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Climate Adaptation Through Crop Variety Selection: Farmers' Preferences for Climate-Resilient Rice and Maize Traits in Colombia

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THE IMPACT OF NATURAL DISASTERS ON WEALTH IN THE UNITED STATES

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Abstract

This paper investigates the effects of natural disasters on wealth in the United States. Employing local projection methods, we estimate the dynamic responses of net worth across sectors and households' wealth distribution following major natural disasters. We find that household wealth declines by approximately 2% within ten quarters after a disaster, driven almost entirely by reductions in financial assets. Non-financial corporate and non-corporate business wealth also fall. Changes in debt and non-financial assets are generally insignificant. The impact on wealth distribution is notably unequal: the top 0.01% and top 10% lose share, while the next 40% gain and the bottom 50% are unaffected. These patterns are consistent with declines in equity prices, which disproportionately affect wealthier households. Overall, the findings highlight that natural disasters have meaningful and persistent effects on wealth, with implications for inequality and economic activity.

JEL: E01, E21, O44, Q54

Keywords: wealth, natural disasters, local projections.

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I. Introduction

Natural disasters have large impacts across the United States. In 1992 Hurricane Andrew caused estimated damage of \$51 billion in Florida and Louisiana. Hurricane Katrina hit New Orleans and a wide surrounding area with damage put at \$173 billion in 2005. And the January 2025 wildfires in the Los Angeles area are thought to have inflicted between \$76 and \$131 billion in damage.¹ Clearly, natural disasters can have large impacts on the capital stock in affected areas of the country.

In recent years there has been considerable study of the impact of natural disasters or extreme weather events on GDP, consumption, unemployment and other aspects of the macroeconomy. However, there has been little study of the effects on wealth. This gap is perhaps surprising since it is the initial destruction of capital that is responsible for most of the other economic effects.²

The purpose of this paper is to study empirically the impacts of natural disasters on wealth in the United States. In addition, we look at effects on GDP, disposable income, consumption, investment and government expenditure. We do these analyses using a time-series local projection approach for 1980 – 2019 on the dynamic effects of a subset of disasters of the types that on average create the largest damage: mainly earthquakes, hurricanes and wildfires.³ The excluded disasters are mostly floods and storms. They are so common there is relatively little variation in their aggregate occurrence over time, which would lead to insignificant results in our local projection approach.

We use quarterly data for 1980-2019, examining impacts by sector and form of wealth. In addition to households and non-profit organizations (NPOs), sectors are labelled as non-corporate non-financial, non-corporate financial, corporate non-financial, corporate financial firms and government. Wealth is the sum of non-financial and financial assets minus debts. Financial assets minus debts will be referred to as financial wealth. Natural disasters will just be called disasters throughout.

In some cases the physical damage caused by disasters may simply be accepted - - home owners can become renters, firms can shut plants or go out of business, and so on. However, in many or most cases there will be repair, replacement or reconstruction. That can be funded by drawing down financial assets or increasing debt. Also, insurance payouts or government compensation may be received, protecting financial wealth to an extent. These aspects can, in principle, be seen in any sector, although there are of course special issues in different sectors.⁴

Insurance and government compensation may cushion the blow of disasters on any household, firm or government entity that has the relevant coverage. But this implies a loss of wealth for

¹ The estimates for Andrew and Katrina are the adjusted total damage according to the EM-DAT database, which we use here in our empirical work. The Los Angeles wildfire estimate is due to Li and Yun (2025).

² A comprehensive analysis would examine the economics impacts of the loss of human capital through deaths, injury and disease, but that is beyond the scope of this paper.

³ We also include volcanic activity, but there were only three cases of that in our study period.

⁴ It might seem odd that the government sector appears to receive compensation from itself. This comes about through higher levels of government providing assistance to lower levels.

one component of the corporate financial sector, that is the insurance industry, as well as for the higher levels of government that provide most of the public compensation.

Wealth impacts on corporations may affect other sectors through changes in share prices, which may fall in the case of direct or indirect harmed caused by a disaster, but may rise – for example for firms involved in repair or reconstruction. The overall net effect is hard to predict, but there will certainly be distributional impacts.

Finally, significant wealth effects can arise due to business interruption. The loss of income for firms and households may lead to a decrease in financial wealth. Thus, where a decline in financial wealth is observed it cannot be interpreted as resulting only from the costs of repair or reconstruction.

While the nature of wealth impacts due to disasters is not difficult to understand, not all of these effects are revealed in the available data. The best comprehensive source of data on disasters both in the U.S. and internationally is the EM-DAT database. However, this does not include estimated damage for a significant portion of the recorded disasters. Our approach deals with this aspect by doing local projections based simply on the occurrence of disasters, rather than on their size or other characteristics. Our source of wealth data is the Flow of Funds balance sheets and distributional accounts produced by the Federal Reserve Board. These are detailed and generally authoritative.

We find that household wealth declines by 2% three quarters after a natural disaster and the effect persists for about three years. This is due to a decline in financial assets while non-financial assets and debts remain unaffected. The story is different for businesses. According to our results, the drop in businesses' net worth is mostly due to a decline in non-financial assets and despite the reduction in debts. For both corporate and non-corporate businesses we find a persistent drop in debts after a natural disaster hits the country. An important difference between the corporate and non-corporate business sectors is that for the latter we also find a decline in financial assets.

Natural disasters not only have a distributional impact across economic sectors but also within the household sector. We also study the effect of natural disasters across households' wealth distribution. Our results confirm that the rich households are the most affected by natural disasters. While we find a decline of 0.2 percentage points of the wealth share of the top 0.01% and 0.5 percentage points for the top 10%, we estimate an increase in the wealth share of those between the median and the top 10% of the wealth distribution. There is no significant change in the wealth share of the bottom 50%. Although the changes in wealth shares are not substantial, they are explained by important declines in wealth levels of those at the top of the distribution.

We then turn to estimate how national disasters affect a set of macroeconomics variables, some of which have been already analyzed in previous studies. First, natural disasters are expansionary, at least in the short run, as GDP increases slightly in the first year after the disaster. We also find an increase in CPI inflation and, over a longer horizon, an increase in unemployment and a decline in employment. This is consistent with a reduction in private consumption, investment and disposable income. Despite the increase in unemployment and a

worse performance of private consumption and investment, the short-lived increase in GDP after a natural disaster is due to an increase in state and local government expenditure. Public spending helps to sustain economic activity.

The decline in financial assets estimated for households, but also to some extent to the non-financial corporate and non-corporate business sectors, is explained mostly by an important decline in equity prices. This is not only consistent with the decline in financial assets but also with the decline of the wealth share of the top 0.01% and top 10%.

Overall, our results imply a wealth effect on consumption. The reduction in household wealth is associated with a reduction in consumption. The aggregate decline in consumption is probably not as important because the households more affected by the decline in wealth, i.e. rich households, have a lower marginal propensity to consume (MPC).

II. Literature review

Estimates of the cost of physical damage due to natural disasters are often reported and are an important indication of the impact of disasters on wealth (Delforge et al., 2023; NOAA National Centers for Environmental Information, 2025). However, to our knowledge, there have been no previous studies on the broader effects of natural disasters on wealth, including financial assets and debt, in the United States or any other country. In contrast, there have been several recent studies on the effects of temperature and climate change on GDP or other macroeconomic variables (Colacito et al., 2019; Natoli, 2023; Berg et al., 2024; Bilal and Känzig, 2024; Bilal and Stock, 2025). Studies have also looked at the impacts on the macroeconomy of severe weather (Ehlers et al., 2025; Kim et al., 2025) and natural disasters (Noy, 2009; Sahin, 2011; Hsiang et al., 2014; Yun and Kim, 2022; Bodenstein et al., 2024, and Eickmeier et al., 2024). All these strands of research throw some light on the possible impact of disasters on wealth, although they do not explicitly address those impacts. They are also important here since they deal with estimation issues similar to those we encounter.

As described by Bilal and Känzig (2024) - - BK, one element of the literature on temperature and climate change consists of multi-country studies on the impact of a country's own temperature on GDP (see BK for references). These generally find significant but small negative effects. BK point out that the hunt for localized temperature effects may be off target. For example, the frequency and magnitude of cyclones depends on ocean temperatures, which may not be closely related to local temperature. Using a sample of 173 countries, BK find that with global temperature as the driver, GDP impacts are on average six times greater than they appear when using local temperature. Globally, they estimate that GDP per capita fell by 18% over 1960-2018 as a result of temperature rise. A temperature increase of one degree Celsius was estimated to reduce global GDP by 12%.

For the U.S., advances in estimation methods have also led to a revision of an earlier picture of significant but small temperature effects on the macroeconomy. Colacito, Hoffmann and Phan (2019) - - CHP - - estimated temperature effects in quarterly data for the U.S. over 1957-2012 using both aggregate and time series/panel runs across states. By using quarterly data CHP were able to control for season. They found that summer temperature had a negative effect on GDP

while fall temperature had a smaller positive effect. Overall, a temperature increase of one degree Fahrenheit reduced GDP on average by 0.15 to 0.25 percentage points.

