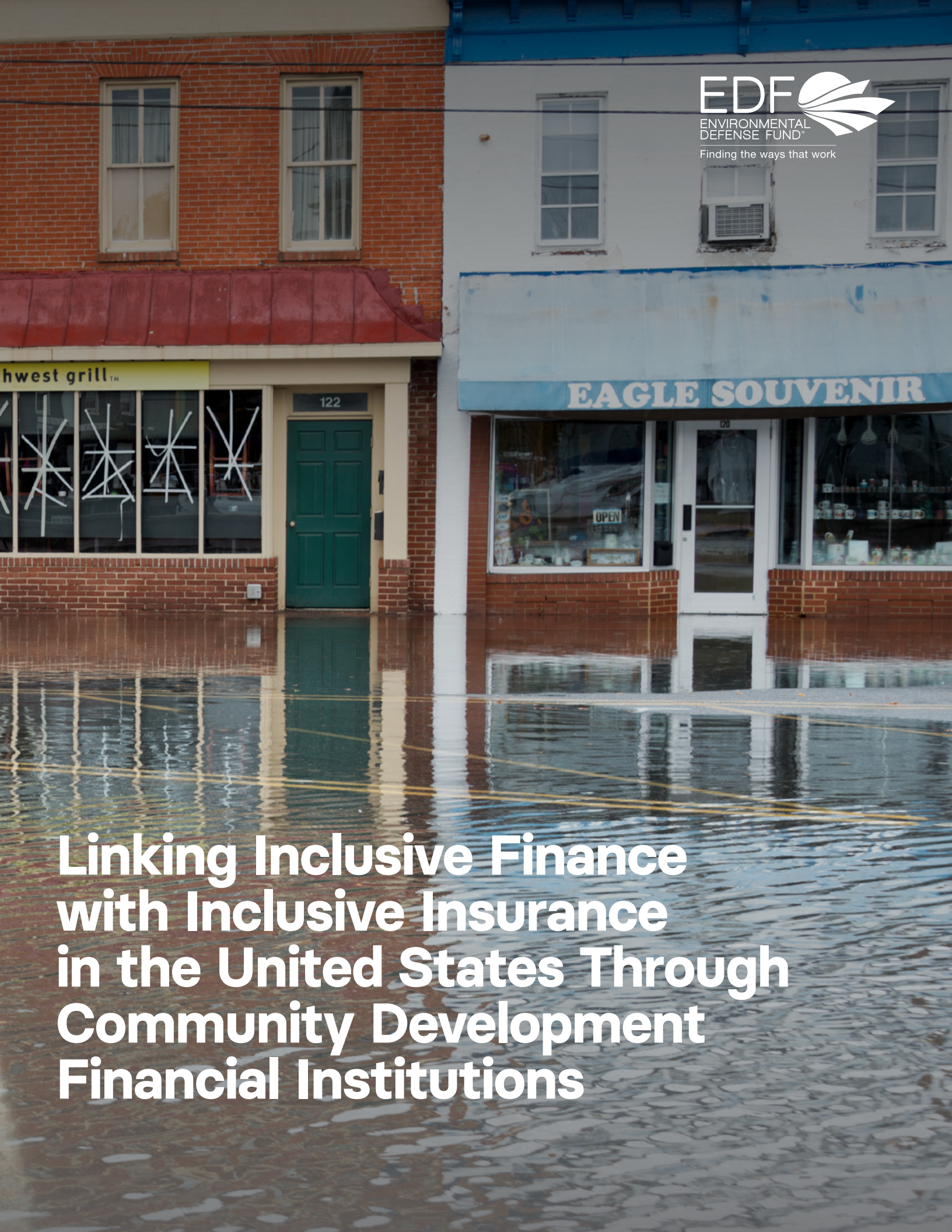

Linking Inclusive Finance with Inclusive Insurance in the United States Through Community Development Financial Institutions

Linking Inclusive Finance with Inclusive Insurance in the United States Through Community Development Financial Institutions

Authors

Xuesong You

Climate Research Economist, *Freddie Mac*
xuesong_you@freddiemac.com

Carolyn Kousky

Associate Vice-President for Economics and Policy, *Environmental Defense Fund*
ckousky@edf.org

Helen Wiley

Disaster Preparedness Program Director, *SBP*
hwiley@sbpusa.org

Jerry Skees

Director and Founder, *Global Parametrics*
jskees@uky.edu

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Executive summary

Climate change is altering the frequency and magnitude of extreme weather events, disproportionately harming low- and moderate-income (LMI) communities. Small businesses and microenterprises play a critical economic role in these communities. These businesses are essential for disaster recovery, providing needed goods and services and reestablishing employment, and yet are themselves highly vulnerable to economic shocks, such as extreme weather events. In this report, we examine the financing challenges that small businesses in LMI communities face after a disaster, finding they have less access to resources, including post-disaster loans. Limited access to post-disaster financing can jeopardize business recovery.

Several approaches have emerged around the globe, particularly in developing and emerging economies, to link inclusive finance (financial products and services tailored for lower-income populations) with inclusive insurance (appropriate and affordable risk transfer for those not served by the market). We examine lessons from these programs to inform the development of insurance-based approaches in the United States. We focus on community development financial institutions (CDFIs), which are mission-driven organizations that often provide financing for small businesses in distressed communities. We suggest two innovative risk transfer models CDFIs could harness to improve the recovery of small businesses in disadvantaged areas from weather-related extremes, with spillover benefits for their broader communities.

