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CONSUMER SPENDING AND FISCAL CONSOLIDATION: EVIDENCE FROM A HOUSING TAX EXPERIMENT

Paolo Surico (London Business School)

Riccardo Trezzi (University of Cambridge)

A major change of the property tax system in 2011 generated significant variation in the amount of housing taxes paid by Italian households. Using new questions added to the Survey on Household Income and Wealth (SHIW), we exploit this variation to provide an unprecedented analysis of the effects of property taxes on consumer spending. A tax on the main dwelling leads to large expenditure cuts among households with mortgage debt and low liquid wealth but generates only small revenues for the government. In contrast, higher tax rates on other residential properties reduce private savings and yield large tax revenues.

CONSUMER SPENDING AND FISCAL CONSOLIDATION: EVIDENCE FROM A HOUSING TAX EXPERIMENT[☆]

Paolo Surico[a], Riccardo Trezzi[b]

[a] *London Business School, and CEPR, UK.*
[b] *Board of Governors, Federal Reserve System, in USA.*

Abstract

A sudden change of government in Italy at the end of 2011 prompted the legislation of a large fiscal consolidation plan. A major intervention of this plan was a temporary change (referred in the law as 'experiment') to the property tax system, generating significant variation in the amount of housing taxes paid across home-owners. Using new questions appositely added to the Survey on Household Income and Wealth (SHIW), we exploit this cross-sectional variation to provide an unprecedented analysis of the effects of a fiscal consolidation policy on consumer spending. A tax hike on the main dwelling leads to large expenditure cuts among mortgagors with low liquid wealth but generates only small revenues for the government. In contrast, higher tax rates on other residential properties reduce private savings and yield large tax revenues.

Keywords: fiscal consolidation, tax hike, housing taxes, marginal propensity to consume, mortgage debt.
JEL: classification E21, E62.

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"*Household debtors are frequently young families acquiring homes and furnishing before they earn incomes to pay for them outright; given the difficulty of borrowing against future wages, they are liquidity-constrained and have a high marginal propensity to consume*"

(James Tobin, 1980, 'Asset accumulation and economic activity', p. 10)

1. Introduction

What are the effects of fiscal consolidation on consumer spending? And what type of policy interventions are likely to distort less the behavior of different groups of households? More than six years have passed since the inception of the Euro crisis and still little academic or policy consensus has emerged to answer these important questions. A main reason for such an uncertainty seems to lay on the fact that while a large body of research has made notable progress to quantify the effects of tax rebates, little is known about the impact of tax hikes on consumer spending and about whether some groups of society may disproportionally bear the costs of any fiscal consolidation plan.

The present analysis fills this important gap in the literature exploiting the 2011 changes in the Italian property tax "Imposta Municipale Unica" ("IMU"). A newly appointed central government swiftly legislated and implemented a sizable fiscal consolidation plan whose main intervention temporarily re-designed the municipal system on housing taxes. The changes raised around 4.0bn Euros from taxes on the main dwelling and an additional 10.1bn Euros from taxes on other residential properties, for a total revenue increase of 0.90 percent of GDP. The IMU affected 25.8 million tax payers (or around 70 percent of households) with an average contribution per tax-paying household around 357 Euros on the main dwelling and about 905 Euros on other residential properties.

Using a new set of questions (on the amount of IMU paid) appositely added to the Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy, we identify the effects of housing taxes on consumer spending. We do so by comparing the difference in expenditure for IMU payers before and after the tax change to the difference in expenditure for non-IMU payers over the same period, employing a range of specifications that control for demographics, changes in house value, property characteristics, expectations

on future household income and expectations on future local house prices as well as regional fixed effects. In the most restrictive specifications, we look at home-owners only and therefore we focus exclusively on variation in the amount of property taxes paid.

Our identification strategy builds upon four features of the 2011 changes in the municipal system of housing taxation in Italy. First, the central government introduced a new tax on the main dwelling and increased by an exogenous factor the (by then obsolete) land registry estimates of the rental values used to calculate the tax base for the main dwelling and other residential properties. Second, the timing and depth of the legislated changes were largely unanticipated. Third, municipal authorities were allowed to unilaterally modify the rates proposed by the central government and, as shown in Section 2, the geographical variation in property tax rates appears unrelated to past local economic conditions or other local economic policies. Fourth, the IMU tax changes were announced by the government as an experiment (whose possible extension would have been subject to government revision) and most respondents in the 2012 wave of the SHIW did not expect the changes to persist longer than five years. Indeed, the housing tax on the main residential property was subsequently abolished in July 2015.

A household-level approach appears to offer two main advantages relative to a more macro strategy that relates changes in central government tax revenues to changes in aggregate consumption. First, macroeconomic interventions –like a change in housing taxes– are often the endogenous policy response to conditions in the aggregate economy, thereby posing a reverse causality problem when using data from national statistics. In contrast, the cross-household variation in property tax rates that we exploit for identification on micro data seems unlikely to be the policy response to specific circumstances at the individual household level, especially after controlling for demographics and property characteristics as we do here. On the other hand, aggregate circumstances or the effects of other economic policies may confound the evaluation of the impact of the 2011 property tax changes on household behavior. However, an extensive analysis in Section 3 reveals that the amount of IMU taxes paid is not systematically related to the household variables that were directly affected by other policy changes over the same period. A second advantage of using survey data is that they allow us to explore potentially interesting dimensions of heterogeneity across liquid holdings and household debt positions, so as to shed lights on the specific channel(s) of policy transmission.

The empirical analysis isolates five major empirical regularities. First, the marginal propensity to consume

(MPC) non-durable goods and services out of the IMU tax is around 0.05 whereas the MPC on durable goods is about 0.43. Second, these average effects mask pervasive heterogeneity across residential properties, with the taxes paid on the main dwelling associated with a large and significant MPC on durable goods and the taxes on other residential properties associated with a small and insignificant MPC on durable goods. In contrast, the MPCs on non-durable goods and services are statistically indistinguishable from zero, both across residential properties and across household groups. Third, the significant response to the main dwelling IMU tax is far more pronounced among home-owners with mortgage debt and with low liquid wealth-to-income ratio. Fourth, debtors concentrated their cuts on vehicles expenditure while non-debtors responded to the increase in housing taxes with a reduction of their savings. Fifth, the direct negative consequences of the changes in the IMU residential property taxes are estimated to be around 0.11 percent of GDP in 2012 vis-à-vis an increase in tax revenues of 0.90 percent of GDP (or 1.80 percent of government revenues). On the other hand, the direct impact of the housing taxes on the car industry in 2012 was large, making a contribution of about -5% (or approximately one fourth of the overall decline) relative to 2011.

Related literature. Our analysis makes contacts with five strands of empirical research. First, an important set of studies pioneered by Johnson et al. [24] and investigated further by Parker et al. [34], Agarwal and Qian [2] and Misra and Surico [30] look at household expenditure responses to fiscal stimuli, when (income) taxes are rebated. More specifically, Parker et al. [34] report on U.S. CEX data a significant MPC on durable goods of about 0.5 and an insignificant MPC on non-durable goods and services but find little evidence of heterogeneity across household characteristics. In contrast, the present analysis offers an unprecedented evaluation of fiscal consolidation, when (property) taxes are increased, revealing pervasive heterogeneity across household debt positions. Second, a growing literature exemplified by Ramey [36], Guajardo et al. [18], Ramey and Zubairy [37], and Alesina et al. [4] investigates the impact of fiscal expansions and consolidation plans, documenting that tax increases (cuts) tend to be more recessionary (expansionary) than public spending cuts (increases). With these papers, we share an emphasis on fiscal austerity but we employ a different identification strategy based on household survey data (rather than national statistics), which allows us to explore relevant sources of heterogeneity across groups of society. Third, a burgeoning line of theoretical research has emphasized the role that illiquid wealth (especially housing) could play in the transmission of macroeconomic policies. Selected examples include Eggertsson and Krugman [15], Kaplan and

Violante [25], Ragot [35], Mitman [31] and Andres et al. [5]. Our evidence provides support for the notion of debt-constrained households put forward by these theories. Fourth, a large number of contributions, including Campbell and Cocco [11], Attanasio et al. [6], Mian and Sufi [27], Mian et al. [29], Guiso et al. [19] and Paiella and Pistaferri [33] look at the statistical association between consumption and house prices. While these earlier studies exploit local variation in house prices, our evidence is based on perceived house price changes as self-reported by each household. Fifth, Jappelli and Pistaferri [23] find evidence of heterogeneous marginal propensities to consume using a newly added question in the 2010 SHIW about a hypothetical increase in household income. Their average effect is in line with our baseline estimates and the bi-modality of one and zero responses that they report is consistent with our findings of heterogeneity across the IMU taxes on the main dwelling and on other residential properties. Finally, we are not aware of other studies that look at the empirical association between property taxes and consumer spending at the household level using survey data.

Structure of the paper. Section 2 describes the institutional design and the cross-sectional variation that we exploit for identification. Section 3 presents the data and the empirical specifications before assessing the role of other confounding factors. The main results on the IMU tax paid on the main dwelling and on other residential properties as well as the heterogeneous responses across liquidity and debt positions are presented in Section 4, together with evidence on savings. Estimates for different spending categories as well as further results on age, income, uncertainty, house price expectations and on accounting for measurement errors are the focus of Section 5. Here, we also present independent evidence from official statistics on car registrations about the significantly negative association between a higher rate of housing taxes and a lower number of vehicle purchases across municipalities. We conclude in Section 6 with some back of the envelope calculations that quantify the direct impact of the IMU tax changes on the Italian economy in 2012.

2. Institutional design and geographical variation

In this section, we first outline a brief history of housing taxation in Italy. We then describe the specific context in which the property tax changes were introduced in December 2011 and finally we describe the variation in the IMU rates that we exploit in the econometric analysis.

2.1. A brief history of municipal property taxes in Italy

The "Municipal Tax on Properties" ("Imposta Comunale sugli Immobili", aka "ICI") was introduced in the Italian legislation by the law by decree number 333 on July 11^{th}, 1992 and subsequently transformed into law on December 30^{th}, 1992.[1] The ICI tax base included three main categories: buildings, building plots, and farmlands.[2] Our analysis on household expenditure will focus on the "buildings" category. Under the ICI system, the tax base for "buildings" was the land registry value defined as an estimate of what the rental value of the property would have been in 1988-1989, which was used as a base biennium. This (rough) estimate, which was self-reported to the municipal registry by the buyer at the time of purchase, was based on the location and building type but did not account for other important dimensions such as the type of construction, the age of the building and more generally for the conditions of the property. Not surprisingly, the system became obsolete soon after its introduction but was left essentially unchanged in the following two decades against the backdrop of steadily growing house prices. In Figure A.1 of Appendix A, we show that the ratio of the estimated land registry values to the actual market values at the end of the ICI system averaged around 3.6 (see Bocci et al. [8] and IMF [21] for similar evidence). The property tax rates were set independently by the municipal governments within the range of 0.4-0.7 percent, according to local preferences.

The ICI remained substantially unchanged until the end of 2007, when the government led by Prime Minister Romano Prodi approved an increase of the basic deduction of 0.133 percent.[3] The policy change applied only to taxes on the main dwelling with a cap of 200 Euros. Finally, on 27^{th} March 2008, the subsequent government led by Prime Minister Silvio Berlusconi abolished the ICI tax on the main dwellings

[1] Respectively: "decreto legislativo 11 luglio 1992, n.333" and "decreto legislativo 30 dicembre 1992, n. 504".

[2] The ICI (then IMU) was a yearly tax on housing wealth as measured by the land registry rental value of the property (based on its main characteristics of location and size). As such, it is conceptually (and administratively) very different either from a transaction tax on the sale price such as the British stamp duty or from a yearly tax on housing services (based on property characteristics) such as the British council tax. More specifically, and despite similarities in the way the tax base is imputed, a main difference between the Italian IMU and the British council tax is that the former is a progressive tax charged to the home-owner whereas the latter is a regressive tax charged to the occupier (independently of its housing tenure status). On the other hand, the Italian IMU appears conceptually closer to the American (local) property tax which is paid yearly by the owner on the basis of a periodically re-assessed property value and the tax rates set by jurisdictions below the state level.

[3] The law was officially passed on December 24^{th} ("Legge 24 Dicembre, 2007 n. 244") and published on the "Gazzetta Ufficiale" on December 28^{th} ("Gazzetta Ufficiale 28 Dicembre 2007").

(excluding three building categories corresponding to "luxury houses" (category "A1"), "villas" (category "A8") and "castles" (category "A9")) with the law by decree number 93/2008 while the ICI tax on other properties remained unchanged.

2.2. The "IMU" tax

On 4^{th} December 2011, a newly appointed Italian government led by Prime Minister Mario Monti announced a fiscal consolidation plan which was meant to "ensure fiscal stability, growth and equity". The plan was passed into law with immediate effect on 22^{nd} December 2011.[4] Among the most sizable interventions, the government reformed the property tax system, abolished ICI, introduced a single municipal property tax under the heading of "Imposta Municipale Unica" ("IMU"), and presented the policy change to the public as an "experiment". According to the official technical notes accompanying the law, the introduction of the IMU accounted for three quarters of the increase in taxation associated with the 2011 consolidation plan. The swift implementation of Monti's government IMU reform (in less than two months since the resignation of former Prime Minister Silvio Berlusconi), together with the frequency of the SHIW (conducted in 2010 and 2012), makes these property tax changes most likely unanticipated by households (especially back in 2010). Finally, in line with the government announcement back in 2011, the IMU tax on the main dwellings (subsequently extended to housing services under the new heading of "TASI") was abolished in July 2015 by the government led by Prime Minister Matteo Renzi.

The introduction of the IMU tax significantly reformed the property tax regime along three dimensions. First, it included the land registry value of the main dwelling in the tax base, previously excluded. Second, the land registry values (for both main dwellings and other properties) were scaled up by an exogenous factor (homogeneous across all municipalities and equal to 1.6 for residential dwellings), so as to increase the tax base by an average of 49 percent (see IMF [21]). Finally, the IMU system set the basic tax rate on primary (other) residences at 0.4 (0.76) percent of the registry value but allowed municipalities to modify this rate within a 0.2 (0.3) percent band. Furthermore, the government set the basic deduction at 200 Euros plus an additional 50 Euro deduction per children less than 26 years old (up to a maximum of an additional 400

[4] Law 22 December 2011, n. 24 (published on the "Gazzetta Ufficiale" on December 27^{th} 2011, n. 300).

Euros): while municipalities were allowed to modify this, around 98 percent of local governments chose the basic deduction of 200 Euros.[5] Overall, the IMU system determined a sharp increase in residential property taxation: the revenues on the main properties increased from nothing in 2011 to 4.0bn Euros in 2012 while those on other properties increased from 7.8bn in 2011 to 17.9bn in 2012. Between 2011 and 2012, total tax revenues on residential properties increased by 14.1bn Euros corresponding to around 0.90 percent of Gross Domestic Product (GDP) in 2012.[6]

Our analysis exploits the fact that in the 2012 Italian Survey on Household Income and Wealth (SHIW), respondents were appositely asked for the first time to report the amount of recurrent housing taxes paid on both the main dwelling and other residential properties. In Figure 1, we plot the distribution of self-reported IMU payments per household from the SHIW, distinguishing between the amount of housing taxes paid on the main dwelling (in the first row) and the amount of taxes paid on other residential properties (in the second row). The first column displays the distribution of the absolute amount of euros paid whereas the second column reports this as a share of the household monthly income. Because of the deductions, 21.6 percent of home-owners did not pay the IMU tax on the main dwelling and 13.2 percent of home-owners with more than one property did not pay the IMU tax on other residential properties. The IMU affected 25.8 millions of tax payers (or around 70 percent of households). The average payment on the main dwelling was about 357 Euros (or 14 percent of a household monthly income) while the average payment on all residential properties was 905 Euros (or 36 percent of a household monthly income). It is worth noting that, as shown by Norregaard [32], it is very hard to evade property taxes in a high-income country like Italy. Finally, about 30 percent of SHIW respondents reported a zero probability that the IMU tax would have been eliminated within five years and not replaced by another similar tax.[7]

[5]Source: "IFEL" ("Institute for Local Economics and Finance" - "Istituto per la Finanza e l'Economia Locale") database (accessible at: www.webifel.it/ICI/AliquoteIMU.cfm).

[6]The direct benefits for the fiscal position of the central government (in the form of either higher direct revenues or lower transfers to the municipal governments) totaled to about two thirds of the overall increase in the property taxes raised. To the extent that most municipal governments used the changes in IMU revenues to reduce their deficits (as shown below), the consolidated balance sheet of the central government –which includes the net fiscal positions of all levels of governments– improved in 2012 by an amount close to the overall IMU revenue increase of around 0.90 percent of GDP. To give a sense for the magnitude of this intervention, we have calculated that a 1 percent increase in VAT could possibly generate a maximum increase in tax revenues of about 0.25 percent of GDP, under the assumption of no change in aggregate demand.

[7]Because of an ambiguity in the wording of the SHIW question D37, however, this share is likely to over-estimate significantly the proportion of households who regarded the tax change as permanent. The reason is that even respondents who either expected a significant reduction in at least one of the two property rates (as several political parties indicated during 2012) or expected

2.3. IMU rate variation and local business cycle

The variation in the amount of IMU tax paid across households stems from three main features of the law: demographics (and in particular the number of children eligible for deduction), property characteristics (including surface and building type, which determine the land registry rental value) and local tax rates (given that municipalities were allowed to vary the rates set by the government). In the SHIW, we observe demographics and property characteristics but –to preserve anonymity– we are only provided with the region (rather than the municipality) where a household lives in. This implies that controlling for demographics and property characteristics in a projection of household expenditure change on the income change stemming from the IMU taxes disbursement is likely to isolate variation in the amount of property taxes paid due either to geographical variation in the municipal tax rates or to unobserved characteristics that are not absorbed by our rich set of covariates. In 2012, 35.2% (57.3%) of municipalities chose to modify the tax rate on the main dwelling (other residential properties) set by the national government, with the vast majority opting for higher rates. In Figures B.1 and B.2 of Appendix B, we construct heat maps that illustrates the municipal variation in property tax rates on the main dwelling and other residential properties across the national territory.

To interpret the coefficient on IMU paid as the causal effect of the tax change on private expenditure, we need to verify that the geographical variation in the tax rates was not the municipal government response to past local economic conditions. The concern is that property tax rates may have been consistently higher in municipalities with a higher concentration of households with certain (financial and economic) characteristics. To assess this hypothesis, Table B.1 in Appendix B reports the correlation between the municipal IMU tax rates of 2012 and a number of indicator of local economic performance in 2010 and 2011, ranging from personal and business income to night light density.[8] The main take away from this table is that there

a longer time horizon for the elimination of the IMU could have possibly responded "zero" to the specific question "*In your opinion, which is the probability that the Municipal Property Tax (IMU) will be abolished within the next 5 years and not replaced by another similar tax?*" (question D37 of the 2012 SHIW survey).

[8]Data are collected by the US Air Force Weather Agency and distributed by the National Geophysical Data Center (accessible at: http://ngdc.noaa.gov/eog/dmsp/downloadV4composites.html). Technically, the nighttime lights is derived from the average visible band digital number (DN) of cloud-free light detections multiplied by the percent frequency of light detection. The inclusion of the percent frequency of detection term normalizes the resulting digital values for variations in the persistence of

is little evidence of a systematic relation between the IMU tax rates and local economic conditions in the preceding years.

This latter result is echoed by Figure B.3 of Appendix B, which records the correlations between the share of votes to the left-wing coalition in the municipal elections immediately before the property tax reform and (i) the IMU tax rates on the main dwelling (top left panel), (ii) the IMU tax rates on other properties (top right panel), (iii) night light density (bottom left panel) and (iv) business income growth (bottom right panel). While, on the one hand, the top row reveals a significant relation between the tax rates and political orientation, the findings in the bottom panels suggest that, on the other hand, political orientation is not systematically linked to local economic performance. This chimes with the evidence in Alesina and Paradisi [3] who show that the IMU tax rates tend to be systematically lower during local election years, which turn out to be randomly distributed across Italian municipalities.

