Essays on the Economic Effects of Pension-Related Policies

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Declaration

"I, Susana Parraga Rodriguez confirm that the work presented in this thesis "Essays on the Economic Effects of Pension-related Policies" is entirely my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis"

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Certified by Professor Morten O. Ravn (Supervisor)

Abstract

This thesis analyses the economic effects of changes in pension-related policies. Chapter 1 provides an overview.

Chapter 2 estimates the impact of pension-related policies on household spending. The identification exploits the deviation in pensioner income and expenditure caused by the introduction of a new pension system during the 1980s and the 1990s in Spain and constructs a new narrative series of legislated pension changes. I find that increases in the average pension have a roughly one-for-one effect on pensioner spending. The strongest effects are on the wealthy pensioners, with associated high levels of expenditure, income, and real estate. Estimates for different categories of expenditure indicate that benefit increases trigger the consumption-rich to spend more on durables, while the consumption- and income-poor pensioners spend more on non-durables and necessities such as food.

Chapter 3 compares the dynamic aggregate effects of exogenous shocks to two key components of public expenditure in the United States, government income transfers and government spending. In an SVAR framework, I instrument the structural shocks to public expenditure with exogenous measures of changes in federal spending constructing a new narrative variable of legislated increases in US social security benefits. I demonstrate that shocks to different types of public expenditure do not have the same macroeconomic impact. The estimated government spending multiplier is between 0 and 1, while increases in transfers generate a multiplier effect above 1.

Chapter 4 focuses on the aggregate effects of changes in old-age pensions and for a sample of European Union countries. This chapter constructs another new measure of transfer shocks building on a dataset by public finance experts of the European System of Central Banks (ESCB). I find that increases in old-age pensions have a positive impact on aggregate expenditure components and employment consistent with a multiplier effect of between 0 and 1.

Impact Statement

This research creates new ways of thinking about public expenditure shifting the attention to pension-related policies. Chapter 2 presents one of the few studies on the effects of income changes on the elderly and pensioners. The analysis has significant implications for the growing macroeconomic literature on the heterogeneous effects of fiscal policy. Increases in the average pension appear to have a roughly one-for-one effect on pensioner spending. The strongest effects are on the wealthy pensioners, with associated high levels of expenditure, income, and real estate. Nonetheless, benefit increases induce the consumption- and income-poor pensioners to spend more on necessities such as food.

High estimates for pensioners' marginal propensity to consume point to significant effects on the macroeconomy. Departing from the numerous studies on the macroeconomic impact of government spending, chapters 3 and 4 constitute some of the few exceptions that provide evidence on the aggregate effects of government income transfers. Chapter 3 has been published in a specialized economics journal. The analysis compares and contrasts the dynamic aggregate effects of exogenous shocks to two key components of public expenditure in the United States, government income transfers and government spending. Chapter 4, instead, focuses on the aggregate effects of changes in old-age pensions in a sample of European countries. The analysis for many advanced economies indicates that public spending and transfers share an impact multiplier between 0 and 1.

This thesis provides new data vital to study the impact of pension-related policies on the economy controlling for the potential reverse causality in the relationship between fiscal policy and other economic variables such as output or household spending. Chapter 2 presents an original narrative series that covers the implementation of a new Social Security in Spain during the 1980s and 1990s. Chapter 3 extends and improves a previous narrative account of legislated changes in US Social Security benefits correctly controlling for the bias due to a positive correlation between inflation adjustments and current macroeconomic conditions. Chapter 4 uses a new and confidential dataset by public finance experts from the European System of Central Banks to construct yet another new measure of exogenous government income transfer shocks.

This research influences the public policy open debate on pension systems reforms. An estimated transfers impact multiplier below unity indicates the limited effectiveness of fiscal actions involving old-age pensions in the short-run. At the same time, the high pensioners' MPC out of benefits increases points to significant direct effects on the beneficiaries and household spending. These results pose a trade-off for policymakers between the economic effects of pension-related policies at the household level and the macroeconomy. In this context, desirable policies to reduce the fiscal deficit should include measures that effectively improve the fiscal stance, while having a contained adverse effect on the aggregate economy. While the results justify cuts in public pensions as an efficient way to reduce the deficit, the adjustments should not entail an equal burden for all pensioners if policymakers want to avoid the associated fall in their welfare and living standards.

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The compiling of the narrative of Spanish pension-related policies, which accompanies Chapter 2, was an arduous task. On starting the project, I was lucky enough to have the advice and knowledge of Francisco Martí at the Banco de España, whose detailed understanding of the Spanish history, economy, and fiscal policy proved an invaluable asset. I am much indebted to José María Labeaga for sharing the historical household expenditure survey data. The analysis in Chapter 2 would not have been possible without his data and detailed understanding of the Spanish household expenditure

surveys. I am also very thankful to the ESCB-WGPF members, especially Javier Pérez, for sharing the fiscal questionnaires that permitted constructing the dataset used in Chapter 4.

Finally, I must thank my family and friends - especially my parents Gloria and Miguel - for their unconditional and constant support through the good times and the bad. My partner César proved the reliable safeguard despite the long distance. I have little doubt that without the kind support of my good friends Chiara and Farah, living abroad would have been immeasurably harder.

This thesis is dedicated to all of them.

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Chapter 1

Introduction

The research agenda has recently turned the attention to the economic impact of pension-related policies. For one, the Global Financial Crisis (GFC) revived the interest in the economic effects of public expenditure. As the GFC unfolded, automatic stabilizers responded, and public finances deteriorated in many advanced economies. The loss of fiscal space was particularly problematic for European countries and called for the adoption of austerity measures since 2010. Both fiscal stimulus and austerity programmes included sizeable policy actions regarding public expenditure, specifically government income transfers. Furthermore, these recent experiences occur in a context of a structural increase in the importance of public expenditure in the government budget of many advanced economies. For example, in the United States, total public expenditure represented about 34% of gross domestic product (GDP) between 1995 and 2015. Within public expenditures, government income transfers have become over time the most important category, more than doubling their ratio to GDP over the second half of the 20th century. In the European Union, the ratio of total public expenditure to GDP averaged about 45% between 1995 and 2015, with transfers accounting for more than 65% of this figure since the GFC.[1] Finally, concerns about financial sustainability and the projected population aging have put pension systems under the spotlight again.

Chapter 2 studies the direct effects of pension-related policies on household spending. The paper represents one of the few studies on the effects

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[1]Data sources: US Bureau of Economic Analysis and Eurostat.

of income changes on the elderly and pensioners (see, for example, Japelli and Pistaferri (2010) for a good literature review on the prolific evidence at the household-level of the effects of income changes on working-age individuals). Moreover, the analysis addresses the distributional impact of changes in benefits and has significant implications for the growing macroeconomic literature on the heterogeneous effects of fiscal policy. The estimation method exploits the change in pensioner expenditure caused by the introduction of a new welfare state legislation in Spain during the 1980s and 1990s. Using household expenditure surveys, I estimate difference-in-difference models for multiple policy interventions. The eligibility to collect a pension defines the treatment and control groups such that only the treated (pensioners) receive the benefit increases. The estimates imply that increases in the average pension have a roughly one-for-one effect on pensioner spending. The results seem to be driven by the wealthy pensioners, with associated high levels of expenditure, income, and wealth. Moreover, consumption-rich pensioners allocate a more substantial fraction of the benefit increases to durables, while the consumption- and income-poor pensioners spend more on non-durables and necessities such as food. These high estimates for pensioners' marginal propensity to consume point to a significant impact on aggregate consumption and output. However, to correctly quantify the aggregate effects of benefit increases, one needs to account for the general equilibrium effects that could have amplified or diminished the initial impulse to spending.

The bulk of the literature has concentrated on quantifying the macroeconomic impact of government spending shocks (some recent examples include Perotti 2007, Mountford and Uhlig 2009, Ramey 2011, Fisher and Petters 2010, Auerbach and Gorodnichenko 2011, Nakamura and Steinsson 2014, Wilson 2012, and Suárez-Serrato and Wingender 2014, Chodorow-Reich, Feiveson, Liscow, and Woolton 2012, Ramey and Zubairy 2017; Alloza 2017, Auerbach and Gorodnichenko 2012). On the other hand, the evidence on the aggregate effects of government income transfers has been scarce. Romer and Romer (2016) constructed a series of legislated increases in social security benefits in the US from 1951 to 1991 and studied the effect of innovations measured by their narrative variable on private consumption. Like Wilcox (1989), Romer and Romer (2016) exploit the variation in the cost-of-living-adjustments to estimate the aggregate effects

of benefit increases. Compared to them, I do a better control of the potential bias in the estimations due to a positive correlation between inflation adjustments and current macroeconomic conditions. Moreover, my analysis expands the set of outcome variables to include output, investment, consumption of durables, non-durables and services, and several labor market indicators. In this regard, like Gechert, Paetz, and Villanueva (2016), a principal contribution of this research is an estimate for the transfers output multiplier.

Chapters 3 and 4 contribute to the literature with a study of the aggregate effects of exogenous shocks to different types of public expenditure. Chapter 3 presents estimates of the response of several macroeconomic variables to increases in government spending and government income transfers in the United States over a post-WWII sample. The analysis compares and contrasts the dynamic macroeconomic impact of government spending, which effects have been widely studied in the literature, with the relatively unknown effects of government income transfers. Despite finding a similar impact multiplier for both types of public expenditure, the differences build up over time. While the government spending multiplier reaches its maximum cumulative effect at one, increases in transfers appear to generate a multiplier effect well above unity. Chapter 4, instead, estimates the aggregate effects of government income transfers using a panel dataset of 22 EU Member States corresponding to 2007-2015. Accurately, I estimate the multiplier effect and the response of the multiple macroeconomic variables to changes in old-age pensions. Using the European data and a sample period since the GFC, the estimates for the multiplier effect of old-age pension are between 0 and 1.

The challenge for any study of the economic effects of fiscal policy, either at the aggregate or with household level data, is the potential endogeneity of policy actions. Policymakers take actions for a variety of reasons. For example, during periods of high levels of inflation, governments may increase income transfer payments to guarantee the purchasing power of their beneficiaries. Another example is that in the event of a recession, extraordinary measures may be needed to help a growing number of unemployed. Then, on many occasions, fiscal policy measures are responding to the current state of the economy. On the other hand, a key identifying assumption to produce unbiased estimates of the effects of pension-related

policies is that discretionary changes in government income transfers are exogenous. The identification strategy to control for reverse causality in the relationship between pension-related policies and other economic variables such as output or household spending is to use a narrative approach.

Chapter 2 presents a new narrative series of legislated changes in public pensions adopted in Spain corresponding to 1979-1997. Marked by the Spanish Constitution of December 1978, the narrative covers the implementation of a new Social Security in Spain. The result of the narrative analysis is a record of likely exogenous pension-related policies that will be used as an instrumental variable for aggregate expenditure in public pensions to estimate the effects of changes in the average allowance. This strategy circumvents the lack of data on household income in the survey covering the essential pre-treatment years.

Using the methodology of the 'Proxy SVAR,' Chapter 3 embeds narrative measures of public expenditure changes in a VAR framework. The 'Proxy SVAR' is an attractive estimator because it does not impose direct short-run assumptions, as in the SVAR approach of, for example, Perotti (2007). Moreover, the instruments do not need one-to-one mapping with the structural shocks, as in the narrative approach of Ramey (2011) or Romer and Romer (2016). I use Ramey's (2011) measure of US defense spending shocks as an instrument for the structural shocks to government spending, available from the first quarter of 1969. Military spending has been widely accepted in the profession as a good source of exogenous variation in government spending in the US because it appears to be induced by geopolitical events most likely unrelated to the state of the US economy. On the other hand, the strong link between inflation and the narrative variable of Romer and Romer (2016) motivates the estimation of an alternative measure of exogenous shocks to government income transfers. The new measure corresponds to the residuals of regressing an extension of the narrative series on inflation. Unlike the original narrative series, aggregate variables representing the state of the economy cannot predict the new measure.

Chapter 4 uses a new and confidential dataset by public finance experts from the European System of Central Banks (ESCB) to construct yet another new measure of exogenous government income transfer shocks. The

dataset contains detailed information on public revenue and expenditure policies for several EU countries. Importantly, within government income transfers, the data reports policy actions for old-age pensions. The reported policy actions have annual frequency following standardized questionnaires in the context of regular projection exercises. A process of peer review guarantees that the data across countries is harmonized. Furthermore, an interesting feature of this novel dataset is that it measures fiscal actions as the difference relative to a benchmark for what fiscal policy can be considered neutral. A contribution of the paper is to reclassify the discretionary changes in transfers recorded in the ESCB dataset as either exogenous or not exogenous based on their motivation. The classification has been made using the information contained in the descriptions accompanying all measures in the ESCB dataset. Other country-specific legislation, government reports, country reports by different international organizations, and the occasional newspaper complemented this information.

Finally, the results have significant policy implications. First, an estimated transfers impact multiplier between 0 and 1 indicates limited effectiveness in the short-run of fiscal actions involving benefits. At the same time, the high pensioners' MPC out of benefits increases points to significant direct effects on the beneficiaries and household spending. These results pose a trade-off for policymakers between the economic effects of pension-related policies at the household level and the macroeconomy. Moreover, this tradeoff has different implications for fiscal stimulus and deficit reduction programs. On the one hand, despite increasing the spending and welfare of pensioners, increases in old-age pensions might represent costly stimulus measures given their modest positive impact on the macroeconomy. On the other hand, desirable policies to reduce the deficit should include measures that effectively improve the fiscal stance, while having a contained negative effect on the aggregate economy. In this context, according to the OECD, recent reforms addressing the financial sustainability of pension systems will lower pension benefits in many advanced economies. The evidence presented predicts that such policies will result in a substantial drop in pensioners' spending, with associated fall in their welfare and living standards. However, the policies represent an efficient way to reduce the fiscal deficit insofar they would have a contained adverse effect on the aggregate economy.

Chapter 1

Chapter 2

The effects of pension-related policies on household spending

2.1 Introduction

Concerns about financial sustainability and the projected population aging have led to a renewed interest in pension systems. As a result, the research agenda has turned attention to the economic impact of social security benefits. Recent papers have made progress in the quantification of the aggregate effects of pension-related policies (see, for example, Romer and Romer 2016, and Parraga-Rodriguez 2016, 2018); however, the question remains what the direct impact of pension-related policies on household spending is. Filling this gap in the literature is essential because estimates of the effects of fiscal policy on the aggregate economy cannot fully explain the distributional impacts of changes in benefits.

This paper provides evidence on the impact of unexpected changes in public pensions on net recipients (pensioners). I find that increases in the average pension have a roughly one-for-one effect on pensioner spending. To gain insights into the components of this high marginal propensity to consume (MPC), I look into the implied impact for different categories of expenditure, as well as across the distribution of pensioners' spending, income and wealth.

My findings have significant implications for the growing macroeco-

nomic literature on the heterogeneous effects of fiscal policy. First, the results imply different effects across the distribution of household expenditure, and by types of spending. While pensioners at the bottom of the distribution of expenditure appear to spend increases in benefits mostly on non-durables, pensioners at the top allocate a more substantial fraction of the benefit increases to durables. Second, the results seem to be driven by the wealthy. In this regard, a simple classification concerning net worth suffices to obtain significant heterogeneous effects out of benefit increases. The latter contrasts with the recent theoretical advances in heterogeneous agent models where fiscal policy is more effective the more significant the proportion of liquidity-constrained households (Kaplan and Violante 2014, Eggertsson and Krugman 2012). The results also contrast with the empirical works that study the heterogeneous effects of tax changes (Cloyne and Surico 2016, Misra and Surico 2014). A comparison with these papers points to the exclusion of the elderly from the samples and the fact that these have lower outstanding debt compared to working-age individuals, as explanatory factors for the divergences.

The estimation method exploits the change in pensioner expenditure caused by the introduction of a new welfare state legislation in Spain during the 1980s and 1990s. This political and economic transition implied a significant departure of the spending path of pensioners relative to working-age individuals. Using household expenditure surveys corresponding to 1977q2-1997q1, I estimate difference-in-difference (DD) models for multiple policy interventions. The DD is an attractive method for this exercise because it recognizes that in the absence of random assignment, treatment and control groups may differ for many reasons. The eligibility to collect a pension defines the treatment and control groups such that only the treated (pensioners) receive the benefit increases. Compared to the standard DD exercise though, all households are potentially affected by aggregate shocks such as pension-related policies. Even so, I show that if pensioners and non-pensioners are similarly affected by increases in aggregate income, time effects will efficiently control for the general equilibrium effects in the regressions.

Like Stephens (2003), I study the consumption behavior of Social Security beneficiaries. Stephens (2003) estimates the consumption response to the regular arrival of Social Security checks exploiting the fact that partic-

ipation in the Consumer Expenditure Survey is independent of the date the checks arrive. However, whereas he studies how recipients react to known check amounts, this paper estimates the consumption response to 'surprise' changes in pensions. In fact, he excludes any observations within the window around the arrival of checks with unknown amounts that incorporate cost-of-living adjustments (COLAs). Wilcox (1989) and Romer and Romer (2016) exploit the variation in the COLAs to estimate the aggregate effects of benefit increases. Compared to them, this paper controls better for the potential bias in the estimations due to a positive correlation between inflation adjustments and current macroeconomic conditions.

The identification strategy to control for reverse causality in the relationship between pension-related policies and household spending is to use a narrative approach. This paper presents a new narrative series of legislated changes in public pensions adopted in Spain corresponding to 1979-1997. Marked by the Spanish Constitution of December 1978, the narrative covers the implementation of a new Social Security in Spain, with a significant number of pension-related policies. The result of the narrative analysis is a record of likely exogenous pension-related policies that will be used as an instrumental variable for aggregate expenditure in public pensions to estimate the effects of changes in the average allowance. This strategy circumvents the lack of data on household income in the survey covering the essential pre-treatment years.

Last but not least, the high estimates for pensioners' MPC point to a significant impact on aggregate consumption and output. However, to correctly quantify the aggregate effects of benefit increases, one needs to account for the general equilibrium effects that could have amplified or diminished the initial impulse to spending. Still, this paper provides sound evidence to support the implicit assumption that research using aggregate data has made in that recipients of social security benefits have high MPC, especially for durables expenditure.

The next section gives details on the construction of the new narrative series of exogenous pension-related policies and the household expenditure surveys. Section 2.3 presents the econometric specifications. Once section 3.3 establishes a robust and significant impact of unexpected changes in public pensions on pensioners' spending, section 2.5 reports the heteroge-

neous effects of pension-related policies on household spending. Section 3.4 offers concluding remarks.

2.2 Dataset

2.2.1 Institutional background

The estimation sample corresponds to the implementation of a new welfare state in Spain. In this new system, public pensions became the most important component of public expenditure. According to OECD, average expenditure on public pensions in Spain during 1985-1997 was 10.6% of GDP, above the average for OECD countries (8.9%). During this period, public pensions accounted, on average, about 25% of total public spending.[1]

Public pensions in Spain are a pay-as-you-go system of defined benefits. There exist two primary modalities, contributory and non-contributory pensions. The former includes benefits for old age, disability, and survivors. Social contributions carry the weight in the financing of contributory pensions. For example, in 1980 contributions for social insurance accounted for 89.4% of total revenues into the Social Security, while in 1990, social contributions accounted for 71.9% of total revenues, a fall mainly explained by the sharp rise in the government transfers to the Social Security to finance the public health care. The benefits amount depends on the number of years a worker contributes to the system and the contribution basis. Benefit amounts below a minimum threshold are topped-up to guarantee a minimum pension. Pensions cannot exceed a maximum benefit amount established by the law either.

Within contingencies, old-age pensions account for more than 60% of total expenditure on public pensions (see Appendix A1). In the sample period, the normal retirement age was 65 years old, although early retirement was possible without penalty in certain professions, and with a penalty for all other employees. The old-age benefit ratio (the ratio between the average old-age pension benefit and the economy-wide average wage) increased

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[1]The Ministry of Finance Macroeconomic Database of the Spanish Economy.

substantially during the sample period. In 1980 the benefit ratio was 28%, compared to 32% in 1997.[2] Moreover, the replacement rate at retirement (the average first pension as a share of the economy-wide average wage at retirement) was above 80% by 1995.[3] The little importance of private pension plans in Spain can partly explain these high replacement rates.[4]

On the other hand, those who can prove need but have not made sufficient contributions are eligible for a non-contributory pension. These pensions cover the contingencies of old age and disability. General taxes and government transfers finance non-contributory pensions. Taking into account those who receive a minimum pension supplement, about 30% of beneficiaries receive a non-contributory pension.[5] Regarding the entitlements, non-contributory pensions pay subsistence benefits. For example, highlights the fact that the minimum old-age pension for those over 65 did not match the legal minimum wage until 1990.

2.2.2   Narrative series of pension-related policies

Directly using benefits income to estimate the impact of pension-related policies on household spending would ignore endogeneity problems. In other words, pension-related policies that respond to current macroeconomic developments fail to isolate the effect of other shocks affecting household spending, therefore producing biased estimates. In this regard, inflation adjustments are a special feature of Social Security benefits compared to other forms of public spending. To the extent that inflation might reflect the recent economic evolution, it is necessary to purge the benefits series from changes directly attributable to inflation. Another endogeneity problem relates to how the timing of policies might depend on the available fiscal space, which in turn, partly depends on the economic cycle.

Figure 2.1 compares the evolution of public pensions from 1978 to 1997 with two economic indicators that often influence policymakers actions.

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[2] Data sources: Ministry of Labor and Social Security and Ministry of Economy.

[3] See Monasterio et al. (1996).

[4] According to the earliest data available from OECD pensions database, and as documented by Luengo-Prado and Sevilla (2013), total assets in private pension funds were about 2% in 2001, compared with 75% in the US.

[5] Data from the National Institute of Social Security.

The left panel of Figure 2.1 plots the year-on-year change in gross domestic product and total expenditure in Social Security benefits. The plot also includes the evolution of unemployment benefits to illustrate the relationship between output growth and social benefits other than pensions. The fluctuation of the latter over the business cycle contrast with the more steady evolution of Social Security benefits. Thus, the relationship between output growth and increases in benefits does not point to the business cycle as the primary driver of pension-related policies.

The right panel of Figure 2.1 plots the inflation rate as measured by the year-to-year change in CPI December together with the evolution in the average benefits per pensioner. Notice that the development in the number of pensioners does not affect much the overall trend or volatility of growth of expenditure, as plotted in the left panel. More importantly, the close evolution of inflation and growth of average benefits suggests a potential endogeneity problem. Put it differently, the high correlation between both series makes a necessity to account for the relationship between inflation and pension adjustments to determine the causal effects of pension-related policies. However, growth in average benefits tends to exceed the inflation rate. While the average difference is of 3.0 pp, the gap varies over time, with a maximum value of 16.6pp in 1978 and a negative gap in 1982. Using the year-on-year change in CPI November instead results in similar gaps.[6] These frequent and heterogeneous gaps suggest that other factors besides inflation determine increases in average benefits.

Figure 2.2 turns the attention to the relationship between pensions and the balance of the Social Security budget. The figure plots the Social Security's non-financial balance and the year-to-year growth rate of benefits per recipient. The evolution of expenditure in public pensions seems somewhat correlated with the balance of the Social Security budget. While the growth in spending appears to have a downward trend, it also picks up during years with positive balances. The implementation of the Social Security system in the early 1980s meant high growth rates of expenditure, beyond the inflation rate, despite modest surpluses or even negative balances. Moreover, the growth of spending over 1987-92 reached higher values than during later expansions (not shown in the figure), despite higher positive balances

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[6]Until 1986 pensions indexation effectively based on the year-on-year change in CPI December. After, indexation used the CPI November.
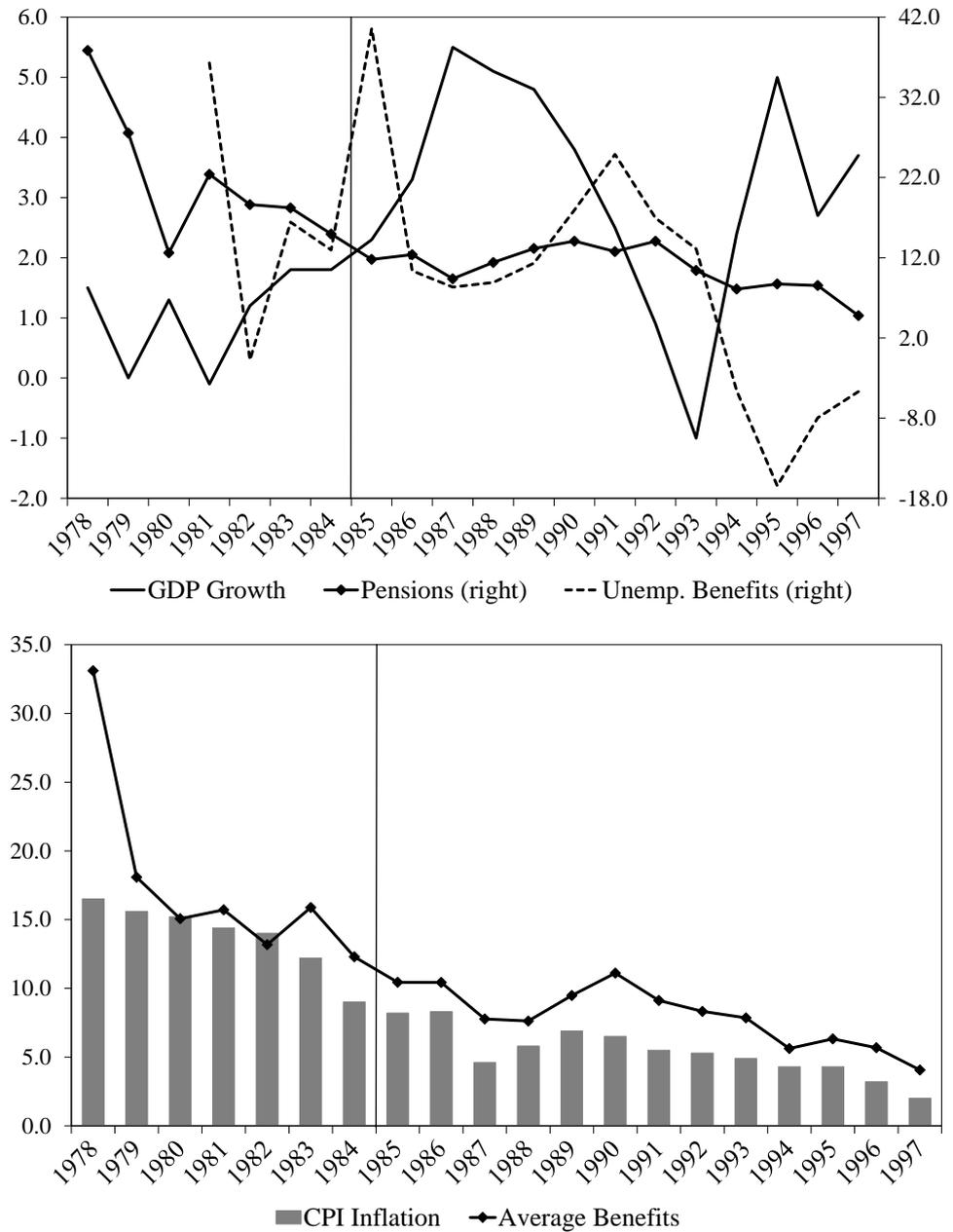
Figure 2.1: Economic Indicators and Public Pensions, 1978-1997

Notes: The plots show the year-to-year change in gross domestic product, unemployment benefits, public pensions, average benefits per recipient, and CPI December. Vertical lines indicate waves of the expenditure survey. Authors calculations using data from the Annex of the Economic and Financial Reports to the Social Security Budget, National Institute of Statistics, and the Ministry of Finance.
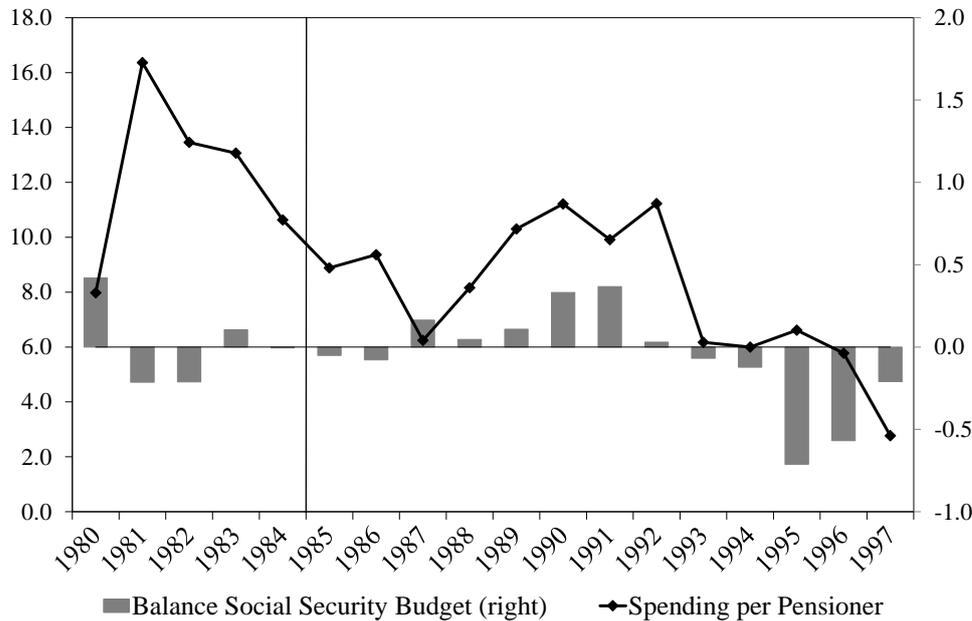
Figure 2.2: Growth of Public Pensions and the Balance of the Social Security

Notes: The plot shows the year-to-year change in benefits per pensioner and the balance of the Social Security budget as a percentage of GDP. Vertical lines indicate waves of the expenditure survey. Authors calculations using data from Economic and Financial Reports to the Social Security Budget.

during the following periods. More generally, during the 1980s and early 1990s, many policies were implemented to improve the generosity and coverage of the Social Security system, but without an equivalent counterpart to the financing of the same. In other words, with the establishment of the democracy takes place an accelerated formation of the welfare state in Spain. Carreras and Tafunell (2010) document that while the welfare state represented only 13 percent of GDP in 1970, its weight increased to about 25 percent by 1985. Among expenditure items, public pensions more than doubled its share of GDP, reaching a ratio of 10 percent of GDP in 1985, compared to 4 percent in 1970, and absorbing a quarter of total public expenditure. Nevertheless, the continuous gap between expenditure and social insurance revenues worsened during the economic crisis of 1992-93, and was one of the reasons for the ambitious reform known as the Toledo Pact of 1995.[7]

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[7]The report known as the Toledo Pact was passed on April 6, 1995. The Toledo Pact analyzed the structural problems of the Social Security system and formalized the

The identification strategy to control for reverse causality in the relationship between pension-related policies and household spending is to use a narrative approach. This paper presents a new narrative series of legislated changes in public pensions adopted in Spain corresponding to 1979-97. Because current macroeconomic developments, including inflation and the fiscal space, may determine pension-related policies, we exclude interventions with short-run stabilization goals as the primary motive. As a norm, we also discount the inflation rate from all benefit increases. The result of the narrative analysis is a record of likely exogenous pension-related policies to be used as an instrument for retirement income. Since pension-related policies affect household spending through changing their disposable income, we could identify the exogenous variation in household income caused by pension-related policies, and use it to estimate the effects on household spending. However, the household survey corresponding to the early period of the estimation sample, the EPC, does not report information on household income. Even so, using this survey is essential to guarantee a sufficient number of time periods before the treatment begins. Then, since the goal is to estimate the effects of pension-related policies on household expenditure, the narrative series will be used to instrument aggregate expenditure in public pensions to determine the impact of changes in the average allowance.

Multiple sources have been used to identify and analyze the policy changes. We use the Economic and Financial Reports to the State Budgets (IEF by its abbreviation in Spanish) - a detailed account of the economic context, the government goals and spending policies involved in the Budget Law- as a starting point for identifying significant policy changes.[8] These re-

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structural reforms necessary to ensure its sustainability in 15 recommendations. 1) Social insurance contributions should suffice to cover contributory benefits, while general taxation and transfers from the General Government should finance non-contributory benefits. 2) Constitute a reserve fund. 3) Contribution base enlargement. 4) Better financing of the specific regimes. 5) Better tax collection mechanisms. 6) Simplification and integration of the specific schemes. 7) Management combination. 8) Enhance social insurance contributions. 9) Improve the equity and contributivity of the system. 10) Standard retirement age at sixty-five. 11) Guarantee the automatic indexation of benefits. 12) Reinforcement of the solidarity by raising the maximum age to collect a survivors benefit [orphanhood], and increasing the survivors' benefits [widows]. 13) Better management. 14) Promote complementary and private saving. 15) Analysis and monitoring of the evolution of the system.

[8]The Economic and Financial Reports analyze the main characteristics and figures of the State Budget. The Reports consist of three parts. The first part describes the economic context of the State Budgets. The second part describes the government priorities and

ports have been digitalized and are available online since 2000.[9] On can find hard copies of reports for earlier fiscal years in the library of Banco de España.[10] After identifying the laws, we used the Spanish Official State Bulletin (BOE for its acronym in Spanish) to collect the legislative texts of the enacted laws. News articles, mainly from the digital archive of *El País* where occasionally used to fill information gaps.[11] This line of action makes it very likely we identify the majority and most significant policy measures.

The narrative analysis categorizes policies as either exogenous or not exogenous based on their motivation. Examination of the introductory comments of each bill, press releases, media news and different reports were used to assess the motivation of each measure. We establish three exogenous motivations based on similar classifications by Romer and Romer (2016), Cloyne (2013), and Gil et al. (2017). First, "ideological" changes due to philosophical reasons such as fairness or redistribution. For example, the introduction of new benefits for the social integration of the disabled in 1984, or the introduction in 1985 of a war pension for those who fought for the losing side in the Spanish Civil War. From all types of measures with an ideological motivation, rises of minimum and non-contributory pensions stand out because of their quantity and weight in the budget. Discussions about these measures in the legal texts and reports often involve motivations such as "*to improve the level of social protection, political will to increase minimum pensions above the CPI, equation of the minimum pensions to the legal minimum wage, equation of the minimum survivors [widows] pension with the amount of the minimum individual retirement pension,*" etc.

Second, for increases in benefits other than minimum and non-contributory pensions we establish the category of "purchasing power" improvements beyond (or below) the annual change in CPI. Due to concerns about the correlation between inflation and the short-run macroeconomic conditions, we calculate the impact of all policies against the benchmark of annual in-

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main characteristics of the Budgets, as well as an analysis of the spending policies that make them up. The third part analyses the budgets for different agencies integrated into the general government, including the Social Security.

[9]http://www.sepg.pap.minhafp.gob.es/sitios/sepg/es-ES/Presupuestos/InformeEconomicoFinanciero

[10]For missing volumes one can use as an alternative the proposal of State Budget.

[11]This is done introducing in the archive's searcher keywords related to a particular policy and in a window around the vicinity of the event.

creases in pensions equal to the inflation rate. Besides, the calculations also net out the evolution in the number of beneficiaries and the higher value of new pensions compared to existing ones. As already discussed, we often find a gap between the inflation rate and the growth rate of average benefits per pensioner. One explanation could be that policymakers repeatedly miscalculated their inflation forecasts, which, by law, were used to set the annual inflation adjustments. The latter seems unlikely given that the number of continuous and significant gaps extends for more than a decade. Moreover, during another entire decade starting in 1999 indexation of contributory pensions perfectly matched CPI inflation. Therefore, these gaps may also reflect discretionary increases in pensions because of ideological motivations and with the aim of improving the purchasing power of pensioners. The empirical strategy is to use these measures in the baseline estimates while addressing any remaining doubts about their exogeneity in the robustness section. As shown later on, the exclusion of these measures does not significantly influence the estimates obtained.

So finally, policies caused by a structural reform with long-run objectives such as a fiscal consolidation to ensure the system sustainability or reforms that address challenges stemming from demographic phenomena. Unlike other spending items, there tend to be fewer reductions in pensions to improve the budget balance in the short term. For example, in the IEF for 1990 we find *The content of the State Budget for 1990 has an important social character [e.g., spending in public pensions], although this does not imply neglecting the conservative economic policy applied in recent years*". In the IEF for 1993 similar remarks were made, adding "*The effort of spending restraint has been concentrated on the other spending items [instead of social spending such as pensions], with reductions or increases that in practice represent a freeze in nominal terms.*" Other reports and for different years include similar remarks. Finally, this category also includes reforms and changes in expenditure the result of a court ruling.

On the other hand, we classify as endogenous pension-related policies in compensation for other fiscal actions, or to boost economic growth in the short run because of their counter-cyclical motivation. Finally, reassignments of some benefits over time, which do not imply a change in coverage, are not considered as a policy.