While studies of the impact of temperature on GDP are interesting, more relevant here are the growing number of studies, both for multiple countries and the U.S. alone, that study the impact of severe weather or other natural disasters on GDP or other macroeconomic variables.

Noy (2009) studied the short-run effect of disaster damage on GDP in a sample of 109 countries for the years 1970-2003. He found large negative effects on GDP growth in developing countries, and small positive effects in OECD countries. Sahin (2011) studied the total impacts globally of natural disasters that created a minimum of \$20 million (USD) and at least 1% of GDP in developed countries and 2% of GDP in developing countries over the period 1990-2007. In aggregate, physical damage was \$742 billion while lost output was \$678 billion. The output loss grew over time, although it did not trend upward relative to GDP.

Hsiang and Jina (2014) examined the effect of 6,700 cyclones on GDP around the world over the period 1950-2008. They found that a cyclone with impact at the 90th percentile level had a persistent effect on GDP, reducing per capita income in a country by 7.4% two decades later.

Bodenstein and Scaramucci (2024) studied the impact of severe physical hazards on GDP in 98 countries over the period 1980-2019, using the local projection method, which we also use in this paper. The largest events (above the 90th percentile of damages) reduced GDP on average by 0.5 percent for several years without recovery to trend. Smaller events (below 90th percentile) saw a less immediate decrease (0.1 percent) that progressively widened to be similar to the effect of larger disasters after 10 yrs. Climatological hazards (droughts and forest fires) appeared to have the largest effects. These findings are robust across country groupings by development and alternative measures of the strength of the physical hazard.

Ehlers et al. (2025) also used the local projection method, studying the impact of natural disasters in eight countries with major economies in the Americas. They found that droughts reduce economic output over the two years after they occur due to lasting effects on agriculture, forestry and electricity production. Results for floods, storms and wildfires are insignificant. However, point estimates indicate that while floods and wildfires also have little effect on GDP in the first year after they occur, in the subsequent four quarters GDP may be reduced by wildfires and increased by floods.

Many studies in the U.S. have examined the impact of particular disasters on GDP at the state or regional level. Such analysis is a standard part of the costing of indirect disaster damage. There are important limitations of such studies, however. These are twofold. First, labor and equipment typically flow into the disaster area to assist with repair and reconstruction, creating output that boosts state or regional GDP. Second, there is generally out-migration from the disaster area, which acts to raise local GDP per capita (Yun and Kim, 2022). Therefore, in order to get a good idea of the impact of disasters on income and output it makes sense to look at the effect on GDP at the national level as well as the local level.

Eickmeier et al. (2024) study the dynamics of the macroeconomic impacts of disasters in the U.S. using monthly data for the period 2000 – 2019. They focus on the type of disasters whose

frequency and severity is most associated with climate change: extreme temperature events, floods, and storms, finding significant and persistent negative effects on output, consumption, employment and investment. They also look at financial impacts, showing that these disasters increased bank risk, financial risk and uncertainty, and also led to general declines in confidence.

Kim, Matthes and Toan (2025) - - KMT - - applied a smooth transition Vector Auto Regression (VAR) to monthly U.S. data for the period 1963-2019 to study the impact of severe weather on the macroeconomy. Since GDP is not available on a monthly basis, they instead looked at impacts on consumption, which made up 60% of GDP on average in their sample. They found that a one standard deviation rise in the Actuaries Climate Index (ACI) reduced consumption by 0.13 percentage points initially, with a persistent effect over 20 months.

III. Data

The empirical analysis is based on three sources of data: the Federal Reserve flow of funds or financial accounts, the Federal Reserve Distributional Financial Accounts (DFA) and the Emergency Events Database (EM-DAT) (Delforge, D. et al. (2023)).

The EM-DAT database contains information about the date, location, health, and economic impact of natural disasters since 1900 to the present. Globally, there are more than 26,000 disasters recorded in the database of which 1,165 occurred in the US. To be included in the database the disaster must comply with one of the following inclusion criteria: at least ten deaths, at least 100 people affected or, declaration of emergency or international assistance. Natural disasters are classified as: drought, earthquake, epidemic, extreme temperature, flood, glacial lake outburst, insect infestation landslide, mass movement, storm, volcanic activity and, wildfire.

The flow of funds data is part of the US National Accounts and contains information about the level and composition of net worth for several sectors of the economy. Complete balance sheet information, i.e. financial assets, real assets and debts, is available for households and non-for-profit organizations (NPOs), the non-financial corporate business sector and, the non-financial non-corporate business sector. On the other hand, financial accounts containing information on financial assets and debts, but lacking data on real assets, is available for domestic non-financial sectors (households and NPOs, non-financial business, general government), domestic financial sectors (monetary authority, private depository institutions, property-casualty insurance companies, life insurance companies, private and public pension funds, money market funds, mutual funds, closed-end funds, exchange-traded funds, government sponsored enterprises, agency- and GSE-backed mortgage pools, issuers of asset-backed securities, finance companies, mortgage real estate investment trusts, security brokers and dealers, holding companies, other financial business), and the rest of world.

The DFA provide quarterly information of the distribution of wealth across US households. The data are available from the third quarter of 1989 up to now. As we are interested in how the distribution of household wealth is affected by natural disasters, we use information of the wealth share of the top 0.01%, the top 10%, the next 40% and the bottom 50%. This allows us to analyze the effect of natural disasters across the whole distribution of household wealth.

Table 1: Sample periods across databases

	Source	Available data
Wealth level	Flow of funds	1945 Q4 to 2023 Q4
Wealth distribution	DFA	1987 Q3 to 2023 Q4
Natural disasters	EM-DAT	1900 M9 to 2023 M12

IV. Empirical strategy

Estimate the effect of a natural disaster (only earthquakes, volcanic activity and wildfire) on aggregate net worth in the US using Local projections. The graph shows the impulse response in the change in net worth after a natural disaster in the following 16 quarters.

We basically estimate the following regression using Jorda (2005) local projection method:

$$\Delta Y_{t+h} = \alpha + \sum_{j=0}^8 \beta^{h,j} ND_{t-j} + \sum_{j=0}^4 \theta^{h,j} X_{t-j} + \delta Y_{t-1} + \varepsilon_{t+h}$$

Where: ΔY_{t+h} is the change in (log) net worth, financial assets, real assets or debts between quarter t and $t+h$. ND_t is a dummy variable that takes the value 1 if there was a natural disaster (earthquakes, volcanic activity, wildfire or tropical cyclone) at time t . The vector X includes the following control variables, including 4 lags: (log) house prices, (log) stock price index, (log) GDP and a dummy variable that captures the period of the Global Financial Crisis (2007q1 to 2009q2). Quarterly data is expressed in (log) USD in constant prices (prices of 2005q1, adjusted by aggregate CPI).

For the wealth level regressions, the sample period considered ranges from 1980q1 to 2019q4. There are two reasons to consider this period. First, EM-DAT is more reliable for the latest years, so we opted to discard natural disasters data previous to 1980. Secondly, we end the sample period in the last quarter of 2019 to avoid including the COVID-19 pandemic that might affect the results.

For the regressions on the impact of natural disasters on wealth distribution we consider as the dependent variable the share of wealth in the top 0.01%, top 1%, top 10%, next 40% and bottom 50%. In that case, the dependent variable is the percentage points change in the wealth share of the corresponding percentile. The control variables are the same as for the wealth level regressions. Given the availability of data from the DFA, the sample period considered for the impact of natural disasters on wealth distribution ranges from 1989q3 to 2019q4.

Figure 1 shows the evolution of net worth, financial assets, real asset and debts for the three economic sectors for which data are available: (a) households and NPOs, (b) non-financial corporate business and, (c) non-financial non-corporate business. Net worth, or wealth, is defined as the value of financial assets plus real assets minus debts. Financial assets include currency and deposits, equity and shares, securities, pensions and insurance and other financial assets. Real assets are mostly housing but also include equipment, intellectual property products, consumer

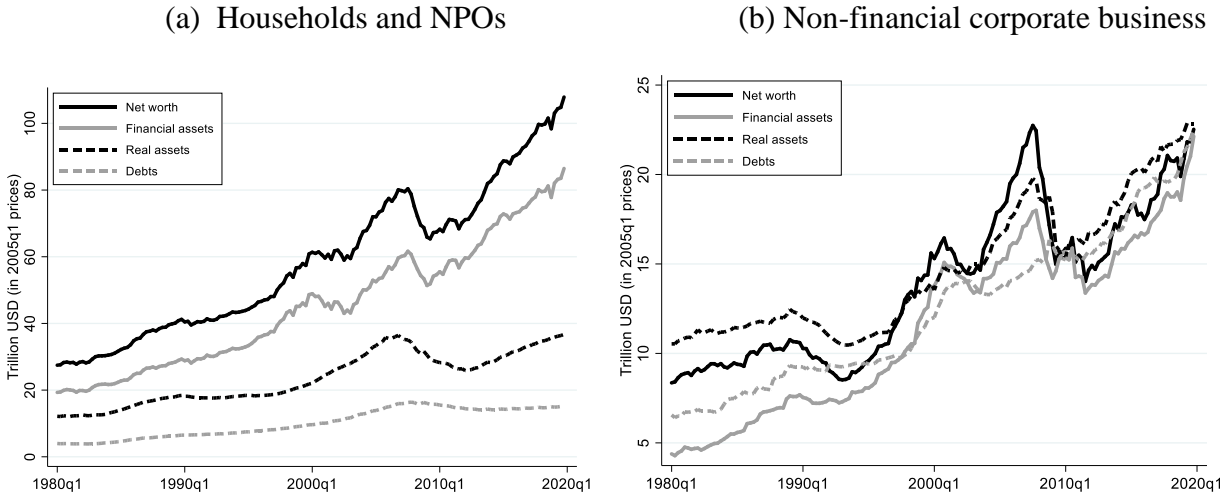
lasting goods and other real assets. Debts include mortgages, consumer credit, other loans, securities, trade payables, and other liabilities.

