The Effects of Government Spending on the Distribution of Consumption

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Abstract

We study the effects of government spending on the distribution of consumption. We find a substantial degree of heterogeneity: consumption increases at the bottom and falls at the top of the distribution, implying a significant temporary reduction of consumption inequality. The effects of the shock display correlations of around -0.7/-0.9 with the percentage of stockholders within the decile. We interpret the results as in line and yielding support to models of limited participation where, while the Ricardian equivalence holds for rich households, for poor household, with no access to capital markets, the Keynesian multiplier is at work.

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1 Introduction

Little consensus has been reached among economists about the effects of government spending on consumption. In their seminal paper, Blanchard and Perotti (2002) use a VAR model and identify a government spending shock by imposing that government spending is not affected on impact by any other shock. The main finding is that government spending leads to a large increase in consumption. Similar results are obtained by Fatas and Mihov (2001), Mountford and Uhlig (2002), and Perotti (2002, 2007). On the contrary, Ramey and Shapiro (1998), using a dummy variables identification approach, find that consumption falls, implying a very small value for the government spending multiplier. Burnside, Eichenbaum, and Fisher (2004), Cavallo (2005), Edelberg, Eichenbaum, and Fisher (1999), Eichenbaum and Fisher (2005) and Ramey (2009) have similar findings.

Most of the empirical analyses have focused on aggregate consumption. From a theoretical point of view however the importance of going beyond the representative consumer and allowing for agents heterogeneity is well-understood, see Heathcote, Storesletten and Violante (2009) and Storesletten, Telmer and Yaron (2001). Heterogeneity can be particularly relevant for fiscal policy, see Kaplan (2011) and Heathcote (2005). The latter finds that with consumers heterogeneity and borrowing constraints, lump-sum cuts, which are neutral under the representative agent setting, turn out to have large real effects. Gali, Lopez Salido, and Valles (2007) extends the representative agent Neo-Keynesian model by introducing two types of consumers: consumers who are constrained in that they do not have access to capital market ("rule-of-thumb consumers") and Ricardian optimizing consumers. They show that the two types respond very differently to the government spending shock. More specifically while rule-of-thumb consumers increase consumption because a Keynesian style multiplier is at work, consumer with access to capital markets reduce consumption because the Ricardian equivalence appears to hold.

If these theoretical considerations are also empirically important, then limiting the attention to the response of aggregate consumption can hide important features of the reaction of consumption to government spending shocks. So probably the question whether aggregate consumption increase or falls after a government spending shock is misleading. The correct question to address is where, in the consumption distribution,

consumption increases or falls.

While the empirical macro literature has completely neglected heterogeneity so far, on the empirical micro front there are a few contributions providing evidence about the effects of tax rebates on consumption, see for instance Johnson, Parker, and Souleles (2006) and Misra and Surico (2011). In these papers, a high degree of heterogeneity in the response of consumption is typically found. To our knowledge, however, no evidence on the heterogeneity in the response of consumption to government spending shocks is available.

We try to fill this gap in the current paper. We investigate the effects of government spending shocks on the whole consumption distribution. The goal is twofold. First, to unveil potential heterogeneity in the response of consumption which are hidden in the analyses using aggregate variables. Second, to investigate what class of theoretical models the heterogeneity can lend empirical support to.

In order to develop our analysis we first construct household non-durable consumption expenditures from CEX data between the first quarter of 1984, and the fourth quarter of 2010 (all the available data at the time of writing). Then we compute the deciles of the consumption distribution and estimate, using the principal component estimator, the component of these variables driven by macroeconomic conditions and aggregate shocks, the so-called common component. Finally we use the common components of the consumption deciles in a VAR to study how they respond to government spending shocks. The government spending shock is identified using two alternative procedures. One is that proposed in Ramey (2011): the use newspaper sources to construct a variable containing exogenous episodes of government spending. The second is that proposed in Gambetti (2012) and is based on forecast revisions of long-run government spending.

Our main result is that after a government spending shock consumption increases at the bottom of the distribution (1st and 2nd deciles) while it falls at the top (7th to 10th deciles). The middle of the distribution responds very little. The result implies a significant temporary reduction of consumption inequality measured as the difference between top and bottom decile. A strong negative correlation, around -0.7/-0.9 depending on the particular identification strategy, between the effects of the shock within the first year and the percentage of stockholders within the decile emerges. While in the first decile only 7% of the households hold stocks, at the top of the distribution around

40% of the households hold some financial asset. We interpret this result as in line and yielding support to models of limited participation where consumers with no access to capital market increase consumption, as implied by the Keynesian multiplier, while consumer who actively participate in the capital markets reduce consumption because the Ricardian equivalence holds.

The reminder of the paper is organized as follows. Section 2 describes the data; section 3 describes the econometric framework; section 4 present and discusses the results; section 5 concludes.

2 Data description and stylized facts

We construct household non-durable consumption from CEX data spanning from the first quarter of 1984 to the fourth quarter of 2008. The CEX records consumption and expenditure for a large set of goods together with demographics and other households characteristics as income, assets and so on.[1] Here we focus on real non durable consumption expenditure per adult equivalent to capture household size and economies of scale effects (as in Attanasio and Weber, 1995, Krueger and Perri, 2006, Attanasio, Battistin and Padula, 2009, Parker and Vissing-Jorgensen, 2009).[2] Nominal consumption expenditure is constructed using the definition in Attanasio and Weber (1995); real consumption is nominal consumption divided by the CPI.[3]

We then construct consumption deciles using the population weights provided in the CEX. As we observe households more than once we need to decide how to define our deciles as households can move in and out of those deciles, in fact we have evidence that those movements are neither negligible nor confined to the marginal households. We assign households to a given decile once and for all by ordering households mean

[1] For a detailed description of the CEX see Attanasio and Weber, 1995, Goldenberg and Ryan, 2009, and Battistin and Padula, 2010.

[2] We use an equivalence scale suggested by the World Bank, i.e. we divide our relevant variables by the squared root of the number of household members.