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Introduction

Climate change is escalating the risk of extreme weather events around the globe (e.g., Diffenbaugh et al., 2017; Pörtner et al., 2022). Financially vulnerable communities are disproportionately impacted by these disasters, often having greater exposure to hazards and fewer resources for recovery, leading to slower, more difficult, and sometimes incomplete recoveries (e.g., Fothergill & Peek, 2004; Hallegatte et al., 2020; Lieberman-Cribbin et al., 2021; Peacock et al., 2014). These communities may also lack the resources needed to improve their preparedness and resilience before a disaster strikes. A survey of professionals working with low- and moderate-income (LMI) communities and communities of color found that over 80 percent believed that the communities they serve are not well prepared for the impacts of extreme weather events (Mattiuzzi & Hodge, 2021).

Small businesses[1] are critical assets for their owners, employees, and communities. These businesses tend to fill underserved niches in labor markets, such as providing job opportunities in LMI communities that have high unemployment rates (Federal Deposit Insurance Corporation, 2011). As a vehicle for wealth creation, small business ownership can help close the racial wealth gap at the household and community level (Bradford, 2014). Small businesses are also central to the pace of recovery after a disaster (Carrido, 2000). For example, a survey of households and businesses conducted in New York City after Hurricane Sandy in 2012 found that community businesses, particularly small, locally owned businesses, are not just economic units, but play critical social roles in the functioning of the community, such as strengthening community ties (Xiao et al., 2018). Overall, household and business recovery decisions are strongly interlinked, with their interaction influencing the outcomes for overall community recovery (Comerio, 2014; Xiao & Van Zandt, 2012). As such, the return of small businesses can be of vital importance to the disaster recovery of LMI communities. Unfortunately, due to financial constraints and simultaneous revenue shocks, small businesses experience more obstacles in reestablishing operations to pre-disaster levels.

The ability of many small businesses—particularly those in LMI neighborhoods—to withstand a weather shock is low. Compared to larger firms, small businesses depend primarily on local customers (Alesch et al., 2001; Zhang et al., 2009). Since local customers will suffer from the same extreme weather event, revenue for small businesses is vulnerable, and more so than for larger firms that have customers in different geographies. Residents of these neighborhoods have been historically marginalized from financial markets and left with limited access to affordable financing options (Mills et al., 2019), which could further

1 Small businesses are commonly defined as firms with fewer than 500 employees, including both firms with no paid employees and firms with employees in addition to the owner (Small Business Association 2021). In this report, we concentrate on employer firms with 1-499 employees.

suppress their ability to support small businesses financially after a weather shock. Being in an LMI community makes post-disaster financing more challenging, in addition to the general finding that small businesses tend to be more financially constrained (Beck et al., 2005). Our analyses find that small businesses in LMI communities are less likely to receive approvals from federal disaster financing programs, and if approval does come, it is slightly more delayed than in higher income communities.

Historically, inclusive finance has played an important role in delivering appropriate and affordable financial services for underserved and disadvantaged groups, addressing the issue of financial marginalization and exploitation in LMI communities (Caplan, 2014). Inclusive finance can also be an effective recovery tool by promoting equitable post-disaster lending (Becchetti & Castriota, 2011). Having liquidity and capital at the moment of an extreme weather event can help compensate for the interruption to business and corresponding lowering of returns at this critical moment. In the United States, this role is often played by community development financial institutions (CDFIs). CDFIs are mission-driven institutions, providing financing to under-resourced communities. As such, in the wake of a natural disaster they are uniquely positioned to meet the financing needs of adversely affected LMI communities.

CDFIs play a critical role, since other sources of financing for disaster recovery may be in short supply for lower-income borrowers.[2] Yet their lack of specific funding resources for extreme weather (Simms & Mattiuzzi, 2022) may impede their flexibility to engage in post-disaster recovery activities. CDFIs could also be prone to vulnerabilities at the same moment that their community needs them the most. Weather-related disasters could weaken balance sheets as the rate of non-performing loans (NPLs) increases. As such, harnessing disaster insurance could assist CDFIs in meeting the post-disaster financial needs of their clients.

In this report, we first discuss the post-disaster financing challenges facing small businesses in LMI communities in the United States. In Section 3 we go on to discuss the role of CDFIs in LMI communities. In Section 4, we summarize lessons from developing and emerging economies around the globe where insurance has been linked with lending to support lower-income populations and those that may be left out of broader risk transfer and financial markets. We then draw on those lessons in Section 5 to propose two risk transfer solutions that may hold promise in the United States for countering the growing threat of extreme events and their potential to disrupt the gains from expansion of inclusive financing: (1) insurance for small businesses in LMI communities tied to their CDFI loans; and (2) risk transfer for CDFIs themselves to enable their continued services post-disaster.

[2] Note that the overall credit availability does appear to increase post-disaster in the U.S. For example, in response to credit demand increases caused by natural disasters, bank lending increases significantly in affected regions during the months following disasters (Cortés & Strahan, 2017). In addition, the Small Business Administration (SBA) also provides low-cost lending opportunities to affected businesses from its disaster loan program. However, low-income borrowers with limited repayment ability are deemed less qualified for either source.

Financing challenges facing small businesses in LMI communities

To examine small businesses and microenterprises in LMI communities, we use the 2015–19 American Community Survey data from the United States Census Bureau (2021) and data on small businesses from the 2020 InfoGroup business database.[3] Analysis of these combined datasets reveals that small businesses are fairly evenly distributed across lower- and higher-income census tracts, and that LMI census tracts constitute 28 percent of U.S. developed land area[4] and are home to 34 percent of small businesses.[5] There is, however, substantial state-level heterogeneity.[6]

For this report, we limit our attention to small businesses located in LMI census tracts. As shown in Table 1, the vast majority of small businesses in these areas are microenterprises: over half have fewer than five employees and roughly 77 percent have fewer than 10 employees. The top three industries represented by small firms in LMI neighborhoods are: business support and consumer services, retail, and non-manufacturing goods production and associated services.