The increase in households' net worth after the 2008 Global Financial Crisis (GFC) has already been documented in. In real terms, household wealth initially rose from USD 27 trillion in 1980 to USD 80 trillion in 2007, before dropping to USD 65 trillion due to the GFC. Growth started again after 2008 at an even higher pace to reach USD 108 trillion by the end of 2019 (See Figure 1a). This remarkable increase in household wealth was mostly due to the increase in the value of financial. While financial assets increased on average 4% annually between 1980 and 2019, real assets increased just 3% per annum. This resulted in an increase in the proportion of gross assets held in financial assets. While financial assets represented 70% of gross assets by 2019, the figure was 61% in 1980. The debt-to-net worth ratio increased during the GFC but in 2019 was at the same level as in 1980.

The trend in wealth and its components for the non-financial corporate business sector is shown in Figure 1b. Compared to households, the non-financial corporate sector is more indebted relative to its wealth. The debt-to-net worth ratio increased from 44% in 1980 to 50% by the end of 2019. Another difference with respect to households is the composition of assets, by the end of the sample period gross assets were equally split between financial and real assets.

The non-financial non-corporate business sector exhibit a lower debt-to-net worth ratio but shows a steady increase since 1980. While debts represented just 6% of wealth in 1980 it increased to 29% by the end of 2019. In terms of the composition of assets, the non-corporate sector is mid-way between households and the corporate sector. The proportion of gross assets held in financial assets increased from 23% in 1980 to 41% in 2019.

Figure 1: Economic Sectors: net worth, financial assets, non-financial assets and debts (in USD trillion, 2005q1 prices)



(c) Non-financial non-corporate business

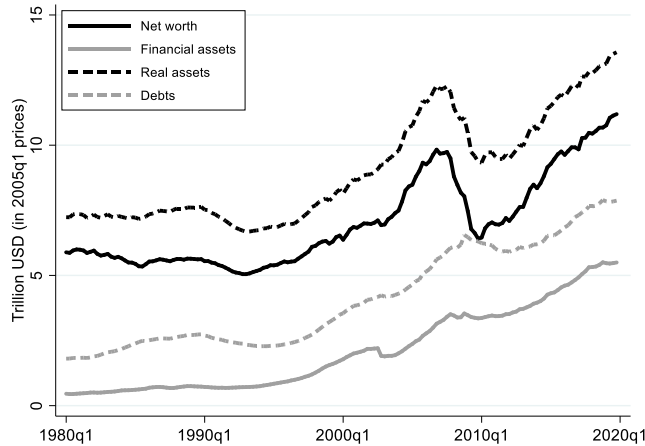
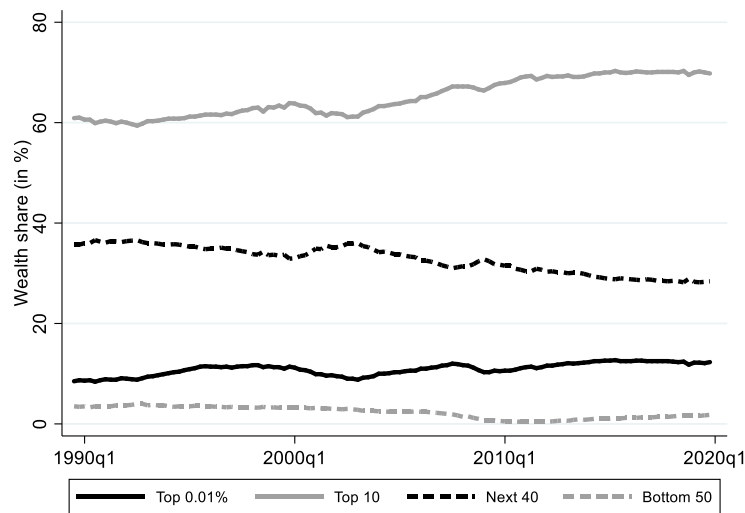


Figure 2 shows the evolution of household wealth distribution between end of 1989 to the last quarter of 2019, just before the COVID-19 pandemic. It is well known that wealth is highly concentrated, much more than income. After 10 years of being about 60% of total household wealth, the wealth share of the Top 10% increased since the beginning of this century to reach 70% of total household wealth by the end of 2019. The top 0.01% of households own 12% of total wealth, up from 8.5% by the end of the 80s. At the other spectrum of wealth distribution, the share of the bottom 50% dropped from 3.5% to 1.8% during the same period, while the share of those above the median but below the top 10%, what we call the next 40%, declined from 36% in 1989 to 28% in 2019. In sum, during the period we study and particularly since the beginning of this century, there was an increase in household wealth concentration in the US.

Figure 2: Household wealth distribution (in % of total wealth)



Finally, Table 2 shows the trend in natural disasters during the period under analysis. It has already been documented the increase in the frequency of natural disasters during the last decades. This is confirmed in our data. While in 30% of quarters it was registered a natural disaster in the 5 years between 1980 and 1984, the figure is 65% between 2014 and 2019. Not only we find an increase in the proportion of quarters in which a natural disaster is registered but also in their frequency. While there were 0.5 disasters per quarter in 1980-1984, there are 1.6 disasters per quarter in the last 5 years of our sample.

Table 2: Natural disasters over time

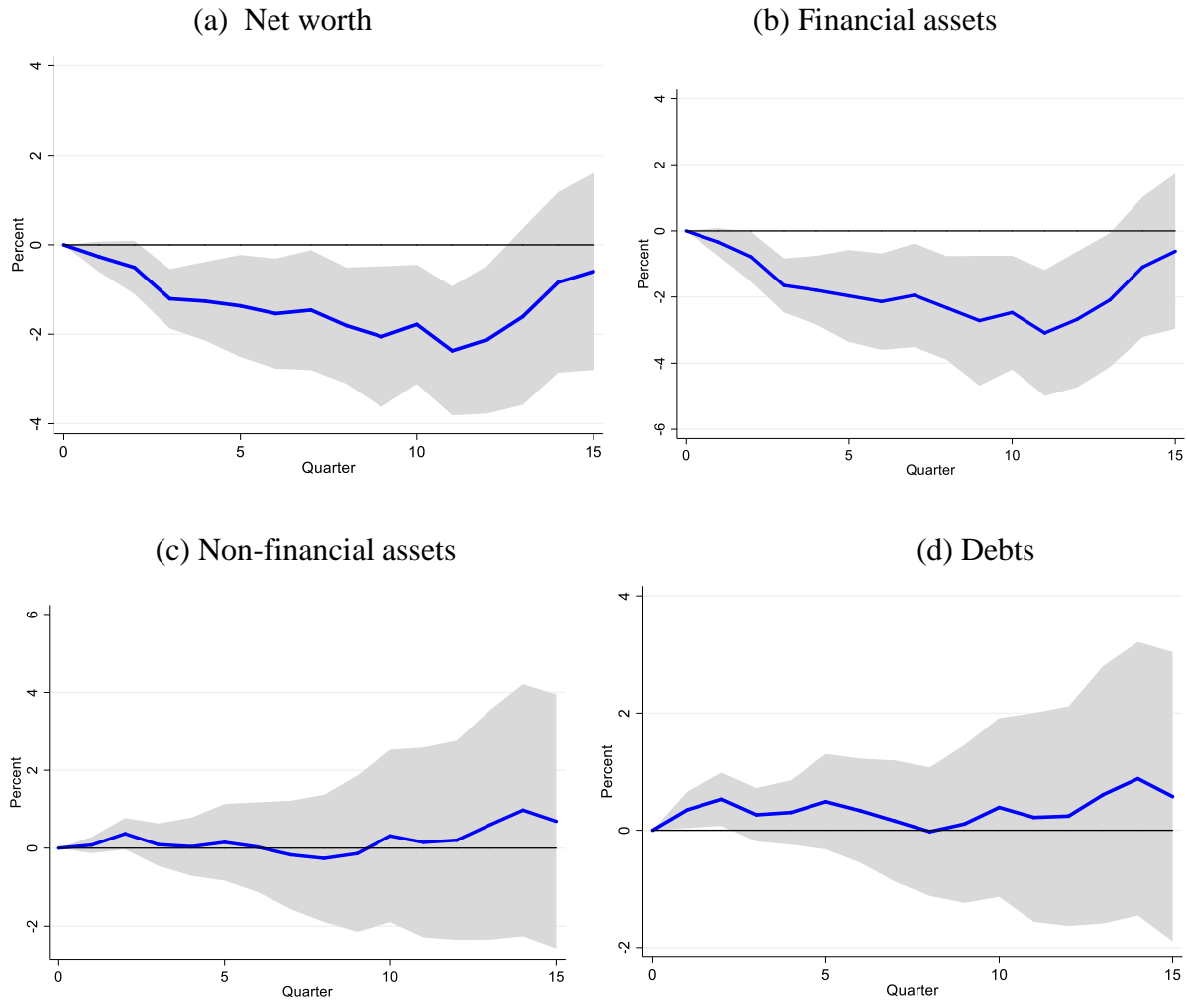
	Proportion of quarters with a disaster (in %)	Average number of disasters per quarter
1980-1984	30	0.5
1985-1989	45	0.7
1990-1994	70	1.4
1995-1999	60	1.2
2000-2004	80	1.5
2005-2009	70	1.3
2010-2014	55	1.1
2014-2019	65	1.6

