

From disaster to debt: Exploring the link between natural catastrophes and syndicated loans

SMW Murad ^a , RB Durand^a , C Zheng ^a

^a School of Accounting, Economics and Finance, Curtin University, Perth, WA, 6102, Australia
Email: S.Murad@curtin.edu.au

Abstract: This paper investigates how natural disasters affect the allocation and pricing of syndicated loans in the US corporate credit market. Drawing on detailed firm-bank-county-month-level data from DealScan and disaster records from the SHELDS database, the study demonstrates that disasters not only increase loan demand in affected areas but also significantly alter how banks reallocate credit and adjust interest rates. A one-standard-deviation increase in disaster-induced property damage exposure results in a 1.26% increase in lending share and an 11.6% rise in interest spreads, relative to their respective means.

The paper constructs a theoretical model in which banks with limited short-term credit supply allocate funds across disaster-affected and unaffected regions under endogenous regional risk premia. Credit is reallocated to disaster-hit regions due to increased marginal productivity of capital, but this shift occurs at higher interest rates to compensate for elevated default risk. The model includes convex credit cost functions and introduces a role for relationship lending as a mitigating factor against information asymmetry. These theoretical predictions align well with the empirical patterns.

Empirically, syndicated loan reallocation is observed using granular panel data that capture firm-bank-county-month-level variation. The analysis reveals that higher disaster exposure leads to significantly higher loan shares and interest rates in affected counties. These results are robust to alternative specifications, the exclusion of extreme events (e.g., Hurricane Katrina), and placebo tests using simulated data. In addition, the study documents strong spillover effects in adjacent counties, suggesting regional interdependencies in credit demand and financial contagion effects in neighboring areas (Barth et al. 2024; Giannetti and Saidi 2019).

To address endogeneity concerns, particularly the possibility that banks with higher disaster exposure may be systematically different, the paper adopts the Lewbel (2012) approach, which exploits heteroskedasticity to generate internal instruments in the absence of strong external instruments. This approach confirms that the observed relationships between disaster exposure and lending behavior are robust.

A central innovation of the study lies in its treatment of relationship lending. Rather than focusing solely on bilateral ties, the paper introduces a triadic relational structure involving the borrower, the lead arranger, and participant lenders. This structure is motivated by growing evidence that relationship networks in loan syndicates, especially those involving repeated interactions, reduce agency costs and improve risk-sharing (Sufi 2007; Li 2018; Bharath et al. 2011). The paper finds that strong borrower-lead and participant-lead ties jointly reduce interest rates and increase lending shares during disasters, validating the notion that cohesive syndicate structures act as shock absorbers during uncertain times.

In exploring heterogeneity across firms, the study shows that smaller firms and smaller loans are more sensitive to disaster-induced credit disruptions, consistent with findings in prior work (Cortés and Strahan 2017; Ivanov, Macchiavelli, and Santos 2022). Furthermore, while disaster-prone counties see an increase in lending following disasters, the magnitude of that increase is lower than in rarely-affected areas, perhaps because firms in those regions have already adapted to recurring shocks through stronger risk management practices.

The paper also examines how unaffected but connected markets respond when banks reallocate credit toward disaster zones. Using bank-level exposure measures, it finds evidence of contraction in lending to unaffected regions, highlighting a crowding-out effect due to the inelasticity of short-term credit supply. However, despite reduced credit in unaffected markets, there is no statistically significant increase in interest rates there, likely due to firms delaying investments in the face of uncertainty (Stokey 2016; Bloom, Bond, and Van Reenen 2007).

From a policy point of view, the study underscores the limitations of market-driven credit reallocation in response to exogenous shocks. Banks optimize based on expected returns and perceived risks, but this may result in *suboptimal* outcomes from a social welfare perspective, particularly if information frictions or coordination problems hinder credit access for vulnerable firms. The findings suggest that credit guarantees,

support for relationship lending, and transparency-enhancing mechanisms within syndicates may improve the resilience and efficiency of post-disaster credit markets.

Overall, this study makes multiple contributions. First, it introduces a theoretical model of spatial credit reallocation under disaster risk. Second, it provides empirical evidence from granular syndicated loan data on how disasters affect lending decisions and pricing. Third, it emphasizes the importance of triadic relationship lending structures. Finally, it documents regional spillovers and crowding-out effects in unaffected credit markets.

Future research could extend our analysis by exploring the role of nonbank financial institutions in disaster-induced credit markets and examining the long-term effects of repeated climate shocks on financial stability. In addition, further investigation into the heterogeneity of credit reallocation across different industries could provide additional information on the broader economic consequences of natural disasters.

Keywords: *Natural Disasters, Syndicated Lending, Credit Reallocation, Disaster Risk, Financial Networks*

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