizon closest to the actual, suggesting that forecasters tend to make use of cross-country linkages when forecasting the next year or so, but tend to rely more on individual country characteristics when forecasing medium term growth. In this context, we also find that large and negative revisions have a stronger impact than smaller and/or positive revisions, and that revisions at the peak of the GFC (year 2009) has been a key driver of these results, especially for LICs and some EMDE groups. On the other hand, the relevance of ToT revisions for growth revisions is mainly robust for LAC and again in the last horizon. Although it would be interesting to investigate the role of China's and other systemic economies forecast revisions, we leave for future research the issue of disentangling the effect of these economies.

Fourth, WEO & Consensus Forecast growth revisions are strongly correlated, both at annual and semi-annual horizons, suggesting a commonality in the movement of these forecasts. Fifth, we document that the fall-to-spring WEO revisions are more correlated with the corresponding fall-to-spring Consensus Forecasts revisions compared to spring-to-fall revision pairs.

Fifth, people act upon mistakes, in the sense that if projections were optimistic this year in forecasting growth for this year, then next year forecasters will revise down forecasts for next year. Also, revisions for a given time horizon are not autocorrelated across vintages, suggesting that forecast cannot be improved upon by looking at past vintages, a result that points toward efficiency of revisions. Nonetheless, within vintages, revisions tend to be positively correlated—implying that positive (negative) growth revisions for the current year are associated with positive (negative) growth revisions for the next 1 or 2 years—thereby suggesting that forecasters generally perceive shocks to have short-term persistence.

Lastly, we acknowledge that future research could fruitfully investigate the differential effect case of the IMF program and surveillance cases (similar to Kareem, Perelli, and Yang (2020)), as well as inspecting more closely the extent of cross-country revision dependence.

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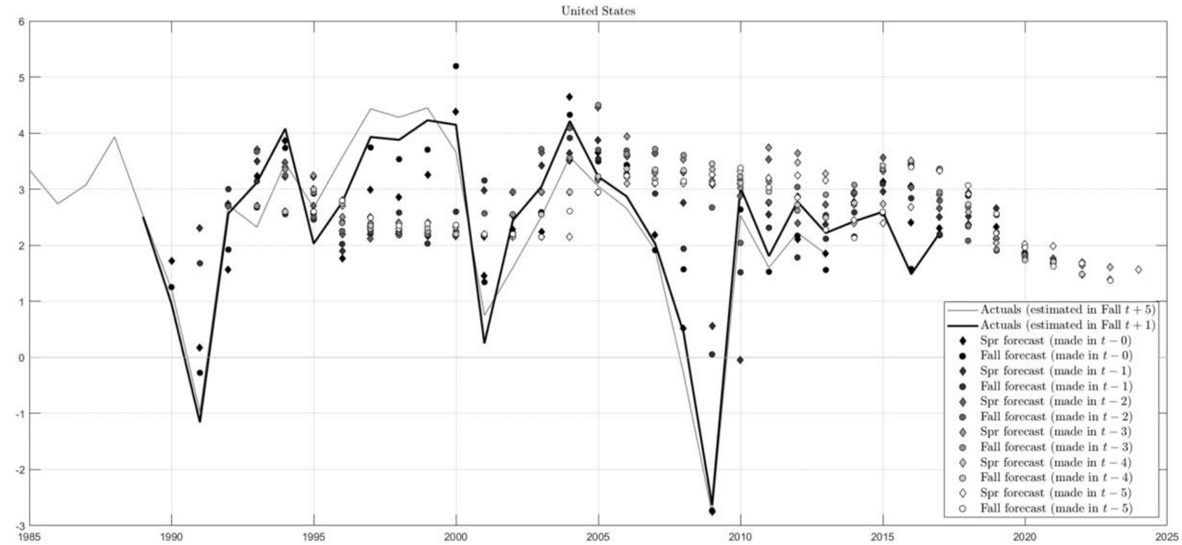
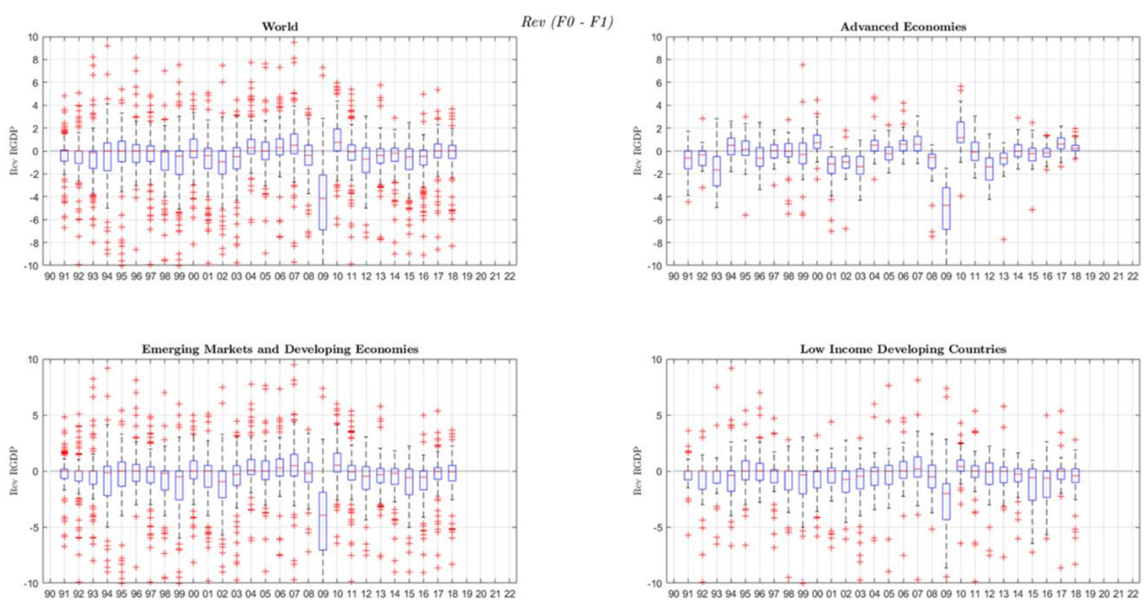
X. ANNEX

Figure A1. Sample: US Growth Forecasts and Outcomes



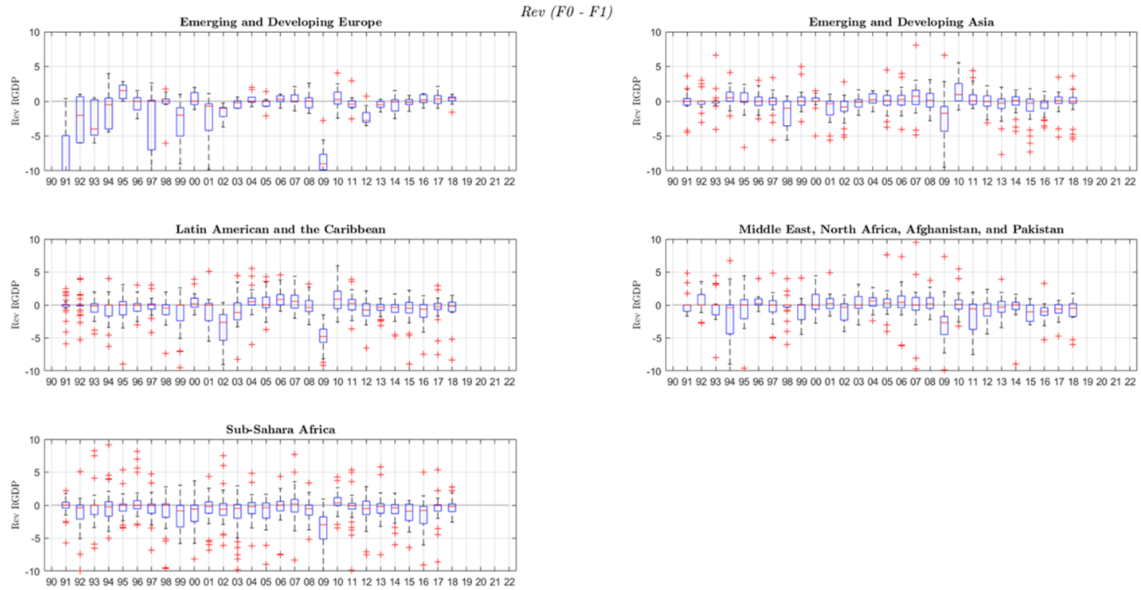
Source: WEO datbase and authors' calculations

Figure A2. Growth Revisions for Country Groups (Latest Revision Vintage)