4.1 Effect on wealth levels by economic sector

4.1.1 Households and NPOs

Figure 3 shows the estimated effect of natural disasters on households and NPOs wealth and its components: financial assets, real assets and, debts. According to our estimates, household wealth declines 2% three quarters after a natural disaster occurs, and the effect persists for about 13 quarters (Figure 3a). The drop is explained mainly by a similar decline in financial assets, while we find no statistically significant effect of natural disasters on households and NPOs real assets and debts, although there is a small and short-lived increase in debts right after the shock.

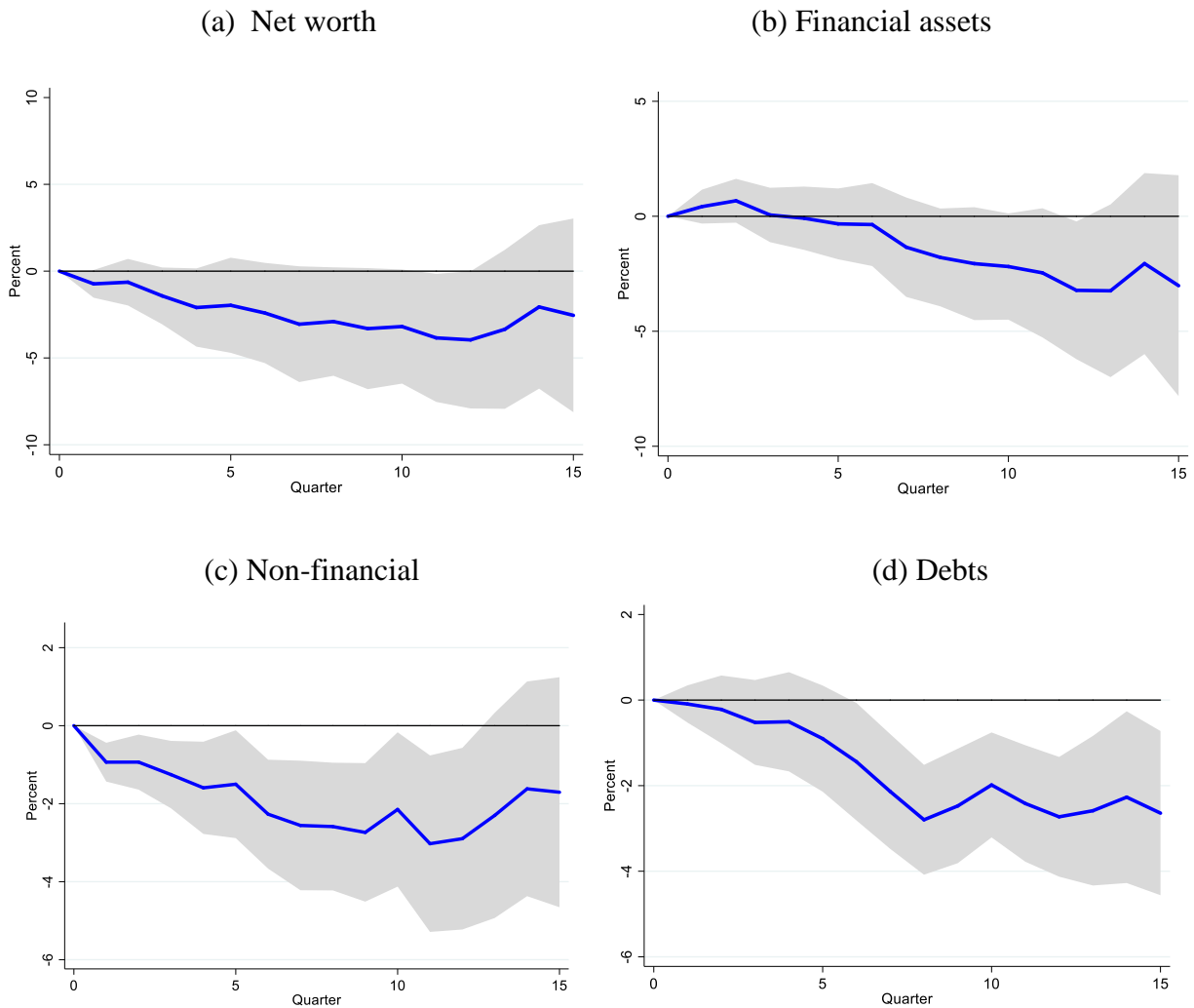
Figure 3: Effect of natural disasters on wealth and its components (Households and NPOs, in %)



4.1.2 Non-financial Corporate Business

A noticeable difference between the non-financial corporate business sector and households is that while we estimate a decline in financial assets after a natural disaster for the former, the main effect is on the value of real assets and debts. Corporate businesses reduce their indebtedness after a natural disaster and the effect persists even four years after the shock.

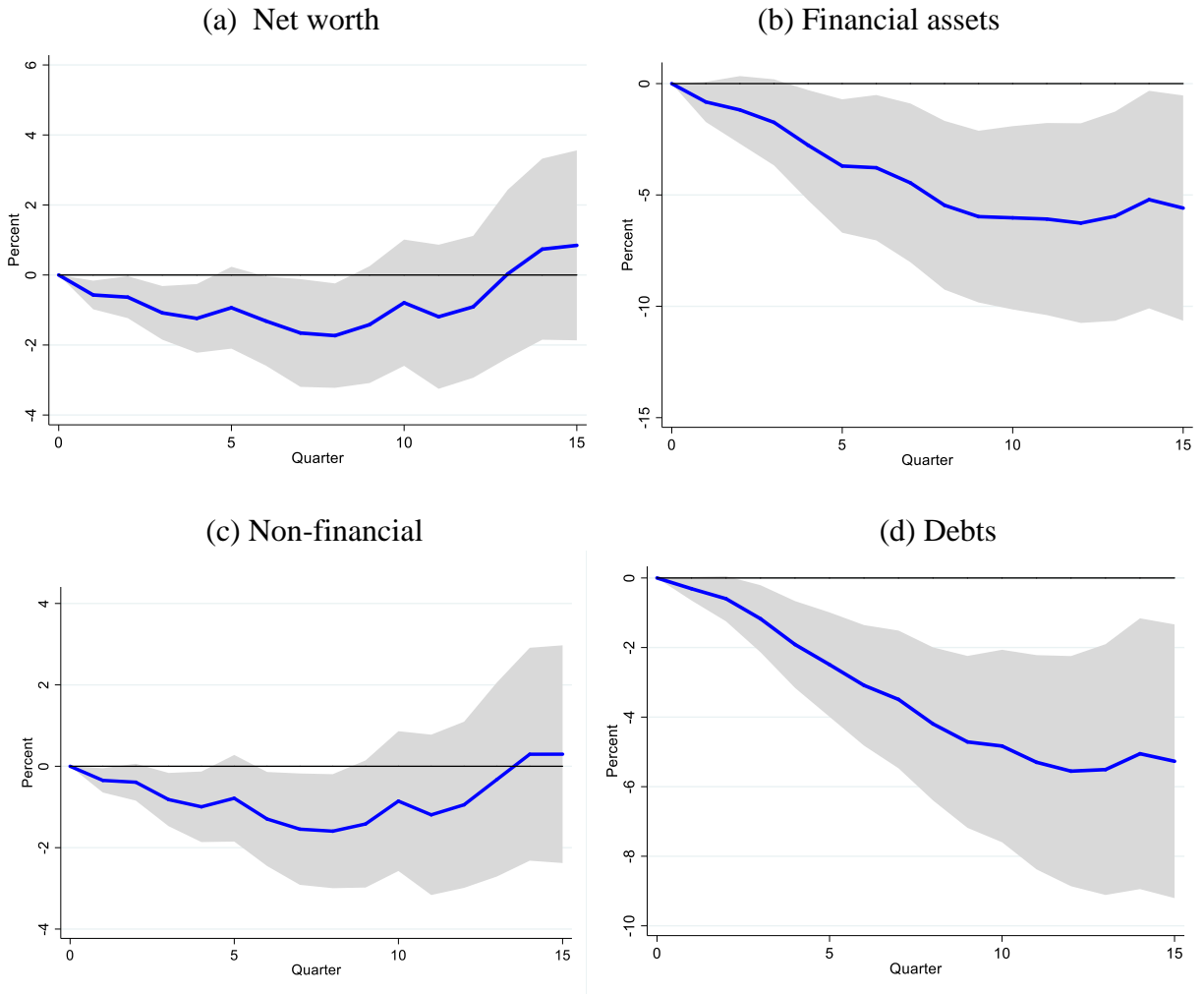
Figure 4: Effect of natural disasters on wealth and its components (non-financial corporate business, in %)