2.4. Other local economic policies

To isolate the effects of property taxes (as opposed to the effects of other local economic policies), it seems important to establish how municipal governments have employed the extra resources made available by the IMU tax. We do so in this section by focussing on changes (between 2011 and 2012) in the local authorities balance sheets, whose descriptive statistics are reported in Table C.1 of Appendix C. More specifically, we project the change in (i) municipal government expenditure, (ii) other municipal tax revenues (net of IMU revenues), (iii) municipal property tax revenues and (iv) local fiscal deficit on the municipal IMU tax rates using official data from the Ministry of the Interior. To control for the size of each municipality, the dependent variables are standardized by the number of inhabitants. We run these specifications either over the full sample of Italian municipalities or only for those with more than 2000 inhabitants to ameliorate possible concerns on the quality of balance sheets in smaller cities.

The evidence from Table 1 suggests that there is no significant association between IMU rates and changes in either municipal public spending (in column 1) or other municipal tax revenues (in column 2). Also, there

lighting. The Arc-GIS software used to elaborate the raster automatically calculates the average density of all pixels within a municipal territory on a continuous scale between 0 ("low density" - dark) to 62 ("high density").

is no statistical association (not shown in Table 1) between IMU rates and other local government revenues (grants and dismissals). On the other hand, the estimates in column 3 suggest that increasing the IMU rate on the main dwelling by 0.1 percentage points tend to bring IMU tax revenues up by 8.7 Euros per capita (9.3 Euros per capita when restricting the sample to municipalities above 2,000 inhabitants). At the same time, an increase of 0.1 percentage points in the IMU rate on the other dwellings generates an average rise in IMU tax revenues of 22.4 Euros per capita, consistent with the fact that IMU revenues on other residential properties are about three times larger than IMU revenues on the main dwelling at the national level. Finally, these extra property tax revenues seem to translate fully into a reduction of the "municipal fiscal deficit" (in column 4), which is the fiscal target as defined by the central government in the "Internal Stability Pact".[9] It is worth mentioning that the law requires to calculate the municipal fiscal deficit on a "mixed accrual-cash basis", with current expenditure and revenues evaluated on an accrual basis and capital expenditure and revenues evaluated on a cash basis. For this reason (and because total revenues also include grants and dismissals), the first three columns of Table 1 do not sum up to the last column.

Our findings are consistent with the evidence reported by Grembi et al. [17], who show that following a less stringent constraint on municipal fiscal deficits in Italy, local governments responded mainly by cutting real estate taxes and marginal income tax rates. Independent evidence on the lack of correlation between property taxes and other local taxes is provided in Figure C.1 of Appendix C, which scatter plots the IMU rates against the rates on the municipal component of income taxes ("IRPEF"). In summary, the geographical variation in IMU rates across municipalities does not seem to be associated with the cross-sectional variation in other municipal government economic policies.

3. Data and empirical framework

In this section, we present the household survey data and outline the empirical specification that we use to link the income change induced by the IMU taxes paid to the expenditure change. As discussed in the previ-

[9] By the budget law n. 488 in 1998, amended by the law n. 200 of 13 december 2010, the "Internal Stability Pact" assigns Italian municipalities with fiscal targets that ensure the country as a whole meet the fiscal targets imposed by the European Union. For 2011 (2012), the fiscal balance was imposed to be at least equal to the fixed amount of 14 percent (16 percent) of the "historical" expenditure, which is the average of 2006-2008 current expenditure.

ous section, we use a rich set of demographics and property-specific covariates to isolate exogenous variation across households at a similar stage of their life-cycle, owing properties with similar value and characteristics but living in (unobserved) municipalities with different tax rates. Finally, we discuss and evaluate the role of possible confounding factors, including other macroeconomic interventions, as well as run a placebo test over two waves of the SHIW that witnessed no changes in municipal property taxes.

3.1. The household survey data

Our dataset is based on the 'Survey on Households Income and Wealth' (SHIW) conducted by the Bank of Italy. The survey is run every two years and covers around 8,000 households distributed over about 3,000 Italian municipalities. The data are available in anonymous form. Each survey is conducted at the end of the respective year during the last few weeks of December. On average, about half of the households that appear in one survey overlap in the following wave. Given that sampling design involves unequal stratum sampling fractions, the use of household sampling weights is necessary to obtain unbiased estimates of the corresponding aggregates.

In our econometric analysis, we rely on two consecutive surveys (2010 and 2012), although in some of the analyses we consider all waves from 2002 to 2012. The 2010 survey covers 19,836 individuals grouped in 7,951 households while the 2012 survey covers 20,022 individuals grouped in 8,151 households. We use household level data and keep households who were surveyed both in 2010 and 2012 (about 56 percent of the 2012 survey). Then, we drop observations with missing values in some relevant variables (typically the market value or the surface of the main dwelling). Finally, to reduce the impact of compiling errors and outliers, we drop observations in the 0.5 percent tails of the distribution of total expenditure changes, leaving us with a sample of 4,002 observations.

We report the descriptive statistics of our working dataset in Table 2, highlighting mean, median, 25^{th} and 75^{th} percentiles of the distribution of the variables of interest for the full regression sample (first three columns), home-owners only (middle panel) and mortgagors (last three columns). To correct for the under-reporting of financial assets (see D'Aurizio et al. [13]), we rescale this variable by the ratio between the value of financial assets for the whole economy calculated by the Bank of Italy on data from the national statistical

agency (ISTAT) and its SHIW counterpart obtained by summing up the value of financial assets for all households in the survey using sampling weights. Home-owners are around 71.5 percent (27.9 percent by inheritance) of our regression sample whereas the share of mortgagors is 13.7 percent of the home-owners.[10] As shown in Figure D.1 of the Appendix D, these shares display a remarkable stability over time and while the fraction of households owning only one residential property has somewhat decreased between 2010 and 2012, we note that the start of this decline dates back to 2006.

The net wealth of Italian households is among the highest in the world but it has a defining peculiarity: around 65 percent is represented by real assets. The median net wealth is around 270 thousand Euros (348 thousand Euros among all home-owners and 289 thousand Euros among mortgagors) corresponding to a lower debt-to-income ratio than in other advanced economies.[11] Relative to the full regression sample, which also include renters, home-owners tend to have a higher level of both net liquid and illiquid wealth. Relative to all home-owners, mortgagors tend to have a younger head, higher income, more volatile expenditure, lower net liquid wealth and real estates with a higher value.

3.2. Empirical specifications

The goal of our analysis is to relate variation in income stemming from cross-household variation in the IMU taxes to variation in household expenditure. As there was no tax on the main residential property in 2010 (and only a small tax amount was typically paid on other residential properties because of the obsolete land registry rental value then), we begin by looking at the effect of the tax paid on the main dwelling in 2012 on the household expenditure change between 2010 and 2012. Then, we turn our attention to the richer specification that also includes as a regressor the IMU paid on other residential properties in 2012.[12] To ensure our empirical strategy isolates variation in the amount of taxes paid that is unrelated to household

[10] The share of inherited dwelling is 29.5 percent for the main dwellings and 53.7 percent for other residential properties (as estimated using the variable "poss3" in the database "immp2012.dta"). All these figures (including the 13.7 percent share of mortgagors) refer to the unweighted averages of the regression sample.

[11] In 2010 the median net wealth of Italian households was well above the Euro area average and almost the double then the median in Germany - see IMF [22]. Also, the proportion of households with debt in Italy was less than half with respect to Spain, Germany, and France (see IMF [22], page 5). The full International Monetary Fund (IMF) report is available at: http://www.imf.org/external/pubs/ft/scr/2013/cr13348.pdf.

[12] Unfortunately, the question on the amount of taxes paid on other residential properties was not asked in the 2010 SHIW.

and property characteristics, a rich set of controls is featured in the following specification:

$$\triangle C_i = \alpha + \gamma \cdot IMUmain_i + \delta \cdot \triangle HP_i + \boldsymbol{\theta}\mathbf{X}_i + \varepsilon_i, \tag{1}$$

where $\triangle C_i$ indicates the change in expenditure (on either non-durable goods and services or durable goods) of household i between 2010 and 2012 ($\triangle C_i = C_{i,2012} - C_{i,2010}$), $IMUmain_i$ is the amount of IMU tax paid on the main dwelling in 2012, $\triangle HP_i$ is the self-reported change in house price ($\triangle HP_i = HP_{i,2012} - HP_{i,2010}$), $\mathbf{X}_i$ contains a set of controls and ε_i is an idiosyncratic shock.[13] As covariates in matrix $\mathbf{X}_i$, we add four sets of variables: (i) households demographics, including age and educational attainment of the household head, family size, number of children and their square values, two dummies that takes value of one for home-owners and mortgagors respectively, (ii) regional dummies, (iii) property characteristics including type of building, surface, number of owned properties and dummies for the type of neighborhood (city center, suburbs, etc..) and (iv) a set of dummy variables capturing expectations about future income and about future local house prices (see Appendix E for a detail description).

As we control for both demographics and property characteristics, which influence either directly (through the deductions) or indirectly (through the land registry rental value) the household-specific amount of municipal property tax paid, the coefficient γ on IMU is likely to capture the variation in household consumption due to the municipal variation in the IMU tax rates. As the latter appears unrelated both to other local economic policies and to past local economic conditions (as discussed in the previous section), equation (1) can be estimated using OLS and the coefficient γ can be interpreted as the causal effect of the IMU property tax on consumer spending. The coefficient δ captures the household-level association between changes in expenditure and changes in the subjective house value. Finally, our empirical strategy relies on the absence of dissimilar pre-treatment trends in expenditure (between IMU payers and non-IMU payers) which may account for the post-treatment differences across the two groups. In Section 5.1, we present evidence consistent with this hypothesis.

In the richer specification, we also consider the $IMUother_i$ paid on other residential properties:

[13] Because the IMU tax paid in 2010 was zero, equation (1) is specified in differences rather than log-differences.

$$\triangle C_i = \alpha + \gamma_1 \cdot IMUmain_i + \gamma_2 \cdot IMUother_i + \delta \cdot \triangle HP_i + \boldsymbol{\theta}\mathbf{X}_i + \varepsilon_i, \tag{2}$$

where the coefficients of interest are now γ_1 and γ_2, representing the impact of the IMU tax on the main dwelling and the IMU tax on other residential properties.

Equations (1) and (2) are estimated either over the full sample or for home-owners only, exploiting in the latter case exclusively variation in the amount of property taxes paid. To shed lights on the characteristics driving any possible heterogeneous response, in Section 5 we will split our sample into households with low and with high net liquid wealth to income ratios respectively and then into households with and without (mortgage) debt. The expenditure changes from these sample splits are then compared in Section 5 to the findings from more traditional groupings based on age and income as well as to sub-samples of households reporting different levels of uncertainty about their future income. In that Section, we also focus on the different categories of durable expenditure in an effort to evaluate whether the significant responses identified in Section 4 are concentrated in any particular sub-component.

3.3. Other confounding factors

As shown in Section 2, the IMU tax hikes appear related neither to other local economic policies nor to past local economic conditions. Still, the availability of households survey data only in 2010 and 2012 poses the challenge that other macroeconomic developments may confound the inference one can draw about the effect of the property taxes on consumer spending. In this section, we take this challenge at face value and we ask whether the IMU tax changes were correlated with any other significant macroeconomic change that may have occurred over these two years. Accordingly, we use specifications which are all like (1) and (2) but the dependent variable which in turn becomes: the amount of taxes paid on other non-IMU austerity macro interventions, changes in households transfers from the central government (including pensions), changes in house value, changes in the taxes paid on "super-cars" and changes in the expenditure for those non-durable goods and services whose VAT increased between 2010 and 2012.

The dependent variable in the first column of Table 3 is calculated as the sum of the increase in taxation on electricity bills, the increase in taxation on cooking gas, the increase in taxation on motor fuel, and the

increase of the regional marginal tax rate on personal income. This is meant to capture the host of other austerity interventions that were passed together with the IMU tax changes. The columns on transfers and house value assess whether the change in municipal property taxation was associated, amplified or perhaps offset by other changes in the government budget, the household balance sheet or the tax base. This seems particularly important in the light of the Fornero reform of the Italian pension system, which was also part of the fiscal consolidation plan passed into law by Prime Minister Mario Monti's government in December 2011. Given the very significant fall in vehicles expenditure associated with the property tax changes (reported in Section 5), in the fourth column we evaluate the relation between the amount of property taxes paid by each households and the taxes paid on supercars (defined as cars above 185 kW), whose tax rate was also changed in 2011.[14] An additional confounding factor occurred in September 2011 when the government led by Prime Minister Silvio Berlusconi passed an increase in the Value Added Tax (VAT) rate from 20 to 21 percent. Accordingly, the last column of Table 3 reports the consumption response of those non-durable goods and services that were subject to the VAT rate change.

Reassuringly, in each of the two panels and samples, there is little evidence that the amount of IMU taxes paid by each household was systematically related to any of the macro policy and economic changes summarized in Table 3. Furthermore, the Fornero reform on pensions affected younger generations evenly across housing tenure groups and we will show in Section 5.3 (left panel of Table J.2) that young households who paid the IMU taxes contracted their durable expenditure by a significantly larger amount than young households who did not pay the IMU taxes. Finally, the VAT rate changed both on vehicles and on all other (non-vehicle) durable goods: but, as we will show in Section 5.1, only the expenditure on vehicles witnessed a significant contraction, suggesting that the 2011 VAT rate change seems unlikely to have contributed to our findings.

In Figure 2, we explore further the impact of the VAT change by reporting the evolution of three price indexes from national accounts: (i) items that experienced an increase in the VAT rate (dash-dotted black line), (ii) items that did not experience an increase in the VAT rate (light gray solid line) and (iii) cars (red solid line), which were also subject to the VAT rate change. The vertical lines correspond to the dates of

[14] In Appendix H, we provide details on the construction of these variables.

the introduction of the VAT rate increase and of the IMU reform respectively. Two main developments are apparent from Figure 2. First, following the VAT rate change of September 2011, both the increase in the price index on all items subject to the VAT rate hike and the increase in the price index on cars are far sharper than the mild increase in the price index on flat-VAT rate items. Second, the behavior of the price index on increased-VAT rate items decouples from the behavior of the car price index around December 2011 when the IMU tax changes were passed into law by Mr Monti's government. Given we will show that vehicles purchases was the single most responsive and most declining spending category to the IMU taxes, we interpret the flat profile of the car price index after the introduction of the IMU (relative to the steadily rising profile of the price index on all increased-VAT rate items) as most likely stemming from the effect of the property taxes on consumer spending.

Finally, the inference on the effects of an increase in property taxes may be distorted by a decline in central government expenditure, which –as illustrated in Table F.1 of Appendix F– mainly came in the form of a fall in government consumption or wages for public employees (see Born et al. [9]). With respect to this hypothesis, we focus on two sub-groups of households: those headed by a public employee and those not. We find no statistical differences in the coefficients on $IMUmain_i$ and $IMUother_i$ across the two groups, with estimated responses being slightly stronger for non-public employees. In summary, the results in this section suggest that the effects of the IMU tax paid on household expenditure seem unlikely to be confounded by other nation-wide policies or macroeconomic factors that changed over the same period.

3.4. Placebo test

As a further empirical validation of the extent to which our framework is well-suited to capture the effect of the IMU taxes on consumer spending, we run placebo regressions –using either specification (1) or (2)– that correlate the change in expenditure of each household between 2008 and 2010 with the IMU tax paid by that very household in 2012. If the IMU fiscal shock of December 2011 was unanticipated and was indeed the trigger of the significant expenditure decline in 2012 (which we document in the next section), then we would expect it to have no significant effect on expenditure before 2012, given that no actual changes in property taxes occurred between the end of 2008 and the end of 2010 when these two other waves of the SHIW were

conducted.

In this section (and in this section only), all other right hand side variables (including $\triangle HP_i$) refer to the period 2008-2010. In contrast, $IMUmain_i$ and $IMUother_i$ refer to the amount of taxes paid by household i in 2012. The left hand side variable is the expenditure change of that same household i between 2008 and 2010. For the placebo analysis, we only rely on households who appear in all three waves. Accordingly, the regression sample is reduced from 4,002 to 2,480 observations.

The results of the placebo test are shown in Table 4. Both $IMUmain_i$ and $IMUother_i$ never affect significantly either non-durable consumption or durable expenditure and the estimated coefficients have often the wrong sign.[15] On the other hand, the effect of house prices is highly significant for non-durable consumption (but not for durable expenditure), with magnitudes that are not statistically different from the point estimates we will present in the next section for 2010-2012.

4. The Response of Household Expenditure

In this section, we present the main results of our analysis. We start with the baseline estimates in Table 5, which associate the IMU taxes paid on the main dwelling and other residential properties with non-durable and durable expenditure. Then, we explore the heterogeneity of these responses and the extent to which they may depend from individual circumstances or characteristics. More specifically, we split households according to their net liquid wealth to income ratio and to whether they have (mortgage) debt, providing strong evidence of significant variation across these groups. In the final part of this section, we show that the households who did not contract their expenditure reduced their savings instead. In the next section, we will show that the evidence in favor of heterogeneity is far weaker along more traditional dimensions such as age and income or when splitting the sample into lower and higher uncertainty groups.

4.1. Baseline results

The estimates of equation (1) and equation (2) are presented in Panel A and Panel B of Table 5, respec-

[15] Similar results are obtained using the change in vehicle expenditure between 2008 and 2010 as dependent variable.

tively.[16] The two columns on the left refer to the full sample whereas those on the right focus on home-owners only. The odd columns display the relevant IMU and house price coefficients for a specification using non-durable consumption on the left hand side whereas in the even columns the dependent variable is durable expenditure.

Four main empirical regularities emerge from these baseline estimates. First, the MPC associated with the IMU tax paid on the main dwelling in columns (1) and (3) is always very close to and never statistically different from zero. Second, the MPC on durable goods from $IMUmain_i$ is always very significant and large, with point estimates around 0.43 in columns (2) and (4). Interestingly, Parker et al. [34] report a marginal propensity to spend around 0.5 in response to the 2008 income tax rebate in the U.S. while Jappelli and Pistaferri [23] document that for every hypothetical euro of transitory income, the average SHIW respondent would increase expenditure by 48 cents. Third, the results on $IMUmain_i$ are robust to using a richer specification that also includes $IMUother_i$ among the regressors. Fourth, and in sharp contrast to the main dwelling, the IMU tax paid on other residential properties in Panel B triggers neither a significant contraction in non-durable consumption nor a significant contraction in durable expenditure, with point estimates always in the neighborhood of zero.[17]

Of independent interest, both panels record also the estimates of the house price effect. In particular, the coefficient on $\triangle HP_i$ is small and statistically indistinguishable from zero in columns (2) and (4) for durable expenditure. But the marginal propensity to consume out of housing wealth in columns (1) and (3) is always very significant and precisely estimated at 1 percent (i.e. a 100 euro appreciation in house prices tends to be associated with a 0.97 cent increase in non-durable consumption). While these estimates are in line with the effects reported by Guiso et al. [19] and Paiella and Pistaferri [33] on earlier SHIW samples, they are sizably smaller than the 5 to 7 cents reported by Mian et al. [28] for the U.S. or the 7 to 9 cents reported by Campbell and Cocco [11] for the U.K. It should be noted, however, that the scarcity of refinancing oppor-

[16] For completeness, we also estimate a set of specifications including as a main regressor $IMUtotal_i = IMUmain_i + IMUother_i$. The estimated coefficients are typically between -0.01 and -0.06 (reflecting the larger variation and larger incidence of $IMUother_i$) while the standard errors are very high in all columns, consistent with the pervasive heterogeneity that we will show below across the two taxes ($IMUmain_i$ and $IMUother_i$).

[17] To assess the influence of any possible under-reporting, we have verified that our findings are not sensitive to adjusting household expenditure on either non-durable goods and services or durable goods by the ratio between the corresponding aggregate variable from national statistics and its SHIW counterpart, which was aggregated using household weights.

tunities –and in particular of mortgage equity withdrawal– makes housing wealth in Italy significantly more illiquid (see Calza et al. [10], IMF [20] and Grant and Peltonen [16]). Accordingly, the statistical association between house prices and consumption in Italy seems more likely to reflect a direct wealth effect rather than a collateral constraint effect.