[3] In particular we refer to the following definition extracted by Attanasio and Weber (1995), *"...In what follows we consider various components of nondurable expenditure. In particular, for reasons to be discussed below, we look at food (defined as the sum of food at home, food away from home, alcohol, and tobacco) and expenditure on other nondurable goods and services, such as services, heating fuel, public and private transport (including gasoline), and personal care, and semidurables, defined as clothing and footwear..."*.

nondurable consumption expenditure overtime. As a typical household is observed for 3 quarters, this in practice means that we average household consumption over that time period and we order that average to locate each household in the appropriate decile. This is quite important since, in so doing, we avoid confounding true variation with compositional changes in the various deciles. At the same time the averaging over the available waves, for each household, also reduces the extent of measurement error in the ranking of the consumption measure.

As the sample sizes for the CEX cohorts have changed over time, by using deciles, rather than smaller aggregations, we make sure that there are at least 80 households per decile, with max of over 300 per decile. At the same time we still preserve a substantial amount of heterogeneity as our analysis shows.[4]

It has to be noticed that our non durable consumption measure corresponds to about 44% of the after tax income for a typical (average) household. That share increases with income and consumption deciles. So that it is a smaller share for the very bottom decile at about 40% with the share being about 62% in the highest decile. Another observation is that the food share over our consumption measure decreases along the consumption deciles, from a high 50% at the bottom to about 25% for the top decile of the distribution.

In Table 1 we detail several characteristics of the composition of the different deciles. The table makes clear that different deciles include very different agents rather than similar consumers differing for their saving/consumption choices. First, as expected income increases in the deciles. Second, marked differences emerge in race: it is striking that the bottom 3 deciles contain more than 50% of the African American in the sample, with almost a quarter of blacks in the bottom decile. Third, in terms of education, as one would expect, the lower educated cluster in the bottom deciles. In particular more than half of the (up to) high-school drop outs are in the bottom 3 deciles. At the same time one in two college graduates or higher is found in the top 3 deciles of consumption. As one would expect education is a close proxy for permanent income and therefore is positively related to consumption. Finally and most importantly, there are large differences across deciles in terms of asset market participation. Not surprisinly, the share of households holding any financial asset, excluding housing, increases in the

[4]Dividing the data in twentiles has very little qualitative effect on the results presented in the current paper.

deciles. It is about 25% on average (across deciles), but goes from 6% in the bottom decile to 40% in the very top decile. These figures are in line with those in Mankiw and Zeldes (1991). This last fact is of particular importance in our perspective since below we will try to relate the responses of the consumption distribution to government spending shock with the extent of asset market participation.

3 Econometric framework

Estimation of the effects of government spending shocks on consumption entails two steps. First cleaning the data from noise and measurement errors in order to obtain the component of the consumption deciles driven by common aggregate macroeconomic shocks. Second, identifying and estimating the effects of the shock. We describe the two steps below.

3.1 Estimating the common component of the consumption deciles

Individual consumption data are plagued by measurement errors, idiosyncratic terms and other components which are completely unrelated to macroeconomic conditions in particular to government spending. When computing the distribution deciles many of these household-specific components will be averaged out. However still one can reasonably expect some of the idiosyncratic components to not completely vanish. Therefore as a first step in our analysis we try to "clean" the deciles data from such components. To do that we proceed by specifying a formal econometric framework following De Giorgi and Gambetti (2012). Let c_{it} be the consumption of the i-th decile for $i = 1, ..., 10$. We assume that c_{it} is the sum of two orthogonal components, the common component χ_{it} and the idiosyncratic component ξ_{it}:

$$c_{it} = \chi_{it} + \xi_{it} \tag{1}$$

The common component is the part of consumption which is driven by common aggregate macroeconomic shocks while the idiosyncratic component contains decile-specific characteristics unrelated to aggregate shocks. The common components are common in that they are linear combinations of a relatively small number r of possibly unobserved factors in f_t,

$$\chi_{it} = a_i f_t \tag{2}$$

where the factor loading a_i are decile-specific.

To estimate the unobserved factors we use the ten principal components of a large panel of macroeconomic data containing 108 quarterly series from 1984:I to 2010:IV (see the Appendix for details). More formally, let x_t be the (column) vector containing the 109 macroeconomic time series and the ten consumption deciles; let Γ^x be the sample variance-covariance matrix of x_t. The estimated factors are $\hat{f}_t = \hat{A}' x_t$ where $\hat{A}$ is the 119×10 matrix having on the columns the normalized eigenvectors corresponding to the first largest 10 eigenvalues of Γ^x.[5] The estimated loadings for the consumption deciles, $\hat{a}_i$, are simply the corresponding row of $\hat{A}$. Once the estimates of the factors $\hat{f}_t$ and the loading are available the estimated common components are $\hat{\chi}_{it} = \hat{a}_i \hat{f}_t$.

The approach has two main advantages. First, as mentioned, it allows to separate the component attributable to government spending and other macroeconomic shocks from the decile-specific terms. Second, as shown in De Giorgi and Gambetti (2012), such a procedure produces data which are very similar to PCE consumption data at business cycle frequencies, i.e. our transformed CEX data series matches very closely the aggregate measure of consumption derived from the National Accounts.

3.2 Identification of the government spending shock

The effects of government spending shocks are obtained using a VAR model. The model includes the ten common components of the consumption deciles plus a variable which drives the identification of the government spending shock. The identification government spending shock is still an open question. It is well known that different approaches provide different results in terms of aggregate consumption. In this paper we prefer not to rely on identification schemes *à la* Blanchard and Perotti (2003) because of the evidence provided in Ramey (2011) and Forni and Gambetti (2011). These last two papers show that approach proposed by Blanchard and Perotti (2003) delivers a shock which is Granger caused by the forecast of government spending from the Survey of Professional Forecasters. In other terms the shock cannot be the government spending shock. Moreover, under fiscal foresight, that is when government policies are anticipated by the agents, on the one hand identification schemes based on combinations of the VAR residuals are likely to fail in recovering the structural shocks (see Leeper, Walker and Yang, 2011). On the other hand if policies take time to affect fiscal variables imposing

[5] The number of factors, 10, is obtained by applying the Bai and Ng (2002) criterion.

a contemporaneous effect on government spending, as implied by the Blanchard and Perotti (2003) identification, can yield very misleading results.

