The Consumption Response to Liquidity-Enhancing Transfers: Evidence from Italian Earthquakes*

Antonio Acconcia, Giancarlo Corsetti, and Saverio Simonelli

This draft: March 2015

Abstract

Exploiting three earthquakes in Italy as quasi-experiments, we analyze the response of homeowners’ consumption to transfers targeted to finance housing repair and reconstruction. To the extent that funds are made available up-front, these transfers are akin to loans, mainly affecting the liquidity of households’ wealth. We show that these transfers have little effect over a multi-year horizon—they are not a windfall. Yet, access to reconstruction transfers has a strong and significant effect on non-durable consumption on impact, especially for households with a low level of liquid wealth and bank debt. In contrast, we find no significant consumption change in response to the in-kind equivalent of cash transfers. Our study contributes to the recent literature on the dynamics of the consumption demand by the wealthy hand-to-mouth, providing micro-evidence in line with the main predictions of the theory.

JEL classification: E21, E62

Keywords: Consumption, Liquidity, Fiscal transfer, Quasi-experiment

*Acconcia: Department of Economics and Statistics, University of Naples Federico II, Via Cintia, 80126 Napoli, Italy, and CSEF (e-mail: antonio.acconcia@unina.it); Corsetti: Faculty of Economics, Cambridge University, Sidgwick Avenue, Cambridge, CB3 9DD, and CEPR (e-mail: gc422@cam.ac.uk); Simonelli: Department of Economics and Statistics, University of Naples Federico II, Via Cintia, 80126 Napoli, Italy, and CSEF (e-mail: saverio.simonelli@unina.it). We would like to thank our discussant, Ethan Ilzetzki, and Francesco Drago, Tullio Jappelli, Marco Pagano, Harald Uhlig, seminar participants at the Bank of Estonia, Science-Po, in the 2014 CIF-CFM-UCL-CSEF Conference on “Aggregate Fluctuations: Causes and Consequences,” CSEF-IGIER Symposium on Economics and Institutions (CISEI), the 2013 meeting of the European Economic Association, the European University Institute, and LUISS for useful comments and discussions. Jasmine Xiao provided superb research assistance. Corsetti gratefully acknowledges the support by the Keynes Fellowship in Cambridge, and the Centre For Macroeconomics.
1 Introduction

Households with a positive net wealth should be in a position to smooth consumption in the face of temporary income and expenditure shocks. Yet, recent theoretical and empirical literature emphasizes that their ability to do so depends on the liquidity of their portfolios—i.e. the overall costs of extracting fungible cash from their assets. By applying the methodology of Blundell et al. (2008) to data of the Panel Study of Income Dynamics, Kaplan et al. (2014) document that the consumption of “wealthy hand-to-mouth” households responds significantly to transitory income shocks. In the theoretical work after Kaplan and Violante (2014), “wealthy hand-to-mouth” are households with a large fraction of their wealth in illiquid assets (such as housing). Evidence consistent with the predictions of the theory is also provided, among others, by Misra and Surico (2014), who find a large propensity to consume out of the U.S. tax rebates among homeowners with high mortgage debt.1

In this paper, we contribute empirical micro-evidence to this literature by examining the impact of transfers that raise the liquidity of portfolios owned by the relatively wealthy, but not necessarily liquid, households. Using public transfer programs in the aftermath of three earthquakes in Italy as quasi-experiments, we analyze the consumption response of homeowners residing in a disaster area, who suffer damages to their housing units, and receive public money to finance repair and reconstruction work.

These case studies qualify as suitable quasi-experiments due to three features. The first is the randomness of the event that defines our treatment group. In the aftermath of an earthquake, homeowners both suffer from a random expenditure shock, due to the need of fixing damages to their housing, and benefit from the entitlement to reconstruction transfers. By the characteristics of the buildings in the regions in our sample—historical units not conforming to anti-seismic norms—luxury and ordinary housing are similarly vulnerable to earthquake-related shocks. Hence the amount of damage varies significantly within and across households with different levels of wealth and income. The second feature is that the transfers considered in our analysis are strictly targeted. They are paid exclusively to owner-occupiers, who are relatively wealthy. The amount is determined based on a technical assessment of the damages, and require homeowners to document the realization of the reconstruction work and its costs, thus households cannot reallocate funds at their discretion. However, in the short run households can rely on them to finance current consumption expenditure againsts lower consumption in the future. In this respect, the transfers in our analysis are akin to short-term loans. The third feature is that the size of the transfers is large relative to households’ current income.

We focus on three earthquakes: (i) the 1980 earthquake in the South of Italy, a strong seismic event hitting a large geographical area including the regions of Campania and Basilicata; (ii) the 2012 earthquake in the Emilia region, which was

---

1See Section 2 for a discussion of the recent contributions.
less damaging and more concentrated geographically; and (iii) the 2009 earthquake which destroyed the city of L’Aquila and significantly damaged the area around this city. The selection of our three case studies is essentially dictated by the availability of the Bank of Italy Survey of Households’ Income and Wealth (SHIW).

In the case of the 1980 earthquake in the South of Italy, the transfer program was initially restricted to the residents in Campania and a small area in Basilicata; it was extended with a delay to cover the whole earthquake area in the Basilicata region. Exploiting the institutional features of government intervention, we can thus study the consumption behaviour of homeowners with access to transfers in the earthquake area—our treatment group—against that of multiple control groups. Households are differentiated by (i) residence inside or outside the earthquake region, (ii) entitlement to transfers in the first or the second year after the disaster (which determines the timing of cash payments to homeowners). In the other two case studies, there was no delay in extending transfers to different groups of homeowners. Yet, in these two cases we can exploit accurate information about the households’ portfolio compositions (not available for the years of our first case study), so to refine our treatment and control groups depending on whether homeowners (with or without access to transfers) have a high/low liquid-wealth-to-income ratio and bank debt. Finally, the 2009 earthquake in Abruzzo differs from the other cases, in that homeowners were entitled to housing repair work by firms directly reimbursed by the government. Hence we can analyze whether household consumption responds to transfers when these are in kind rather than in cash. In conducting our econometric analysis, we follow the literature and focus on nondurable consumption as the main variable of interest. In the case of earthquake, this choice helps us to minimize the risk of confusing consumption/saving choices with expenditures on replacing essential household items damaged in the earthquake.

Our main results are as follows. Using the 1980 case study, we show that, relative to homeowners outside the earthquake region, the consumption of homeowners hit by the earthquake and eligible to reconstruction transfers remains on the same trend over the 1980–1984 period as a whole—consistent with the nature of the transfer targeted to finance work on housing units. However, it is significantly higher in the 1981–82 period, at the time when the programme was implemented and households gained access to funds. This initial peak is offset by a contraction in the following years. In our estimate, the impact marginal propensity to consume out of the transfers is around 22 percent. We are especially interested in verifying whether our results depend on the liquidity of households’ wealth. This information is only available for the years of the earthquakes in Emilia and Abruzzo. Thus, we compare liquid and illiquid owner-occupiers in the earthquake region, with control groups defined by owner-occupiers with similar attributes either in the neighboring Italian regions, or in the rest of the country. We obtain two complementary but distinct results. In our 2012 Emilia case study, where cash transfers are made to households, we find a significant rise in the nondurable consumption, but only for the illiquid homeowners, that is, homeowners with a relatively low liquidity-to-wealth ratio and with bank debt. Liquid homeowners in
the earthquake area behave like those in the rest of Italy. In our 2009 Abruzzo case study, where cash was paid out not to households, but directly to firms conducting reconstruction work, we detect no significant difference in the consumption of liquid and illiquid homeowners. Overall, this evidence suggests that the response of households to cash transfers is systematically different from the response to their in-kind equivalent, in the form of repairing services.