4.2. Liquid wealth

A large empirical literature exemplified by the important contributions of Johnson et al. [24], Parker et al. [34], Jappelli and Pistaferri [23] and Agarwal and Qian [2] emphasize the role that liquidity constraints may play to drive heterogeneity in the marginal propensities to consume. In keeping with these studies, Table 6 splits the sample in two groups of households depending on whether the level of held net liquid wealth (defined as the sum of deposits, CDs, repos, postal savings certificates, and government securities net of unsecured debt and mortgage payments) is smaller or larger than their monthly disposable income. Whenever the variable used to partition the data is continuous, one may fear that the results could be somewhat sensitive to the specific cutoff chosen as well as to using dummy variables for each group and their interaction with the variable of interest (as opposed to splitting the sample). We come back to these issues at the end of this section.

The estimates in Panel A suggest that households with net liquid wealth below one month of their income respond to the IMU tax on the main dwelling with a large and significant cut in durable goods spending, with point estimates around 0.9, both for the full sample of column (2) and for home-owners only in column (4). In Section 5, we will show that the size of these estimated MPC is largely driven by the contraction in vehicles expenditure. On the other hand, the MPCs recorded in columns (1) and (3) are never significant while the responses of both non-durable consumption and durable expenditure to other residential property taxes are imprecisely estimated, probably reflecting the fact that only few households with lower liquid wealth own more than one property. Finally, the marginal propensities to consume out of housing wealth tend to be somehow larger than their full sample counterparts in Table 5.

The estimates for households with liquidity in excess of one monthly income are reported in Panel B. In sharp contrast to Panel A, more affluent households do not contract their consumption (independently on

whether they pay taxes on the main dwelling or other residential properties) and display a marginal propensity to consume out of housing wealth which is smaller than the households with lower liquidity. In Appendix J, we show that similar results are obtained retaining a single sample but using a dummy for the lower liquidity group together with two variables that interact such a dummy with $IMUmain_i$ and $IMUother_i$.

To assess the statistical significance of the heterogeneous responses across alternative liquidity cutoffs, we collect in Figure 3 the findings from a set of specifications which use the full regression sample but enrich equation (2) with the interaction variables described above, across progressively increasing thresholds (for the monthly income multiple below which households are deemed as with lower liquid wealth). The blue dashed (solid) line reports the point estimates (90 percent confidence confidence band) for the coefficient on $IMUmain_i$, which represents the durable response of the higher liquidity group. The red lines refer to the sum of $IMUmain_i$ and the interaction of the lower-liquidity group dummy with $IMUmain_i$, thereby representing the durable response of the less affluent households. Up to the threshold of three times the monthly income, the MPC bands for the lower liquidity group do not include zero whereas this is always the case throughout the chart for the more affluent group. Furthermore, the MPC distributions for the two sub-samples largely overlap across all cutoffs and the two sets of point estimates tend to converge by the threshold of four multiples of the monthly income.

In summary, net liquid wealth appears strongly correlated with the household characteristics that make some agents display a large marginal propensity to spend. At the same time, the evidence of heterogenous responses from a cutoff categorization based on liquidity seems statistically tenuous. In the next section, we move beyond the simple liquidity categorization and ask whether a household debt position may provide sharper evidence for the presence of liquidity constraints, so as to yield significant differences in the spending responses across alternative grouping strategies.

4.3. Mortgage debt

A growing strand of empirical studies, including Dynan [14], Kaplan et al. [26], Cloyne and Surico [12] and Acconcia et al. [1] advocate a role for household debt in the transmission of structural and policy shocks. The geographical variation across households subject to different IMU rates allows us an unprecedented evaluation

of this hypothesis in the context of a fiscal consolidation policy such as a housing tax hike. To this end, in Table 7 we group households in the full sample according to whether they have debt (first two columns) or not (last two columns). In an effort to maximize number of observations, we include secured and unsecured debt in Panel A whereas we focus on mortgage debt in Panel B.[18]

The main take away from Table 7 is that the significant average effects on durable goods recorded in the previous tables are entirely driven by home-owners with debt, whose marginal propensities to spend (out of the taxes paid on the main dwelling) in column (4) tend to be larger and more significant than in Table 5, despite the far fewer number of observations. The results from columns (1) and (2) of Panel B reveal further that removing as few as some 400 mortgagors from the full sample yields very small and largely insignificant responses on both property taxes. In the next section, we will show that vehicle purchases account for the lion share of the behavior of household expenditure on durable goods and that the magnitude of the MPCs in Table 7 is consistent with the typical downpayment for buying a car. Interestingly, the house price effect in column 3 tends to be smaller for debtors in Panel A and not statistically different from zero (though imprecisely estimated) for mortgagors in Panel B, consistent with a shortage of refinancing opportunities in the Italian credit market.

To build intuition for the link between household balance sheets, liquid wealth and the presence of liquidity constraints, in Figure 4 we report the average value of the net liquid wealth together with the total amount of IMU taxes paid by mortgagors and non-mortgagors according to the number of properties owned. While there is little difference in the IMU tax paid across the two groups, mortgagors tend to hold less liquidity, with their median value typically closer to the median value of housing taxes paid, especially for home-owners with only one property.

To investigate further the extent to which mortgagors may indeed be liquidity constrained, Figure 5 compares, by number of dwellings, the distribution of the net saving rate –which is disposable income minus total consumption as a share of disposable income– with the distribution of the debt service ratio –which is mortgage repayments as a share of disposable income. Mortgagors owing only one property seem to fit well

[18]Mortgage debt represents on average around 70 percent of total household debt in Italy. The majority of this is secured against the main dwelling with a typical loan-to-value around 50 percent. About half of all mortgages are on fixed rates but we have verified that the results in this section are robust to using mortgagors with either variable- or fixed-rate products only, though the standard errors increase substantially due to the very few number of observations in each sub-group.

the notion of 'wealthy hand-to-mouth' agents: after expenditure and mortgage repayments, they are left with essentially very little disposable income as exemplified by a very small distance between the median values of net saving rates (17 percent) and debt service ratio (16 percent). In contrast, mortgagors with more than one property appear far less constrained, with a vast portion of the distribution of the net saving rate located to the right of the debt service ratio distribution.

Finally, we note that some durable goods (such as cars, motorbikes, furniture or electrical appliance) may be purchased using consumer credit. Accordingly, a worsened access to financial markets during 2011 and 2012 could –at least in principle– be partially responsible for the large adjustment on durable goods recorded between the two waves of the SHIW (at the end of 2010 and at the end of 2012) in Tables 5 and 7. As shown in Figure G.1 of Appendix G, however, there seems to be little evidence that over this biennium households were charged systematically higher interest rates for consumer credit (on purchases either below or above five thousands euros) relative to 2010 when these series begin.

In summary, grouping households by their debt position, and in particular whether home-owners with only one property have a mortgage or not, seems to provide sharp(er) evidence of significant heterogeneity in the expenditure responses (than, for instance, simply looking at liquid wealth to income ratios).[19] Inspection of the balance sheets of the different groups reveals further that, in each month, owner-occupier mortgagors can only spare little liquidity after meeting expenditure bills and mortgage repayments, consistent with Tobin' conjecture (cited in the introduction) that debt makes households liquidity constrained and thus have a high marginal propensity to consume.

4.4. The role of savings

Having shown that debtors have significantly reduced their durable expenditure, we shed lights now on the resources that non-debtors had to rely upon to pay their IMU taxes. Table 8 complements the findings in Table 7 by recording the estimates over the full-sample of a specification that uses the same regressors of (2) but has now a measure of savings in 2012 as dependent variable. More specifically, we compute the

[19] Table J.1, and in particular the p-values for the null hypothesis of the interaction terms being equal to zero, provides formal statistical evidence in favor of the grouping strategy based on household debt.

latter as the fitted values of a projection of the difference between after-tax income and total expenditure on the answers to the question "Were you able to save this year? If so, how much did you save?".[20] To the extent that more affluent households tend to under-report their annual income (but do not necessarily under-report their annual savings), this projection would isolate the common variation across the two series (their correlation is 0.37). Finally, to control for the pre-existing liquidity position, we also add household income in 2010 as additional regressor.

Three main results emerge from this exercise. First, the reduction in savings for non-debtors in columns (1) and (3) of Table 8 are large, significant and not statistically different from minus one. Second, the IMU tax paid on the main dwelling had a positive but insignificant impact on debtors' savings, consistent with the finding of a larger-than-one MPC in Table 7. Third, the IMU taxes on other residential properties paid by the small number of debtors with more than one property were associated with a marginally significant reduction in savings, which was however not statistically different from (and less precisely estimated than) the corresponding responses for debtors.

In summary, the IMU had little impact on the (relatively small) savings of mortgagors with only one property but made the rest of Italians drive significantly down their savings to resist any expenditure cut. As the tax on other residential properties was associated with saving reductions also among mortgagors, we conclude that the lower incidence of debt repayments on disposable income (shown in Figure 5) seems likely to have made mortgagors with more than one property better placed (than mortgagors with only one property) to cope with unanticipated negative income shocks. On the other hand, the behavior of home-owners without debt appears consistent with Ricardian equivalence and the absence of liquidity constraints.

5. Further results

In this section, we explore further the extent of heterogeneity in the household responses to the IMU

[20] In the 2012 survey, we rely on the questions C42, C43, and C44. Question C42 asks "Please consider all of the sources of income for your household that you have told me about during this interview (employment income, rent, income from capital, etc.). Could you tell me if in 2012 your household i) spent its entire yearly income and didn't manage to save anything, ii) spent less than its entire yearly income and succeeded in saving, iii) spent more than its entire yearly income, drawing on savings or borrowing". Question C43 asks "About how much did you save in 2012?". Finally, question C44 asks "About how much more than your income did you spend in 2012?". In the 2010 survey the questions were respectively the C43, C44, and C45.

property taxes across spending categories. In particular, we show that vehicle purchases (or lack thereof) are a main driver of the aggregate results and that the magnitude of the coefficients on $IMUmain_i$ reported in Table 7 for debtors is consistent with a typical downpayment for buying a car. Finally, we discuss the results of a number of sensitivity analyses (fully presented in Appendix J), including the assessment of the heterogeneous responses by age, income and uncertainty levels as well as the estimation of probit regressions meant to ameliorate concerns about measurement errors in the expenditure data.

5.1. Spending categories

To shed lights on the findings in the previous section, we re-run specification (2) over several categories of non-durable and durable expenditure. Based on question E02 of the 2012 (and 2010) SHIW survey, we consider as "durable good" precious objects, cars, other means of transport, furniture, furnishings, appliances and "various equipment".[21] Non durable expenditure is calculated as the difference between total expenditure net of rents or mortgage payments and expenditure on non-durable goods.

Given the estimates in the previous tables, it should not come as a surprise that we find little evidence of heterogeneity among non-durable goods and services. As for durable goods, we find that net vehicle expenditure (defined as the difference between vehicle purchases and vehicle sales) is the only component that displays large and significant responses to the IMU taxes. This is recorded in Table 9, which splits durable expenditure into vehicles (which account for about 70 percent of durables) and every other durable goods. In the top panel, we report findings over the full-sample and for home-owners only whereas in the bottom panel we display results for debtors and mortgagors.

The coefficients on net vehicles purchases in columns (2) and (4) of Panel A are similar (and statistically indistinguishable) from the coefficients on durable expenditure in Table 5. When net vehicles purchases are excluded from durable expenditure in columns (1) and (3), however, both IMU tax coefficients become insignificant, revealing that this durable category drives the total expenditure response. In Panel B of Table

[21] The complete list of "durable goods" included in question E02 of the survey is as follows: jewelry, coins or gold, artwork, antiques including antique furniture, cars, motorcycles, caravans, boats, bicycles, furniture, furnishings carpets, lamps, small appliances, washing machines, dishwashers, vacuum cleaners, floor polishers, TVs, PCs, refrigerators, cookers, stoves, air conditioners, radio, video recorder, CD players, stereos, phones, fax machines, and cameras.

9, we restrict our attention to indebted households, who display the strongest durable expenditure response, and show that their behavior is indeed driven by net vehicle purchases. The coefficients on $IMUmain_i$ in columns (2) and (4) of Panel B appears in line with their durable expenditure counterparts in Table 7 whereas the responses of non-vehicle durables in columns (1) and (3) tend to be small and statistically indistinguishable from zero.

In Figure 6, we provide a graphical counterpart of the results in Table 9. In particular, we show not only that (i) the average reduction in net vehicle purchases by IMU payers (dashed-dot dark gray line) was larger than the average reduction by those home-owners who –because of the deductions– did not pay IMU taxes (dashed gray line), but also that (ii) the average reduction for mortgagor IMU payers (red line) was even more pronounced that the average reduction across all IMU payers. Also, Figure 6 provides graphical evidence not only that the pre-treatment trend was identical between mortgagors IMU-payers and home-owners non-IMU payers but also that the decline in vehicles expenditure for all IMU payers between 2008 and 2010 (i.e. before the treatment) was, if anything, smaller than the decline for home-owners non-IMU payers over the same period. Similar evidence (available upon request) applies to all variables of interest. Finally, it is possible to show that the parallel trends extend back in time, although at the expense of reducing the sample size given the sample rotation in the SHIW survey.

Two points are worth emphasizing about the magnitude of the vehicle expenditure response in Table 9. First, Italian households paid a significant amount of property taxes in 2012, with an average around 357 euros and a significant portion of payers above 1000 euros. This suggests that some households may have chosen to defer or even eliminate a large durable purchase, whose saving could prove sufficient to offset the significant increase in property taxes (possibly over a multi-year horizon). Second, given the average IMU tax disbursement, a marginal propensity to spend around two –while statistically close to one– is entirely consistent with a downpayment of 10 percent on a vehicle purchase, whose average in the 2010 SHIW is around 8,000 euros. Interestingly, Parker et al. [34] find that the response of American households to the 2008 tax rebate was concentrated on car expenditure while Misra and Surico [30] show that this is driven by a handful of vehicle purchases by mortgagors, who display a marginal propensity to spend on this category far larger than (though not statistically different from) one.

The results in Table 9 are further corroborated by independent evidence reported in Figure 7, which displays the volume of monthly transactions of new and used cars as published by the Italian automobile association ("Automobil Club d'Italia"). The vertical line denotes the launch of the IMU reform in December 2011 and this is also the month when the break in the mean of the time series is apparent. Finally, in Table I.1 of Appendix I, we use registration data from the Ministry of Infrastructure and Transport to show that this drop is more pronounced among new cars but that it is even spread across national and international makers.

In summary, the previous section has shown that home-owners with debt appears to drive the durable expenditure response to the IMU taxes over the full-sample. This section has further shown that the very significant adjustment in net vehicle purchases appears to drive the behavior of durable expenditure.

5.2. Municipal car registrations

Independent evidence on the effects of property taxes on vehicle purchases can be obtained by looking at the extent to which the municipal variation in housing tax rates correlates with the municipal variation in car registrations. These latter data come from the government-supported agency ACI ("Automobile Club d'Italia") and record the number of cars registered per year in each municipality according to the buyer place of residency.[22] Our exercise consists of running a battery of cross-sectional specifications in which the unit of observation becomes the municipality. More specifically, we project the change in car registrations between 2011 and 2012 for each municipality onto the IMU tax rates set in 2012 by the local government of that very municipality. Formally, our model can be expressed as

$$\triangle Cars_j = \alpha + \gamma_1 \cdot IMUrateMain_j + \gamma_2 \cdot IMUrateOther_j + \boldsymbol{\theta}\mathbf{X}_j + \varepsilon_j, \tag{3}$$

[22] All data are available at: http://www.aci.it/laci/studi-e-ricerche/dati-e-statistiche/autoritratto.html.

where $\triangle Cars_j$ is the percent change between 2011 and 2012 in car registrations for municipality j, $IMUrateMain_j$ and $IMUrateOther_j$ are the IMU rates set in 2012 by municipality j on the main dwellings and other residential properties respectively, $\boldsymbol{\theta}$ is a vector of coefficients and ε_j is a disturbance term. For expositional convenience, we rescale $IMUmain_j$ and $IMUother_j$ by 1,000, so that a unitary increase of the explanatory variables correspond to a 0.1 surge in the housing tax rate. The matrix of controls, $\mathbf{X}_j$, includes a set of provincial dummies, the percent change of declared personal income, the percent change of business income, the percent change in night light density, the percent change of population and the per capita change in municipal government total expenditure (current plus capital). Each of these sets of controls will be added progressively to the baseline specification to verify robustness.

The findings of this exercise are presented in Table 10. The first column report the estimates of a regression in which we only include the provincial dummies as controls. In the second column, we add the three proxies for local economic activity (declared personal income, business income, and night light density). In the third column, we consider municipal population as a further regressor. And in the last column, we also look at municipal government total expenditure as an additional covariate.

In keeping with the findings based on SHIW data, the estimated coefficients for $IMUrateMain_j$ based on municipal data are always statistically significant at the 5 percent level across all columns, while the estimated coefficients for $IMUrateOther_j$ never are. The elasticity between the municipal housing tax rate on the main dwelling and municipal car registrations is precisely estimated and it implies that following an increase in the tax rate on the main dwellings of 0.1, car registrations would decrease by around 1.2%. Given that the average tax rate on the main dwelling across all Italian municipalities is 0.422, the estimates in Table 10 suggests that the introduction of IMU contributed to around one fourth of the overall decline in the car industry over that year (or 5% of the market size in 2011).

In summary, employing a different empirical strategy, using different data and exploiting variation at a different level of (geographical) disaggregation relative to the Bank of Italy SHIW data, we have reached conclusions that are fairly consistent with the evidence from the previous section, namely that the impact of the housing tax on the main dwelling on the car industry was significant and large.

5.3. Sensitivity analysis

In this section, we summarize the findings of a set of additional analyses reported in Appendix J:

- *AGE of the HOUSEHOLD HEAD.* In Table J.2 of Appendix J, we group households into younger and older according to whether their head belongs or not to the youngest quartile of the household head age distribution.[23] The top panel refers to the full sample whereas the bottom panel focuses on home-owners only. The results reveal that (i) the younger group tends to have a larger marginal propensity to spend than the older group, (ii) this is driven by vehicle purchases, whose estimates appear sharper in the home-owners sample, and (iii) the evidence of heterogeneous responses by age on durable goods is far weaker than when households are grouped according to their debt positions, in a combination of smaller point estimates (in absolute value) and larger standard errors than in Table 7. While the results in Table J.2 are consistent with the evidence in Table 2 that debtors tend to be younger than non-debtors, it also suggests that age appears less likely than debt to be a primitive determinant of the heterogeneity we have documented so far. Furthermore, as noted in Section 3.3, the finding in the left panel of Table J.2 that young households who paid (more of) housing taxes decrease their durable expenditure by more than young households who did not pay (or paid less of) housing taxes suggests that our estimates are unlikely to reflect any possible effect of the Fornero pension reform, which was launched over the same period and should have affected evenly all young households independently of their housing tenure status or the payment of the IMU taxes.

- *HOUSEHOLD INCOME.* The analysis of Table J.3 focuses on income, using the 75th percentile of the household income distribution to categorize observations in to lower- (bottom 25 percent) and higher- (top 75 percent) groups. The MPCs of less affluent households tend to be imprecisely estimated and

[23] Neither for age nor for income, results are significantly different using any other percentile between 60 and 90 as cutoff.

their distribution largely overlap with the distributions of the MPC for the higher-income group. The point estimates of the latter are marginally (more strongly) significant for durable (vehicle) expenditure, thought the estimates for either group or for either spending category tend to be far smaller than the coefficients in Table 7. On the other hand, the house price effect appears stronger among households with a relatively lower income. While inspection of Table 2 reveals that debtors tend to have higher income than the rest of the sample, also in Table J.3 the inference on the heterogeneous responses to the property taxes is far weaker than the inference one can draw from Section 4. This suggests that –unlike a household's debt position– age and income appear only weakly correlated with the unobserved characteristics that drive the excess sensitivity of durable expenditure to the income change induced by the IMU property taxes.