In total, 64 exogenous pension-related policies are identified, with 47 policies taking place after 1985. While there are roughly the same amount of actions by type of benefits (contributory, minimum, non-contributory, and other pensions), ideological reasons seem to be the most common motivation. Combining all the changes for the different benefits, we identify 27 economic shocks, of which only three correspond to net reductions of benefits. Quantification of the narrative series is in annualized terms, that is, as the additional expenditure equivalent to one fiscal year as a result of a legislated change in pensions. All authoritative sources indicate the date of enactment; we follow Romer and Romer (2016) and consider that a policy is effective when beneficiaries cash in the pensions. Then, policies are assigned to the quarter when they become active. For example, while Congress usually passes the State Budget in the last quarter of the year, we attribute budget policies to January of the following year (1st quarter). The final series is transformed into real and per beneficiary terms. To do so, we divide the change in pension-related expenditure by the CPI general index base 1992 and the total number of pensions (contributory and non-contributory). The cumulative yearly impact of pension changes is on average 4,552 pesetas (about 28 euros) per beneficiary, at 1992 prices. This impact rises to 6,676 pesetas per beneficiary when we only account for net increases. For comparability with the literature, Figure 2.3 shows the narrative series normalized by GDP. Compared to other fiscal instruments, the budgetary impact of increases in pensions is rather small. For example, Gil et al. (2017) estimate a yearly amount of permanent tax cuts in Spain of about 0.25% of GDP (0.22% for increases) between 1986 and 2015. In contrast, pension increases have an average impact of 0.07% of GDP for a similar sample from 1986 to 2014. Finally, we refer the reader to the Appendix A2 for further details on all identified policies during the narrative analysis corresponding to 1979-97. Details of the Spanish pension system were provided earlier in the text.

Sample restrictions - While the complete narrative analysis covers legislated changes in public pensions adopted until 2014, this paper restricts attention to policy actions during 1979-1997. This sample choice responds to various reasons. First, starting in 1998 the new household expenditure surveys are not directly comparable with the earlier waves. For example, the survey corresponding to 1998-2005 uses a different classification for
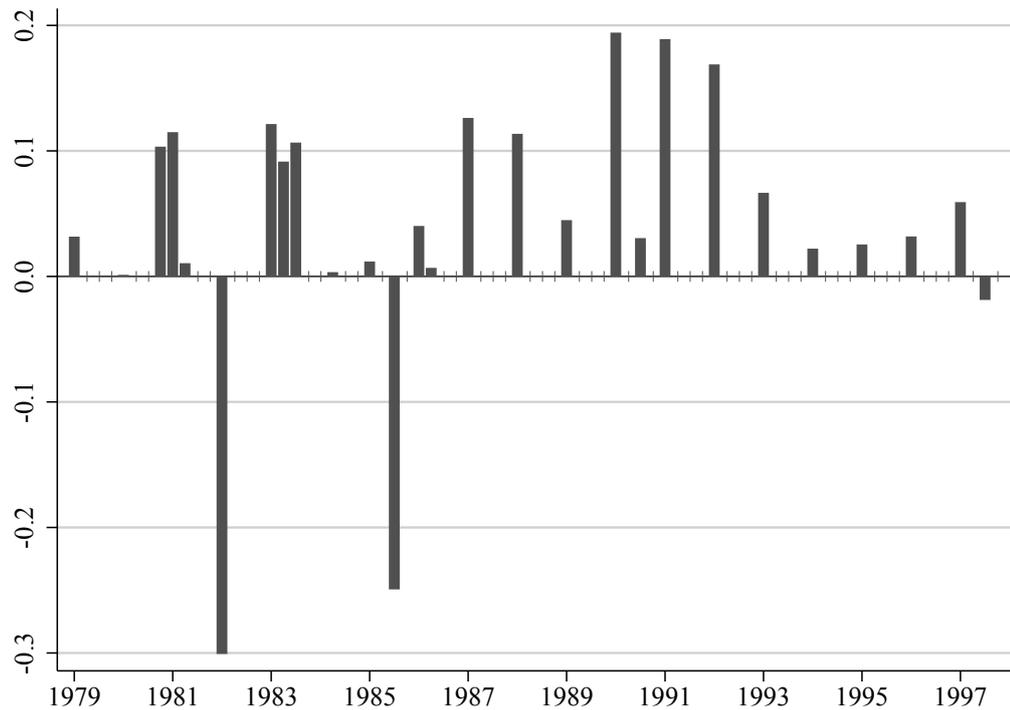
Figure 2.3: Pension-Related Policy Changes as Percentage of GDP

Notes: The plot shows the combined changes in contributory, minimum, non-contributory, and other pensions as percentage of GDP corresponding to 1979-1997

goods and services and involves a changing scheme of household participation.[12] Since 2006 the expenditure survey has changed to annual frequency. Second, the start date in the first quarter of 1979 guarantees a period of relatively institutional stability. The death of the dictator Francisco Franco in November 1975 marked the beginning of a transition period to a new democratic regime. In this historical context, the Spanish Constitution of December 1978 established the basis for the current system of Social Security. Therefore, the narrative analysis starts within the initial years of a new welfare system and covers a period with substantial variation in spending on public pensions. Later, one finds relatively infrequent policy activity. For example, during an entire decade starting in 1999 indexation of contributory pensions perfectly matched CPI inflation. Finally, data restrictions

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[12]In the survey corresponding to 1998-2005 households alternate between reporting all their spending (full participation) and their infrequent spending such as durable goods purchased during the three months before their interview (partial participation). The scheme of participation for a household participating eight consecutive quarters would have been G G g g G G g g, where G denotes full reporting and g denotes partial participation.

and the availability of reports from government agencies also determine the starting point.

Predictability tests - Next, I analyze the predictability of the exogenous pension-related policies to past macro developements in output, inflation, other fiscal policies or the monetary policy stance. These are standard tests that the literature on narrative fiscal changes has proposed as a suggestive alternative to the non-testable exogeneity assumption (see, for example, Gil et al. 2017). The results in Table 2.1 uniformly indicate that macro developments do not help forecast decisions on pension-related policies or their magnitude. First, I perform an F-test of the joint significance of various macro covariates in the linear regression:

$$NV_t = c + \sum_{j=1}^{4} \alpha_j NV_{t-j} + \sum_{j=1}^{4} \beta_j X_{t-j} + \varepsilon_t \qquad (2.1)$$

where *NV* represents the narrative variable and the macro variables in *X* include the log of GDP, CPI inflation, the average implicit personal income tax rate, and the short-term interest rate. Second, using the same covariates and lag length, I perform a VAR Granger causality test. Next, I test wether the *decisions* on pension-related policies can be forecasted on the basis of past information using an ordered probit approach following Mertens and Ravn (2012). This requires constructing and indicator variable based on the encatment date rather than the implementation date. Let T_t measure a pension-related policy announced at date t, and define the variable ω_t as:

$$\omega_t = \left\{ \begin{array}{rcl} -1 & if & T_t < 0 \\ 0 & if & T_t = 0 \\ 1 & if & T_t > 0 \end{array} \right\}$$

ω_t is a dummy variable taking the value 1 (-1) when benefit increases (cuts) are announced, and 0 otherwise. The predictability of pension-related policy announcements ω_t is assessed using a likelihood ratio test on ordered probit regressions with and without the macro covariates. The third and fourth rows of Table 2.1 show the p-value for these tests of the macro variables having no predictive power on the timing of legislated pension-related policies. The fourth line performs a similar likelihood ratio test but defining the dependent variable at the implementation date instead. Again, the last two tests also include four lags of the covariates and the dependent variable.

Table 2.1: Predictability Tests

	(1) Full sample	(2) ECPF85
F-test	0.480	0.875
Granger Causality	0.310	0.543
Ordered Probit Enactment Date	0.390	0.235
Ordered Probit Implementation Date	0.388	0.659

Notes: p-value of predictability tests for the amount and timing of exogenous pension-related policies. Full Sample from 1979q1:1997q4; ECPF85 sample in column 2 from 1985q1:1997q4. Macro variables include the log of GDP, CPI inflation, the average implicit personal income tax rate, and the short-term interest rate. All regressions include four lags of the macro variables and the narrative series.

2.2.3 The Spanish household expenditure surveys

The household level data for this paper comes from two quarterly Spanish household expenditure surveys, the *Encuesta Permanente de Consumo* (EPC) and the *Encuesta Continua de Presupuestos Familiares* (ECPF85). The EPC was carried out from the 2nd quarter of 1977 to the 4th quarter of 1983, while the ECPF85 corresponds to 1985-97. Therefore, the sample period spans from the 2nd quarter of 1977 to the 1st quarter of 1997. Based on personal interviews and expenditure diaries, these surveys report detailed information on households expenditure and other characteristics, albeit only the ECPF85 includes data on household income. The earlier survey interviewed about 2,000 families every quarter, while the ECPF85 interviewed about 3,200 families. In either survey part of the sample is renewed each period, which yields an unbalanced panel. While we observe some households for up to 24 quarters in the EPC, participation in the ECPF85 shortens to a maximum of 8 consecutive quarters.

The eligibility to collect a pension defines the treatment and control groups such that only the treated receive the benefit increases. Given that old-age pensions represent the bulk of social security benefits (see section 2.2.1 or appendix A1) and the need to minimize composition changes, retirement status defines the treatment and control groups. The treated consist of households with a reference person collecting benefits since their first interview in either of the surveys. Moreover, their age is restricted to be at least 58 years old at the time of their first interview. The age threshold

is set lower than 65 to cover cases of early retirement. By definition, the treated include households collecting benefits and no longer paying social contributions. In other words, net recipients at the time of a pension-related policy. I will refer to this group as the "pensioners".

The control group consists of households with a reference person in working-age but not entitled to a pension. Out of lack of a better name, I will refer to the control group as the "workers". Even if the reference earner might not collect a pension, the household could nonetheless receive benefits through other earners. Families with another earner older than 58 have been excluded to correct for this circumstance. I have also dropped households whenever the reference person is less than 25 or over 58 years old by their last interview. The lower-bound on age allows taking the education decision as given, while the upper-bound has a twofold purpose. Firstly, setting an upper bound lower than the standard retirement age minimizes composition changes attributable to pension-related policies, which would invalidate the grouping of households according to retirement status. Secondly, unlike the standard difference-in-difference (DD) exercise, the treatment affects both the treated (pensioners) and the non-treated (workers) because all households are affected by aggregate shocks such as pension-related policies. Given positive multiplier effects, increases in benefits might lead to higher national income. A high age threshold for the control group makes it more likely that pensioners and workers are affected similarly by general equilibrium effects amid increases in aggregate income. Moreover, a pay-as-you-go pension system finances benefit increases with current social insurance contributions, which might induce workers to cut consumption. The control group includes households which are net contributors at the time of a pension-related policy. It includes families paying social security insurance but not entitled to any benefits. Thus, if benefit increases triggered changes in taxation that induced households to cut spending, one might worry that contemporary policy changes affecting workers could positively bias the DD estimates. However, there is little evidence of contemporaneous changes in the taxation of personal income. For example, the general social insurance rate mainly decreased or remained unchanged over the sample period.[13]   Even so, the evolution of the rates might not

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[13]Between 1977 and 1984 the total social insurance rate fell 10 pp, followed by a stable 28.8% rate between 1985 and 1992. After that, although the tax rate temporally rose half percentage point in 1993-94, a new lower 28.3% rate since 1995 counterbalanced any

Table 2.2: Comparison of Characteristics of Pensioners and Workers

	Pensioners	Workers
Observations	45,115	89,550
Share in aggr. expenditure	23.4%	77.8%
Age	71	43
Spouse's age	66	40
College education	2.9%	9.7%
Female	28.8%	9.0%
Household size	2.4	4.1
Total expenditure	170,386 pts	189,834 pts
Non-durables	143,043 pts	150,933 pts
Durables	18,275 pts	30,238 pts
Food	54,849 pts	52,974 pts
Homeownership	81.2%	74.5%
Other real estate	9.4%	10.4%

Notes: The share in aggregate expenditure refers to the average share over 1977q2-1997q1. Age, education, and sex of the reference person. The household size is measured as the number of family members. Median expenditures per equivalent consumption units and quarter at 1992 prices. The percentage of home ownership does not distinguish whether a household has any outstanding debt.

entirely reflect the growth of the average contribution for social insurance, which decreased between 1977 and 1985 but showed an upward trend after that. Nevertheless, the robustness checks will include controls for other policy changes related to the taxation of personal income.

Table 2.2 compares pensioners and workers. The final estimation sample has more observations for workers than pensioners. Workers also contribute a larger share into total expenditure, 77.8% compared to 23.4%. Regarding characteristics of the reference person (lines 3-5), pensioners and workers differ in characteristics other than age. Pensioners are on average less educated than workers and over three times more likely to be a woman. Not surprisingly either, workers have larger household sizes.[14] Regarding median levels of expenditure (lines 8-12), the table indicates that pensioners have a lower level of total expenditure. In relative terms, pensioners also spend

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previous hikes.

[14]See Attanasio and Weber 2010 and references therein for other papers documenting this fact.

on average a larger fraction of non-durables, while workers spend more on durables. Finally, lines 13-14 report that pensioners have a higher rate of homeownership. Although the surveys do not contain direct information about households wealth, real state variables indicate that pensioners are wealthier than workers. Moreover, although the surveys do not distinguish between mortgagors and non-mortgagors, the one-time surveys of 1980-81 and 1990-91 reveal that pensioners usually have a much lower outstanding debt than workers.

I define nine categories of expenditure: (1) food and non-alcoholic beverages; (2) shelter, which includes utilities and household services; (3) apparel and footwear; (4) transportation (public and private), vehicles, and communications; (5) leisure, which includes entertainment, meals away from home and hotels; (6) non-durables, which include all non-durable goods and services in (1)-(5), plus expenditure in tobacco and alcohol, education and other personal services (7) homeware, furnishings and fittings, including durables for the personal care; (8) durables, which include vehicles, therapeutic material, leisure durable goods, furnishings and other personal durables; (9) total expenditure as the sum of non-durables and durables. Table A1 in the appendix provides more details about the classification of expenses. All variables are log transformed with a minimum expenditure set to 1 peseta, which is below the lowest positive level of spending in either category.

The adjustment for the reference period of expenditure deserves special mention. The surveys collect expenses with non-recurring purchases as the spending incurred during the last three months before the interview. Consequently, there may be a gap between the quarter of the meeting and the time of the expenditure. Following Pou and Alegre (2002), I reallocate infrequent spending to the previous quarter whenever the week of interview falls within the first three to four weeks of a quarter to correct for this gap.

Another concern relates to the zero expenditure records. The nature of observed zeros depends on the category and, among others, might result from non-participation, infrequency of purchases, or a corner solution. The estimation method assumes there is one primary source of zeros for each category. Moreover, it is presumed a positive expenditure for the consump-

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tion necessities food and housing.[15] Notice that as a result, total and non-durable expenditures are also always positive. The remaining categories pile up at zero with varying intensity. First, given the broad definition of leisure, zero records might result from a corner solution. In other words, one could assume that if the market value for these kinds of goods and services were to be below a reservation price, households would have spent a definite amount on leisure goods and services. Secondly, infrequency of purchases refers to those categories with zero records because the survey period is too short compared to the rate of purchases. As long as goods have some durability and there are transactions costs, consumption will occur more frequently than purchases. The categories that might be affected by the infrequency of purchases include durables, apparel, health, transport and furnishings, homeware and fittings. The infrequent purchases could arise together with corner solutions; however, either option implicitly assumes participation. To simplify the analysis, I exclude categories with zero records most likely because of non-participation. Precisely, I do not estimate the effect of pension-related policies on tobacco, alcohol, health and education expenditures.[16]

There exist alternative methods to account for zero expenditure records. Compared to methods based on distributional assumptions to obtain either a likelihood function or an appropriate censored conditional mean, censored quantile regression is not sensitive to misspecification of the error distribution. Nonetheless, censored quantile regression implicitly restricts that the same stochastic process determines consumption and purchases. Relaxing this assumption usually implies to model a purchase probability dependent on household characteristics. It is not straightforward though, what observables one could exclude from the consumption decision and at the same time determine the purchases policy. At the same time, given a dependency of the purchases probabilities on household characteristics, when controlling for individual characteristics in the regressions, we are also partly controlling for the effects of infrequent purchases.

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[15]In practice, this implies deleting 5,234 observations (2.8% of the original sample).

[16]Another reason to disregard health expenditures is the substantial subsidies toward healthcare in Spain. As a result, this category in the EPC accounts on average only 25.3% of the National Accounts data, and, according to Pou and Alegre (2002), 45% in the ECPF85. These could explain the adverse effects on spending in health found during the initial stages of estimation. Luengo-Prado and Sevilla (2013) and Labeaga and Osuna (2007) reach similar conclusions.

Finally, our data match relatively well the national accounts figures, this is especially so for the ECPF85. On average, total expenditure in the ECPF85 accounts for more than 75% of consumption in the Spanish national accounts (see Pou and Alegre, 2002). The underreporting is stronger in the early survey though, and on average total expenditure in the EPC accounts only for 55% of consumption in the national accounts. By categories, food expenditure is particularly well represented in either survey and accounts on average for 88% of the national accounts figures. Nevertheless, the discrepancies between micro and aggregate data are frequent in some other countries (see, for example, Campos, Reggio, and Gracía-Píriz, 2013), while for the Spanish data the underreporting is not concentrated in any particular year.

2.3   Identification

This section presents a regression difference-in-difference model for multiple policy interventions to estimate the impact of pension-related policies, an aggregate fiscal shock, on household spending. Following Angrist and Pischke (2015), we could estimate the direct effects of exogenous variation in the average pension on household spending by fitting variants of the following difference-in-difference specification

$$c_{it} = b_0 + b_1(P_{it} \times SS_t) + b_2 P_{it} + b_3 H_{it} + \sum_{j=2}^{T} \gamma_j yq_{jt} + u_{it} \qquad (2.2)$$

where c_{it} refers to log quarterly household expenditure in either of the nine categories described in section 2.2.3. Importantly, expenditure is transformed into (real) equivalent consumption units to account for the household size. P_{it} is a dummy variable indicating whether a household head is a pensioner, and SS_t represents pension-related policies measured as (real) aggregate expenditure on pensions per beneficiary. The time effects γ_j, are the coefficients on the year-quarter dummies, yq_{jt}, indexed with a subscript t for quarter t and the index j to keep track of the period supplying the observations. H_{it} denotes household characteristics.

The interaction term $P_{it} \times SS_t$ indicates pensioners' observations at the time of a pension-related policy. The coefficient b_1 captures the direct ef-
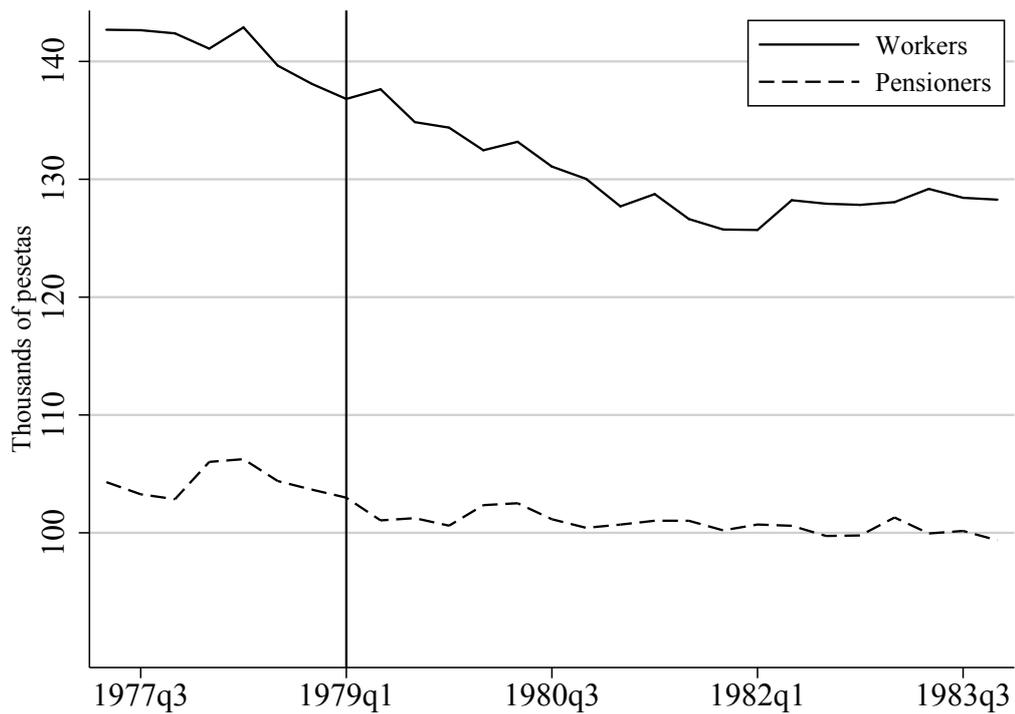
Figure 2.4: Median Total Expenditure at 1992 Prices for Pensioners and Workers

Notes: 5-quarters centered moving average. The vertical line indicates the Constitution of December 1978.

fects of changes in average benefits. An essential identifying assumption is that absent the policies, the change in pensioners and workers expenditure would have shown common trends. Figure 2.4, which plots the median level of expenditure for pensioners and workers, provides graphical evidence in support of this assumption. The data for this period comes from the early survey corresponding to 1977-83, the EPC. A reference line indicates the starting date of the multiple policies which might have affected pensioners spending. Before 1979, the evolution of median total expenditure of pensioners and workers suggests a common trend. Afterward, workers' spending shows a marked downward trend compared to pensioners' fairly constant level of consumption. Thus, one could argue that the introduction of a new welfare system and pension-related policies helped to maintain the consumption level of pensioners.[17] Over time, because treat-

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[17]Several studies on the income and consumption distribution in Spain found that the development of the welfare system contributed significantly to the reduction of inequality during the transition to democracy. See, for example, Labeaga and Osuna (2007), Alcaide

ment effects emerge gradually, it is more difficult to distinguish so clearly the impact on spending of the multiple and continuous changes in public pensions. Notice that only between 1979 and 1983 we identify eight exogenous net increases in pensions and one cut. For example, in May 1981 the unfortunate incident of the Toxic Oil Syndrome implied an unexpected rise in public pensions;[18] in January 1983, the government decided a discretionary rise in pensions, notably minimum pensions, above the CPI inflation. In August of that same year increased the spending on war pensions caused during the Spanish Civil War.

Time effects capture other sources of variation in household expenditure such as monetary policy or other economic shocks. Moreover, time effects capture the general equilibrium effects that would determine the ultimate effects on consumer spending and output caused by any initial benefits increase. In a pay-as-you-go system for old-age-pensions, an increase in pensioners' disposable income comes at the expense of working-age individuals. Then, if benefit increases hurt working-age individuals through expected higher taxes, estimates of b_1 could be positively biased. On the other hand, if more generous pensions have a positive effect on working-age individuals through an increase in national income or expected pension wealth, then my estimate of b_1 could be seen as a lower bound. The latter raises fewer concerns, while the former demands robustness checks to test for this possibility. In this line of reasoning, the possible existence of regional spillovers could also compromise the ability of the time dummies to control for general equilibrium effects. The robustness section will also check for the existence of regional spillovers.

Another concern is that pension-related policies may not be exogenous if governments time their policies in response to economic developments in the short-run. The identification strategy bases on an instrumental variables approach. An implicit assumption is that exogenous pension-related policies do not affect household expenditure outside of their effect on aggregate

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(2000), Calonge and Manresa (1997), or Bel (1997).

[18]The TOS is a disease most famous for a 1981 outbreak in Spain which killed over 600 people. The consumption of colza oil intended for industrial rather than food use seemed to cause the outbreak and the name of the syndrome. Many affected individuals suffer chronic symptoms.

expenditure on pensions. The first stage takes the form

$$SS_t = \pi_0 + \pi_1 NV_t + \pi_2 t + \sum_{j=2}^{4} q_{it} + v_t \qquad (2.3)$$

where the narrative series NV_t of pension-related policies can be used as a source of exogenous variation in public pensions (see section 2.2.2). A linear time trend and quarterly dummies are included to control for time and seasonal effects. The instrumental variable approach substitutes SS_t with the first stage fitted value $\hat{SS}_t$.

Given (2.2) and (2.3) we can easily estimate b_1 using regression. A regression framework allows convenient control for a vector of household characteristics, H_{it}. Controls include age, sex and education attainment of the reference person.[19] Alternatively, we could follow a fixed effects strategy. Combining the first stage and reduced form, the general specification taken to estimation reads

$$c_{it} = b_0 + b_1(P_{it} \times \hat{SS}_t) + b_2 P_{it} + \sum_{j=2}^{T} \gamma_j yq_{jt} + b_3 H_{it} + u_{it} \qquad (2.4)$$

To investigate further the effects of pension-related policies on spending, some sections semi-aggregate household data for different groups. Specifically, in section 2.4.1 data is aggregated at the regional level to study the implications of local spillovers. In addition, the section also investigates the effects for different cohorts of pensioners. In the later case we can aggregate observations across cohorts and replace P_{it} for a set of cohort effects. In short, the regressions for semi-aggregated data are variants of

$$C_{gt} = b_0 + \sum_{s=1}^{S} b_s(\pi_{sg} \times \hat{SS}_t) + \sum_{s=2}^{S} \alpha_s G_{sg} + \sum_{j=2}^{T} \gamma_j yq_{jt} + u_{gt} \qquad (2.5)$$

where C_{gt} represents the log of the average (real) expenditure by group g, and π_{sg} is a measure of the exposure to the policies for each group. Every group but one gets its own dummy variable, G_{sg}, indexed with a subscript g for group g and an index s to keep track of the group supplying the observations.

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[19]Base categories are men and no schooling/primary education.

Regarding the estimation method, quantile regression is more robust to extreme values than estimates of the conditional mean, which is particularly relevant given the skewness in the distribution of household expenditure. In this sense, censored quantile regression is a method not sensitive to misspecification of the error distribution that accounts for zero expenditure records. Other estimates usually found in the literature instead estimate the conditional mean response of household expenditure to income changes.

For τ in $(0,1)$, provided that the τ-quantile conditional on covariates of the error term u_{it} equals zero, the conditional τ-quantile function takes the form $Q_{\tau}(c_{it}|X_{it}) = X'_{it}\beta_{\tau}$, with $X_{it} = (P_{it}, \hat{S}S_t, H_{it}, YQ_t)$, and YQ_t summarizes the year-quarter dummies.[20] Koeneker and Bassett (1978) posed that the quantile regression estimator can be expressed as the solution to the following optimization problem

$$\beta_{\tau} \equiv arg\min_b \frac{1}{N}\sum_{i=1}^{N}\rho_{\tau}(c_{it} - Q_{\tau}(c_{it}|X_{it})) \qquad (2.6)$$

the check function $\rho_{\tau}(u) = u \cdot (\tau - 1[u < 0])$, with $1[\cdot]$ the indicator function, introduces asymmetric penalties for the absolute residuals at different parts of the expenditure distribution. Varying the weights in the objective function, quantile regression estimates a family of slope coefficients across each expenditure distribution conditional on covariates. That is, the heterogeneous response of household expenditure to pension-related policies. Moreover, given the linear model (2.2) and provided exogenous variation in the average pension, $b_1(\tau) = \frac{\partial Q_{\tau}(c_{it}|X_{it})}{\partial SS}$ measures the causal effect of pension-related policies on household spending.

On the other hand, household level data and disaggregated expenditure categories often imply zero expenditure records. The impact of zero records might be attenuated defining broad categories; however, some categories like durables will still pile up at zero. The latter motivates using censored

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[20]For τ in $(0,1)$, the τth quantile of any real valued random variable X is that x that splits the data into proportions τ below and $(1-\tau)$ above. Formally, the τth quantile of X can be expressed as

$$Q_{\tau}(X) = \inf\{x : F(x) \geq \tau\}$$

where $F(x) = \mathrm{Prob}(X \leq x)$ defines the cumulative distribution function of X. Like the distribution function, the quantile function provides a complete characterization of the random variable X.

quantile regression for durables, furnishings, leisure, apparel, and transport. When latent expenditure is left-censored at zero, we observe the maximum between zero and the right-hand-side of (2.2). Then, exploiting the equivariance of quantiles with respect to monotonic transformations, the conditional τ-quantile function of household expenditure takes the form $Q_\tau(c_{it}|X_{it}) = \max\{0, X_{it}'\beta_\tau\}$.

Given the assumption of a linear parametric quantile function, the minimization problem (2.6) can be solved efficiently by linear programming methods. Estimation is more complicated for censored quantile regression. The standard Powell estimator excludes predictions below the censoring point which would introduce bias into the objective function. However, the function $\max\{0, x\}$ also introduces non-convexities in the objective function that present well-known computational difficulties. Moreover, the transformation function implies that observations below the censoring point do not contribute information about the unknown β_τ. As a result, identification requires a sufficient fraction of the observations to be non-zero and sufficiently variable (Powell 1984 and 1986). Based on these requirements, Chernozhukov and Hong (2002) devise a computationally tractable algorithm to estimate the censored quantile regression estimator consistently. The algorithm is a three-step procedure that selects the observations for which the conditional quantile function is above the censoring point. The first step involves selecting a nontrivial subset of observations unlikely to be censored based on the predicted conditional probability of censoring from a probit model.[21] In the second step, quantile regression on the selected observations yields an initial estimator. Then, we retain the second set of observations such that their predicted conditional quantile values are uncensored; the refined sample gets asymptotically close to the ideal set of uncensored observations. In the final step, quantile regression on this sample produces consistent estimates. For more details see Chernozhukov and Hong (2002) and the extensions by Chernozhukov and co-authors (2015) and Kowalski (2016).

Finally, the (censored) quantile regression estimator is consistent when the data are dependent, as might be the case with repeated observations of

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[21]In the first step, one can use any flexible binary choice model such as the probit or logit model. Given the selection rule, the model does not need to be correctly specified. It suffices to retain a nontrivial subset of observations above the censoring point.

expenditure taken on the same household (see, for example, Chen, Wei and Parzen 2003; Abrevaya and Dahl 2008). However, the standard asymptotic-variance formula or standard bootstrap methods to compute the estimators' standard errors are invalid. Instead, one could estimate standard errors clustered by household following the formulas of Machado, Santos Silva and Wei (2016). An alternative option would be to use the bootstrap method suggested by Abrevaya and Dahl (2008). Appendix A6 does a simple simulation exercise to compare the efficiency of both methods. Although the simulation implies similar confidence intervals for either method, boot-strapped standard errors are unfeasible in practice. The bootstrap method is too time-consuming for the current application, which involves a considerable number of observations and includes numerous covariates in the regressions.

2.4 The effects of pension-related policies on household spending

The starting point consists of providing evidence of a significant and robust impact of unexpected changes in public pensions on net recipients' (pensioners) spending. This section focuses on the effects on spending at the median for different categories of expenditure, while section 2.4.1 presents a battery of robustness checks. Section 2.5 will shed light over the results looking into the effects at other points in the distribution of spending, as well as classifying pensioners by their income and wealth.

Table 2.3 reports the first-round effects of pension-related policies on different categories of household expenditure. The estimates represent the percentage increase in spending caused by an increase of 1,000 pesetas in the average pension.[22] The standard errors reported in parenthesis are clustered by household. Column (1) reports the baseline estimates from (censored) median regressions of the difference-in-difference specification (2.4). For brevity, the first stage results are omitted; however, it is crucial to verify that the first stage has sufficient predictive power. For example, the R-squared is 0.82 and the F-statistic for the weak instrument's test on

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[22]Given the fixed exchange rate of 166.386 pesetas per euro, a rise of 1,000 pesetas amounts to 6 euros.

the narrative series 13.86. Using only the early survey corresponding to 1977q2-1983q4, the R-squared reduces to 0.29, but the F-statistic becomes as high as 200.84.

I find a positive and statistically significant effect at the median on the majority of expenditures. Lines 2-3 point to similar effects on non-durables and durables of about 0.6%, however, concerning the underlying level of expenditure and the estimates in section 2.5.1, the effects on total expenditure seem to be dominated by non-durables. This dominance might only reflect that non-durables represent, on average, 79% of total expenditure. Taking advantage of the equivariance property of the median we can calculate marginal effects concerning the underlying level of expenditure.[23] Median total (real) expenditure per equivalent consumption units of pensioners amounts to 170,386 pesetas, implying that, all else equal, a 100 pts rise in average benefit increases total pensioner expenditure by 115 pesetas ($=\frac{170,386 \times 0.68}{1,000}$). The estimated marginal propensity to consume (MPC) out of benefit increases lies in the interval [89, 141], at the 95 percent confidence level. Romer and Romer (2016) also find that permanent benefit increases in the US have a roughly one-for-one effect on consumer spending in the month the larger checks arrive. Regarding the allocation of this spending between durables and non-durables, I find a marginal effect for non-durables of about 81 pesetas, with a 95 percent confidence level interval between [61, 101]. In contrast, the low level of spending in durables at the median yields a much lower MPC between 5 and 15 pesetas.

Among categories of non-durables, pension-related policies have the most significant effect on leisure, which is roughly 0.9%. However, due to the relatively low median spending on leisure goods and services, the marginal effect is only of 6 pesetas. The necessities food and shelter also show a significant increase, respectively, 0.4% and 0.8% or 24 pesetas and 39 pesetas concerning the underlying level of expenditure. These results are consistent with the findings of Stephens (2003). Stephens (2003) exploits the randomization of households in the Consumer Expenditure Survey's Diary to estimate changes in daily household consumption around the arrival date of social security checks. He finds an increase in the amount and probability of spending on non-durables, food and instantaneous forms

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[23]Because the peseta was a currency without cents, the marginal effects correspond to an increase in benefits of 100 pesetas.

Table 2.3: The Effects of Pension-Related Policies on Spending

	(1)	(2)	(3)	(4)
Total	0.675	0.666	-0.043	-0.059
	(0.078)	(0.074)	(0.085)	(0.129)
Non-durables	0.566	0.555	-0.123	-0.217
	(0.071)	(0.07)	(0.081)	(0.12)
Durables	0.550	0.057	-0.355	0.468
	(0.139)	(0.217)	(0.408)	(0.317)
Food	0.437	0.527	0.044	-0.070
	(0.065)	(0.066)	(0.102)	(0.12)
Shelter	0.823	0.758	-0.080	0.002
	(0.125)	(0.12)	(0.123)	(0.212)
Leisure	0.847	0.353	-1.289	1.092
	(0.282)	(0.372)	(0.498)	(0.766)
Apparel	0.840	0.233	0.032	0.701
	(0.149)	(0.262)	(0.518)	(0.315)
Furnishings	-0.525	0.859	-0.481	1.325
	(0.356)	(0.35)	(0.754)	(0.728)
Transport	1.830	-0.227	-2.672	-1.248
	(0.734)	(0.453)	(0.691)	(1.256)
Estimator	LAD-DD	OLS-DD	FE	LAD-DD
Observations	130,624	134,665	134,665	25,092

Notes: Percentage change in the level of spending caused by an increase of 1,000 pesetas in the average pension. Column (2) reports least squares estimates; column (3) reports resuts from a fixed effects regression; Columns (1) and (4) use median regression. Estimation sample from 1977q2 to 1997q1; estimates reported in column (4) use the early survey corresponding to 1977q2-1983q4. All regressions include time effects and controls for households characteristics. Robust standard errors clustered by household in parenthesis. Minimum number of observations across regressions by type of expenditure.

of leisure. Notably, he finds that daily non-durable expenditures increase by \$1.40 during the immediate days after receipt of the checks, which is in line with my estimates. Compared to Stephens (2003), my coefficients are also lower for spending on food and leisure, albeit quarterly data partly anticipated this comparison.

Regarding categories of expenditure that have a significant weight in durables, transport is the most affected category, increasing about 1.8% at the median. However, again due to a low median level of expenditure, the marginal effect is only of 2 pesetas. Next, apparel spending increases roughly 0.8%, or 7 pesetas given the underlying level of median expenditure in clothes and shoes. In contrast, I do not find a significant effect at the median on furnishings.

Next, we could compare our baseline estimates with the results from alternative specifications. First, using only the early survey corresponding to 1977q2-1983q4 yields very imprecise estimates (column 4). The large standard errors could be due to a much smaller estimation sample compared to the baseline; idiosyncrasies of the alternative sample could also have played a role. Nevertheless, highlights the substantial effects on durables, especially on apparel. Secondly, least squares estimates allow for comparability with the literature. The least squares estimates (column 2) resemble their median regression counterparts (column 1) for the categories mainly made of non-durable expenditures. On the other hand, except furnishings, least squares estimates for categories that mostly include durables tend to be smaller than their median regression counterparts. Given the nature of these categories, this could be a consequence of zero expenditure records. Finally, another alternative specification would be to estimate a fixed effects model (column 3). Fixed effects estimates are in general very imprecisely estimated. Moreover, pensioners are net recipients of the policies, and we would expect a non-negative response. Here, it is worth noticing the impact that a limited variation of the covariates across households (aggregate policies and time dummies) could have for identification in a fixed effects specification.

2.4.1 Robustness

This section presents additional checks for the identifying assumptions discussed in section 2.3. First, the section extends the discussion of the potential endogeneity of the narrative series. Next, we explore the bias that other contemporary policies might have on the estimates. Third, I investigate the existence of regional effects and local spillovers, as well as the possibility of cohort effects. The section ends with other standard checks.

Insofar that macroeconomic developments might affect inflation and the cost-of-living adjustments of pensions, there might exist endogeneity concerns about the new narrative series. In response to these concerns, the quantification of all exogenous pension-related policies was against the benchmark of annual increases in pensions equal to the inflation rate (see section 2.2.2). The narrative analysis also excludes any pension-related policies with a clear countercyclical motivation. Moreover, the results in Table 2.1 reject that macro variables including output, inflation, and the short-term interest rate predict the timing or size of exogenous pension-related policies. Despite these actions, including inflation adjustments among the pension-related policies could still introduce a positive bias in the estimates. For example, the estimation sample includes a period of economic growth driven by the entry of Spain into the European Community. Besides, the Spanish growth model during that period was mostly demand-side driven. This model tends to generate higher inflation and implies a positive relationship between inflation, consumption, and benefit increases. With these considerations in mind, column (2) of Table 2.4 reports the results of regressions that exclude inflation adjustments for all types of pensions. Column (1) reproduces the baseline estimates for convenience again. Comparing (1) and (2), the estimates across categories of expenditure are robust to the exclusion of these policies from the narrative series.