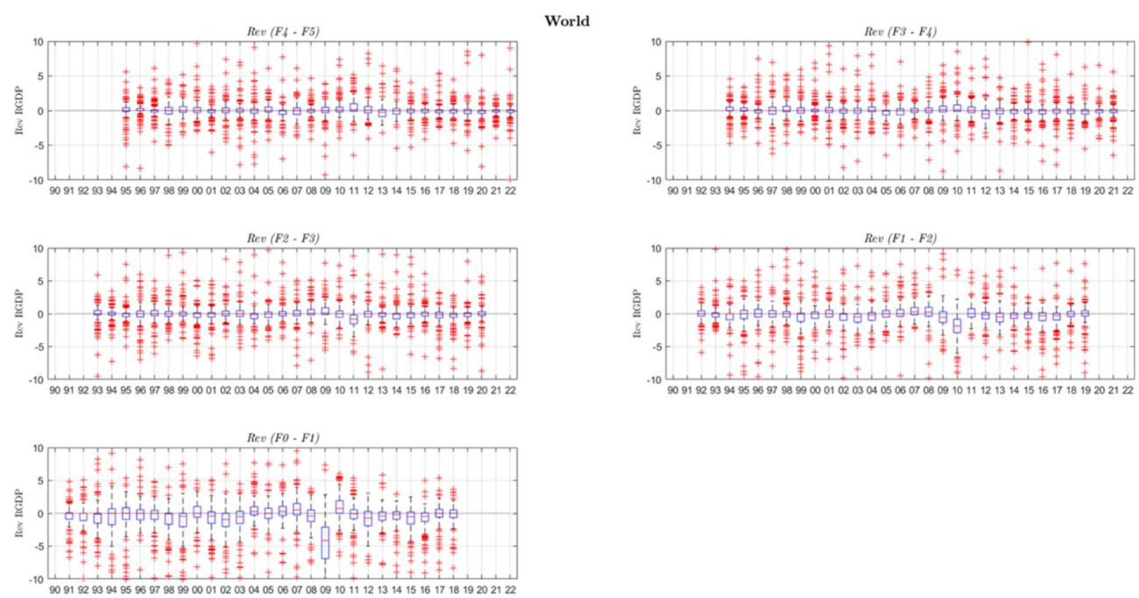
Source: WEO database and authors' calculations.

Figure A3. Growth Revisions Across EMDE Regions (Latest Revision Vintage)



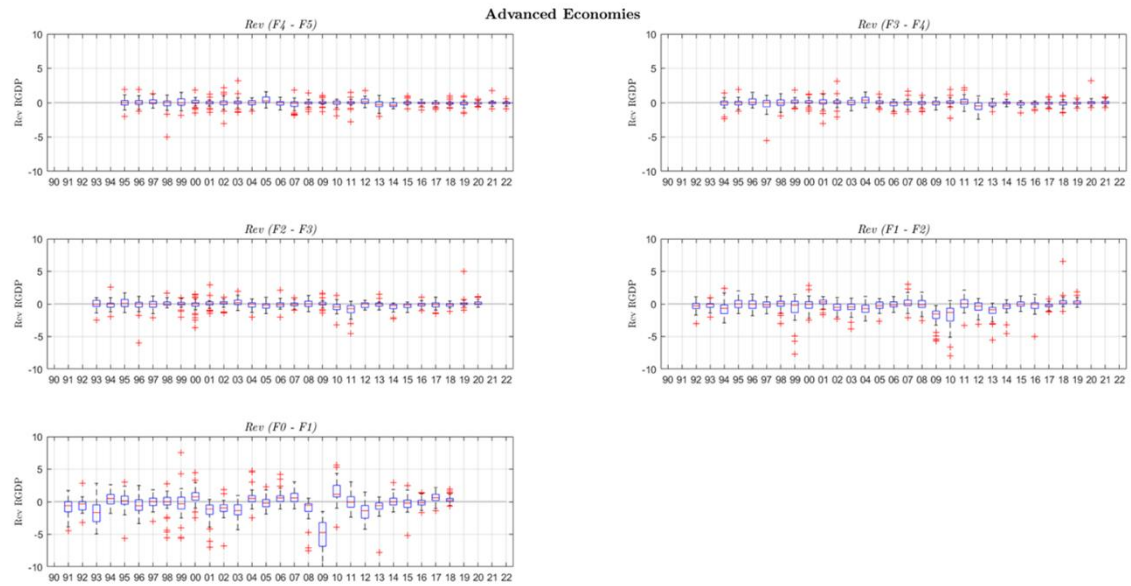
Source: WEO database and authors' calculations.

Figure A4. Growth Revisions for the World Across Vintages



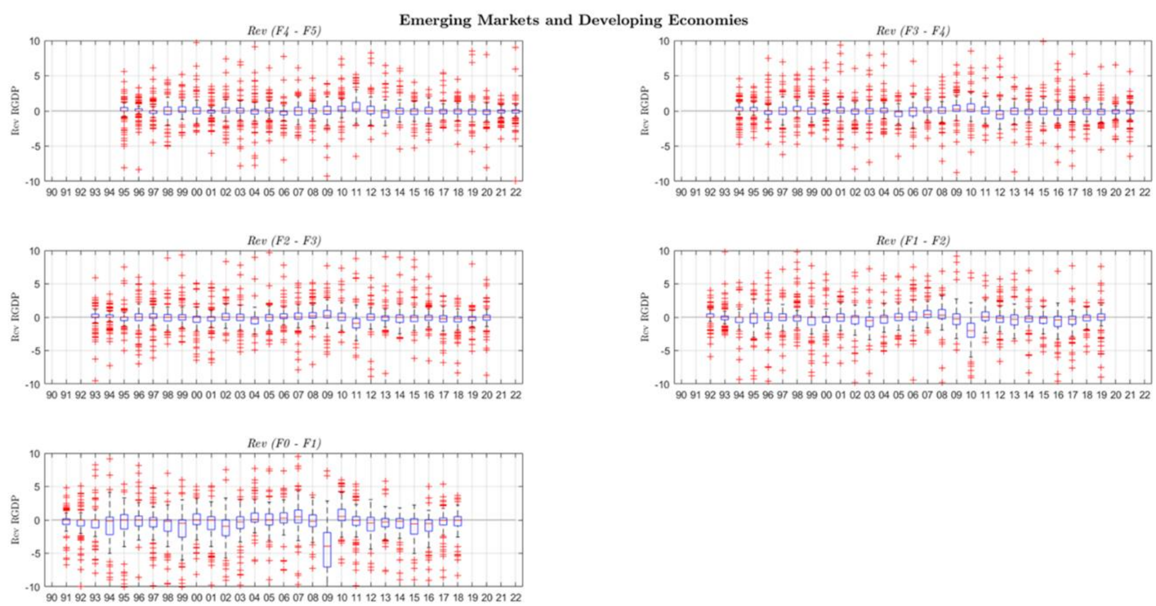
Source: WEO database and authors' calculations.

Figure A5. Growth Revisions for Advanced Economies Across Vintages



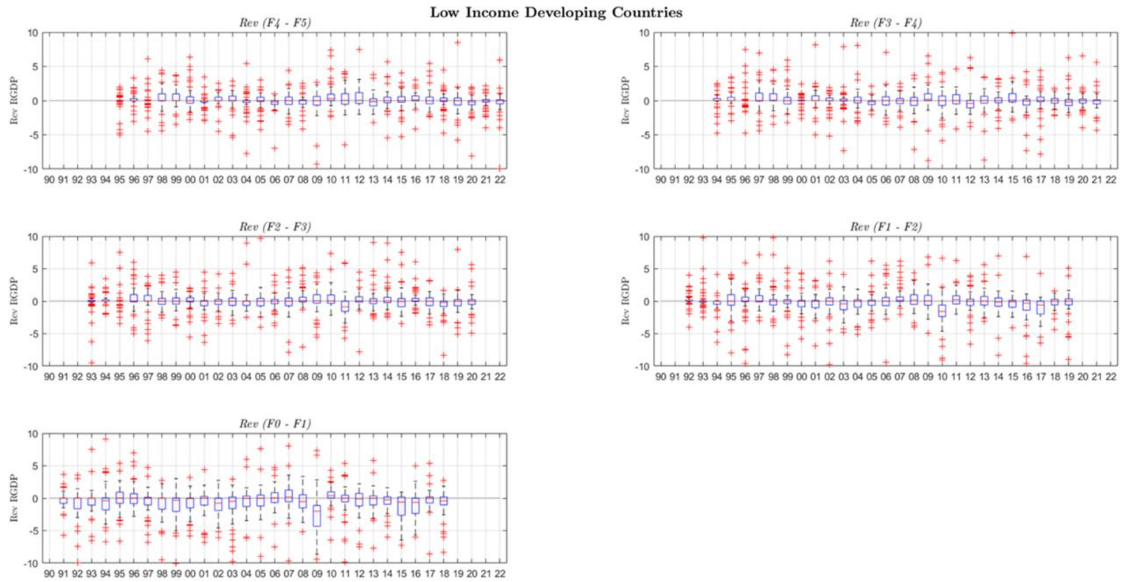
Source: WEO database and authors' calculations.