- *MEASUREMENT ERRORS and NON-LINEARITIES.* While non-durable and small durable expenditure may be subject to non-negligible measurement errors, Attanasio et al. [7] note that whether a household owns or purchases a large durable good (such vehicles) is likely to be far less uncertain. We build on this intuition to construct two binary variables that take the value of one if vehicle expenditure and other durable expenditure respectively are positive and zero otherwise. These become the dependent variables in separate probit regressions that use the same regressors as in the rest of the paper. The results in Table J.4 reveals –consistently with the estimates in Table 9– that only for debtors and mortgagors, paying the IMU tax on the main dwelling significantly reduces the probability of buying a vehicle. Furthermore, Figure J.4 shows that the marginal effect of $IMUmain_i$ (which is the probability of purchasing a vehicle following the payment of the IMU tax on the main dwelling) is monotonically decreasing in the amount of taxes paid.

- *UNCERTAINTY.* In Table J.5, we explore whether a different degree of uncertainty about the future resources available at the household level implies heterogeneous expenditure responses. In keeping with the dummies on income and house price expectations used in the baseline regressions, the "lower uncertainty" group comprises households who assigned a probability above 70 percent to any of the possible outcomes indicated in each question for at least one of the questions about (i) future household income, (ii) future local hose prices and (iii) future levels of the stock market index. Conversely, the

"higher uncertainty" group is made of households who assigned probabilities equal or below 70 percent to all possible outcomes indicated in each of these three questions.[24] Three main results emerge from this exercise. First, the coefficients on IMU main for non-durable, durable and vehicles expenditure in the "lower uncertainty" group are never statistically different from their "higher uncertainty" group counterparts and, if any, they imply MPC point estimates which are slightly larger than those for the latter group. Second, the effects of the main dwelling tax on durable and vehicles expenditure in Table J.5 appears far smaller and less significant than the effects estimated in Table 7 across household debt positions, consistent with the fact that mortgagors appear evenly spread across the two uncertainty groups. Third, the IMU tax on other residential properties is never statistically different from zero while the house price effect are only slightly larger for households reporting a higher degree of uncertainty.

- *HOUSE PRICE EXPECTATIONS.* The size and the persistence of the IMU tax changes may have induced some households to expect lower future house prices and this in turn may affect the interpretation of our estimates. Accordingly, in Table J.6, we re-run our baseline specification excluding from the list of regressors the self-reported household-specific change in house price expectations. We find that this modification does not overturn our main empirical findings of heterogeneous responses across durable goods and non-durable goods and services as well as across the housing tax on the main dwelling and the tax on other residential properties.

6. Conclusions

This paper offers an unprecedented evaluation of the heterogeneous effects of a fiscal consolidation policy on consumer spending using a large and unanticipated housing tax hike, which took place in Italy at the end of 2011. Our analysis reveals that the taxes paid on the main dwelling triggered a large and very significant decline in household expenditure whereas the taxes paid on other residential properties caused a small and statistically insignificant change. The adjustment was mostly borne by home-owners with mortgage debt and

[24] Similar results are obtained using a 60% or a 80% threshold.

was concentrated on net vehicles purchases whereas households without debt responded with a proportional reduction of their savings.

While the property tax change may have also generated non-negligible general equilibrium effects, we can use our estimates together with data from national statistics reported in Figure 8 to provide some back of the envelope calculations for the direct effect of the legislated changes on the aggregate economy in 2012 along the lines of Johnson et al. [24]. The tax revenues on the main dwelling (other residential properties) for 2012 totaled 4.0bn (10.7) Euros or 0.3 (0.6) percent of GDP. Bearing in mind an average marginal propensity to consume of 0.43 for the main dwelling and a coefficient statistically indistinguishable from zero for other properties (see column (2) in Panel B of Table 5), the direct recessionary effect of the IMU taxes on the Italian economy in 2012 was about 0.11 percent of GDP (or 0.21 percent of personal consumption expenditure) vis-à-vis a tax revenue expansion around 0.90 percent of GDP (or 1.71 percent of personal consumption expenditure).

As for the specific categories that drive the aggregate result, the estimates in Table 9 identify a large drop in vehicle expenditure for debtors. The time series of car sales recorded an average fall of about 185,000 units per year between 2008 and 2011. But during 2012, car sales plummeted by around 346,000 units: an extra fall of some 160,000. Our analysis attributes half of the extra fall (or one fourth of the total decline) in 2012 to the introduction of the IMU tax. We conclude that while the short-run direct cost (in the form of foregone consumer spending) of the property tax changes for the Italian economy was small relative to the amount of extra taxes raised, the negative consequences for the car industry in 2012 were significant. This is consistent with the pattern in Figure 8: the decline in vehicle expenditure (red broken line) during 2012 (shaded area) appears abrupt and more pronounced than the steady decline visible in any other year since the Great Recession of 2007-08.

As for policy implications, the present analysis contributes to two important debates on the design of fiscal consolidation plans and housing taxes in particular. More specifically, our evidence suggests that setting a (carefully implemented) multi-year plan of higher property tax rates for non owner-occupied dwellings as well as providing owner-occupier mortgagors with property tax deductions related to their level of outstanding debt (as currently done for instance in The Netherlands, Spain and Switzerland among other countries) can generate sizable government revenues over a relatively short period of time while minimizing the contrac-

tionary effects that levying a property tax may otherwise induce. Furthermore, our analysis provides both one instance in which a fiscal consolidation intervention appears highly recessionary (when it comes in the form of a housing tax borne by households with debt) but also another instance in which the same fiscal policy does not seem recessionary at all (when the housing tax is borne by households without debt). This suggests that the decisions of what specific policy instrument to use and what specific group(s) of society to target could (and perhaps should) become another relevant dimensions along which to evaluate the effectiveness and desirability of any fiscal consolidation plan.

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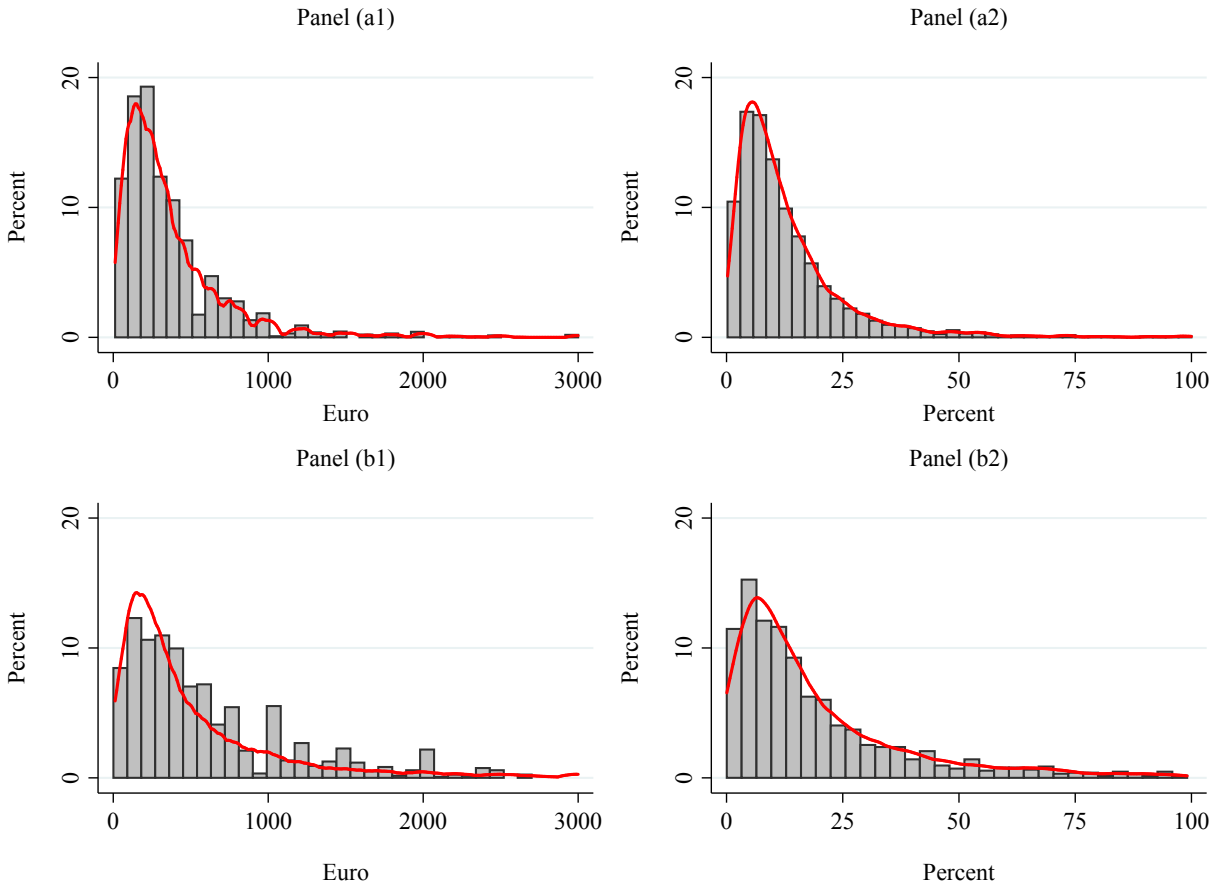
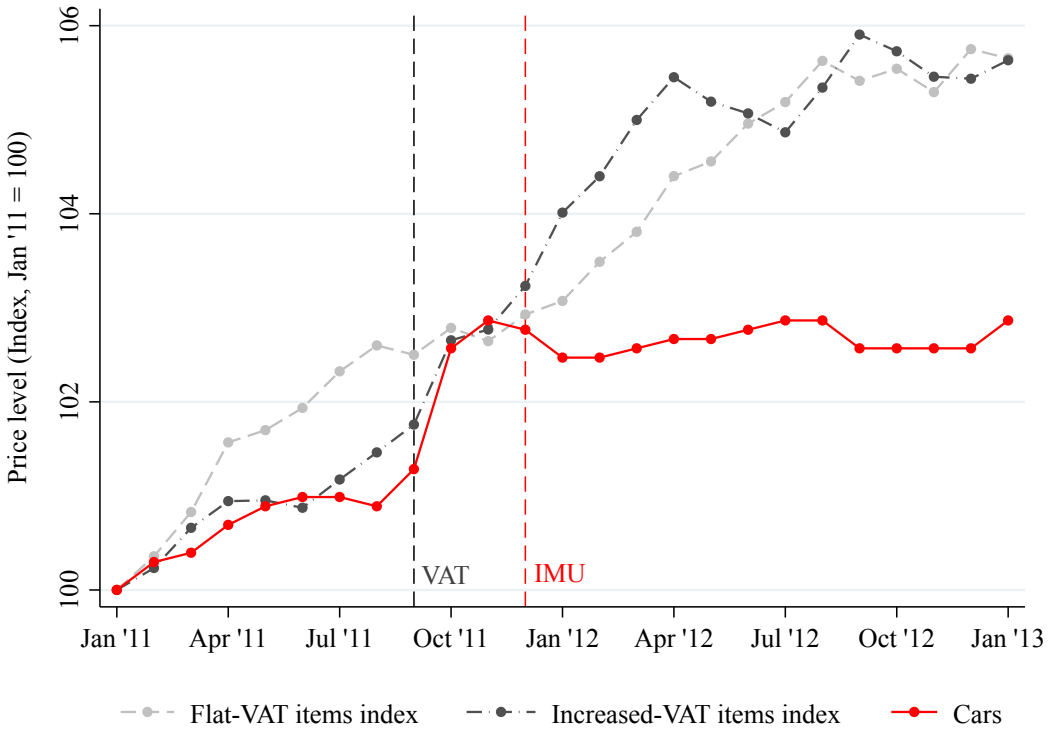
Figures and Tables

Figure 1: IMU - Tax burden per household.



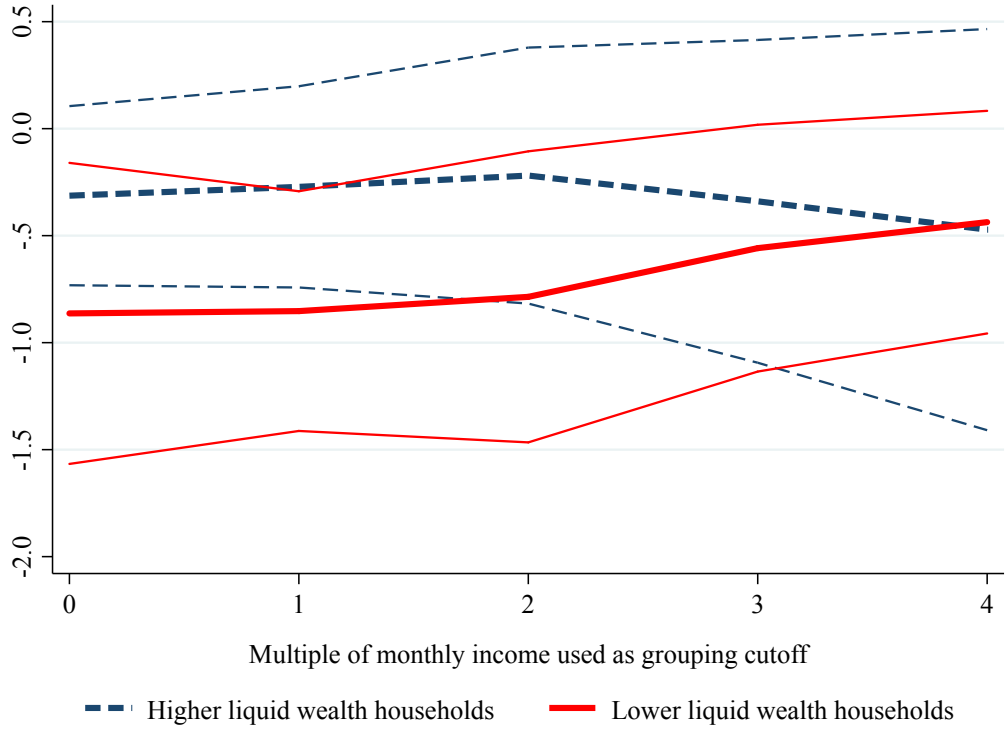
Note: The figures refer to owners, IMU tax payers only. The red line plots the Epanechnikov kernel density. Panel a1 (a2) refers to the amount paid on main dwellings in Euro per household (as a share of households' monthly income), excluding 14 observations higher than 3,000 Euros. Panel b1 (b2) refers to the amount of IMU tax paid (as a share of monthly income) on other properties, excluding 129 observations higher than 3,000 Euros. Source: authors' calculations on SHIW survey data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Figure 2: Evolution of prices.



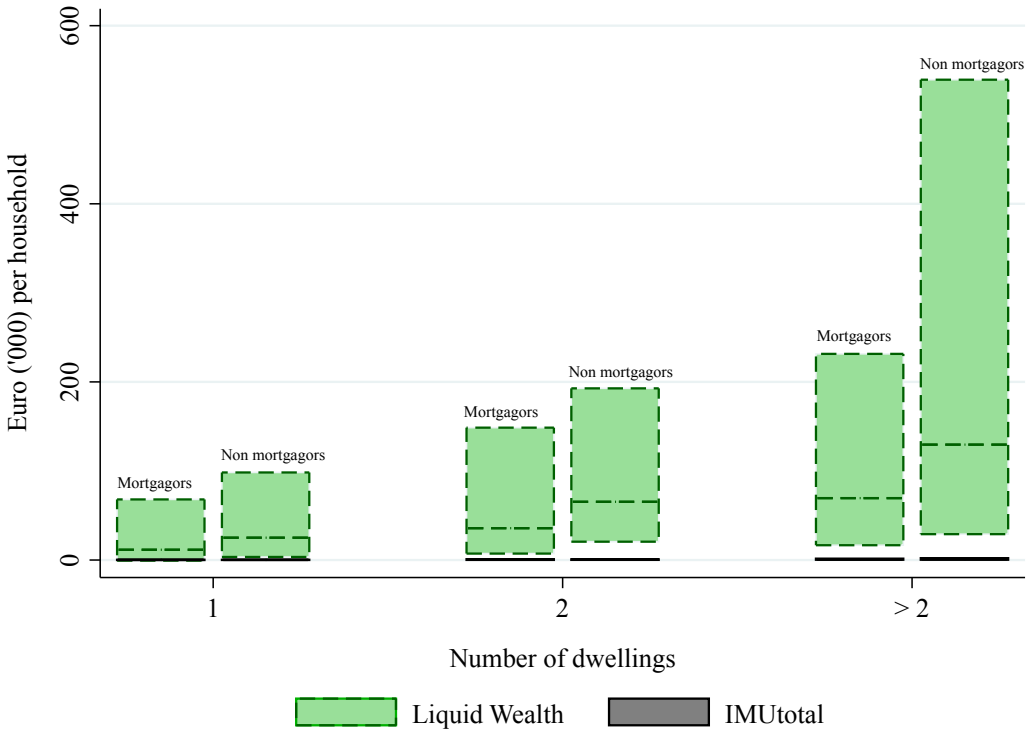
Note: the figure shows the evolution of prices for cars, items subject to the 2011 VAT increase, and items exempted from VAT increase (these items are subject to a 0 percent VAT, 4 percent VAT, or 10 percent VAT according to the category; these VAT rates were unchanged in the considered period). The aggregate indexes (for "Flat-VAT items" and "Increasing-VAT items") are weighted averages of the respective sub-indexes. The relative weights are provided by ISTAT. Inflation for "cars" refer to the "motor cars" category (ISTAT code 711). Items excluded from VAT changes include: "education", "food" (excluding "ready-made meals"), "restaurants and hotels", "miscellaneous goods and services" (excluding "mineral or spring waters"), "actual rentals for housing", "water supply and miscellaneous services relating to the dwelling", "electricity, gas and other fuels", "medical products, appliances and equipment", "out-patient service", "hospital services", "transport services", "postal services", "recreational and cultural services", "newspapers, books and stationery". The share of items (including cars) subject to the VAT increase in 2011 was 40.6 percent. Source: authors' calculations on ISTAT data (available at: http://dati.istat.it/?lang=en).

Figure 3: Durable expenditure response of lower and higher liquid wealth households.



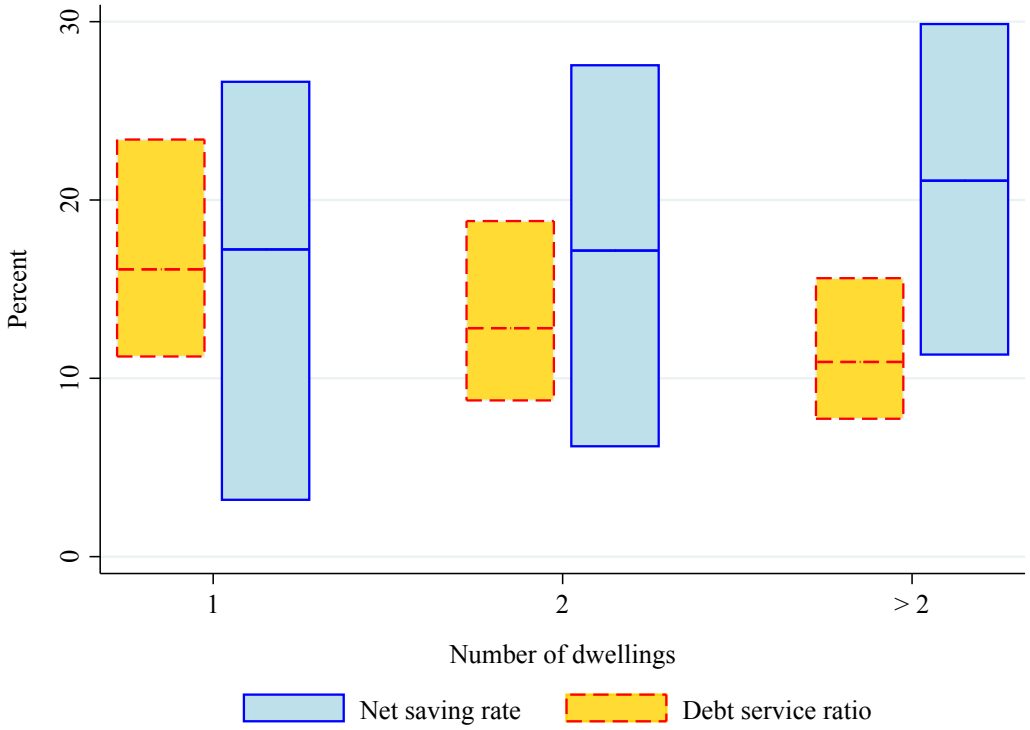
Note: the figure shows the durable expenditure response of lower liquid wealth households versus higher liquid wealth households. The blue dashed line plots the coefficient on the variable "IMUmain" (amount of IMU tax paid on the main dwelling) in a specification in which we allow as additional regressors a dummy measuring the level of (net) liquid wealth (defined as the sum of liquid financial assets net of mortgage repayments and uncollateralized debt) and its interactions with "IMUmain" and "IMUother". The red line plot the sum of the coefficients on the "IMUmain" variable and the interaction of "IMUmain" with the liquidity dummy. The liquidity dummy varies according to the threshold reported on the x-axis of the figure (for instance, for the threshold "one month", the liquidity dummy takes the value of "1" for households with net liquid wealth lower than one month of their disposable income). The thin lines (red and dashed-blue) plot the 90 percent confidence intervals. Source: authors' calculations on Bank of Italy SHIW surveys data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Figure 4: Distribution of net liquid wealth and total IMU paid per number of property.