Given that the sample includes multiple periods, we could modify the difference-in-difference specification (2.4) to test the Granger causality of the policy changes (see, for example, Autor 2003). If the policy changes cause spending and not vice versa, introducing dummies for future policy changes in the specification (2.4) should not matter. At the same time, we can introduce lagged effects to investigate how the causal effects evolve. The estimated leads and lags, running from one quarter ahead to four quar-

ters behind, are plotted in the left panel of Figure 2.5.[24] The estimates show no significant effects the quarter before pension-related policy take place, with gradually increasing effects in the quarters after a policy change, which they appear to flatten out to a permanently higher spending level. This pattern seems consistent with a causal interpretation of the results. Moreover, the persistence of pension increases seems closely linked to this pattern. The right panel in Figure 2.5 shows that exogenous pension-related policies involve relatively persistent benefit increases, with benefits sharply decreasing in the first few quarters after the initial shock, practically disappearing after one year. Romer and Romer (2016) also find limited persistent effects for their series of permanent benefit increases in the US.

Another important consideration is the potential bias from other contemporaneous policy changes, especially other policies that affect workers such as personal income taxes and social insurance contributions. In this regard, the narrative exercise of Gil et al. (2017) finds but one simultaneous increase in Social Security benefits and contributions between 1986 and 1996. That is an increase of 0.5% in social contributions the first quarter of 1993. However, there is no evidence that the evolution of public pensions influenced tax policy over that period. First, the highest increase in social benefits attributable to the 1992-93 economic crisis was not due to public pensions but unemployment benefits. Moreover, Gil et al. (2017) argue that the tax reforms of 1991 and later extensions also responded to European directives and past reforms. Other tax policies in 1992 and 1995 had a negative impact on revenue. Lacking of a series of exogenous tax changes that goes sufficiently back in time, column (3) of Table 2.4 includes as an additional regressor the previous year (real) average monthly contribution for social insurance.[25] Reassuringly, the estimates are robust to including this additional covariate. Moreover, including a control for contemporaneous tax policy yields stronger effects on spending, a change in the opposite direction from the expected effects were the difference-in-difference es-

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[24]Using two or three lags, instead of four, also implied an increasing effect in the quarters after a policy. All the specifications yielded a statistically insignificant coefficient for the lead.

[25]The real average monthly contribution for social insurance refers to total contributions for social insurance divided by the number of insured employees and the CPI base year 1992. The annual average contribution is divided by 14 to obtain a monthly equivalent. Sources: Table I.10 and I.28 from the Annex to the Economic and Financial Report of the Social Security budget of 2016; Table 12.31 from Carreras and Tafunell (2005); Spanish Statistics Office.
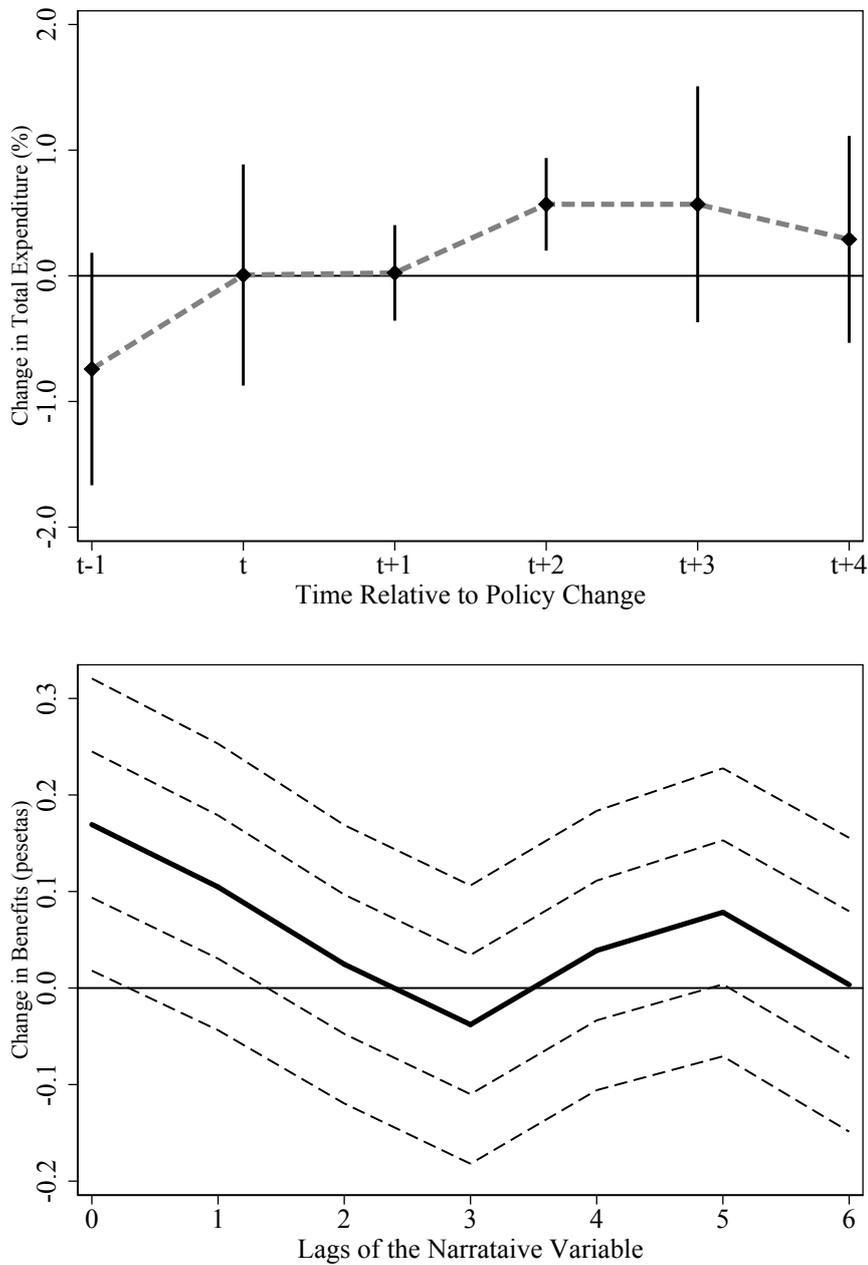
Figure 2.5: The Dynamics of Benefit Increases

Notes: The top plot reports the result for a median regression of total expenditure on the contemporaneous value, a lead, and four lags of benefits, household characteristics and time effects. The vertical lines report 95 percet confidece intervals. Sample 1977q2 to 1997q1; observations 40,498. The bottom plot reports the results for a regression of benefits per pensioner at 1992 prices on the contemporaneous value and six lags of the narrative series and a linear time trend. The broken lines report 95 and 68 percent normal based confidence intervals. Sample 1979q1 to 1997q4.

Table 2.4: Robustness Checks - Effects of Pension-related Policies on Spending

	(1)	(2)	(3)	(4)	(5)	(6)
Total	0.675	0.666	0.756	0.651	0.602	0.587
	(0.078)	(0.077)	(0.126)	(0.077)	(0.08)	(0.072)
Non-durables	0.566	0.562	0.641	0.542	0.501	0.497
	(0.071)	(0.071)	(0.12)	(0.072)	(0.071)	(0.073)
Durables	0.550	0.538	0.741	0.546	0.553	0.417
	(0.139)	(0.139)	(0.244)	(0.136)	(0.141)	(0.141)
Food	0.437	0.435	0.536	0.437	0.445	0.425
	(0.065)	(0.065)	(0.108)	(0.065)	(0.067)	(0.068)
Shelter	0.823	0.821	0.933	0.798	0.702	0.693
	(0.125)	(0.124)	(0.23)	(0.124)	(0.113)	(0.116)
Leisure	0.847	0.819	0.526	0.677	0.478	0.042
	(0.282)	(0.283)	(0.553)	(0.297)	(0.295)	(0.265)
Apparel	0.840	0.810	1.031	0.825	0.834	0.699
	(0.149)	(0.152)	(0.253)	(0.154)	(0.157)	(0.151)
Furnishings	-0.525	-0.526	-1.805	-0.573	-0.644	-0.728
	(0.356)	(0.356)	(0.588)	(0.362)	(0.362)	(0.372)
Transport	1.830	1.850	-0.171	0.932	0.643	0.144
	(0.734)	(0.722)	(1.099)	(0.643)	(0.594)	(0.641)
Observations	130,624	130,628	130,622	130,624	130,625	130,621

Notes: Percentage change in the level of spending caused by an increase of 1,000 pesetas in public pensions per beneficiary. Column (1) reproduces the baseline estimates; Column (2) excludes exogenous pension-related policies due to indexation. Column (3) includes the previous year average social insurance contributions to control for simultaneous tax policies. Column (4) includes the share of pensioners in the population of each region. Column (5) includes dummies for the 18 Spanish regions; the base region is Madrid. Column (6) includes dummies for rural, intermediate and urban habitats. All regressions control for time effects and household chanracteristics. Robust standard errors clustered by household in parenthesis.The minimum number of observations across regressions.

timates to be positively biased by contemporary policy changes affecting workers.

Next, specification (2.4) could suffer from omitted variables bias if the effects of pension-related policies on consumption depended on the share of pensioners living in each region. Appendix A4 illustrates the likely necessity to control for regional spillovers in the regressions. The bar plots show an unequal distribution of pensioners over the Spanish territory (data from the one-time surveys of 1980-81 and 1990-91). In provinces such as Madrid, Cádiz or Navarra less than 20% of the population were pensioners. In contrast, pensioners represent more than 35% of the population in the provinces of Ourense or Soria.[26] It is also noteworthy the generalized rise of pensioners in the population over the decade. From 1980 to 1990 the average share of pensioners in the population raised five percentage points from 23 percent in 1980.[27]

One could control for these possible regional spillovers including an additional covariate in the regressions representing the share of pensioners in each region. However, the ECPF85 does not report information about the regions or provinces where households live. Then, it has been necessary to construct such variable using other information provided by the ECPF85. The procedure assigns the grossing-up factors to the different regions using the information we have of the theoretical number of households by regions and "zones".[28] The information though was insufficient to recover a province variable. Column (4) of Table 2.4 reports estimates including as an additional covariate the share of pensioners in each region to capture any regional spillover effects. Again, the new coefficients are very close to the baseline estimates in column (1). Alternatively, we could introduce dummies for each of the 18 regions (column 5), or an indicator of whether

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[26]The Spanish territory consists of 16 regions called "Comunidades Autonomas", the Foral Community of Navarra, and two autonomous cities, Ceuta and Melilla. These regions are divided administratively in a total of 50 provinces, plus the two autonomous cities.

[27]Data from *Encuesta Básica de Presupuestos Familiares* for 1980/81 and 1990/91.

[28]See "Cuadro 1: ECPF. Distribución espacial del número de secciones y viviendas muestrales" in INE (1988). According to López (1993), every Spanish region includes three "zones" (except Madrid and Catalunya with four zones, and Ceuta-Melilla with one zone) concerning the size of township based on Census information. The factors represent the ratio between population size and sample size for each "zone". In total, there are 51 different grossing-up factors each quarter.

Table 2.5: Regional Differences in the Effects of Pension-Related Policies on Spending

	Total	Non-durables	Durables
$\pi_{sg} \times \hat{SS}_t$	-0.060	-0.024	-0.017
	(0.072)	(0.082)	(0.086)
	Food	Shelter	Leisure
$\pi_{sg} \times \hat{SS}_t$	-0.100	-0.038	0.114
	(0.112)	(0.150)	(0.136)
	Apparel	Furnishings	Tranport
$\pi_{sg} \times \hat{SS}_t$	-0.408	-0.065	-0.215
	(0.128)	(0.179)	(0.287)

Notes: Median regression estimates for the percentage increase in average regional expenditure caused by an increase of 1,000 pesetas in aggregate pensions per beneficiary. A shorthand for the dependent variable stated on top. Details about the difference-in-difference specification given in the text. Regressions include controls for time effects and regional dummies. Standard errors in parenthesis clustered by region. 1,341 observations; sample 1977q2 to 1997q1.

households live in a rural, intermediate, or urban habitat (column 6).[29] It is reassuring that the implied effects are not statistically different from the baseline at the standard levels.

An alternative test of the influence of regional spillovers would be to run regressions aggregating data at the regional level. To this end, I fit a variant of specification (2.5) with a single interaction term, $\pi_{sg} \times \hat{SS}_t$, such that π_{sg} represents the annual fraction of pensioners in each region g. In other words, we adjust the aggregate spending on public pensions by the importance of pensioners in each region. The regressions control for time effects and include dummies for the regions. If regional spillovers were not an issue, we would expect to find non-significant coefficients. Otherwise, a significant coefficient would indicate that the share of pensioners in the population influences the impact of benefit increases on spending. Except for apparel, the implied effects are insignificant and the standard errors large (Table 4.3). For the case of apparel, given the negative sign of the coefficient, the estimates suggest that regions with more pensioners

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[29]An urban habitat corresponds to townships with more than 50,000 inhabitants or the capitals of a province; intermediate includes townships with 10,000-50,000 inhabitants; a rural habitat includes townships with less than 10,000 inhabitants.

Table 2.6: The Effects of Pension-Related Policies on Total Expenditure by Cohort

	(1) $\leq 1920s$	(2) 1920-29	(3) 1930-39	(4) $\leq 1930s$
b_s	-0.130	-0.195	0.393	-0.049
	(0.218)	(0.190)	(0.190)	(0.230)
Households	3,963	4,089	4,411	12,463

Notes: Median regression estimates for the percentage increase in average total expenditure by cohort caused by an increase in benefits of 1,000 pesetas per beneficiary. Details about the difference-in-difference specification are given in the text. A shorthand for the cohort is stated on top. The regressions control for cohorts and time effects. Standard errors in parenthesis are clustered by cohort. Sample 1977q2 to 1997q1. Number of observations 429.

tend to have lower levels of spending in apparel. However, estimates for the effects on apparel reported in columns (4)-(6) of Table 2.4 are very close to the baseline. Overall, the results do not support different effects between regions.

On another note, it is a possibility that cohort effects could drive the estimates. To explore the role of cohort effects pensioners were subdivided depending on their date of birth. Specifically, historical and social events occurred between the 1980s and 1930s suggest three subgroups: pensioners born before 1920s, born in the 1920s, and born in the 1930s. Importantly, this grouping guarantees an even split of households. Then, we can fit a variant of specification (2.5) that aggregates observations by cohort, and replaces P_{it} with a set of cohort dummies. Notice that the sum of interactions between cohort dummies and aggregate expenditure on public pensions simplifies to $1[\leq 1930s] \times \hat{SS}_t$, where $1[\leq 1930s]$ is an indicator function that takes the value of one for all cohorts formed by pensioners, and zero otherwise. The results reported in Table 2.6 do not agree with different effects between cohorts. For each cohort, and on average, the coefficients are not statistically significant and the standard errors substantial.

Finally, other standard robustness checks are worth mentioning. First, Angrist and Pischke (2015) pose that introducing group-specific trends constitutes a critical check on the causal interpretation of specifications such as (2.4). Doing so, although the implied effect on total spending reduces to about 0.3 percent, compared to a baseline estimate of 0.7 percent, it does
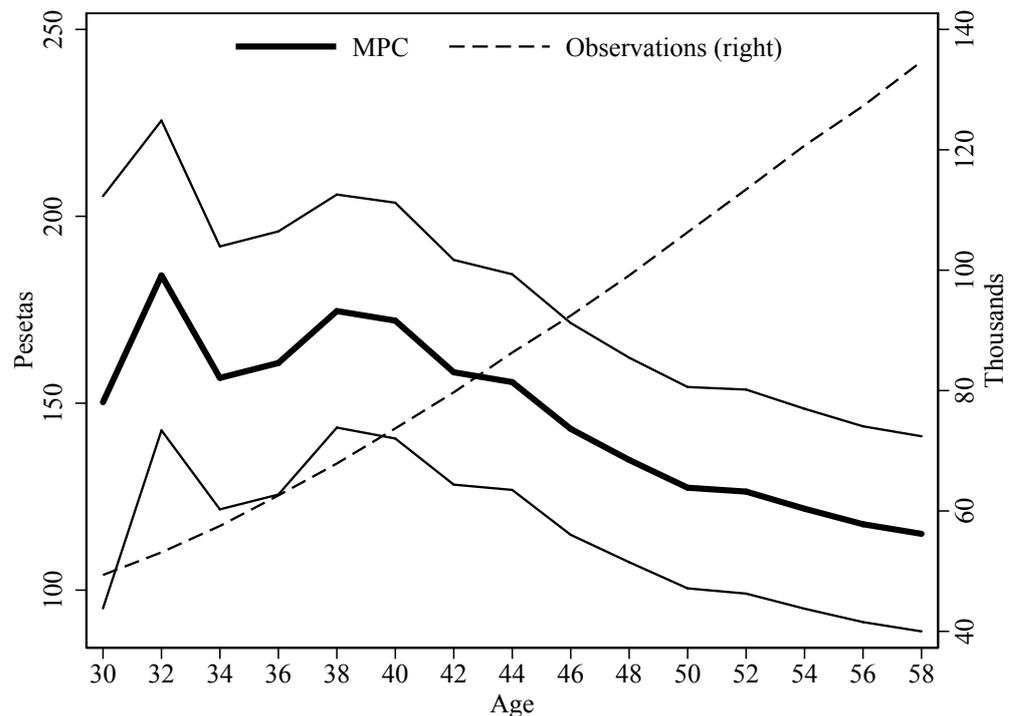
Figure 2.6: Marginal Effects on Total Spending for Alternative Control Groups

remain statistically significant at the standard confidence levels. Second, it is also relevant to check the definition of the control group. To this end we can fit alternative regressions that set different age thresholds for 'workers'. Figure 2.6 plots the estimated MPC of total expenditure for the alternative control groups, along with the 95 percent confidence level bands. The implied marginal effects out of a 100 pesetas rise in the average pension decrease the higher the age threshold set for workers. Up to 39 years old the implied MPC is the highest, averaging 165 pesetas, but the estimation samples also have the lowest number of observations. Between 40-49 years old we find an average MPC of roughly 150 pesetas. Finally, for ages 50 or older we find an MPC of about 120 pesetas. Besides the number of observations, the estimates for the highest age segment were in line with the baseline.

The choice of a high age threshold for the control group seeks to do a good control of general equilibrium effects. A condition for time effects to capture general equilibrium effects is that pensioners and non-pensioners are affected similarly by an increase in aggregate income. The lower the

age threshold set for the control group, the more unlikely this assumption will be satisfied. Standard consumption theory predicts that 'young workers' will respond less to changes in expected retirement income than 'older workers' (see, for example, Attanasio and Rohwedder, 2003). Intuitively, an individual that is 30 years old by the time they report to either consumption survey should, on average, discount 35 years any expected change in their future retirement income! At the same time, remember that 'older workers' do not collect any money from the pension-related policies. The control group includes households with neither their reference person nor any other family member earning benefits. Hausman (2016), Parker et al. (2013) or Stephens (2003) used similar strategies for constructing their treatment and control groups.

2.5 The heterogeneous effects

2.5.1 Other quantiles of expenditure

We could expect different effects for high and low-level spenders. To investigate the different effects of pension-related policies on spending this paper suggests fitting quantile regressions at other points of the conditional distribution of expenditures besides the median. Figure 2.7 shows the 0.1, 0.3, 0.5, 0.7 and 0.9th quantile estimates for total expenditure, and the sub-aggregated categories of non-durables, food and shelter. Censored quantile regression estimates are reported for the remaining categories. The estimates report the response to an increase of 1,000 pesetas per beneficiary in public pensions. The plots also report normal based 95 percent confidence intervals.[30]

Two results stand out: (i) I find significant differences between the response of pensioners with either a high or a low level of spending; and (ii), these differences depend on the durability of the goods and services consumed. The top row shows the estimates for total expenditure and the broad categories of non-durables and durables. The pattern of the effects on total expenditure seems to be dominated by non-durables. Precisely, the effects of pension-related policies on non-durable expenditure fall the higher the

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[30]Cluster standard errors by household.

level of spending. As a result, pensioners at the 0.1th quantile increase their spending on non-durables almost twice as much as those at the 0.9th quantile - 0.75% compared to 0.39%, respectively. By contrast, the effects on durable expenditure remain relatively constant across quantiles that exhibit a positive level of spending.

Within non-durables, highlights the effects on spending on goods and services for leisure (left panel in the bottom row) of those pensioners in the lowest quantiles but with a definite level of spending - 2.29% at the 0.3th quantile. Moreover, pensioners at the median spend almost four times more on leisure activities than those at the 0.9th quantile - 0.85% compared to 0.22%, respectively. The effects on food expenditure are similar (left panel in the middle row). Pensioners at the bottom of the distribution of food expenditure increased their spending almost two times more than those at the median, and almost four times more than those at the top - respectively, 0.85% compared to 0.44% and 0.24% at the 0.1th, median and 0.9th quantile. Shelter (middle panel in the middle row) in contrast, shows a stable effect across quantiles of household spending, which is consistent with the little evidence of heterogeneity in utilities, household operations and housing found by Misra and Surico (2014).
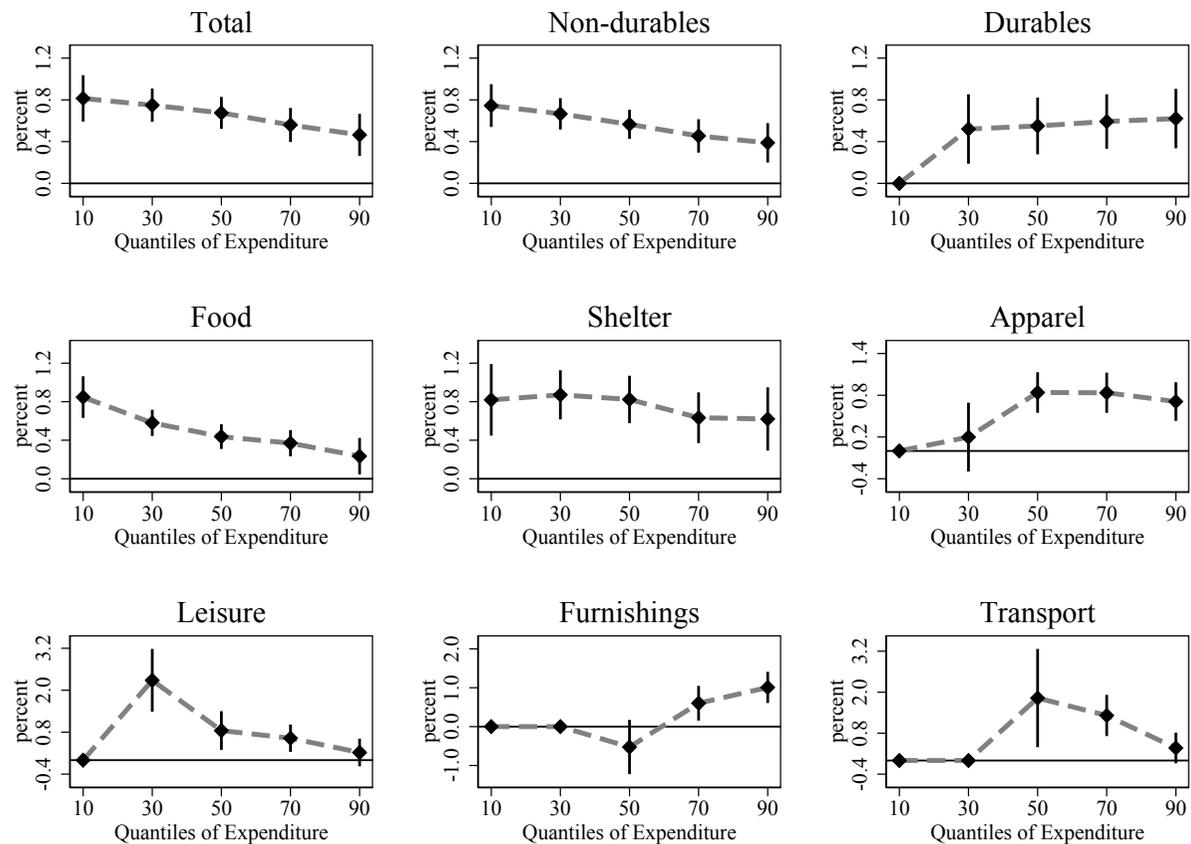
Figure 2.7: Effects of Pension-related Policies by Quantile of Household Expenditure

Notes: The dashed lines with marker report quantile regression estimates. Censored quantile regression estimates for durables, leisure, apparel, furnishings, and transport. Details on the specification can be found in the text. All the regressions control for time effects and household characteristics. Sample 1977q2 to 1997q1. Observations 130,624. The vertical lines reports 95 percent confidence intervals.

Regarding categories of durable expenditure, I find the most substantial impact on transport expenditure (right panel in the bottom row). Despite the broad confidence bands, increases in benefits trigger a maximum significant rise in transport expenditure of 1.83% at the median, five times stronger than the impact at the 0.9th quantile. This pattern contrasts with a rising effect on the level of expenditure for apparel and furnishings, furniture and fittings. Moreover, this pattern contrasts with the positive correlation found by Misra and Surico (2014) between the impact of the tax rebates of 2001 and 2008 in the US and the spending on transport-related items. Nevertheless, they also found strong effects on transport and apparel.

In summary, the implied effects depend on the level of pensioner expenditure. Pensioners with lower levels of spending appear to allocate increases in benefits mostly to non-durable goods and services, as well as necessities such as food. The results also imply that pensioners with higher levels of spending allocate a more significant fraction of benefit increases to durables. The next section investigates further the different effects among pensioners classifying them concerning their income and wealth.

2.5.2   The role of wealth

To investigate whether pension-related policies affect similarly wealthy and poor households we could fit a variant of specification (2.4) allowing for different effects by wealth level. However, the surveys do not contain direct information on the wealth of households. A second best could be to group pensioners according to their real estate tenure. Real estate constitutes a significant component of households' wealth, particularly relevant for Spain and older individuals.[31] Columns (1) and (2) in Table 2.7 compare the characteristics of pensioners grouped according to their tenure of real estate. 'Owners' refers to pensioners owners of their primary residence or any other real estate such as a second home, parking garages, or office buildings. Both groups have reference persons with a similar average age and educational attainment. Even so, non-owners are more likely to be a

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[31]For evidence using other surveys see, for example, Díaz-Giménez and co-authors (1997), Masier and Villanueva (2011), or Banco de España (2004). Bover and co-authors (2005) offer a good international comparison between the balance sheets of households in Spain, the United States, Italy and the United Kingdom.

woman, report lower levels of expenditure, and spend relatively more on non-durables and necessities like food. Here, notice that the unequal distribution of pensioners between the two groups constitutes a caveat of this classification, with more than 80 percent of pensioners owning some real estate.

Figure 2.8 shows the different effects that an increase of 1,000 pesetas in the average pension has on pensioners grouped according to their real estate. For brevity, the figures report estimates for total expenditure, as well as spending on non-durables and durables. The figures also report estimates for food expenditure as a representative of spending in necessities and strictly non-durables. This selection completely summarizes the effects of pension-related policies on spending. The implied estimates indicate that 'owners' (dark lines) are the primary drivers of the results so far obtained. The effects are not statistically significant for the total spending by non-owners (light lines), as well as for durables and non-durables. Nevertheless, both groups of pensioners are similarly affected when it comes to spending on food.

Alternatively, we could use capital income earnings as a proxy for wealth. Everything else equal, the higher the level of capital income, the more likely a household holds high levels of assets and wealth. However, the EPC does not report information on household income. Even so, we can use the information reported in the ECPF85 about household income to estimate the probability that households have a level capital income above the median on individual characteristics common to both surveys. Specifically, I estimate the probit model

$$Pr[y_i = 1|X] = \Phi(X'_{it}\beta) \tag{2.7}$$

where $\Phi(\cdot)$ is the cumulative distribution function for the standard normal. The choice of a probit model has the obvious advantage of bounding the estimated probabilities between zero and one.[32] The dependent variable $y = 1$ if a household average capital income is above the median and zero otherwise. The regressors X include a polynomial of second order for the age of the reference person, a dummy for whether they are a woman or

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[32]There was little difference with the predicted probabilities form a logit model. A simple linear probability model produced some predicted probabilities that were either negative or exceeding one.
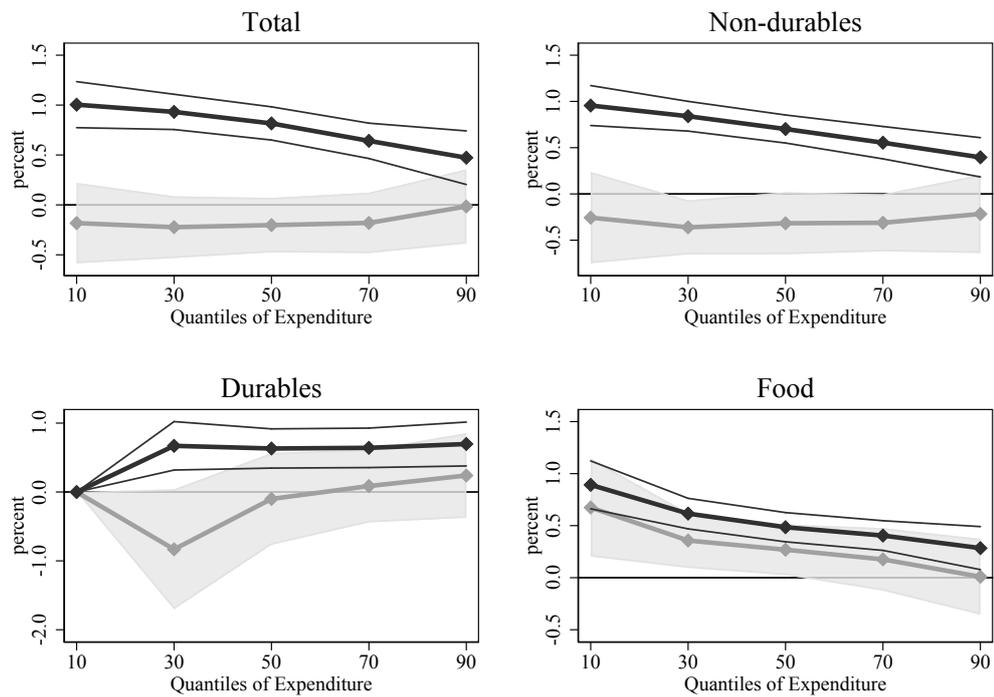
Figure 2.8: Effects on Spending by Quantile of Household Expenditure, Grouping of Pensioners Based on their Real Estate

Notes: The dark lines report the effects on pensioners owners of real estate of an increase of 1,000 pesetas in public pensions per beneficiary. The light lines report the effects on pensioners that don't own any real estate. (Censored) Median regression estimates for (durables) total expenditure, non-durables, and food. Regressions include controls for household characteristics and time effects. The thin lines report 95 confidence level intervals. Estimation sample 1977q2 to 1997q1. Observations 130,625.

have no/primary education, the household size in equivalent consumption units, dummies for whether the household owns any real estate, and regional dummies.[33]

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[33]The base region is Madrid.

Table 2.7: Characteristics of Pensioners, Grouping According to their Wealth

	(1) Owners	(2) Non-Owners	(3) Wealthy	(4) Poor	(5) Wealthy Hand- to-Mouth	(6) Hand-to- Mouth
Households	7,186	1,380	4,373	4,193	2,833	1,360
Observations	38,085	7,030	22,419	22,696	15,754	6,942
Home owner	98.05%	0.0%	97.96%	67.76%	97.62%	0.0%
Other real estate	14.86%	0.0%	21.10%	4.09%	5.90%	0.0%
Age	71	72	70	72	71	72
Spouse's age	66	66	65	67	67	66
Woman	26.46%	41.68%	24.72%	32.90%	28.98%	41.80%
No/Primary education	91.39%	89.74%	86.85%	95.37%	97.69%	90.10%
Total expenditure	176,108 pts	142,323 pts	209,626 pts	137,457 pts	135,736 pts	141,733 pts
Non-durables	147,625 pts	117,853 pts	176,206 pts	114,947 pts	113,988 pts	117,197 pts
Durables	18,651 pts	16,572 pts	22,069 pts	15,123 pts	14,608 pts	16,408 pts
Food	54,706 pts	55,590 pts	56,785 pts	52,536 pts	51,252 pts	55,540 pts

Notes: 'Owner' refers to pensioners owners of real estate. 'Wealthy' ('Poor') refers to pensioners with a level of capital income above (below) the median. 'Wealthy hand-to-mouth' refers to pensioners with a level of capital income below the median but owners of real estate; 'Hand-to-mouth' refers to pensioners with a level of capital income below the median and without real estate. Predicted probabilities have been estimated for observations without information on household income. Age, sex and education attainement of the reference person. Median expenditures per equivalent consumption units and quarter at 1992 prices.

The estimation sample includes all households of the ECPF85 whose reference person is a pensioner. This provides 37,886 observations, sufficient to correctly estimate the probability that a household has a level of capital income above of the median as a function of household characteristics. For example, the pseudo-R^2 was 0.23, and the histograms included in Appendix A5 show similar profiles of the empirical distribution of probabilities for either survey. Given the predicted probabilities, pensioners in the EPC were assigned a level of capital income above the median ($y = 1$) if their predicted probabilities were in the upper half of the distribution. This classification implies similar characteristics for pensioners with $y = 1$ in both surveys (Table A2) and suggests that the procedure yields reasonable estimates.

Given the probabilities, we can now make an alternative classification of pensioners based on their capital income as a proxy for their wealth. 'Wealthy' pensioners either reported an average level of capital income above the median or their estimated probability is in the upper half of the distribution. On the other hand, 'poor' pensioners either reported capital income below the median or had too low predicted probabilities to assign them a high level of wealth. Columns (3) and (4) in Table 2.7 show an even split of pensioners between both groups. Compared to 'poor' pensioners, 'wealthy' pensioners are on average younger, more educated, less likely to be a woman, own more real estate and report higher expenditure. Regarding items of expenditure, while both groups spend about the same share on durables, 'poor' pensioners spend a more significant share on food. Figure 2.9 indicates that, under this alternative classification, the implied effects of pension-related policies are more equally distributed between wealthy and poor pensioners. Both groups of pensioners show similar and significant responses for all types of spending, with the effects on the rich remaining the strongest. These are consistent with the findings of Giavazzi and McMahon (2013) on the effects of government spending policies on household spending. Misra and Surico (2014) also found that the income-rich had the largest MPC out of the 2001 and 2008 tax rebates in the US. On the other hand, the results contrast with the findings of Parker et al. (2013) in their series of studies of the latter tax rebates. Their estimates suggest the most significant spending response for the low-income, old age, and borrowing constrained households. Even so, their estimates also suggest that
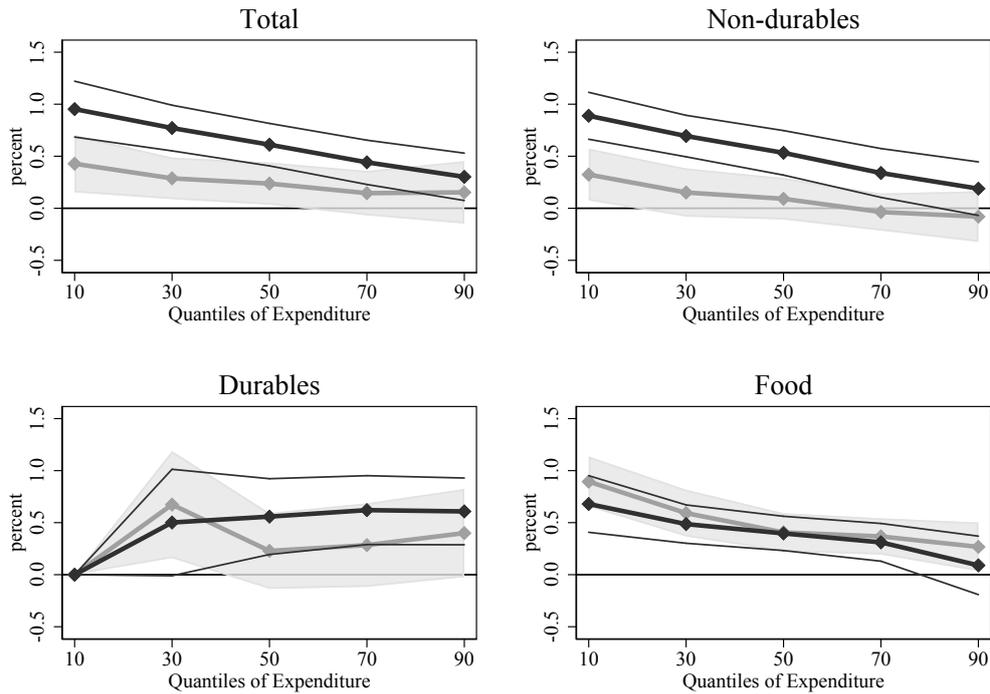
Figure 2.9: Effects on Spending by Quantile of Household Expenditure, Grouping of Pensioners Based on their Capital Income

Notes: The dark lines with marker report the response of pensioners with capital income above the median to an increase of 1,000 pesetas in the average pension. The light lines with marker report the response of pensioners with capital income below the median. The solid lines and shaded area report 95 confidence level intervals. Predicted probabilities for observations without information on household income. (Censored) Median regression estimates for (durables) total expenditure, non-durables, and food. Regressions include controls for household characteristics and time effects. Estimation sample 1977q2 to 1997q1; Observations 130,621.

there are no statistical differences in the spending response between low- and high-income groups.