TABLE 1:
Size and sector of small businesses in LMI census tracts, 2020

SIZE		SECTOR	
No. of employees	**Percentage**	**Industry name**	**Percentage**
1–4	52.94%	Business support and consumer services	18.64%
5–9	24.13%	Retail	15.71%
10–19	11.81%	Non-manufacturing goods production and associated services	14.51%
20–49	7.09%	Healthcare and education	11.22%
50–99	2.46%	Professional services	10.84%
100–249	1.30%	Leisure and hospitality	9.86%
250–499	0.27%	Real estate	5.40%
		Finance and insurance	5.37%
		Manufacturing	3.80%
		Other	4.65%

NOTE: Only small businesses with 1–500 employees in LMI census tracts are included. Produced by authors with data from the 2020 InfoGroup business database.

[3] The InfoGroup business databases provide a comprehensive list of businesses in the United States. The data include business name, location, industry, corporation structure, and employment, among other information. Business information is compiled and updated from numerous sources, such as yellow pages directories, credit card billing data, public sources, web research, news feeds, and utility connects and disconnects. To verify information, Infogroup makes phone calls to every business. An independent audit conducted by the University of Nebraska at Omaha College of Information Science and Technology found that the database is, in general, of higher quality than other similar datasets (InfoGroup, 2019).

[4] Land cover data are obtained from the National Land Cover Database (Multi-Resolution Land Characteristics Consortium, 2019).

[5] We follow Community Development Financial Institutions Fund (CDFI) (2021) in defining census tracts as LMI if either: (1) the tract is located in a metropolitan area with a median family income (MFI) at or below 80 percent of the greater of either the metropolitan or national metropolitan MFI; or (2) the tract is located in a non-metropolitan area that has an MFI at or below 80 percent of the greater of either the statewide or national non-metropolitan MFI.

[6] We observe 19 states where the share of small firms in LMI census tracts is greater than the overall national level (34.2%). These are: MS (54.1%), AR (51.7%), WV (49.9%), LA (48.8%), NM (48.7%), SC (46.9%), FL (46.8%), AL (45.6%), TN (45.2%), SC (42.9%), KY (42.2%), AZ (42.0%), OK (41.9%), GA (39.9%), NV (39.9%), TX (39.2%), ID (36.9%), IN (36.8%), and MO (36.4%).

Extreme weather events are an economic shock for small businesses, which face a range of repair and rebuilding costs and may also suffer revenue losses from having to close for a period of time. Reasons for closure include direct physical damage, loss of lifelines such as power or water, interruption of supplies, loss of customers, and/or employees themselves being impacted and unable to work. Previous studies have found that business interruption revenue losses can be more prevalent than direct property damage (e.g., Collier et al., 2021; "Small biz owners," 2013). Of small firms impacted by disasters in 2017, for example, 96 percent reported having revenue losses while only 64 percent reported experiencing structural property damages (Battisto et al., 2018).

Firms have several sources of funding and financing to cover such a financial shock, including existing revenues and reserves, insurance, and credit (from either the private market or public programs). For small businesses, access to any of these may be difficult. Prior research has found that small businesses rely primarily on business earnings and reserves to finance disaster recovery (Collier et al., 2021). However, the role of using such sources is limited, especially as earnings are likely to suffer post-event. In a hypothetical case where revenues were interrupted due to a disaster, the median small business had only enough cash reserves to support 27 days of regular operations (Farrell & Wheat, 2016). When taking into account additional expenses and replacement costs of any damaged property, its cash buffer would be exhausted much sooner.

Insurance could provide the needed increase in liquidity and capital when a disaster destroys property, but small firms appear vastly underinsured. In a survey of small businesses affected by Hurricane Harvey in 2017, less than 20 percent reported using insurance payments to fund disaster-related damages (Collier et al., 2021). For small businesses, which are typically more financially constrained than large corporations, purchasing insurance as an ex ante risk management tool may be costly relative to using the premium to take advantage of investment opportunities (Rampini & Viswanathan 2010, 2013). Beyond affordability challenges, decision-makers are prone to weigh short-run returns more than smoothing revenue with insurance (e.g., Meyer & Kunreuther, 2017).

With other options limited, firms may turn to credit post-disaster, but small businesses are frequently credit-constrained after an extreme weather event (Collier et al., 2019). Following a disaster declaration, the Small Business Administration (SBA) is authorized to make loans to firms in the impacted areas. The SBA was created in 1993 as an independent federal agency to aid, counsel, assist, and protect small businesses. It runs a disaster loan program for businesses, nonprofits, households, and renters located in declared disaster areas to repair and replace damaged properties. Businesses may also obtain loans to cover lost revenue.

