Online Annex 2. El Niño's Potential Impact on Latin America[1]

El Niño—an extreme phase of the *El Niño–Southern Oscillation* phenomenon related to oceanic temperature changes—began in June this year. It is expected to persist into early 2024, and diagnostics by the National Oceanic and Atmospheric Administration suggest that the current episode will be "strong".[2] By mid-2024, the phenomenon is expected to cause abnormal weather conditions.

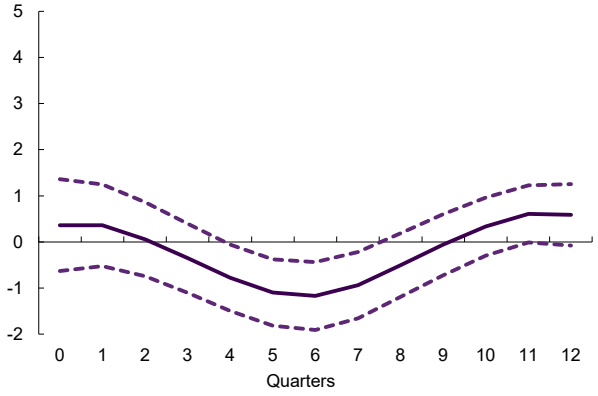
In past episodes, El Niño had noticeable but heterogeneous impact on weather conditions across Latin America, affecting a broad array of economic sectors. The adverse impact on weather conditions—generally due to higher temperatures and drier-than-usual conditions—has been most pronounced and mainly concentrated in the Andean region as well as in CAPDR. On the other hand, some economies along the Atlantic coast of South America, such as Argentina, have generally benefitted from higher-than-usual rainfalls that helped raise agricultural production. Meanwhile, the impact in some other countries—such as Bolivia, Brazil, Chile, and Mexico—has been less clear, reflecting differences across regions within the same country. Strong El Niño episodes have been associated with a slight uptick in climate-related disasters in the region, and specific countries—such as Ecuador and Peru—have experienced massive floods and landslides, causing severe infrastructure damages. Overall, El Niño is found to affect a broad array of sectors—to varying degrees—such as fisheries, energy, mining, transport, construction, and health.

Strong episodes of El Niño have had visible economic effects—with substantial differences across subgroups of countries. Empirical estimations following the local projection method of Jordà (2005) and accounting for other shocks find that strong El Niño episodes have had substantial impacts on output—on average, these effects peak about 1½ years after the start of the episode and are generally reversed within 2 years.[3] Specifically:[4]

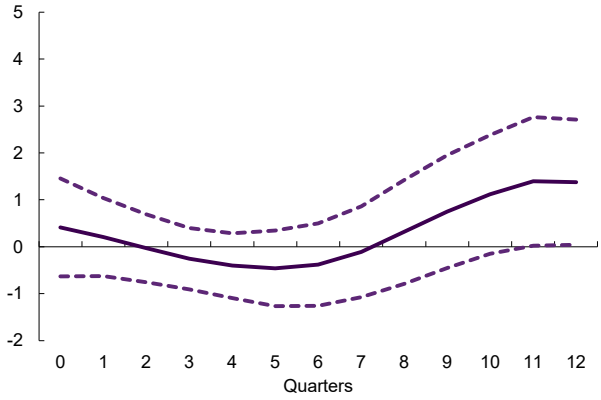
- **The Andean region (Colombia, Ecuador, and Peru) and CAPDR** experienced the largest losses in output, partly due to lower exports, averaging about 1 percent a year and a half after the start of a strong episode.

Online Annex Figure 2.1. Impact of El Niño on Output
(Percent; cumulative impact)

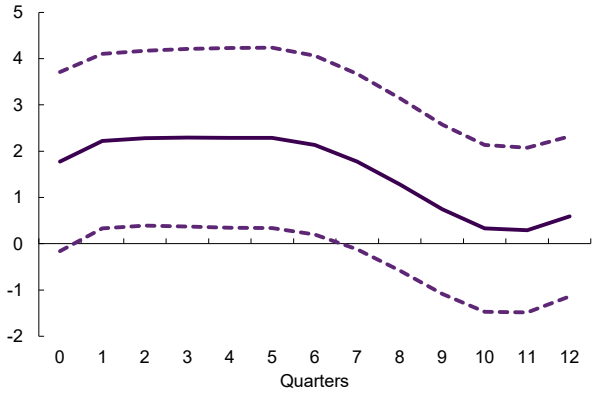
1. CAPDR, Colombia, Ecuador, and Peru



2. Bolivia, Brazil, Chile, and Mexico



3. Argentina, Paraguay, and Uruguay



Source: IMF staff calculations.
Note: Shows the estimated impact of El Niño events on real GDP using the local projection method in a cross-country panel. Dashed lines correspond to 10th/90th percentile confidence intervals.

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[2] A strong episode is defined as the 95th percentile (or 1.5) of the Oceanic Niño Index (ONI) that measures its intensity.

[3] Similar empirical estimations imply statistically significant, albeit small, effects of El Niño on CPI and food prices in the Andean region and CAPDR, while the effects are not statistically significant for the other subregions. On average, the impact on CPI and food prices peaks within one year.

[4] These estimates are broadly consistent with past research, such as Cashin et. al. (2017), Kim et al. (2022) and Martín (2016).

- **Bolivia, Brazil, Chile, and Mexico** show ambiguous effects on output, likely reflecting the heterogeneous effects of El Niño across regions within these countries.
- **The Southeastern region—comprising Argentina, Paraguay, and Uruguay—**has benefitted from El Niño, experiencing higher output (2 percent on average), sustained by higher exports, although these estimates entail large confidence intervals pointing both to considerable upside and downside risks.

While the interplay between El Niño and climate change remains largely uncertain, as climate change unfolds, some of El Niño's impact is expected to be exacerbated. The Intergovernmental Panel on Climate Change assigns low probability to El Niño being a human-induced phenomenon. Nevertheless, it expects that an El Niño episodes of the same intensity as those in the past could contribute to amplified precipitation or more severe drought conditions in the future.

The heterogenous impact of El Niño and its likely amplification over time highlight the importance of integrated global markets and robust safety nets to alleviate the impact on the most vulnerable. Integrated markets allow countries to share climate-related risks and maintain adequate supply of key goods between countries positively and negatively impacted. At the same time, the impact of these events on local food prices points to the need for stronger safety nets and well designed—temporary and targeted—measures to mitigate the risk of food insecurity and disease outbreaks. The Fund stands ready to provide support to the countries' that are affected by El Niño, including financial support, advice on macroeconomic policy, and technical assistance on building resilience, as needed.