A classification of pensioners based either on their real estate or their capital income only covers net worth partly. In turn, each type of wealth covers assets with different liquidity. On the one hand, capital income includes liquid returns in the form of interests, dividends, or rents.[34] On

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[34]Capital income in the ECPF85 defined as interest income from current accounts, savings accounts, and other accounts; Dividends and distribution of profits; Bond yields, bills of exchange and other disposals of equity; Income that companies pay to the members of their boards of directors, provided that they are not salaried employees; Income from temporary or life annuities; Yields of intellectual or industrial property (if the author is not the recipient of the profits, since in this case they will be considered as self-employment income); Rental of homes, premises and land; Participation of the owner or the beneficial

the other hand, real estate constitutes the most important illiquid asset for households. Based on this observations, Kaplan and Violante (2014) proposed a quantitative model that serves as a theoretical basis for the extensive empirical evidence that temporary changes in income can generate high MPCs (for example, Parker et al. 2013, Misra and Surico 2014, Cloyne and Surico 2016, Jappelli and Pistaferri 2014). A vital feature of the model is that besides poor hand-to-mouth households, it also features what has been called wealthy hand-to-mouth households. These are households that hold sizable amounts of illiquid wealth, yet deviate from the consumption behavior predicted by the permanent income hypothesis. The wealthy hand-to-mouth act as if they are constrained, but they would not appear constrained from the viewpoint of a classification based on net worth.

Ideally, we would like to have four groups of pensioners according to whether they have a high/low level of capital income and own/don't own any real estate. Unfortunately, there were only 20 households with high capital income and no real estate in the sample. Then, if pensioners have average capital income above the median, they are assigned to the group previously called 'wealthy'. Otherwise, I set two groups for those pensioners with no or little capital income. Those that own real estate will be labeled the 'wealthy hand-to-mouth', while those that do not own any real estate will be simply called the 'hand-to-mouth'. The latter fits well the stereotype of liquidity constrained households in theoretical models (Cloyne and Surico, 2016). Moreover, we might worry that the number of debtors in either group might influence the results. However, pensioners usually have low rates of outstanding debts, as reported by the one-time surveys of 1980/81 and 1990/91.

Table 2.7 offers a comparison between the three groups. Columns (3) and (5) compare 'wealthy' and 'wealthy hand-to-mouth' pensioners. Both groups show very similar homeownership rates, however, 'wealthy' pensioners show, on average, higher rates of other types of real estate. 'Wealthy' pensioners are also younger, more educated, and report higher expenditure. Regarding items of expenditure, while all three groups spend about the same share on durables, 'wealthy hand-to-mouth' and 'hand-to-mouth' pensioners (column 6) spend a larger share on food. 'Hand-to-mouth' pensioners are the least numerous group, older, and more likely to be a woman.

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owner in the price of subletting or transfer; Leasing, rights, business or mines.

Figure 2.10 shows the different effects that pension-related policies have on pensioners concerning wealth. As before, the figure plots (censored) quantile regression estimates at different points in the distribution of the expenditures, together with normal based 95 percent confidence level intervals.[35] The novelty is that the figure shows estimates by groups of pensioners based on their wealth, liquid and illiquid. Overall, the results in Figure 2.10 suggest that the wealthy pensioners are the most affected by increases in benefits. However, I find that the most affected group depends on the type and durability of the goods and services consumed. Notably, the first two rows of Figure 2.10 show the effects of the policies on total expenditure and non-durables. I find similar effects on the 'wealthy' and 'wealthy hand-to-mouth' pensioners, albeit stronger for the former. At the same time, I find a negative but insignificant effect on 'hand-to-mouth' pensioners. This puzzling result seems to be driven by a negative effect on their shelter expenditure (not shown), which, in turn, could be due to the reduced number of 'hand-to-mouth' pensioners, and the fact that they own zero real estate. When it comes to food expenditure (last row), all pensioners are positively affected, although I find the strongest effects for the 'wealthy hand-to-mouth'. Regarding durables, pension-related policies seem to affect wealthy hand-to-mouth pensioners the most. Also, the positive effects, despite being statistically insignificant, on durables expenditure by the 'hand-to-mouth' contrasts with the implied negative effects on their total spending and non-durable goods and services. Even so, the flat effects on durables by quantiles of the expenditure shown in Figure 2.7 are closer to the effects on the wealthiest pensioners. Last but not least, concerning the underlying spending, although 'wealthy hand-to-mouth' spend less in absolute terms than the wealthiest, I find similar MPC out of benefit increases for both groups. For example, benefit increases have a positive effect on all pensioners at the median of durables expenditure. At the same time, the estimates are the strongest for the 'wealthy hand-to-mouth', with an MPC out of a benefit increase of 19 pesetas, compared to 18 for the wealthiest pensioners, and 5 for the poorest. These implied effects remind of the negative correlation between MPC and cash-on-hand found by Jappelli and Pistaferri (2014).

Taken all together, the estimates for the three alternative groupings indi-

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[35]Standard errors clustered by household.
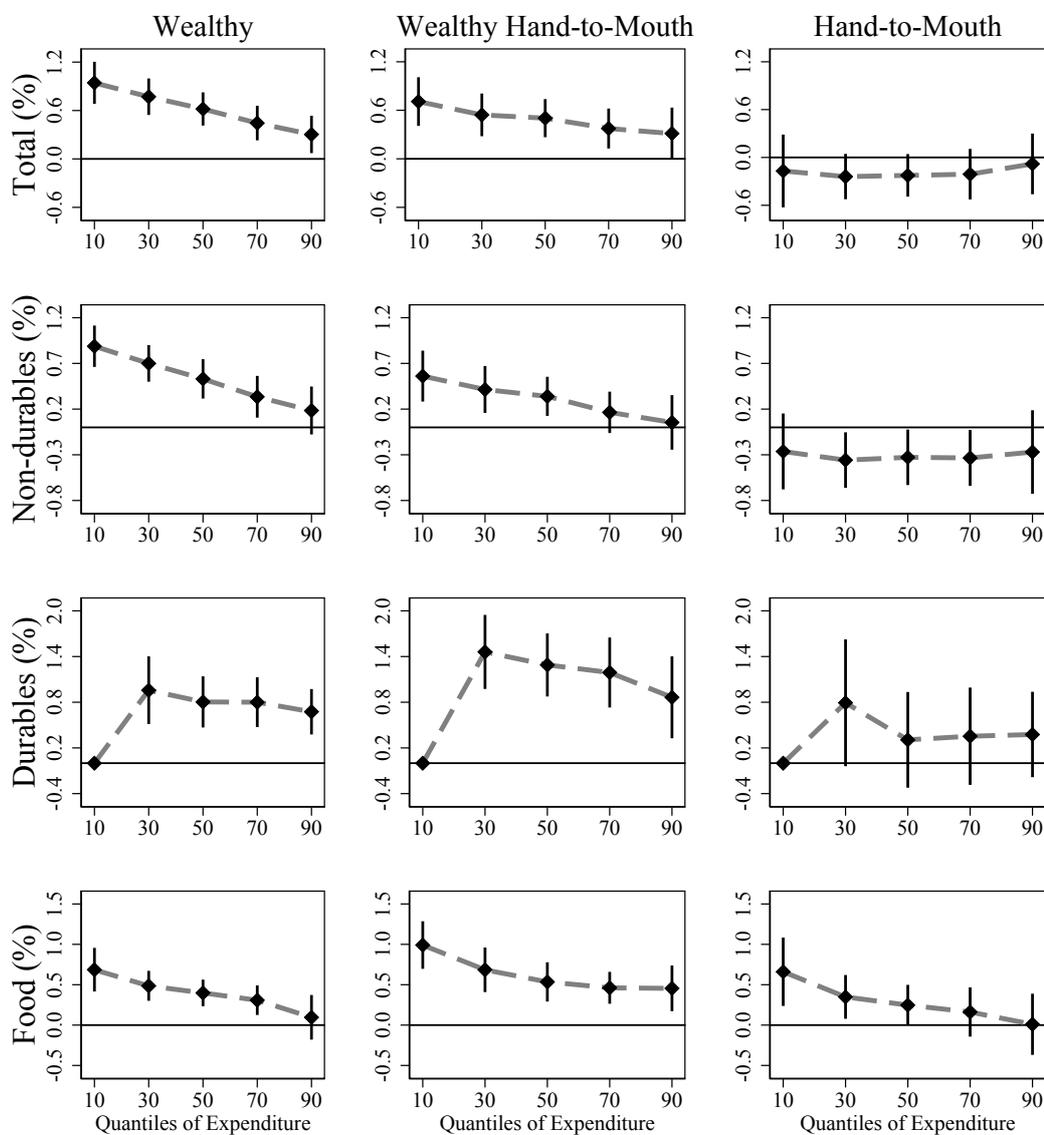
Figure 2.10: Effects on Spending by Quantile of Household Expenditure, Grouping of Pensioners According to their Wealth

Notes: The dashed lines with marker report the percentage increase in expenditure to an increase of 1,000 pesetas in the average pension. The vertical lines report 95 confidence level intervals. Definitions for the groups of pensioners given in the text. Estimated probability that a household has a level of capital income above the median for observations without information about the household income. (Censored) Median regression estimates for (durables) total expenditure, non-durables, and food. Regressions include controls for household characteristics and time effects. Estimation sample 1977q2 to 1997q1; Observations 130,621.

cate that the response of wealthy pensioners drives the results. In turn, the significant effects on the wealthy imply little support for the existence of substantial bequests motives. This result contrasts with previous work on the savings of the elderly. For example, Jappelli and Pistaferri (2014) cite bequests motives, survival risk or large medical expenses as possible explanations for the savings of the elderly. De Nardi, French, and Jones (2010) can replicate the savings of the elderly, especially the richer ones, in the United States with a model that features these three elements. My results are consistent with Hurd (1989), who does not find support for substantial bequests motives when he assumes that instead of a luxury good, bequests are normal goods. Accordingly, Hurd (1993) finds that bequest motives do not offset increases in social security benefits based on a simulated model of life-cycle behavior.

Regarding the definition of 'wealthy', a simple classification in terms of net worth appears sufficent to obtain significant heterogeneous effects of benefit increases. Thus, I find no compelling evidence to support adding layers of complexity to model pensioners in macro models, as proposed by the recent theoretical advances on heterogeneous agent models to study the effectiveness of fiscal policy (Kaplan and Violante 2014, Eggertsson and Krugman 2012). Moreover, a comparison with empiric applications that study the heterogeneous effects of tax changes such as Cloyne and Surico (2016) or Misra and Surico (2014) points to the exclusion of the elderly from the samples, and the fact that these have lower outstanding debt compared to working-age individuals, as explanatory factors for the divergences.

2.6   Concluding remarks

This paper estimates the impact of pension-related policies, an aggregate fiscal shock, on household spending. Particularly, I estimate the spending sensitivity of net recipients (pensioners) to exogenous variation in the average pension. The estimation strategy exploits the deviation in pensioner income and expenditure caused by the introduction of a new pension system on the onset of a new democratic regime in Spain in the late 1970s. Moreover, this paper presents a new narrative series of legislated pension

changes in Spain corresponding to 1979q1-1997q4 to deal with the endo-geneity issues related to benefit increases.

The results imply that pension-related policies have real direct effects on household spending. First, increases in the average pension have a roughly one-for-one impact on pensioner spending. Second, an exploration of the heterogeneous effects of benefit increases reveals the most robust results on the wealthy pensioners, with associated high levels of expenditure, income, and real estate. Moreover, given the low levels of debt owed by pensioners, the results suggest that using a simple classification concerning net worth suffices to obtain significant heterogeneous effects out of benefit increases. Last but not least, a detailed look at the impact for different categories of expenditure indicates that benefit increases trigger the consumption-rich to spend more on durables. At the same time, pension-related policies targeted to the consumption- and income-poor pensioners, e.g., minimum pensions, also affect the spending on non-durables and necessities such as food posi-tively.

Finally, the results have significant policy implications. For example, according to the latest OECD report on pension systems,[36] recent reforms addressing the financial sustainability of pension systems will lower pen-sion benefits in many countries. The results in this paper predict that such policies will result in a substantial drop in pensioners' spending, with as-sociated fall in their welfare and living standards, and point to a significant adverse impact on the aggregate economy. However, further advances in the study of the aggregate impact of transfer changes are needed to draw a firmer conclusion on the aggregate effects of pension-related policies.

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[36]OECD, Pensions at a Glance 2017.

Chapter 3

The dynamic effects of public expenditure shocks in the United States[*]

3.1 Introduction

Government spending and government income transfers represent the two key components of public expenditure in the United States. Figure 3.1 shows that these categories jointly account for about 80% of the total public expenditure. Within public expenditure, government income transfers have become the most important category over time. However, the existing literature on the aggregate effects of public expenditure shocks has focused on government spending shocks (recent examples include Perotti 2007, Mountford and Uhlig 2009, Ramey 2011, Fisher and Petters 2010, Auerbach and Gorodnichenko 2011, Nakamura and Steinsson 2014, Wilson 2012, and Suárez-Serrato and Wingender 2014, Chodorow-Reich, Feiveson, Liscow, and Woolton 2012). This paper, instead, estimates the dynamic aggregate effect of exogenous shocks to different public expenditure in the United States over a post-WWII sample. Specifically, I estimate the response of aggregate expenditure components and labor market indicators to increases in government spending and government income transfers.
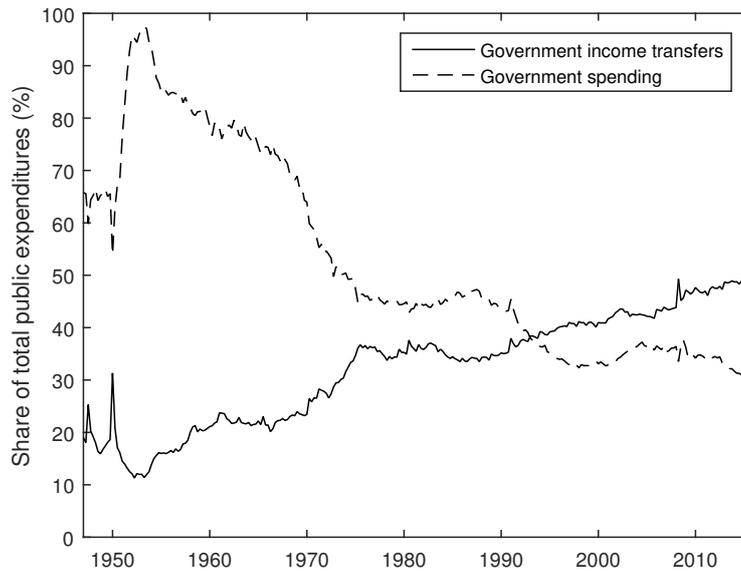
Figure 3.1: U.S. Federal Government Main Expenditures as Percentage of Total Public Expenditures from 1947:I-2015:II.

Research on the aggregate effects of government income transfers shocks is scarce and has focused on the effect that changes in income have on private consumption expenditure. In the framework of the permanent income hypothesis, Poterba (1988) estimates that a $1 increase in transitory income due to the U.S. tax rebates of 1975 raised spending on non-durables and services by about 12 to 24 cents. Wilcox (1989) found that a predictable 10% increase in U.S. social security benefits raises durable goods purchases by 3% in the same month. More recently, Romer and Romer (2016) constructed a series of legislated increases in social security benefits in the U.S. from 1951 to 1991 and studied the effect of innovations to their narrative variable on private consumption. This paper extends Romer and Romer's (2016) work along two dimensions. First, I estimate and compare the aggregate effect of exogenous shocks to different types of public expenditure. Secondly, I expand the set of outcome variables to include output, investment, consumption of durables, non-durables and services, and several labor market indicators. Moreover, this paper complements parallel work in Parraga-Rodríguez (2016), which estimates the aggregate effects of government income transfer shocks but for a sample of EU countries for the period 2007-2015.

I adopt the identification strategy of Mertens and Ravn (2013) and identify the structural shocks to public expenditure in an SVAR framework with exogenous measures of public expenditure changes. The 'Proxy SVAR' is an attractive estimator because it does not impose direct short-run assumptions, as in the SVAR approach of, for example, Perotti (2007). Moreover, the instruments do not need one-to-one mapping with the structural shocks, as in the narrative approach of Ramey (2011) or Romer and Romer (2016). Structural shocks to government spending are instrumented with a measure of U.S. defense spending shocks by Ramey (2011), available from 1969:I. Military spending has been widely accepted in the profession as a good source of exogenous variation in government spending in the U.S. because it is induced by geopolitical events most likely unrelated to the state of the U.S. economy. On the other hand, finding a good instrument for the structural shocks to transfers is no trivial task. The strong link between inflation and the narrative variable of Romer and Romer (2016) motivates the estimation of a new measure of exogenous shocks to government income transfers. The new measure is based on the residuals of regressing an extension of the narrative series on inflation. Unlike the original narrative series, the new measure cannot be predicted by aggregate variables representing the state of the economy.

The principal contribution of this paper is an estimate of the fiscal multiplier for different components of public expenditure, especially for government income transfers. The estimated impact multiplier for both types of public expenditure is close to 0.2. However, differences build up over time. Four quarters later, transfers have accumulated a multiplier effect equal to one, while it is only 0.7 for government spending. Moreover, an estimated positive response of output to transfers shocks yields a gradually rising cumulative multiplier, with a maximum effect of 2.8 by the end of the forecast horizon. In contrast, the government spending multiplier reaches its maximum cumulative effect of one between the sixth and twelfth quarters. Thereafter, I find that a government spending shock induces a fall below the trend of output, which translates into an accumulated multiplier effect below unity.

The different estimates could be explained by the different transmission mechanisms that government spending and income transfers have. On the one hand, government spending contributes directly to aggregate de-

mand producing and providing services to the public. However, the estimates indicate that increases in government spending do not sufficiently enhance private spending to generate a multiplier effect larger than one. On the other hand, government income transfers indirectly affect aggregate demand through changing individuals' disposable income and their spending decisions. The estimates are consistent with household level evidence that benefits recipients are likely to have higher marginal propensities to consume than other individuals (for example, Hausman 2016, Bodkin 1959, Parker et al.2006, 2013). I find a positive response of private spending to increases in transfers, especially the consumption of durable goods. I also find a positive response of non-residential investment. Moreover, the estimated transfers multiplier reaches values larger than one despite a neutralizing response of monetary policy, and a negative response of labor supply by labor market participants due to the self-financed nature of increases in transfers.

The remainder of the paper is organized as follows. Section 3.2 explains the econometric framework and gives details about the narrative variables. Section 3.3 presents evidence on the effect of shocks to different components of public expenditure; section 3.3.3 presents an analysis in terms of multipliers. Section 3.4 offers concluding remarks.

3.2   Econometric framework

3.2.1   Baseline specification

The aim of this paper is to estimate the dynamic aggregate effect of exogenous shocks to different components of public expenditure. The system of simultaneous equations describing the dynamics between public expenditure and the other macroeconomic variables of interest can be expressed by:

$$\mathbf{A}_0 \mathbf{Y}_t = \mathbf{c}_0 + \mathbf{c}_1 t + \sum_{j=1}^{p} \mathbf{A}_j \mathbf{Y}_{t-j} + \varepsilon_t \tag{3.1}$$

The matrix $\mathbf{A}_0$ describes the contemporaneous correlation across the n endogenous variables contained in $\mathbf{Y}_t$. The deterministic term $\mathbf{c}_t = \mathbf{c}_0 + \mathbf{c}_1 t$

includes a linear time trend. $\mathbf{A}_j$, $j = 1, ..., p$, are the $n \times n$ coefficients matrices. The orthogonal structural shocks ε_t are assumed to be *i.i.d.* with zero mean and normalized covariance matrix, i.e. $E[\varepsilon_t] = 0$, $E[\varepsilon_t \varepsilon_t'] = I$, $E[\varepsilon_t \varepsilon_s'] = 0$ for $s \neq t$ and I is the identity matrix. Premultiplying the system by $\mathbf{B} \equiv \mathbf{A}_0^{-1}$ we have the reduced form representation to be estimated:

$$\mathbf{Y}_t = \mu_0 + \mu_1 t + \sum_{j=1}^{p} \Phi_j \mathbf{Y}_{t-j} + \mathbf{u}_t \qquad (3.2)$$

where $\mu = \mathbf{Bc}$, $\Phi_j = \mathbf{BA}_j$, for $j = 1, ..., p$, and the $n \times 1$ vector of reduced form residuals $\mathbf{u}_t = \mathbf{B}\varepsilon_t$.

Identifying restrictions are required to compute economically meaningful impulse responses. The existing literature offers several alternatives. The SVAR approach pioneered by Blanchard and Perotti (2002) uses institutional knowledge to directly impose the value of some elements in $\mathbf{B}$. Alternatively, Mountford and Uhlig (2009) impose sign restrictions. The appeal of the SVAR approach resides in its simplicity. However, Mertens and Ravn (2014) and Ramey (2011) document two important shortcomings: fiscal foresight and uncertainty regarding the imposed fixed parameters. The narrative approach of Romer and Romer (2010) uses the narrative record to construct a measure of the structural shock of interest and estimates the aggregate response to changes in such a measure. I, instead, adopt the identification strategy of Mertens and Ravn (2013) and instrument the structural shock to either type of public expenditure in the SVAR with an exogenous measure of changes in public expenditure. The Proxy SVAR is an attractive estimator because it avoids direct assumptions on the elements of $\mathbf{B}$, as in the traditional SVAR approach. Moreover, unlike the narrative approach, the Proxy SVAR does not assume that the proxies have a one-to-one mapping with the true structural shocks. It does not require each proxy to be correlated with a single structural shock either. Put differently, compared to the narrative approach, the proxy SVAR has superior control of the measurement error from the narrative identification of the proxies.

The identifying strategy complements the standard $n(n+1)/2$ independent restrictions from an estimate of the covariance matrix of the reduced form residuals with $(n-k)k$ additional identifying restrictions from using

k proxies for the structural shocks of interest. While insufficient to identify all coefficients in **B**, the additional restrictions allow for identifying sufficient coefficients to estimate impulse responses to the structural shocks of interest, in this case shocks to public expenditure. Let $\mathbf{m_t}$ be the $k \times 1$ vector of proxy variables and partition the structural shocks $\varepsilon_t = [\varepsilon'_{1t}, \varepsilon'_{2t}]'$ such that ε_{1t} contains the *k* shocks to public expenditure. The key requirement for identification is that the proxy variables need to be correlated with the structural shocks of interest but uncorrelated with all other shocks. That is,

$$E[\mathbf{m_t}\varepsilon'_{1t}] = \Omega \tag{3.3}$$

$$E[\mathbf{m_t}\varepsilon'_{2t}] = 0 \tag{3.4}$$

Notice that the inability to recover all of the coefficients in **B** comes from not placing further assumptions on Ω except from invertibility.

I estimate separately the aggregate effect of shocks to government spending and transfers. The baseline VAR for transfers includes social security benefits to persons, output, and as controls for tax and monetary policy the Barro-Redlick average marginal income tax rate, the federal funds rate and the Consumer Price Index for urban wage earners and clerical workers.[1]

Government income transfers include very different types of benefits. For example, transfers in cash like old age pensions differ substantially from medical benefits. Another example is that recipients of unemployment benefits are engaged in labor market activities, while recipients of old age pensions and disability insurance are out of the labor force. I focus on social security benefits to facilitate the economic interpretation of the results. Social security benefits also have the largest share among government income transfers (see Figure B1 in the appendix). Moreover, the broader the definition of transfers, the less relevant the instrument becomes. The structural shocks to transfers are based on an extension of Romer and Romer's (2016) narrative of U.S. social security benefits increases. The sample consists of quarterly observations from 1951:I-2007:IV.

To study the aggregate effect of government spending shocks, the baseline VAR replaces social security benefits with government consumption

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[1] I use the CPI for urban wage earners because this is the index of reference for the cost-of- living-adjustments of social security benefits in the U.S. In the appendix I explore alternative price indexes.

expenditure and gross investment. The structural shocks to government spending are instrumented with a measure of U.S. defense spending shocks proposed by Ramey (2011), available from 1969:I-2007:IV.

Given the limited number of observations, I follow Burnside, Eichenbaum, and Fisher's (2004), and Ramey's (2011) strategy to estimate the effect of an expenditure shock on other variables of interest, adding them, one at a time, to the baseline VARs. This estimation strategy balances the number of parameters to be estimated and the inclusion of enough variables to avoid significant omitted variable bias. The additional variables include the other public expenditure, consumer expenditure on non-durable goods and services, durable-goods purchases, residential and non-residential private investment, total hours per worker, employment per capita, labor force per capita, a measure of the real wage and productivity. Precise data definitions can be found in the Data Appendix. According to Akaike's information criterion, the lag length is set to four in all specifications.

3.2.2 Narrative measures

This section elaborates on the measures used as instruments for the structural shocks to public expenditure in the SVARs.

Government income transfers shocks

The proxy for the structural shocks to government income transfers is based on the series by Romer and Romer (2016). Using documents from the Social Security Bulletin, reports from the U.S. Congress, the Economic Report of the President and presidential speeches they identify the motivation, timing, and size of legislated changes in social security benefits in the United States from 1951:I to 1991:IV.[2] The narrative series includes benefit increases in the old-age and survivors insurance program (OASI), the disability insurance program (DI), and the Supplemental Security Income (SSI) program. In turn, Romer and Romer (2016) classify benefit increases according to whether they were permanent or temporary. Given that con-

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[2]Romer and Romer (2016) construct a monthly series. I sum the monthly values within a quarter to create the quarterly series.

sumption theory like the life-cycle permanent income model predicts very different impacts from permanent and temporary income changes, Romer and Romer (2016) compare their effects. The goal of this paper though is to compare the dynamic aggregate effect of different components of public expenditure and from now it on focuses on permanent income changes.[3] To account for anticipation effects, I follow Mertens and Ravn (2012) and exclude all social security benefits changes with more than 90 days between their enactment and the actual increase.[4] Moreover, consistent with Romer and Romer's (2016) methodology I extend this narrative series to 2007:IV with all benefits increases due to automatic cost-of-living adjustments. Table B2in the appendix contains more details about these additional observations. The extended series overlaps more quarters with the series for government spending shocks and facilitates comparing the estimates.

Romer and Romer (2016) classify as exogenous the changes in Social Security benefits to keep up with past inflation, or to increase the insurance provided by the Social Security programs, i.e. ideological motivation of fairness or equity. However, a major concern regarding the Romer and Romer (2016) series is the link between inflation and increases in benefits. To the extent that inflation responds to the state of the economy, there exists a concern that macroeconomic developments might be leading the increases in benefits motivated by a desire to keep up with past inflation. For example, a Granger causality test of the extended narrative series on inflation has a p-value of 0.00, thus rejecting the null hypothesis that inflation does not Granger cause the narrative series.[5] Romer and Romer (2016) argue that increases in benefits to keep up with past inflation should not be systematically correlated with contemporaneous macroeconomic condi-

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[3]Romer and Romer (2016) find that temporary benefit increases have a much smaller impact on consumption than permanent increases. They argue that one explanation could be that permanent benefit increases are relatively smaller than temporary benefit increases. Their findings are consistent with previous evidence that consumers would behave as predicted by the permanent income hypothesis (rule-of-thumb consumers) for relatively large (small) income changes.

[4]From a total of 58 observations, 14 changes in social security benefits were legislated at least 90 days before their implementation. I verified how important these observations are for the results and the estimates are similar whether or not they are included.

[5]Inflation rate based on the CPI for urban wage earners and clerical workers. Alternative tests on real output per capita and the unemployment rate resulted in p-values of 0.71 and 0.24 respectively. The p-values for tests using the original series are 0.01, 0.14 and 0.34 respectively. All regressions include 12 lags of the narrative variable and the aggregate.

tions. Until automatic indexation was adopted in 1974, increases in benefits to mitigate the loss of purchasing power due to past inflation were ad hoc and irregularly spaced. Thereafter, automatic indexation at discrete intervals weakened the relationship between increases in benefits and short-run macroeconomic developments. In other words, automatic indexation is not deliberately countercyclical because cost-of-living adjustments are limited by law to take place once a year. Indexation is automatic as opposed to previous irregular increases in benefits. Moreover, Romer and Romer (2016) exclude all changes explicitly undertaken with a countercyclical motivation.

I take additional steps to address the potential endogeneity issues. First, I remove the predictable response to inflation from the increases in benefits. The new measures of exogenous shocks to transfers are the residuals of regressing the nonzero observations of the narrative series on a constant and the lag of inflation. To be consistent with the calculation of cost-of-living adjustments, the inter-annual change in CPI for urban wage earners is used as the measure of inflation. The new series cannot be predicted by inflation or other aggregates such as real output per capita or the unemployment rate. Moreover, I include controls for monetary and tax policy in the baseline VARs, that is, the Federal Funds rate, the price level, and the Barro-Redlick average marginal income tax rate. Notice that including the price level accounts for other influences not removed from the new measure of exogenous shocks, which might affect both benefits increases and inflation. Finally, because of the self-financed nature of Social Security benefits, including the average marginal income tax rate also accounts for the potential bias from a coupling of increases in benefits and higher taxes.[6]

A good instrument also needs to have explanatory power over the VAR residuals. I adopt Ramey's (2011) strategy to test the relevance of the candidate proxy variables as an instrument for the structural shocks to public

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[6]Social Security in the United States is federal programs financed with payroll taxes, also known as Federal Insurance Contributions Act (FICA) taxes. The Social Security trust funds provide an accounting mechanism for tracking all income to and disbursements from the trust funds. The Social Security Act limits trust fund expenditures to benefits and administrative costs. Between 1985 and 2010 the Social Security trust funds had persistent surpluses. In 1982 the assets of the largest trust fund (OASI) were nearly depleted. The deficit was addressed with temporary borrowing from other federal trust funds and legislation was enacted to strengthen OASI Trust Fund financing. The borrowed amounts were repaid with interest within 4 years. See www.ssa.gov.

Table 3.1: Relevance Tests for the Candidate Proxy Variables

	F-test	p-value
Original sample	9.05	0.003
Extended sample	16.48	0.000

Notes: A shorthand for the proxies on the left. Original sample from 1951:I-1991:IV. Extended sample from 1951:I-2007:IV.

expenditure. Compared to the standard narrative literature, the proxy SVAR instruments the latent shocks to public expenditure instead of the aggregate series of public expenditure. The tests are based on a regression of the reduced form residuals from the baseline VAR on the proxies. The new measure of exogenous shocks to social security benefits has an F-statistic equal to 16.5 (second row Table 3.1). Moreover, the results of the relevance tests offer additional validation to extend the narrative series. Extending the narrative series improves the proxy's explanatory power compared to the original series (first row Table 3.1).

Figure 3.2 compares the extended narrative variable (gray line) with the new measure of transfers shocks based on the non-predictable residuals (black line). The figure plots the demeaned narrative shocks, expressed as the percentage of last quarter's total taxable personal income. The first observation in 1952 corresponds to an increase in social security benefits to keep up with the inflation that had occurred during the Korean War. The next two observations in the 1950s also correspond to discretionary increases in benefits to keep up with inflation. The observations in the 1960s reflect extensions of benefits to improve the insurance component of the Social Security programs. In 1971 we again find another discretionary increase in benefits to keep up with inflation. From 1975 onwards, the observations correspond to automatic cost-of-living adjustments. Until 1983 the indexation of social security benefits was effective in June; thereafter the increases were effective in December. Compared to the narrative series, the non-predictable residuals correct downwards the cost-of-living adjustments and give more importance to the early observations.
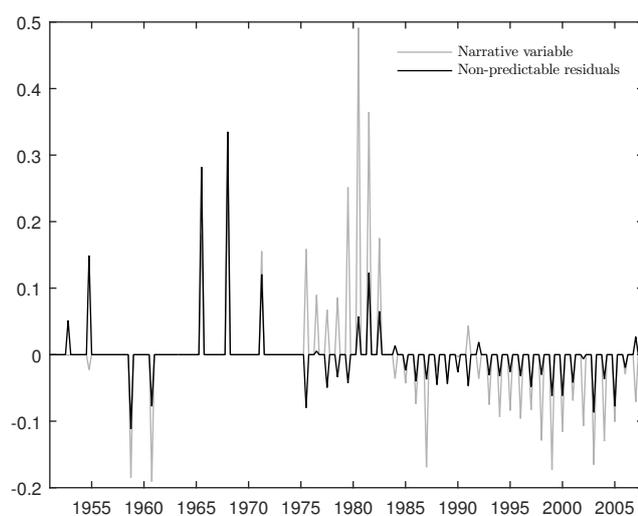
Figure 3.2: Proxy Variables for Social Security Benefits Shocks, 1951:I-2007:IV

Government spending shocks

Ramey (2011) estimates two variables that serve as potential instruments for government spending structural shocks. First, using *Business Week* and other newspaper sources, Ramey (2011) constructs a variable for military spending news as a measure of government spending shocks from 1890 to 2013. Alternatively, the second variable is based on the survey of professional forecasters predictions about U.S. defense spending. This second variable covers the period 1969-2008. The narrative measures are based on spending forecasts, which approximate the changes in expectations at the time and account for anticipation effects.

Ramey's variables rely on the identifying assumption that U.S. national military spending is dominated by foreign political events, and as such is most likely to be unrelated to the state of the U.S. economy. Recently, Nakamura and Steinsson (2014) exploited the regional differences in military procurement across U.S. states to estimate the government spending multiplier. Their observations contribute evidence that U.S. foreign military interventions are unlikely to be related to the state of the U.S. national economy. On the other hand, Albornoz and Hauk (2014) found that the party in office or the presidential approval rate are key factors in determining the willingness of the U.S. to take part in foreign military interventions. As

Table 3.2: Predictability Tests for Candidate Proxy Variables

	Output	Inflation	Unemp. rate
Based on SPF	0.72	0.89	0.24
Based on newspapers	0.88	0.96	0.51

Notes: p-values for Granger causality tests. A shorthand for the aggregate variable is stated at the top. A shorthand for the narrative variables is stated on the left. Regressions include twelve lags of the narrative variable and the selected aggregates. Sample for the narrative variable based on SPF 1969I:2007:IV. Sample for the narrative variable based on newspapers 1951I:2007IV.

Table 3.3: Relevance Tests Candidate Proxy Variables

	F-test	p-value
Based on SPF	176.33	0.00
Based on newspapers	4.84	0.03

Notes: A shorthand for the narrative variable is stated on the left. Sample for the narrative variable based on SPF 1969I:2007:IV. Sample for the narrative variable based on newspapers 1951I:2007IV.

for the candidate proxies for transfer shocks, we can test the predictability of the narrative variables related to government spending. The tests illustrate that neither of Ramey's (2011) narrative variables can be predicted by aggregates representing the state of the economy (Table 3.2).

Table 3.3 reports the relevance tests of defense news shocks as a proxy for structural shocks to government spending. Again, the F-test and associated p-value are from regressions of the reduced form residuals from the baseline VAR on each candidate. The VAR including the news variable based on the professional forecaster's survey is from 1969:I-2007:IV. The news variable based on newspapers is available for a longer sample from 1951:I-2007:IV. Despite the interest in using the longer sample, the tests clearly select the news variable based on professional forecasts. As reported by Ramey (2011), the exclusion of the WWII from the sample period has a considerable effect on the explanatory power of the instrument based on newspaper sources (see her table III on pg. 28).[7] The proxy variable is the demeaned narrative variable and is expressed as a percentage of last quarter's gross domestic product.

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[7]Fisher and Peters (2010) constructed an alternative narrative measure based on the accumulated excess returns of large US military contractors. However, this instrument results in less explanatory power for government spending (see Table 2 in their paper).

3.3 The aggregate effect of public expenditures shocks

Discriminating between government spending and income transfers provides a richer analysis of the aggregate effect of public expenditure shocks. Section 3.3.1 presents the estimates for government income transfers shocks, while section 3.3.2 describes the aggregate impact of government spending shocks. All impulse responses are for a 1 percent increase in the respective type of public expenditure, and the forecast horizon is set to 20 quarters. The solid lines report the point estimates; the broken lines report bootstrap-computed 95 percent confidence intervals. Section 3.3.3 compares the estimates in terms of the multiplier effect.

3.3.1 The aggregate effect of government income transfers shocks

Figure 3.3 shows the effects of an increase in social security benefits. The initial increase of 1 percent is reduced by half by the fourth quarter; thereafter social security benefits gradually revert to the pre-shock level. An increase in social security benefits implies a positive output response. Output rises 0.15 percent on impact and has a peak response in the second quarter of 0.2 percent. Although the output response is positive during the entire forecast horizon, it is only significant the first four quarters. Benefits increases also trigger a positive response of aggregate expenditure components. Consumption of non-durables and services, and durable goods purchases show a significant increase in the short-run. Consistent with evidence at the household level, durable goods purchases respond more than private consumption of non-durables and services; the impact responses are 0.57 and 0.07 percent respectively.[8] The estimated consumption response is lower than estimates by Romer and Romer (2016). The estimated consumption response is lower than the estimates of Romer and Romer (2016). They find that a permanent benefits increase of 1 percent raises aggregate consumption by 1.2 percent in the month in which the checks arrive. The effect persists after four months. However, their estimates are also

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[8]See, for example, Parker et al. (2013, 2006) and Souleles (1999).

mainly driven by a rise in durables consumption. Parraga-Rodriguez (2016) also finds that innovations to old age pensions trigger a larger response of durables purchases than non-durables. Non-residential investment increases significantly during the first 6 quarters, with a peak increase in the fourth quarter of 0.45 percent. One explanation for this positive response of non-residential investment could be that businesses, like policymakers (as explained below), see increases in social security benefits as expansionary. Moreover, Romer and Romer (2010) also find a strong response of investment to tax cuts which, as they argue, could be because investment depends strongly on the overall economic conditions.