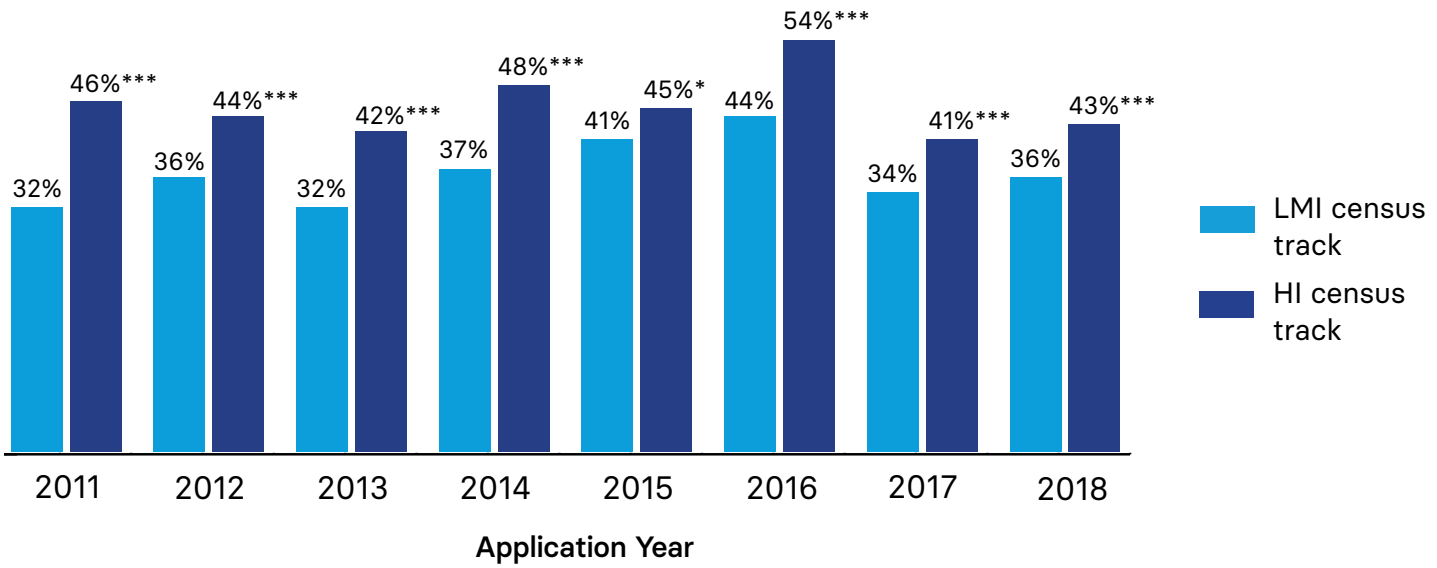
Based on our analysis of SBA disaster loan data, on average less than half of loan applications from small businesses are approved and the approval rates are lower for firms located in LMI communities. From 2011 to 2018, only 36 percent of small business applicants in LMI census tracts received approval for an SBA disaster loan, compared with 44 percent among firms in higher-income (HI) census tracts (see Figure 1). This is unsurprising as these smaller firms may have higher debt-to-income ratios and lower credit scores; the two leading reasons for SBA disaster loan denials are lack of repayment ability and lack of credit history (United States Government Accountability Office, 2020).

We take a deeper look at access to SBA disaster loans for small businesses located in LMI communities. Using data on the loans made between 2011 and 2018, we regress whether a firm receives SBA disaster loan approval on whether or not the firm is located in an LMI community, along with a suite of firm-level controls (including size, age, sector, ownership structure, and amount of disaster damage). We find that small business applicants located in LMI census tracts have a decreased likelihood of getting approval for

[7] We show in Appendix Table 2 that among firms that applied for SBA disaster loans, those located in LMI census tracts are more likely to have a non-positive business cash flow to repay additional debt and their reported credit scores are lower, in comparison to firms in HI census tracts.

an SBA disaster loan (see Appendix Table 1). Their lower ability to repay[7] only partially explains the difference. Our finding remains statistically significant after controlling for an applicant's business cash available to service additional debt (i.e., income minus existing debt and anticipated expenses/taxes) and reported credit score. Overall, compared to higher-income communities, firms in LMI tracts that applied for SBA disaster loans are 16.9 percent less likely to receive loan approvals than firms in HI tracts.

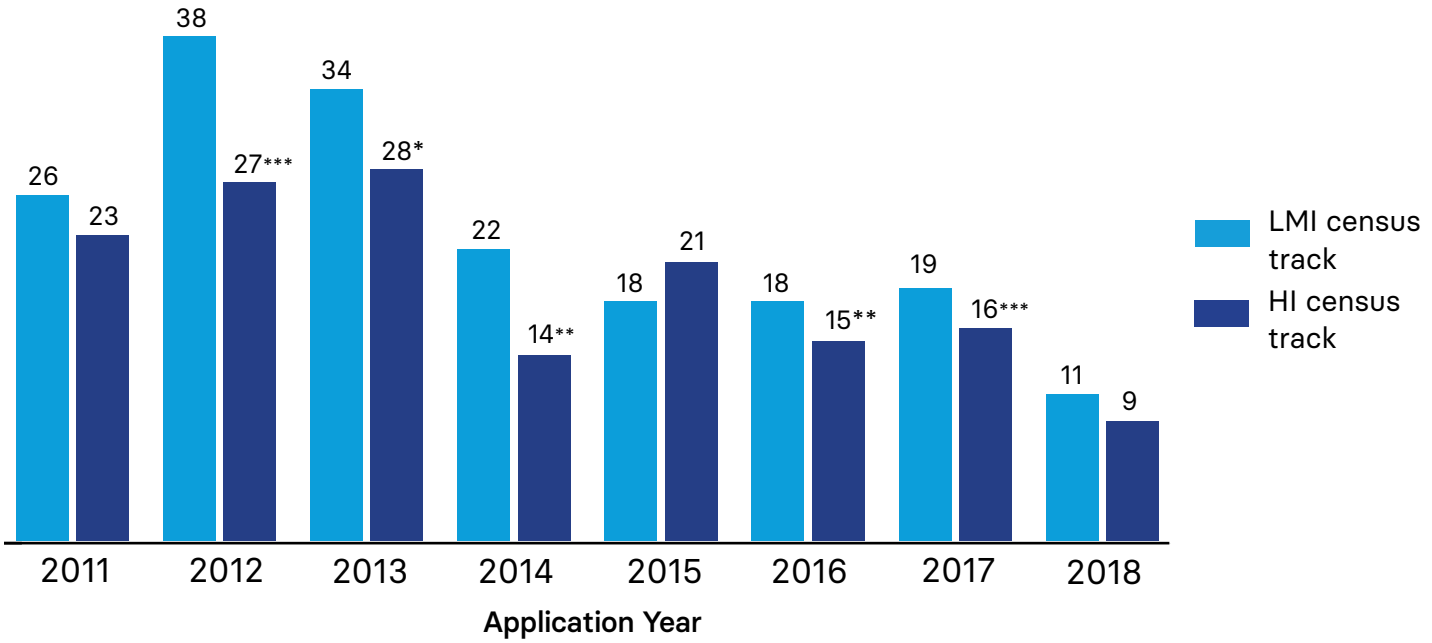
FIGURE 1:
SBA disaster loan approval rate for business loans: LMI vs. HI census tracts