A key concern in our study is the possibility that the earthquakes may have direct or indirect effects on the consumption by resident homeowners which may confound with the effects of transfers. First, households may face the need to replace items destroyed or lost in the disaster, well in advance to their natural wear-and-tear process. Second, in line with the literature on the topic, the earthquake may actually raise incomes and employment prospects in the area, driven by the demand for goods and services connected with reconstruction activities. Using the specific features of our first case study, we can address this concern by relying on residents in the earthquake area as a control group. In particular, with the second exercise proposed we compare the consumption by owner-occupiers when they become eligible to transfers, with that by all the other residents in the earthquake area, who may be exposed to similar shocks and face a similar economic environment. The empirical evidence confirms and strengthens the result of a strong effects of transfers on the nondurable consumption of homeowners.

Our econometric exercises rely on microeconomic data drawn from the Bank of Italy Surveys of Household Income and Wealth (SHIW), providing detailed household-level information on disposable income, consumption, residential status, as well as employment status, education and age of the householder and the number of households components. In the years around the 1980 earthquake in the South of Italy, these Surveys mainly report repeated cross-sectional data; for the later earthquake episodes, they include a panel of households, as well as detailed information about households’ portfolios. For our institutional analysis, we rely on a variety of public sources, including official documents and newspaper articles.

The rest of the paper is organized as follows. Section 2 maps our study in the literature. Section 3 is devoted to our 1980 earthquake case study, discussing facts, institutional details, study design, econometric methodology and results, in turn. Following a similar scheme, Section 4 is devoted to the 2012 earthquake in Emilia and the 2009 earthquake in Abruzzo. Section 5 concludes.

2 Relation to the literature

The main goal of our study is to investigate whether transfers targeted to finance the costs of fixing the housing damages caused by the random occurrence of an earthquake can have an effect on consumption, arguably through their impact on the liquidity of the households’ wealth. Thus our study naturally relates to several strands of the empirical literature testing the role of liquidity constraints in consumption decisions.
To start with, we have already noted that the transfers in our study are akin to loans. Despite their preset destination, the cash made available up-front to households can be used to finance current consumption against future income and/or expenditure adjustment. From this perspective, our study can thus be brought to bear on the conclusions of empirical work assessing the consumption sensitivity to (variations in) credit availability, such as Gross and Souleles (2002). These authors document that the response to an increase in the supply of credit, i.e. a rise in credit card limits, is stronger for households close to their credit utilization rate limits. They interpret their result as evidence on the strong role played by liquidity constraints in consumer behavior.\footnote{Evidence on financing constraints at the household level is also documented by Jappelli and Pagano (1989), Jappelli (1990), and Jappelli et al. (1998a) among others.}

Significant heterogeneity by income and wealth is also found in studies analyzing the impact of variations in housing wealth on spending. According to Mian and Sufi (2014), for instance, an increase in housing prices has a strong impact on the consumption of low-income households, who aggressively borrow against housing equity to spend, but has virtually no effect on high-income households. Robust evidence on the consumption impact of changes in credit conditions is nonetheless difficult to produce, in light of the well-known issues in identifying supply and demand conditions separately: lenders may increase credit supply because they anticipate a strong credit demand; conversely, households may demand more credit in anticipation of large purchases.\footnote{To alleviate the endogeneity concerns, for instance, Gross and Souleles (2002) use detailed information about issuers’ credit supply policy.}

The fact that in our quasi-experiments the entitlement to transfers is driven by the random effects of a natural disaster arguably lessens endogeneity concerns.

Second, in our case studies, the transfers accrue exclusively to households of owner-occupiers, who on average are not poor, but are not necessarily liquid. A large share of owner-occupiers’ wealth is invested in their house, hence hardly accessible for consumption smoothing, especially in financially repressed economies like the Italian regions in the years included in our early case study. In addition, a significant share of owner-occupiers have a mortgage, requiring them to generate a steady cash flow to service their bank debt. From this perspective, our evidence can be brought to bear on the predictions of recent literature, especially after Kaplan et al. (2014), that transfers affect consumption by raising the liquidity of homeowners’ overall portfolios.

While in our work we focus on natural disasters at local level using Italian data, our results—that the consumption of illiquid households significantly rises in the year in which the transfers are paid out—resonate with the findings of many contributions focused on crisis periods using US data. Namely, studies of the U.S. fiscal stimulus payment episodes of 2001 and 2008 suggest that (i) overall, households spend a non negligible share of a cash transfer on nondurable goods, and (ii) there is significant heterogeneity in consumption responses due to differences in wealth liquidity and the degree of indebtedness of the homeowners. Regarding the 2001 episode (Johnson et al., 2006), the cumulative change in expenditures on nondurable goods during the quarter of the tax rebate and the subsequent
three-month period is estimated to be roughly 70 percent of the amount rebated. Between 20 and 40 percent of the rebate is spent in the quarter when funds are received. This strong consumption response is measured relative to the control group of households that do not receive the rebate in that same quarter. For the 2008 episode, Broda and Parker (2014), and Parker et al. (2013) conclude that a significant effect is detectable only in the quarter in which households receive their rebates. However, in that quarter the share of the stimulus payment spent on nondurable goods is large, in line with the estimates for the 2001 stimulus. Furthermore, there is also a significant increase in spending on durable goods. For both episodes of U.S. tax rebates, Misra and Surico (2014) conclude that households who own real estate and have a mortgage debt have the largest propensity to consume out of the tax rebate. In particular, half of the population does not respond to the rebates at all while 20% consume more than half of them, the response by the rest of the population being somewhere in between. Consistent with this evidence, Jappelli and Pistaferri (2014) find that the MPC out of rebate checks in Italy is 0.65 for the lowest cash-on-hand households, and 0.30 for the highest (Agarwal et al., 2007; Jappelli et al., 1998b; Johnson et al., 2006; Parker et al., 2013; Shapiro and Slemrod, 2009). Relating this literature to our work, however, we should stress a well-known difference in studies of national versus local transfer programs. The former raise a number of general-equilibrium issues in the transmission of fiscal policy—ranging from potential effects on market interest rates to the anticipation of higher taxation in the future—that are not as relevant in regional analyses. The earthquakes in our case studies had negligible effects on bond prices and policy rates at national level. The transfers accruing to the earthquake areas were not financed at all by local taxes.