Figure A6. Growth Revisions for EMDEs Across Vintages



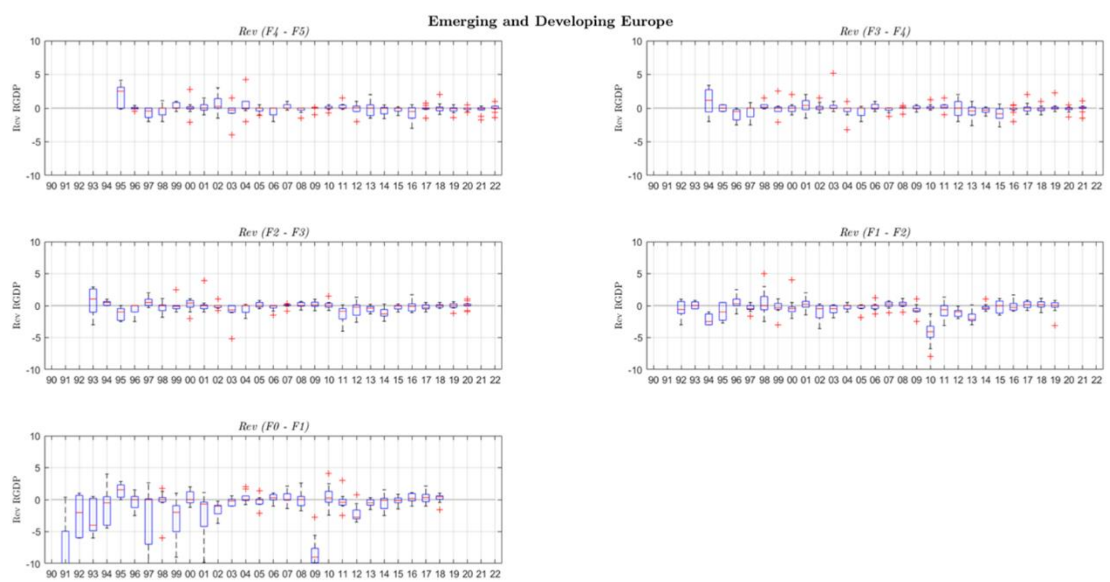
Source: WEO database and authors' calculations.

Figure A7. Growth Revisions for LICs Across Vintages



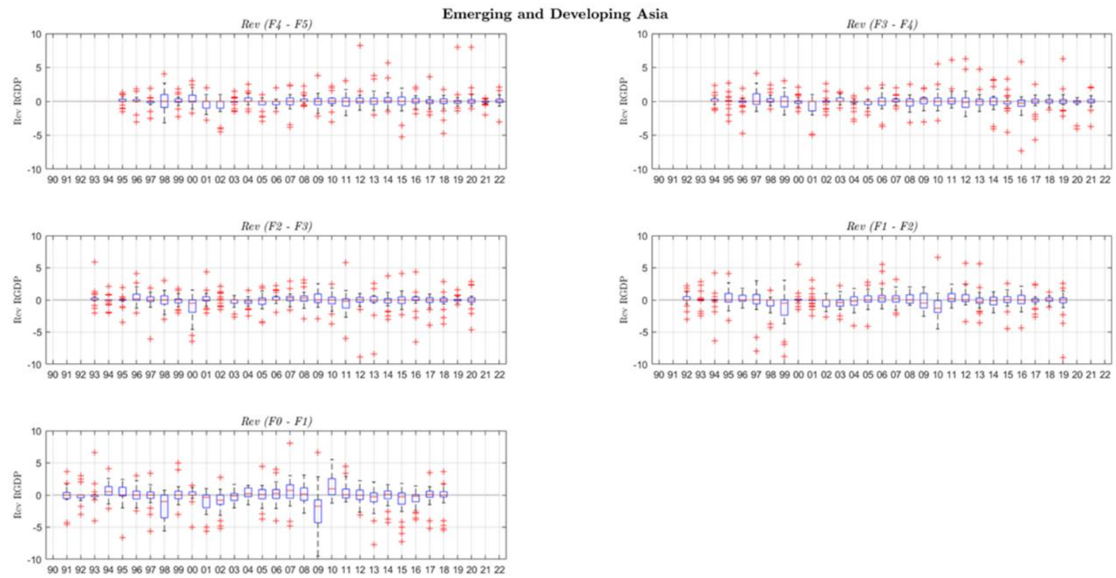
Source: WEO database and authors' calculations.

Figure A8. Growth Revisions for Emerging & Developing Europe Across Vintages



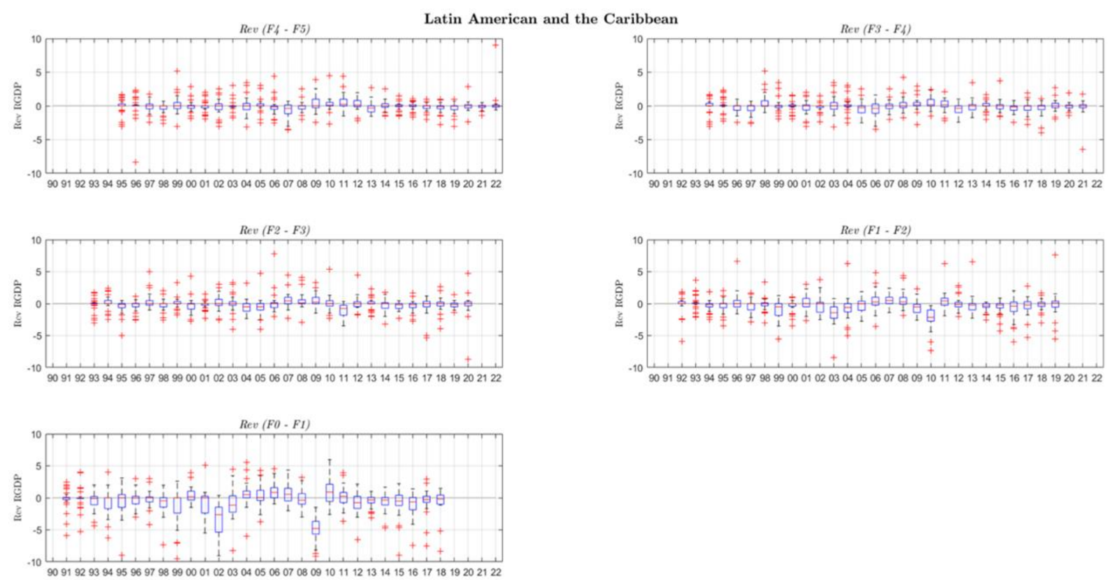
Source: WEO database and authors' calculations.

Figure A9. Growth Revisions for Emerging & Developing Asia Across Vintages



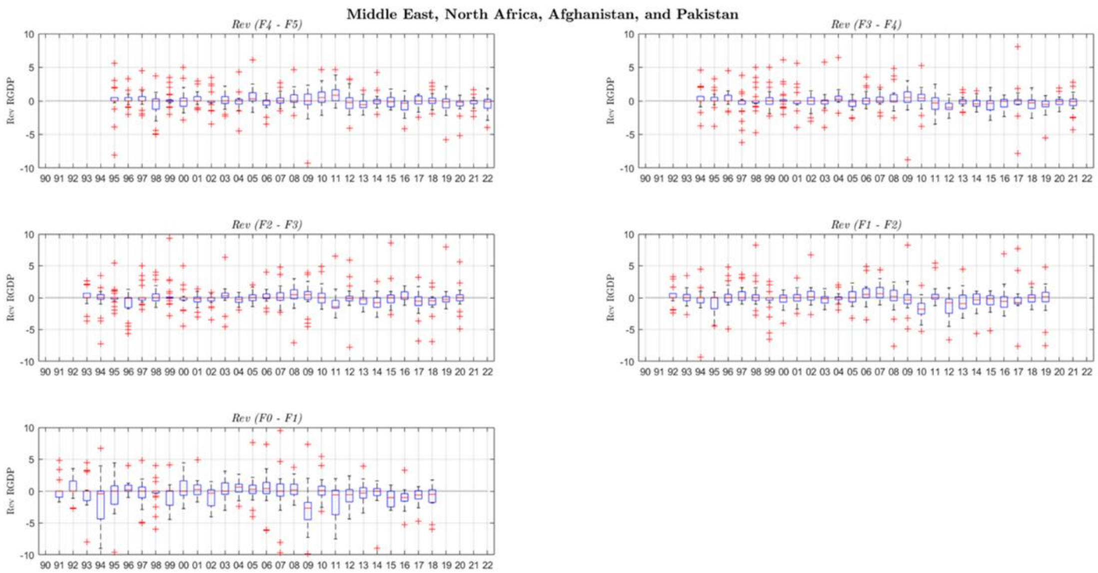
Source: WEO database and authors' calculations.

Figure A10. Growth Revisions for LAC Across Vintages



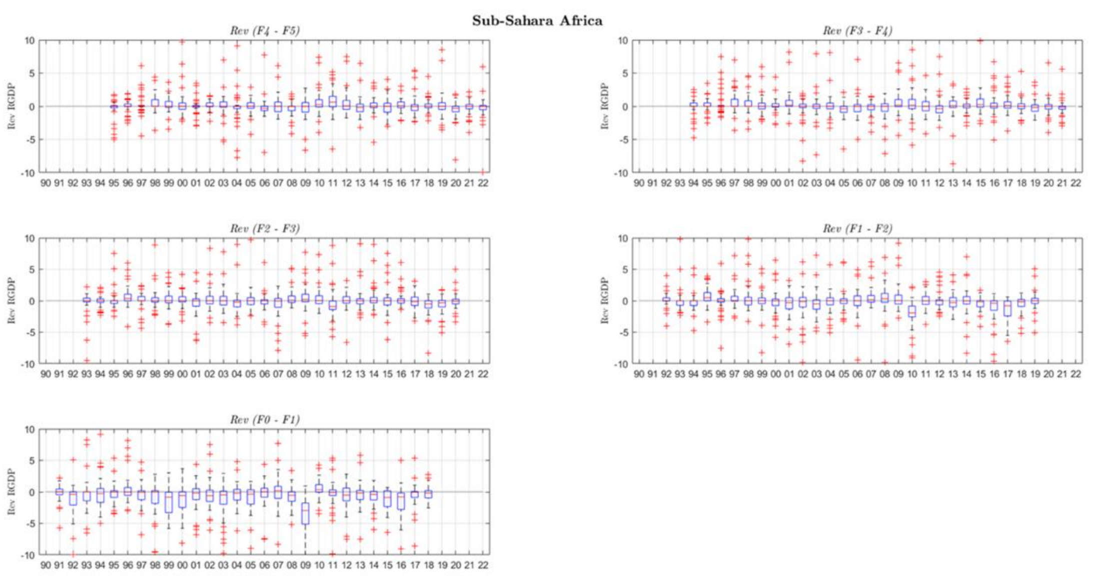
Source: WEO database and authors' calculations.

