

Real Effects of Sovereign Debt Inflow Shocks

By LORENZO PANDOLFI AND TOMAS WILLIAMS*

What are the real effects of sovereign debt inflow shocks? In a frictionless small open economy model, foreign demand shocks to sovereign debt markets, if unrelated to changes in countries' fundamentals, should have no real effects. However, with imperfect financial markets, a sudden change in foreigners' demand for domestic sovereign debt can significantly impact two key variables: sovereign bond yields and exchange rates. These changes, in turn, can affect firms operating in the recipient countries. For instance, a decrease in government bond yields might be beneficial for financial firms holding considerable amounts of government debt, which might also expand their supply of credit, thus benefiting financially constrained firms as well (Gennaioli, Martin and Rossi, 2014; Williams, 2018). At the same time, the reduction in the government's cost of capital might produce positive spillovers for state-owned companies and for firms which are closely related to the government (Chari, Leary and Phan, 2019). Conversely, firms relying more on exports might be negatively affected by the appreciation of the domestic currency which would erode their competitive advantage (Gabaix and Maggiori, 2015). Yet, testing for these channels is challenging from an empirical point of view, because of the endogeneity of sovereign debt inflows to the future economic prospects of recipi-

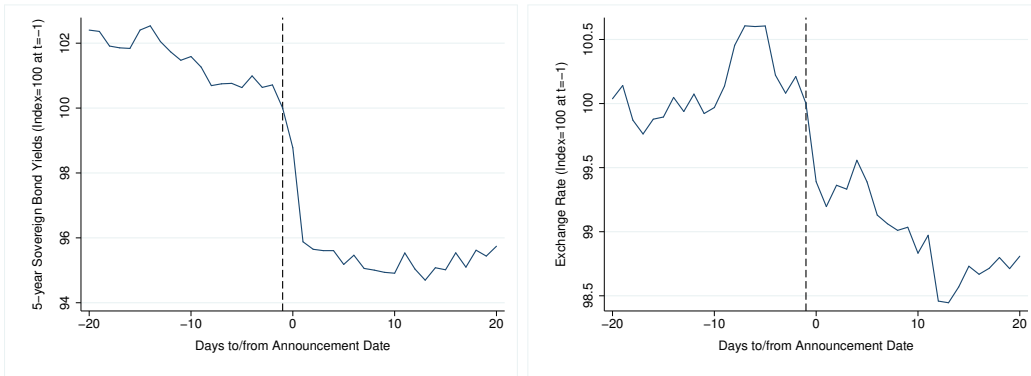
ent countries. In Broner et al. (2019), we address this issue by focusing on sovereign debt inflow shocks which are triggered by the inclusions of six emerging countries in two major local currency sovereign debt indexes: the Citigroup World Government Bond Index (WGBI) and the J.P. Morgan Government Bond Index Emerging Markets (GBI-EM).¹ These events trigger large capital inflows from international investors benchmarked against the two indexes, who suddenly increase their demand for local-currency denominated sovereign bonds of the newly included countries in order to replicate the composition of the index they follow.² In a multiple event study, we exploit the arbitrary timing of the announcement made by index providers to show that: i) rebalancing-driven sovereign debt inflow shocks lead to a significant decline in government bond yields and to an appreciation of the domestic currencies (Figure 1); ii) domestic listed firms are significantly and heterogeneously affected by these shocks, as witnessed by their cumulative abnormal returns (CARs) in the two days following the announcement episodes. In particular, financial firms and firms more closely related to the government exhibit CARs which are on average greater than zero. Instead, the CARs of firms operating in tradable industries are negative. Also, more financially constrained firms exhibit larger CARs. In this paper, we complement the evidence in Broner et al. (2019) by analyzing the long-term real effects of these shocks on domestic firms, as measured by the evolution of balance sheet variables in the years following the inclusion episodes. Our results are con-

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¹The newly included countries are Colombia, Czech Republic, Mexico, Nigeria, Romania, and South Africa.

²A similar strategy has been used also in Pandolfi and Williams (2019), where we show that the monthly mechanical rebalancings in the J.P. Morgan GBI-EM Global Diversified significantly increase the price of sovereign bonds and appreciate the domestic currency.