Finally, our findings can be interpreted as a refinement of the conclusions from the earlier literature that, like ours, exploits natural disasters as quasi-experiments to study consumption behavior. Most notably, the work by (Sawada and Shimizu-tani, 2008) relies on retrospective surveys to analyze households’ consumption around the 1995 earthquake in Kobe, Japan. These authors conclude that consumption is not smoothed by households who ex post consider themselves to be credit-constrained at the time of the disaster. Our findings further suggests that consumption behavior in the disaster area may have been significantly different depending on liquidity indicators.

\footnote{Misra and Surico (2014) emphasizes that this heterogeneity is likely to be blurred in analyses that focus exclusively on income groups, because a large marginal propensity to consume tends to be found for both low and high income households. In their findings, the spending propensity of a sizable fraction of high income/high debt households is significantly larger than the spending propensity of low income/renting families.}
3 The consumption response to reconstruction transfers: the 1980 earthquake in the South of Italy

This section focuses on our first case study, the major earthquake that hit the South of Italy on November 23, 1980. The earthquake affected a large area comprising two regions, Campania and Basilicata, with a combined population of about 6 million inhabitants (approximately 11 percent of the Italian population). Its effects were devastating. About 350,000 houses either collapsed or were seriously damaged and a much larger number suffered less serious damages. Moreover, the earthquake caused 2,734 deaths and left 8,850 people seriously wounded (Commissione Parlamentare di Inchiesta, 1991).

3.1 Institutional setting and study design

In response to the 1980 earthquake, the bulk of government interventions consisted of a massive transfer program aimed at speeding up reconstruction. Based on the available official information (Commissione Parlamentare di Inchiesta, 1991), by the end of 1989 the Italian government had budgeted a total of 32 trillions liras to finance private reconstruction (40 trillions including funds targeted to finance public structures). In particular, between 1981 and 1984 (the period of our interest for the empirical investigation) the Italian government mobilized resources up to 8 trillions of current Italian liras, equivalent to about 28.5 percent of the 1981 GDP in the earthquake area. A sizeable part of these funds was targeted to rebuild private dwellings. Specifically, owner-occupiers of damaged housing units were entitled to receive a cash transfer towards expenditure needed to ‘restore habitability’.

The transfer program was restricted to owner-occupiers, and strictly targeted to finance repair and reconstruction work on the main household residence, covered up to 110 squared meters; work on any additional squared meters must be financed privately by the owners. Secondary and vacation residences only qualified for a small subsidy. The amount of funds was set according to technical estimates of the costs of repairing earthquake-related damages. These estimates were produced by technical employees of the municipalities, working in coordination with both local and central authorities, based on preset engineering and economic standards. Housing units included in the programmes were classified in three categories, ranked by the scale of the damage: (i) collapsed units, (ii) seriously damaged units, and (iii) mildly damaged units. In the case of houses in the first two categories, one fourth of the total transfer was provided up-front, at the time of the application for the transfer, and the rest upon providing documented expenditures and a technical report on the work done (Law 219/81). Importantly, with the official communication of the transfer, the households were open to a...
credit line at a local bank, which provided the initial sum. In the case of houses in the third category, owners obtained the entire transfer up-front.

It is worth emphasizing that the stock of housing in the earthquake area consisted of historical buildings not conforming to anti-seismic criteria: luxury and ordinary housing were similarly vulnerable to earthquake-related shocks. This observation motivates the maintained assumption underlying our empirical models, that the distribution of damages is random across homeowners with different wealth and liquidity levels, so that the public funds are not systematically related to these key characteristics of the households in our sample. In any case, our regression models include controls for the household disposable income and a variety of indicators such as the number of members of the household, the age, the level of education and the employment status of the householder. These indicators are included to absorb household-specific differences in consumption expenditure.

The 1991 report by the Commissione Parlamentare di Inchiesta emphasizes that, in the initial phase of the reconstruction period (1981-1984), public funds were allocated efficiently, with a strict adherence to the technical parameters in the assessment of costs. Collapsed houses were to be reconstructed in the exact location and with the same characteristics as the pre-existing units. Owners were required to finance on their own any improvement relative to the pre-existing conditions. There was limited freedom in contracting workers: the government provided a list of (usually local) firms the households could contact to carry out the repair work.

As already mentioned, despite the fact that the earthquake hit the Basilicata municipalities with an intensity and level of destruction comparable to Campania municipalities, the program was extended to the two areas in the earthquake regions at different times, mainly reflecting randomness in the political process. Virtually all municipalities in Campania were included in the program by mid 1981. Out of 549 municipalities in this region, 337 were included already by January, and another 205 by the end of May. In the Basilicata region, only municipalities right at the epicenter of the earthquake were included in the initial list. The law extending the transfer program to all Basilicata municipalities hit by the disaster was passed only later in the year, on November 13, 1981. As a result, accounting for the timing of administrative procedures, the payment of transfers in the two regions started in two different calendar years. The date of the earthquake (end of 1980) and the date of the program extension (end of 1981) allow us to use yearly data for 1980, 1981, and 1982 to distinguish the pre-earthquake year, and the early and late access to transfers.

A key concern in our study is the possibility that the earthquake has direct or indirect effects on homeowners’ consumption which may conflate with the effects

---

6 At the end of the 1980s, an extensive inquiry into corruption and criminal activities around the management of public funds for reconstruction was realized (Commissione Parlamentare di Inchiesta, 1991). The Commissione documents that, in general, illegal practices were very much contained in the first phase of reconstruction activities, that is before 1984, when most of the funds were targeted to individual households with very restrictive criteria. However, such practices were more prevalent in the second phase, when funds were targeted to public works.
of transfers. In particular, to the extent that an earthquake results in the destruction of goods, such as furniture and appliances, households may face the need to replace them much in advance to their natural wear-and-tear process. These material damages may thus translate into an exogenous earthquake-related shock, causing households in the earthquake area to raise their consumption expenditure irrespective of transfers. While this argument mainly applies to durable expenditures, it could possibly be extended to some nondurable items (e.g. clothing) as well.7

By the same token, consumption may respond to changes in incomes specifically driven by the earthquake. As is well understood, the sign of these changes is ambiguous. On the one hand, earthquakes typically result in a negative supply shock, due to the destruction of physical/infrastructure capital, correlated with firm exits or a drop in the level of production. On the other hand, new jobs and earning opportunities arise with the reconstruction activities and public transfers, generating a positive demand shock for goods and services produced in the earthquake area.8 Because of these contrasting forces, several studies find that earthquakes have a non-negative impact on average economic activity and growth (see Cavallo and Noy, 2009; Hochrainer, 2009; Noy, 2009). In line with this literature, we also find in our sample that the disposable incomes rise relative to the control group of adjacent regions in Italy for three years, and return to the historical trend only in 1984. To illustrate how this can raise potential issues for our estimation, suppose realistically that incomes rise in tandem with reconstruction activities, and that the bulk of these activities start in Basilicata with some delay compared to Campania (accidentally following the same timing of the transfer program). Then, a hike in consumption in Campania one year before that in Basilicata could be driven by variations in disposable incomes, rather than the disbursement of public transfers.