4.1.3 Non-financial Non-corporate Business

We also find a steadily decline of debts after a natural disaster for the non-financial non-corporate business sector. But, for this sector we not only estimate an important decline in real assets but also in financial assets. Moreover, the drop in financial assets is estimated to be 5% after six quarters and to persist in that level even after 16 quarters. The fact that wealth returns to its level previous to the occurrence of a natural disaster after about two years is due to the further reduction in debts and despite the persistent decline in financial assets.

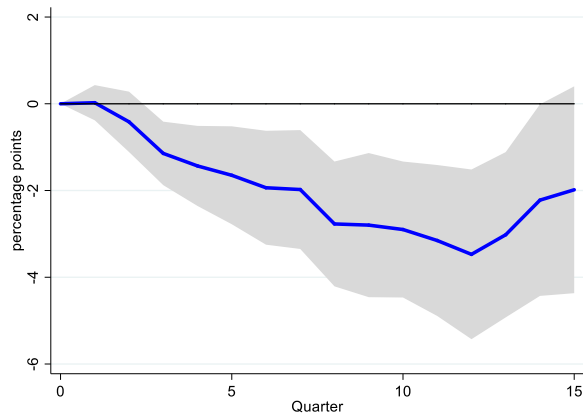
Figure 5: Effect of natural disasters on wealth and its components (non-financial non-corporate business, in %)



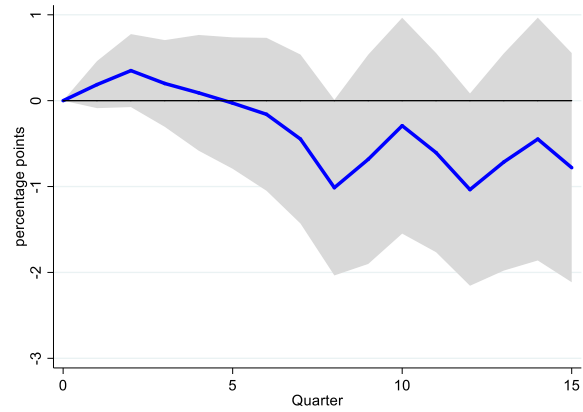
4.1.4 Effect by economic sector on financial assets and debts only

Domestic nonfinancial sectors

Financial assets

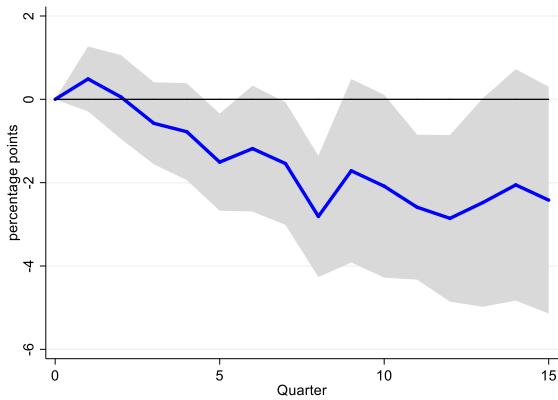


Debts

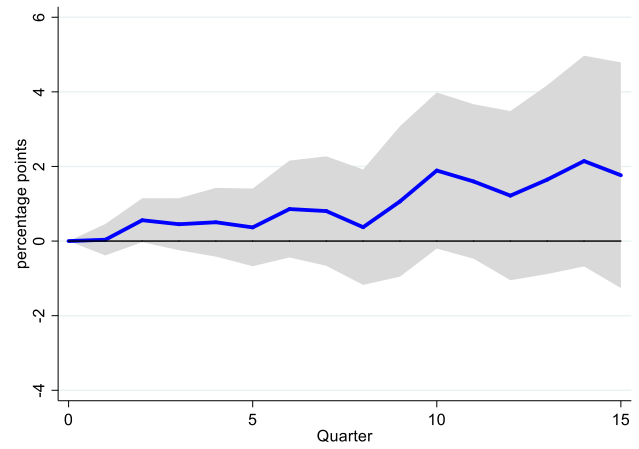


General Government

Financial assets

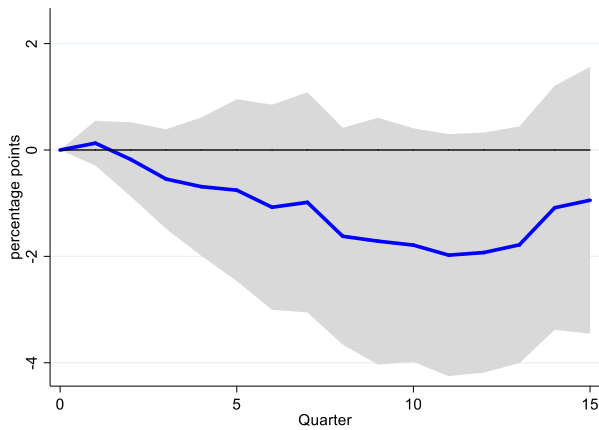


Debts

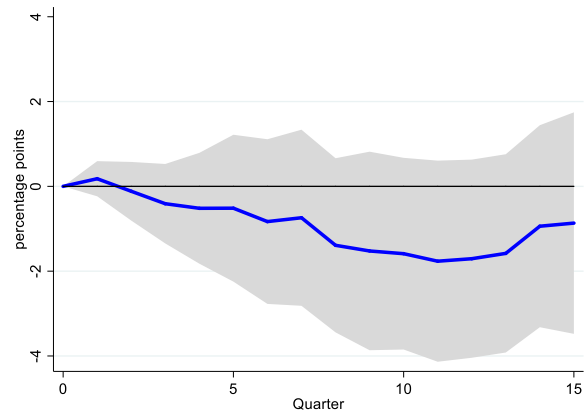


Domestic financial sectors

Financial assets



Debts



4.2 Effect of natural disasters on households' wealth distribution

Natural disasters not only have a distributional impact across economic sectors but also within the household sector. In this section we study the effect of natural disasters across households' wealth distribution. Our results confirm that the rich households are the most affected by natural disasters. While we find a decline of 0.2 percentage points of the wealth share of the top 0.01% and 0.5 percentage points for the top 10%, we estimate an increase in the wealth share of those between the median and the top 10% of the wealth distribution. There is no significant change in the wealth share of the bottom 50%. Although the changes in wealth shares are not substantial, they are explained by important declines in wealth levels of those at the top of the distribution (see Appendix A.2).

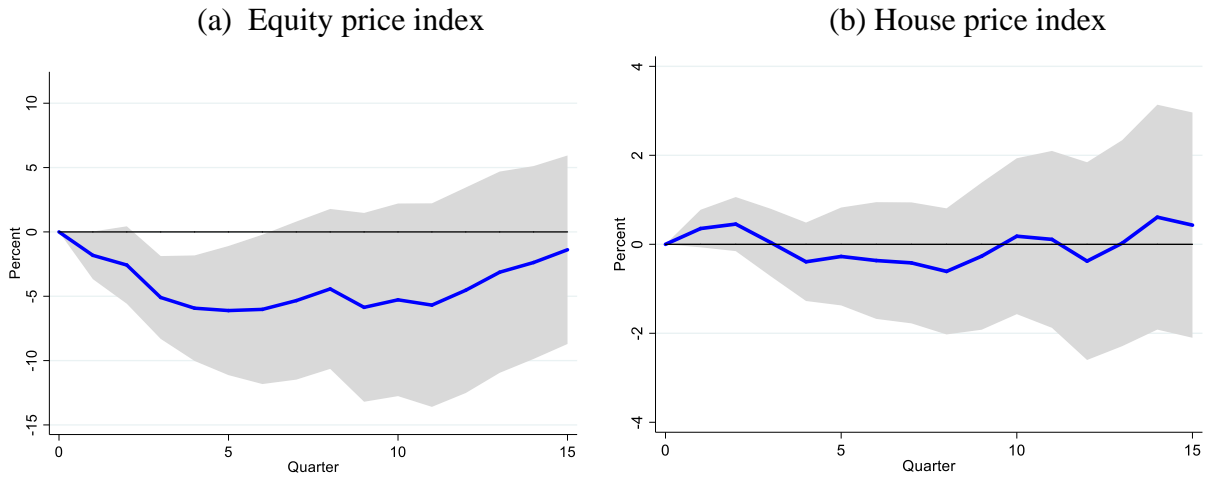
Figure 6: Effect of natural disasters on household wealth distribution (in %)