NOTE: The figure presents SBA business disaster loan approval rates for presidentially declared disasters from 2011 to 2018, comparing small business applicants located in low- and moderate-income (LMI) and high-income (HI) census tracts. Withdrawn applications are excluded. We follow CDFI (2021) in defining a census tract as LMI if either: (1) the tract is located in a metropolitan area with a median family income (MFI) at or below 80 percent of the greater of either the metropolitan or national metropolitan MFI; or (2) the tract is located in a non-metropolitan area that has an MFI at or below 80 percent of the greater of either the statewide or national non-metropolitan MFI. The prior-year MFI information from the American Community Survey (United States Census Bureau, 2022) is used to determine whether a census tract has LMI or HI status in a given year. Asterisks on HI census tract firm estimates denote statistical differences from LMI census tract firms: stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

Even when they do receive approval, we find that borrowers in LMI communities take longer to receive their approval, introducing delays that could be financially burdensome. Over the period 2011 to 2018, our analysis of the SBA data finds that the average processing time from receipt of an SBA loan application to approval is 23 days for firms in LMI census tracts, about three days longer than those in HI census tracts. The delays are most significant in years when a high volume of applications is submitted (see Figure 2). For example, in 2012 when Hurricane Sandy occurred, the decision time from application to approval was about 11 days longer for small businesses in LMI census tracts compared to firms in HI areas. In 2017, when Hurricane Harvey and Hurricane Irma made landfall, small businesses in LMI areas needed an average of 19 days to receive approval from SBA, which was three days longer than applicants in HI areas. We do not have additional insight on the drivers of these delays. For example, it could be that firms in these communities have greater difficulties with the application process, that these applications require additional review or delays are incurred from other aspects of loan processing, or for other reasons. This is an area that merits further research.

FIGURE 2:
Average days from SBA's receipt of application to loan approval, 2011–18



NOTE: The figure presents average days from SBA's receipt of application to loan approval for presidentially declared disasters from 2011 to 2018, comparing small business applicants located in LMI and HI census tracts. Only approved SBA disaster loans are included. We follow CDFI (2021) in defining a census tract as LMI if either: (1) the tract is located in a metropolitan area with a median family income (MFI) at or below 80 percent of the greater of either the metropolitan or national metropolitan MFI; or (2) the tract is located in a non-metropolitan area that has an MFI at or below 80 percent of the greater of either the statewide or national non-metropolitan MFI. The prior-year MFI information from the American Community Survey (United States Census Bureau, 2022) is used to determine whether a census tract has LMI or HI status in a given year. Asterisks on HI census tract firm estimates denote statistical differences from LMI census tract firms: stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

The combined findings in this section have important implications for small businesses located in LMI areas. With smaller cash flows that are also more likely to be interrupted, these firms have more restricted margins as a buffer when a disaster strikes. This, combined with lower credit scores, also creates a lower repayment ability, reducing the likelihood that they can obtain financing from either traditional channels (such as private lenders) or the federal disaster loan program. Indeed, we find disaster loans from the SBA are less likely to be approved in LMI communities. In addition, LMI neighborhoods appear to have slightly longer delays in receiving loans, potentially contributing to a slower business recovery.

The role of community development financial institutions (CDFIs)

Inclusive financing refers to efforts to make financial tools available to underserved and unserved populations, particularly lower-income households and small businesses. In the United States, community development financial institutions (CDFIs) have played a major role in providing inclusive finance to economically distressed communities. CDFIs are mission-driven organizations that offer affordable financial services to individuals and businesses that may not qualify for mainstream financing.

To grow the network of CDFIs, in 1994 the federal government created the CDFI Fund, which provides support, training, tax credits, grants, bond guarantees, and investments to CDFIs around the country. As of September 2022, there were 1,378 certified CDFIs in the United States: 42 percent were loan funds; 34 percent were credit unions; and 24 percent were depository institution holding companies, banks, or thrifts[8] (Community Development Institutions Fund [CDFI], 2022). Whereas CDFI depository institutions (including banks and credit unions) are federally insured and regulated, CDFI loan funds are non-depository financial institutions and are generally not subject to federal banking regulations. In 2019, CDFIs financed more than 210,000 small businesses in LMI communities (versus more than 760,000 funded by large banks),[9] even though the total assets of certified CDFIs remain at less than 1 percent of mainstream financial services providers (banks and credit unions).[10]

The funding structures of CDFIs vary, especially by institutional type. CDFI depository institutions (including banks and credit unions) are funded primarily by deposits (Balboni and Travers 2017). CDFI loan funds, however, combine multiple sources of funding, including from the federal government, banks, and philanthropy (Federal Reserve Community Development, 2021). Notably, investments from banks have increasingly become an important part of CDFI loan funds' capital base since 1995, in large part due to regulatory changes that allowed such support to meet requirements of the Community Reinvestment Act (CRA) (Balboni & Travers, 2017). The most recent CRA modernization proposal includes disaster preparedness and climate resiliency activities as an additional definition of community development activities. This effort could help catalyze climate-focused investments through CDFIs from banking institutions. In addition, in the wake of the COVID-19 pandemic various new types of resources from federal programs, corporations, and private foundations have become increasingly available to CDFIs, providing additional capacity (Boyd & Van Dijk, 2022).