Romer and Romer (2016) find that increases in social security benefits often include increases in payroll taxes in their legislation. Consistent with this evidence, the rise in social security benefits is tax-financed. An increase in social security benefits is accompanied by a significant and steady increase in the Average Marginal Income Tax Rate, which rises by 0.17 percentage points upon impact. The combined response of output and the average marginal tax income rate imply an increase in tax revenues. This response of the AMITR is also consistent with the results obtained using total tax revenues instead.

On the other hand, the narrative analysis does not find contemporaneous increases in other public expenditure. The rise in government spending questions the identifying assumption that the proxies must be unrelated to all other shocks (see equation 3.4), and could suggest that the output response might be due to higher government spending. However, the instruments for government spending and income transfer shocks have a correlation close to zero, i.e. -0.04.[9] Moreover, the next section demonstrates that government spending shocks have a weaker impact on output and aggregate expenditure components. For example, an increase in government spending yields a flat response of durable goods purchases. Augmenting the baseline VAR with government spending does not significantly change the output response either. The positive government spending response to increases in social security benefits could simply be an automatic response to higher tax revenues. It could also reflect a stimulus to private spending on goods and services provided by the government at a price below the market's (e.g. health-care).

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[9]Sample available for both variables from 1969:I-2007:IV.
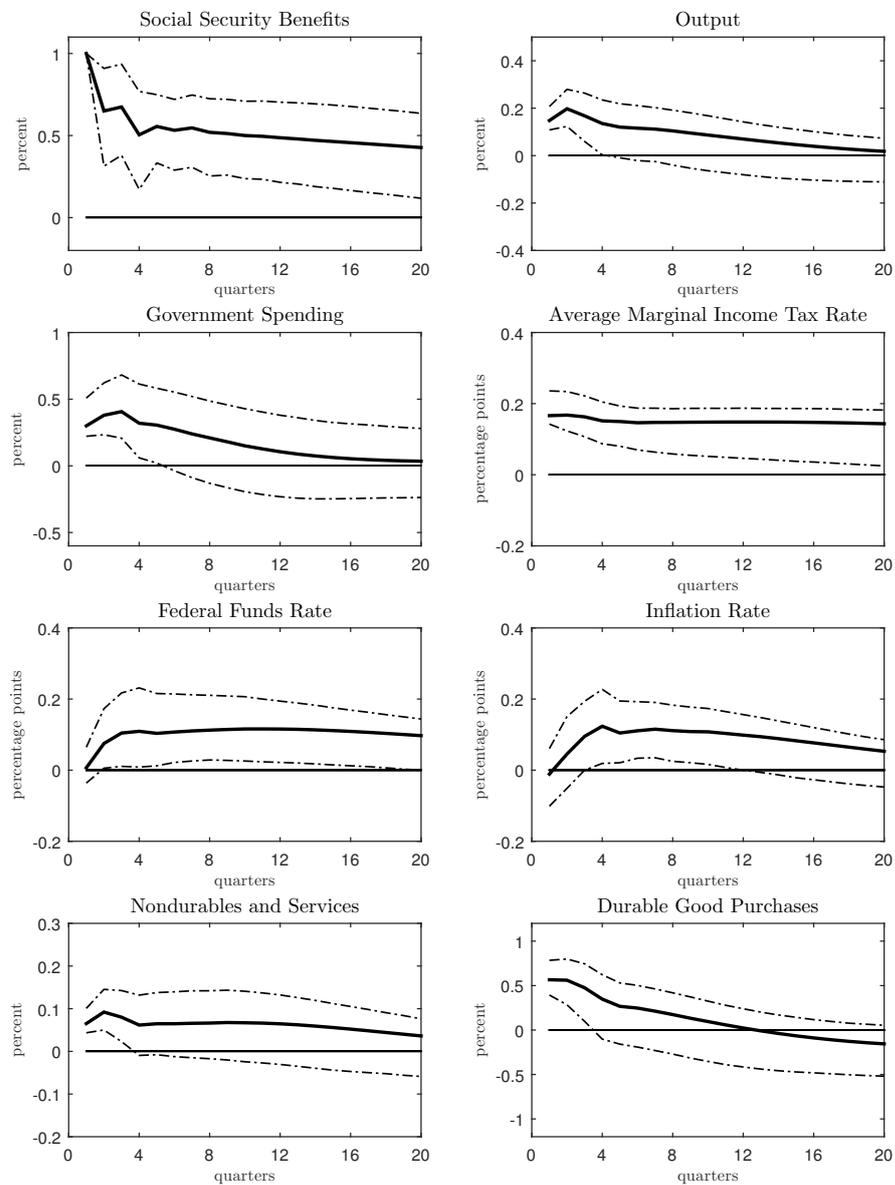
Figure 3.3: Aggregate Effects of Social Security Benefits Shocks

Notes: Impulse responses from VAR. Sample 1951:I-2007:IV. The baseline includes social security benefits, output, AMITR, FF rate, price level. Inflation response computed as the annualized change in the price level. Augmented VARs include all other variables one at a time. The solid lines report point estimates. The broken lines report the 95 percent confidence interval.
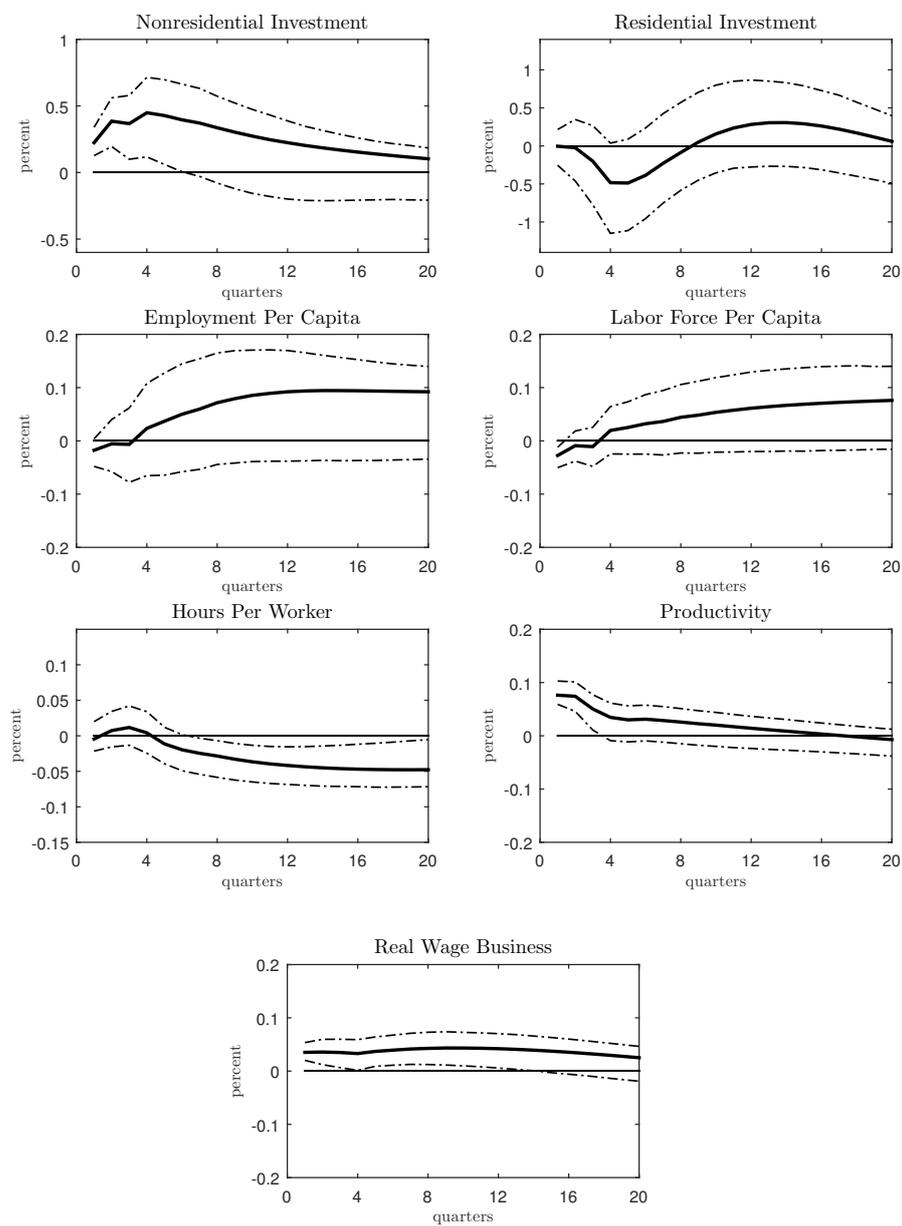
Figure 3.3 cont'd

Benefits increases yield a slight, but persistent rise in the real wage of the business sector. This contributes to higher inflation in the medium term. The inflation rate responds with a delay to an increase in social security benefits. By the fourth quarter, inflation has a maximum increase of 0.12 percentage points. The response of inflation is significant at standard levels for 8 quarters.[10] More importantly, the inflationary nature of increases in benefits triggers a response of monetary policy. Romer and Romer (2016) document the counteracting monetary policy response to increases in social security benefits, through examining the minutes of the Federal Open Market Committee (FOMC) meetings. For example, the staff economic report for the meeting on the 10th of August 1965, pg.28, states that

> The mailing of checks to Social Security beneficiaries, including both the new higher scale of payments and lump-sum retroactive benefits, will be adding to disposable personal income shortly. [...] How rapidly, and for what goods or services, recipients of the benefits will spend their funds is a big unknown; we have very little basis for estimating the consumption function for this older age group. But it's hard to believe that the bulk of it won't get into the spending stream fairly promptly.

And in pg. 65, we find

> I would not want to ease policy right now, for a considerable degree of new fiscal stimulus lies immediately ahead of us. Some of this will come from the enlarged Social Security payments.

Regarding labor market indicators, increases in benefits trigger a positive response of labor participation and employment from the 4th quarter. The point estimates though are imprecisely estimated and insignificant at the 95 percent confidence level. On the other hand, hours do not respond in the short run but fall in the medium and long run. The combined effect of higher output and the same hours during the first four quarters yields a significant increase in productivity in the short run. The negative response of hours in the medium and longer-term indicates that increases in benefits distort the labor supply of labor market participants. This is consistent with the view that higher taxes represent a weaker incentive to work (for example, Rogerson 2007; Olovsson 2009; Nickell 2004; Prescott 2004; and Ragan 2013).

To summarize, increases in social security benefits yield a positive out-

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[10]The response of inflation is computed as the annualized change in the price level.
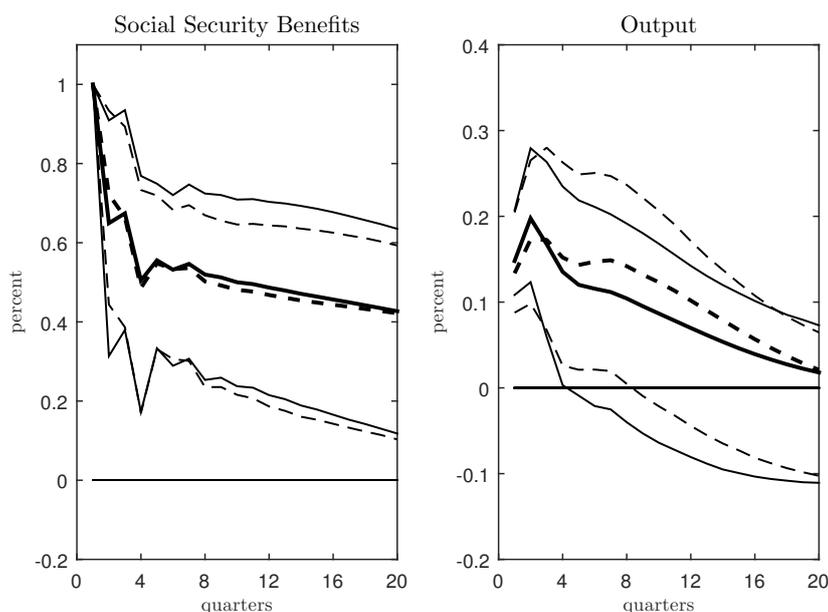
Figure 3.4: Estimates for the Predictable and Non-Predictable Proxy

Notes: Impulse responses from VAR. Sample 1951:I-2007:IV. The solid lines report base-line estimates. The broken lines report estimates using the extended narrative variable as instrument. The thin lines report the 95 percent confidence interval.

put response. While all of the consumption aggregates show a positive response, households seem to spend a larger share of their increased bene-fits on durable goods. Businesses see increases in benefits as expansionary and invest in their production capacity. However, increases in benefits also generate inflationary pressures that induce monetary policy to tighten. Fi-nally, increases in benefits are self-financed and distort the labor supply of labor market participants in the medium and longer term.

Next, we check the robustness of these results to using alternative spec-ifications. First, we compare the Proxy SVAR methodology with alterna-tive identification schemes. Figures B5-B6 in the appendix confirm that the baseline results using the Proxy SVAR approach are consistent with the findings using alternative identification strategies based on a SVAR ap-proach (e.g. Blanchard and Perotti, 2002) and a narrative scheme (Ramey, 2011). Secondly, we estimate a specification in first differences. Figure B4 in the appendix shows that first-differencing yields a very similar positive impact effect on output, albeit the effects of benefits shocks become much less persistent.

Understanding the sign of the bias

The close link to inflation of Romer and Romer's (2016) series raised doubts about the exogeneity of the narrative variable. Yet, if the nature of social security benefits increases implies a positive correlation between the state of the economy and transfers, we would expect a positive bias in the estimates using the narrative variable. Many increases in benefits are motivated by the desire to keep up with past inflation. Therefore, periods of higher inflation like expansions would translate into larger increases in benefits, and vice versa Estimates that use the (extended) narrative variable as an instrument for the structural shocks to transfers would overestimate the effect of transfer shocks because part of the positive impact attributed to increases in transfers would be the result of concealed factors associated with a good state of the economy. To better understand the potential bias, a comparison of the estimates is shown in Figure 4. The broken lines represent the estimates instrumenting the structural shocks to transfers with the narrative measure; to help in the comparison I again reproduce the baseline estimates (solid lines). The thin lines are the bootstrap-computed 95 percent confidence intervals. The paths of social security benefits are virtually the same in both specifications. However, the output responses differ. The alternative specification yields a longer-lasting output response; the positive output response is bumpier and significant for 8 quarters instead of 4 quarters.

3.3.2   The aggregate effect of government spending shocks

Figure 3.5 shows the effect of increasing government spending by 1 percent. The results from the Proxy SVAR methodology are consistent with the findings under alternative identification strategies (see figures B7 and B8 in the appendix). Government spending responds very persistently to its own shock as in Blanchard and Perotti (2002). The output response to increases in government spending is positive in the short run and significant during 3 quarters. Thereafter output declines and falls below trend before returning to the pre-shock level. The peak response of output corresponds to the impact increase of 0.14 percent. If increases in government spending were less persistent, the output response would be very similar to that of Ramey (2011).
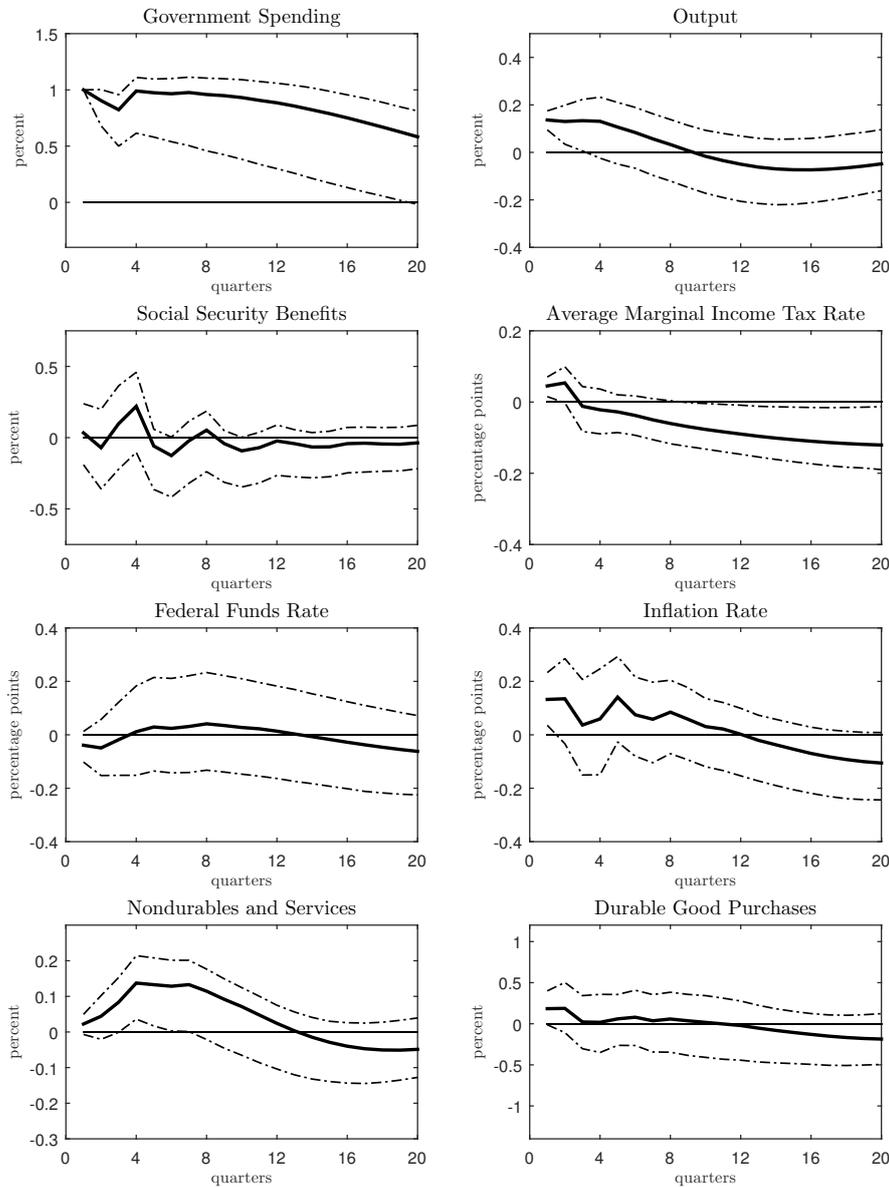
Figure 3.5: Aggregate Effects of Government Spending Shocks

Notes: Impulse responses from VAR. Sample 1969:I-2007:IV. Baseline includes government spending, output, AMITR, FF rate, price level. Inflation response computed as the annualized change in the price level. Augmented VARs include all other variables individually. The solid lines report point estimates. The broken lines report the 95 percent confidence interval.
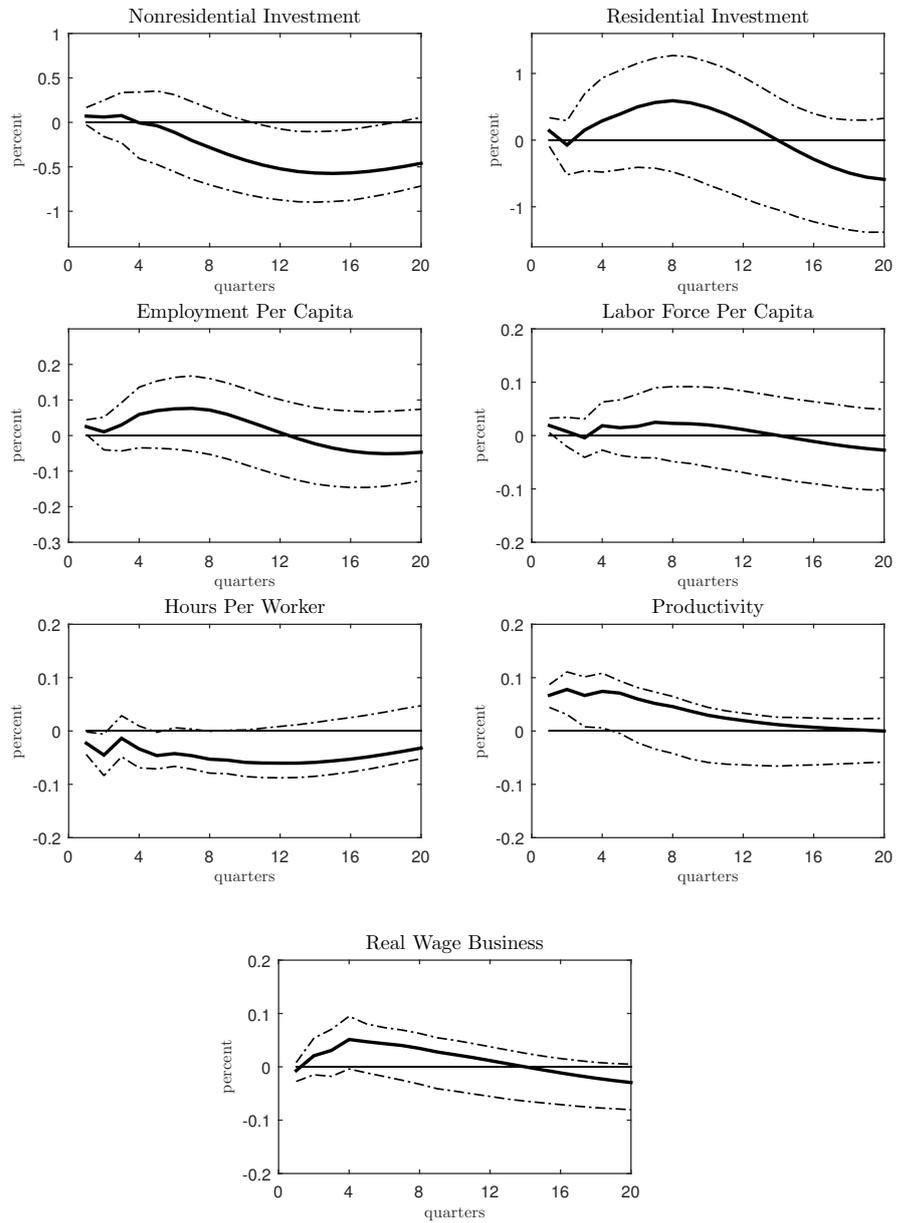
Figure 3.5 cont'd

Consumption of non-durables and services shows a hump-shaped response, with a peak increase in the fourth quarter of 0.14 percent. Unlike increases in transfers, a rise in government spending yields a flat response of durable goods purchases. Non-residential investment also remains flat for six quarters and then declines, with a significant maximum fall of -0.57 percent in the 14th quarter. The response of both investment components is similar to that of Perotti (2007) (see Figure 3 in his paper).

Compared to increases in transfers, government spending increases yield a flat response of wages in the business sector, and inflation. With the exception of an increase of 0.13 percentage points upon impact, the inflation response is not statistically significant. The estimates indicate that monetary policy does not tighten in response to increases in government spending. The response of the Federal Funds rate is not statistically significant. Ramey (2011) also finds a non-significant response of the 3-month Treasury bill rate. These estimates are in agreement with the narrative evidence. Expanding on the examples provided in the previous section, during the meeting on the 10th of August 1965 the short-term effects of the step-up in U.S. activities in Vietnam on prices were extensively discussed. The general agreement seemed to be that "the proposed step-up in defense expenditure could be absorbed without any significant inflationary pressures." (Minutes, 8/10/65, p. 54). For this conclusion though, it is important to take into account that post-Korea defense buildups involved fewer resources compared to the Korean outbreak (see Ramey 2011). Moreover, consistent with other studies that also excluded the Korean war from the sample period, I find a flat response of the tax rate (see Ramey 2011, Perotti 2007, or Fisher and Peters 2010). Social security benefits do not respond to increases in government spending either.

Regarding labor market variables, neither employment, nor labor force nor hours shows a statistically significant response. Similar to increases in transfers, the combined effect of higher output and the same, or slightly lower, hours results in a significant productivity rise in the short run.

3.3.3   The multiplier effect of different types of public expenditure

A principal contribution of this paper is an estimate of the output multiplier for different types of public expenditure, especially the transfers output multiplier. The analysis so far has been based on a qualitative comparison. The output multiplier is a standardized measure that quantitatively compares the estimates. The output multiplier can be calculated by rescaling the output response to either shock such that the public expenditure rises by 1 percent of GDP. Figure 3.6 shows the multiplier effect for both types of public expenditure as well as the cumulative effect for a forecast horizon of 20 quarters. The estimates indicate that both public expenditure shocks yield a similar aggregate effect on impact, with both having an impact multiplier close to 0.2. The differences, however, build up over the forecast horizon. Four quarters later, transfers have an accumulated effect equal to 1.0, while the government spending cumulative multiplier is only 0.7. Furthermore, the positive response of output to transfer shocks yields a gradually rising cumulative multiplier; after eight quarters it takes the value of 1.9, and it has a maximum value of 2.8 by the end of the forecast horizon. Allowing for a longer horizon is unlikely to result in a much higher effect because the output multiplier is close to zero, and insignificant, by the end of the forecast horizon. On the other hand, the government spending multiplier reaches a maximum accumulated effect of unity between the sixth and twelfth quarters. Thereafter, the fall below trend of output translates into an accumulated effect of government spending shocks below unity. Finally, it can be seen that there are wide confidence intervals for the cumulative multiplier effects at later time periods.

At this point, it is imperative to compare these estimates with other measures of fiscal output multipliers in the existing literature. Ramey (2011) also estimates the aggregate effect of government spending shocks for the narrative variable based on professional forecasts of defense spending and finds a multiplier of 0.8 when using the peak responses. Blanchard and Perotti (2002) find an impact spending multiplier of 0.8, and a peak response of 1.3 after fifteen quarters. Nevertheless, the output multiplier for government spending is in its usual range, which according to Ramey's (2011a) literature survey it ranges from 0.6 to 1.8. It is also important to
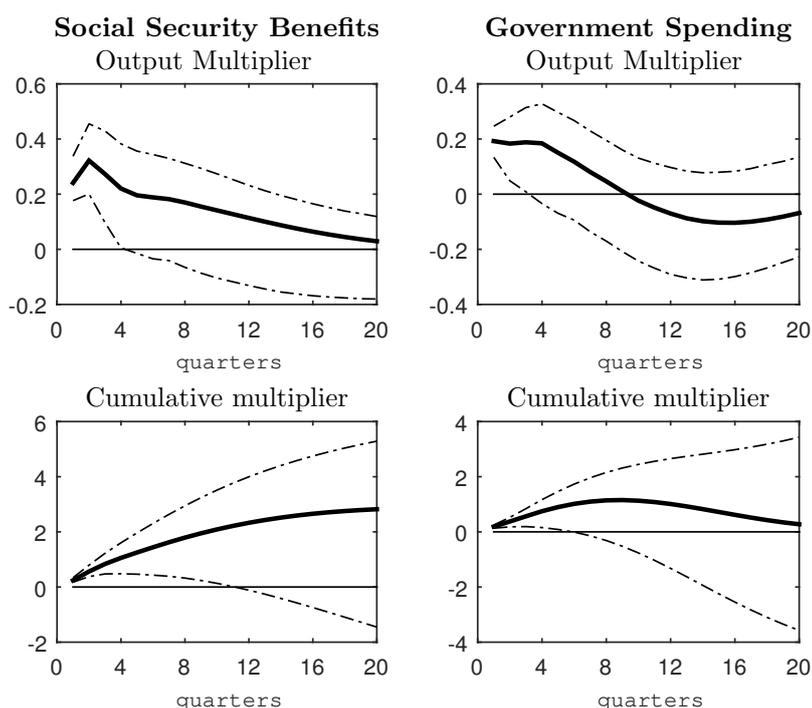
Figure 3.6: Output Multipliers for Different Public Expenditures

Notes: Transformation of output response from baseline VARs. Sample for social security benefits 1951:I-2007:IV. Sample for government spending 1969:I-2007:IV. The solid lines report multiplier effect. The broken lines report the 95 percent confidence interval.

compare the estimates for the transfers multiplier with estimated tax multipliers (although these measures do not afford a one-to-one comparison). In the SVAR tradition and for total tax revenues, Blanchard and Perotti (2002) find a peak multiplier of 0.8. Using sign restrictions in the SVAR framework, Mountford and Uhlig (2009) also estimate the effect of aggregate taxes and find an impact multiplier of 0.3, which rises to 0.9 after one year and reaches a maximum value of 3.4 after twelve quarters. Romer and Romer (2010) construct a narrative variable of legislated tax changes and estimate that a tax hike of 1 percent of GDP has a small and not statistically significant effect on output upon impact, but a maximum effect of 3.1 percent after ten quarters. Mertens and Ravn (2013) estimate the proxy SVAR for personal income taxes and find a multiplier of 2.0 on impact, rising to a maximum of 2.5 in the third quarter.

The recent literature has highlighted that fiscal multipliers can show a variation over the course of the business cycle (for example, Ramey and Zubairy, 2017; Alloza, 2017; Caggiano, Castelnuovo, Colombo, and

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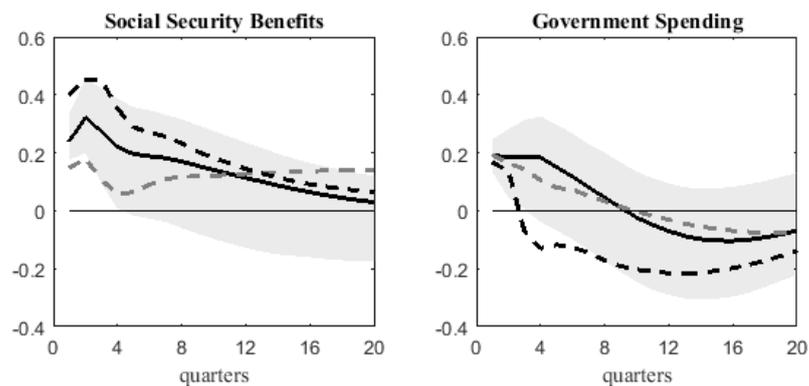
Figure 3.7: Output Multipliers During Times of Recession and Expansion

Notes: Transformation of output response from baseline VARs augmented with a dummy variable for the official NBER dates for recessions. Sample for social security benefits 1951:I-2007:IV. Sample for government spending 1969:I-2007:IV. The solid lines report baseline multiplier effect. The dashed black (-gray) line shows effects during times of recession (boom). The shaded gray area reports the 95 percent confidence interval for baseline estimates.

Nodari, 2015; Arin, Koray, and Spagnolo, 2015; Auerbach and Gorodnichenko, 2012; Bachmann and Sims, 2012). However, the mounting evidence is far from conclusive, partly due to the variety of methodologies employed and the different definitions used to define a slack economy. To investigate whether the magnitude of my multipliers differs between expansions and recessions we could follow the simple and transparent strategy of Alloza (2017), which consists of dividing the estimation sample into two using the official NBER dates for recessions as a dummy variable and looking into the interaction term with the identified shocks to public expenditure. This procedure allows for differential effects according to whether the public expenditure shocks occur during times of recession or expansion.

Figure 3.7 shows the results. Starting with the effects of Social Security benefits (left panel), the results suggest that the response of output to benefits shocks depends on the state of the business cycle. We find the strongest effects during times of recession, with an estimated impact multiplier close to 0.4 and a maximum multiplier effect after two quarters of between 0.4-0.5. The estimated dynamics during recessions are very similar to the baseline and statistically significant for two additional quarters (confidence bands not shown in the figure). Compared to these, during times of expansion, the estimated impact multiplier is below 0.2. The effects are very persistent, although not statistically significant at the standard levels

from the second quarter onwards (not shown in the figure). On the other hand, I find that the state of the business cycle seems to have no significant impact on the multiplier effect of government spending.

An additional check on the stability of the estimates over time would be to re-estimate the baseline VAR using subsamples that reflect a possible structural break in the early 1980s (see for example, Leeper, Traum, and Walker, 2017; Bilbiie, Meier, and Müller 2008). The first subsample corresponds to the pre-Volcker era ending in 1979:II; the second subsample corresponds to the period of the Great Moderation 1982:I to 2007:IV. Regarding the impact of benefits increases, the results for the two subsamples suggest that excluding the Volcker dis-inflation period from the estimation samples conditions the strength and persistence of government income transfers on output (see Figure B9 in the appendix). Here, the poor dynamics of benefits for the second subsample should be noted; these are possibly due to the fact that the shocks only consist of cost-of-living adjustments. Regarding government spending, in line with the existent literature, the results hint at a loss in the strength of government spending effects on output during the Great Moderation. However, the first sample period is too short to draw a firm conclusion.

An explanation for the different effects of government spending and transfer shocks could be their different transmission mechanisms. On the one hand, government spending contributes directly to aggregate demand producing and providing services to the public. Then, the effect of increases in government spending depends critically on the extent to which government spending replaces private spending. An increase in government spending triggers a positive response of non-durables and services consumption between the fourth and eighth quarters. However, increases in government spending also seem to compete directly with private investment. An increase in government spending triggers a negative response of non-residential investment from the fourth quarter. Altogether, the initial change in aggregate demand does not enhance private spending enough to generate a multiplier effect larger than one.

On the other hand, government income transfers indirectly affect aggregate demand through redistributing income across individuals and influencing their spending decisions. I find that increases in transfers yield a pos-

itive effect on private consumption and investment, especially on durable goods purchases. Altogether, the estimates indicate that transfers generate a multiplier effect greater than one redistributing income towards those individuals with a stronger response to changes in income. This is consistent with household-level evidence that benefits recipients are likely to have higher marginal propensities to consume than other individuals due to liquidity constraints or other idiosyncratic characteristics such as different consumption patterns. For example, in a pioneering quasi-experimental approach, Bodkin (1959) looked at the consumption response of WW-II veterans after the receipt of unexpected dividend payments from the National Service Life Insurance in 1950. He found the marginal propensity to consume non-durables to be as high as 0.72. Hausman (2016) also looked at the consumption response of veterans of WW-I, in a natural experiment setting. He found that within six months of receiving a large bonus in June 1936, veterans spent between 0.65 and 0.75 cents out of every dollar received and that they spent a large fraction of their bonuses on cars, i.e. durable goods. Parker et al. (2013) exploited the randomization in the assignation of Social Security numbers to estimate the changes in household spending following the tax rebates of 2008 in the U.S. They found that on average households spent about 50 to 90 percent of their stimulus payments on durable goods (mainly cars), and about 12 to 30 percent on non-durable consumption goods and services. The estimated spending responses are largest for low-income, old age and borrowing constrained households.[11] Moreover, Budría-Rodríguez et al. (2002) and Díaz-Giménez et al. (1997) report interesting facts regarding the income and wealth distribution in the U.S. For example, non-workers (excluding retirees) tend to be poor in terms of income and wealth, and transfer payments constitute a substantial source of their income. On average, retirees tend to be income-poor but wealth-rich. However, data also points to substantial wealth inequality within this group. Using the Assets and Health Dynamics of the Oldest dataset, De Nardi et al. (2010) found that the elderly in the lowest quintiles of a distribution by social security benefits hold very few assets. Also, the benefits-poor elderly run down their assets much faster than the benefits-rich (See Figure 1 in their paper). Finally, Hubbard, Skinner, and Zeldes (1995) and Scholz, Seshadri, and Khitatrakun (2006) argue that social insurance programs induce low-income individuals not to save.

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[11]Parker et al. (2006) study the effects of the 2001 tax rebates with similar findings.

3.4 Conclusion

This paper has presented evidence on the dynamic aggregate effects of public expenditure shocks, discriminating between government spending and government income transfers in the U.S. for a post-WWII sample. I take on the identification challenge by adopting the identification strategy of Mertens and Ravn (2013).

The results demonstrate the different macroeconomic impacts that different public expenditures shocks have. Increases in transfers affect aggregate demand through changing individuals' disposable income and their spending decisions. The positive response of private spending, especially durable goods purchases, results in a transfers multiplier with values well above unity. In contrast, consistent with the theory of the crowding-out effect, increases in government spending do not enhance private spending enough to generate a multiplier effect larger than one.

This study is useful in that it contributes to better understanding the macroeconomic effect of shocks to different components of public expenditure. The results also have important policy implications. An estimate for the transfers multiplier of well above one compared to an estimate of the spending multiplier of between 0 and 1 indicates that for expenditure policies to have an effect on the business cycle, these policies should be directed to changes in transfers. In turn, the results side with the documented importance of transfers in total public expenditure and support recent fiscal efforts like the American Recovery and Reinvestment Act of 2009. To draw stronger conclusions though, future research should explore alternative sources of exogenous variation. For example, recent literature has begun analyzing cross-section variation to identify the macroeconomic effects of government spending and interregional transfers. There is room to explore where government income transfers to persons are involved.