4.3 Effect on macroeconomic variables

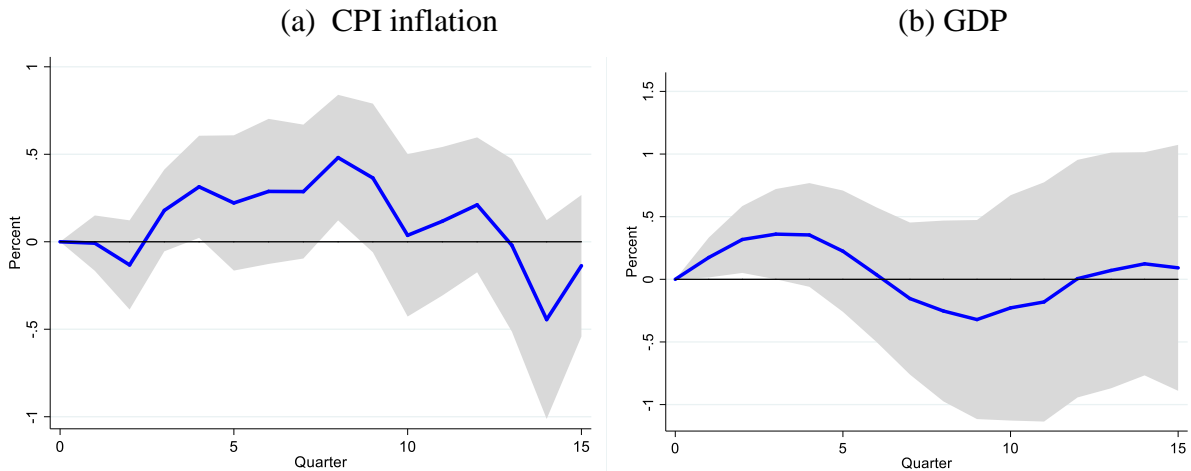
The drop in financial assets estimated for households, but also to some extent to the non-financial corporate and non-corporate business sectors is explained mostly by an important decline in equity prices. Our results suggest that equity prices decline by about 5% after a natural disaster hit the US, but the effect disappears after six quarters. On the other hand, and despite the small increase in the quarters after the shock, we find no statistically significant effect of natural disasters on house prices (Figure 7).

Figure 7: Effect of natural disasters on assets price indexes (in %)



We then turn to estimate how natural disasters affect a set of macroeconomic variables. First, natural disasters are expansionary, at least in the short run, as GDP increases slightly in the first year after the disaster. We also find an increase in CPI inflation and, over a longer horizon, an increase in unemployment and a decline in employment. This is consistent with a reduction in private consumption, investment and disposable income (Figure 9). Despite the increase in unemployment and a worse performance of private consumption and investment, the short-lived increase in GDP after a natural disaster is due to an increase in state and local government expenditure (Figure 10). Public spending helps to sustain economic activity.

Figure 8: Effect of natural disasters on macroeconomic variables (in %)



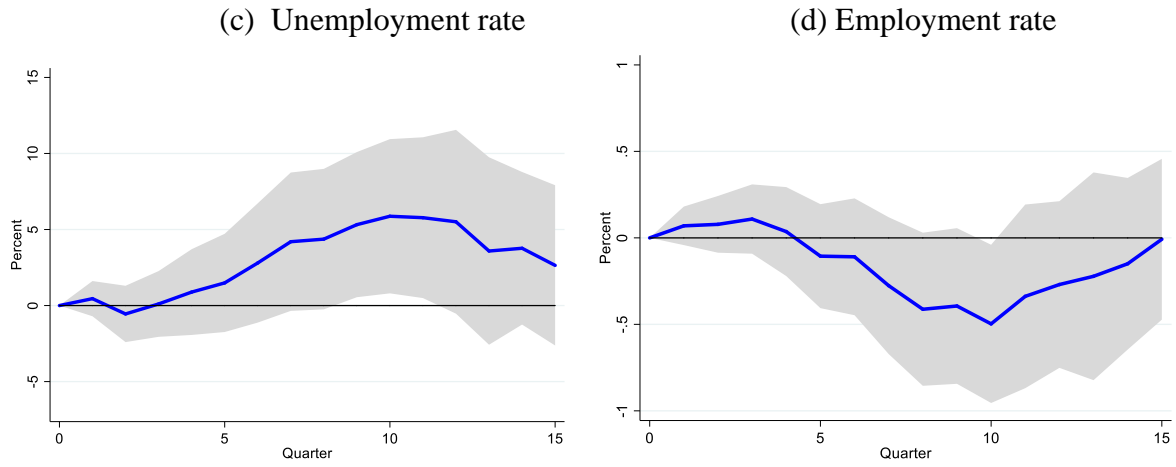
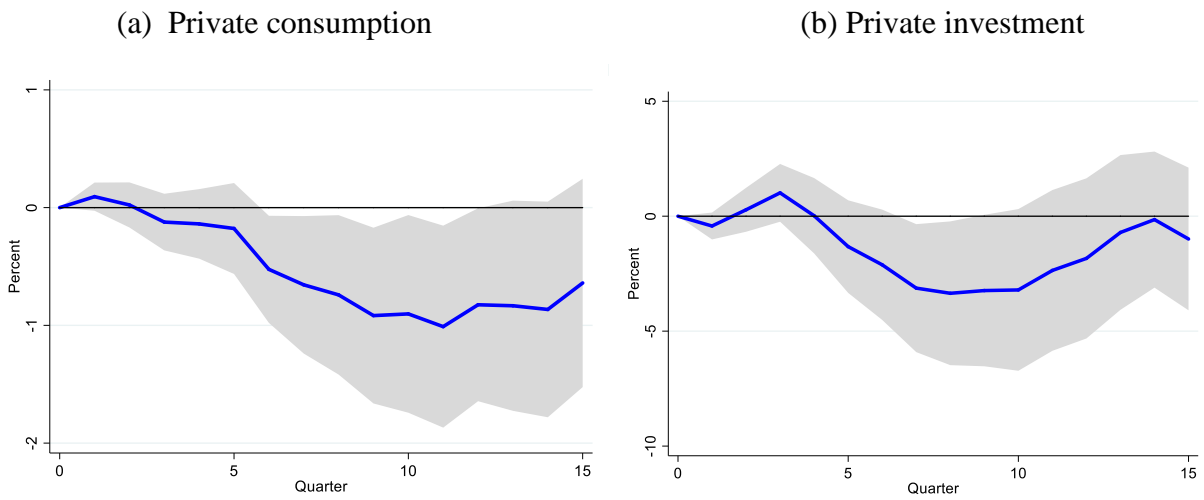
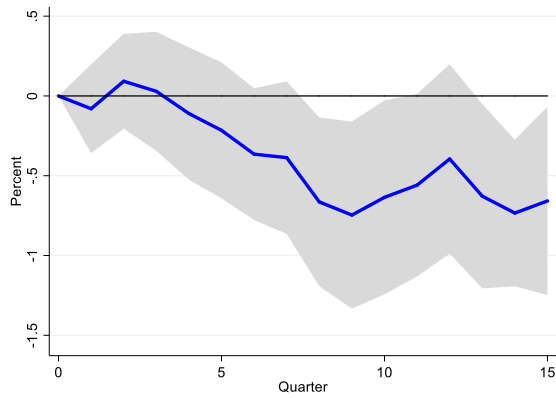


Figure 9: Effect of natural disasters on macroeconomic variables of the private sector (in %)

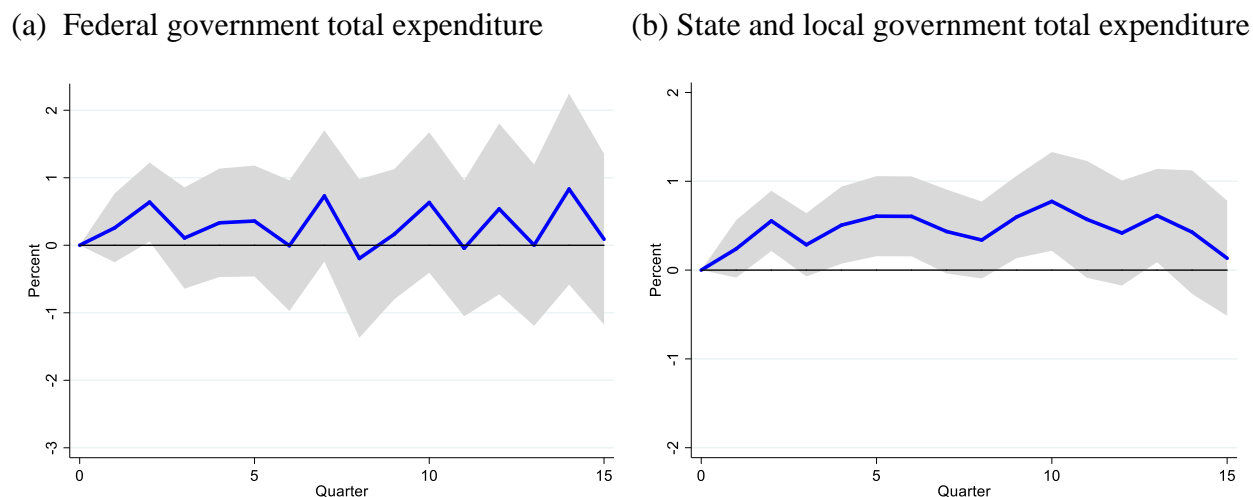


(c) Disposable income



The public sector response to the natural disaster seems to come from the state and local governments, as we do not find any effect on the Federal government expenditure.