Because of the possibility of these confounding effects, in our study we carry out Difference-in-Differences analysis using two complementary specifications of the empirical model. First, we will compare the consumption of owner-occupiers in the earthquake area (eligible to transfers) with the consumption of owner-occupiers outside the area. Second, we will run a model exploiting the variability within the earthquake area. Namely, focusing on the residents in the earthquake area only,

---

7 Using our survey data, we can document evidence of an anomalous rise in durable consumption in the earthquake area, that can be interpreted as an indicator of an earthquake-related shock to expenditures on these goods. Namely, while information on total durable consumption is only available from 1980 on, we obtain a longer record using a subset of durable expenditures from the survey item “consumi reali,” which records purchases of furniture, works of art and the like. For this variable, we calculate the percentage of households that report a non-zero expenditure, averaged over the four years before and after the earthquake, that is 1977-80 and 1981-84. In the regions adjacent to the earthquake area, this percentage falls across the two periods, from 10.24 to 7.66 percent. Against this negative trend, in the earthquake area the percentage of households reporting a non-zero expenditure rises from 8.66 to 12.55 percent. Hence, relative to the control group, the earthquake area records a 50 percent increase. In our findings the rise is stronger for owner-occupiers than for tenants.

8 Work by Porcelli and Trezzi (2014) contrasts the negative supply effects of an earthquake with the positive multiplier effects of public work and tax cuts in the earthquake regions in Italy.
we will compare the consumption of owner-occupiers when they become eligible to transfers, with that of all the other residents who may be exposed to similar shocks and face a similar economic environment. In all our empirical exercises, we control for a number of household and householder characteristics. Interestingly, these controls turn out not to play any role in our conclusions.

3.2 Evidence on Homeowners’ consumption

The Bank of Italy Surveys do not collect household-level information on earthquake related damages or transfers. However, since the transfer program was targeted to owner-occupiers, and initially restricted to only part of the earthquake area, we can rely on the households’ residential status (owner-occupier) and residence/year (Campania 1981 and Basilicata 1982) to identify the households with access to reconstruction transfers.

For the years around 1980, the SHIWs provide repeated cross-sectional, household-level data for about 4,000 households, representatives of the Italian population. The households in the disaster area amount to about 10 percent of the national sample; of these, about 50 percent are owner-occupiers.

3.2.1 Non-durable consumption after the earthquake

We start with an investigation of the change over time in the consumption of owner-occupiers residing in the disaster area, relative to owner-occupiers residing outside it. As a control area, we can use either the rest of Italy or, to allow for a more homogeneous sample, the regions adjacent to the disaster area. Since our conclusion does not depend on this choice, to save space we only report results for the comprehensive control group.

Our empirical analysis exploits data relative to the first phase of the program, in the period 1981-84, and distinguishes two subsamples: the two years immediately after the earthquake (1981-82), when the households applied to and started to receive public transfers, and the following two years (1983-84), when households operated having already gained access to the reconstruction transfers. In particular, we adopt the following Difference-in-Differences regression model

\[ C_{i,t} = \alpha + \eta_t + \delta A_i + \mu QUAKE_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t} \]  

(1)

where \( C_{i,t} \) is either nondurable consumption expenditure or its log; \( QUAKE_{i,t} \) is an identifier of owner-occupiers residing in the disaster area over different periods, as detailed below; \( \eta_t \) is the time fixed effect, \( A_i \) is a dummy with value 1 for the disaster area and 0 otherwise, while \( X_{i,t} \) is the vector of controls including household disposable income, key characteristics of the householder, such as age, education, employment status, sector where she works, and an index of the size of the municipality where the households live.\(^9\)

\(^9\)Different from later surveys, the 1980-84 surveys do not report information on the composition of households portfolios, so we cannot exploit information on assets and debt to build indicators of wealth liquidity.
Based on the above model, we carry out three distinct exercises. The first exercise provides evidence on the change in consumption between 1980 and the whole post-earthquake adjustment period (\(QUAKE_{i,t}\) is 1 for the period 1981-84). In the second exercise, we compare consumption in 1980 relative to 1981-82, the two years when the transfer program was implemented and households gained access to the funds (\(QUAKE_{i,t}\) is 1 for period 1981-82). The last exercise compares owner-occupiers consumption in the years 1981-82 and 1983-84, the core phase of reconstruction (\(QUAKE_{i,t}\) is 1 for the period 1983-84 and we take 1981-82 as the base period). Through these exercises, we track the evolution of consumption responses to the transfers in different phases.

Results. Our estimation of (1) is shown in Table 1. In the table, we report results for our three exercises twice. In Panel A, the dependent variable is the level of consumption, while in Panel B is its logarithm. Results are consistent across the two specifications.

Our key finding is twofold. First, the average nondurable consumption for the entire post-earthquake period is not significantly different from 1980: the point estimate of the difference in consumption is very close to zero. The evidence is therefore consistent with the fact that the public transfers in our study are not a windfall. Households receive cash to finance repair and reconstruction work, which cannot be expected to have a strong consumption effect akin to income supplements. We should note that our first finding indeed addresses the potential concern that transfers were more generous than the actual cost borne by the households. During the 1980 earthquake, housing repair costs were estimated fully by employees of technical offices at municipality level. While these public officers were required to strictly apply technical criteria, and were expected to report to both local and central authorities, it might be possible that their estimates varied across households and locations—depending on the willingness of the technical employee of a municipality to circumvent checks and controls, and inflate estimates in favor of people with whom she/he had political and personal connections.\footnote{By contrast, in later earthquakes, such as the 2012 quake in Emilia, the cost were estimated by the Protezione Civile, the central government agency in charge of homeland security.}

Second, there are remarkable differences across subperiods: a strong expansion of consumption in 1981-82 is followed by a strong contraction in 1983-84. Compared to the pre-earthquake year 1980, nondurable consumption in the earthquake area rises significantly in 1981-82, when the transfer program was implemented and households gained access to funds—relative to consumption by households residing outside the earthquake area. Column 2 suggests that the difference amounts to about 9 percent. The initial increment in expenditure for nondurable consumption is followed by a pronounced contraction in 1983-84. This contraction is somewhat larger than the expansion in the previous two years, consistent with the result in column 1.

For comparison, we have also estimated equation (1) with the sample of tenants. For these households, we find no evidence at all of a strong consumption response
in the earthquake area during the 1981-82 period; if anything, we tend to find a contraction.\footnote{In principle, tenants’ consumption may reflect a possible worsening of the housing rental market. As the stock of housing is damaged by the earthquake, market forces may put pressures on rents. There are however reasons to believe that this factor was weak in our case study. First, in the emergency the government provided free or subsidized housing to the displaced households (and rents were suspended when the housing units were not usable); second, and more importantly, the Law (“Equo Canone”) regulated and capped rents in the 1980s.}

### 3.2.2 Controlling for the effects of the earthquake

In the analysis so far, we have compared owner-occupiers within and outside the earthquake area. As explained above, however, earthquakes may have economic effects that affect consumption independently of the transfer program. To control for these effects, in Table 2, we identify the response of consumption to transfers by comparing treatment and control groups selected from the sample of residents in the earthquake area, i.e. relying exclusively on households exposed to the earthquake shock. We restrict the sample to the period 1981-82.