While CDFIs provide a range of financial services and technical assistance to their clients, small business lending is either a primary or secondary line of business for 62 percent of CDFIs (Federal Reserve Community Development, 2021). Aside from being affordable, their lending policies are often more flexible and more tailored to the needs of their specific borrowers. They also tend to provide financial education and counseling to their borrowers. Small business borrower satisfaction has been found to be consistently the highest among those listing CDFIs as their primary credit provider, outperforming banks, credit unions, and online lenders (Battisto et al., 2021). Among all types of CDFI institutions, about 85 percent of small business lending clients are served by CDFI non-depository institutions (e.g., loan funds) (Federal Reserve Community Development, 2021).

[8] The primary types of thrift institutions are mutual banks and savings and loan associations.

[9] In 2019, CDFIs served 212,942 clients in LMI and disadvantaged communities through small businesses and microlending (CDFI, 2020). In contrast, federally insured banks and other depository institutions with total assets of more than $1 billion originated 763,561 small business loans in LMI areas (Federal Financial Institutions Examination Council, 2020).

[10] Based on our calculation using asset data from CDFI (2020), Federal Financial Institutions Examination Council (2020), and National Credit Union Administration (2020).

Linking inclusive finance with inclusive insurance: Lessons from elsewhere

In the developing world, models linking microfinance with risk transfer have been developed and piloted; these programs hold lessons for such applications in a U.S. context. Like CDFIs in the United States, microfinance institutions in many developing economies are an important channel of financial inclusion, delivering financial services (e.g., loans, savings and checking accounts, and other services) to lower-income and underserved populations (see, e.g., Khavul, 2010). By offering loan opportunities for entrepreneurship, microfinance institutions contribute to poverty alleviation and economic improvement of borrowers (Chemin, 2008; Dalla Pellegrina, 2011; McIntosh et al., 2011). These benefits, however, can be severely disrupted by natural disasters, adversely impacting both borrowers and microfinance institutions (e.g., Asian Development Bank & VisionFund International, 2016; Becchetti & Castriota, 2011). At the individual level, borrowers may experience repayment difficulties or even default on their obligations. They may also need additional capital to fully restore their financial position. At the institutional level, credit providers may face constraint issues resulting from an impaired balance sheet, hindering their ability to supply additional credit when this is most needed following a disaster. The balance sheets of lending and savings institutions can further suffer as impacted clients withdraw their savings.

There have been attempts globally to meet the needs of both borrowers and financial institutions using event-based or parametric insurance or other risk transfer instruments. Parametric risk transfer refers to products that pay out a predefined amount upon occurrence of an observable and objective measure of the hazard event, such as observed flood depths or wind speeds in a certain location (Sengupta & Kousky, 2020). Two key benefits of parametric approaches are speed and flexibility. Because there is no need for a time-consuming loss adjustment process after a disaster, as required in standard indemnity insurance, the payout can often be made within days. In addition, the proceeds can be used to cover whatever pressing needs the insured business faces, including interruption losses.

To date, a couple of different parametric models—at different scales—have been used to help support financial recovery in this context. One approach harnesses microinsurance, which refers to low-premium, low-coverage insurance policies designed for low-income populations. Such insurance policies can be tied to existing microcredit products to protect the borrower from economic shocks (Akter et al., 2011; Manuamorn, 2005; Mechler et al., 2006; Sawada & Takasaki, 2017). This design is often used globally in farming and livestock production contexts (Akter et al., 2011; Churchill, 2007; Mechler et al., 2006). The model protects both the borrower and the lender, who in turn could offer a lower interest rate on the original loan or expand access to credit since the insurance lowers default risk (Betram-Huemmer & Kraehnert, 2018; Hellmuth et al., 2009; Mukhtar, 2013). While a number of programs exist, questions have been raised about the sustainability of micro-level index insurance for correlated risks such as weather extremes (Collier et al., 2009; Mazambani & Mutambara, 2018). Lack of demand, basis risks, scalability, efficient structuring, and transfer of risk into global markets remain challenging. This is why many microinsurance programs are supported by public sector or philanthropic partners.

Another model also harnesses parametric insurance, but for the financial institution itself. If the lending institution received a payout to support loan forgiveness or to increase credit in the aftermath of a disaster, this could protect the institution and those it serves. Just as microinsurance has been piloted around the world, so too have variations on this model, including by VisionFund International, Global

Following this concept, Global Parametrics and Enabling Qapital launched the Climate Resilience Enhanced Debt product. The first packaged debt product was purchased by Chamroeun, a Cambodia microfinance institution, in 2021. Under the contract, Enabling Qapital promises contingent debt to Chamroeun on pre-agreed terms triggered by drought and flood. Meanwhile, Enabling Qapital has also purchased matching parametric risk transfer protection from Global Parametrics. As a result, when the contingent loan is triggered, Enabling Qapital gets a payout from Global Parametrics and transfers the majority to Chamroeun in the form of interest rate reduction or principal forgiveness.

Parametrics, and BlueOrchard (Skees et al., 2016). VisionFund also pools disaster risks among 27 microfinance institutions, taking advantage of geographical diversification. This pooling mechanism enhances efficiency because it reduces the coverage needed compared to the purchase of independent contracts for each microfinance institution.

One efficient design packages the less frequent risk transfer funding as subordinate debt that could convert to capital alongside contingent credit for more frequent events to serve liquidity needs. This allows for protection to be packaged into a single debt contract, with ordinary debt in the senior position, contingent debt in the next position, and subordinate debt in the last position and with the intent to forgive that debt so it counts as capital (Skees, 2022).[11] Thus, by using a single debt instrument, both liquidity (contingent debt) and capital (subordinate debt) can be offered to microfinance institutions. This has the potential to offer an efficient and effective mechanism for rebuilding balance sheets but also protection of ordinary debt. These protections are meant to improve the terms of trade for financial institutions, allowing for more inclusive financing and potentially lowering the cost of capital over time.