Figure A11. Growth Revisions for MENAP Across Vintages



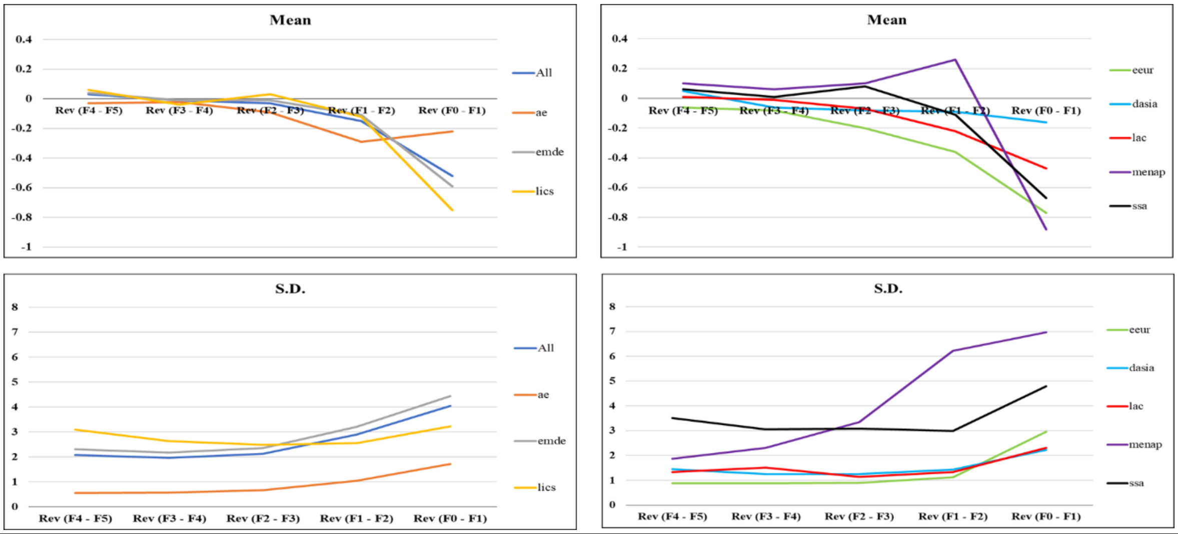
Source: WEO database and authors' calculations.

Figure A12. Growth Revisions for Sub-Saharan Africa Across Vintages



Source: WEO database and authors' calculations.

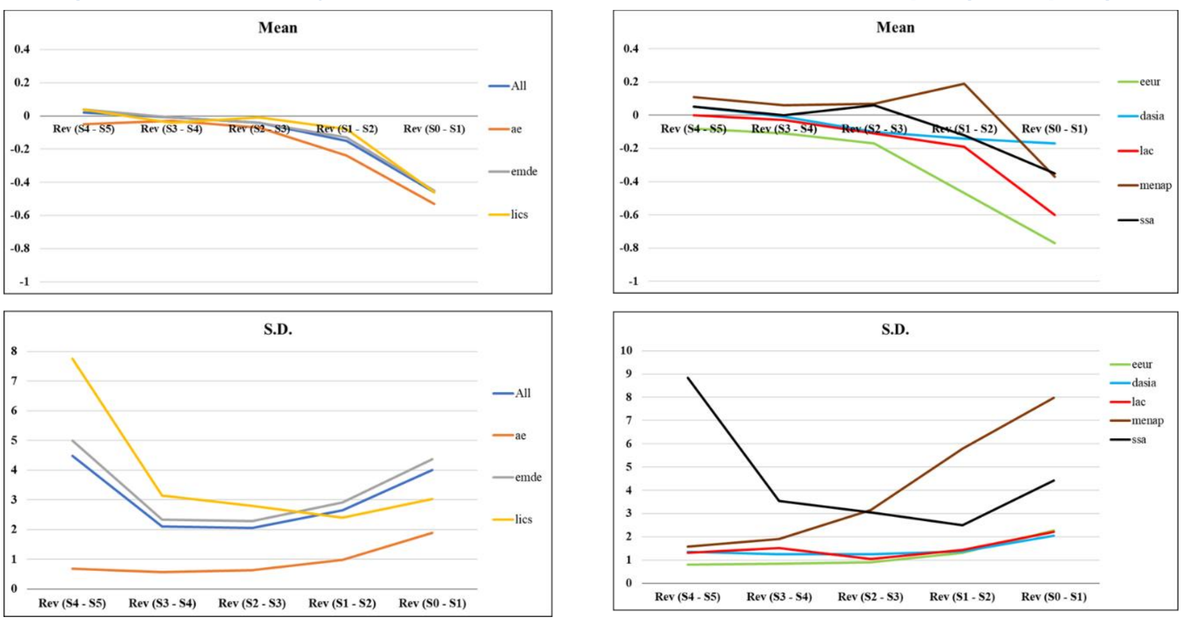
Figure A13. Summary: Visual Evidence About Growth Revisions (Excluding 2009)



Note: The upper charts show mean revisions for different country groups and regions across five time horizons. The lower charts show the corresponding standard deviations. All charts exclude year 2009.

Source: WEO database and authors' calculations.

Figure A14. Summary: Visual Evidence About Growth Revisions (Spring-to-Spring)



Note: The upper charts show mean revisions for different country groups and regions across five time horizons. The lower charts show the corresponding standard deviations. Revisions are calculated as Spring-to-Spring differences.

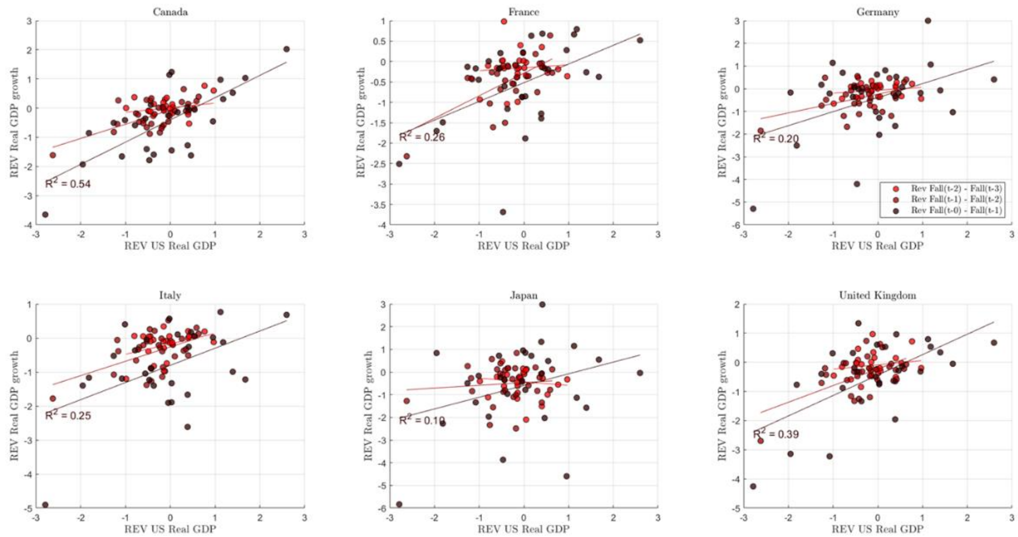
Source: WEO database and authors' calculations.