In its general form, our empirical model can be written as follows:

\[
C_{i,t} = \alpha + \lambda_1 D_t + \lambda_2 D_r + \beta_1 HS_s + \beta_2 TR_{r,t} + \beta_3 (HS_s \cdot TR_{r,t}) + \gamma X_{i,t} + u_{i,t},
\]

where \(C_{i,t}\) is either nondurable consumption expenditure by household \(i\) in year \(t\) or its logarithm; \(HS_s\) (standing for ‘Housing Status’) is a dummy that equals one if the housing status \(s\) of the household is owner-occupier; \(TR_{r,t}\) (standing for ‘Transfer Region’) is a dummy indicating when the region \(r\) is included in the transfer program—it equals one for households whose region of residence in 1981 and 1982 was, respectively, Campania and Basilicata, and zero otherwise; \(D_r\) is a binary variable indicating the household region of residence (Campania or Basilicata) while \(D_t\) is a binary indicator that equals 0 in 1981 and 1 in 1982; \(X_{i,t}\) denotes a vector of further control variables for household disposable income as well as other household or householder characteristics, as defined above.

The binary variable \(D_r\) controls for time-invariant differences in consumption across the two regions. Most importantly, the variable \(D_t\) takes care of nationwide policies and cyclical factors, as well as changes in household expenditures which are side-effect of the earthquake unrelated to transfers.\footnote{Together with the anomalous rise in durable consumption, after the earthquake we also note a significant rise in the spread of households’ income in Campania and Basilicata. In particular, the variance of disposable income in the earthquake area is about three times higher in 1981 than in 1980. This result is statistically significant at standard confidence levels. No evidence of rising variability emerges when the same test is applied to the control area. Drawing on the argument by Dardanoni (1991), among others, we can interpret these changes in the variability of income as an indicator of a hike in income uncertainty.}

The main coefficient of interest is \(\beta_3\), attached to the interaction between the housing status and the region’s access to the transfer program, namely \(HS_s \cdot TR_{r,t}\). This coefficient measures how consumption differ across households in the earthquake area when they first gain access to the transfer programme, relative to other residents who are either not entitled to the program (tenants) or do not gain access to it in the

\(\)
In light of the fact that housing wealth is illiquid, and access to cash transfers is a compensation for prospective costs of repairing material damages, we naturally interpret $\beta_3$ as accounting for the liquidity effect of transfers on consumption.

**Results.** The main results from estimating equation (2) are shown in Table 2. In Panel A of this table, the dependent variable is the level of consumption; in Panel B (as a robustness check), it is the logarithm of consumption. In either Panel, the effect of transfers on homeowners’ consumption is estimated relative to the alternative control groups. In columns (1) through (3) of the table, the control group includes homeowners in Basilicata in 1981 (before receiving cash in 1982), homeowners in Campania in 1982 (the year after they gained access to the transfer), as well as tenants in the earthquake area in both 1981 and 1982. In column (4), we drop the tenants from the sample, and thus $HS_s$ and $TR_{r,t}$ from the regression model. Finally, the model specification of column (1) only includes the region and year dummies; that in column (2) includes the full set of controls but disposable income, which is then added in column (3). The specification in column (4) (without tenants) includes the full set of controls.

The empirical model essentially identifies the effect of transfers on spending by comparing consumption of homeowners in the years when they gain access to the transfer programme (the treatment group), with the consumption of households—including homeowners and tenants—that do not have access to the program during those years (the control group). Looking at the results in the first column: in the year homeowners gain access to the transfer cash, on average, they spend about 1 million of Italian Liras more than the control group on nondurable goods. The difference corresponds to 15 percentage points (see column 1, Panel B). Notably, our estimates are not sensitive to adding controls: they are very similar in magnitude in columns 2 and 3, where we run the complete specification, without and with the disposable income variable.

Since tenants were not eligible to receive reconstruction transfers in any year, we include them in our regression model as a way to control for potential confounding effects of the earthquake on consumption: tenants face a variety of earthquake-related shocks that are also also faced by homeowners, but do not receive cash transfers. In columns 2 and 3 of the Table, the variables $HS$ specifically allows the average consumption of recipients of reconstruction funds to differ from that

---

13 Observe that, if the variables $D_r$, $HS_s$, and $TR_{r,t}$ are dropped our empirical model becomes similar to the baseline specification adopted by Parker et al. (2013), when a dummy variable is used to represent the stimulus payment. If, instead, the group of tenants (and the variable $TR_{r,t}$ and $HS_s$) are dropped than our specification becomes similar to that in Broda and Parker (2014) and also considered by Parker et al. (2013). In this case, the coefficient $\beta_3$ would capture differences in consumption only among households that receive the transfers and the identification would only rely on the delay of including Basilicata in the transfer program.

14 We should stress that the relative rise in nondurable expenditure by homeowners is not associated with a reduction in durable expenditure. As said before, the latter is actually rising on average in the earthquake area, possibly reflecting an earthquake-related shock to expenditure, more so for homeowners than for tenants (see the Appendix for details).
Remarkably, the last column of the table suggests that our main conclusion does not hinge on this control. In fact, our estimated coefficient remains stable when we drop the tenants from the sample (and the variables HS and TR from the set of controls).

The estimated impact consumption response to transfers in this second model is consistent with the one obtained from our previous Difference-in-Differences model, for the two-year period 1981-82. A comparison of the two estimates suggest that the hike in consumption concentrated in the first year in which households gained access to the transfer.

3.2.3 Marginal propensity to consume

In our findings, while in the post-earthquake period nondurable consumption by owner-occupiers in the earthquake area follows the national trend, there is an economically and statistically significant short-run rise in the consumption response to the cash transfers. In this subsection, we translate this response in terms of the households’ propensity to consume, by drawing on the official documents recording the total and per capita magnitude of transfers in the earthquake area during the 1980s.

Unfortunately, there is no single consistent source providing a consolidated estimate of the transfers. We need to combine data on applications to funds with estimates of the costs of repairing and reconstruction activities by category of housing. Based on the available official documentation (Commissione Parlamentare di Inchiesta, 1991), the number of collapsed and strongly damaged housing units was 352,000 — a bit less than half the number of owner-occupiers residing in the disaster area. Owners of these units were entitled to receive, on average, a total transfer of 29 millions liras, and one fourth of this sum was paid up-front. Hence, we can estimate that overall, in the aftermath of the earthquake (1981-82) owner-occupiers received up to 2.5 trillion liras. To this amount, we need to add the funds provided to owners of housing units with mild damage (the third category of eligible housing units), amounting to about 1 trillion liras. This brings our estimate of the total transfers to eligible households in the period 1981-82 to 3.5 trillions liras. Based on the Italian census in 1981, the number of owner-occupiers residing in the earthquake area in 1981 was about 800,000. Dividing through, it follows an average of 4.5 million liras per household. The results from our empirical analysis suggest that, during the period 1981-82, the average expenditures on nondurables by owner-occupiers in the earthquake area rose by 1.2 million liras relative to the pre-earthquake year; about 80 percent of the increment occurred when households gained access to the transfer. It follows that the marginal propensity to consume out of transferred cash at the start of the transfer program is 22 percent. Relative to the total transfers accruing to the earthquake region between 1981 and 1989 the marginal propensity to consume in the two years after the earthquake lowers to 7 percent.