Figure 1. : Government Bond Yields and Exchange Rate Around Announcement



Note: This figure depicts the evolution of 5-year sovereign bond yields and exchange rates across all the six countries in the sample in a 40-day window around the announcement dates. The indexes for both panels are created by computing the median log change in the 5-year local currency government bond yield and the exchange rate across countries and then computing an index which is 100 one day before the announcement date.

sistent with those in Broner et al. (2019): financial and government-related firms exhibit a growth in income, employment, and dividends which is greater than that of tradable firms. More financially constrained firms also appear to benefit from the shocks. These results not only corroborate those in Broner et al. (2019), but also shed further light on the long-term real effects of sovereign debt inflow shocks: at least in emerging countries, large sovereign debt inflow shocks can actually trigger a transition from a mostly export-based economy to a more financial-centric, service-based one.³

I. Data

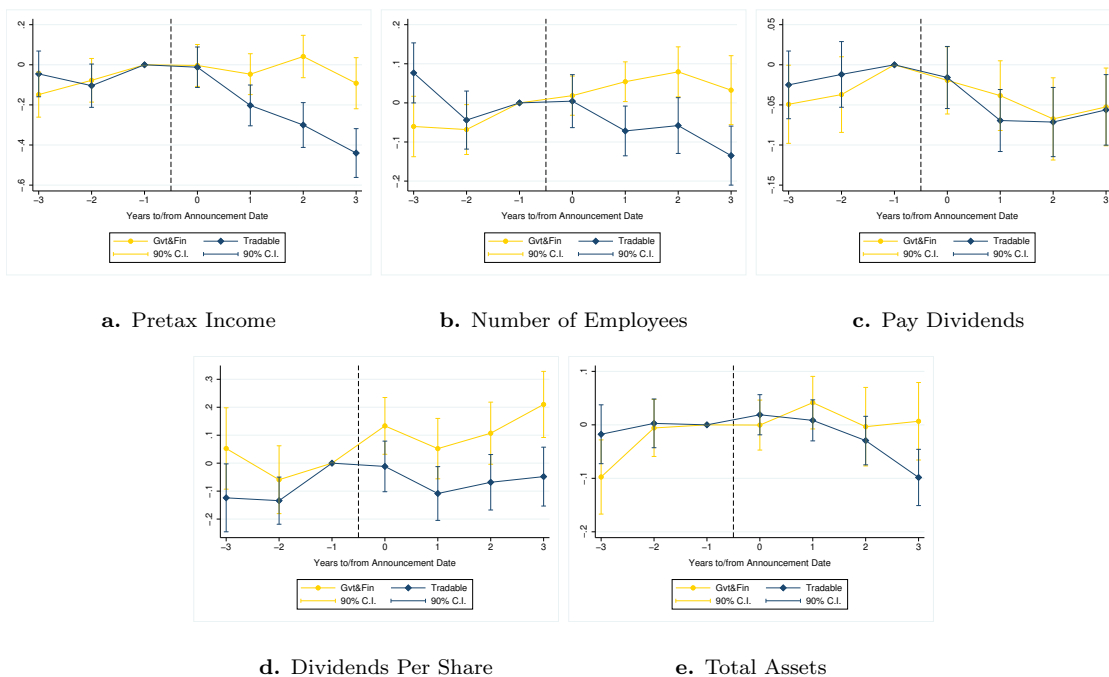
To conduct our analysis, we gather data from multiple sources. First, we retrieve the dates in which the inclusion events are announced from the index providers' websites. Then, we search Datastream to get the name, the International Securities Classification Number, the industry classification, and the business description of listed firms operating in the countries in

our sample.⁴ We combine this information with end-of-year balance sheet data which we obtain from Worldscope. This include data on pretax income, number of employees, dividends, and total assets. As in Broner et al. (2019), we identify firms which are more closely related to the government by: i) merging our dataset with the list of state-owned firms in each country – that is, firms whose majority shareholder is the domestic government –, which we retrieve from Thomson Reuters Securities Data Company (Thomson Reuters SDC) Platinum; ii) looking into the business description of firms, searching for the keywords “public” and “government”. Then, we classify as export-intensive those firms operating in tradable industries, which we identify using the classification in Mian and Sufi (2014). Finally, we identify firms facing greater financial constraints as the ones belonging to the top quintile of the country-specific distribution of the ratio between capital expenditures net of cash flows from operations and capital expenditures, in the spirit of Rajan and Zingales (1998).