Chapter 4

The aggregate effects of government income transfers - EU evidence

4.1 Introduction

The economic and financial crisis of 2007/2008 has revived interest in the macroeconomic effect of public expenditures. As the recent crisis unfolded automatic stabilizers responded and public finances deteriorated in many industrialized countries. This was particularly problematic for European economies and called for the adoption of austerity measures since 2010. Both fiscal stimulus and austerity programmes include important public expenditure measures, specifically government income transfers. The recent average total public expenditures as percentage of gross domestic product (GDP) for the EU is around 44%, and social transfers account for more than 65% of this figure. Within social transfers, transfers other than in kind have a larger share than transfers in kind, i.e. 55% and 45% respectively.[1] However, the question of what is the aggregate effect of government income transfers shocks has received comparatively little attention in the literature. This paper contributes to the existing literature estimating the aggregate effect of government income transfers shocks using a panel dataset of 22 EU

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[1]Average for 2006-2015. Oh and Reis (2012) document the composition of the increase in public expenditures between 2007 and 2009 for the U.S. and arrive at a similar conclusion.

Member States over the sample period 2007-2015. Specifically, I estimate the multiplier effect and the response of aggregate expenditure components and labour market indicators to changes in old age pensions.

Empirical evidence on the subject is scarce and has focused on the effects that changes in income have on private consumption expenditures. In the framework of the permanent income hypothesis, Poterba (1988) estimates that a $1 increase in transitory income due to the U.S. tax rebates of 1975 raised spending of non-durables and services by about 12 to 24 cents. Wilcox (1989) finds that a predictable 10% increase in U.S. social security benefits raises durable goods purchases by 3% in the same month. More recently, Romer and Romer (2016) construct a series of legislated increases in social security benefits in the U.S. from 1951 to 1991 and study the effect of innovations to their narrative variable on private consumption. They find that permanent benefit increases have a significant impact on consumption upon impact. This paper complements parallel work in Parraga-Rodriguez (2016a) and extends Romer and Romer (2016) work along two dimensions. First, the set of outcome variables includes output, aggregate private consumption, investment, and several labour market indicators. Moreover, like Gechert, Paetz and Villanueva (2016), a principal contribution of this research is an estimate for the transfers output multiplier. Like Oh and Reis (2012) I look at a recent sample period. However, while they focus on the expansionary side of fiscal policy actions in the U.S. between 2007 and 2009, my economic unit of reference are European countries and the sample period includes both stimulus plans and fiscal consolidations.

Evidence at the household-level is much more prolific and indicates a positive response of individual spending to increases in government income transfers. Japelli and Pistaferri (2010) offer a good literature review on the subject. Relevant studies include, for example, a pioneering quasi-experimental approach by Bodkin (1959). He looks at the consumption response of WW-II veterans after the receipt of unexpected transfer payments in 1950, and finds a marginal propensity to consume nondurables as high as 0.72. Hausman (2016) also looks at the consumption response of U.S. veterans, but of WW-I, in a natural experiment setting. He finds that within six months of receiving a large bonus in June 1936, veterans spent between 0.65 and 0.75 cents out of every dollar received, and that they spent a large fraction of their bonus on cars, i.e. durable goods. Parker

et al. (2013) exploit the randomization in the assignation of Social Security numbers in the U.S. to estimate the effect of the tax rebates of 2008 on households spending. They find that on average households spent about 50 to 90 percent of their stimulus payments on durable goods (also mainly cars), and about 12 to 30 percent on non-durables consumption goods and services in the quarter of the tax rebate. The estimated spending responses are the largest for low-income, old age and borrowing constrained households.[2] Finally, Stephens (2003) investigates the response of household consumption expenditures to the monthly arrival of social security checks in the U.S. He finds an increase in the amount and probability of consuming food perishables and entertainment the immediate days after receiving the checks. The results are even more significant for those households for which social security transfers constitute their main source of income.

Government income transfer shocks are constructed from a new and confidential dataset by public finance experts from the European System of Central Banks (ESCB). The dataset contains detailed information on public revenue and expenditure policies for several EU Member States. Within government income transfers, the data reports policy actions for old age pensions, unemployment benefits, and a residual category for other transfers. This paper though estimates the aggregate effect of government income transfers shocks using policy actions for old age pensions. This restriction is primarily due to a lack of observations of discretionary changes in unemployment benefits and, the difficult economic interpretation of estimates for other transfers due to the miscellaneous benefits included in this category.[3] The policy actions are reported with annual frequency following standardised questionnaires in the context of regular projection exercises; the data is harmonized across countries. The dataset defines a policy action as any change to legislation which determines benefit entitlements. Furthermore, an interesting feature of this new dataset is that fiscal actions are measured as the difference relative to a benchmark for what fiscal policy can be considered neutral. The ESCB dataset compiles discretionary changes in fiscal policy.

The challenge for any study of the aggregate effect of fiscal shocks is

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[2]Johnson et al. (2006) study the effects of the 2001 tax rebates with similar findings.

[3]Other transfers include benefits such as family/children, sickness, exclusion, disability, and housing, or health-care related transfers.

the potential endogeneity of policy actions. Policymakers take policies for a variety of reasons. For example, during periods of high levels of inflation, governments may increase income transfer payments to guarantee the purchasing power of their beneficiaries. Another example is that in the event of a recession, extraordinary measures may be needed to help a growing number of unemployed. Then, on many occasions fiscal policy measures are responding to the current state of the economy. The key identifying assumption to produce unbiased estimates of the aggregate effect of transfers shocks is that discretionary changes in government income transfers are exogenous. The ESCB dataset records discretionary changes in transfers. A contribution of this paper is to reclassify these discretionary changes as either exogenous or not exogenous based on their motivation. To do so I use information contained in the descriptions accompanying all measures in the ESCB dataset. I complement this information with several other sources, including country-specific legislation and government reports, country reports by different international organizations, and the occasional newspaper.

I find a multiplier effect between 0 and 1. The estimated old age pensions output multiplier is 0.5 upon impact, with a maximum accumulated response close to unity. Consistent with the existing literature (and household-level evidence) I also find a larger effect on durable goods consumption than non-durables or services. The response of investment is comparable to that of durables consumption. Moreover, increases in transfers have a positive though modest impact on employment. To gain insight into these results, estimates are also broken down by main motivation behind the policy actions and for three geographic regions, i.e. North, South and East Europe. Estimates breaking down policy actions by main motivation indicate similar positive aggregate effects. Regarding regional estimates, I find that the point estimates are only statistically significant for South Europe. Nevertheless, estimates by region highlight that pooled estimates recover the average effect of transfers shocks in EU Member States.

An estimate of the transfers multiplier effect is crucial for assessing the effectiveness of fiscal policy actions. A multiplier effect between 0 and 1 indicates limited effectiveness of fiscal actions involving government income transfers. However, this limited effectiveness might not have the same implications for stimulus and austerity programmes. For example, the re-

sults indicate that increases in old age pensions might be costly stimulus measures given their modest positive impact. On the other hand, desirable austerity programmes should include measures that effectively reduce the government deficit while having a contained negative effect on the real economy.

The remainder of the paper is organised as follows. Section 4.2 describes the ESCB dataset and the construction of the new measure of transfers shocks. Section 4.3 gives details about the specification used for estimation. Section 4.4 explains the main results in terms of the multiplier effect and investigates the transmission mechanism of transfers shocks. Section 4.5 breaks down the estimates by motivation and economic region. Section 4.6 offers concluding remarks.

4.2   A new measure of transfers shocks

A contribution of this paper is to construct a new measure of government income transfers shocks. To do so I apply the narrative analysis pioneered by Romer and Romer (2010) to a new dataset compiled by public finance experts from the European System of Central Banks (ESCB).

4.2.1   The ESCB dataset

The ESCB dataset compiles discretionary changes of fiscal policy. The dataset defines a policy action for old age pensions any change to legislation which determines benefit entitlements. Moreover, policy actions are measured as the difference relative to a 'neutral policy' benchmark for what policies can be considered to follow the standard development. The benchmark for adjustments of pensions is to report the measures in deviation from the price index of reference, once controlled for the evolution of beneficiaries. The benchmark for reforms is a hypothetical counterfactual of no change in the legislation. A measure due to a reform is defined as the difference in expenditure from what this would have been absent the change in the legislation. It is assumed that the dynamics of the item would have been flat, or the same dynamics as in the previous year. Table C2 in
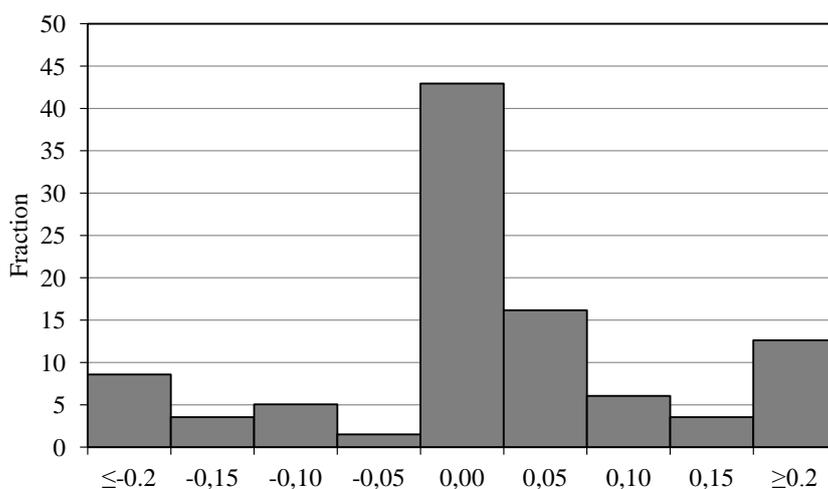
Figure 4.1: Histogram of All Changes in Old Age Penions

Notes: Measures as percentage of previous period nominal GDP. All countries, 2007-2015.

the appendix summarizes the policy actions and methods reported in the ESCB dataset by Spain. The table includes the source, motivation, and description for all policy actions. Morris and coauthors (n.d.) provide more examples for other countries. The estimates reported in the ESCB dataset are based partly on official/external sources and partly on estimates by the members of the public finance group. Estimates were produced whenever the impact of a measure was not available, properly specified or the actual macroeconomic and/or demographic situation deviated significantly from the assumptions made by the external source.

The EU Member States covered in this paper are Austria (AT), Belgium (BE), Bulgaria (BG), Cyprus (CY), The Czech Republic (CZ), Germany (DE), Spain (ES), Finland (FI), France (FR), Greece (GR), Hungary (HU), Ireland (IE), Italy (IT), Luxembourg (LU), Latvia (LV), Malta (MT), The Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), and Slovakia (SK). The ESCB dataset is not publicly available though and this paper cannot disclose data by country. The sample period spans from 2007 to 2015, both years inclusive. This constitutes a panel dataset with 22 countries over 9 years. The ESCB dataset records policy actions as the impact compared to previous year budget and expressed in millions of national currency. To have a consistent variable across Member States, the variables used for estimation are converted to millions of euros of 2015 and expressed in per capita terms.

Panel data offers regression analysis that the short time dimension of the dataset rules out by country. Although the sample period is admittedly short, the sample of countries and time period covered presents a rich amount of variation, essential for adequate regression analysis. Figure 4.1 shows the heterogeneity present in the sample with a histogram covering the entire sample of countries over the period 2007-2015. The measures range from less than -0.2 to more than 0.2 of GDP. Around 43% of the observations are zero. However, there are also a significant number of nonzero observations; there are more pension increases than pension cuts.

The sign variation of the measures might reflect particularities of the sample period. During the first years we find a number of measures taken as the result of the generalization of the economic and financial crisis to the EU Member States. Since 2010, the EU Member States have implemented austerity programmes to deal with inherited fiscal deficits, and to improve the confidence in their economies to reduce borrowing costs. In some countries, long-run issues such as demographic trends or an ageing population have also been dealt with. On the other hand, we also find increases with an ideological motivation or as means to improve the welfare insurance to vulnerable groups and individuals with low income throught the sample period.

As explained earlier in the text, a number of fiscal policy actions can be argued to be systematically related to the current state of the economy. In contrast, the identifying assumption to produce unbiased estimates of the aggregate effect of transfers shocks is that discretionary changes in old age pensions are exogenous. The ESCB dataset records discretionary changes in transfers relative to a 'neutral policy' benchmark. In other words, the compiled fiscal actions directly account for developments in GDP, inflation, or more generally, the level of economic activity. The next step is to identify the discretionary fiscal actions motivated by factors other than a systematic response to the current state of the economy.

4.2.2 Narrative analysis

The ESCB dataset also contains a description for all measures. The descriptions are a valuable source of information about the motivation behind

the transfers changes. Whenever the descriptions are too short or imprecise, I complement this information with the narrative record. Among others, I consulted country-specific legislation and government reports; several papers and reports on behalf of the European Commission; and country reports by the IMF and the OECD. Occasionally, I also consulted news from sources such as The Wall Street Journal or The Economist. A full list of all complementary sources for the narrative analysis can be found in the Appendix. The narrative analysis reclassifies the discretionary changes as either exogenous or not exogenous assigning them to one of the following categories:

- *Cyclical*: This category includes changes in transfers consequence of current macroeconomic developments. For example, changes in transfers to promote short-run economic growth or to compensate for a tax hike or other public expenditures cuts. Deficit reduction actions are also classified as cyclical when they respond to short-run movements in the deficit or to offset another shock.

- *Reform*: The most clearly exogenous reforms are policy actions to deal with demographic trends, or an ageing population. Following Cloyne (2013), this category also includes deficit consolidation actions to guarantee the long-run sustainability of public finances that were taken independent of the current macroeconomic situation. 'Reforms' also include policy actions imposed on policymakers by external bodies such as European rules or court rulings. I also include reforms for efficiency gains such as combining different transfers into a unique benefit, or to avoid incorrect receipt of benefits from those who actually do not meet the eligibility requirements when they are not a clear consequence of current macroeconomic developments.

- *Purchasing Power*: policy actions aiming to maintain and improve the purchasing power and living standards of beneficiaries. Includes those changes that, according to the established rule for adjustments, change transfers above or below the price index of reference. Also includes discretionary changes in transfers, usually targeted to low-income individuals, with the desire to increase the insurance provided by the welfare system. In other words, changes in transfers with an

Table 4.1: Predictability Tests

	Output	Inflation	Unemploy-ment rate	ALTR	Primary surplus
All changes	0.28	0.68	0.23	0.36	0.47
Exogenous	0.38	0.88	0.19	0.54	0.56

Notes: p-values for Granger causality tests. A shorthand for the aggregate variable is stated at the top. A shorthand for the transfer shock is stated on the left. Regressions include one lag of the transfers shock and the selected aggregate. All regressions include country and year fixed effects. Estimation is by least squares and standard errors are clustered by country. Sample 2007-2015.

ideological motivation of fairness.[4]

'Endogenous' changes include policy actions motivated by cyclical reasons or within a package of opposing fiscal measures. Changes motivated by the desire to maintain the purchasing power of beneficiaries or due to a reform could be considered exogenous. Romer and Romer (2016) consider exogenous the changes in U.S. social security benefits to keep up with past inflation, to increase the insurance provided by the Social Security programmes, or due to computational mistakes. Compared to them, my reclassification also includes changes in transfers motivated by a structural reform or due to an 'external' imposition. Moreover, the reclassification follows a conservative approach that may over-classify the fiscal actions as countercyclical. While reducing the accuracy of the point estimates, this is done on the basis of obtaining unbiased estimates. From a total of 177 changes, I find 44 'endogenous' changes and 133 'exogenous'. Within the later, 59 changes were motivated by purchasing power reasons and 74 were the result of a reform.

4.2.3 Predictability tests

If exogenous changes were in fact the response to other influences on output growth, it is likely that these discretionary changes could be predictable by proxies for those influences. This section tests this possibility following

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[4]Initially I broke down 'Purchasing Power' into changes motivated to keep up with inflation, and changes motivated by the desire to increase the safety net of the social security. There were too few observations per category though to have meaningful variables. Moreover, it could be argued that the ultimate goal in both cases is to maintain and enhance the living standards of beneficiaries.

Romer and Romer (2010) and, Mertens and Ravn (2012) strategy.

To test whether changes in transfers are predictable, I regress the discretionary changes on their own lag and a lag of output, inflation, the unemployment rate, the implicit Average Labour Tax Rate (ALTR), or the primary surplus. The selected macroeconomic variables aim to capture short-run macroeconomic conditions in each EU State Member. The regressions include country and year fixed effects. Then, I compute the F-test under the null hypothesis that the macroeconomic variables do not Granger cause the discretionary changes in transfers.[5] A high significance level implies that we cannot reject the null. Table 4.1 shows the p-value for each test. The exogenous changes in old age pensions cannot be predicted by the selected indicators. Moreover, excluding 'endogenous' changes improves the tests results for several macroeconomic variables.

4.3   Econometric framework

This paper estimates the aggregate effect of government income transfers shocks using policy actions for old age pensions. In the context of the Dynamic Linear Panel Regression Model consider the following baseline specification:

$$lny_{it} = \alpha_i + \delta_t + \rho lny_{it-1} + \beta \Delta T_{it} + \gamma X_{it} + \varepsilon_{it} \qquad (4.1)$$

where the macroeconomic variable of interest y_{it} for country i and year t is expressed in logs. The specification includes a lag of the dependent variable to capture dynamics in the relationship between transfers and the macroeconomic variables.[6] ΔT_{it} are the new measure of government income transfers shocks. The transfer shocks measure discretionary changes in old age pensions relative to previous year and are expressed in millions

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[5]Standard errors are clustered by country and are robust to heteroskedasticity and serial correlation.

[6]Estimation is by two-stage least squares and positions the lagged dependent variable with the second lag of lny_{it}. I verified whether this is sufficient to control for the potential non-stationarity that values of ρ close or larger than one imply. All estimates are well below unity, and figures 2-4 show stationary dynamics. The inclusion of country fixed effects controls for unobserved heterogeneity, and each dummy is absorbing the effects particular to each country.

of euros of 2015 and per capita terms. $100 \cdot \beta$ measures the average percentage increase in a macroeconomic variable of interest caused by a unit increase in old age pensions. α_i is the unobserved heterogeneity, δ_t year fixed effects. X_{it} is a set of control variables to be discussed below. Finally, ε_{it} stands for the idiosyncratic error term.

Under double causality an estimate of β would be biased. The strategy to deal with the potential endogeneity of ΔT_{it} consists of applying a narrative analysis to the measures compiled in the ESCB dataset. The new measure of government income transfer shocks is most likely to satisfy the identifying assumption that transfers shocks are exogenous. First, the ESCB dataset compiles discretionary changes relative to a 'neutral policy' benchmark. That is, the measures directly account for short-run macroeconomic developments. Secondly, and most important, the narrative analysis excludes from these discretionary changes those systematically correlated with the current state of the economy.

Specification (4.1) also includes controls for other influences that might affect both, the outcome variables and transfers changes at the same time but may not be explicitly explained in the narrative record. Alternatively, we can think of the inclusion of control variables as a refinement to guarantee unbiased estimates. First, I include government spending and the implicit ALTR (inclusive of social security contributions) to control for spending in other public expenditures and how discretionary changes in transfers are financed. The Appendix presents results from regressions that use alternative variables to control how discretionary changes in transfers are financed.[7] Secondly, several changes in old age pensions correspond to inflation adjustments. Discretionary changes in transfers are measured in deviation to the standard evolution of prices in each country, but accidental correlation with other factors that affect both, the outcome variables and the changes in pensions due to inflation is always a possibility. Then, it seems important to include the lag of the price level in the regressions.[8] Moreover, the set of controls also includes a proxy for the monetary pol-

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[7]The implicit ALTR is defined as total taxes on employed labour (Eurostat's series D51A_C1, D29c and D611) divided by compensation of employees (Eurostat's series D1) plus total wage bill and payroll taxes (Eurostat's series D29c). Government spending stands for the sum of intermediate consumption, gross fixed capital formation and compensation of employees of the general government (data from Eurostat).

[8]Series from Eurostat, All items HICP (2015=100).

icy stance. The majority of countries belong to the Euro-area and have their interest rate of reference set by the European Central Bank. However, Slovakia is a Euro area member since 2009, while Bulgaria, the Czech Republic, Hungary, Poland and Romania have their interest rate of reference set by their respective national central bank.[9] Finally, under the assumption that changes in international confidence are a common shock to all countries, they are captured in the year fixed effects. Any country-specific fixed deviations from the international sentiment would be captured in the country fixed effects.

The macroeconomic variables of interest are output, non-durables goods consumption, services consumption, durable goods consumption, and private investment. All variables are in real and per capita terms.[10] I also investigate the effect of transfers shocks to selected labour market indicators, which include employment per capita, hours per worker, the unemployment rate and the real wage.[11] The measures of transfers shocks are available at annual frequency from 2007 to 2015. The rest of variables are available from 2005.

4.4 The aggregate effect of transfers shocks

I start estimating specification (4.1) for output as the outcome variable. Figure 4.2 shows the response of output to an increase in old age pensions. Multiplier effects are obtained with a shock to old age pensions equivalent to the value of 1 percent of median GDP in the sample, and normalized

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[9]Source: international financial statistics (IMF). Euro-area, Slovakia and Bulgaria interest rate of reference correspond to the Central Bank Policy Rate. The Czech Republic and Poland interest rate is the Repurchase Agreement Rate. The interest rate of reference for Hungary and Romania corresponds to the Discount Rate.

[10]Output corresponds to gross domestic product at market prices (Eurostat's national accounts). Consumption aggregates are retrieved from Eurostat's final consumption aggregates by durability at market prices of non-durable goods, durable goods and services. Private investment corresponds to gross fixed capital formation at current prices of the private sector (AMECO series UIGP). Nominal variables are deflated with the HICP base 2015. Variables are converted in per capita terms dividing by total population (Ameco series NPTD). Data last retrieved in April 2016.

[11]Employment per capita corresponds to total Employment (Ameco series NETD) divided by population; Hours per worker correspond to average annual hours worked per person employed (Ameco series NLHA) divided by 52; the unemployment rate corresponds to the Eurostat series une_rt_a; the real wage is nominal compensation per employee of the total economy (Ameco series HWCDW) divided by the HICP.

by the ratio of GDP-to-old age pensions. The plot also reports bootstrap computed confidence intervals at the 95 and 68 percent confidence level.[12] Transfers shocks for the baseline specification are the narrative variable including only exogenous changes in old age pensions (black lines).

The estimated multiplier effect for the baseline specification is between 0 and 1. On impact, output rises 0.45 percent. Thereafter, the effect of transfers shocks also includes the effect through lagged output. After one year, about half of the initial effect has faded and the multiplier takes the value of 0.25 percent. After three years the multiplier is statistically not different form zero. An alternative measure of the long run effect of transfer shocks would be the long run cumulative multiplier. This can be calculated as the sum of the impact responses of output until the effect of the shock dies out.[13] The estimated long run multiplier effect is close to 1.

In line with Parraga-Rodriguez (2016a), using all discretionary changes overestimates the short-run effect of transfer shocks on output (circle marker). Output rises 0.54 percent upon impact, however, the multiplier is not statistically different from zero by the third year. The resultant long run multiplier effect is slightly above unity and takes the value of 1.1 percent. The sign of the bias suggests a positive correlation between the estate of the economy and changes in old age pensions. Estimates that use all discretionary changes could be attributing to increases in transfers what in reality would be the result of concealed factors associated with better financing capacity. The estimates do not differ significantly though. This could reflect the pre-treatment of policy actions in the ESCB dataset because policy actions are measured relative to a 'neutral policy' benchmark.

As a robustness check, I also present estimates for an alternative measure of the shocks based on the residuals of regressing all discretionary changes in transfers on a constant and a lag of output (gray line). That is, the alternative measure of transfer shocks removes predictable responses to output from the discretionary changes in transfers. The point estimates for

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[12]Robust standard errors to heteroskedasticity and serial correlation are clustered by country. The confidence interval for the impact responses are equivalent to adding or substracting 1 or 2 standard deviations. Thereafter, confidence intervals are computed from 10,000 draws of β and ρ from a bivariate normal distribution with mean and covariance matrix equal to the point estimates and covariance matrix of the regression coefficients.

[13]Formally, $m = \sum_{t=0}^{\infty} \rho^t \beta = \frac{\beta}{1-\rho}$, where m denotes the long run multiplier.
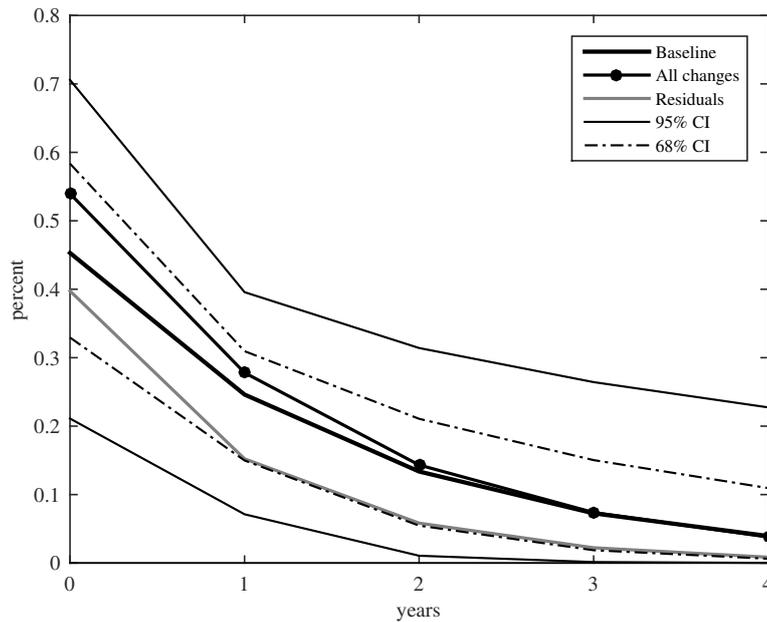
Figure 4.2: Dynamic Response of Output to Transfers Shocks

Notes: Response to an increase in old age pensions equivalent to 1 percent of GDP. Transfer shocks are the narrative variable including only exogenous changes (black), all changes (marker), or residualized (gray). Full lines are point estimates; thin and broken lines indicate one and two standard deviations confidence intervals respectively.

this alternative measure are below the baseline estimates the entire forecast horizon. Output increases 0.40 percent upon impact, and the long run multiplier effect is 0.6 percent. However, the differences are not statistically significant either.

At this point it is imperative a comparison with other estimates of the multiplier effect in the existing literature (although these measures do not afford a one-to-one comparison in all cases). In parallel work I estimate the dynamic aggregate effect of innovations to social security benefits in the U.S. during the period 1951-2007. There I find an impact multiplier of 0.2, which rises to an accumulated response of 1.0 after four quarters and reaches a maximum value of 2.2 in the long run. With the same methodology, Gechert, Paetz and Villanueva (2016) estimate a multiplier effect of shock to social security in Germany between 0 and 1. Gechert, Paetz and Villanueva (2016) point out that the different estimates for U.S. and European data could be due to a higher ratio of imports-to-GDP in Europe compared to the U.S. Other comparable estimates are those for the tax mul-

tiplier. The following estimates are based on U.S. data. In the SVAR tradition and for total tax revenues, Blanchard and Perotti (2002) find a peak multiplier of 0.8. Using sign restrictions in an SVAR framework, Mountford and Uhlig (2009) also estimate the effect of aggregate taxes and find an impact multiplier of 0.3, which rises to 0.9 after one year and reaches a maximum value of 3.4 after twelve quarters. Romer and Romer (2010) construct a narrative variable of legislated tax changes in the U.S. and estimate that a tax hike of 1 percent of GDP has a small and not statistically significant effect on output on impact, but maximum effect of 3.1 percent after ten quarters. Mertens and Ravn (2013) estimate the proxy SVAR for personal income taxes and find a multiplier of 2.0 on impact, rising to a maximum of 2.5 in the third quarter. Finally, Ramey (2011a) literature survey sets the range of estimates for the government spending multiplier from 0.6 to 1.8.

4.4.1 The different components of aggregate expenditure

Government income transfers affect the macroeconomy through changing the disposable income of households and their spending decisions. Therefore, it is important to study the effect of transfers shocks to different expenditure components to better understand the point estimates for the output multiplier. To this end, the next outcome variables are aggregate private consumption of non-durables, services and durables, and aggregate private investment.

Figure 4.3 shows the dynamic response of aggregate expenditure components to an exogenous increase in old age pensions. The shocks are scaled to be equivalent to 1 percent of GDP. The plots also report 95 and 68 percent confidence intervals. An increase in old age pensions yields a positive effect on all three aggregate consumption components. The larger response of durable goods consumption, 0.58 percent, than non-durables, 0.33 percent, or services, 0.19 percent, is in line with the existing literature. Evidence at the household-level predicts a larger response of durables than non-durables purchases to increases in disposable income.[14] Moreover, Romer and Romer (2016) and Parraga-Rodriguez (2016a) find that

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[14]See, for example, Parker et al (2013, 2006), Souleles (1999).

innovations to social security benefits trigger a larger response of durables purchases than non-durables consumption in the US. However, the estimates for durables and services consumption are only significant at the 68 percent confidence level and transfer shocks have a longer lasting effect on non-durables consumption. On the other hand, private investment rises 0.99 percent upon impact. Standard theory of the effect of public expenditure shocks predicts crowding out effects. However, unlike government spending, transfers do not compete directly with private spending. Government income transfers indirectly affect aggregate demand through redistribution. Moreover, this strong response of investment is in line with other estimates of the response of investment to tax shocks (see Romer and Romer 2010). The estimates though are also imprecisely estimated; confidence intervals are wide on impact and, thereafter, the point estimates are not significant at the 95 percent confidence level.

4.4.2   Labor market indicators

Evidence on the aggregate effect of public expenditures shocks to the labor market is scarce and has focused on the effect of government spending shocks.[15] As an exception, Romer and Romer (2016) estimate with US data the effect of permanent increases in social security benefits on employment. This section complements parallel work in Parraga-Rodriguez (2016a) and extends the outcome variables to include hours per worker, the unemployment rate, and the real wage. The labour market indicators represent the extensive, intensive margins of labour, and a measure of labour costs.

Figure 4.4 shows the dynamic response of the selected labour market indicators to an increase in old age pensions. The shocks are scaled and equivalent to 1 percent of GDP. The plots also report 95 and 68 percent confidence intervals. An increase in old age pensions has a positive effect on employment and the unemployment rate. This is consistent with the point estimates for the output multiplier and aggregate expenditure components. On the other hand, the response of hours is virtually zero and not significant. The estimates also indicate that increases in transfers are wage inflationary. The real wage rises 0.21 percent upon impact and the

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[15]See Monacelli et al (2010), Ravn and Simonelli (2007), Chodorow-Reich et al (2012) and references therein.
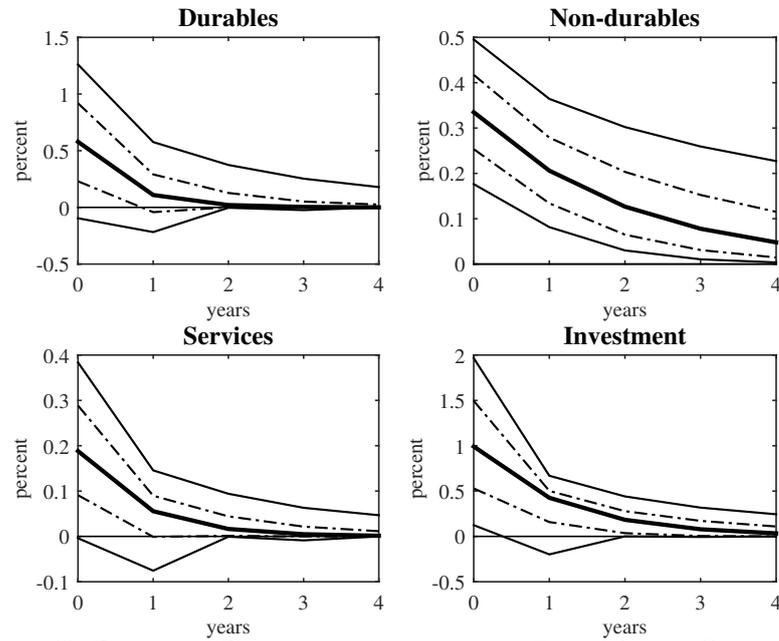
Figure 4.3: Dynamic Response of Aggregate Expenditure Components to Transfers shocks
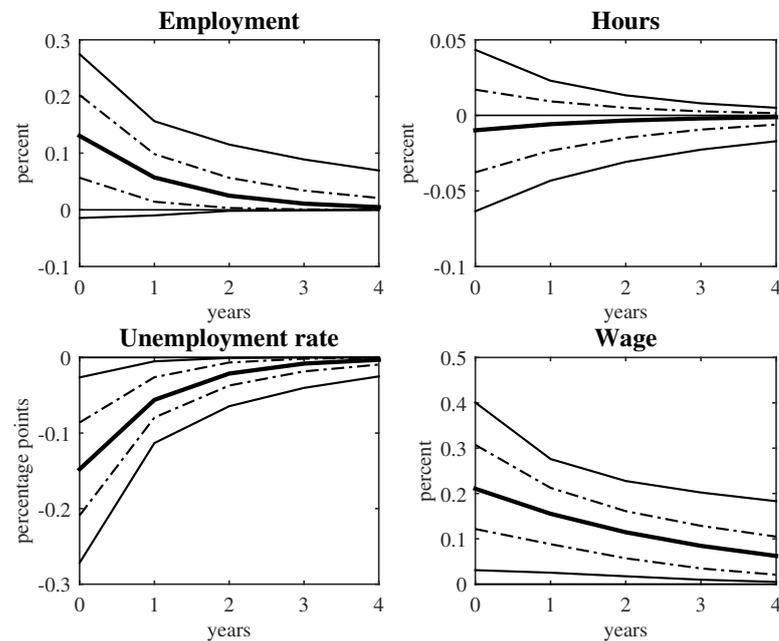
Figure 4.4: Dynamic Response of Labour Market Indicators to Transfers Shocks

Notes: Response to an exogenous shock to old age pensions equivalent to 1 percent of GDP. Full lines are point estimates; thin and broken lines indicate 68 and 95 percent confidence intervals respectively.

response is quite persistent. Overall though, and like Romer and Romer (2016) or Parraga-Rodriguez (2016a), the size of the estimates is modest or imprecisely estimated.

4.5 Estimates by motivation and for different regions

4.5.1 The different motivations

The narrative analysis has highlighted the different motivations for transfers changes. The criteria used to reclassify the discretionary changes in transfers established three main motivations: changes in transfers motivated by cyclical conditions, due to a reform or, aiming to sustain and improve the living standards of their beneficiaries. Transfers changes in the last two categories are considered exogenous. Reforms include policies to guarantee the long run sustainability of public finances, for efficiency gains or as a result of an external imposition on policymakers. 'Purchasing power' measures include those changes that, according to the established rule for adjustments, change transfers above or below the price index of reference. This category also includes changes with an ideological motivation of fairness or equity. However, changes associated with structural reforms usually involve transfers cuts while changes to improve the purchasing power of the beneficiaries usually involve increases. As a result, we might expect different effects from discretionary changes by motivation. This section investigates whether this is the case.

Table 4.2 presents the results. To help in the comparison, I reproduce again estimates for the narrative variable which includes exogenous changes due to both motivations. The selected dependent variables summarize the aggregate effect of transfers shocks and include output, total private consumption expenditures, private investment, and employment per capita.[16] Again, the coefficients correspond to the effect of an increase in old age pensions equivalent to one percent of GDP. Robust standard errors are in

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[16]Total aggregate consumption corresponds to the sum of non-durables, durables and services consumption.

Table 4.2: The Aggregate Effect of Transfers Shocks by Motivation

	Output	Consumption	Investment	Employment
Purchasing Power	0.55	1.01	2.13	0.38
	(0.56)	(0.40)	(0.93)	(0.22)
Reform	0.46	0.21	0.89	0.11
	(0.14)	(0.08)	(0.48)	(0.06)
All Exogenous	0.45	0.29	0.99	0.13
	(0.13)	(0.11)	(0.49)	(0.07)

Notes: A shorthand for the dependent variable is stated at the top of each column. A shorthand for the transfers shocks is stated on the left. The regressors include the lagged dependent variable, instrumented with the second lag. All regressions include country and year fixed effects; also include controls for monetary and tax policy. Estimation is by two-stage least squares and standard errors are clustered by country. The sample period is 2007-2015.

brackets and clustered by country. Comparing the second and third row in Table 4.2, the baseline point estimates are close to estimates which only include 'reform' changes. This indicate that the baseline estimates might be mainly driven by changes due to reforms. On the other hand, estimates for 'purchasing power' changes have large standard errors. This imprecision though could be partly attributed to the lower number of observations in this category. Nevertheless, once accounted by the larger standard errors for the 'purchasing power' category, the point estimates for either motivation indicate similar positive aggregate effects.

4.5.2   Different regions

This section relaxes the assumption of a single slope coefficient in specification (4.1) and presents estimates for the output multiplier in different regions. Pooled estimates measure the average effect of transfer shocks in EU Member States. However, the sample of countries presents differences like the degree of openess, the share of social expenditures or the number of retirees per capita that might affect the multiplier effect of transfers shocks. I establish three regions in line with EuroVoc's definition of sub-regions in Europe. A Northern or continental region for AT, BE, DE, FR, FI, LU, NL. A Southern or Mediterranean region formed by CY, ES, GR, IT, PT, SI. The remaining countries form an Eastern European region: BG, CZ, HU,

Table 4.3: Multiplier Effect by Region

	Baseline	South	North	East
Impact effet	0.45	0.25	0.00	0.43
	(0.13)	(0.03)	(0.30)	(0.79)
Long-run effect	1.0	0.8	0.0	1.0

Notes: A shorthand for the region is stated at the top of each column. The regressors include the lagged dependent variable, instrumented with the second lag. All regressions include country and year fixed effects; also include controls for monetary and tax policy. Estimation is by two-stage least squares and standard errors are clustered by country. The sample period is 2007-2015.