Reassuringly, we are able to obtain comparable estimates of the per household transfer using alternative sources, i.e. total disbursements from the Law 219/81
and the “Legge Stralcio.” According to the Law 219.81 (art. 3), over the three-year period between 1981 and 1983 the earthquake area was entitled to a total transfer sum of up to 5.7 trillions of 1981 liras. The “Legge Stralcio” instead mandated a total of 2 trillions for reconstruction and repairing work. Using these figures, the implied marginal propensity to consume at the start of the transfer is very similar to our estimate above.

4 The response of illiquid homeowners: evidence from earthquakes in Emilia and Abruzzo

In our first quasi-experiment, we find that owner-occupiers significantly respond to transfers that cover the costs of housing repair work—lending support to the idea that consumption rises in response to measures enhancing the liquidity of portfolios owned by relatively wealthy households. In this section, we investigate two further issues. The first is whether a higher average consumption by homeowners as a group conceals different responses within the group. We may expect that transfers had minimal impact on the consumption by unconstrained households with liquid wealth, but had very strong impact on the consumption by households with illiquid wealth. Only in recent years the SHIWs started to collect information on portfolio composition and liquidity that would allow us to refine our sample along these lines. Hence we use the 2012 earthquake in the Emilia region as a complementary quasi-experiment to address this issue. The second issue is whether the households’ consumption responds differently to cash transfers than the provision of the same services in kind. The earthquake that hit the area around L’Aquila in the Abruzzo region in 2009 can be used to shed light on the second one.

4.1 The 2012 earthquake in Emilia

Relative to our first quasi-experiment, the Emilia earthquake, while strong, was less destructive, and more concentrated geographically. Hitting an area that comprises 15 percent of the municipalities in the region, it resulted in 30,000 damaged houses and a relatively low number of fatalities (27 in total).\textsuperscript{15}

In response to the earthquake, the central government channeled 2.4 billions of euros to support housing repairing activities in 53 municipalities. Public interventions were initially regulated by the Law D.L. 74/2012. In this law, the Art. 3 (paragraph 1, letter a) funded grants for repairing housing damages, in favor of homeowners. Households were granted access to a tax credit against housing repair costs, associated with a public guarantee on bank loans (Law D.L. 95/2012). Specifically, Art. 3-bis entitled homeowners with a damaged housing unit to bank loans guaranteed by the State (hence issued at low interest rates). Against the

\textsuperscript{15}Unfortunately recent SHIWs no longer contain information that we can use to assess the response of durable expenditure.
cost of this loan, homeowners could claim a tax credit for the principal and in-
terest paid over the years. In practice, households borrowed from banks at a low
interest rate, and financed the cost of the loan by saving on taxes for a few years.
According to the press and our local sources, the program was implemented quite
swiftly, with limited or no delay in setting up the administrative procedure.

4.1.1 Study design and econometric model

Recent SHIWs include a much richer set of information on households, compared
to the SHIWs used in our first experiment. In particular, the recent surveys follow
a panel of households. Thus, we can also estimate a model in growth rates, so
to address the well-known concerns with regressions in levels. In addition, the
surveys include a wide range of questions on household portfolios. We can thus
refine the treatment group by distinguishing households according to indicators
of liquidity.

The earthquake in Emilia occurred in the first semester of 2012—which is a
survey year. Hence, we can study the consumption behavior of owner-occupiers
in Emilia just after the earthquake. Our empirical model consists of the following
Difference-in-Differences regression:

\[ C_i = \alpha + \beta_1 HS_i + \beta_2 EMILIA_i + \beta_3 (HS_i \cdot EMILIA_i) + \gamma X_i + u_i, \quad (3) \]

where \( C \) is the logarithm of the household nondurable consumption expenditure,
\( HS \) (standing for ‘Housing Status’) is a dummy equal to one if the housing status
of the household is owner-occupier, while \( EMILIA \) is a dummy equal to one for
residents in Emilia in the year of the earthquake. The vector \( X \) contains the
same controls used in our analysis of the 1980 earthquake (employment status of
the householder, disposable income and number of components of the household).
As in the previous section, the parameter of interest is \( \beta_3 \): a significant positive
estimate would indicate different consumption behavior for households receiving
a transfer after the earthquake.

The control area is defined as either the four regions adjacent to Emilia, namely,
Liguria, Toscana, Marche and Umbria, or the rest of Italy. In our baseline estima-
tion, we do not include the neighboring regions of Lombardia and Veneto in the
control, since some parts of these regions were also affected by the earthquake, if
only slightly. However, it turns out that results are qualitatively identical if we
extend the control area, by including all other Italian regions.

By exploiting the detailed information provided by recent waves of the SHIW,
we can distinguish households according to whether they are liquid or illiquid. In
particular, we build an index of wealth illiquidity, \( ILLIQUID \), that allows us to
identify the subgroup of wealthy-hand-to-mouth owner-occupiers in our sample.
Wealthy but illiquid households correspond to the group of owners of real estate
(house and land) who, before the earthquake (at the beginning of 2011), satisfy two
criteria: (i) they held liquid assets (the sum of cash and bank deposits) amounted
to less than 50 percent of their disposable income and (ii) they were in debt with
a bank, e.q. with a mortgage. This definition draws on recent contributions to the
literature on transfers. Specifically, the ratio of liquid wealth to income is in line
with the definition proposed by Kaplan et al. (2014) and the work by Misra and
Surico (2014), who—in revisiting the recent episodes of tax credit in US—show
that the consumption response to transfers is stronger by mortgagors. It is worth
stressing that, in our data, the subgroup of owner-occupiers virtually overlaps
with the subsample of households with positive wealth.

We test for the relevance of liquidity in different ways. First, we add the index
ILLIQUID interacted with HS-EMILIA, to the baseline specification (3). Second,
we split the sample according to this index and re-estimate our empirical model
for the two subsamples (after dropping HS and HS-EMILIA).16 Third, we exploit
the data panel to control for household characteristics (potentially correlated with
the region of residence), by taking the first difference of household consumption
with respect to 2010. In this case, we estimate the following specification twice,
for liquid or illiquid households, respectively:

\[
\Delta C_i = \alpha + \beta EMILIA_i + \rho Z_i + \varepsilon_i. \tag{4}
\]

where Z is the vector of controls, which now includes the growth rate of disposable
income among others.

