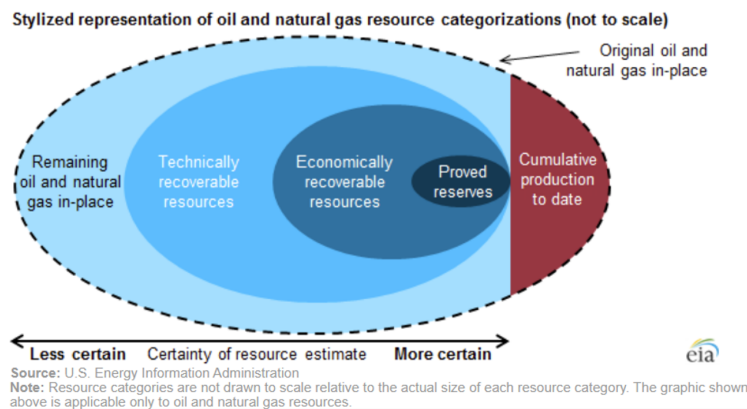


# 1 Data appendix

## 1.1 Controlling for oil reserves

As documented by [Hamann, Mendez-Vizcaino, Mendoza, and Restrepo-Echavarria \(2023\)](#), the dynamics of proved oil reserves have a significant impact on the evolution of credit worthiness of emerging economies who are oil exporters. In order to understand my findings in light of their results it is important to note a conceptual distinction between proved oil reserves and URR. There is a range of categories to measure oil reserves. Figure 1 shows a conceptual diagram from the U.S. Energy Information Administration that illustrates the differences between these categories.

Figure 1: Oil and natural gas resource categories



Each category implies a different level of uncertainty, where the most certain measure is proved reserves and the most uncertain is remaining oil and natural gas in-place. Oil and gas in-place refers to the total amount of resources within a geological formation. Technically recoverable resources includes oil and gas that can be produced based on current technology.<sup>1</sup> This is the estimate of URR that [Arezki, Ramey, and Sheng \(2017\)](#) use to construct the NPV of oil fields, which can be interpreted as the amount of oil in a field that is physically feasible to extract. Economically recoverable resources (ERR) are all URR that can be profitably produced given economic conditions (like the price of oil and variable costs of production) at the time of measurement. Finally, proved oil reserves require a higher standard of certainty to be considered profitably and physically recov-

<sup>1</sup>Geophysical characteristics of rocks, as well as physical properties of hydrocarbons (such as viscosity) prevent technology from producing the entirety of the ultimately recoverable reserves.

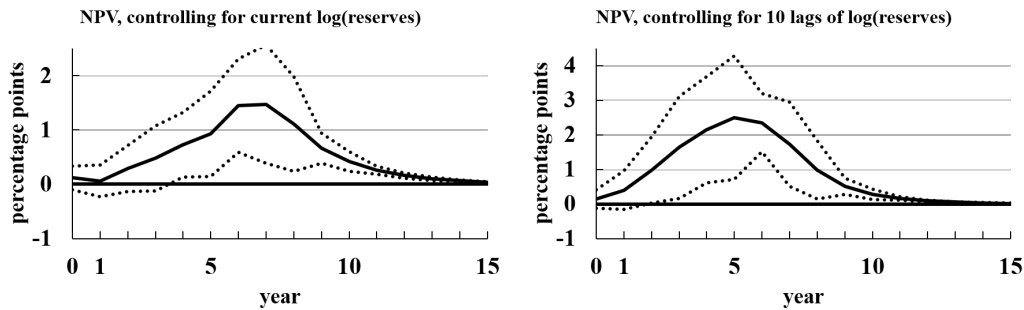
erable. As ERR, proved reserves shrink and grow as the prices of oil and extraction inputs vary, URR do not.

It is crucial to note that, by definition, the resources contained in giant oil field discoveries are not included in the measure of proved oil reserves at the time of the discovery. Instead, the oil in a field is gradually added to proved reserves once drilling starts and new information is collected about its feasibility and profitability.

[Hamann, Mendez-Vizcaino, Mendoza, and Restrepo-Echavarria \(2023\)](#) document how marginal changes in proved oil reserves impact the credit worthiness of oil exporting countries, identifying both long and short-run effects. The shocks these authors identify are driven by international economic conditions (like oil prices) and by endogenous extraction decisions, both of which are the main source of variation in proved oil reserves. There are three important differences between [Hamann, Mendez-Vizcaino, Mendoza, and Restrepo-Echavarria \(2023\)](#) and the work presented in this paper. The first has to do with the magnitude of the shocks at hand. By definition, the size of year-to-year changes in proved reserves is dwarfed by the size of giant oil discoveries. The second has to do with the fact that newly discovered giant oil fields cannot be immediately exploited; instead, they require a substantial amount of investment through several years in order to become productive. In contrast, proven reserves can be more easily exploited within shorter periods of time. These differences imply that discoveries may affect sovereign interest rate spreads in a way that marginal changes in proved reserves do not.