Another approach has been developed in concept by Global Parametrics and the World Bank's International Finance Corporation. This model would use risk transfer to purchase NPLs post-disaster from the inclusive finance institutions using the payouts from risk transfer purchased by the financial institution. By using the cash to purchase NPLs, the balance sheet would be strengthened in two ways, by both removing the NPLs and adding capital via the cash purchase. This program is being put out for bid as this document is being completed.

Risk transfer models for CDFIs in the United States

These international models could be applied to help CDFIs and the borrowers they serve in the United States. Following the international examples described in Section 4, CDFIs could harness risk transfer through two different approaches. The first is a borrower-level model, where parametric insurance policies are tied to small business loans provided by CDFIs. The second is a so-called meso-insurance model, where a parametric product is purchased by a CDFI to strengthen its balance sheet and allow for more lending following disasters. While these are both potentially useful models, they could face affordability challenges without public or philanthropic support. Further research on whether and how these models could meet the needs of small businesses in LMI communities or help serve the mission of CDFIs is merited, given the increases in climate risk that are threatening gains made in financial inclusion.

5.1. Microinsurance for borrowers

Microinsurance policies could be bundled with microcredit. When a borrower in an LMI area that is at high risk of extreme weather events is issued a business loan, the loan could come with a microinsurance policy attached to it. The policy could be for a single peril or for multiple perils, depending on how the parametric trigger was structured. This cost would be wrapped into the overall interest rate on the loan. As such, this policy would be feasible only when costs could be kept low enough for borrowers to be able to pay, or when a philanthropic or public sector funder was willing to co-finance the risk transfer cost. Alternative structures for such microinsurance could be explored to further lower costs. For example, if the CDFI community created a captive insurer—an insurance company wholly owned and controlled by the CDFIs and offering coverage only through those members—it might be able to provide insurance at a lower cost than the private market.

The insurance could be designed either to provide a direct cash payment to the borrower or to forgive the loan, or any combination of these two uses of payments. From the perspective of small businesses, a cash infusion would be a flexible option that could be used for any post-disaster need. Loan forgiveness, on the other hand, would relieve the business from debt obligations in a period of financial stress and could allow

it to maintain creditworthiness. According to a survey conducted by Federal Reserve Banks, the two leading financial challenges reported by disaster-affected small businesses are paying operating expenses (46 percent) and credit availability (43 percent), followed by making payments on debts (33 percent) (Battisto et al., 2018). Loan forgiveness to borrowers would also mean that the insurance product protects the lenders themselves. This financial protection could be partially returned to the borrower through lower borrowing costs and greater access to credit.

5.2. Risk transfer for CDFI lenders

Alternatively, CDFIs themselves could purchase a parametric product at the level of the institution. In theory, this type of product could provide CDFIs with an infusion of liquidity when they may be facing concerns about debt repayment and when they may have a large number of potential clients in need of new loans for disaster recovery. By shoring up their balance sheets, the CDFIs would be better positioned to provide recovery loans immediately after an extreme weather shock. Many CDFIs know the businesses they serve well and would know how to target loans effectively post-disaster. It is possible that additional business after the disaster could offset the cost of the risk transfer. An extra benefit of this structure is that transferring disaster risk ex ante could allow CDFIs to operate without the need to hold excess loan loss reserves and thus expand lending in their targeted communities, regardless of whether a disaster occurs (see, e.g., Collier, 2020; Collier & Skees, 2012). Nonetheless, detailed analysis would be needed to more fully understand the cost and benefits of these products.

Some work has been undertaken documenting CDFI financing needs post-disaster. Following Hurricane Sandy, for example, some CDFIs explicitly expressed capital needs for recovery lending and/or for additional loan loss reserves to support riskier disaster loans (CDFI, 2013). A 2022 roundtable discussion organized by the Federal Reserve Bank of San Francisco documented existing financing challenges of CDFIs in supporting climate resilience, such as lack of climate-specific and flexible funding, and insufficient capacity (Simms & Mattiuzzi, 2022). The payout structure of a parametric policy could be designed to add both flexibility and capacity to manage impacts to a CDFI's balance sheet and/or support disaster recovery services within its target communities.

Such a policy would need to be uniquely tailored to the needs of the particular CDFI, including its financial position and its risks. The assessment of such needs could be built upon a CDFI's existing risk assessment framework of loan portfolios. For instance, a group of CDFIs have recently developed a tool (the Resilience Assessment Tool) to evaluate the level of resilience in a loan as part of their underwriting process or existing loan risk management (Resilient Cities Network, 2021). In addition, detailed analysis would be needed to see if CDFIs could afford such a product. Mechanisms to lower costs could also be explored, such as creating a pool of CDFIs to collaborate with industry network organizations to jointly spread the costs, or again, creating a captive insurer. With the right products and a detailed analysis, it might be possible for a CDFI captive to combine the two approaches outlined in this report, offering risk transfer directly to small businesses as well as to the CDFIs themselves.

Conclusion

As weather-related extreme events increase around the United States, LMI communities are facing growing and disproportionate impacts. Small businesses are important to these economies and could play a critical role in community-wide recovery, yet they themselves often struggle with post-disaster financing. We find small businesses in LMI communities typically have fewer financial resources available for their recovery. They have fewer reserves, and there is a higher chance that their revenue will be interrupted as their customer base is likely more concentrated and could be struggling from the same disaster. The lower ability of smaller businesses in LMI communities to repay loans also makes them less eligible to receive post-disaster credit from private sources or the SBA Disaster Loan Program.