Table A1. Overview of Descriptive Findings

	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev (F4 - F5)									
Min	-50.91	-5	-50.91	-50.91	-4	-5.22	-8.37	-9.3	-50.91
Mean	0.02	-0.04	0.04	0.06	-0.07	0.08	0	0.08	0.05
Median	0	0	0	0	0	0	0	0	0
Max	50.86	3.24	50.86	50.86	4.19	17.6	24.76	20.89	50.86
S.D.	2.06	0.56	2.29	3.04	0.88	1.58	1.31	1.85	3.46
Rev (F3 - F4)									
Min	-48.86	-5.5	-48.86	-48.86	-3.2	-10.25	-6.41	-11.77	-48.86
Mean	-0.02	-0.04	-0.02	-0.05	-0.08	-0.05	-0.03	0.03	0.01
Median	0	0	0	0	0	0	0	0	0
Max	34.73	3.17	34.73	13.1	5.2	6.3	34.73	29.07	17.21
S.D.	1.94	0.59	2.15	2.6	0.9	1.28	1.51	2.27	3.01
Rev (F2 - F3)									
Min	-38.4	-6	-38.4	-38.4	-5.2	-8.84	-8.66	-11.37	-38.4
Mean	-0.05	-0.12	-0.04	0.01	-0.24	-0.09	-0.11	0.06	0.07
Median	0	-0.03	0	0	0	0	0	0	0
Max	61.27	5.02	61.27	54.21	3.96	5.89	7.79	61.27	54.21
S.D.	2.13	0.69	2.36	2.51	0.95	1.28	1.15	3.32	3.11
Rev (F1 - F2)									
Min	-30.34	-7.94	-30.34	-30.34	-8	-8.92	-8.46	-25.28	-30.34
Mean	-0.22	-0.35	-0.18	-0.17	-0.52	-0.12	-0.3	0.19	-0.18
Median	-0.01	-0.2	0	0	-0.3	0	0	0	0
Max	112.85	6.58	112.85	45.42	5	6.66	7.61	112.85	45.42
S.D.	2.9	1.13	3.19	2.58	1.41	1.46	1.4	6.14	2.99
Rev (F0 - F1)									
Min	-69.92	-19.16	-69.92	-36.87	-28	-21.2	-18.88	-69.18	-47.87
Mean	-0.68	-0.42	-0.74	-0.82	-1.09	-0.26	-0.63	-0.95	-0.79
Median	-0.09	-0.17	-0.05	-0.1	-0.04	0	-0.1	0	-0.3
Max	82.64	13.2	82.64	22.82	4.1	22.82	5.97	49.16	82.64
S.D.	4.13	2.11	4.49	3.25	3.33	2.35	2.43	6.88	4.79
Obs	4995	989	4006	1578	266	704	896	621	1219
Countries	193	39	154	59	12	30	32	23	45

Source: WEO database and authors' calculations.

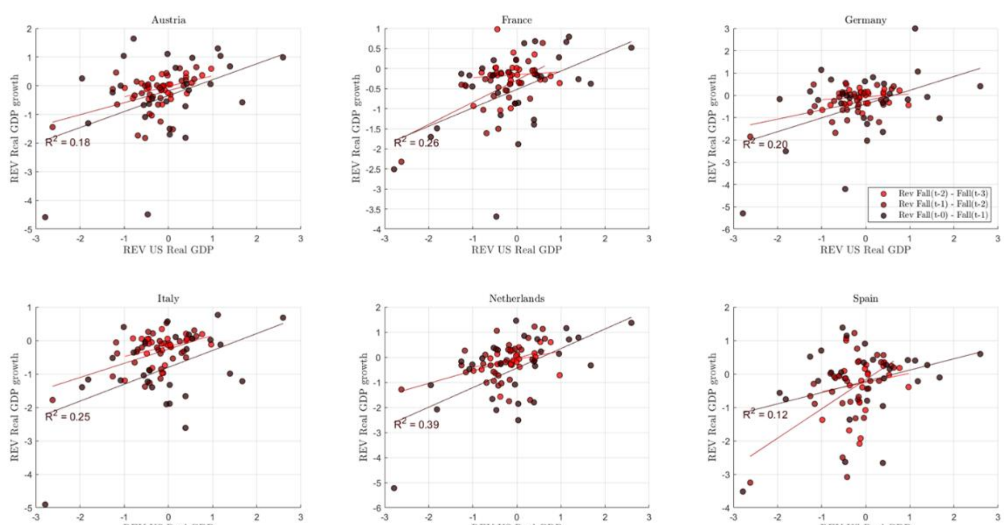
Figure A15. Impact of US Growth Revisions on G7 Economies



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.

Source: WEO database and authors' calculations.

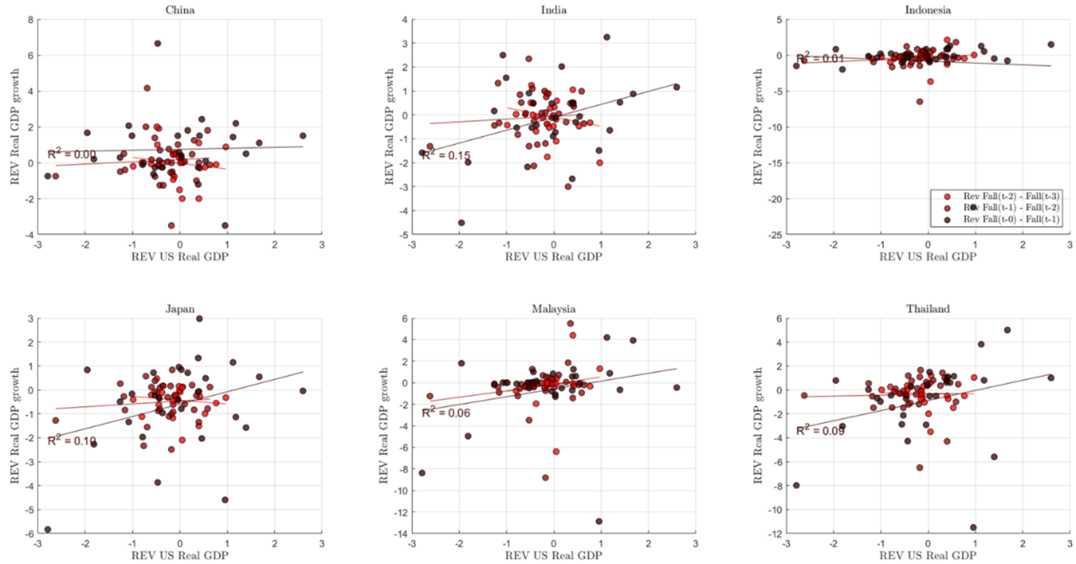
Figure A16. Impact of US Growth Revisions on Euro Area Economies



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.

Source: WEO database and authors' calculations.

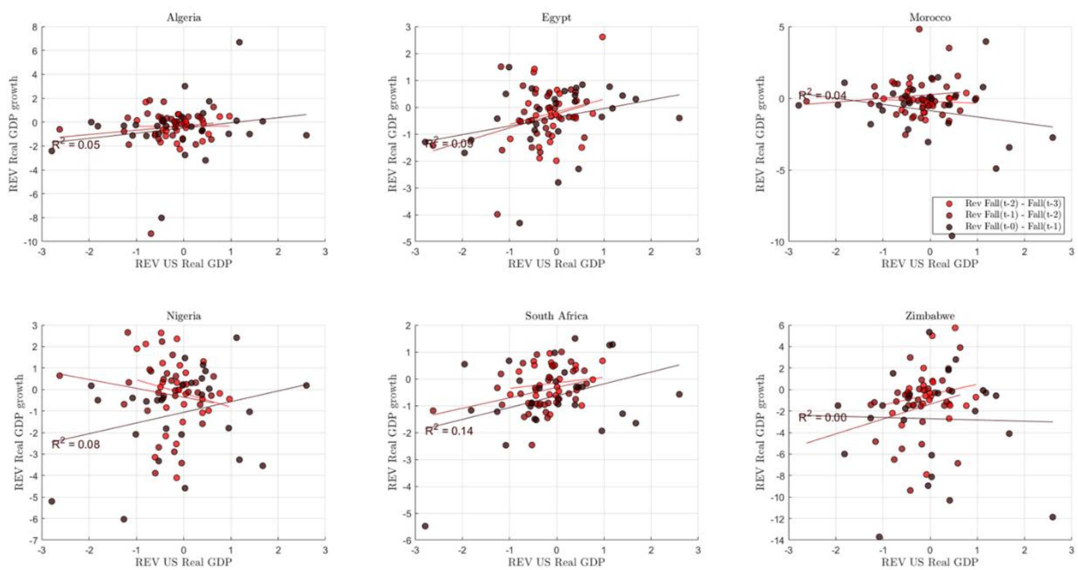
Figure A17. Impact of US Growth Revisions on Economies in Asia



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.

Source: WEO database and authors' calculations.

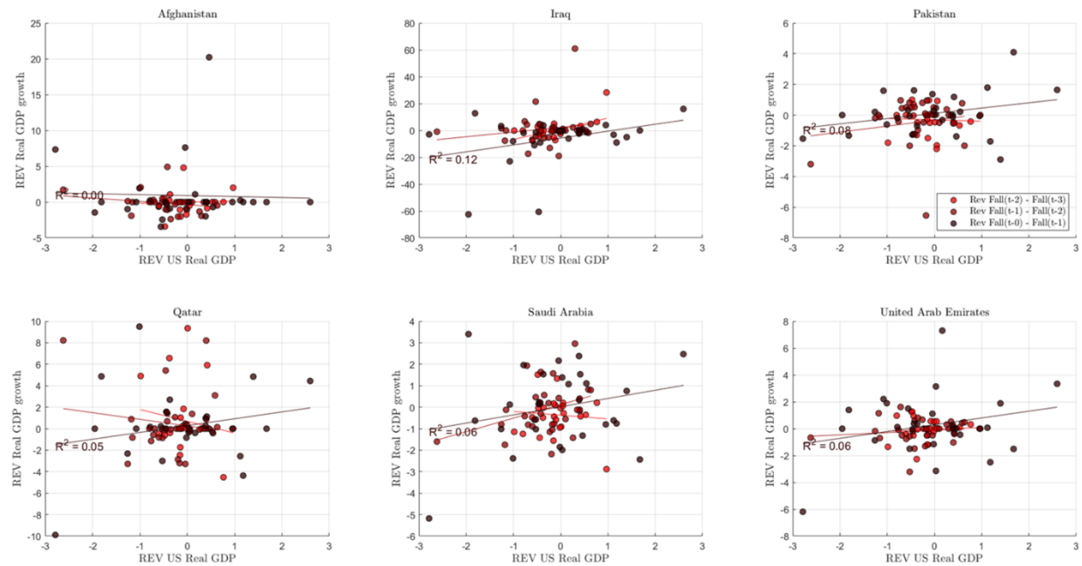
Figure A18. Impact of US Growth Revisions on Economies in Africa



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.