³Thus, our results are consistent also with the evidence in Benigno, Converse and Fornaro (2015). However, differently from the latter, we specifically consider sovereign debt inflows rather than capital inflows in general. Further, our inflow shocks are triggered by index rebalancings and not by global financial conditions or changes in a country's fundamentals.

⁴We obtain from Datastream also the country-specific time series of daily exchange rates, that is, the amount of local currency needed to buy one US dollar. The local-currency 5-year government bond yields are obtained from Bloomberg.

Figure 2. : Coefficients of Leads-and-lags Regressions



Note: This figure depicts the evolution of the estimated coefficients of *Gvt&Fin* and *Tradable* on our main variables of interest, which are: Pretax Income (in logs), Number of Employees (in logs), Pay Dividends (a dummy variable which is equal to one if a firm pays non-zero dividends in a given year), Dividends per Share (in logs), and Total Assets (in logs). *Gvt&Fin* is a dummy variable which takes value one for financial firms and government-related firms. *Tradable* is a dummy variable which takes value one for firms operating in tradable sectors. The coefficients are obtained by running five separate regressions in which we control for country-by-time fixed effects and firm fixed effects. The time period spans from $t = -3$ to $t = 3$, 0 being the country-specific year of the inclusion event. The 90% confidence interval reported in the figure are calculated using robust standard errors.

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Figure 2 provides a graphical representation of the main results from our analysis. We display the estimated coefficients of the indicator variables $Gvt\&Fin_i$ – which is equal to 1 for financial firms and for firms closely related to the government – and $Tradable_i$ – which equals 1 for firms operating in tradable sectors – in five leads-and-lags regressions, one for each of our main variables of interest. These are pretax income, number of employees, an indicator for firms paying dividends, dividends per share, and total assets (all of which are in logs, except for the non-zero dividends indicator).⁵ While on similar trends

⁵For the outcome variables in logs, negative and zero values are not used in the corresponding regressions.

in the years preceding the shocks, financial and government-related firms tend to grow much more than firms in tradable sectors in the three years after the shock, in terms of income, employment, dividends, and total assets. To quantitatively assess the overall differential effect of our sovereign debt inflow shocks on the two categories of firms in the post-inclusion period, we then estimate the following regression:

$$(1) \quad Y_{ict} = \theta_{ct} + \gamma_i + Tradable_i \times Post_t + Gvt\&Fin_i \times Post_t + \varepsilon_{ict},$$

in which Y_{ict} is either of the 5 yearly balance sheet outcome variables we consider, θ_{ct} are country-by-time fixed effects, γ_i are firm fixed effects, $Post_t$ is a dummy variable for the period after the event, $Gvt\&Fin_i$, and $Tradable_i$ are the indicator variables

Table 1—: Baseline Estimation

Balance Sheet Variables					
	Pretax Income	Number of Employees	Pay Dividends	Dividends per share	Total Assets
Gvt&Fin×Post	0.049 (0.040)	0.083*** (0.027)	-0.015 (0.017)	0.125*** (0.038)	0.046** (0.023)
Tradable×Post	-0.175*** (0.040)	-0.067** (0.027)	-0.040*** (0.015)	0.025 (0.037)	-0.017 (0.018)
Firm FE	Yes	Yes	Yes	Yes	Yes
Country-Time FE	Yes	Yes	Yes	Yes	Yes
N. of Firms	1470	1240	1530	1048	1628
Observations	7978	6197	9320	5546	9901
R ²	0.95	0.96	0.72	0.96	0.99