Figure 10: Effect of natural disasters on macroeconomic variables of the public sector (in %)



V. Conclusion

The purpose of this paper is to study empirically the impacts of natural disasters on wealth in the United States. In addition, we look at effects on GDP, disposable income, consumption, investment and government expenditure. We do these analyses using a time-series local projection approach for 1980 – 2019 on the dynamic effects of a subset of disasters of the types that on average create the largest damage: mainly earthquakes, hurricanes and wildfires.

We find that household wealth declines by 2% three quarters after a natural disaster and the effect persists for about three years. This is due to a decline in financial assets while non-financial assets and debts remain unaffected. The story is different for businesses. According to our results, the drop in businesses' net worth is mostly due to a decline in non-financial assets and despite the reduction in debts. For both corporate and non-corporate businesses we find a persistent drop in debts after a natural disaster hits the country. An important difference between the corporate and non-corporate business sectors is that for the latter we also find a decline in financial assets.

Natural disasters not only have a distributional impact across economic sectors but also within the household sector. We also study the effect of natural disasters across households' wealth distribution. Our results confirm that the rich households are the most affected by natural disasters. While we find a decline of 0.2 percentage points of the wealth share of the top 0.01% and 0.5 percentage points for the top 10%, we estimate an increase in the wealth share of those between the median and the top 10% of the wealth distribution. There is no significant change in

the wealth share of the bottom 50%. Although the changes in wealth shares are not substantial, they are explained by important declines in wealth levels of those at the top of the distribution.

We then turn to estimate how national disasters affect a set of macroeconomics variables, some of which have been already analyzed in previous studies. First, natural disasters are expansionary, at least in the short run, as GDP increases slightly in the first year after the disaster. We also find an increase in CPI inflation and, over a longer horizon, an increase in unemployment and a decline in employment. This is consistent with a reduction in private consumption, investment and disposable income. Despite the increase in unemployment and a worse performance of private consumption and investment, the short-lived increase in GDP after a natural disaster is due to an increase in state and local government expenditure. Public spending helps to sustain economic activity.

The decline in financial assets estimated for households, but also to some extent to the non-financial corporate and non-corporate business sectors, is explained mostly by an important decline in equity prices. This is not only consistent with the decline in financial assets but also with the decline of the wealth share of the top 0.01% and top 10%.

Overall, our results imply a wealth effect on consumption. The reduction in household wealth is associated with a reduction in consumption. The aggregate decline in consumption is probably not as important because the households more affected by the decline in wealth, i.e. rich households, have a lower marginal propensity to consume (MPC).

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APPENDIX

A.1 Robustness check: number of disasters

In this section we present robustness checks on the effect of natural disasters on net worth, financial assets, real assets and debts for the 3 sectors for which the data are available: households and NPOs, non-financial corporate business and, non-financial non-corporate business.

The regressions are the same as shown in the main body of the paper but using the number of natural disasters instead of the dummy variable that takes de value 1 if a natural disaster happened in a given quarter.

Figure A.1: Effect of natural disasters on wealth and its components (households and NPOs, in %)

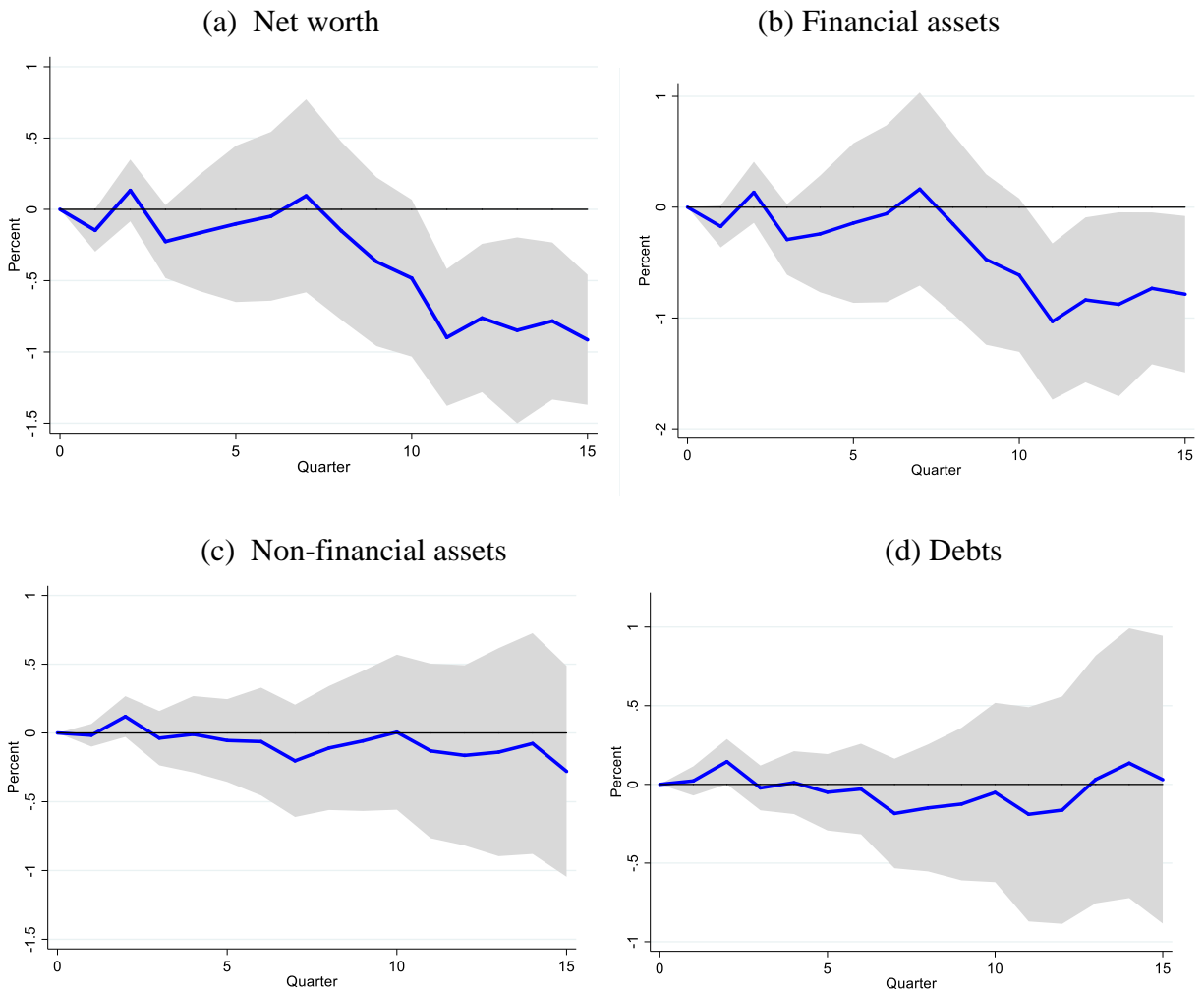
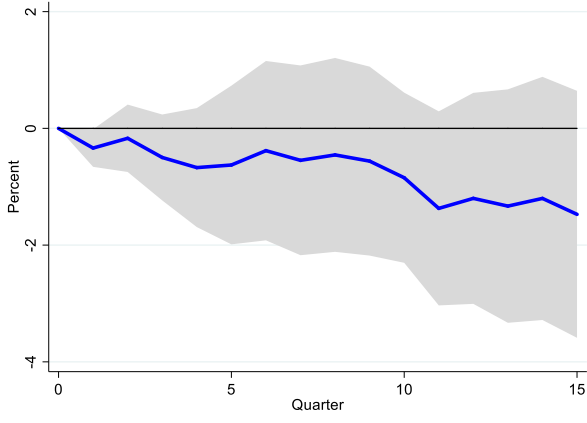
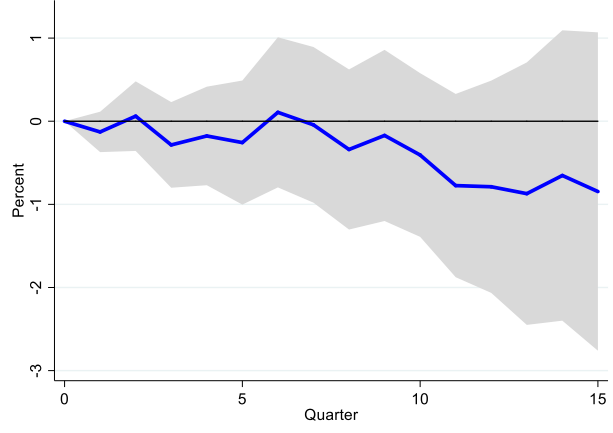