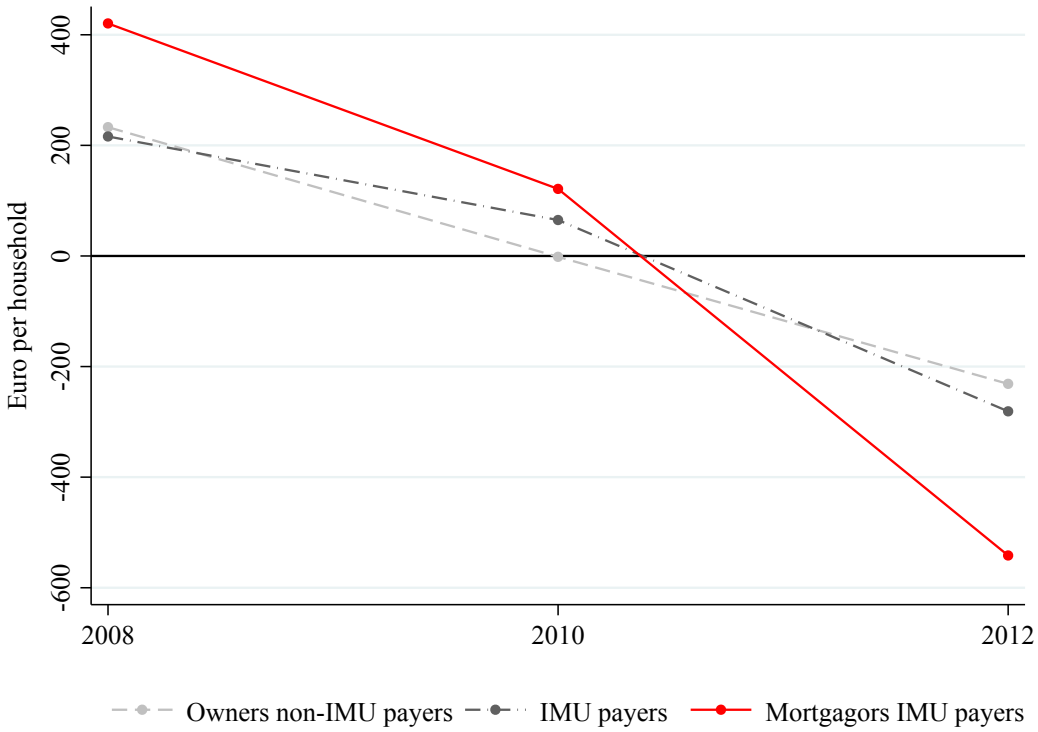
Note: the figure shows the distribution of net liquid wealth and total IMU paid for home-owners by number of properties. For each of the three categories (one dwelling, two dwellings, and three or more dwellings), we split between households with no mortgage debt (right columns) and households with mortgage debt (left columns). The bars span in between the 25th and 75th percentile of the distribution while the horizontal lines in each bar indicate the median of the distribution. Liquid wealth is defined as the difference between total financial assets (variable "af" in the SHIW survey, database "ricfxx.dta" where "xx" indicates the year of the survey), mortgage service payments (variables "tdebita11" plus "tdebita12" plus "tdebita13", database "alld2_res.dta" in the 2012 survey), debts toward commercial firms (variable "pf1" in the SHIW survey, database "ricfxx.dta" where "xx" indicates the year of the survey), and debts towards other households (variable "pf2" in the SHIW survey, database "ricfxx.dta" where "xx" indicates the year of the survey). Source: authors' calculations on Bank of Italy SHIW surveys data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Figure 5: Distribution of net saving rates and debt service ratio per number of property.



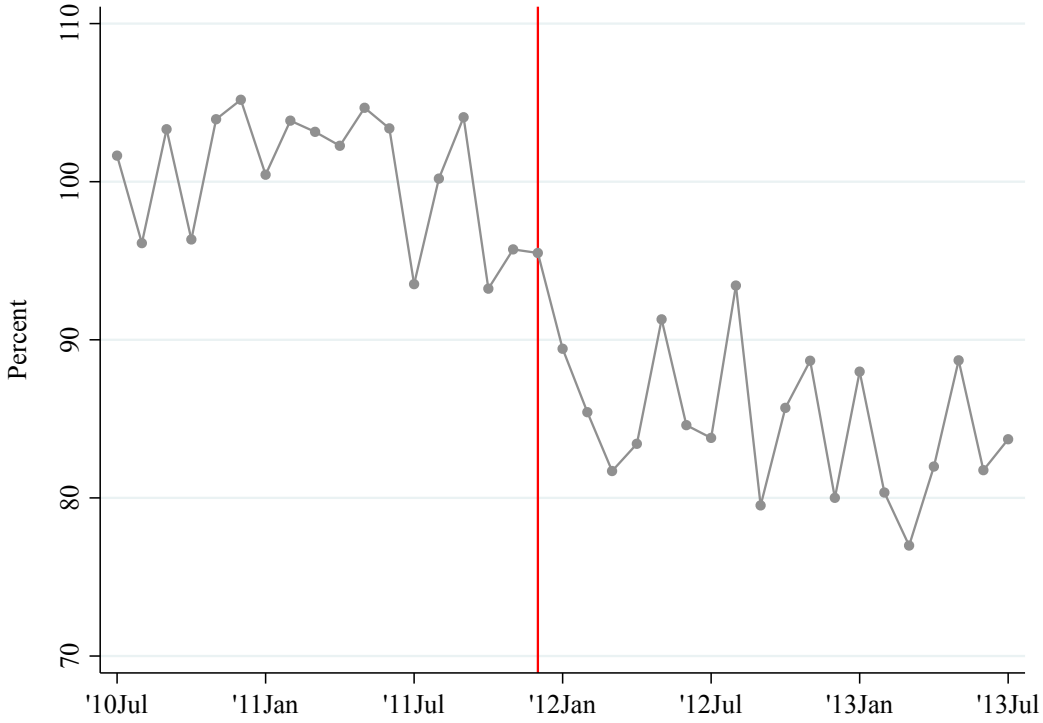
Note: the figure shows the distribution of net saving rates (using after tax income) and debt service ratio to net disposable income by number of properties. The bars span in between the 25th and 75th percentile of the distribution while the horizontal lines in each bar indicate the median of the distribution. Monthly saving rates defined as the ratio between variable "s2" and variable "y2" in database "cons12.dta". Mortgage service payments is based on variables "tdebita11" plus "tdebita12" plus "tdebita13", database "alld2_res.dta" in the 2012 survey. Source: authors' calculations on Bank of Italy SHIW surveys data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Figure 6: Expenditure on vehicles.



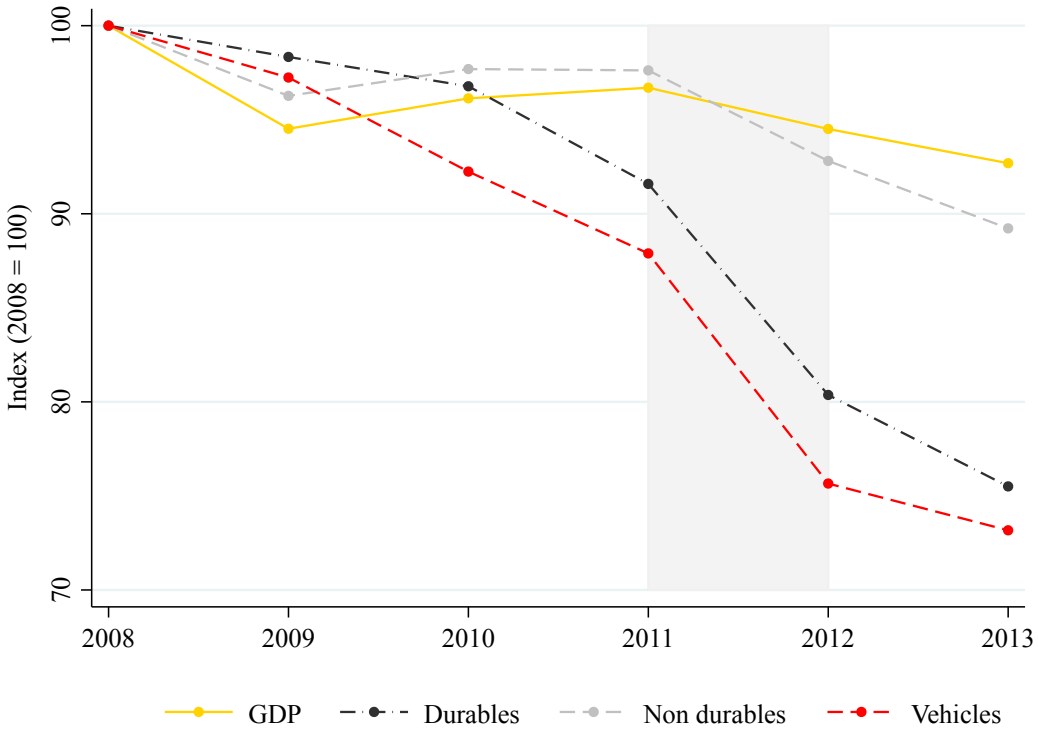
Note: The chart shows the expenditure on vehicles over time among home-owners in deviation from their respective means. The pre-treatment trend is identical across groups and the same evidence applies to all variable of interest. If the time period is extended back in time (at the expenses of the sample size) the evidence of parallel trends remains identical. The chart is based on those households entering in the three waves of the SHIW survey reported. The expenditure on vehicles refers to variable "cd1" in database "consXX.dta" (where the suffix "XX" refers to the year of the survey). The households with a debt are identifies using the variable "deb12a" ("Amount of debts owed at the end of the year to banks or financial companies for the purchase or restructuring of buildings") in database "famiXX.dta". Source: authors' calculations on Bank of Italy SHIW surveys data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Figure 7: Monthly sales of (new and used) cars.



Note: The figure shows the evolution of monthly sales of cars (new and used vehicles). The series refers to the seasonally adjusted sales as a share of the 2011 average level. The seasonal adjustment has been performed using an unobserved component model casted in the state-space (the Kalman filter has been initiated using a diffuse prior). The vertical red line indicates the month when the IMU tax was announced (December 2011). Source: authors' own calculations on ACI ("Automobile Club d'Italia") data (available at: http://www.aci.it/laci/studi-e-ricerche/dati-e-statistiche/auto-trend.html).

Figure 8: Evolution over time of key variables.



Note: The series 'GDP' refers to real Gross Domestic Product estimated by ISTAT (Italian National Institute of STATistics). The series 'Durable' and 'Non durable' refer to real households consumption of durable and non durable goods estimated by ISTAT. Finally, the series 'Vehicles' refers to the total number of cars (new and used) and motorbikes (new and used) sold. Source: authors' own calculations on ISTAT data (available at www.istat.it), and ACI ("Automobile Club d'Italia") data (available at: http://www.aci.it/laci/studi-e-ricerche/dati-e-statistiche/auto-trend.html).

Table 1: Other municipal government policies.

Panel A *all municipalities*	Municipal public expenditure	Other municipal tax revenues	IMU revenues	Municipal fiscal deficit
IMU main rate	**8.18**	**-1.85**	**8.71*** **	**-7.56*** **
	[10.00]	[1.84]	[1.75]	[2.23]
IMU other rate	**1.85**	**-2.12**	**22.40*** **	**-20.81*** **
	[5.85]	[1.35]	[1.51]	[2.21]
Observations	7,355	7,355	7,355	7,355
R^2	0.02	0.04	0.17	0.06
Panel B *municipalities above 2000 inhabitants*	Municipal public expenditure	Other municipal tax revenues	IMU revenues	Municipal fiscal deficit
IMU main rate	**6.25**	**-3.38**	**9.32*** **	**-9.72*** **
	[7.59]	[2.44]	[2.02]	[2.35]
IMU other rate	**0.37**	**-2.06**	**22.47*** **	**-19.81*** **
	[5.04]	[1.43]	[1.53]	[1.93]
Observations	4,258	4,258	4,258	4,258
R^2	0.04	0.06	0.22	0.12

Note: Each column reports results of a regression where the left hand side variable is the per-capita change of the municipal government instrument in the title between 2012 and 2011 projected on the IMU rates on the main dwelling and other residential properties set by that very municipality in 2012. Municipal public expenditure refers to the variable "Total expenditure" ("Totale generale delle spese"), other municipal tax revenus refers to the sum of all municipal tax revenues net of IMU payments (speifically we consider the following taxes: "Scopo", "Soggiorno", "Pubblicita"', "Occupazione degli spazi pubbliche", "Raccolta e smaltimento dei rifiuti", "Tassa affissioni", "Anagrafe", "Uffici giudiziari", "Polizia municipale", "Istruzione elementare", "Istruzione media", "Assistenza scolastica", "Biblioteche", "Teatri, attività culturali", "Piscine comunali", "Stadio comunale, palazzo dello sport", "Manifestazioni diverse", "Servizi turistici", "Viabilità", "Trasporti pubblici locali", "Urbanistica", "Edilizia residenziale pubblica locale", "Servizio idrico", "tariffa igiene ambientale", "Asili nido", "Proventi servizi di prevenzione e riabilitazione", "Ricovero per anziani", "Assistenza, beneficenza pubblica", "Servizio necroscopico e cimiteriale", "Entrate da sanzioni amministrative", "Mezzi pubblicitari", "Proventi di bene", "Scuola materna", "Addizionale IRPEF", "Segreteria", "Ufficio tecnico", "Servizi turistici", "C.O.S.A.P.", "Concessioni cimiteriali"). Fiscal deficit calculated as difference between municipal expenditures (current + capital) and municipal revenues (tax revenues + current grants + dismissals). Current revenues and expenditures are on accrual basis, capital revenues and expenditures are on a cash basis. For this reason, the sum of the coefficients in the first three columns cannot equal the coefficient in the last column. Robust standard errors clustered by provinces in brackets. *** indicates significance at 1% level, **at 5% * at 10%. Source: Ministry of Interior data (publicly available at: http://finanzalocale.interno.it/apps/floc.php/in/cod/4).

Table 2: Summary statistics, regression sample.

		Full sample				**Home-owners**				**Mortgagors**			
Variable	**Unit**	*Mean*	*Median*	*25%*	*75%*	*Mean*	*Median*	*25%*	*75%*	*Mean*	*Median*	*25%*	*75%*
Education	Index	3.1	3.0	2.0	4.0	3.2	3.0	2.0	4.0	3.6	4.0	3.0	4.0
# components	Units	2.4	2.0	1.0	3.0	2.4	2.0	2.0	3.0	3.1	3.0	2.0	4.0
Age	Years	60.9	62.0	50.0	73.0	62.1	62.0	51.0	73.0	50.6	49.0	43.0	57.0
Children	Units	0.5	0.0	0.0	1.0	0.5	0.0	0.0	1.0	1.1	1.0	0.0	2.0
Income	Euro ('000)	36.4	30.9	20.2	47.1	40.8	35.7	24.3	51.9	46.5	42.2	29.2	57.2
△ Y	Euro ('000)	1.6	1.7	-2.9	6.5	2.0	2.1	-2.9	7.4	2.5	2.6	-2.9	8.8
△ C	Euro ('000)	0.6	0.6	-3.6	5.1	0.8	0.9	-3.6	5.9	1.7	1.5	-4.7	7.6
△ CD	Euro ('000)	-0.4	0.0	-0.4	0.0	-0.3	0.0	-0.5	0.0	-0.2	0.0	-0.8	0.3
△ CV	Euro ('000)	-0.2	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
△ CN	Euro ('000)	1.0	0.9	-3.0	4.9	1.2	1.2	-3.0	5.4	1.9	1.6	-3.2	6.9
Net liquid wealth	Euro ('000)	171.8	44.2	6.3	152.2	207.5	63.4	12.8	196.7	122.8	34.7	9.5	114.1
Real estate	Euro ('000)	219.4	172.4	60.9	304.4	281.2	213.1	142.0	355.1	284.6	233.3	152.1	355.0
Mortgage debt	Euro ('000)	6.2	0.0	0.0	0.0	7.9	0.0	0.0	0.0	59.1	50.0	18.0	90.0
IMU main	Euro	208.9	120.0	0.0	300.0	267.7	200.0	60.0	390.0	249.2	200.0	60.0	350.0
IMU other	Euro	150.2	0.0	0.0	0.0	192.5	0.0	0.0	44.0	185.8	0.0	0.0	100.0
△ House Price	Euro ('000)	-3.4	0.0	-35.0	20.0	-4.0	0.0	-50.0	50.0	-0.1	0.0	-50.0	40.0
# properties	Units	1.2	1.0	1.0	2.0	1.6	1.0	1.0	2.0	1.6	1.0	1.0	2.0
Number of observations		**4,002**				**3,122**				**420**			

Note: "Age" and "Studio" refer to the age and the education level (1 = elementary or lower, 6 = post-graduate degree) of the head of the household. "△ Y" refers to the change of household disposable income. "△ C" refers to the change of household consumption. "△ CD" refers to the change of household consumption on durables. "△ CV" refers to the change of household consumption on vehicles. The entries for vehicles purchases are consistent with the data from ACI (www.aci.it) which show that in 2012, about 2.5 millions of vehicles were exchanged across all Italian households, which are around 24.5 millions. "Net liquid wealth" calculated as the difference between financial assets and unsecured financial liabilities (variables "af", "pf2", and "pf3" in database "ricf2012.dta"). "Real estate" refers to the variable "ar1" ("Real assets (housing, land, and other buildings)") in database "ricf2012.dta". "Mortgage debt" refers to variable "deb12a" in dataset "fami2012.dta".

Table 3: Confounding factors.

Panel A	Austerity non-IMU	Transfers	△ HP	Supercar	VAT
IMU main	**0.02**	**0.01**	**0.03**	**0.01**	**-0.01**
	[0.01]	[0.02]	[0.03]	[0.01]	[0.02]
Observations	4,002	4,002	4,002	4,002	4,002
R^2	0.14	0.03	0.21	0.03	0.09
Panel B	Austerity non-IMU	Transfers	△ HP	Supercar	VAT
IMU main	**0.02**	**0.01**	**0.03**	**0.01**	**-0.01**
	[0.01]	[0.01]	[0.03]	[0.02]	[0.02]
IMU other	**0.01**	**0.01**	**0.04**	**-0.03**	**-0.00**
	[0.04]	[0.01]	[0.03]	[0.03]	[0.03]
Observations	4,002	4,002	4,002	4,002	4,002
R^2	0.14	0.03	0.22	0.03	0.09

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%.IMU "main" and "other" refer to the IMU tax paid for the main dwelling and other properties respectively. Because the variables have different magnitudes and variances, all left-hand side variables, IMUmain and IMUother have been standardized. When running the same regressions on non-standardized variables we obtain very similar results. $\triangle HP$ refers to the change of (self-reported) market value of all properties owned. "Austerity non-IMU" refers to the sum of the increase in taxation on electricity bills, the increase in taxation on cooking gas, the increase in taxation on motorfuel, and the increase of the local (regional) marginal tax rate on personal income. "Transfers" refers to total transfers to households, including pensions. "Supercar" is a variable calculated as the product between the value of the car if above 40,000 Euros and the average yearly tax rate of 1.26 percent on supercar (estimated using Automobile Club of Italy data). Finally, "VAT" refers to theconsumption change on non-durable goods and services whose VAT rate changed in September 2011.