Given the considerations above, we rely on two alternative identification strategies. One is that proposed in Ramey (2011): using the *Business Week* and other newspaper sources, constructs a variable containing exogenous episodes of government spending. More specifically the variable measures changes in the expected present value of government spending triggered by exogenous events. The second is that proposed in Gambetti (2012) and is based on forecast revision of long-run government spending. While the former is largely known, we will explain the second one in more details. Let g_t be the logarithm of government spending, $g_{t+q|t}$ the logarithm of the q-periods ahead forecast from the Survey of Professional Forecasters given the information available at time t.[6] We define the following two long run forecasts

$$\begin{aligned} h_t^1 &= g_{t+4|t} - g_{t+1|t} \\ h_{t-1}^2 &= g_{t+4|t-1} - g_{t+1|t-1}. \end{aligned}$$

The variable to predict, the sum of the growth rate between time $t+2$ an $t+4$, is the same in the two forecasts. What changes is the information set. Indeed h_t^1 is formed using information up to time t while h_t^2 is formed using the information only up to time $t-1$. The forecast revision is, then, defined as the difference

$$r_t = h_t^1 - h_{t-1}^2. \tag{3}$$

This variable represents the change in the long run expectation of government spending due to the new information released at time t which was not available at time $t-1$, i.e. the "news". A positive value of r_t means that professional forecasters learn (e.g. passing of a law) that government spending will increase, not immediately, but in the future.[7]

The main advantage of the first approach is that the Ramey's variable includes only truly exogenous changes in government spending. The main advantage of the second identification procedure is that it incorporates valuable information available to economic agents but presumably not conveyed in fiscal variables and consequently omitted

[6] We focus on forecasts of the growth rate because in the SPF dataset the forecast have different base year the levels cannot be used.

[7] Gambetti (2012) discusses the informational content of the forecast revision variable and shows that it is helpful for forecasting government spending.

in standard specifications. Moreover both identification procedures leave the impact response of government spending completely unrestricted. In particular, government spending can respond with several periods of delay as implied by fiscal foresight.

Identification is implemented as follows. The identifying variable, the Ramey's variable or the forecast revision, is ordered first in the VAR and the first shock in the Cholesky representation is interpreted as a government spending shock.[8]

4 Results

4.1 Statistical properties of the consumption deciles

We start off by examining the dynamics of the consumption deciles in terms of volatilities and correlations. Figure 1 shows the standard deviations and the correlations of the common component (second row), the idiosyncratic component (third row) and the common component at the business cycle frequencies of the common component (fourth row).[9]

As for the raw data (first row), both the common and the idiosyncratic component are substantially more volatile at the top end of the distribution. Both the idiosyncratic and the common components of the 10th decile are about twice more volatile than that of the other deciles. At business cycle frequencies the first and the tenth decile are the most volatile with standard deviations which are about 50% larger than those of the remaining deciles.

The second column of Figure 1 shows the correlations between consumption deciles. Each rectangular cell displays the correlation between the consumption decile specified in the x-axis and the y-axis; the higher the correlation the lighter the color of the corresponding cell. It is quite evident, irrespective of whether one looks at the raw data or the common component, that consumption at the two tails of the distribution

[8]The potential drawback of the second identification strategy is that the innovation in the forecast revision does not necessarily contain only exogenous government spending shocks. In fact the revision might in principle change contemporaneously because of predicted future increase in government spending reflecting change in systematic fiscal policy. This is not the case in practice as, if we order the variable after the GDP and considered the second Cholesky shock as government pending shock, the results are unchanged.

[9]The business cycle frequencies are computed with a band-pass filter which retains fluctuations between 2 to 8 years.

is less correlated with all the other deciles. The average correlation of the first and tenth deciles are 0.29 and 0.42. The numbers are higher than those obtained for raw data but still small. On the contrary, the consumption deciles from the second to the seventh present very high correlations, higher than those in the raw data. For instance the average correlation between the second and seventh decile is about 0.93.

We begin investigating the relation between consumption and government spending by simply looking at some unconditional correlations between consumption deciles and some selected fiscal policy variables, see Table 2. Unconditional correlations with government expenditures are quite low and comparable across deciles. Substantial differences, amongst the consumption deciles, emerge for social benefits and primary deficit measures. First, the correlations with government social benefits are positive for the first deciles, vanishing for the middle deciles and becoming negative for the right tail of the consumption distribution. The result seems very plausible suggesting that consumers at the bottom deciles are those who benefit most from social security programs. Second, a similar pattern in terms of heterogeneity emerges for the primary deficit: the left tail of the consumption distribution is positively correlated with deficit while the right tail is negatively correlated. We interpret the finding as a prima facie evidence that government spending and fiscal policy in general might have very different effect in different part of the consumption distribution. In particular this pattern of correlations suggests a non-Ricardian behavior of the poor households and a Ricardian one for the agents at the top of the consumption distribution.

4.2 The effects of government spending shocks

Figure 2-3 display the impulse response functions at selected horizons for the consumption deciles. Solid lines are the point estimates, dotted lines are the 68% confidence bands obtained with bootstrap (see Forni and Gambetti (2010) for details). In the plots the x-axis refers to the decile, the y-axis measures the effect on consumption in percentage terms.

The most striking feature, common to both identifications, that emerges is that the effects of the government spending shocks fall (from positive to negative) with the deciles: the higher the decile the smaller (or negative) the effect. This is particularly pronounced for horizon of one quarter and one year. More specifically the spending shock raises consumption for the bottom 20% of the distribution and reduces it at the

top. The size and the significance of the effects vary somewhat using the two identification strategies. The effects tend to be larger and more significant using the Ramey's identification. In this case (*Identification 1*) the consumption of the first decile increases by 0.4% while that of the tenth decile falls by 0.4% and the effects are both statistically significant. Using the forecast revision strategy (*Identification 2*), consumption in the 1st and 10th decile increases and falls by about 0.2% respectively. The middle deciles respond very little to the shock. At 2 and 3-year horizons the response is negative for all the deciles but the first one. The results here are similar to those obtained in Misra and Surico (2011) using tax rebates, where they find that 45% of the household behave as Ricardian households, while around 30% of the households significantly increase their consumption following the tax rebate. Moreover these authors find, again in line with our results, that 20% of the households are credit constrained.

One implication of the previous result is that the government spending shock temporarily reduces consumption inequality. Figure 4 displays the responses of consumption inequality measured as the difference between the responses of the 8th and 3rd decile (first column) and 10th and 1st decile (second column) in the two identifications; the Ramey's one is in the first row, the Gambetti's one is in the second row. In all cases, consumption inequality significantly falls in the short run, while at longer horizons the shock has no effects.