Figure A.2: Effect of natural disasters on wealth and its components (non-financial corporate business, in %)

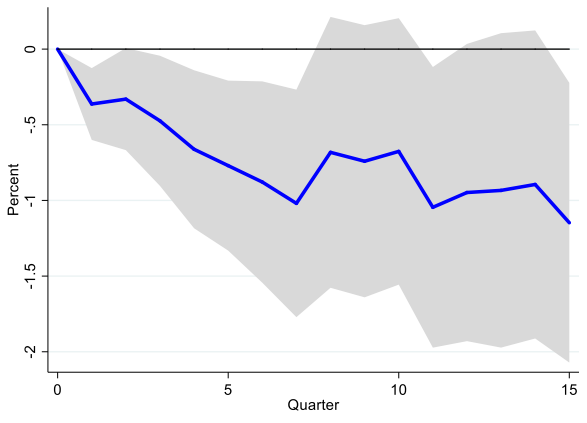
(a) Net worth



(b) Financial assets



(c) Non-financial assets



(d) Debts

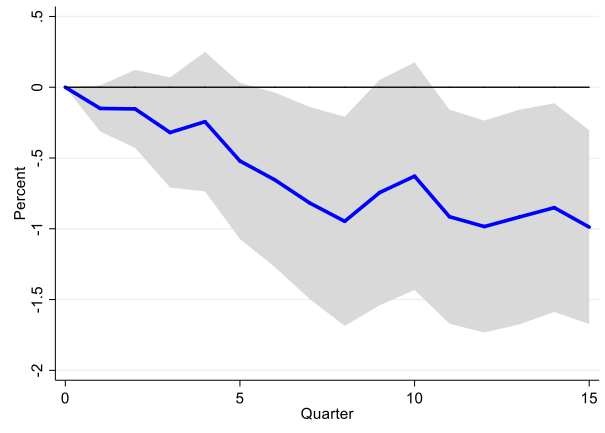
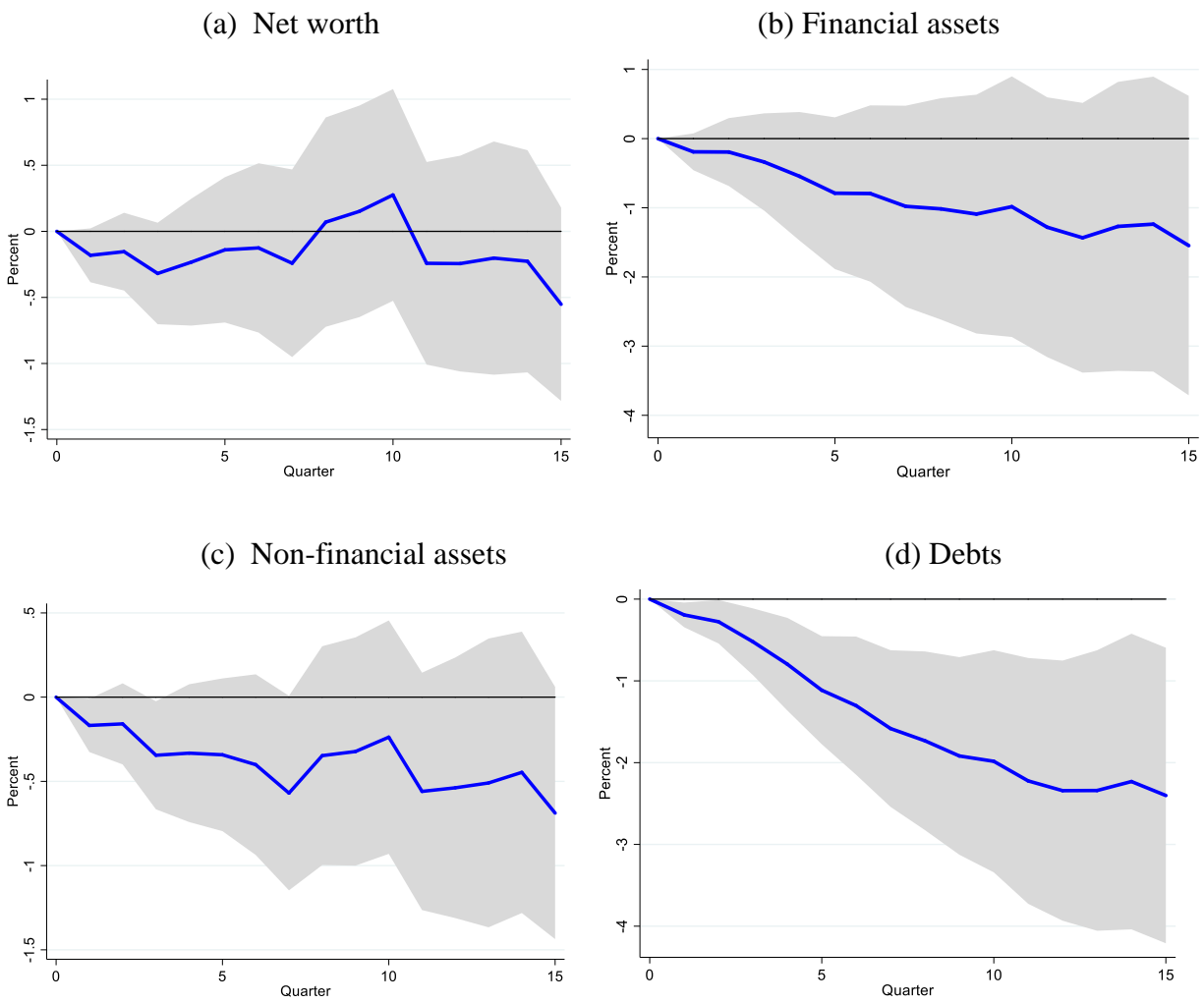


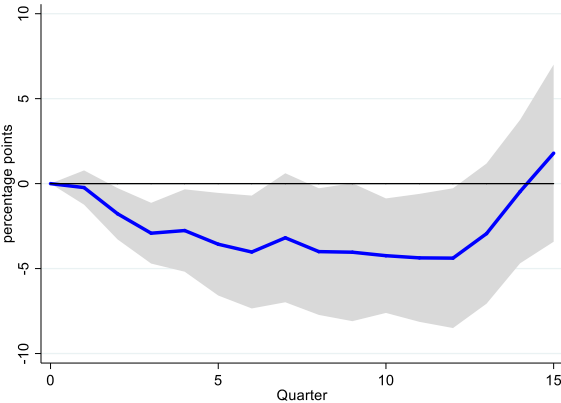
Figure A.3: Effect of natural disasters on wealth and its components (non-financial non-corporate business, in %)



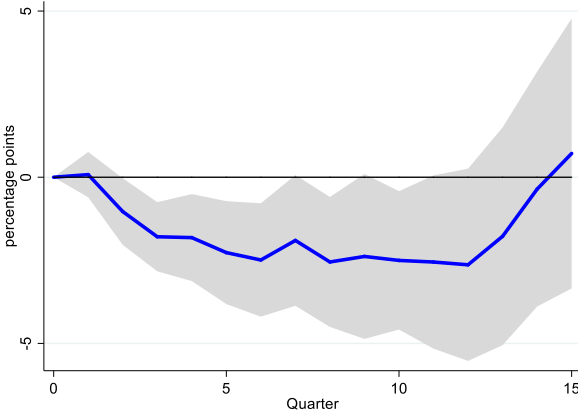
A.2 Natural disasters and wealth levels across the households' wealth distribution

Figure A.4: Effect of natural disasters on household wealth (in %)

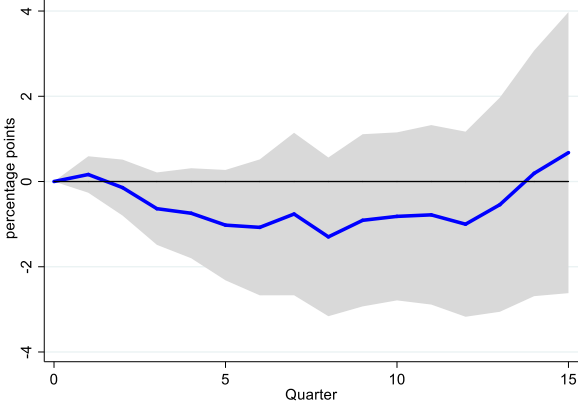
(a) Share of top 0.01%



(b) Share of top 10%



(c) Share of next 40%



(d) Share of bottom 50%