This paper has explored models in developing and emerging economies that help unite the benefits of risk transfer and inclusive finance. Drawing on these examples, we propose two models of parametric risk transfer interventions to help improve post-disaster recovery of microenterprises and small businesses in LMI communities in the United States through CDFIs. One model would attach a parametric insurance product to individual loans to provide borrowers with a cash infusion or loan forgiveness following a disaster. The second would provide risk transfer at the level of the CDFI institution, protecting its balance sheet and providing additional capacity for needed post-disaster lending. CDFIs are well positioned to explore either of these approaches or to combine them. These offerings fit the mandate of CDFIs, since they are tasked with addressing systemic inequities within the financial system by providing small businesses that historically may have been denied these opportunities with the financial resources and capital to pursue business and investments. To further explore the potential role of risk transfer in this context, a detailed needs assessment of CDFIs and their borrowers is needed, along with deeper conversations between insurers and inclusive finance institutions.

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Appendix: Additional tables

APPENDIX TABLE 1:
Correlates of SBA small businesses disaster loan approvals, 2011–18

	(1)	(2)	(3)
LMI census tract	-0.249***	-0.185***	-0.222***
	(0.024)	(0.025)	(0.028)
Available cash flow (thousands, $)		0.022***	0.079***
		(0.005)	(0.013)
Credit score		0.005***	0.005***
		(0.000)	(0.000)
Credit score not reported		3.804***	3.601***
		(0.143)	(0.154)
Initially verified physical damage>0	0.635***	0.601***	
	(0.031)	(0.031)	
Initially verified physical damage (thousands, $)	0.001***	0.0005***	0.0005***
	(0.000)	(0.000)	(0.000)
log(employee)	0.182***	0.161***	0.168***
	(0.016)	(0.017)	(0.020)
Firm age	0.009***	0.008***	0.007***
	(0.001)	(0.001)	(0.001)
Self-employed	-0.482***	-0.420***	-0.426***
	(0.098)	(0.101)	(0.111)
Business support and consumer services	-0.967***	-0.851***	-0.927***
	(0.040)	(0.041)	(0.047)
Finance and insurance	-0.644***	-0.573***	-0.304**
	(0.097)	(0.099)	(0.146)
Healthcare and education	-0.558***	-0.493***	-0.525***
	(0.053)	(0.054)	(0.066)
Leisure and hospitality	-0.821***	-0.748***	-0.776***
	(0.044)	(0.046)	(0.051)

APPENDIX TABLE 1 CONTINUED:

Manufacturing	-0.854*** (0.073)	-0.780*** (0.074)	-0.737*** (0.087)
Non-manufacturing goods production	-0.901*** (0.038)	-0.822*** (0.040)	-0.891*** (0.046)
Professional services	-0.540*** (0.049)	-0.479*** (0.050)	-0.577*** (0.063)
Retail	-0.846*** (0.041)	-0.774*** (0.043)	-0.857*** (0.049)
Other industry	-1.675*** (0.112)	-1.624*** (0.114)	-1.616*** (0.117)
Sample	Available cash flow reported	Available cash flow reported and physical damage >0	
Disaster FE	Yes	Yes	Yes
Observations	34,849	34,849	27,456

NOTE: The table presents logistic regressions of SBA small business disaster loan approvals on whether or not the firm is located in an LMI community, as well as business-level characteristics. Data consist of business loan applications (withdrawn applications excluded) for presidentially declared disasters from 2011 to 2018. Only firms that provided information regarding cash available to service additional debt are included in our analysis. Among those that failed to provide such information, none was approved for an SBA disaster loan. The dependent variable is an indicator of whether a business applicant was approved for an SBA disaster loan. Column (1) controls for whether a business had any physical damage and amount of damage; business applicant size, age, ownership structure (self-employed or not), and industry; and the disaster event. Column (2) further controls for a firm's ability to repay by adding in an applicant's reported cash available to service additional debt and credit score. In Column (3), we limit our sample to applicants with non-zero verified damage. The omitted category of industry is "Real estate." The coefficient of interest on LMI census tracts equals -0.188 in Column (2), indicating that a small business applicant located in LMI census tracts is |e^(-0.185)-1|*100 = 16.9 percent less likely to receive approval for an SBA disaster loan. Similarly, among firms with confirmed physical damage, those located in LMI communities are |e^(-0.222)-1|*100 = 19.9 percent less likely to be approved for an SBA disaster loan. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

APPENDIX TABLE 2:
SBA disaster loan applicants for business loans: LMI vs. HI census tracts

	LMI census tract			HI census tract			
	Mean	SD	N	Mean	SD	N	t stat
Non-positive cash available to service additional debt	0.26	0.44	13,755	0.25	0.43	21,094	1.71*
Credit score not reported	0.44	0.5	13,755	0.51	0.5	21,094	-12.52***
Credit score | Credit score reported	668.09	118.47	7,710	696.71	105.92	10,383	-16.81***
Approval rate	0.56	0.5	13,755	0.59	0.49	21,094	-6.39***
Decision time | Approved	22.98	56.68	7,674	20.14	50.57	12,499	3.61***
Decision time | Declined	20.36	63.3	6,081	20.02	56.68	8,595	0.34

NOTE: The table presents summary statistics for SBA disaster loan applicants for small businesses located in LMI and HI census tracts, respectively. Data consist of business loan applications (withdrawn applications excluded) for presidentially declared disasters from 2011 to 2018. Only firms that provided information regarding cash available to service additional debt are included. Among those that failed to provide such information (about 30 percent of the entire sample), none was approved for an SBA disaster loan. The last column presents simple t-test statistics for differences in the mean of each variable by comparing firms in LMI and HI communities. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.