The kind of effects across deciles discussed above are in line with models of limited participation to the asset market where consumers with no access to the capital market increase their consumption, because a sort of Keynesian multiplier is at work, while wealthier consumers, who actively participate in the capital markets, reduce their consumption because the Ricardian equivalence holds. According to the data description seen above, asset market participation measured as the share of stockholders within the decile is increasing with the deciles (see Table 1). Figure 5 plots the average response of consumption deciles (y-axis) and the share of stockholders within the decile (x-axis). A strong negative relation emerges: the correlation coefficient is -0.93 under the Ramey's identification and -0.76 under the alternative scheme. An increase of 1% of the share of consumers holding asset within the decile is associated with a reduction of consumption within the decile of about 1.16% under the Ramey's identification and 0.46% under the alternative identification. Although quite narrative in spirit, we believe that the evidence provided in the current paper is in line and lends support to

the theory discussed earlier.[10]

5 Conclusions

In this paper we study the responses of the consumption distribution to government spending shocks. We move away from aggregate consumption data and, instead, investigate the responses of the whole consumption distribution (partitioned in deciles). Allowing for heterogeneity in the responses unveil a novel and important result: consumption increases at the bottom and falls at the top of the distribution after an increase in government spending. This implies a significant temporary reduction of consumption inequality. The effects of the shock display correlations of around -0.7/-0.9 with the share of stockholders within the decile. We interpret the results as in line and lending support to models of limited participation to capital markets where, while the Ricardian equivalence holds for wealthier households, for poor household, with no access to capital markets, a kind of Keynesian multiplier is at work. To conclude, we believe that the question whether aggregate consumption increase or falls after a government spending shock is probably misleading. The correct question to address is where, in the consumption distribution, consumption increases or falls.

[10] A further check of the validity of our interpretation would be to compute the decile of the asset distribution and study the response of the shock to the corresponding consumption data. This strategy however is not feasible since the financial wealth data are top coded in the CEX.

Appendix

Macro Data

Transformations: 1=levels, 2= first differences of the original series, 5= first differences of logs of the original series.

no.series	Transf.	Mnemonic	Long Label
1	5	GDPC1	Real Gross Domestic Product, 1 Decimal
2	5	GNPC96	Real Gross National Product
3	5	NICUR/GDPDEF	National Income/GDPDEF
4	5	DPIC96	Real Disposable Personal Income
5	5	OUTNFB	Nonfarm Business Sector: Output
6	5	FINSLC1	Real Final Sales of Domestic Product, 1 Decimal
7	5	FPIC1	Real Private Fixed Investment, 1 Decimal
8	5	PRFIC1	Real Private Residential Fixed Investment, 1 Decimal
9	5	PNFIC1	Real Private Nonresidential Fixed Investment, 1 Decimal
10	5	GPDIC1	Real Gross Private Domestic Investment, 1 Decimal
11	5	PCECC96	Real Personal Consumption Expenditures
12	5	PCNDGC96	Real Personal Consumption Expenditures: Nondurable Goods
13	5	PCDGCC96	Real Personal Consumption Expenditures: Durable Goods
14	5	PCESVC96	Real Personal Consumption Expenditures: Services
15	5	GPSAVE/GDPDEF	Gross Private Saving/GDP Deflator
16	5	FGCEC1	Real Federal Consumption Expenditures & Gross Investment, 1 Decimal
17	5	FGEXPND/GDPDEF	Federal Government: Current Expenditures/ GDP deflator
18	5	FGRECPT/GDPDEF	Federal Government Current Receipts/ GDP deflator
19	2	FGDEF	Federal Real Expend-Real Receipts
20	1	CBIC1	Real Change in Private Inventories, 1 Decimal
21	5	EXPGSC1	Real Exports of Goods & Services, 1 Decimal
22	5	IMPGSC1	Real Imports of Goods & Services, 1 Decimal
23	5	CP/GDPDEF	Corporate Profits After Tax/GDP deflator
24	5	NFCPATAX/GDPDEF	Nonfinancial Corporate Business: Profits After Tax/GDP deflator
25	5	CNCF/GDPDEF	Corporate Net Cash Flow/GDP deflator
26	5	DIVIDEND/GDPDEF	Net Corporate Dividends/GDP deflator
27	5	HOANBS	Nonfarm Business Sector: Hours of All Persons
28	5	OPHNFB	Nonfarm Business Sector: Output Per Hour of All Persons
29	5	UNLPNBS	Nonfarm Business Sector: Unit Nonlabor Payments
30	5	ULCNFB	Nonfarm Business Sector: Unit Labor Cost
31	5	WASCUR/CPI	Compensation of Employees: Wages & Salary Accruals/CPI
32	5	COMPNFB	Nonfarm Business Sector: Compensation Per Hour
33	5	COMPRNFB	Nonfarm Business Sector: Real Compensation Per Hour
34	5	GDPCTPI	Gross Domestic Product: Chain-type Price Index
35	5	GNPCTPI	Gross National Product: Chain-type Price Index
36	5	GDPDEF	Gross Domestic Product: Implicit Price Deflator
37	5	GNPDEF	Gross National Product: Implicit Price Deflator
38	5	INDPRO	Industrial Production Index
39	5	IPBUSEQ	Industrial Production: Business Equipment