Table 4: Placebo test.

Panel A	Full sample		Home-owners	
	Non-durables	Durables	Non -durables	Durables
IMU main	**0.13**	**0.21**	**0.19**	**0.15**
	[0.78]	[0.54]	[0.83]	[0.54]
△ HP ('000 €)	**9.01*** **	**0.65**	**8.89*** **	**0.70**
	[1.83]	[0.70]	[1.87]	[0.67]
Observations	2,480	2,480	2,419	2,419
R^2	0.15	0.02	0.15	0.02
Panel B	Full sample		Home-owners	
	Non durables	Durables	Non durables	Durables
IMU main	**0.12**	**0.23**	**0.18**	**0.17**
	[0.79]	[0.54]	[0.84]	[0.55]
IMU other	**0.08**	**-0.13**	**0.06**	**-0.13**
	[0.19]	[0.09]	[0.21]	[0.10]
△ HP ('000 €)	**9.01*** **	**0.65**	**8.89*** **	**0.71**
	[1.83]	[0.69]	[1.86]	[0.67]
Observations	2,480	2,480	2,419	2,419
R^2	0.15	0.02	0.15	0.02

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned.Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table 5: Baseline results.

Panel A	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**-0.05**	**-0.43****	**-0.09**	**-0.42****
	[0.57]	[0.18]	[0.53]	[0.20]
△ HP ('000 €)	**9.73*****	**0.27**	**9.73*****	**0.43**
	[0.97]	[0.46]	[1.01]	[0.49]
Observations	4,002	4,002	3,122	3,122
R^2	0.15	0.02	0.16	0.02
Panel B	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**-0.05**	**-0.44****	**-0.08**	**-0.43****
	[0.57]	[0.18]	[0.53]	[0.20]
IMU other	**-0.05**	**0.06**	**-0.06**	**0.09**
	[0.44]	[0.09]	[0.44]	[0.09]
△ HP ('000 €)	**9.74*****	**0.26**	**9.74*****	**0.42**
	[0.97]	[0.47]	[1.02]	[0.49]
Observations	4,002	4,002	3,122	3,122
R^2	0.15	0.02	0.16	0.02

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods. (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)"Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned.Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table 6: Liquid wealth to income ratio.

Panel A *lower liquid wealth*	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**-0.41**	**-0.93*** **	**-0.09**	**-0.85***
	[0.96]	[0.32]	[1.03]	[0.44]
IMU other	**-0.21**	**0.37**	**-0.17**	**0.31**
	[1.64]	[0.63]	[1.69]	[0.59]
△ HP ('000 €)	**12.01*** **	**-0.16**	**11.85*** **	**-0.03**
	[2.62]	[0.95]	[2.58]	[0.88]
Observations	1,525	1,525	1,052	1,052
R^2	0.15	0.03	0.18	0.06
Panel B *higher liquid wealth*	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**0.02**	**-0.32**	**-0.01**	**-0.30**
	[0.88]	[0.88]	[0.88]	[0.31]
IMU other	**-0.02**	**0.01**	**-0.03**	**0.03**
	[0.51]	[0.10]	[0.51]	[0.10]
△ HP ('000 €)	**9.43*** **	**0.55**	**9.35*** **	**0.64**
	[1.30]	[0.55]	[1.30]	[0.57]
Observations	2,477	2,477	2,070	2,070
R^2	0.17	0.03	0.18	0.04

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned."LLW" indicates "Low Liquid Wealth" households defined as the household with net liquid wealth below one month of disposable income. "HLW" indicates "High Liquid Wealth" households defined as the household with net liquid wealth above one month of disposable income. Net liquid wealth is defined as total financial assets (variable "af" in dataset "ricfXX.dta") net of unsecured debt and mortgage payments. Disposable income refers to variable "y2" in dataset "consXX.dta" (where the suffix XX indicates the year of the survey). Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table 7: Debtors (mortgagors) vs. non-debtors (non-mortgagors).

Panel A *total debt*	Non-debtors		Debtors	
	Non-durables	Durables	Non-durables	Durables
IMU main	**-0.09**	**0.13**	**0.16**	**-2.71*** **
	[0.56]	[0.22]	[1.42]	[0.56]
IMU other	**-0.12**	**0.08**	**0.15**	**0.13**
	[0.54]	[0.12]	[0.90]	[0.45]
△ HP ('000 €)	**10.24*** **	**0.04**	**7.19*** **	**0.33**
	[1.32]	[0.44]	[2.26]	[1.13]
Observations	3,121	3,121	881	881
R^2	0.15	0.03	0.21	0.07
Panel B *mortgage debt*	Non-mortgagors		Mortgagors	
	Non-durables	Durables	Non-durables	Durables
IMU main	**-0.01**	**-0.17**	**-0.34**	**-2.60** **
	[0.66]	[0.21]	[2.55]	[1.02]
IMU other	**-0.02**	**0.07**	**0.24**	**-0.09**
	[0.47]	[0.10]	[1.47]	[0.75]
△ HP ('000 €)	**9.85*** **	**0.19**	**6.62**	**0.61**
	[1.20]	[0.46]	[4.20]	[1.92]
Observations	3,582	3,582	420	420
R^2	0.14	0.02	0.27	0.11

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively. $\triangle HP$ refers to the change of (self-reported) market value of all properties owned. "Debtors" refer to households with (secured or unsecured) debt at the end of 2012 (meaning with positive entry of the variable "pf" in database "ricf12.dta")."Mortgagors" refer to households with mortgage debt at the end of 2012 (meaning with positive entry of the variable "deb12a" in database "fami12.dta"). Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table 8: Savings.

	Non-Debtors	Debtors	Non-mortgagors	Mortgagors
IMU main	**-1.24***	**0.99**	**-1.02***	**1.76****
	[0.59]	[1.00]	[0.57]	[0.62]
IMU other	**-0.30**	**-0.86****	**-0.35***	**-1.72****
	[0.21]	[0.32]	[0.20]	[0.70]
△ HP ('000 €)	**-3.51**	**-1.17**	**-3.94**	**-4.15**
	[2.83]	[3.54]	[2.36]	[3.57]
Observations	3,121	881	3,582	420
R^2	0.15	0.19	0.15	0.25

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. The dependent variable is "Savings" computed as described in the main text. IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. "Debtors" refer to households with debt at the end of 2012 (meaning with positive entry of the variable "pf" in database "ricf12.dta")."Mortgagors" refer to households with mortgage debt at the end of 2012 (meaning with positive entry of the variable "deb12a" in database "fami12.dta"). Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area, (iv) expectations about household income and local house prices, and household income in 2010.

Table 9: Vehicles versus non-vehicles durable expenditure

Panel A	Full sample		Home-owners	
	Non-vehicles	Vehicles	Non-vehicles	Vehicles
IMU main	**0.16**	**-0.61*** **	**0.18**	**-0.61*** **
	[0.12]	[0.17]	[0.12]	[0.19]
IMU other	**-0.01**	**0.08**	**-0.01**	**0.10**
	[0.07]	[0.09]	[0.07]	[0.08]
△ HP ('000 €)	**0.49***	**0.23**	**0.49***	**-0.07**
	[0.27]	[0.34]	[0.27]	[0.34]
Observations	4,002	4,002	3,122	3,122
R^2	0.02	0.02	0.03	0.02
Panel B	Debtors		Mortgagors	
	Non-vehicles	Vehicles	Non-vehicles	Vehicles
IMU main	**-0.33**	**-2.38*** **	**-0.06**	**-2.54** **
	[0.36]	[0.55]	[0.55]	[1.02]
IMU other	**-0.09**	**0.22**	**-0.47**	**0.38**
	[0.15]	[0.36]	[0.46]	[0.65]
△ HP ('000 €)	**1.06**	**-0.73**	**2.28**	**-1.67**
	[0.74]	[0.99]	[1.37]	[1.30]
Observations	881	881	420	420
R^2	0.06	0.07	0.10	0.09

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non-vehicles" refers to the change in household expenditure on durable goods excluding vehicles (variable "cd2" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Vehicles" refers to the change in household expediture on vechicles (variable "cd1" in dataset "consXX.dta"). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table 10: Municipal car registrations.

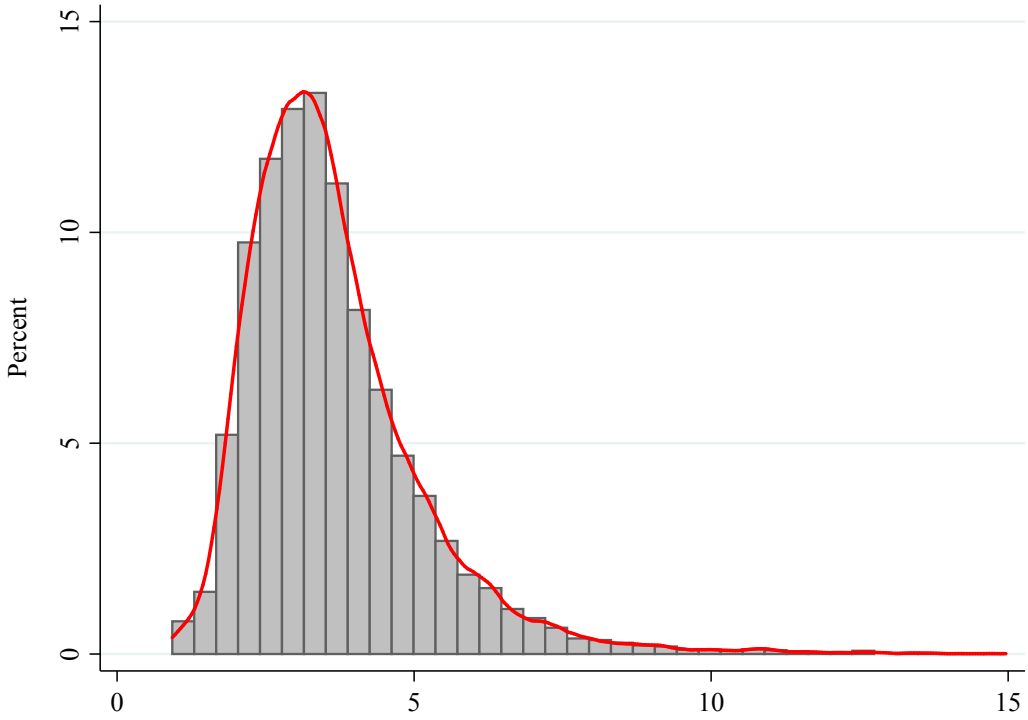
	(I)	(II)	(III)	(IV)
IMU main	**-0.020****	**-0.012****	**-0.013****	**-0.012****
	[0.009]	[0.006]	[0.006]	[0.006]
IMU other	**-0.006**	**-0.002**	**-0.002**	**-0.003**
	[0.005]	[0.003]	[0.003]	[0.003]
Controls				
Provincial dummies	YES	YES	YES	YES
Local activity		YES	YES	YES
Population			YES	YES
Local expenditure				YES
Observations	6,836	4,646	4,646	4,646
R^2	0.020	0.029	0.030	0.031

Note: robust standard errors clustered by province in brackets. *** indicates significance at 1% level, **at 5% * at 10%. All regressions refer to 2012. The dependent variable is the percent change between 2011 and 2012 of municipal car registrations (data available at: http://www.aci.it/laci/studi-e-ricerche/dati-e-statistiche/autoritratto.html). IMUmain and IMUother refer respectively to the municipal IMU rate on the main dwelling and on other residential properties. IMUmain and IMUother are multiplied by 1,000 (therefore 0.2% is expressed as 2). "Local activity" refers to three variables: the percent change (between 2011 and 2012) of declared personal income, the percent change of business income, and the percent change in night light density. "Population" refers to the percent change in population. "Local expenditure" refers to the per capita change of municipal government total expenditure (current plus capital).

Appendix

Appendix A. House registry and market values

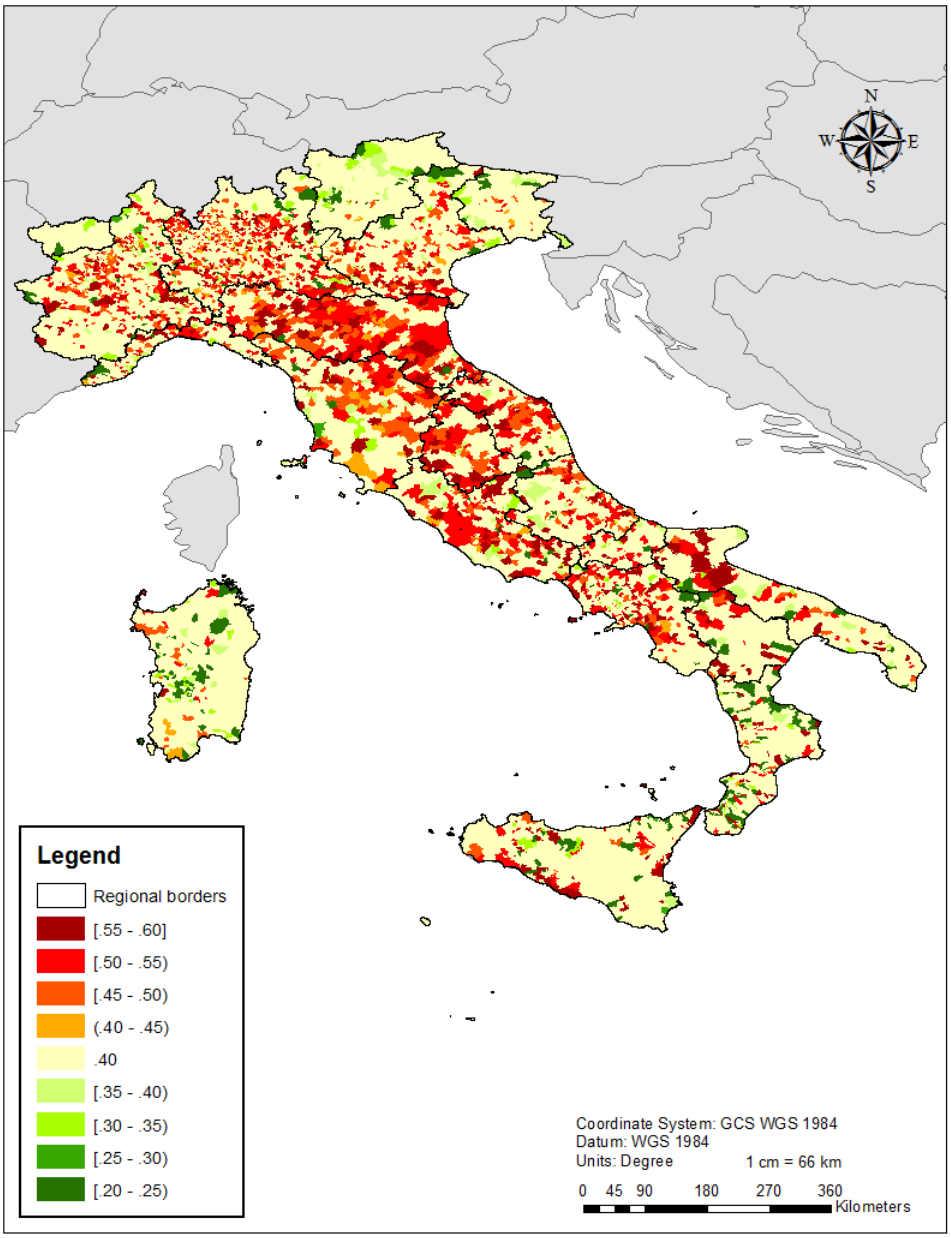
Figure A.1: Ratio between house market values and registry values.



Note: The figure plots the distribution of the ratio between house market values and registry values (averages in each municipality for a total of 7,867 observations). The mean of the distribution is 3.64 and the standard deviation is 1.48. The figure refers to 2009, average of all types of residential houses. Registry values are essentially stable over time because of their nature while market values are time dependent. The red line plots the Epanechnikov kernel density with a bandwidth of 0.2350. Source: authors' own calculation on Ministry of Economics and Finance data. Specifically, we rely on the data of the fiscal department ("Agenzia delle Entrate"), database "OMI" ("quotazioni immobiliari dell'Osservatorio del Mercato Immobiliare dell'Agenzia delle Entrate").

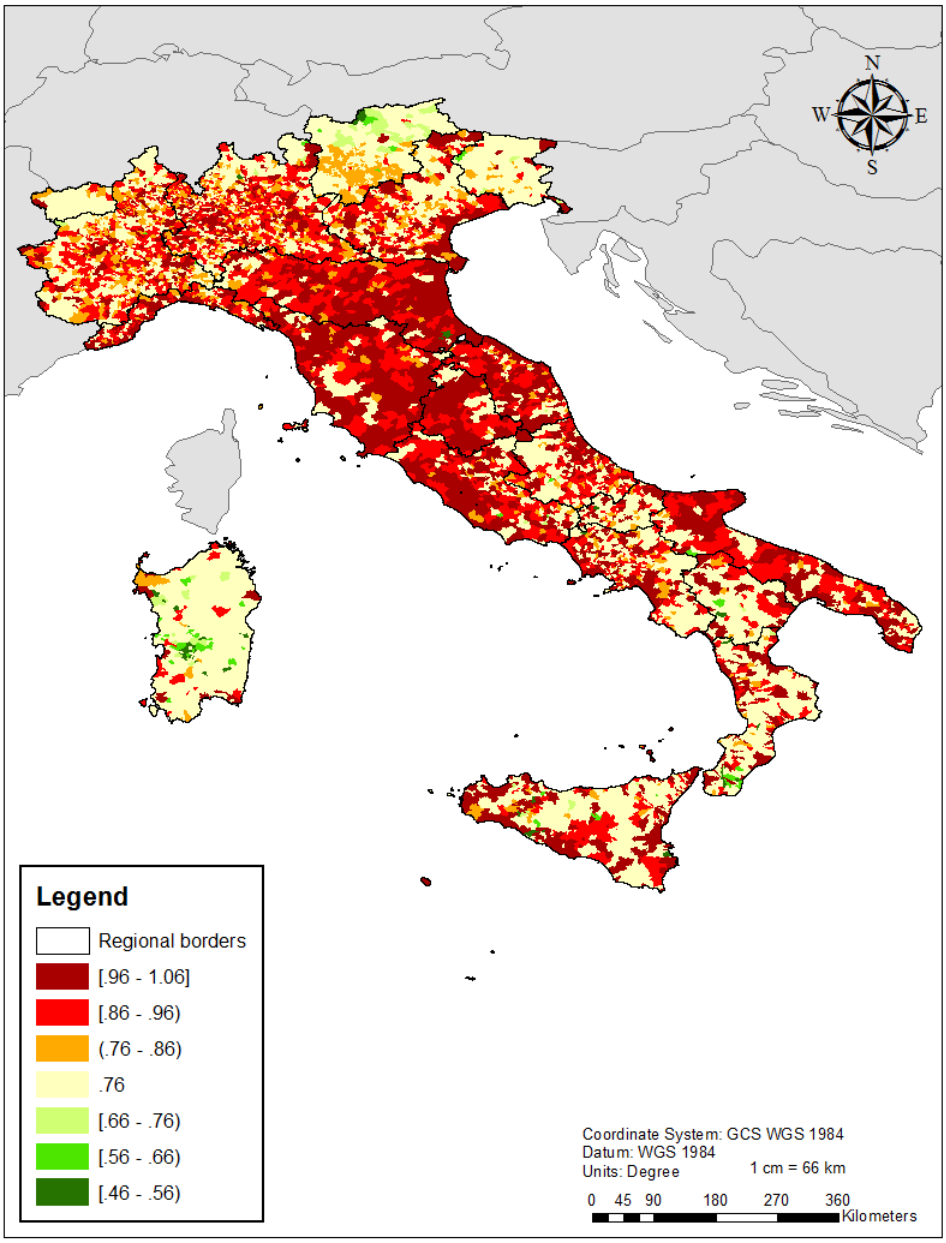
Appendix B. IMU tax rate heat maps

Figure B.1: IMU rates on main dwellings - heat map.