4.1.2 Results

Results in level for the whole sample, including all tenants and owner-occupiers,
are shown in the first two columns of Table 3. According to column (1), after the
earthquake the nondurable consumption by all (liquid and illiquid) homeowners
in Emilia is not significantly different relative to homeowners in the control area.
However, this result conceals an important difference between groups. In the
specification in the second column of Table 3, we add to our baseline the index
ILLIQUID interacted with HS-EMILIA. The coefficient of this interaction term
is positive and significantly different from zero, indicating that the consumption
by the illiquid homeowner is about 15 percent higher in Emilia than in the control
area.

In the rest of the table, we restrict our analysis to homeowners only, splitting
this subsample according to ILLIQUID, which is the approach with more precise
estimates. Column (3) and (4) show that the consumption of homeowners in the
earthquake area is significantly different from that of the control group for only
the illiquid households, but not the liquid ones. The difference in consumption
across areas is economically and statistically significant: the consumption of illiq-
uid homeowners in Emilia is estimated to be 23 percent higher than that of the
illiquid homeowners in the control area.

We note here that if we include the liquid tenants to the specification in col-
umn (3), and run a Difference-in-Differences regression, the estimate of the key

16Note that according to our index of illiquidity two households are identified as illiquid ten-
ants. Hence, we drop them from the sample. Results are however unchanged if we treat those
households as liquid.
The coefficient is virtually the same as the estimate if we restrict the sample to homeowners. Moreover, the previous results are robust to extending the control area to the whole Italy (not reported in the table). In this case, consumption in the earthquake area differs from the control only for the illiquid households.  

The results from the model in growth rates, shown in Table 4, clarify that the differential response across groups of households is not due to a possible upward bias in the level specification. In fact, our estimates become stronger when we run the model in the growth-rate specification: the point estimate of the post-earthquake nondurable consumption by illiquid homeowners is 25 percent higher in the earthquake area relative to the control area. As in the previous exercises, we do not detect any statistically significant difference for the liquid households (whether or not tenants are included in the sample).  

These results are not affected by including lagged consumption growth. We do so in the model shown in the last two columns of Table 4. The coefficient estimates are virtually unchanged relative to the other columns, suggesting that our results are not driven by differential trends of the consumption of illiquid homeowners unrelated to the transfers. The change in consumption we detect is specific to the Emilia region after the earthquake.  

Overall our results lend support to the hypothesis that the wealthy hand-to-mouth households significantly increase their consumption in response to transfers—in line with Broda and Parker (2014) and Misra and Surico (2014)—while households with liquid wealth do not, in line with the permanent income theory (see, for instance, Souleles, 1999). In light of our results for Emilia, we should also note that the 15 percent estimate in our first case study could be considered as an average consumption response across liquid and illiquid households, a the strength of the coefficient reflects their relative weight in the sample.

### 4.2 The 2009 earthquake in Abruzzo

Our final question concerns whether the modalities of the transfers—whether in cash or in kind—makes a difference for households’ consumption. To shed light on this question, we consider the earthquake that hit the area around the city of L’Aquila in the Abruzzo region in 2009. For this case study, the earthquake area includes 57 out of the 305 municipalities in the region. The epicenter was close to the city of L’Aquila, which suffered the most pervasive damages. The earthquake caused serious damages to 10,000 buildings, and resulted in 309 fatalities. Also in this case, the government implemented a massive reconstruction program. Unlike the other earthquakes, however, the government paid directly the construction companies carrying out the work, rather than financing households.

---

17In this dimension, our study contributes to a small literature exploiting natural disasters as quasi-experiments. Most notably, earlier work by (Sawada and Shimizutani, 2008) studies households’ consumption around the 1995 earthquake in Kobe, Japan, based on retrospective surveys. These authors focus on the different behavior across households, depending on whether they were credit-constrained before the disaster.  
18The table reports evidence relative to liquid homeowners without tenants. The same conclusion applies if we estimate a Difference-in-Differences regression adding tenants.
For this case study, the available survey data are for 2008 and 2010, that is the year before and after that of the earthquake. When we estimate equation (4) replacing the dummy EMILIA with the dummy ABRUZZO, we find no evidence of a differential response by homeowners in the earthquake region, regardless of the liquidity of their wealth and bank debt (see Table 5). A natural interpretation is that wealth illiquidity is not correlated with higher consumption growth in response to a transfer, if such transfer is in kind instead of cash.

5 Conclusion

In this paper we have produced micro-evidence on the effects of transfers on the consumption of wealthy but illiquid households. We focus on transfers that finance the costs of damages from a random shock, and are targeted to homeowners only, who are on average not poor but may not be liquid. A significant share of the funds is made available to eligible households upfront. Hence, by the very nature of these transfers, their key effect consists of rising the liquidity of households’ portfolios.

The qualifying feature of our study is that such transfers are not a windfall. In our findings, they have no effect on consumption over a multi-year horizon. Yet, they have a statistically and economically significant effect on nondurable consumption on impact. Using the case studies for which we have detailed information about the composition of the households’ portfolios, we show that this result holds only for the subsample of illiquid households. Also, it is strictly driven by their access to cash—when households receive the in-kind equivalent of the cash transfers, we find no evidence of any consumption response.

The marginal propensity to consume out of the transfer is economically significant. For our first case study, we estimate the impact marginal propensity to consume to be 22 percent of the funds households receive in the first two years after the earthquake, and 7 percent of the total transfers accruing to the earthquake area over a decade. While lower than the estimates in the literature, these figures are remarkable. In our case studies, households appear to take advantage of cash on hand to raise consumption expenditure in spite of the fact that the funds are strictly targeted to compensate the cost of repairing housing damages.

19 This is not to say that transfers were ‘ineffective’ as regards to demand and economic activity, but their assessment would require a study of firms dynamics operating in the area, and spillovers outside the earthquake area.

References


Porcelli, Francesco and Riccardo Trezzi, “Shake me the Money!,” University of Cambridge, mimeo June 2014.


Table 1: Consumption after the 1980 Earthquake in the south of Italy

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Nondurable consumption (level)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUAKE</td>
<td>-64.13</td>
<td>600.35**</td>
<td>-1215.70***</td>
</tr>
<tr>
<td></td>
<td>(272.29)</td>
<td>(294.14)</td>
<td>(302.43)</td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Quake Area FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.50</td>
<td>0.46</td>
<td>0.49</td>
</tr>
<tr>
<td>Observations</td>
<td>11078</td>
<td>6079</td>
<td>9395</td>
</tr>
</tbody>
</table>

| **Panel B: Nondurable consumption (log)** |         |         |         |
| QUAKE            | 0.04    | 0.09**  | -0.11*** |
|                  | (0.03)  | (0.04)  | (0.03)  |
| Time FE          | Yes     | Yes     | Yes     |
| Quake Area FE    | Yes     | Yes     | Yes     |
| Controls         | Yes     | Yes     | Yes     |
| Adjusted $R^2$   | 0.56    | 0.50    | 0.53    |
| Observations     | 11078   | 6079    | 9395    |