no.series	Transf.	Mnemonic	Long Label
40	5	IPCONGD	Industrial Production: Consumer Goods
41	5	IPDCONGD	Industrial Production: Durable Consumer Goods
42	5	IPFINAL	Industrial Production: Final Products (Market Group)
43	5	IPMAT	Industrial Production: Materials
44	5	IPNCONGD	Industrial Production: Nondurable Consumer Goods
45	2	AWHMAN	Average Weekly Hours: Manufacturing
46	2	AWOTMAN	Average Weekly Hours: Overtime: Manufacturing
47	2	CIVPART	Civilian Participation Rate
48	5	CLF16OV	Civilian Labor Force
49	5	CE16OV	Civilian Employment
50	5	USPRIV	All Employees: Total Private Industries
51	5	USGOOD	All Employees: Goods-Producing Industries
52	5	SRVPRD	All Employees: Service-Providing Industries
53	5	UNEMPLOY	Unemployed
54	5	UEMPMEAN	Average (Mean) Duration of Unemployment
55	2	UNRATE	Civilian Unemployment Rate
56	5	HOUST	Housing Starts: Total: New Privately Owned Housing Units Started
57	2	FEDFUNDS	Effective Federal Funds Rate
58	2	TB3MS	3-Month Treasury Bill: Secondary Market Rate
59	2	GS1	1-Year Treasury Constant Maturity Rate
60	2	GS10	10-Year Treasury Constant Maturity Rate
61	2	AAA	Moody's Seasoned Aaa Corporate Bond Yield
62	2	BAA	Moody's Seasoned Baa Corporate Bond Yield
63	2	MPRIME	Bank Prime Loan Rate
64	5	BOGNONBR	Non-Borrowed Reserves of Depository Institutions
65	5	TRARR	Board of Governors Total Reserves, Adjusted for Changes in Reserve
66	5	BOGAMBSL	Board of Governors Monetary Base, Adjusted for Changes in Reserve
67	5	M1SL	M1 Money Stock
68	5	M2MSL	M2 Minus
69	5	M2SL	M2 Money Stock
70	5	BUSLOANS	Commercial and Industrial Loans at All Commercial Banks
71	5	CONSUMER	Consumer (Individual) Loans at All Commercial Banks
72	5	LOANINV	Total Loans and Investments at All Commercial Banks
73	5	REALLN	Real Estate Loans at All Commercial Banks
74	5	TOTALSL	Total Consumer Credit Outstanding
75	5	CPIAUCSL	Consumer Price Index For All Urban Consumers: All Items
76	5	CPIULFSL	Consumer Price Index for All Urban Consumers: All Items Less Food
77	5	CPILEGSL	Consumer Price Index for All Urban Consumers: All Items Less Energy
78	5	CPILFESL	Consumer Price Index for All Urban Consumers: All Items Less Food & Energy
79	5	CPIENGSL	Consumer Price Index for All Urban Consumers: Energy

no.series	Transf.	Mnemonic	Long Label
80	5	CPIUFDSL	Consumer Price Index for All Urban Consumers: Food
81	5	PPICPE	Producer Price Index Finished Goods: Capital Equipment
82	5	PPICRM	Producer Price Index: Crude Materials for Further Processing
83	5	PPIFCG	Producer Price Index: Finished Consumer Goods
84	5	PPIFGS	Producer Price Index: Finished Goods
85	5	OILPRICE	Spot Oil Price: West Texas Intermediate
86	5	USSHRPRCF	US Dow Jones Industrials Share Price Index (EP) NADJ
87	5	US500STK	US Standard & poor's Index if 500 Common Stocks
88	5	USI62...F	US Share Price Index NADJ
89	5	USNOIDN.D	US Manufacturers New Orders for Non Defense Capital Goods (BCI 27)
90	5	USCNORCGD	US New Orders of Consumer Goods & Materials (BCI 8) CONA
91	1	USNAPMNO	US ISM Manufacturers Survey: New Orders Index SADJ
92	5	USVACTOTO	US Index of Help Wanted Advertising VOLA
93	5	USCYLEAD	US The Conference Board Leading Economic Indicators Index SADJ
94	5	USECRIWLH	US Economic Cycle Research Institute Weekly Leading Index
95	2	GS10-FEDFUNDS	
96	2	GS1-FEDFUNDS	
97	2	BAA-FEDFUNDS	
98	5	GEXPND/GDPDEF	Government Current Expenditures/ GDP deflator
99	5	GRECPT/GDPDEF	Government Current Receipts/ GDP deflator
100	2	GDEF	Government Real Expend-Real Receipts
101	5	GCEC1	Real Government Cons. Expenditures & Gross Investment, 1 Decimal
102	5		Real Federal Cons. Expenditures & Gross Investment National Defense
103	2		Federal primary deficit
104	5		Real Federal Current Tax Revenues
105	5		Real Government Current Tax Revenues
106	2		Government primary deficit
107	5		Real (/GDPDEF) Gov. Social Benefit
108	1		Gov. social benefits/ Gov. Curr Exp

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Tables

Decile	(Real) Log-Income		Share of capital holders		Race (% by Column)			Education (% by Column)						
	Mean	Std.	Mean	Std.	White	Black	Asian	None	Elem.	HS drop	HS	Coll. drop	College	Grad.
1	4.47	0.72	0.07	0.25	7.86	22.70	15.02	45.47	31.32	24.42	9.91	7.81	2.72	1.69
2	4.94	0.67	0.13	0.33	8.75	16.26	11.46	17.60	19.93	17.44	11.01	9.08	5.04	3.31
3	5.20	0.64	0.17	0.37	9.33	13.29	9.59	9.60	13.79	13.14	11.52	10.21	6.55	4.68
4	5.38	0.61	0.22	0.41	9.76	10.37	12.02	8.93	9.33	10.45	11.35	10.76	8.32	6.22
5	5.55	0.60	0.26	0.43	10.10	8.82	10.29	2.40	7.10	8.42	11.04	10.80	9.72	8.47
6	5.68	0.60	0.29	0.45	10.38	7.43	10.50	4.27	5.30	7.35	10.53	10.69	10.99	10.24
7	5.80	0.59	0.32	0.46	10.61	6.66	8.81	4.40	4.62	5.36	9.71	10.53	12.77	12.79
8	5.94	0.60	0.34	0.47	10.91	5.18	8.46	3.73	3.34	5.19	8.94	10.43	14.19	14.43
9	6.07	0.61	0.36	0.48	11.09	5.15	7.86	1.07	2.77	4.56	8.41	9.92	14.70	17.77
10	6.26	0.61	0.40	0.49	11.22	4.15	5.99	2.53	2.50	3.67	7.58	9.77	15.00	20.42

Table 1: Households (head) characteristics by decile.

Decile	Gov. Spending	Social Benefits	Primary Deficit
1	0.2593	0.4933	0.2787
2	0.2930	0.3293	0.1324
3	0.2686	0.1820	0.0511
4	0.2407	0.0597	-0.0328
5	0.1991	0.0283	-0.0421
6	0.1254	-0.1245	-0.1569
7	0.1004	-0.1321	-0.1521
8	0.1733	-0.1902	-0.1169
9	-0.0287	-0.3562	-0.1528
10	0.2176	-0.2312	-0.2548

Table 2: Sample correlation of the common component of the consumption deciles with some fiscal policy variables.