Note: IMU rates on main dwellings are expressed in percent. Source: authors' calculations on IFEL data (available at: http://www.webifel.it/ICI/AliquoteIMU.cfm).

Figure B.2: IMU rates on other residential properties heat map.



Note: IMU rates on other residential properties are expressed in percent. Source: authors' calculations on IFEL data (available at: http://www.webifel.it/ICI/AliquoteIMU.cfm).

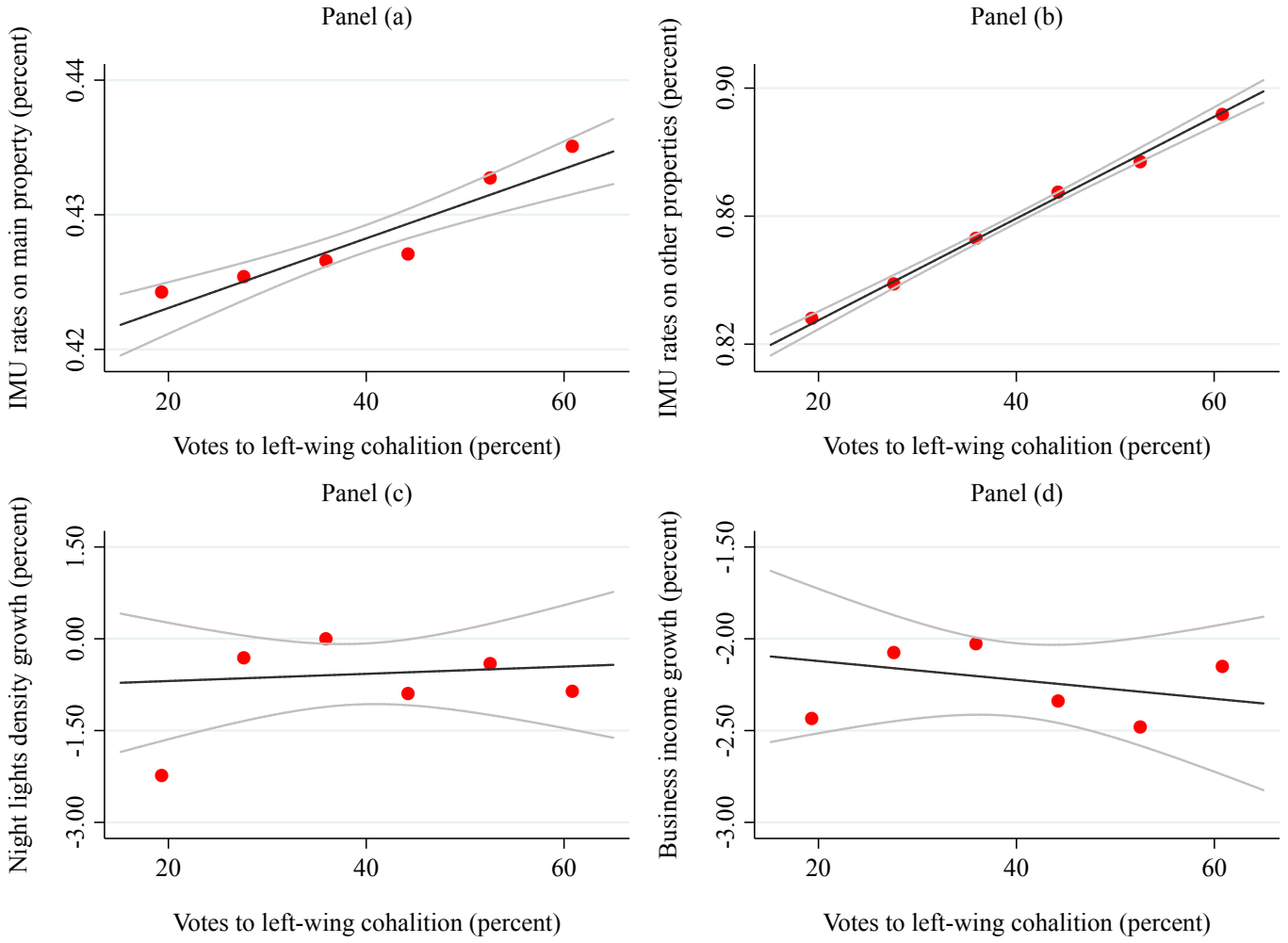
Table B.1: Correlation between IMU rates and local economic activity.

Variable	**transform**	**main dwelling rate***	**other properties rate***
Personal income 2011	level	0.154	0.121
Personal income 2010	level	0.145	0.119
Personal income 2010-2011	% change	0.056	0.016
Business income 2011	level	0.051	-0.062
Business income 2010	level	0.056	-0.031
Business income 2010-2011	% change	0.022	0.004
Night lights density 2011	level	0.115	0.205
Night lights density 2010	level	0.125	0.198
Night lights density 2010-2011	% change	0.021	0.107
IMU rate on other properties		0.323	1

* IMU rates on both main dwelling and other residential properties refer to 2012.

Night lights density correlations exclude small municipalities (< 5,000 inhabitants) and big cities (> 300,000 inhabitants).

Figure B.3: Correlations political orientation - IMU rates - local business cycle.



Note: Each dot on the charts represents the average of the respective bin. "Votes to left-wing cohalition" refers to the share of votes to the lef-wing cohalition in regional elections. For most municipalities the latest regional election before the IMU change was in 2010 (March 28th). Source: authors' calculations on IFEL data (available at: http://www.webifel.it/ICI/AliquoteIMU.cfm) and Ministry of Interior data.

Appendix C. Municipal fiscal balances

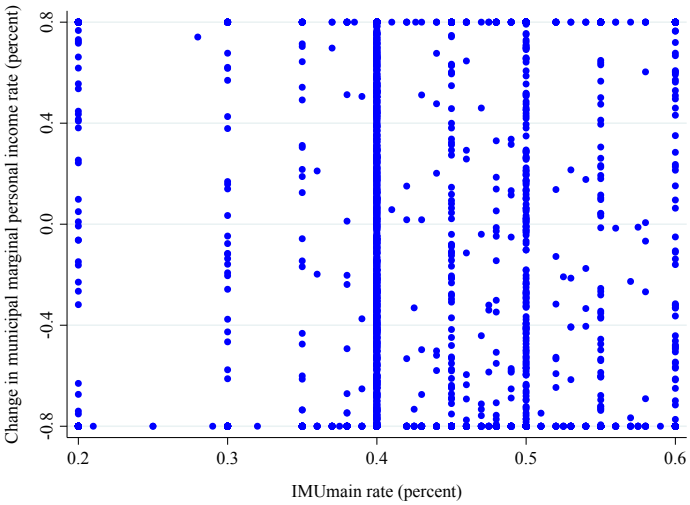
Table C.1: Summary statistics of municipal fiscal balances.

		2011		2012	
Variable	**Unit**	*Mean*	*St. Dev*	*Mean*	*St. Dev*
Total Expenditure (a)	Euro per capita	1,344.3	898.9	1,301.9	860.6
Total Revenues (b)	Euro per capita	1,299.9	865.1	1,322.5	851.4
Tax revenues	Euro per capita	730.5	329.9	792.8	343.9
IMU tax revenues	Euro per capita	162.5	121.3	250.6	143.1
Transfers	Euro per capita	183.8	356.2	161.6	337.4
Transfers from central government	Euro per capita	67.1	133.1	55.7	109.8
Loans	Euro per capita	106.4	244.0	97.0	226.1
Dismissals	Euro per capita	173.9	451.5	171.4	449.3
Other revenues	Euro per capita	105.2	108.5	99.5	99.0
Balance (b) - (a)	Euro per capita	**-44.3**	**99.5**	**20.6**	**100.8**
Number of observations		**7,355**		**7,355**	

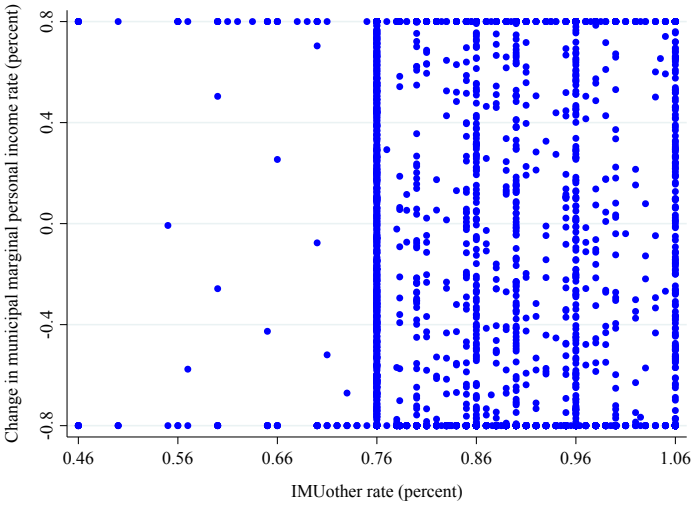
Note: All figures are real in 2012 Euros. Total expenditure refers to the variable "Totale Generale delle Spese" in "Quadro 3" of the municipal balance sheets. Total revenues refers to the variable "Totale generale delle entrate" in "Quadro 2" of the municipal balance sheets. Tax revenues refers to the sum of the variables "Titolo I - Totale entrate tributarie" and "Titolo III - Totale entrate extratributarie" in "Quadro 2" of the municipal balance sheets. Transfers refers to the sum of all transfers from higher level of governments, that is the variable "Titolo II - Entrate derivanti da contributi e trasferimenti correnti" in municipal balance sheets. Loans refers to the variable "Titolo V - Entrate derivanti da accensione prestiti" in "Quadro 2" of the municipal balance sheets. Dismissals refers to the variable "Titolo IV - Entrate derivanti da alienazione, da trasferimenti di capitali e da riscossioni di crediti". "Mean" calcualted by aggregating the variables and dividing by the sum of total population in each year. Source: Ministry of Interior data (publicly available at: http://finanzalocale.interno.it/apps/floc.php/in/cod/4).

Figure C.1: Correlation between change of IRPEF marginal rates and IMU rates.

Panel (A): IRPEF rates - IMUmain rates.



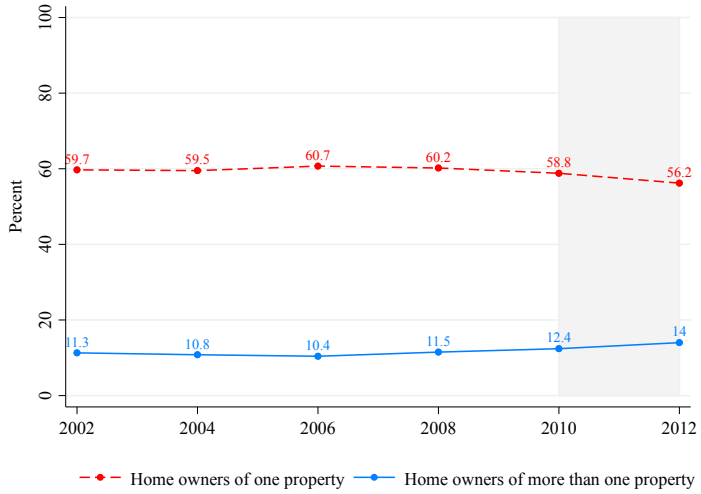
Panel (B): IRPEF rates - IMUother rates.



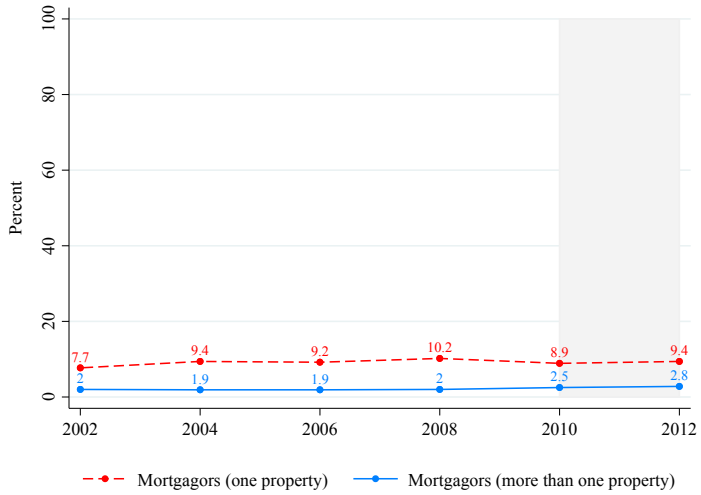
Note: The figures show the correlation between the change in municipal marginal income rates (IRPEF) between 2011 and 2012 and the IMU rates (panel (a) for the IMU main rates and panel (b) for the IMU other rates). The change in municipal marginal income rates have been estimated as the difference between the (percent) change of tax revenues (out of personal income tax) and the change of the tax base (declared personal income at the municipal level). The correlation between changes in marginal IRPEF rates and IMUmain rates is -0.0536 while the one with IMUother rates is -0.0045. Source: authors' calculations on Ministry of Interior data (available at: http://finanzalocale.interno.it/apps/floc.php/in/cod/4).

Appendix D. Share of home-owners and mortgagors over time

Figure D.1: Evolution over time of ownership and mortgage position.
Panel (A): share of home-owners over time.



Panel (B): share of households with a mortgage debt over time.



Note: Panel (A) shows the percentage of households that own one property (red line) and more than one property (blue line) as a share of the total number of households across all observations in each SHIW wave. Panel (B) shows the percentage of mortgagors that own one property (red line) and more than one property (blue line) as a share of total number of households. To determine the home-owner households we rely on the database "qXXd.dta" (where the letters "XX" indicates the year of the SHIW survey) and include all households listed in it. Mortgagors are determined using the variable "deb12a" in database "famiXX.dta". All observations are weighted averages. Source: authors' calculations on Bank of Italy (SHIW surveys, several years) data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Appendix E. Selected 2012 SHIW survey questions

Appendix E.1. Questions about the IMU taxes

We rely on questions D33, D34, D35, D36 and D37 of the 2012 survey.[25] The questions asks the following. **Question D33:** *"In 2012 , did you or a member of your household have to pay the Municipal Property Tax (IMU) for principal residence?"*. **Question D34:** *"What was the total amount paid in 2012?"*. **Question D35:** *"During 2012 did you or a member of your household have to pay the Municipal Property Tax on other properties (if they are co-owned with non-members of your household, please consider only your own portion)?"*. **Question D36:** *"What was the total amount you paid in 2012?"*. **Question D37:** *"In your opinion, which is the probability that the Municipal Property Tax (IMU) will be abolished within the next five years and not replaced by another similar tax? On a scale of 0 to 100, assign a low number if there is little chance of this happening and a high one if there is a good chance"*.

Appendix E.2. Questions about expectations

We capture households expectations about future income and house prices relying on a set of questions in Section C of the 2012 SHIW survey. Specifically, we rely on questions C47, C48, and C49. The survey randomizes these questions according to the year of birth (even versus odd) of the household's head. Specifically, to the first subset of households (year of birth even number), the survey asked the following questions. **Question C47:** *Twelve months from now, your household's income will be (please distribute 100 points): (i) much higher than today (by 10 percent of more), (ii) somewhat higher (2 to 10 percent), (iii) basically the same (no more than a 2 percent increase or decrease), (iv) somewhat lower (2 to 10 percent), (v) much lower than today (by 10 percent or more).* **Question C48:** *Twelve months from now, the price of a house in your neighborhood will be (please distribute 100 points): (i) much higher than today (by 10 percent of more), (ii) somewhat higher (2 to 10 percent), (iii) basically the same (no more than a 2 percent increase or decrease), (iv) somewhat lower (2 to 10 percent), (v) much lower than today (by 10 percent or more).*

[25] The answers are reported in the "q12d.dta" dataset available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/.

To the remaining households (year of birth odd number) the survey asks the following questions. **Question C47:** *Twelve months from now, your household's income will be higher than today, even by just one Euro (on a scale of 0 to 100).* **Question C47a:** *(if C47 >= 50) Supposing it is higher, it will be at least 5 percent higher (on a scale of 0 to 100).* **Question C47b:** *(if C47 < 50) Supposing it is lower, it will be at least 5 percent lower (on a scale of 0 to 100).* **Question C48:** *Twelve months from now, the price of a house in your neighborhood will be higher than today, even by just one Euro (on a scale of 0 to 100).* **Question C48a:** *(if C48 >= 50) Supposing is is higher, it will be at least 5 percent higher (on a scale of 0 to 100).* **Question C48b:** *(if C48 < 50) Supposing it is lower, it will be at least 5 percent lower (on a scale of 0 to 100).*

Appendix E.3. Measuring expectations and uncertainty

We capture households expectations with four dummies, two dummies for future income (one for expected higher future income, and one for expected lower future income) and two dummies for future house prices (one for expected higher future house prices, and one for expected lower future house prices). In order to make the first set of questions comparable with the second set, we construct the expectations dummies as follows. We construct the dummy "expected higher income" assigning the value of one if the sum of the answers to points (i) and (ii) in question C47 (for the first group) is higher than 70 or, equivalently, if the answer to question C47a is higher than 70 (for the second group). We also evaluated other cutoffs (60, 80), resulting in very similar findings. Along the same lines, we construct the dummy "expected lower income" assigning the value of one if the sum of the answers to points (iv) and (v) in question C47 (for the first group) is higher than 70 or, equivalently, if the answer to question C47b is higher than 70 (for the second group). Following the same logic, we construct the dummies "expected higher house prices" and "expected lower house prices" relying on questions C48, C48a, and C48b. Finally, we proxy uncertainty relying both on the questions above and on C50 (C50a, C50b) which ask about future level of the Italian stock market index. We consider in the "lower uncertainty" group households with expectations exceeding 70 percent probability in at least one of the aforementioned questions and in the "higher uncertainty" group the remaining households (i.e. with expectations equal or below 70 percent probability for all set of questions on future income, local house prices and stock market).

Appendix F. Main fiscal aggregates - Italian economy

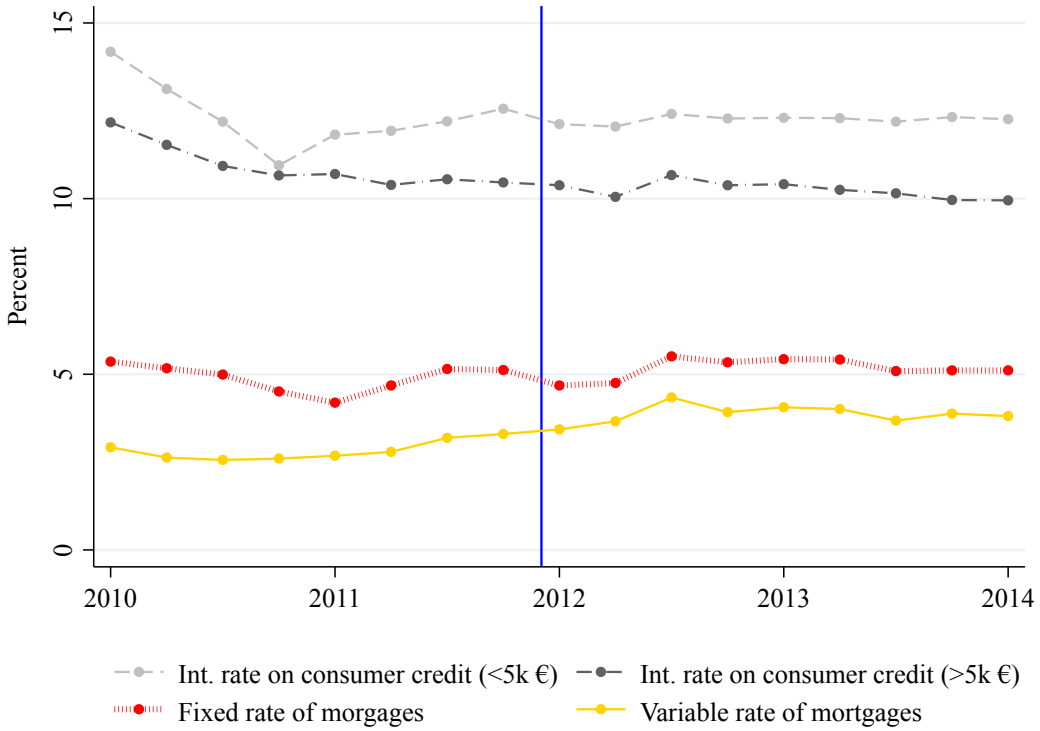
Table F.1: Main fiscal aggregates.