Note: This table reports the estimated coefficients of Equation 1. The outcome variables Pretax Income, Number of Employees, Dividends per Share, and Total Assets are in logs. Pay Dividends is a dummy variable which takes value one if a firm pays positive dividends in a given year. *Gvt&Fin* is a dummy variable which takes value one for financial firms and government-related firms. *Tradable* is a dummy variable which takes value one for firms operating in tradable sectors. *Post* is an indicator variable which is equal to one in the year of the event and afterwards. The time period spans from $t = -3$ to $t = 3$, 0 being the country-specific year of the inclusion event. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

for financial and government-related firms, and for firms operating in tradable sectors, respectively. Most of the coefficients of $Gvt\&Fin_i \times Post_t$ are positive and significant, whilst those of $Tradable_i \times Post_t$ are mostly negative and significant. Interestingly, the coefficients of $Gvt\&Fin_i \times Post_t$ on the non-zero dividends dummy, and that of $Tradable_i \times Post_t$ on dividends per share are both zero. This suggests that the shock increases the dividends paid by government-related and financial firms, whilst it makes exporting firms more likely to stop paying dividends rather than reducing it. Finally, we also look at the effect of the shocks for financially constrained firms, by re-estimating Eq. 1 after adding the interaction term $HighEFD_i \times Post_t$, where $HighEFD_i$ is an indicator variable for firms in the top quintile of the distribution of the measure of external financial dependance – computed as capital expenditures minus cash flows from operations over capital expenditures (Rajan and Zingales, 1998) in $t = -2$. The coefficients of $HighEFD_i \times Post_t$ – reported in Table 2 – on pretax income and the non-zero dividends dummy are positive and significant. Thus, financially constrained firms experience an increase in profitability and are more likely to be paying dividends in

the years after the inclusion episodes. Thus, consistent with Broner et al. (2019), financially constrained firms appear to benefit from these shocks (the only negative coefficient being the one on total assets).⁶

III. Conclusions

Broner et al. (2019) show that positive shocks in the foreign demand for sovereign bonds can reduce sovereign bond yields, appreciate the local currency, and affect heterogeneously the stock price of domestic firms. In this paper we complement those results by showing that such price effects are actually followed by a heterogeneous evolution of real balance sheet items. Government-related and financial firms experience a larger growth in profits, employment, and dividends relative to firms operating in tradable sectors. More financially constrained firms appear to benefit from the inclusion events as well. These results highlight the role that sovereign debt inflow

⁶In the Online Appendix we present augmented regressions as in Broner et al. (2019), where we also interact the variables of interest with the size of the shock in sovereign bond yields and exchange rates. We also replicate Figure 2 and Table 2 extending our sample period to the fourth year following the episodes. In both cases, results are qualitatively very similar to those reported in this paper.

Table 2—: Estimation with External Financial Dependence

Balance Sheet Variables					
	Pretax Income	Number of Employees	Pay Dividends	Dividends per share	Total Assets
Gvt&Fin×Post	0.060 (0.040)	0.083*** (0.027)	-0.011 (0.017)	0.123*** (0.038)	0.041* (0.023)
Tradable×Post	-0.175*** (0.040)	-0.067** (0.027)	-0.042*** (0.015)	0.027 (0.038)	-0.014 (0.018)
HighEFD×Post	0.210*** (0.072)	0.014 (0.040)	0.080*** (0.017)	-0.038 (0.076)	-0.112*** (0.027)
Firm FE	Yes	Yes	Yes	Yes	Yes
Country-Time FE	Yes	Yes	Yes	Yes	Yes
N. of Firms	1470	1240	1530	1048	1628
Observations	7978	6197	9320	5546	9901
R ²	0.95	0.96	0.72	0.96	0.99

Note: This table reports the estimated coefficients of Equation 1 including also an indicator for highly financially constrained firms. The outcome variables Pretax Income, Number of Employees, Dividends per Share, and Total Assets are in logs. Pay Dividends is a dummy variable which takes value one if a firm pays positive dividends in a given year. *Gvt&Fin* is a dummy variable which takes value one for financial firms and government-related firms. *Tradable* is a dummy variable which takes value one for firms operating in tradable sectors. *HighEFD* is an indicator variable which is equal to one for firms belonging to the top quintile of the country-specific distribution of the proxy for external financial dependence. *Post* is an indicator variable which is equal to one in the year of the event and afterwards. The time period spans from $t = -3$ to $t = 3$, 0 being the country-specific year of the inclusion event. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

shocks can play in shaping the economy of emerging countries.

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