LV, PL, RO, SI, SK.[17]

Table 4.3 compares the multiplier effect across regions caused by an identical increase in old age pensions in all regions. The shock to transfers is scaled to be equivalent to the value of 1 percent of median GDP, and normalized by the ratio of GDP-to-old age pensions. To help in the comparison I reproduce again the baseline estimates for the pooled sample. The multiplier effect is the strongest in East Europe, while it is virtually zero in North Europe. The point estimates for these regions though have large standard errors and should be interpreted with caution. On the other hand, the output response is statistically significant for South Europe. An increase in old age pensions triggers a lower impact effect in South Europe compared to the baseline, however, the shock is more persistent and the resultant long-run multiplier effect of 0.8 is similar to the baseline estimates.[18]

4.6 Conclusion

This paper has provided evidence on the aggregate effect of government income transfers shocks using a panel dataset of 22 EU Member States during 2007-2015. A contribution of this paper is the construction of a new measure of transfers shocks based on a dataset by public finance experts of the ESCB. The ESCB dataset records discretionary changes in old age pensions relative to a 'neutral policy' benchmark. A narrative analysis re-

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[17]IE, and MT are excluded due to a lack of variation in discretionary changes for old age pensions.

[18]As described earlier in the text, long-run effects are computed as the sum of output responses.

classifies these discretionary changes as either exogenous or not exogenous, i.e. a systematic response to the current state of the economy, according to their motivation.

A principal contribution of this paper is an estimate for the output transfers multiplier. The estimated old age pensions output multiplier ranges between 0 and 1. I also find a positive and significant effect of transfers shocks to aggregate expenditure components. On the other hand, the estimates indicate a positive though modest effect on the labour market. Estimates were also broken down by main motivation behind the policy actions and for three geographic regions, i.e. North, South and East Europe.

Finally, these results have important policy implications. A multiplier effect between 0 and 1 indicates limited effectiveness of fiscal actions involving transfers. However, this limited effectiveness might not have the same implications for stimulus and austerity programmes. On the one hand, the results indicate that increases in old age pensions might be costly stimulus measures given their modest positive impact. On the other hand, desirable austerity programmes should include measures that effectively reduce the government deficit while having a contained negative effect on the real economy. To draw stronger conclusions a larger panel either in terms of time span and/or number of countries seems the most promising way.

Appendix A

Appendices to Chapter 2

A1   Types of benefits

Figure A1 shows that old-age benefits accounted for more than half the
expenditure on public pensions. Here, notice that the government paid dis-
ability benefits after the beneficiary was 65 years old until 1997. Since
1998, recipients of disability benefits have been transferred to old-age pen-
sions when they turn 65. At the time of the change, the weight of old age
pensions in the Social Security's budget increased about 10 pp. Survivors
benefits include benefits for widows, orphans, and other relatives. Although
there were some special subsidies, non-contributory pensions did not exist
until 1991. Data from Economic-Financial Reports to the Social Security
budget.
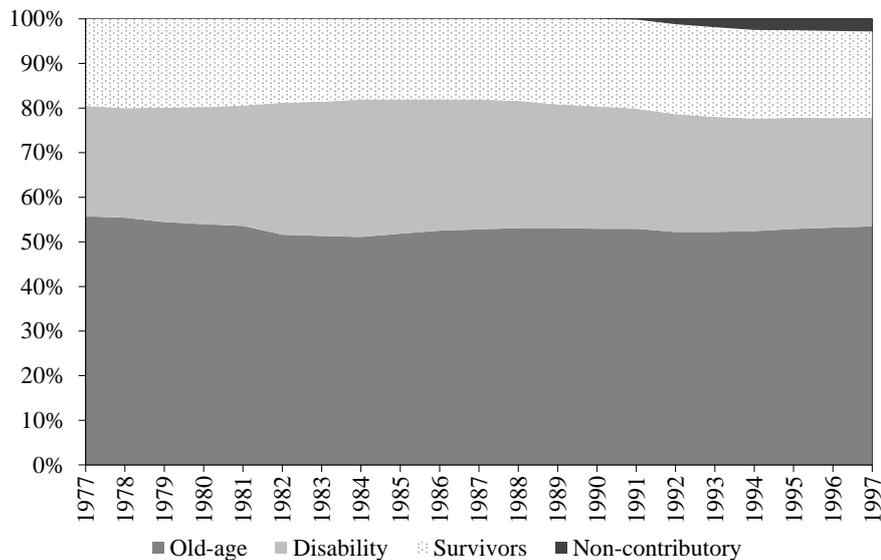
Figure A1: Weight in the Budget of the Different Social Security Benefits

A2   Narrative series of pension-related policies in Spain

Table A1 summarizes all exogenous pension-related policies correspond-
ing to 1979q1 to 1997q4. For each policy, the table reports the source, the
enactment and implementation date, a short description, the motivation and
the estimated annualized impact in millions of pesetas of 1992. While the
sources where all in Spanish, this table provides a useful summary in En-
glish. A more detailed account of each policy, including quotes and expla-
nations for the motivations is provided next. About the date of legislation
and implementation, these correspond, respectively, to the day of passing
the corresponding piece of legislation and the day when it becomes effec-
tive. Finally, the acronyms PP, I, and R represent the motivations, which
stand for, respectively, Purchasing Power, Ideology and structural Reform.

Table A1: Exogenous Pension-Related Policies

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
The Spanish Constitution	29/12/1978	29/12/1978	Article 41 provides the legal framework to the system of public pensions.	. . .	. . .
Royal Decree Law 43/1978, December 21 of 1978; Royal Decree Law 35/1978, November 16 of 1978.	16/11/1978	01/01/1979	New war pensions derived from the Spanish Civil War.	I	13,059
Royal Decree 47/1980	11/01/1980	01/02/1980	Adjustment social security pensions below CPI inflation.	PP	-45,133
			Discretional rise of minimum pensions below CPI inflation.	I	-1,436
Law 5/1979, September 18 of 1979	16/11/1979	01/01/1980	New war pensions derived from the Spanish Civil War.	I	47,087
Law 35/1980, June 26 of 1980	16/10/1980	10/01/1980	New war pensions derived from the Spanish Civil War.	I	47,087
Law 74/1980 General State Budget for 1981	29/12/1980	01/01/1981	Increase in spending on war pensions derived from the Spanish Civil War.	I	34,300
Newspapers. Special government report BOE 18/12/1995, 184, E.	07/05/1981	07/05/1981	Extraordinary expenses due to the break-out of the Toxic Oil Syndrome.	I	4,413

Table A1 – *Continued from previous page*

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
Royal Decree 77/1981	16/01/1981	01/01/1981	Adjustment social security pensions above CPI inflation.	PP	5,951
			Discretional rise of minimum pensions.	I	6,129
Law 44/1981 General State Budget for 1982	28/01/1981	01/01/1982	Increase in spending on war pensions derived from the Spanish Civil War.	I	6,419
Royal Decree 3218/1981	29/12/1981	01/01/1982	Adjustment social security pensions below CPI inflation.	PP	-98,008
			Discretional rise of minimum pensions below CPI inflation.	I	-30,816
Royal Decree 93/1983	19/01/1983	23/01/1983	Adjustment social security pensions above CPI inflation.	PP	10,302
			Discretional rise of minimum pensions.	I	40,258
Newspapers. Constitutional Court Ruling 103/1983	22/11/1983	04/01/1983	Equation of the criteria required to collect survivors [widows] benefits for men and women.	R	39,331
Law 9/1983 General State Budget for 1983	13/07/1983	01/08/1983	Increase in spending on war pensions derived from the Spanish Civil War.	I	47,345
Royal Decree 383/1984	01/02/1984	01/04/1984	New pensions for the social integration of the disabled	I	1,511
Law 37/1984	22/10/1984	01/01/1985	New war pensions derived from the Spanish Civil War.	I	11,988
Law 50/1984 General State Budget for 1985	30/12/1984	01/01/1985	Adjustment social security pensions below CPI inflation.	PP	-19,811

Table A1 – *Continued from previous page*

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
			Discretional rise of minimum pensions.	I	12,075
			Extension of pensions for the social integration of the disabled.	I	1,040
Law 26/1985	31/07/1985	01/08/1985	Reform of contributory old age pensions.	R	-117,762
			Introduction of automatic indexation begining in 1986.	...	...
Law 46/1985 General State Budget for 1986	27/12/1985	01/01/1986	Adjustment social security pensions below CPI inflation.	PP	-3,406
			Discretional rise of minimum pensions.	I	22,187
Suprem Court ruling Ar. 1741	10/04/1986	01/05/1986	Change in the criteria granting pensions for the disabled.	R	3,332
Law 21/1986 General State Budget for 1987	23/12/1986	01/01/1987	Increase in spending on war pensions derived from the Spanish Civil War.	I	13,560
			Adjustment social security pensions above CPI inflation.	PP	11,804
			Discretional rise of minimum pensions.	I	28,245
			Increase in spending on pensions for the disabled.	I	9,133
Law 33/1987 General State Budget for 1988	23/12/1987	01/01/1988	Increase in spending on war pensions derived from the Spanish Civil War.	I	24,832
			Adjustment social security pensions below CPI inflation.	PP	-21,242
			Discretional rise of minimum pensions.	I	29,369

Table A1 – *Continued from previous page*

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
			Increase in spending on pensions for the disabled.	I	19,543
			Lower retirement age for FAS pensions.	I	7,488
Law 37/1988 General State Budget for 1989	28/12/1988	01/01/1989	Increase in spending on war pensions derived from the Spanish Civil War.	I	1,732
			Adjustment social security pensions below CPI inflation.	PP	-28,096
			Discretional rise of minimum pensions.	I	40,411
			Discretional rise of FAS pensions.	I	5,922
			Increase in spending on pensions for the disabled.	I	4,925
Law 4/1990 General State Budget for 1990	29/06/1990	01/07/1990	Increase in spending on war pensions derived from the Spanish Civil War.	I	14,416
			Increase in spending on pensions for the disabled.	I	4,141
Royal Decree Law 7/1989	29/12/1989	01/01/1990	Adjustment social security pensions above CPI inflation.	PP	31,690
			Discretional rise of minimum pensions.	I	80,329
Law 31/1990 General State Budget for 1991	27/12/1990	01/01/1991	Increase in spending on war pensions derived from the Spanish Civil War.	I	45,922
			Adjustment social security pensions above CPI inflation.	PP	23,981
			Discretional rise of minimum pensions.	I	32,796

Table A1 – *Continued from previous page*

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
			Lower retirement age of FAS pensions.	I	1,369
Law 26/1990	20/12/1990	01/01/1991	Introduction of non-contributory pensions in the system of Social Security.	I	9,826
Law 31/1991 General State Budget for 1992	30/12/1991	01/01/1992	Fall in spending on war pensions due to ageing of the beneficiaries.	I	-458
			Adjustment social security pensions above CPI inflation.	PP	15,566
			Discretional rise of minimum pensions.	I	51,997
			Extension of non-contributory pensions.	I	40,718
Law 39/1992 General State Budget for 1993	30/12/1991	01/01/1993	Adjustment social security pensions above CPI inflation.	PP	11,698
			Discretional rise of minimum pensions.	I	6,236
			Extension of non-contributory pensions. Significant transfer of beneficiaries from other programs of social assistance. Adjustment of existent non-contributory pensions above CPI inflation.	I	23,195
Royal Decree Law 1/1994	20/06/1994	01/09/1994	Consolidation of the General Law on Social Security	. . .	. . .
Law 21/1993 General State Budget for 1994	29/12/1994	01/01/1995	Extension of non-contributory pensions. Significant transfer of beneficiaries from other programs of social assistance. New pensions for the elderly emigrants.	I	13,965

Table A1 – *Continued from previous page*

Source	Enactment	Implementation	Description	Motivation	Mill pts of 1992
Law 41/1994 General State Budget for 1995	30/12/1994	01/01/1995	Extension of non-contributory pensions. Significant transfer of beneficiaries from other programs of social assistance.	I	10,129
Royal Decree 728/1993	14/05/1993	01/01/1995	New pensions for the elderly emigrants	I	6,538
Royal Decree-Law 12/1995	28/12/1995	01/01/1996	Discretional rise of minimum pensions.	I	4,879
			Adjustment social security pensions above CPI inflation.	I	5,722
			Extension of non-contributory pensions. Significant transfer of beneficiaries from other programs of social assistance. Adjustment of existent non-contributory pensions above CPI inflation.	I	5,722
Law 12/1996 General State Budget for 1997	30/12/1996	01/01/1997	Adjustment social security pensions above CPI inflation.	PP	23,651
			Discretional rise of minimum pensions.	I	9,703
			Extension of non-contributory pensions. Significant transfer of beneficiaries from other programs of social assistance. Adjustment of existent non-contributory pensions above CPI inflation.	I	8,119
Law 24/1997	15/07/1997	01/08/1997	Reform of old age and survivors [orphans] pensions.	R	-13,520

Next, I present a detailed account of the pension-related policies of the Spanish System of Social Security between 1979 and 1997. A detailed account of the pension-related policies until 2014 is available upon request. The text is organized as follows. By year, we go over the legal texts that legislate the identified policy actions.[1] All legal texts include the enactment date of the law. Following Romer and Romer (2016), we consider that a policy is effective when beneficiaries receive the first payment. For example, while the General State Budget is usually passed in December, we consider the policy actions included in the budget effective as of January of the following year. For each law, the narrative presents an account by type of benefits. This narrative covers policy action for contributory and minimum pensions of the System of the Social Security; non-contributory pensions and the earlier benefits for the handicapped by the *Ley de Integración Social del Minusválido*, and pensions by the *Fondo de Asistencia Social*;[2] and war pensions.[3]

The measures are estimated in millions of euros. The fixed exchange rate is 166.386 pesetas per euro. All the measures are annualized. That is, represent the additional spending equivalent to one fiscal year. When the policies involve several years, we use the average one-year official reference rate in the interbank market corresponding to the period of implementation of the policy.[4]

The measures are classified as exogenous or not depending on their motivation. To do the classification, we have used the explanations included in the different laws, government reports, academic articles, news in the media, speeches, and official statements in press conferences. Policy actions are considered exogenous when they do not respond to short-run macroeconómic developments. Following Romer and Romer (2016) and Cloyne (2013) we establish the following motivations: (i) the desire to maintain a

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[1] Occasionally, we also include news articles by *El País*

[2] Policies regarding the Seguro Obligatorio de Vejez e Invalidez (SOVI) have been excluded due to their insignificant effect on the budget.

[3] We exclude other state pensions related to the ordinary Clases Pasivas because they had an insignificant effect on the budget. We estimate the most significant policy regarding the Clases Pasivas in 1982, with an insignificant impact on the mandatory spending in transfers for such year of 0.07%. In contrast, we estimate that the most substantial measure related to war pensions accounted for 6.3% of transfers in 1981.

[4] Series BE_19_1.1, "mercado interbancario: tipos de referencia oficiales a un año", available since 1979 in the statistics of Banco de España

sufficient purchasing power of beneficiaries; (ii) an ideological motivation of justice and redistribution; (iii) derive from an "external" imposition due to the ties and agreements of Spain with the European Union, the euro area, and the interaction with financial markets; (iv) structural reforms that seeks long-run objectives such as fiscal consolidations to guarantee the sustainability of the social security, or pension reforms to attend the challenges derived from demography. This last category also includes reforms and changes in expenditure due to court rulings. On the other hand, measures to impulse the economic growth in the short run, or in compensation for other spending measures have been classified as endogenous because of their counter-cyclical motivation. Finally, the narrative does not consider a measure the different reclassifications of some pensions over time, which do not involve an actual change in the payment of benefits.

A2.1   1978

A2.1.1   The Spanish Constitution

The Spanish Constitution, standing since 29 December 1978, constitutes the legal base for all the laws that design the public pension system in Spain. Particularly, in the article 41 says that "The public authorities will maintain a public Social Security system for all citizens that guarantees adequate assistance and social benefits in situations of need, especially in the case of unemployment. Supplementary assistance and benefits shall be optional." ("Los poderes públicos mantendrán un régimen público de Seguridad Social para todos los ciudadanos que garantice la asistencia y prestaciones sociales suficientes ante situaciones de necesidad, especialmente en caso de desempleo. La asistencia y prestaciones complementarias serán libres").

A2.2   1979

A2.2.1   Royal Decree Law 35/1978, of November 16, and Royal Decree Law 43/1978, of December 21

War pensions

1979-TI: 26.043 million euros

A substantial fraction of the war pensions derive from the Spanish Civil War and aim to correct unfair situation paying benefits to those affected and participants in either side of the armed conflict. We consider a measure all the increases/decreases in the spending.

For example, after the approval on July 27, 1979 by the Congress of a bill on the recognition of pensions and social assistance to family members for those killed as a result of the 1936-1939 civil war, and according to the Socialist of Catalonia and former Army Commander Julio Busquets, "the Congress demonstrates its will to do justice to the relatives of the fighters of the Republican side." "Socialists, communists and centrists congratulated themselves for the national reconciliation that the new law means" ("la Cámara demuestra su voluntad de hacer justicia a los familiares de los combatientes del bando republicano". "Socialistas, comunistas y centristas se felicitaron por la reconciliación nacional que significa la nueva ley" - El País, July 28, 1979).

In a context of the first years of transition to democracy, the legislation and regulation of new pensions for those affected by the 1936-1939 civil war and their families is complex. Similarly, the news in the press during those years shows some delay in the payment of new war pensions.

17th October 1980, El País: The Ministry of Defence reports on the benefits for the republicans ("El Ministerio de Defensa informa sobre pensiones a los republicanos")"El general de división Martínez Vara del Rey, secretario general para asuntos de personal y acción social del Ministerio de Defensa, compareció ayer [16 octubre 1980] ante la Comisión de Presupuestos del Congreso y respondió a las denuncias planteadas por el diputado socialista catalán y ex comandante del Ejército, Julio Busquets,

sobre recortes, trabas burocráticas y retrasos en la aplicación de la ley sobre pensiones a militares del Ejército republicano y a viudas de guerra. El general expuso su buena voluntad para solucionar todos los problemas y expresó su deseo de que dentro de medio año el propio Busquets le diga que "la cosa va mucho mejor"."

According to Pepita Gran, vicepresident of the Liga de Cataluña de Mutilados y Viudas de Guerra, "La Administración -hay que reconocerlo- realizó un gran esfuerzo para acelerar la tramitación de expedientes de viudas, un excelente equipo ha hecho un meritorio trabajo para despachar con rapidez las solicitudes presentadas, pero, a pesar de sus buenos deseos, no ha habido tiempo para tramitarlas todas". A lo que añade, "[a] la vista de lo mucho legislado sobre mutilados y viudas de la República, algunos pensarán que disfrutamos de sustanciosas pensiones, cuando la verdad es que tenemos -las que ya cobran- beneficios económicos muy inferiores a los del banco franquista." (El País, 2 December 1980).

The scarcity of data on war pension spending in the second half of the 1970s and the first half of the 1980s made it necessary to collect data from various sources, as well as some judgment calls in its imputation. The following table summarizes the annual expenditure on war pensions between 1978 and 1981:

Table A2.1: Expenditure in War pensions (millions of pesetas)

	1978	1979	1980	1981
Pensiones de guerra	4,667	9,000	45,000	60,000
Diferencia		4,333	36,000	15,000

Sources: Anuario estadístico INE, Informe general de la comisión interministerial para el estudio de la situación de las víctimas de la guerra civil y del franquismo (2006), Informe Económico Financiero a los presupuestos del Estado 1981, El País.

Given the narrative evidence and the data on expenditure made, we consider that the legislation is effective within three months of its entry into force. If a law was approved at the beginning of the quarter, even taking into account the bureaucracy for its processing and delays in payments, the evidence indicates payments of new pensions within the same quarter. On the other hand, when the legislation is passed in the final month and a half

of the quarter, we consider the effective spending takes place in the following quarter.

A compilation of legal texts regarding the "historic memory" published by the Ministry of Justice in 2010 highlight the following laws as important for the year 1979:

- Real Decreto Ley 35/1978, de 16 de noviembre, por el que se conceden pensiones a los familiares de los españoles fallecidos como consecuencia de la guerra 1936-1939.

- Real Decreto Ley 43/1978, de 21 de diciembre, por el que se reconocen beneficios económicos a los que sufrieron lesiones y mutilaciones en la guerra civil española. Regulated afterwards by the Orden de 9 enero de 1979 para cumplimiento del RDL 43/1978, de 21 de diciembre (Ministerio de Hacienda - BOE 12 de 13/1/1979) and the Orden de 24 de febrero de 1979 por la que se regula el procedimiento a seguir en los expedientes tramitados al amparo del RDL 43/1978, de 21 de diciembre (Ministerio de interior - BOE 51 de 28/2/1979).

- Real Decreto Ley 46/1978, de 21 de diciembre, por el que se regulan las pensiones de mutilación de los militares profesionales no integrados en el Cuerpo de Caballeros Mutilados.

The legislation is passed between the end of 1978 and the beginning of 1979. Without being able to distinguish between the expenditure made for pensions in favor of relatives and the mutilated, we attribute the additional expenditure on war pensions of 1979 (4.333 million pesetas) to the first quarter of 1979.

A2.2.2   Royal Decree 177/1979, of February 2

Contributory pensions of the Social Security System

RDL 177/1979, of February 2, established an ad hoc revaluation of pensions of 14% with retroactive effect to January 1979, and payments were made in February. In a context of high rates of inflation and early formation of the welfare state, the will of the government was to increase pensions whenever possible. However, we consider the measure endogenous

since "the revaluation provided by this RD is made taking into account the important effort of adaptation of the levels of protection made during 1978 [Pactos de la Moncloa]". ("la revalorización dispuesta por el presente RD se efectúa teniendo en cuenta el importante esfuerzo de adaptación de los niveles de protección realizado durante 1978 [Pactos de la Moncloa]") See next section for more details.

Minimum pensions

Due to the extraordinary increase in expenditure in 1978 - a revaluation of 30% within the Pactos de la Moncloa - Royal Decree 177/1979 establishes a revaluation of 14% for all pensions, without increasing the percentages for minimum pensions. This government measure responded to concerns about the lack of liquidity of the Social Security system. "The extraordinary attention that has been paid in the latest revaluations to the minimum pensions of the system [. . .] justify, on the contrary, a proportional revaluation." ("La atención extraordinaria que se ha prestado en las últimas revalorizaciones a las pensiones mínimas del sistema [. . .] justifican, al contrario, que la revalorización se lleve a cabo conforme a un módulo de incremento proporcional").

A2.3   1980

A2.3.1   Royal Decree 47/1980, January 11

Contributory pensions of the Social Security System

1980-TI: -103.691 million euros

Before the introduction of the automatic adjustment of pensions to inflation in 1986, the updating of pensions was due to ad hoc changes legislated by decrees. Article 92 of Decree 2065/1974, of May 30, which approves the revised text of the General Law of Social Security so legislates: " The pensions recognized for retirement, permanent disability or death and survival, whatever the contingency that has determined them, will be revalued peri-

odically by the Government, at the proposal of the Ministry of Labor, taking into account, among other indicative factors, the elevation of the level average of the salaries, the index of the cost of the life and the general evolution of the economy, as well as the economic possibilities of the System of the Social Security." ("Las pensiones reconocidas por jubilación, incapacidad permanente o muerte y supervivencia, cualquiera que sea la contingencia que las haya determinado, serán revalorizadas periódicamente por el Gobierno, a propuesta del Ministerio de Trabajo, teniendo en cuenta, entre otros factores indicativos, la elevación del nivel medio de los salarios, el índice del coste de la vida y la evolución general de la economía, así como las posibilidades económicas del Sistema de la Seguridad Social")

As the text shows, the motivation for the revaluation of pensions is to maintain the purchasing power of the beneficiaries. Due to the possible relationship between inflation and the state of the economy in the short term, the measures associated with the revaluation of pensions are calculated net of the inflation rate, in addition to the evolution of the number of pensioners and the increase in the value of the new pensions.

In 1980, the government legislated an average pension revaluation of 11% through the Royal Decree 47/1980, of January 11, on the revaluation and improvement of pensions.

In 1979, the expenditure on pensions, excluding the minimum, was 2,251.86 million euros. The y-o-y CPI December in 1980 was 15.2%.

2.251,86*(0,11-0,15) = -103,691 million euros

Minimum pensions

1980-TI: -3.299 million euros

We consider the increases in minimum pensions separately. These increases have an ideological motivation and seek to increase the protection offered by the Social Security System. For example, the Economic-Financial Report of 1989, p. 241-46, highlights an increase in minimum pensions to approximate them to the Minimum Interprofessional Wage (SMI in Spanish): "Destaca en los últimos años, el importante esfuerzo presupuestario realizado en esta forma de protección [Pensiones], ya en 1977

el peso relativo de las pensiones sobre el conjunto de prestaciones económicas de la Seguridad Social era del 71,65% mientras que en 1989 es del 91,31%. [. . .] causas: -Aumento del número de pensiones (envejecimiento de la población). -El efecto sustitución ya que la cuantía de las pensiones de los nuevos pensionistas, es superior a la de las que causan baja definitiva. -La política de revalorización de los últimos años encaminada a conseguir una aproximación de las pensiones al Salario Mínimo Interprofesional."

The next example comes from the text "La reforma de las pensiones ante la revisión del Pacto de Toledo", by the research department of La Caixa, p. 113: "Political will to increase minimum pensions above the CPI. Between 1986 and 1994, minimum pensions have been revalued by 68.7% while the CPI has increased by 53.4%". ("Voluntad política de incrementar las pensiones mínimas por encima del IPC. Entre 1986 y 1994 las pensiones mínimas se han revalorizado en un 68,7% mientras el IPC se ha incrementado en un 53,4%").

Table A2.2 shows the meager amounts for the minimum pensions. The minimum retirement pensions were lower than the SMI, which in turn was well below the average salary. Minimum retirement pensions (for people over 65 and with a dependent spouse) will not match the net SMI until 1990.

The next table shows the evolution of minimum pensions between 1980 and 1985:

The Royal Decree 47/1979, of January 11, highlights the "legal and social requirement of preferential attention to pensions of lesser amounts" ("la exigencia legal y social de atención preferente a las pensiones de menor cuantía"), as well as a "protection also more outstanding by reason of age" ("protección también mas destacada por razón de edad"), so it will be "extended not only to the revaluation, but also to the improvement of pensions" ("extenderá no sólo a la revalorización, sino también a la mejora de pensiones"). Next, it says that " it has tended to increase more the lower pensions, so that its percentage of increase is notably higher [...] thus pointing to a trend towards what in the future should be the framework within which future pensions should move" ("se ha tendido a aumentar en una mayor proporción a las pensiones más bajas, de forma que su porcentaje de incremente es notablemente más elevado [. . .] señalándose así una tendencia

Table A2.2: Minimum retirement pensions, minimum wage, and average wage

Year	Minimum Retirement Pension	Minimum Wage	Average Wage
1981	18,301	25,62	62,271
1982	20,316	28,44	72,216
1983	23,565	32,16	83,079
1984	26,159	34,74	92,718
1985	28,999	37,17	102,051
1986	32,56	40,14	113,22
1987	32,56	42,15	121,579
1988	37,999	44,04	128,843
1989	42,525	46,68	136,246

Notes: average monthly gross value in pesetas. Minimum retirement pension for people over 65 and with a dependent spouse. Minimum wage for those over 18. Author's calculations based on the Anexo al Informe Económico Financiero a los presupuestos de la Seguridad Social 2014, and the anuario estadístico INE

Table A2.3: Evolution of minimum pensions

Year	Number of Pensions	Million euros	Average Δ%	Inflation (%)
1979	2,097,428	2,250	29.3	15.6
1980	2,149,506	2,652	15.1	15.2
1981	2,221,255	3,150	15.0	14.4
1982	2,280,997	3,591	11.0	14.0
1983	2,341,527	4,277	16.0	12.2
1984	2,387,916	4,691	9.0	9.0
1985	2,405,379	5,426	9.2	8.2

Notes: Author's calculations based on the Anexo al Informe Económico Financiero a los presupuestos de la Seguridad Social 2014, the web of the Social Security, Banco de España. Number of pensions estimated as a changing percentage of total pensions (percentage between 45 and 50%). Inflation refers to the y-o-y change in CPI December.

hacia lo que en el futuro debe constituir el marco dentro del cual deberán moverse las pensiones futuras").

In 1980, despite the desire to improve minimum pensions for ideological reasons, there is a discretional increase in minimum pensions below the inflation measured by the CPI. As we explained above, the measures associated with the revaluation of pensions are calculated net of the inflation rate and the evolution of the number of pensioners.

The total number of pension in 1979 is 4,217,699. The average minimum pension was 76.61 euros / month, in 14 payments. The average increase in minimum pensions in 1980 compared to the previous year was 15.1%. Inflation in 1980 was 15.2%. The imputed proportion of the number of minimum pensions is 49%[5]

0.49*4217699*76.61*14*(0.151-0.152) = -3.299 million euros

A2.3.2   Law 5/2979, of September 18, and Law 35/1980, of June 26

War pensions

1980-TI: 108.182 million euros

1980-TIV: 108.182 million euros

A compilation of legal texts regarding the "historic memory" published by the Ministry of Justice in 2010 highlihgts the following laws as important for the year 1980:

- Ley 5/1979, de 18 de septiembre, sobre reconocimiento de pensiones, asistencia medico-farmacéutica y asistencia social en favor de las viudas y demás familiares de los españoles como consecuencia o con ocasión de la pasada guerra civil (Jefatura del Estado - BOE 233 de 28/9/1979). Regulated by the Real Decreto 2635/1979, de 16 de noviembre, para la aplicación y cumplimiento de la Ley 5/1979 (Ministerio de Hacienda - BOE 277 de 19/11/1979) y la resolución

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[5]Interpolated percentage based on data from the National Institue of Social Security, CCOO, and the newspaper El País.

de la dirección general del Tesoro por lo que se dictan normas para el cumplimento de la Ley 5/1979 y el RD 2635/1979 dispuesto para su aplicación (Ministerio de Hacienda - BOE 284 de 27/11/1979). The Law 5/1979 replaces the RDL 35/1978, of November 16.

- Resolución de 18 de septiembre de 1980, de la dirección general del tesoro sobre solicitudes de las pensiones reguladas por la Ley 5/1979 que extiende el plazo de solicitud de las pensiones (Ministerio de Hacienda - BOE 227 de 20/9/1980).

- Ley 10/1980, de 14 de marzo, sobre modificaciones del Real Decreto Ley 6/1978, de 6 de marzo, por el que se regula la situación de los militares que tomaron parte en la guerra civil (Jefatura del Estado - BOE 76 de 28/3/1980).

- Ley 35/1980, de 26 de junio, sobre pensiones a los mutilados excombatientes de la zona republicana (Jefatura del Estado - BOE 165 de 10/7/1980). Regulated by the resolución de 16 de octubre de 1980 de la dirección general del tesoro sobre solicitudes de pensiones por la Ley 35/1980 (Ministerio de Hacienda - BOE 260 de 29/10/1980). The Law 35/1980 replaces the RDL 43/1978, of December 21, and the RDL 46/1978, of december 21.

In 1980, the expenditure in war pensions was partly explained by legislation passed at the end of the previous year (pensions in favor of family members). However, "the anticipated deficit would have been fulfilled - assured the minister [Jaime Garcia Añoveros] - had it not been for these transfers to unemployment and for pensions to the victims of the civil war, which, in large part, are due to laws passed by the Parliament after the elaboration of the 1980 Budgets [Law 42/1979, of December 29]" ("el déficit previsto se habría cumplido -aseguró el ministro [Jaime Garcia Añoveros]- si no hubiera sido por estas transferencias al desempleo y por las pensiones a las víctimas de la guerra civil, que, en buena parte, se deben a leyes aprobadas por el Parlamento posteriormente a la elaboración de los Presupuestos de 1980 [Ley 42/1979, de 29 de diciembre]") (El País, May 7, 1981).

Without a breakdown by pensions within war pensions, or more information on the distribution of expenditure throughout the year we accounted

for half of the increase in spending on war pensions in 1980 (36,000 million pesetas according to Table A2.1) between the first and third quarter of the year.

A2.4   1981

A2.4.1   Law 74/1980, General State Budget of 1981, of December 29

War pensions

1981-TI: 90.152 million euros

The Economic-Financial Report (EFR) for the General State Budget (GSB) of 1981, p. 148, explains the percentage increase in war pensions for this fiscal year: "Los crédito destinados al pago de pensiones [del Estado] se incrementa un 48,6% [. . .]. Dicho aumento se debe fundamentalmente a las pensiones derivadas de la Guerra Civil española y que ya tuvieron incidencia en el Presupuesto de 1980, por lo que para efectuar una comparación más homogénea es necesario ajustar los créditos iniciales de 1980; una vez practicado dicho ajuste a la tasa de variación se sitúa en unos porcentajes más moderados, el 12,7%". The following table breaks down the expenditure in State pensions between ordinary and war pensions:

Table A2.4: Expenditure in State Pensions

clases pasivas	1980		1981		% 81/80
	Initial	% /total	Initial	% /total	
Ordinary	145,631	14.9	163,888	14.1	12.5
Civil war	5,000	0.5	60,000	5.1	1,100
subtotal	150,631	15.4	223,888	19.2	48.6

Notes: million pesetas. Informe Económico financiero, 1981.

The expenditure on war pensions according to the EFR is consistent with the Informe general de la comisión interministerial para el estudio de la situación de las victimas de la guerra civil y del franquismo elaborated in

2006, and news articles of El País during 1981. The expenditure estimated for 1980, according to Informe general de la comisión interministerial para el estudio de la situación de las victimas de la guerra civil y del franquismo (2006), amounts to 45,000 million pesetas. Increase in spending on war pensions of (60000-45000)/166.386 = 90.152 million euros.

A2.4.2   Royal Decree 77/1981, of January 16

Contributory pensions of the Social Security System

1981-TI: 15.641 million euros

In 1981, the government legislated the revaluation of pensions through the Royal Decree 77/1981, of January 16, on revaluation, improvement and minimum amounts of pensions of the Social Security System: "The royal decree guarantees minimum levels of pensions that represent an increase of fifteen percent, notably higher than the average increase; but the same percentage applies to all pensions coinciding with said minimum level." ("El real decreto garantiza unos niveles mínimos de pensiones que suponen un incremento del quince por ciento, notablemente superior al incremento medio; pero el mismo porcentaje se aplica a los tramos de todas las pensiones coincidentes con dicho nivel mínimo").

Expenditure in pensions, excluding the minimum pensions, in 1980 was 2,606.82 million euros. The y-o-y change in CPI December 1981 was 14.4%.

2606.82 *(0.15-0.144) = 15.641 million euros

Minimum pensions

1981-TI: 16.110 million euros

In 1981, there is a discretionary increase in minimum pensions above the CPI inflation. As we explained above, the measures associated with the revaluation of pensions are calculated net of the inflation rate and the evolution of the number of pensioners.

The total number of contributory pensions in 1980 was 4,398,434. The average minimum pension was 88.14 euros / month, in 14 payments. The average increase in minimum pensions in 1981 compared to the previous year was 15%. Inflation in 1981 was 14.4%. The imputed proportion of the number of minimum pensions is 48%.

0.48*4398434*88.14*14*(0.15-0.144) = 16.110 million euros

A2.4.3   Toxic Oil Syndrome, May 1981

1981-TII: 11.599 million euros

In May 1981, the Toxic Oil Syndrome (TOS) emerged in Spain. The TOS is a chronic disease caused by the consumption of denatured rapeseed oil for industrial uses and fraudulently diverted for human consumption. The total number of affected people amounted to 20,643 people. The TOS represents an extraordinary increase in social spending between 1981 and 1994. Also, despite the long delay, it also involves the payment of large compensation by the State once the judicial process was completed in 1997. We present a summary of the headlines and news of the newspaper El País:

7-May-81: Un niño de Torrejón de Ardoz murió presuntamente a causa de la llamada "enfermedad del legionario".

22-May-81: El brote epidémico se extiende de forma irregular por la mitad norte del país. Sanidad desconoce todavía las causas de la neumonía atípica.

18-Jun-81: Se confirma que el aceite de colza para uso industrial es el causante tóxico de la neumonía atípica.

12-Jul-81: El tema del aceite adulterado será tratado mañana por el Consejo de Ministros.

1-Ago-81: Los afectados por la neumonía tóxica siguen presentando denuncias contra los responsables.

15-Ago-81: El "síndrome tóxico" costará al Insalud 2.000 millones de pesetas, según Sánchez Harguindey.

1-Jun-89: El Gobierno rechaza adelantar indemnizaciones a los afectados por el síndrome tóxico. El ministro de Relaciones con las Cortes recordó que entre 1981 y 1989 los gobiernos han gastado 55.000 millones de pesetas en el sistema de protección establecido, sin contar los gastos de hospitalización, pensiones, becas y ayuda familiar complementaria.

19-Jul-89: La OCU promueve una iniciativa legislativa popular para que el Estado indemnice a los afectados de la colza.