Source: WEO database and authors' calculations.

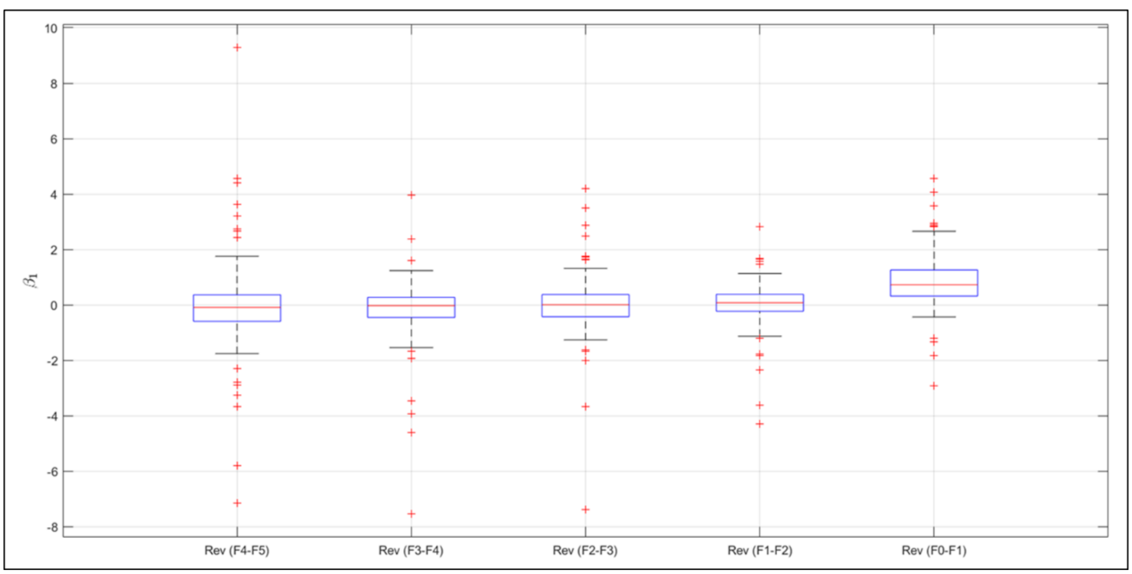
Figure A19. Impact of US Growth Revisions on Economies in the Middle East



Note: Darker (brighter) circles show observations in later (earlier) vintages. Correspondigly, darker (brighter) lines depict the relationship in later (earlier) vintages.

Source: WEO database and authors' calculations.

Figure A20. Impact of US Growth Revisions on Growth Revisions in Individual Economies (Full Distribution of Slope Coefficients)



Note: The boxplots depict the interquartile range of the distribution of estimated slope coefficients from individual-country regression specifications.

Source: WEO database and authors' calculations.

Table A2. Relationship Between Forecast Errors and Subsequent Growth Revisions (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rgdp_0	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E
FE_rgdp_1	-0.693	-0.729	-0.691	-0.495	-0.728	-0.607	-0.576	-0.823	-0.617
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	4797	950	3847	1518	255	669	864	597	1174
Countries	192	39	153	59	12	29	32	23	45
R-squared	0.64	0.77	0.63	0.50	0.74	0.61	0.58	0.78	0.47
Adjusted R-squared	0.62	0.77	0.62	0.48	0.73	0.60	0.56	0.77	0.45
Rev_rgdp_1									
FE_rgdp_2	-0.28	-0.172	-0.287	-0.199	-0.112	-0.164	-0.179	-0.452	-0.203
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.03)	(0.02)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	4602	911	3691	1459	242	638	832	574	1129
Countries	190	37	153	59	12	29	32	23	45
R-squared	0.21	0.19	0.22	0.12	0.08	0.13	0.19	0.34	0.15
Adjusted R-squared	0.18	0.16	0.18	0.08	0.03	0.09	0.16	0.31	0.11
Rev_rgdp_2									
FE_rgdp_3	-0.096	-0.03	-0.102	-0.18	-0.032	-0.109	-0.082	-0.077	-0.139
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.106]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	4411	874	3537	1400	230	608	800	551	1084
Countries	190	37	153	59	12	29	32	23	45
R-squared	0.04	0.02	0.05	0.11	0.01	0.08	0.06	0.03	0.06
Adjusted R-squared	0.00	-0.03	0.00	0.07	-0.04	0.03	0.02	-0.02	0.02
Rev_rgdp_3									
FE_rgdp_4	-0.103	-0.03	-0.109	-0.207	-0.032	-0.103	-0.041	-0.043	-0.185
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.112]	[0.000]	[0.000]	[0.003]	[0.000]
Observations	4221	837	3384	1341	218	579	768	528	1039
Countries	187	36	151	58	12	28	32	23	44
R-squared	0.07	0.02	0.07	0.15	0.01	0.07	0.02	0.02	0.13
Adjusted R-squared	0.02	-0.02	0.03	0.11	-0.05	0.02	-0.02	-0.03	0.09
Rev_rgdp_4									
FE_rgdp_5	-0.105	-0.019	-0.113	-0.241	-0.071	-0.118	-0.03	-0.037	-0.208
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
	[0.000]	[0.012]	[0.000]	[0.000]	[0.000]	[0.000]	[0.008]	[0.002]	[0.000]
Observations	4032	801	3231	1283	206	549	736	505	995
Countries	187	36	151	58	12	28	32	23	44
R-squared	0.05	0.01	0.06	0.12	0.06	0.06	0.01	0.02	0.11
Adjusted R-squared	0.01	-0.04	0.01	0.08	0.00	0.01	-0.04	-0.03	0.07
Standard errors in parenthesis p-values in brackets									

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A3. Results from (Fall-to-Fall) Univariate Regressions (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rGDP_0	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*
Rev_dToT	0.002	-0.026	0.002	-0.007	-0.1	0.011	0.021	0.017	0.002
p-value	[0.639]	[0.215]	[0.582]	[0.084]	[0.038]	[0.288]	[0.062]	[0.186]	[0.803]
R-squared	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.01	0.00
Rev_US_rgdp	0.466	0.682	0.415	0.154	1.032	0.274	0.372	0.636	0.308
p-value	[0.000]	[0.000]	[0.000]	[0.029]	[0.000]	[0.000]	[0.000]	[0.008]	[0.009]
R-squared	0.02	0.14	0.01	0.00	0.12	0.02	0.03	0.01	0.01
Rev_rGDP_1									
Rev_dToT	0	0.009	0	-0.001	0.057	0.008	-0.003	0.017	-0.001
p-value	[0.924]	[0.722]	[0.923]	[0.767]	[0.129]	[0.302]	[0.807]	[0.200]	[0.744]
R-squared	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Rev_US_rgdp	0.134	0.497	0.047	-0.111	0.341	-0.035	0.103	0.535	-0.177
p-value	[0.033]	[0.000]	[0.545]	[0.256]	[0.009]	[0.679]	[0.151]	[0.158]	[0.174]
R-squared	0.00	0.09	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Rev_rGDP_2									
Rev_dToT	0.004	0.008	0.004	0.006	0.018	0.017	0	0.004	0.024
p-value	[0.028]	[0.474]	[0.048]	[0.042]	[0.453]	[0.097]	[0.814]	[0.570]	[0.006]
R-squared	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Rev_US_rgdp	0.13	0.187	0.116	0.075	-0.105	0.03	0.029	0.77	-0.027
p-value	[0.064]	[0.000]	[0.178]	[0.604]	[0.459]	[0.794]	[0.740]	[0.011]	[0.894]
R-squared	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Rev_rGDP_3									
Rev_dToT	0.009	-0.004	0.009	0.011	0.027	-0.04	0	0.002	0.086
p-value	[0.000]	[0.686]	[0.000]	[0.000]	[0.169]	[0.000]	[0.848]	[0.765]	[0.000]
R-squared	0.01	0.00	0.01	0.02	0.01	0.04	0.00	0.00	0.12
Rev_US_rgdp	-0.21	0.046	-0.271	-0.5	-0.06	-0.006	-0.097	0.249	-0.877
p-value	[0.007]	[0.390]	[0.004]	[0.006]	[0.714]	[0.967]	[0.494]	[0.324]	[0.000]
R-squared	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Rev_rGDP_4									
Rev_dToT	0.046	0.036	0.046	0.047	0.004	0.059	-0.005	-0.029	0.05
p-value	[0.000]	[0.042]	[0.000]	[0.000]	[0.837]	[0.000]	[0.689]	[0.152]	[0.000]
R-squared	0.04	0.01	0.04	0.05	0.00	0.04	0.00	0.01	0.05
Rev_US_rgdp	-0.113	-0.044	-0.13	-0.262	-0.085	0.345	-0.047	0.035	-0.544
p-value	[0.290]	[0.506]	[0.324]	[0.350]	[0.651]	[0.109]	[0.769]	[0.899]	[0.133]
R-squared	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A4. Results from (Fall-to-Fall) Multivariate Regressions (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rGDP_0	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*
Rev_dToT	0.002	-0.024	0.003	-0.006	-0.075	0.012	0.027	0.013	0.001
p-value	[0.469]	[0.180]	[0.449]	[0.152]	[0.059]	[0.223]	[0.012]	[0.319]	[0.858]
Rev_US_rgdp	0.871	1.281	0.772	0.364	1.509	0.715	0.821	0.49	0.498
p-value	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.039]	[0.001]
R-squared	0.07	0.27	0.05	0.02	0.34	0.08	0.09	0.02	0.02
Rev_rGDP_1									
Rev_dToT	0	0.016	0	-0.001	0.057	0.008	-0.003	0.017	-0.001
p-value	[0.923]	[0.513]	[0.904]	[0.750]	[0.127]	[0.312]	[0.807]	[0.201]	[0.718]
Rev_US_rgdp	0	0.564	-0.136	-0.229	0.144	-0.082	-0.003	-0.023	-0.402
p-value	[0.996]	[0.000]	[0.042]	[0.068]	[0.313]	[0.448]	[0.979]	[0.887]	[0.017]
R-squared	0.00	0.12	0.00	0.00	0.02	0.01	0.00	0.01	0.01
Rev_rGDP_2									
Rev_dToT	0.004	0.008	0.004	0.006	0.019	0.017	0	0.004	0.024
p-value	[0.028]	[0.474]	[0.049]	[0.041]	[0.426]	[0.098]	[0.811]	[0.571]	[0.006]
Rev_US_rgdp	0.034	0.26	-0.02	0.23	-0.373	0.013	-0.032	-0.052	0.107
p-value	[0.687]	[0.000]	[0.851]	[0.268]	[0.007]	[0.933]	[0.780]	[0.817]	[0.712]
R-squared	0.00	0.04	0.00	0.01	0.05	0.01	0.00	0.00	0.01
Rev_rGDP_3									
Rev_dToT	0.009	-0.005	0.009	0.011	0.027	-0.041	0	0.002	0.084
p-value	[0.000]	[0.653]	[0.000]	[0.000]	[0.175]	[0.000]	[0.852]	[0.769]	[0.000]
Rev_US_rgdp	-0.265	0.136	-0.36	-0.544	-0.253	-0.122	-0.128	-0.065	-0.725
p-value	[0.006]	[0.013]	[0.002]	[0.026]	[0.086]	[0.539]	[0.506]	[0.763]	[0.014]
R-squared	0.01	0.01	0.01	0.02	0.03	0.04	0.00	0.00	0.13
Rev_rGDP_4									
Rev_dToT	0.046	0.038	0.046	0.047	0.006	0.057	-0.005	-0.029	0.051
p-value	[0.000]	[0.035]	[0.000]	[0.000]	[0.750]	[0.000]	[0.693]	[0.153]	[0.000]
Rev_US_rgdp	-0.097	-0.026	-0.113	-0.233	-0.249	0.415	-0.015	-0.018	-0.518
p-value	[0.466]	[0.691]	[0.488]	[0.513]	[0.106]	[0.213]	[0.939]	[0.955]	[0.242]
R-squared	0.04	0.01	0.04	0.05	0.02	0.04	0.00	0.01	0.06