Figures

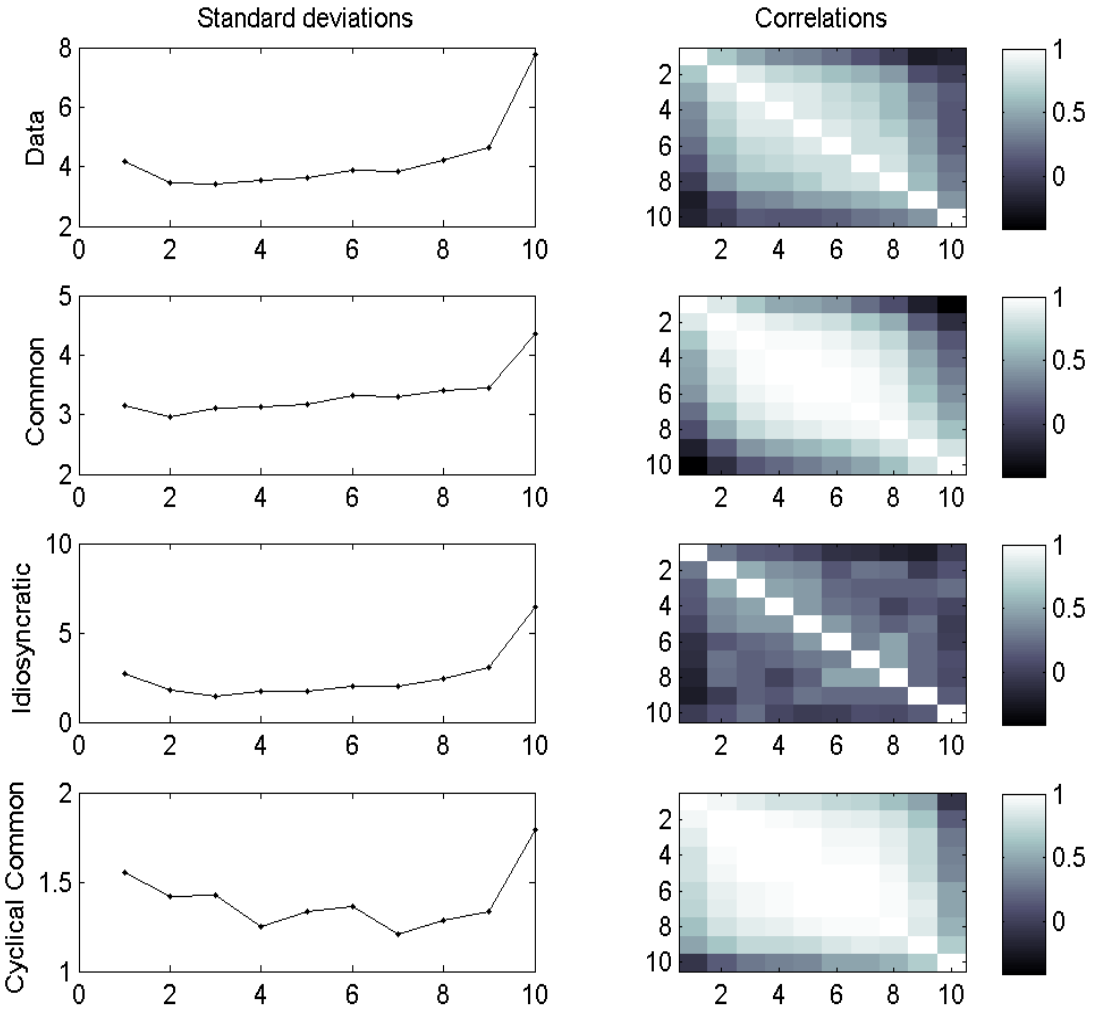

Figure 1: Standard deviations and correlations of consumption deciles. First row: raw data; second row: common component; third row: idiosyncratic component; fourth row: common component at the business cycle frequencies computed using a band bass filter which retains fluctuations between 2 to 8 years.