	2011	2012	% change
Total current expenditure	771.6	765.1	-0.8
Wages	174.0	166.2	-4.5
Intermediate consumption	89.4	87.0	-2.7
Final consumption	329.2	315.7	-19.5
Interest payments	78.4	84.1	7.3
Transfers to households	5.4	6.1	13.0
Total capital expenditure	63.7	64.5	1.3
Total expenditure	**835.3**	**829.6**	**-0.7**
Total current revenues	765.7	775.1	1.2
Indirect taxes	237.1	246.1	3.8
Direct taxes	232.7	239.7	3.0
Total capital revenues	11.0	5.9	-46.4
Total revenues	**776.7**	**781.0**	**0.6**
Fiscal balance	**-58.7**	**-48.6**	**-17.2**
GDP	**1,620.7**	**1,566.9**	**-3.9**

Note: all figures are in real 2012 Euros.
Transfers to households include current and capital transfers.

Appendix G. Interest rates

Figure G.1: Interest rates.



Note: The interest rates refer to the average global effective rates (in Italian "Tassi effettivi globali medi (TEGM)"). The TEGMs include all commissions, excluding taxes. The blue vertical line indicates the month in which the IMU tax was introduced. The data are provided by the Bank of Italy (available at the following link: http://www.bancaditalia.it/compiti/vigilanza/compiti-vigilanza/tegm/index.html).

Appendix H. Details on the construction of some relevant variables

Appendix H.1. "Super-cars" dummy

We proxy the increase of taxes on "super-cars" with the value of the car if above 40,000 times the average yearly tax rate on "super-cars" of 1.26 percent estimated using Automobile Club of Italy data.

Appendix H.2. "Austerity non-IMU" variable

For the electricity bill, we take the 5.8 percent (equal to the marginal increase in taxation) of the 2010 consumption (estimated from the 2012 answer to question E10a-B reported in database "q12e.dta", assuming constant growth in non-durable expenditure). Similarly, for cooking gas, we take the 1.8 percent (equal to the marginal increase in taxation) of the 2010 consumption of cooking gas (estimated from the 2012 answer to question E10a (A and C), assuming constant growth rate in non-durable expenditure). For the gasoline, we multiply the 2010 consumption on gasoline (estimated from the 2012 answer to question E10a-F, assuming constant growth in non-durable expenditure divided by the average 2010 price at the pump (1.538 Euro per liter - source: Ministry of Economics and Finance and Ministry of Development Economics data available at: http://dgerm.sviluppoeconomico.gov.it/dgerm/prezzimedi.asp)) by 0.1944 (equal to the marginal increase in taxation). Finally, for the increase of personal income tax, we multiply the 2010 income by the increase in the marginal regional tax rate on personal income ("addizionali regionali IRPEF", source: Ministry of Economics and Finance data available at: http://www.finanze.gov.it/export/finanze/Per_conoscere_il_fisco/Fiscalita_locale/newaddre in the relevant region.

Appendix I. New (and used) car registrations

Table I.1: Annual car registrations.

	2010			2011			2012			2013		
	#	%	△	#	%	△	#	%	△	#	%	△
FIAT	594.7	30.3	-15%	514.8	29.4	-13%	415.0	29.5	-19%	373.9	28.6	-9%
ALFA ROMEO	51.9	2.6	-6%	58.1	3.3	12%	42.1	3.0	-27%	31.6	2.4	-25%
LANCIA-CHRYSLER	88.4	4.5	-13%	85.5	4.9	-3%	71.4	5.1	-16%	57.0	4.4	-20%
TOTAL NATIONAL (A)	**601.1**	**30.6**	**-15%**	**518.9**	**29.7**	**-13%**	**416.1**	**29.7**	**-19%**	**374.0**	**28.7**	**-9%**
AUDI	59.9	3.1	-0%	60.6	3.5	1%	51.0	3.6	-15%	47.7	3.7	-6%
BMW	53.8	2.7	-2%	50.7	2.9	-5%	42.4	3.0	-16%	42.5	3.3	0%
CHEVROLET	36.8	1.9	-30%	32.6	1.9	-11%	31.1	2.2	-4%	26.3	2.0	-15%
CITROEN	105.6	5.4	-4%	81.6	4.7	-22%	69.4	5.0	-14%	57.8	4.4	-16%
DACIA	22.4	1.1	7%	25.9	1.5	15%	26.0	1.9	0%	27.0	2.1	3%
FORD	182.4	9.3	-13%	146.8	8.4	-19%	99.0	7.1	-32%	87.4	6.7	-11%
HYUNDAI	36.1	1.8	-7%	43.4	2.5	20%	43.5	3.1	0%	38.3	2.9	-12%
KIA	19.0	1.0	-8%	19.4	1.1	2%	27.0	1.9	39%	29.9	2.3	10%
MERCEDES	54.3	2.8	-2%	51.1	2.9	-6%	42.3	3.0	-17%	45.6	3.5	7%
NISSAN	53.6	2.7	1%	63.2	3.6	18%	49.0	3.5	-22%	46.5	3.6	-5%
OPEL	127.4	6.5	0%	116.7	6.7	-8%	78.9	5.6	-32%	70.6	5.4	-10%
PEUGEOT	105.4	5.4	-7%	78.2	4.5	-25%	69.1	4.9	-11%	62.8	4.8	-9%
RENAULT	105.9	5.4	15%	83.3	4.8	-21%	59.8	4.3	-28%	65.7	5.0	9%
TOYOTA/LEXUS	77.5	4.0	-19%	68.9	3.9	-11%	56.4	4.0	-18%	55.8	4.3	-1%
VOLKSWAGEN	136.4	7.0	8%	138.0	7.9	1%	113.6	8.1	-18%	105.4	8.1	-7%
TOTAL IMPORTED (B)	**1,360.4**	**69.4**	**-6%**	**1,230.8**	**70.3**	**-9%**	**986.8**	**70.3**	**-19%**	**929.7**	**71.3**	**-5%**
NEW CARS (C)=(A)+(B)	**1,961.5**		**-9%**	**1,749.7**		**-10%**	**1,403.0**		**-19%**	**1,304.6**		**-7%**
USED CARS (D)	**2,802.8**		**-1%**	**2,792.1**		**-0%**	**2,500.0**		**-10%**	**2,509.9**		**+0%**
TOTAL (C) + (D)	**4,764.3**		**-4%**	**4,541.9**		**-5%**	**3,903.0**		**-14%**	**3,814.6**		**-2%**

Note: in thousand units if not otherwise indicated. Producers with less than 20 thousand units sold per year not included. # is the number (in '000) of units sold, % is the annual market sales share, △ refers to the change relative to the previous calendar year. Source: ministry of infrastructure and transport.

Appendix J. Further results

Table J.1: Interaction terms - durable goods.

	LLW	Debtors	Mortgagors
IMU main	**-0.27**	**-0.09**	**-0.27**
	[0.27]	[0.26]	[0.21]
IMU other	**0.03**	**0.01**	**0.06**
	[0.09]	[0.10]	[0.09]
IMU main + Interaction main	**-0.89*** **	**-2.19*** **	**-2.12*** **
	[0.34]	[0.65]	[0.68]
IMU other + Interaction other	**0.36**	**0.25**	**-0.01**
	[0.31]	[0.38]	[0.73]
△ HP ('000 €)	**0.27**	**0.28**	**0.27**
	[0.49]	[0.47]	[0.47]
P-values of the H0:			
Interaction main = 0	0.225	0.018	0.010
Interaction other = 0	0.285	0.568	0.926
Observations	4,002	4,002	4,002
R^2	0.02	0.02	0.02

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. The left-hand-side variable "durables" refers to the change in household expenditure on durable goods. IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. "LLW" indicates "Low Liquid Wealth" households defined as the household with net liquid wealth below one month of disposable income. IMU (other) + Interaction refers to the sum of the coefficients of IMU (other) and the interaction between IMU (other) and a dummy respectively identifying the LLW, debtors and mortgagors. The dummies identifying the LLW, debtors and mortgagors are also added as controls. The threshold to identify Low Liquid Wealth (LLW) households is a value of net liquid wealth below one month of household income. Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table J.2: Age groups.

Full sample	Younger cohorts			Older cohorts		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**0.41**	**-0.68**	**-0.98****	**-0.24**	**-0.36**	**-0.46****
	[1.04]	[0.58]	[0.44]	[0.62]	[0.24]	[0.21]
IMU other	**-0.26**	**0.58**	**0.22**	**-0.05**	**0.04**	**0.05**
	[0.79]	[0.44]	[0.39]	[0.59]	[0.09]	[0.08]
△ HP ('000 €)	**8.79*****	**0.11**	**-1.72***	**9.86*****	**0.31**	**0.12**
	[1.77]	[1.04]	[0.94]	[1.40]	[0.43]	[0.39]
Observations	1,080	1,080	1,080	2,922	2,922	2,922
R^2	0.20	0.05	0.04	0.18	0.02	0.02
Home-owners	Younger cohorts			Older cohorts		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**0.60**	**-1.36****	**-1.60*****	**-0.38**	**-0.22**	**-0.32**
	[0.96]	[0.61]	[0.49]	[0.65]	[0.24]	[0.19]
IMU other	**-0.33**	**0.87**	**0.30**	**-0.01**	**0.01**	**0.04**
	[0.74]	[0.58]	[0.47]	[0.59]	[0.09]	[0.08]
△ HP ('000 €)	**9.86*****	**0.84**	**-0.90**	**9.68*****	**0.34**	**0.17**
	[1.88]	[1.30]	[1.03]	[1.43]	[0.41]	[0.38]
Observations	800	800	800	2,322	2,322	2,322
R^2	0.25	0.06	0.05	0.19	0.03	0.02

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods. (variable "cn" in dataset "consXX.dta")"Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta"). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. Younger (Older) cohorts defined as the younger 25 (older 75) percent of the household head's age distribution. Control variables include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table J.3: Income groups.

Full sample	Lower income			Higher income		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**0.61**	**-0.56**	**-0.70**	**-0.20**	**-0.47***	**-0.66*****
	[1.39]	[0.61]	[0.58]	[0.56]	[0.23]	[0.21]
IMU other	**-1.11**	**0.23**	**0.29**	**-0.03**	**0.05**	**0.06**
	[1.12]	[0.34]	[0.31]	[0.45]	[0.08]	[0.08]
△ HP ('000 €)	**14.53*****	**-0.16**	**-0.83**	**9.27*****	**0.30**	**-0.19**
	[2.76]	[0.93]	[0.55]	[0.95]	[0.50]	[0.36]
Observations	1,001	1,001	1,001	3,001	3,001	3,001
R^2	0.20	0.08	0.09	0.15	0.03	0.02
Home-owners	Lower income			Higher income		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**0.55**	**-0.35**	**-0.64**	**-0.28**	**-0.46***	**-0.64*****
	[1.56]	[0.66]	[0.65]	[0.54]	[0.23]	[0.22]
IMU other	**-0.83**	**0.16**	**0.28**	**-0.03**	**0.06**	**0.07**
	[1.27]	[0.40]	[0.33]	[0.45]	[0.09]	[0.08]
△ HP ('000 €)	**14.62*****	**-0.51**	**-0.88**	**9.37*****	**0.42**	**-0.08**
	[2.55]	[0.95]	[0.52]	[0.98]	[0.51]	[0.35]
Observations	497	497	497	2,625	2,625	2,625
R^2	0.30	0.11	0.15	0.15	0.02	0.02

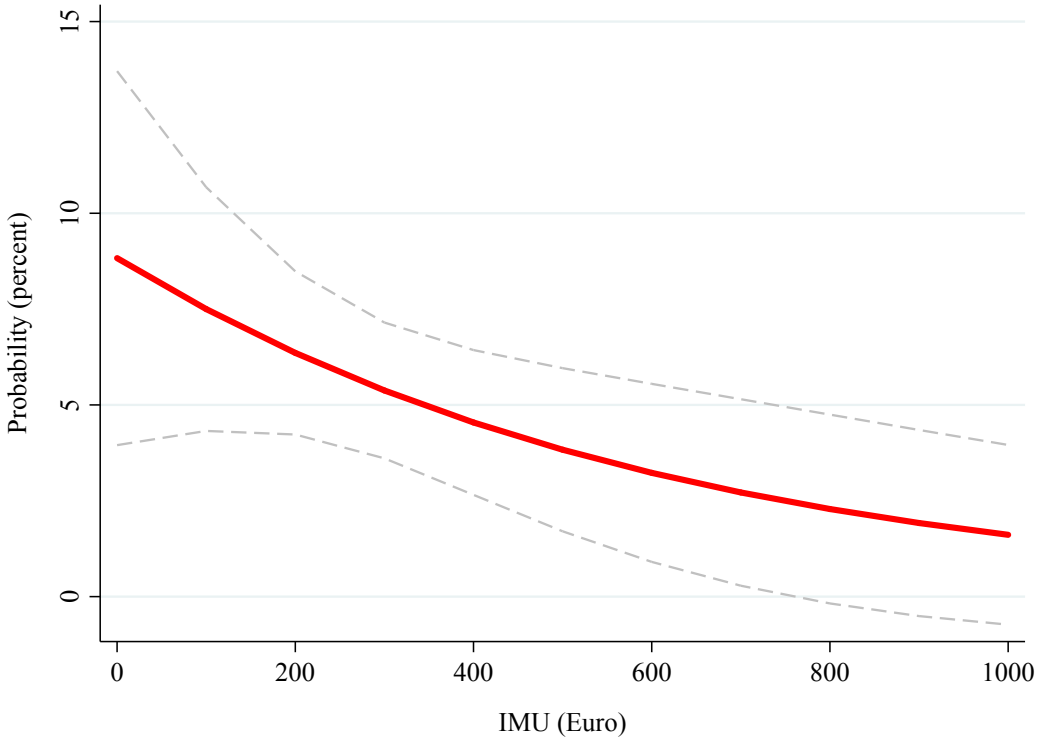
Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods. (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)"Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. Lower (Higher) income cohorts defined as the bottom 25 (upper 75) percent of the household income distribution. "Vehicles" refers to the change in household expediture on vechicles (variable "cd1" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table J.4: Probit regressions.

Panel A	Full sample		Home-owners	
	Non-vehicles	Vehicles	Non-vehicles	Vehicles
IMU main	**0.11**	**-0.18**	**0.16**	**-0.16**
	[0.12]	[0.11]	[0.12]	[0.11]
IMU other	**-0.06**	**-0.03**	**-0.07***	**-0.03**
	[0.04]	[0.05]	[0.04]	[0.05]
△ HP ('000 €)	**0.01**	**0.01**	**0.01**	**0.01**
	[0.01]	[0.01]	[0.01]	[0.01]
Observations	4,002	4,002	3,122	3,122
Area under ROC	0.63	0.77	0.62	0.76
Panel B	Debtors		Mortgagors	
	Non-vehicles	Vehicles	Non-vehicles	Vehicles
IMU main	**-0.15**	**-0.93*** **	**0.01**	**-0.95** **
	[0.24]	[0.27]	[0.31]	[0.47]
IMU other	**-0.22** **	**0.02**	**-0.10**	**0.17**
	[0.09]	[0.10]	[0.18]	[0.19]
△ HP ('000 €)	**-0.01**	**-0.01**	**-0.01**	**-0.01*** **
	[0.01]	[0.01]	[0.01]	[0.01]
Observations	877	877	414	414
Area under ROC	0.66	0.82	0.71	0.80

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non Vehicles" refers to the change in household expenditure on durable goods, excluding vehicles (variable "cd2" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Vehicles" refers to the change in household expediture on vechicles (variable "cd1" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. "Debtors" refer to households with debt at the end of 2012 (meaning with positive entry of the variable "pf" in database "ricf12.dta")."Mortgagors" refer to households with mortgage debt at the end of 2012 (meaning with positive entry of the variable "deb12a" in database "fami12.dta"). Probit estimated via maximum likelihood.Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Figure J.4: IMU marginal.



Note: The figure shows the marginal effect of the variable "IMUmain" on the dichotomous variable "buying a vehicle". The dummy variable "buying a vehicle" is constructed based on the variable "cd1" in database "cons12.dta". We assigned a value of "1" in the dummy variable for all entries greater than one. Restricting the positive entries in the dummy to higher values (for instance, values greater than 5,000 Euros in order to focus only on cars) makes little or no difference. The dashed lines plot the 95 percent confidence intervals. Source: authors' calculations on SHIW survey data (available at: https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/).

Table J.5: Uncertainty.

Full sample	Lower uncertainty			Higher uncertainty		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**-0.54**	**-0.83**	**-0.88***	**0.32**	**-0.16**	**-0.39***
	[0.95]	[0.55]	[0.46]	[0.62]	[0.29]	[0.22]
IMU other	**0.10**	**0.25**	**0.34**	**-0.34**	**0.05**	**-0.02**
	[0.62]	[0.30]	[0.25]	[0.50]	[0.12]	[0.10]
△ HP ('000 €)	**8.94*****	**1.06**	**-0.06**	**10.13*****	**-0.18**	**-0.29**
	[1.57]	[0.84]	[0.79]	[1.50]	[0.58]	[0.42]
Observations	1,539	1,539	1,539	2,463	2,463	2,463
R^2	0.14	0.03	0.03	0.18	0.03	0.03
Home-owners	Lower uncertainty			Higher uncertainty		
	Non-durables	Durables	Vehicles	Non-durables	Durables	Vehicles
IMU	**-0.55**	**-0.73**	**-0.81**	**0.23**	**-0.22**	**-0.47***
	[0.92]	[0.60]	[0.53]	[0.65]	[0.30]	[0.23]
IMU other	**0.01**	**0.30**	**0.39**	**-0.34**	**0.06**	**-0.01**
	[0.64]	[0.30]	[0.24]	[0.49]	[0.12]	[0.10]
△ HP ('000 €)	**9.19*****	**1.09**	**-0.01**	**9.91*****	**-0.05**	**-0.14**
	[1.53]	[0.77]	[0.70]	[1.57]	[0.58]	[0.39]
Observations	1,218	1,218	1,218	1,904	1,904	1,904
R^2	0.15	0.04	0.03	0.20	0.03	0.03

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey)."Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively.$\triangle HP$ refers to the change of (self-reported) market value of all properties owned. Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.

Table J.6: Baseline results without house price expectations.

Panel A	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**0.13**	**-0.43****	**0.14**	**-0.41***
	[0.65]	[0.18]	[0.60]	[0.20]
Observations	4,002	4,002	3,122	3,122
R^2	0.11	0.01	0.12	0.02
Panel B	Full sample		Home-owners	
	Non-durables	Durables	Non-durables	Durables
IMU main	**0.12**	**-0.44****	**0.13**	**-0.42***
	[0.66]	[0.18]	[0.61]	[0.20]
IMU other	**0.05**	**0.07**	**0.05**	**0.10**
	[0.43]	[0.09]	[0.43]	[0.09]
Observations	4,002	4,002	3,122	3,122
R^2	0.11	0.02	0.12	0.02

Note: robust standard errors clustered by regions in brackets. *** indicates significance at 1% level, **at 5% * at 10%. "Non durables" refers to the change in household expenditure on non durable goods. (variable "cn" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey) "Durables" refers to the change in household expenditure on durable goods (variable "cd" in dataset "consXX.dta" where the suffix "XX" indicates the year of the survey). IMU "main" and "other" refer to the tax on the main dwelling and other properties respectively. Control variables (omitted for brevity) include: (i) households demographics,(ii) geographical dummies, (iii) dummies of main dwelling commercial area,and (iv) expectations about household income and local house prices.