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A5. Results from (Spring-to-Spring) Multivariate Regressions (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rGDP_0	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*
Rev_dToT	0.002	-0.015	0.002	-0.01	-0.077	0.016	-0.01	0.003	-0.004
p-value	[0.674]	[0.376]	[0.654]	[0.056]	[0.012]	[0.209]	[0.382]	[0.730]	[0.634]
Rev_US_rgdp	0.522	0.999	0.409	0.185	0.892	0.404	0.429	0.245	0.24
p-value	[0.000]	[0.000]	[0.000]	[0.005]	[0.000]	[0.000]	[0.000]	[0.052]	[0.012]
R-squared	0.06	0.37	0.03	0.01	0.36	0.06	0.06	0.01	0.01
Rev_rGDP_1									
Rev_dToT	-0.002	0.031	-0.002	-0.001	-0.039	-0.012	-0.016	-0.079	-0.001
p-value	[0.196]	[0.140]	[0.210]	[0.797]	[0.156]	[0.128]	[0.136]	[0.000]	[0.733]
Rev_US_rgdp	0.383	0.654	0.317	0.229	0.788	0.229	0.39	0.279	0.146
p-value	[0.000]	[0.000]	[0.000]	[0.010]	[0.000]	[0.006]	[0.000]	[0.119]	[0.194]
R-squared	0.03	0.32	0.02	0.01	0.32	0.03	0.06	0.06	0.00
Rev_rGDP_2									
Rev_dToT	0.034	0.004	0.034	0.034	-0.002	-0.001	-0.001	0.067	0.044
p-value	[0.000]	[0.714]	[0.000]	[0.000]	[0.938]	[0.954]	[0.441]	[0.005]	[0.000]
Rev_US_rgdp	0.126	0.119	0.128	0.242	-0.047	0.108	-0.023	0.084	0.357
p-value	[0.079]	[0.013]	[0.146]	[0.194]	[0.694]	[0.444]	[0.796]	[0.761]	[0.092]
R-squared	0.12	0.01	0.12	0.17	0.00	0.00	0.00	0.02	0.25
Rev_rGDP_3									
Rev_dToT	0.034	0.011	0.034	0.039	0.003	-0.031	-0.002	0.007	0.125
p-value	[0.000]	[0.267]	[0.000]	[0.000]	[0.903]	[0.004]	[0.572]	[0.751]	[0.000]
Rev_US_rgdp	0.032	0.203	-0.008	0.049	-0.035	-0.199	-0.097	0.059	-0.067
p-value	[0.761]	[0.000]	[0.951]	[0.864]	[0.795]	[0.303]	[0.604]	[0.826]	[0.839]
R-squared	0.03	0.03	0.03	0.06	0.00	0.03	0.00	0.00	0.18
Rev_rGDP_4									
Rev_dToT	0.07	0.02	0.07	0.073	0.029	0.04	-0.027	0.036	0.078
p-value	[0.000]	[0.292]	[0.000]	[0.000]	[0.161]	[0.007]	[0.126]	[0.010]	[0.001]
Rev_US_rgdp	-0.219	0.166	-0.311	-0.543	-0.304	-0.068	-0.232	-0.231	-0.778
p-value	[0.556]	[0.025]	[0.500]	[0.635]	[0.075]	[0.829]	[0.299]	[0.458]	[0.588]
R-squared	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.02	0.01

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A6. Results from Semi-Annual Multivariate Regressions (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rGDP_0	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E
Rev_dToT	0.001	0.001	0.001	0.001	0.031	0.011	0.011	-0.016	0.002
p-value	[0.758]	[0.923]	[0.774]	[0.789]	[0.145]	[0.213]	[0.113]	[0.454]	[0.659]
Rev_US_rgdp	0.039	-0.172	0.089	0.008	0.106	0.044	0.026	0.672	-0.034
p-value	[0.545]	[0.058]	[0.243]	[0.944]	[0.450]	[0.740]	[0.812]	[0.061]	[0.787]
R-squared	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00
Rev_rGDP_1									
Rev_dToT	0.005	0	0.005	-0.002	-0.065	0.014	-0.002	0.011	0.001
p-value	[0.134]	[0.988]	[0.153]	[0.561]	[0.020]	[0.167]	[0.840]	[0.239]	[0.875]
Rev_US_rgdp	0.683	1.086	0.587	0.321	1.228	0.545	0.525	0.219	0.464
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.124]	[0.000]
R-squared	0.08	0.39	0.05	0.02	0.45	0.08	0.06	0.01	0.02
Rev_rGDP_2									
Rev_dToT	-0.02	-0.031	-0.02	-0.019	-0.013	0	0.003	-0.054	-0.029
p-value	[0.000]	[0.073]	[0.000]	[0.010]	[0.594]	[0.981]	[0.772]	[0.002]	[0.007]
Rev_US_rgdp	0.096	0.486	0.002	-0.133	0.29	0.028	0.196	0.333	-0.371
p-value	[0.068]	[0.000]	[0.971]	[0.256]	[0.003]	[0.735]	[0.013]	[0.103]	[0.017]
R-squared	0.01	0.13	0.01	0.01	0.06	0.00	0.01	0.03	0.02
Rev_rGDP_3									
Rev_dToT	-0.004	0.044	-0.004	-0.002	-0.017	0.018	-0.02	-0.016	-0.004
p-value	[0.058]	[0.019]	[0.069]	[0.391]	[0.614]	[0.067]	[0.082]	[0.272]	[0.147]
Rev_US_rgdp	0.468	0.715	0.407	0.263	0.941	0.296	0.499	0.44	0.2
p-value	[0.000]	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]	[0.000]	[0.003]	[0.076]
R-squared	0.04	0.33	0.03	0.01	0.30	0.04	0.08	0.03	0.01
Rev_rGDP_4									
Rev_dToT	-0.008	-0.008	-0.008	-0.007	-0.007	-0.004	-0.01	-0.045	-0.008
p-value	[0.000]	[0.596]	[0.000]	[0.000]	[0.677]	[0.450]	[0.143]	[0.019]	[0.001]
Rev_US_rgdp	-0.012	0.153	-0.051	0.132	-0.258	0.043	0.024	-0.03	-0.126
p-value	[0.848]	[0.000]	[0.498]	[0.273]	[0.002]	[0.683]	[0.786]	[0.892]	[0.509]
R-squared	0.01	0.02	0.01	0.02	0.05	0.00	0.00	0.02	0.02
Rev_rGDP_5									
Rev_dToT	0.024	0.015	0.024	0.024	0.05	0.026	0	0.013	0.044
p-value	[0.000]	[0.115]	[0.000]	[0.000]	[0.075]	[0.000]	[0.781]	[0.145]	[0.000]
Rev_US_rgdp	-0.043	-0.169	-0.012	0.15	-0.559	-0.112	-0.384	0.064	0.311
p-value	[0.691]	[0.029]	[0.926]	[0.591]	[0.004]	[0.589]	[0.006]	[0.892]	[0.277]
R-squared	0.12	0.01	0.13	0.17	0.06	0.04	0.01	0.01	0.37