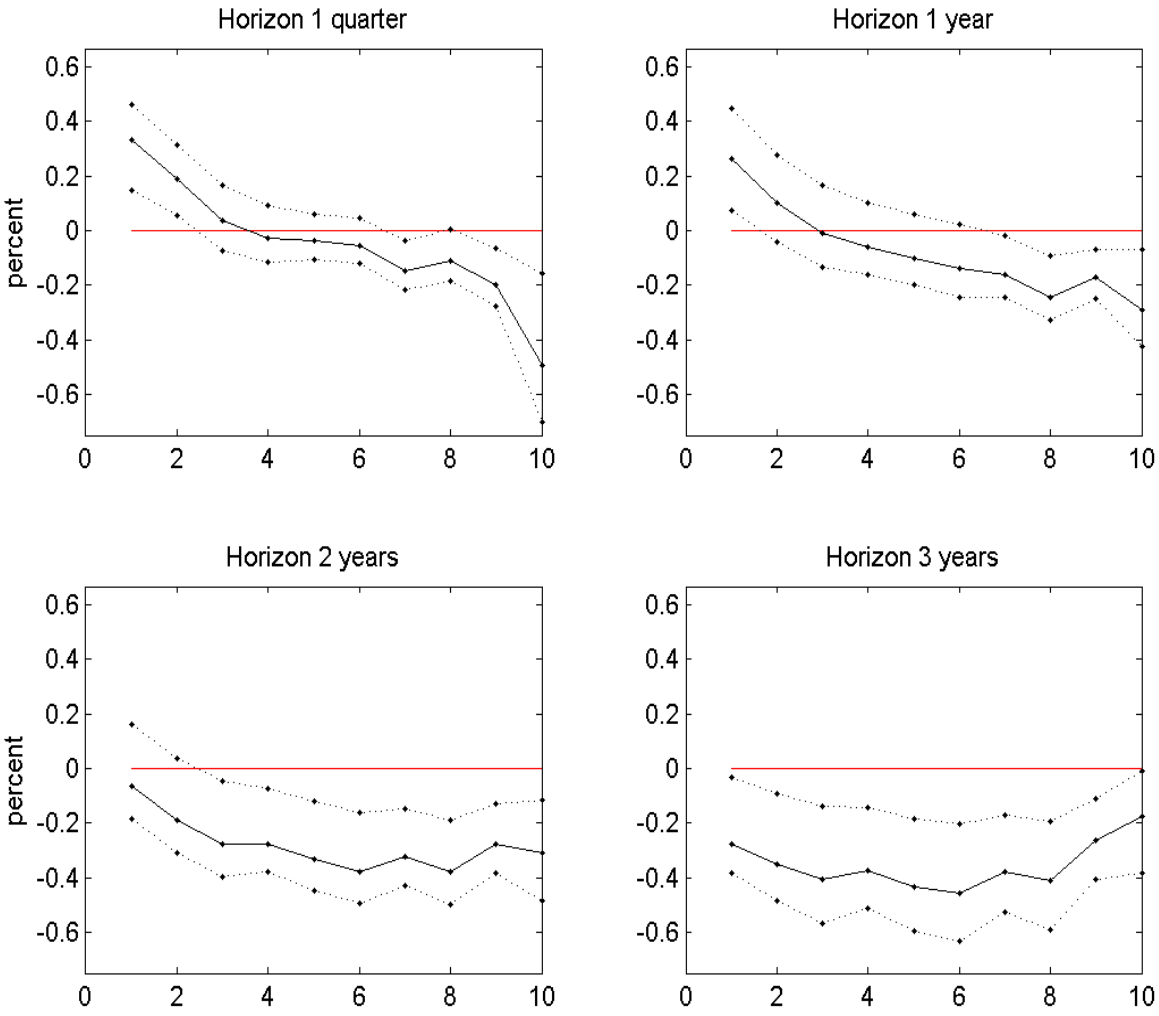

Figure 2: Response of the consumption deciles to a government spending shock identified using the Ramey's variable.

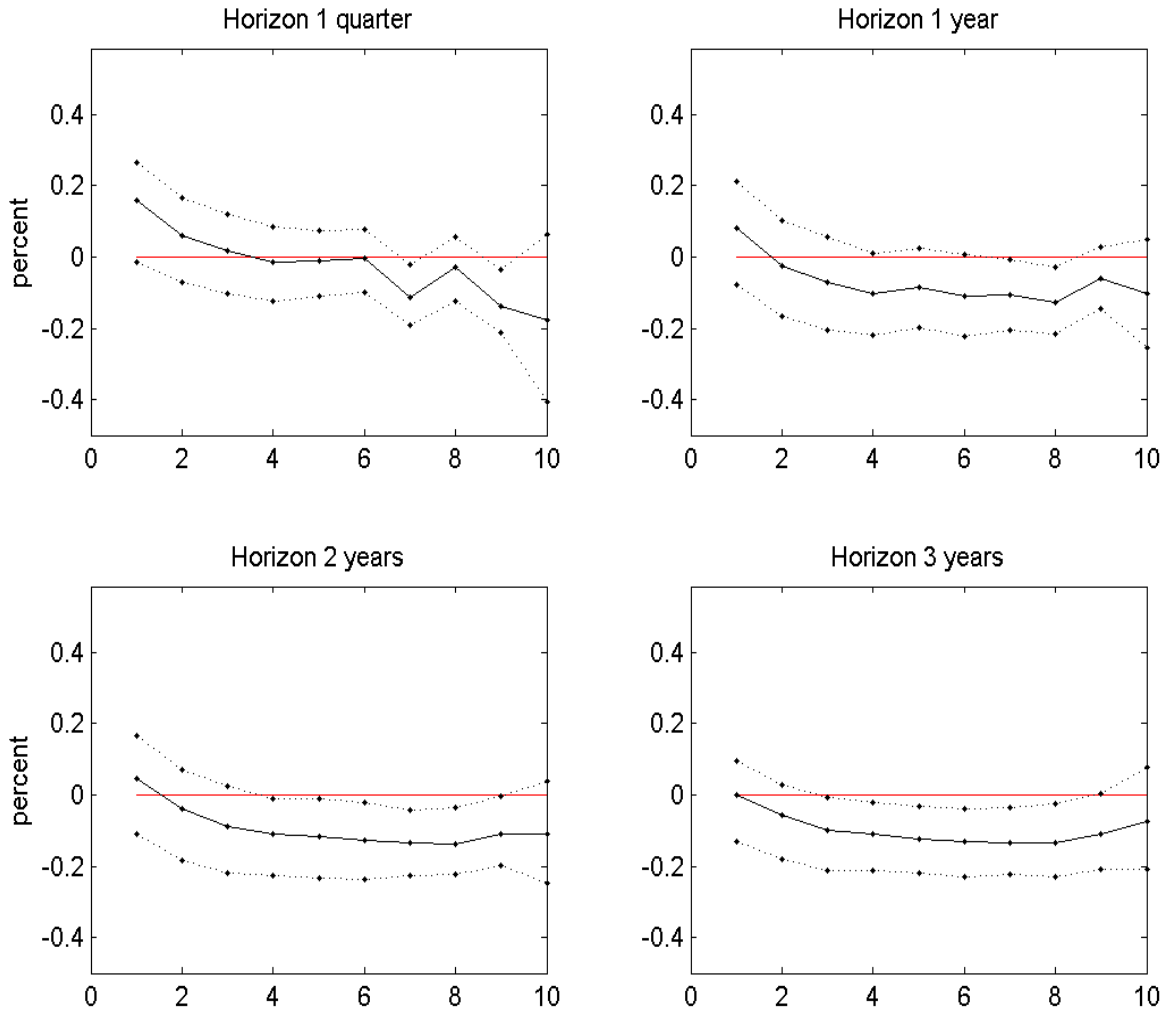

Figure 3: Response of the consumption deciles to a government spending shock identified using the forecast revision variable.