Note: The table shows the results relative to the Difference-in-Differences regression models, comparing owner-occupiers that reside in the disaster area relative to those in the rest of Italy. The left-hand side variable is the non-durable consumption in panel A and its natural logarithm in panel B. In column 1 and 2 we compare, respectively, non-durable consumption over 1981-84 and 1981-82 with consumption in 1980. In column 3 we compare consumption over 1981-82 and 1983-84. All regressions contain a dummy identifying the earthquake area, year-specific dummies, and the full set of controls detailed in the text. QUAKE identifies, respectively, owner-occupiers in the earthquake area during 1981-84 (first specification), 1981-82 (second specification) or 1983-84 (third specification). Standard errors are robust and reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 
Table 2: Consumption and Liquidity-enhancing Transfers: the 1980 earthquake in south of Italy

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Nondurable consumption (level)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS*TR</td>
<td>1081.82***</td>
<td>1072.30**</td>
<td>1085.48**</td>
<td>1395.72***</td>
</tr>
<tr>
<td></td>
<td>(304.81)</td>
<td>(441.44)</td>
<td>(425.98)</td>
<td>(459.65)</td>
</tr>
<tr>
<td>TR (Transfer Region)</td>
<td>14.26</td>
<td>-233.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(415.66)</td>
<td>(392.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS (Housing Status)</td>
<td>161.84</td>
<td>100.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(371.78)</td>
<td>(364.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Region FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.17</td>
<td>0.45</td>
<td>0.48</td>
<td>0.54</td>
</tr>
<tr>
<td>Observations</td>
<td>672</td>
<td>672</td>
<td>672</td>
<td>288</td>
</tr>
</tbody>
</table>

|                | (1)        | (2)        | (3)        | (4)        |
| **Panel B: Nondurable consumption (log)** |            |            |            |            |
| HS*TR          | 0.15***    | 0.16***    | 0.17***    | 0.16***    |
|                | (0.05)     | (0.06)     | (0.06)     | (0.06)     |
| TR (Transfer Region) | -0.03      | -0.05      |            |            |
|                | (0.05)     | (0.05)     |            |            |
| HS (Housing Status) | 0.01       | 0.01       |            |            |
|                | (0.05)     | (0.05)     |            |            |
| Time FE        | Yes        | Yes        | Yes        | Yes        |
| Region FE      | Yes        | Yes        | Yes        | Yes        |
| Controls       | No         | Yes        | Yes        | Yes        |
| Adjusted $R^2$ | 0.15       | 0.48       | 0.50       | 0.52       |
| Observations   | 672        | 672        | 672        | 288        |

Note: The table shows the response of nondurable consumption by homeowners at the time of access to the transfer funds. The sample consists of households in Campania and Basilicata during 1981-82. The left-hand side variable is the nondurable consumption in panel A and its natural logarithm in panel B. The variable HS (standing for Housing Status) is a dummy that is equal to one if the housing status of the household is owner-occupier; TR (for Transfer Region) is a dummy that is equal to one in the year $t$ when the region of residence $r$ is included in the transfer programme. In the first column we only control with region and year dummies. In the second column we add controls for the number of household components, the number of household earners and their unexpected earnings, a full set of dummies for human capital and occupations of householders. In the third column we also add disposable income. In the last column we report results excluding tenants from the sample. Standard errors are robust and reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 
Table 3: Consumption and Liquidity-enhancing Transfers: the 2012 earthquake in Emilia, Level Specification

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS*EMILIA</td>
<td>0.06</td>
<td>0.03</td>
<td>0.05</td>
<td>0.23***</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.03)</td>
<td>(0.07)</td>
</tr>
<tr>
<td>HS<em>EMILIA</em>ILLIQUID</td>
<td>0.15**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMILIA</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>0.08*</td>
<td>0.08*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.50</td>
<td>0.50</td>
<td>0.46</td>
<td>0.53</td>
</tr>
<tr>
<td>Observations</td>
<td>1002</td>
<td>1002</td>
<td>634</td>
<td>164</td>
</tr>
</tbody>
</table>

Note: The table shows the response of nondurable consumption by homeowners in Emilia at the time of access to the transfer funds. The control area includes the regions of Liguria, Tuscany, Marche and Umbria, which are adjacent to Emilia. The left-hand side variable is the natural logarithm of non-durable consumption in 2012. EMILIA is a dummy identifying households in Emilia, HS is a dummy identifying owner-occupier householders, while ILLIQUID is a dummy identifying liquidity constrained householders. It equals one if, at the beginning of the year before the earthquake, the level of household’s liquid asset is lower than 50 percent of disposable income and the householder has a mortgage, and 0 otherwise. All equations include controls for the number of the household components and the level of disposable income, as well as for the age, human capital and occupation of householders. The first column reports our baseline specification. The specification in the second column adds the index of liquidity to the set of controls. In the last two columns we restrict our sample to homeowners and we split the sample according to whether homeowners are liquid (3) or illiquid (4). Standard errors are robust and reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 

24
### Table 4: Consumption Growth after Liquidity-Enhancing Transfers in Emilia

<table>
<thead>
<tr>
<th></th>
<th>Liquid</th>
<th>Illiquid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>EMILIA</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Lag ΔC</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.07</td>
<td>0.27</td>
</tr>
<tr>
<td>Observations</td>
<td>634</td>
<td>634</td>
</tr>
</tbody>
</table>

Note: The table shows results on comparing the growth rate of nondurable consumption by homeowners in the Emilia region with that by homeowners in the control area, including the regions of Liguria, Tuscany, Marche and Umbria. In the first two columns the sample is restricted to the liquid households, while in the last two the sample is restricted to the illiquid ones (the liquidity definition is reported in the text). The left-hand side variable is the bi-annual growth rate of non-durable consumption over the 2010-12 period. EMILIA is a dummy identifying households residing in Emilia. The set of controls includes the number of household’s components and the growth rate of the its disposable income, as well as the householder’s age, human capital and occupation. In the second and fourth columns we add the lag of consumption growth rate to the controls. Standard errors are robust and reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

### Table 5: Consumption Growth and in-kind Transfers: the 2009 Earthquake in Abruzzo

<table>
<thead>
<tr>
<th></th>
<th>Liquid</th>
<th>Illiquid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>ABRUZZO</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>Lag ΔC</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.10</td>
<td>0.23</td>
</tr>
<tr>
<td>Observations</td>
<td>703</td>
<td>703</td>
</tr>
</tbody>
</table>

Note: The table shows results from comparing the growth rate of nondurable consumption by homeowners in the Abruzzo region with that by homeowners in the control area. In the first two columns the sample is restricted to the liquid households, while in the last two the sample is restricted to the illiquid ones (the liquidity definition is reported in the text). The left-hand side variable is the bi-annual growth rate of non-durable consumption over the 2008-10 period. ABRUZZO is a dummy identifying households residing in Abruzzo. The set of controls includes the number of household’s components and the growth rate of the its disposable income, as well as the householder’s age, human capital and occupation. In the second and fourth columns we add the lag of consumption growth rate to the controls. Standard errors are robust and reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 

25