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_rGDP_7	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E	F.E
Rev_dToT	0.003	0.009	0.003	0.002	0.013	0.003	0	-0.002	0.084
p-value	[0.035]	[0.660]	[0.057]	[0.183]	[0.477]	[0.810]	[0.620]	[0.791]	[0.000]
Rev_US_rgdp	0.029	0.075	0.018	0.132	-0.226	-0.099	-0.028	0.051	0.128
p-value	[0.585]	[0.028]	[0.785]	[0.363]	[0.002]	[0.331]	[0.638]	[0.745]	[0.450]
R-squared	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.08
Rev_rGDP_7									
Rev_dToT	0.024	-0.01	0.024	0.027	0.026	-0.024	0	0.017	0.094
p-value	[0.000]	[0.199]	[0.000]	[0.000]	[0.264]	[0.010]	[0.955]	[0.301]	[0.000]
Rev_US_rgdp	-0.05	0.025	-0.069	-0.076	-0.061	0.037	-0.107	0.081	-0.226
p-value	[0.550]	[0.566]	[0.503]	[0.714]	[0.613]	[0.817]	[0.564]	[0.644]	[0.372]
R-squared	0.03	0.00	0.03	0.06	0.01	0.02	0.00	0.00	0.17
Rev_rGDP_8									
Rev_dToT	0.072	0.022	0.072	0.088	0.004	-0.001	-0.005	0.052	0.109
p-value	[0.000]	[0.258]	[0.000]	[0.000]	[0.832]	[0.939]	[0.379]	[0.047]	[0.000]
Rev_US_rgdp	-0.167	0.063	-0.225	-0.293	-0.087	-0.433	-0.105	0.208	-0.362
p-value	[0.036]	[0.139]	[0.022]	[0.182]	[0.383]	[0.001]	[0.180]	[0.394]	[0.176]
R-squared	0.07	0.01	0.07	0.10	0.00	0.03	0.01	0.01	0.13
Rev_rGDP_9									
Rev_dToT	0.015	0.041	0.015	0.013	0.017	0.024	-0.001	0.016	0.014
p-value	[0.000]	[0.025]	[0.001]	[0.059]	[0.407]	[0.117]	[0.955]	[0.267]	[0.068]
Rev_US_rgdp	0.04	0.06	0.035	-0.047	-0.173	0.11	-0.017	-0.032	0.027
p-value	[0.668]	[0.170]	[0.764]	[0.849]	[0.104]	[0.647]	[0.908]	[0.859]	[0.931]
R-squared	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Rev_rGDP_10									
Rev_dToT	0.362	-0.01	0.364	0.44	-0.013	-0.004	-0.019	0.024	0.521
p-value	[0.000]	[0.515]	[0.000]	[0.000]	[0.555]	[0.731]	[0.084]	[0.118]	[0.000]
Rev_US_rgdp	0.245	0.016	0.279	0.667	0.029	-0.144	-0.081	0.187	1.044
p-value	[0.394]	[0.714]	[0.434]	[0.452]	[0.772]	[0.347]	[0.406]	[0.378]	[0.342]
R-squared	0.11	0.00	0.11	0.13	0.00	0.00	0.01	0.01	0.16

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A7. Serial Autocorrelation of Revisions (All Vintages)

Y Var Rev_rGDP_0	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev_rgdp_0_L	0.091	-0.036	0.098	0.07	0.042	-0.059	0.071	-0.018	0.258
p-value	[0.000]	[0.272]	[0.000]	[0.007]	[0.404]	[0.131]	[0.048]	[0.612]	[0.000]
R-squared	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.07
Rev_rGDP_1									
Rev_rgdp_1_L	-0.03	0.217	-0.038	0.002	0.12	-0.024	0.106	-0.067	-0.001
p-value	[0.006]	[0.000]	[0.002]	[0.946]	[0.048]	[0.550]	[0.003]	[0.002]	[0.986]
R-squared	0.00	0.05	0.00	0.00	0.02	0.00	0.01	0.02	0.00
Rev_rgdp_2									
Rev_rgdp_2_L	-0.025	0.04	-0.027	0.009	-0.04	0.088	0.098	-0.065	-0.018
p-value	[0.052]	[0.206]	[0.066]	[0.720]	[0.509]	[0.025]	[0.006]	[0.006]	[0.546]
R-squared	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Rev_rgdp_3									
Rev_rgdp_3_L	0.091	-0.115	0.095	0.14	-0.175	0.158	-0.151	0.144	0.128
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]	[0.000]	[0.000]
R-squared	0.01	0.02	0.01	0.02	0.03	0.03	0.02	0.03	0.02
Rev_rgdp_4									
Rev_rgdp_4_L	-0.021	-0.133	-0.019	-0.038	-0.234	0.257	0.129	-0.182	-0.046
p-value	[0.159]	[0.000]	[0.246]	[0.146]	[0.000]	[0.000]	[0.000]	[0.000]	[0.124]
R-squared	0.00	0.02	0.00	0.00	0.07	0.07	0.02	0.04	0.00

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A8. Relationship Across Revisions for a Given Year (All Vintages)

Y Var Rev_rGDP_0	All F.E	ae F.E	emde F.E	lics F.E	eeur F.E	dasia F.E	lac F.E	menap F.E	ssa F.E
Rev_rgdp_1	0.003	0.255	-0.004	-0.3	-0.005	-0.014	0.139	0.069	-0.184
p-value	[0.872]	[0.000]	[0.831]	[0.000]	[0.969]	[0.822]	[0.024]	[0.078]	[0.000]
R-squared	0.00	0.02	0.00	0.06	0.00	0.00	0.01	0.01	0.01
Rev_rGDP_1									
Rev_rgdp_2	-0.225	-0.006	-0.23	-0.25	-0.04	-0.095	-0.15	-0.199	-0.274
p-value	[0.000]	[0.907]	[0.000]	[0.000]	[0.655]	[0.033]	[0.001]	[0.000]	[0.000]
R-squared	0.05	0.00	0.05	0.06	0.00	0.01	0.01	0.04	0.08
Rev_rgdp_2									
Rev_rgdp_3	-0.186	-0.205	-0.186	-0.171	-0.272	-0.236	-0.186	-0.153	-0.184
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R-squared	0.04	0.04	0.04	0.03	0.08	0.06	0.06	0.03	0.03
Rev_rgdp_3									
Rev_rgdp_4	-0.242	-0.208	-0.242	-0.246	-0.313	-0.034	-0.179	-0.38	-0.254
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.295]	[0.000]	[0.000]	[0.000]
R-squared	0.07	0.05	0.07	0.09	0.11	0.00	0.02	0.13	0.09

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.

Table A9. Persistence of Growth Shocks (All Vintages)

Y Var	All	ae	emde	lics	eeur	dasia	lac	menap	ssa
Rev_F0t1_F1t1	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*	*F.E*
Rev_rgdp_0	-0.007	0.379	-0.028	0.192	0.172	0.332	0.26	-0.381	0.148
p-value	[0.519]	[0.000]	[0.015]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R-squared	0.00	0.52	0.00	0.06	0.16	0.28	0.20	0.18	0.05
Rev_F0t2_F1t2									
Rev_rgdp_0	-0.033	0.125	-0.042	0.063	0.058	0.187	0.134	-0.215	0.022
p-value	[0.000]	[0.000]	[0.000]	[0.002]	[0.001]	[0.000]	[0.000]	[0.000]	[0.245]
R-squared	0.00	0.15	0.01	0.01	0.04	0.12	0.08	0.19	0.00
Rev_F0t3_F1t3									
Rev_rgdp_0	-0.019	0.042	-0.022	0.013	-0.004	0.138	0.092	-0.093	-0.008
p-value	[0.006]	[0.000]	[0.004]	[0.521]	[0.795]	[0.000]	[0.000]	[0.000]	[0.656]
R-squared	0.00	0.02	0.00	0.00	0.00	0.06	0.02	0.08	0.00
Rev_F0t4_F1t4									
Rev_rgdp_0	0.039	0.019	0.04	0.054	-0.027	0.092	0.079	0.019	0.07
p-value	[0.000]	[0.026]	[0.000]	[0.031]	[0.102]	[0.000]	[0.000]	[0.085]	[0.001]
R-squared	0.01	0.01	0.01	0.00	0.01	0.02	0.02	0.01	0.01

Note: Figures highlighted in red depict lack of significance at the 10 percent level.
Each panel displays results for a different revision vintage, starting with the latest vintage at the top.
Source: WEO database and authors' calculations.