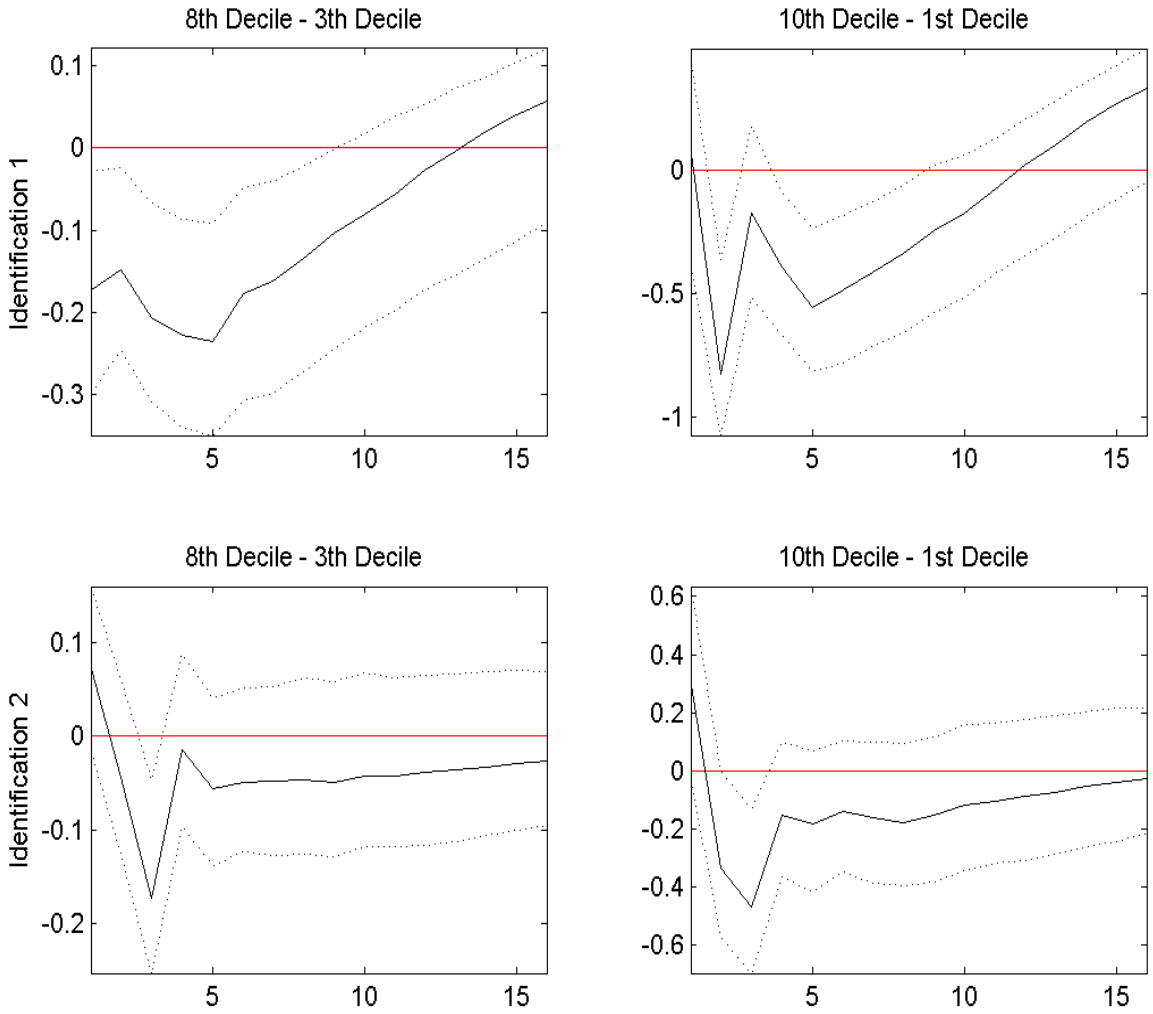

Figure 4: Response of consumption inequality measured as the difference between the response of the 10th and 1st decile (first column) and 10th and 1st decile (second column) in the two identifications; the Ramey's one is in the first row, the Gambetti's one is in the second row.

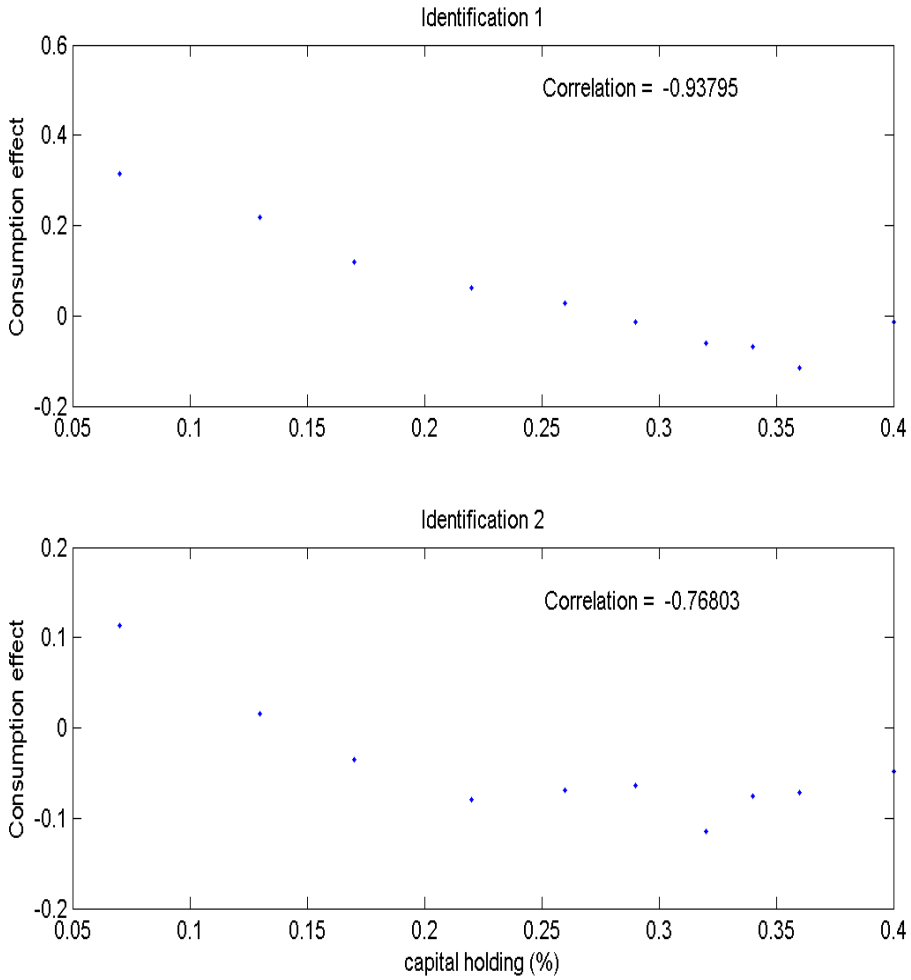

Figure 5: Plot of the average response of consumption deciles (y-axis) and the share of stockholders within the decile (x-axis).