Figure 2 shows the dynamic response of the spreads following a discovery of median size. The left panel controls for the natural logarithm of contemporaneous proved reserves and the right panel controls for this and ten lags. The results are very similar to the benchmark results that do not control for reserves.

Figure 2: Impact of giant oil discoveries on spreads

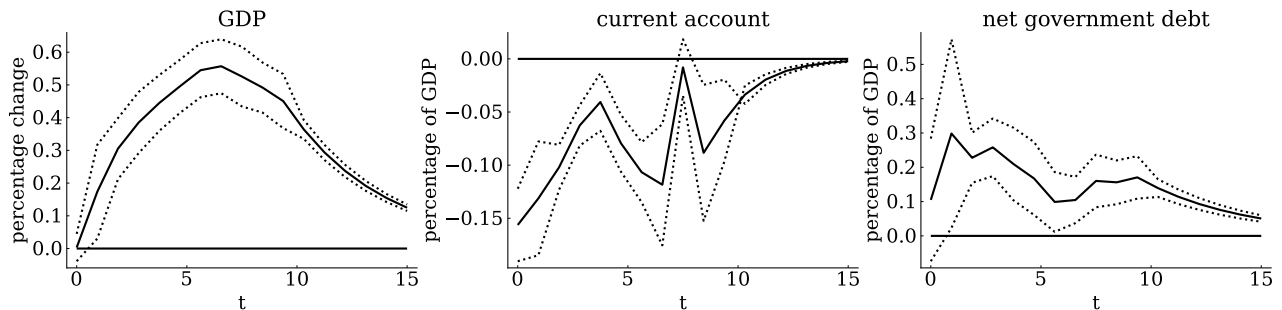


Impulse response to an oil discovery with net present value equal to 4.5 percent of GDP, which is the median size of discoveries in the sample. The dotted lines indicate 90 percent confidence intervals based on a [Driscoll and Kraay \(1998\)](#) estimation of standard errors, which yields standard error estimates that are robust to general forms of spatial and temporal clustering.

## 1.2 Estimates with restricted sample

Figure 3 presents the responses of GDP, the current account, and government debt by restricting the sample to the 37 emerging economies in the EMBI.

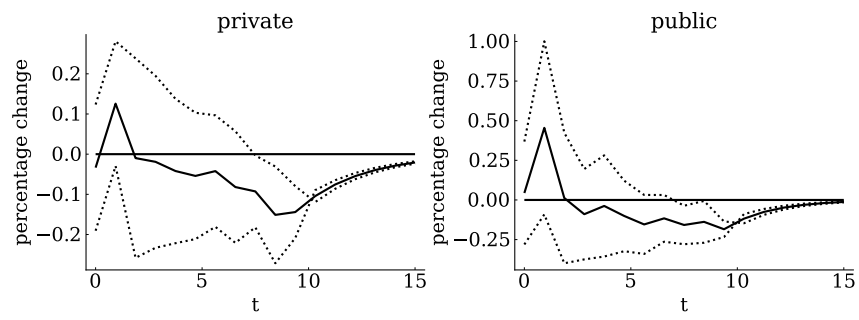
Figure 3: Response of GDP, current account, and government debt



Impulse response to an oil discovery with net present value equal to the median size of 4.5 percent of GDP. The dotted lines indicate 90 percent confidence intervals based on a [Driscoll and Kraay \(1998\)](#) estimation of standard errors, which yields standard error estimates that are robust to general forms of spatial and temporal clustering.

As discussed in the main text, GDP increases and peaks at around the time when the oil field becomes productive, the economies run a current account deficit and government debt increases. Interestingly, GDP starts increasing right after news arrives and the current account reversal is less pronounced. These interactions with production in the rest of the economy are interesting on their own and beyond the scope of this paper. Figure 4 presents the responses of private and public consumption for the restricted sample.

Figure 4: Response of consumption



Impulse response to an oil discovery with net present value equal to the median size of 4.5 percent of GDP. The dotted lines indicate 90 percent confidence intervals based on a [Driscoll and Kraay \(1998\)](#) estimation of standard errors, which yields standard error estimates that are robust to general forms of spatial and temporal clustering.

## References

- Arezki, Rabah, Valerie A. Ramey, and Liugang Sheng. 2017. “News Shocks in Open Economies: Evidence From Giant Oil Discoveries.” *Quarterly Journal of Economics* :103–155. [1](#)
- Driscoll, John C. and Aart C. Kraay. 1998. “Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data.” *Review of Economics and Statistics* 80:549–560. [3](#), [4](#)
- Hamann, Franz, Juan Camilo Mendez-Vizcaino, Enrique G Mendoza, and Paulina Restrepo-Echavarria. 2023. “Natural Resources and Sovereign Risk in Emerging Economies: A Curse and a Blessing.” Working Paper 31058, National Bureau of Economic Research. [1](#), [2](#)