29-May-90: Las indemnizaciones para los 20.000 afectados por la colza pueden elevarse a 230.000 millones [de pesetas]. Los 79 afectados de gran invalidez, que deberían percibir cada uno una indemnización de 90 millones de pesetas ingresarían un montante de 7.110 millones. Las cantidades para los 431 afectados de invalidez absoluta, a razón de 70 millones cada uno, se elevarían a 30.170 millones. Los 1.124 afectados por invalidez total, para los que se prevén indemnizaciones de 40 millones, deberían cobrar 48.560 millones. 135.864 millones irían destinados a los 7.548 perjudicados, cuyas lesiones tardaron en curar más de 90 días.

El resto de las indemnizaciones, hasta totalizar algo más de doscientos treinta y un mil millones de pesetas corresponden a los afectados cuyas lesiones han tenido una duración entre uno y 90 días.

Según los datos actualizados al mes de marzo de este año, el número de afectados por el síndrome tóxico asciende a 20.046.

28-Jun-90: El Estado, responsable.

22-Abr-91: Campaña de protestas de los afectados del síndrome tóxico para exigir que el Estado les indemnice.

1-May-91: 10 AñOS DE COLZA. Según los datos de la Oficina de Gestión de Prestaciones Sociales del Síndrome Tóxico dependiente del Ministerio de Trabajo-, en los 10 años transcurridos los afectados han recibido prestaciones económicas y sociales por valor de 48.400 millones de pesetas.

11-Nov-92: El PSOE aplaza la solución económica del 'caso de la colza' hasta la sentencia judicial.

31-Ago-94: Editorial: Deuda de Estado. El Estado continúa sin saldar la deuda pendiente con las decenas de miles de afectados por el síndrome

tóxico y con los familiares de los varios centenares de fallecidos.

31-Ago-94: Estado ha pagado ya 62.686 millones de pesetas por el síndrome tóxico. La Oficina de Gestión del Síndrome Tóxico, ha pagado 62.686 millones de pesetas desde 1981. Según datos oficiales, hasta el 31 de diciembre de 1993, la mayor partida ha sido la de ayudas familiares complementarias que, con 34.112 millones de pesetas se ha llevado más de la mitad del total pagado. Esta factura no incluye los gastos de hospitalización, con cargo al presupuesto ordinario de la Seguridad Social. Sí figuran, en cambio, las indemnizaciones por fallecimiento algo más 1.500 millones de pesetas entre viudedad, orfandad y otras ayudas-, a razón de tres a cuatro millones de pesetas por víctima, frente a los 15 millones que fija el auto dictado el lunes por el juez Carlos Bueren.

El coste del síndrome tóxico ha sido de 5.000 millones anuales de promedio durante estos 13 años, con un mínimo de 248 millones en 1981, cuando se produjo el envenenamiento, y un máximo de 5.688 millones al año siguiente. En 1993, ascendió a 5.261.

El número de afectados, según el Ministerio de Trabajo y Seguridad Social, asciende actualmente a 19.749.

10-Oct-95: 110.000 millones en ayudas, asistencia e investigación. Casi 110.000 millones de pesetas. ésa es la factura que la Administración lleva pagada desde 1981 por la tragedia de la colza. Una parte de ellos se deduciría de las indemnizaciones (600.000, según las peticiones más elevadas) que el Estado debería desembolsar si fuera condenado como responsable civil subsidiario. 68.103 millones son los abonados hasta el 31 de diciembre de 1994 por la Oficina de Gestión del Síndrome Tóxico, dependiente del Ministerio de Trabajo y la Seguridad Social. A una media anual, estable, en torno a los 5.000, la previsión es que al término de 1995 haya desembolsado 73.000. Los 38.000 millones restantes corresponden a la estimación realizada por el Ministerio de Sanidad y Consumo por las asistencias hospitalarias y la investigación. La partida más elevada es la relativa a las ayudas familiares complementarias: 36.911 millones. Las siguientes son las de invalidez permanente: 7.395; invalidez provisional: 5.562; jubilación: 5.191; ayudas en las tareas domésticas: 3.370; invalidez laboral transitoria 2.729; farmacia: 2.084, y ayudas por fallecimiento: 105. El censo de los afectados comprendía 19.756 personas en 1994, según Tra-

bajo. Las prestaciones mencionadas fueron ese año 7.835, de acuerdo con este desglose: 3.617 por apoyos económicos a las familias, 2.093 por invalidez permanente, 953 por ayudas a domicilio, 879 por jubilación, 167 por viudedad, 74 por orfandad, 41 por invalidez laboral transitoria o provisional, nueve por lactancia y dos por necesidades dietéticas.

13-Mar-96: Concluye el Juicio de la colza contra siete ex cargos públicos. El Estado lleva desembolsados por este caso más de 110.000 millones entre prestaciones y gastos sanitarios.

3-Oct-97: El Estado pagará las indemnizaciones al 100%.

The epidemic outbreak meant an average increase in social expenditure of 1,930 million pesetas (11.6 million euros) between May 1981 and December 1994, updating the annual items, shown in the figure, with an average interest rate of 14.0%. Data from the special report concerning the toxic oil syndrome (BOE 12/18/1995) and Banco de España.
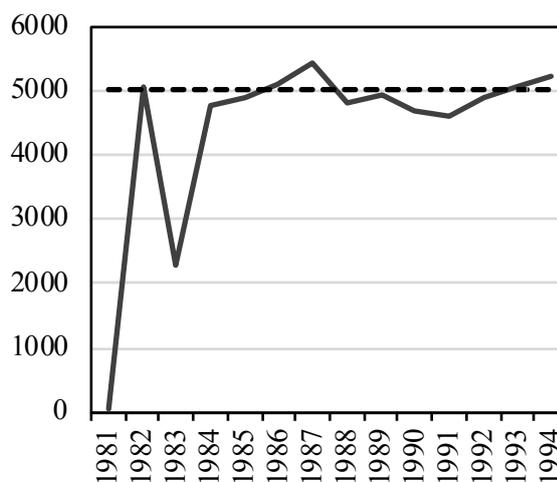
Figure A2.1: Pension expenditure due to the Toxic Oil Syndrome (million pesetas)

A2.4.4   Royal Decree 2620/1981, of July 24

FAS pensions

In 1960, various funds were created. Among them we have the National Fund for Social Assistance (FONAS), from which old-age or disability

pensions could be obtained, albeit discretionally granted. These benefits are also known as FAS pensions. The RD 2620/1981 regulates the granting of these benefits. The regulation establishes that those who "lack of economic means" ("carezcan de medios económicos para la subsistencia"), assistance by family members or other entities and have "reached the age of sixty-nine, for old-age pensions; or, in the cases of disability, being absolutely incapacitated for all kinds of work" ("cumplido sesenta y nueve años de edad, en las ayudas por ancianidad; o, en los casos de ayuda por enfermedad o invalidez, encontrarse absolutamente incapacitado para toda clase de trabajo"). "The amount of the benefits will be determined by the government, at the proposal of the ministries of finance and labor, health and social security, according to budgetary availability" ("La cuantía de las ayudas será la que determine el gobierno, a propuesta de los ministerios de hacienda y trabajo, sanidad y seguridad social, de acuerdo con las disponibilidades presupuestarias").

The following table summarizes the credits allocated to FONAS. The measure does not imply a change in social coverage for the beneficiaries.

Table A2.5: Credits to the FONAS

Year	million pesetas	$\Delta\%$
1975	5,995	...
1976	6,950	16%
1977	7,950	14%
1978	19,869	150%
1979	25,055	26%
1980	29,897	19%
1981	31,659	6%

Author's calculations based on the GSB.

A2.5 1982

A2.5.1 Law 44/1981, General State Budget of 1982, of December 28

War pensions

1982-TI: 19.232 million euros

In 1982 there is an increase in spending on war pensions, as it is recorded in the following news from the newspaper El País:

15-Oct-81: "The pensions of the civilian maimed of the war will increase." "The economic effort of this law, with the equalization of the mutilated of both sides of the fight, will involve an additional cost of 3,200 million pesetas in the State Budget next year."

(15-Oct-81: "Aumentarán las pensiones de los mutilados civiles de la guerra" "El esfuerzo económico de esta ley, con la equiparación de los mutilados de uno y otro bando de la contienda, supondrá un coste adicional de 3.200 millones de pesetas en los Presupuestos del Estado del año próximo".)

A2.5.2 Royal Decree 3218/1981, of December 29

Contributory pensions of the Social Security System

1982-TI: -293.658 million euros

"Los importes mensuales [. . .] que se devenguen a partir del uno de enero de mil novecientos ochenta y dos serán revalorizados mediante la aplicación de la siguiente escala de porcentajes: * Porcentaje * Desde 1 hasta 18.300 pesetas * 11 * Desde 18.301 hasta 36.600 pesetas * 5 * Desde 36.601 pesetas * 3 *".

We understand the revaluation of contributory pensions seeks to guarantee the purchasing power of the beneficiaries.

Expenditure on pensions, excluding the minimum pensions, in 1981 was 3502.84 million euros. The y-o-y change in CPI December 1982 was 14%.

3502*(0.056-0.14) = -293.658 million euros

Minimum pensions

1982-TI:-92.333 million euros

The average minimum pension was 101.28 euros / month, in 14 payments. The average increase in minimum pensions was 11%.

0.47*4626612*(0.11-0.14)*101.28*14 = -92,333 million euros

A2.5.3 Law 13/1982 for the social integration of the disabled, of April 7

"Article 12.1 of Law 13/1982, of 7 April, on the social integration of disabled people, establishes that within a year after its entry into force, the Government will establish and regulate economic benefits for the handicapped who, for not developing a work activity are not included in the field of application of the Social Security System." ("El artículo 12.1, de la Ley 13/1982, de 7 de abril, de integración social de los minusválidos (LISMI), prevé que en el plazo de un año a partir de su entrada en vigor, el Gobierno establecerá y regulará por Decreto un sistema especial de prestaciones sociales y económicas para los minusválidos que, por no desarrollar una actividad laboral no estén incluidos en el campo de aplicación del Sistema de la Seguridad Social.")

The inspiring principles of this law "are based on the rights that article forty-nine of the Constitution recognizes, because of the dignity that is proper to them, to the disabled in their physical, mental or sensory capacities for their complete personal fulfillment and their total social integration, and the profoundly diminished for the necessary assistance and guardianship".[6] ("se fundamentan en los derechos que el artículo cuarenta y nueve

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[6]The article 49 in the Constitution says that "The public authorities will carry out a policy of forecasting, treatment, rehabilitation and integration of the physical, sensory and psychic handicapped to whom they will provide the specialized attention they require and

de la Constitución reconoce, en razón a la dignidad que les es propia, a los disminuidos en sus capacidades físicas, psíquicas o sensoriales para su completa realización personal y su total integración social, y a los disminuidos profundos para la asistencia y tutela necesarias").

A2.6   1983

A2.6.1   Royal Decree 93/1983, of January 19

Contributory pensions of the Social Security System

1983-TI: 34.634 million euros

Lacking a GSB for 1983, the RD 93/1983 establishes the revaluation of pensions for 1983 "Facing the urgent need to proceed with an increase in pensions" ("ante la inaplazable necesidad de proceder a un aumento de pensiones"). "The average absolute increase in pensions of the Social Security System should be adjusted, with the greatest possible rigor, to that of consumer prices foreseen for the same fiscal year" ("El incremento medio absoluto de las pensiones del Sistema de la Seguridad Social debe ajustarse, con el mayor rigor posible, al de los precios al consumo previstos para el mismo ejercicio económico"). We understand, then, that the revaluation of pensions aims to maintain the purchasing power of pensioners. The RD 93/1983 legislates the revaluation of pensions and minimum pensions by amounts according to the type of benefit. However, we do not have such detailed data for 1983. Fortunately, the revaluation of pensions is reflected in the following article of el País: 09-Aug-83: Pension expenses will grow more than 16% in 1984, with an average revaluation of 8% "The policy of 1983 will be maintained, the average revaluation is 13% and the increase of the minimum has been 16%." ("Los gastos por pensiones crecerán más del 16% en 1984, a que la revalorización media será del 8% "Se mantendrá

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will protect them especially for the enjoyment of the rights that this Title grants to all citizens" ("Los poderes públicos realizarán una política de previsión, tratamiento, rehabilitación e integración de los disminuidos físicos, sensoriales y psíquicos a los que prestarán la atención especializada que requieran y los ampararán especialmente para el disfrute de los derechos que este Título otorga a todos los ciudadanos").

pues la política de 1983, cuando la revalorización media es del 13% y la subida de las mínimas ha sido del 16%").

The increase in minimum pensions is consistent with the data in Table A2.3.

The expenditure in pensions, excluding minimum pensions, in 1982 was 4329.27 million euros. The average increase was of 13%.

4329*(0.13-0.122) = 34.634 million euros

Minimum pensions

1983-TI: 135.341 million euros

The following fragment of the RD 93/1983 exemplifies that the revaluations of minimum pensions not only seek to maintain the purchasing power of pensioners but also have an ideological motivation linked to redistribution: "the Government is aware that during 1982 there has been a gap between the increase in pensions and that of prices that must be compensated now in relation to those pensions of minimum amount, and those closest to them, given their true nature of subsistence pensions, the latter pensions which, on the other hand, and by a deterioration of the System itself that will have to be corrected with measures of deeper scope and of necessary social consensus, reach the vast majority of pensioners of our Social Security" ("el Gobierno es consciente de que durante 1982 se ha producido un desfase entre el incremento de las pensiones y el de los precios que es preciso compensar ahora en relación con aquellas pensiones de cuantía mínima, y las más próximas a ellas, dado su verdadero carácter de pensiones de subsistencia, pensiones estas últimas que, de otro lado, y por un deterioro del propio Sistema que habrá que corregirse con medidas de más profundo alcance y de necesaria concertación social, alcanzan a la inmensa mayoría de los pensionistas de nuestra Seguridad Social.").

According to the Annex to the EFR, the total number of contributory pensions in 1982 was 4,837,643. The average minimum pension was 112.44 euros / month, in 14 payments. The average increase in minimum pensions in 1983 compared to the previous year was 16%. Inflation in 1983

was 12.2%. The imputed proportion of the number of minimum pensions is 46%.

0.46*4837643*(0.16-0.122)*112.44*14 = 135.341 million euros

A2.6.2   Law 9/1983, General State Budget of 1983, of July 13

War pensions

1983-TIII: 159.166 million euros

According to the Annual Report of the GSB for 1983, spending on war pensions increased by 54.39% with respect to the previous year. This increase is included in the following table extracted from the EFR for 1983.

Rúbricas más importante [million pesetas]

	1983	1982	Aumento	%
Seguridad Social	473	350	123	35,14
Desempleo	235.244	174.4	60.844	34,89
Corporaciones Locales	224.364	161.43	62.934	38,98
Pensiones de Guerra	75.175	48.692	26.483	54,39
Sociedades estatales	138.738	109.35	29.388	26,88
CCAA iniciales	553.726	400.191	153.535	38,86
CCAA ajustadas	514.567	400.191	114.376	28,58
Total iniciales	1.700.247	1.244.063	456.184	36,67
Total ajustadas	1.661.088	1.244.063	417.025	33,52

According to the GSB for 1982, the total expenditure in war pensions for that year was 48692 million pesetas. 75175-48694=159.166 million euros.

A2.6.3   Supreme Court Ruling 103/1983, of November 22

Contributory pensions of the Social Security System

1983-TI: 132.223 million euros

In 1983, survivors pensions for men were recognized for the first time. The ruling of the Supreme Court 103/1983 declared unconstitutional and,

therefore, void the articles of the General Law of Social Security referring to the case of death of a contributing worker to the Social Security and the right of the spouse to obtain a survivor's pension. Until 1983, there was unequal treatment between men and women. Men were required that, in addition to meeting the requirements of the widow, at the time of their wife's death, they were unable to work and in charge of the deceased. These requirements were contrary to the Article 14 of the Spanish Constitution (of equality before the law).

Between April and May 1983, the press reported some cases in which favorable sentences to widowers that could also receive a pension. We summarize three news appeared in the newspaper El País.

25-abr-83: 100.000 varones podrán cobrar pensión de viudedad. "Según los estudios realizados por el Instituto Nacional de la Seguridad Social (INSS), informa el diario de Oviedo La Nueva España, dicha cantidad incrementaría en 22.000 millones de pesetas el presupuesto destinado a pensiones para 1983."

06-may-83: Nuevas sentencias favorables a que los viudos perciban pensión. "sentencias favorables a la percepción de pensiones de viudedad por hombres, al menos en dos ocasiones, en los últimos meses, apoyando sus fallos en el precepto constitucional que garantiza la igualdad de los españoles ante la ley sin discriminación por razón de sexo."

"El ministro de Trabajo, Joaquín Almunia, señaló recientemente en una conferencia de prensa que el reconocimiento de la pensión de viudedad a los varones representaría para la Seguridad Social un coste aproximado de 22.000 millones de pesetas."

19-jul-83: César Polledo García, "ex funcionario de la Diputación de Madrid, de 75 años, está cobrando desde el mes de abril la pensión de viudedad. Algo que antes era impensable empieza a ser usual en este país. [. . .] Inmediatamente, y sin necesidad de trámite ninguno, César Polledo recibió una carta del banco en el que estaba domiciliada la pensión comunicándole que le era ingresada la parte correspondiente a pensión de viudedad."

According to this information, men would have begun to collect, in a generalized way, survivors' pensions since the second quarter of 1983, for

an additional expenditure to be recorded in the Social Security budget of about 22,000 million pesetas.

A2.7   1984

A2.7.1   Royal Decree 383/1984, of February 1

LISMI pensions

1984-TII: 5.535 million euros

This RD "establishes and regulates the special benefits provided for in Law 13/1982, of April 7, on the social integration of the disabled" ("establece y regula el sistema especial de prestaciones sociales y económicas previsto en la Ley 13/1982, de 7 de abril, de integración social de los minusválidos"). The initial amount of economic benefits is set at the following monthly amounts: (i) minimum income subsidy of 10,000 pesetas, in 14 monthly payments; (ii) subsidy for third party assistance, 5,000 pesetas, in 14 monthly payments; and (iii) subsidy for mobility and compensation for transportation expenses, 3,000 pesetas, for 12 months.

These benefits precede the current non-contributory pensions of the Social Security System and will be void at the entry into force of Law 26/1990, of December 20. The following table summarizes the number of beneficiaries and expenditure in the LISMI benefits from its implementation in 1984 to 1990.

We consider a measure all spending caused by the introduction of these benefits. The RD is published on February 27, 1984, and we consider as the implementation date the second quarter of 1984, taking into account that the requests must be evaluated by multi-professional teams. The measure has a motivation to improve the protective action of the Social Security System. In the first phase of implementation, only the minimum income subsidy and third-party assistance are paid.

Table A2.6: LISMI pensions

	1984	1985	1986	1987	1988	1989	1990
Minimum income subsidy							
Beneficiaries	6955	7405	15622	41398	90737	148562	216044
Δ%	. . .	6.5	111	165	119.2	63.7	45.4
million euros	5,433	9,388	18,402	52,666	131,313	250,000	401,881
Δ%	. . .	72.8	96	186.2	149.3	90.4	60.8
Third party assistance							
Beneficiaries	255	339	857	18541	40931	63524	88345
Δ%	. . .	1229.4	152.8	116.3	120.8	55.2	39.1
million euros	0.102	0.433	5,048	11,795	27,087	43,720	64,488
Δ%	. . .	323.5	1066.4	133.7	129.7	61.4	47.5
Transport subsidy							
Beneficiaries	. . .	2935	8609	12419	21068	29061	36172
Δ%	. . .	. . .	193.3	44.3	69.6	37.9	24.5
million euros	. . .	0.637	2,174	3,386	5,979	8,582	11,333
Δ%	. . .	. . .	241.2	55.8	76.6	43.5	32.1

Sources: Author's calculations based on the EFR of 1991, 1992; Annual report IMSERSO; Annex to the EFR to the Social Security budget of 2016.

A2.8   1985

A2.8.1   Law 37/1984, of October 22

War pensions

1985-TI: 47.531 million euros

This law recognizes the right to a minimum pension for those who during the civil war were part of the Republican army ("Fuerzas Armadas, Fuerzas de Orden Público y Cuerpo de Carabineros de la República").

The law recognizes the right to a pension (from January 1, 1985) that "will be collected in twelve monthly payments plus two extraordinary payments and will be equivalent to the amount of the minimum retirement pension for people over sixty-five years old". The full amount of increase in expending due to this action is taken into account.

The minimum retirement pension for people over 65 was, on average,

169.76 euros/month. The number of beneficiaries was estimated to be about 20,000 (El País 02/07/1984).

20000*169.76*14=47.531 million euros

A2.8.2   Law 50/1984, General State Budget for 1985, of December 30

Contributory pensions of the Social Security System

1985-TI: -78.550 million euros

Increase in pensions of the Social Security System below the inter-annual variation of CPI December. "During the fiscal year 1985, the pensions of the Social Security System and State Pensions will experience an average increase of 7 percent in each of these systems" (BOE 313, p. 37566). ("Durante el ejercicio de 1985 las pensiones del Sistema de la Seguridad Social y las del sistema de las Clases Pasivas del Estado experimentaran en cada uno de dichos sistemas un incremento medio del 7 por 100").

6545.82*(0.07-0.082) = -78.550 million euros

Minimum pensions

1985-TI: 47.878 million euros

The Annex to the Economic-Financial Report to the Social Security budget for 2014 includes an average discretionary increase in minimum pensions above the evolution of the CPI for the year 1985.

0.45*5255999*(0.092-0.082)*140.33*14 = 47.878 million euros

LISMI pensions

1985-TI: 4.125 million euros

The implementation of the LISMI benefits produces a significant increase in current transfers. Also, the mobility allowance established by

Royal Decree 383/1984 begins to be paid.

We consider the total increase in spending on mobility benefits and transport expenses as well as third-party assistance. Table A2.6 indicates that the introduction of the third-person aid subsidy in 1984 was limited. We consider the increase in spending on the minimum income subsidy net of the increase in the number of beneficiaries and the evolution of inflation. To be consistent with the treatment of contributory pensions, we use the December CPI y-o-y variation for the inflation rate.

A2.8.3 Law 26/1985 of urgent measures for the rationalization of the structure and protective action of the Social Security, of July 31

Contributory pensions of the Social Security System

1985-TIII: -466.913 million euros

Although the economic situation exacerbated the imbalances of the system, Law 26/1985 seems to be motivated by the need to implement structural reforms that guarantee the sustainability and viability of the pension system. For example, the law states that "the opinion that Social Security is in need of profound reforms […] in order to guarantee its viability has been constant and widespread" ("ha sido constante y generalizada la opinión de que la Seguridad Social está necesitada de profundas reformas […] en orden a garantizar su viabilidad"). Then, it adds that "the current development achieved by the Spanish Social Security System advises, as has happened in other countries around us, a gradual process of reform that, starting from the level of social protection achieved, correct the deviations and imbalances that are endangering their maintenance and serve as a solid basis for the completion of the process in a more just, effective and complete protective system" ("el actual desarrollo alcanzado por el Sistema español de Seguridad Social aconseja, al igual que ha ocurrido en otros países de nuestro entorno, un proceso gradual de reforma que, partiendo del nivel de protección social alcanzado, corrija las desviaciones y desequilibrios que están poniendo en peligro su mantenimiento y sirva de base sólida para la

culminación del proceso en un sistema protector más justo, eficaz y completo").

Specifically, the text mentions "the following objectives: reinforcement of the professional, contributory and proportional nature of retirement and disability pensions, improvement of the non-contributory protection, improvement of protective efficiency by restructuring resources, and rationalization of the System." ("los siguientes objetivos: reforzamiento del carácter profesional, contributivo y proporcional de las pensiones de jubilación e invalidez; correlativa mejora de la protección no contributiva; mejora de la eficacia protectora por la reordenación de recursos, y racionalización de la estructura del Sistema").

According to Adolfo Jiménez, general director of the Economic Regime of the Social Security, "The proposal of reform of the Social Security delivered yesterday by the minister of Labor to the representatives of UGT and of the Employers CEOE, has like objectives the perfection of the protective system, guarantee an automatic revaluation of pensions and accentuate the contributory system" ("La propuesta de reforma de la Seguridad Social entregada ayer por el ministro de Trabajo a los representantes de UGT y de la patronal CEOE, tiene como objetivos el perfeccionamiento del sistema protector, garantizar una revalorización automática de las pensiones y acentuar el sistema contributivo") (El País, January 24, 1985).

The most critical measures for spending on pensions are: i) the extension of the period for the calculation of the regulatory base (amount resulting from dividing the different contribution bases and used to fix the amount of the pension) from two to eight years, with a phased-in application of the new calculation rule. ii) the extension of the minimum contribution period required to cause entitlement to retirement and disability pensions from 10 to 15 years, of which at least two must be included within the eight years immediately preceding the time of the right to cause.

"[T]he increase in the grace period and the modification of the computation of the regulatory base is a guarantee that the worker's working life is taken into account, while avoiding the fraud that was occurring, especially in certain Special Regimes, that favored the unsupportive practice of the purchase of pensions, making responsible for the cost of the fraud the other workers and pensioners. " ("[E]l incremento del período de carencia

y la modificación del cómputo de la base reguladora supone una garantía de que se tiene en cuenta realmente la vida laboral del trabajador, evitando simultáneamente el fraude que se venía ocasionando, en especial en determinados Regímenes Especiales, que favorecían la práctica insolidaria de la compra de pensiones, haciendo recaer, en definitiva, el coste del fraude sobre los demás trabajadores y pensionistas.")

In partial compensation to the tightening in the calculation and requirements to the right to receive a retirement or disability pension, Law 26/1985 implements the automatic adjustment of pensions of the Social Security system at the beginning of each year according to the evolution of the expected CPI for that year. It was decided that the revaluation of pensions would be made taking as a reference the interannual variation rate of the CPI for November. First implementation for the pensions paid in January 1986.

The automatic adjustment of pensions was a measure extensively demanded by pensioners, unions and other social groups. It is understood that the automatic adjustment of pensions pursues the maintenance of the purchasing power of the beneficiaries, and follows ideological reasons of justice and redistribution.

"[T]he Law introduces the guarantee that pensions will be updated each year according to the evolution of the Consumer Price Index, thus keeping pensioners the purchasing power of their pensions. [. . .] [I]n line with the aim of guaranteeing the justice and effectiveness of the protective action and of ensuring the correct redistribution that corrects situations of necessity, the deviations that, eventually, could occur on the forecast of inflation each year to improve the pensions of the system that are lower than the Minimum Interprofessional Salary." (BOE No. 183, of August 1, 1985, pages 24452 to 24454) ("[L]a Ley introduce la garantía de que las pensiones serán actualizadas cada año según la evolución del índice de Precios al Consumo, manteniendo así los pensionistas el poder adquisitivo de sus pensiones. [. . .] [E]n línea con la finalidad perseguida de garantizar la justicia y eficacia de la acción protectora y de asegurar la debida redistribución que corrija situaciones de necesidad, se tienen en cuenta las desviaciones que, eventualmente, pudieran producirse sobre la previsión de inflación de cada año para mejorar las pensiones del sistema que sean

inferiores al Salario Mínimo Interprofesional.")

Table A2.7: Evolution of Pensions

Year	Benefi-ciaries	million euros	min. pension	average (%)	min. (%)	Inflation (%)
1986	5,545,492	14,471	177.42	8.0	10.0	8.2
1987	5,708,849	15,909	189.72	5.3	6.8	4.7
1988	5,880,479	17,737	204.10	4.3	7.6	5.4
1989	6,032,267	20,007	225.12	6.0	10.3	7.3
1990	6,187,135	22,722	258.97	8.1	12.4	6.7
1991 (1)	6,347,973	25,383	279.47	6.7	6.7	5.7
1992 (1)	6,509,765	28,375	282.79	5.7	5.7	5.1
1993	6,769,903	31,544	297.22	5.1	5.1	4.7
1994 (2)	6,903,083	34,184	310.32	4.4	4.4	4.4
1995 (2)	7,039,678	37,205	323.99	4.4	4.4	4.4

Notes: Author's calculations based on the Anexo al Informe Económico Financiero a los presupuestos de la Seguridad Social 2014, the web of the Social Security, Banco de España. Minimum pension as euros per month. Inflation refers to the y-o-y change in CPI November. (1) Average increase in minimum pensions includes an improvement of survivors benefits. (2) Includes the additional adjustment for deviation of CPI inflation from forecast.

We consider any deviation from the adjustment of pensions concerning inflation (year-on-year change CPI November), once controlled by the number of beneficiaries and the increase in the value of new pensions. The table A2.7 summarizes the evolution of the pensions and minimum pensions of the contributory system of the Social Security between 1986 and 1995.

The press echoed the prospective reform for months before the final text was approved. The articles reveal a high discrepancy between the majority parliamentary groups, as well as between the government and the unions, and within the same socialist party. Consequently, it does not seem it was apparent what the measures finally approved was to be. The law passed on July 31 and its publication date in the BOE on August 1, 1985, coincides with the entry into force of the same. Therefore, we consider the effective reform as of 1985-TIII.

We quantify the measure based on the data provided in the newspaper El País, based on official sources and published on the dates close to the approval of the law. We consider a period of implementation of 8-year.

The government's estimates add to the transitory period of application of the new requirements for the calculation of the regulatory base. The average interest rate for the period is 13.23%. The estimated saving is always growing and accumulated. The following table and graphs summarize the calculations

	Official estimates in the media (million pesetas)	Estimated savings (million pesetas)	Months	Present value (million pesetas)
1985	14.379		5	34.510
1986	44.780		12	39.549
1987	78.142		12	60.952
1988	112.572		12	77.551
1989		144.453	12	87.889
1990		177.247	12	95.244
1991		210.041	12	99.681
1992		242.835	12	101.782
1993		275.629	12	102.032
Total	1.360	1.300		699.189

A2.9   1986

A2.9.1   Law 46/1985, General State Budget for 1986, of December 27

Contributory pensions of the Social Security System

1986-TI: -14.625 million euros

Implementation of the automatic adjustment of pensions: "This budget must be placed within the framework of Law 26/1985, of July 31, on Urgent Measures for the Rationalization of the Structure and the Protective Action of Social Security" ("Este presupuesto debe situarse en el marco de la Ley 26/1985, de 31 de Julio, de Medidas Urgentes para la Racionalización de la Estructura y de la Acción Protectora de la Seguridad Social") (Presentation of the GSB for 1986, page 101). A rise of pensions below the CPI inflation.

7312.73 (0.08-0.082) = -14.625 million euros*

Official estimates and projection
of the savings (pesetas)

$$y = 32794x - 19517$$
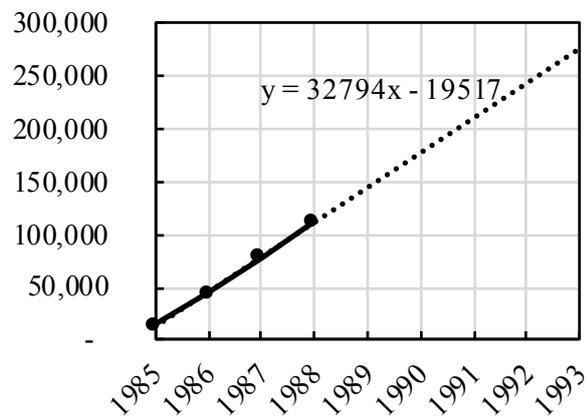
Acumulated (thousand pesetas)
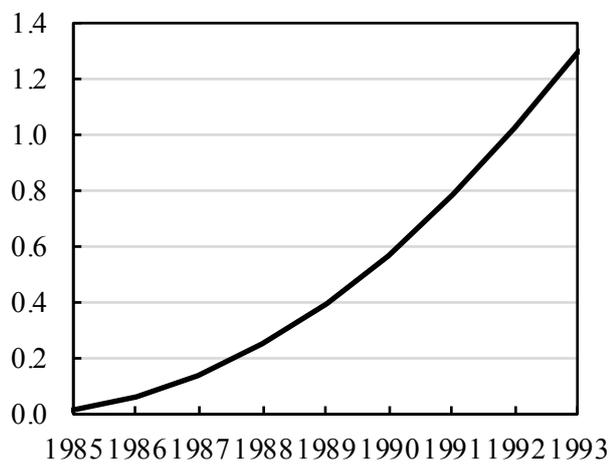
Minimum pensions

1986-TI: 59.346 million euros

An increase of minimum pensions above CPI inflation.

The average minimum pension in 1985 is 161.13 euros/month. The average increase in minimum pensions in 1986 compared to the previous year is 10.0%. The IPC annual change in November in 1986 was 8.2%. The proportion of minimum pensions is 44%.

0.44*5396517*(0.1- 0.082)*161.13*14 =95.271 million euros

A2.9.2   Supreme Court Ruling (Ar. 1741), of April 10

LISMI pensions

1986-TII: 14.308 million euros

The ruling of the Supreme Court (Ar.1741) "established as the criterion to be entitled to benefits of the minimum income subsidy, the personal resources of the possible beneficiary and not the resources of the family unit they belong." ("fijó el criterio de tomar como referencia para tener derecho a las prestaciones del subsidio de garantía de ingresos mínimos, los recursos personales del posible beneficiario y no los recursos de la unidad familiar en la que se inserta") (Economic-Financial Report Project for 1992, p.225). As a result of the ruling there is a substantial increase in expenditure and number of beneficiaries of all LISMI benefits.

We calculate the measure as the increase in expenditure, net of any inflation adjustment. The increase of expenditure due to more beneficiaries can be imputed to the ruling of the Supreme Court. The date of implementation, taking into account the evaluation of the new requests by multi-professional teams, is attributed to the second quarter of 1986.

The interannual variation of the CPI November in 1986 is 8.2%. The net increase in the minimum income subsidy is 87.8% (= 96.0-8.2). The net increase in third parties subsidy is 1058.2%. The net increase in the mobility subsidy and transportation expenses is 233.0%.

8.244 + 4.579 + 1.484 = 14.308 million euros

A2.10   1987

A2.10.1   Law 21/1986, General State Budget for 1987, of December 23

War pensions

1987-TI: 60.904 million euros

We continue to consider all the increases/decreases in war pension spending, having its origin in the Spanish Civil War and having an objective of justice. Increase in spending on war pensions.

The estimated cost of war pensions for 1986 amounts to 55,600 million pesetas. According to the Economic-Financial Report, the expenditure in 1987 amounts to 65,733 million pesetas. (65,733 - 55,600) /166,386 = 60,904 million euros

Contributory pensions of the Social Security System

1987-TI: 53.016 million euros

Pension adjustment above CPI inflation.

Minimum pensions

1987-TI: 127.863 million euros

Minimum pension adjustment above CPI inflation.

LISMI pensions

1987-TI: 41.019 million euros

Rolling out of the effects of the ruling of the Supreme Court (Ar.1741), of April 10, 1986. We calculate the policy action as the total increase in expenditure net of the adjustment for the CPI November in 1987 (4.7%).

A2.11   1988

A2.11.1   Law 33/1987, General State Budget for 1988, of December 23

War pensions

1988-TI: 118.003 million euros

An increase of expenditure on war pensions in 1988. The next table summarizes the evolution of expenditure in this category between 1987 and 1995.

Table A2.8: Expenditure in State Pensions ("Clases Pasivas") (million euros)

	Ordinary	War	Total
1987	1688.41	395.06	2083.47
1988	1608.77	513.07	2121.84
1989	1821.44	521.86	2343.3
1990	2094.94	599.86	2694.8
1991	2155.9	861.97	3017.87
1992	2820.06	859.21	3679.27
1993	3186.85	725.46	3912.31
1994	3402.35	684.82	4087.17
1995	3685.21	681.05	4366.26

Sources: Author's calculations based on the EFR 1991-96

Contributory pensions of the Social Security System

1988-TI: -100.942 million euros

Pension adjustment below CPI inflation.

Minimum pensions

1988-TI: 139.562 million euros

Minimum pension adjustment above CPI inflation.

LISMI pensions

1988-TI: 92.869 million euros

Rolling out of the effects of the ruling of the Supreme Court (Ar.1741), of April 10, 1986. We calculate the policy action as the total increase in expenditure net of the adjustment for the CPI November in 1987 (5.4%).

FAS pensions

1988-TI: 35.581 million euros

Reform that modifies the statutory age to access old-age benefits from the Social Assistance Fund (FAS) from 69 to 68 years. According to the Article 55 of the GSB for 1988: "may be beneficiaries, regarding old-age subsidies, who have reached sixty-eight years of age, without prejudice to compliance with the other established legal requirements." ("podrán ser beneficiarios, en las ayudas por ancianidad, quienes hayan cumplido sesenta y ocho años de edad, sin perjuicio del cumplimiento de los demás requisitos legales establecidos").

The reform is motivated by the desire to improve the protective action of the Social Security System by expanding the coverage of the elderly without resources and with a social disadvantage. We consider the increase in the old-age pension expenditure of the FAS, net of the inflation rate, to be a measure. The increase in the number of old-age pensions is attributed to the change in legislation. We calculated the measure for disability benefits as the growth in the pensions expenditure for disability net of the inflation rate and evolution of the number of beneficiaries.

According to the Annex to the 2016 Social Security budget, the total expenditure on pensions of the FAS in 1987 amounts to 402.61 million euros.

The increase in expenditure from 1987 to 1988 is 14.6%. The estimated increase in the number of beneficiaries is 0.8%; of this, 50% corresponds to old-age pensions. The CPI November annual change in 1988 was 5.4%. A net increase of 8.8%.

402.61*0.088 = 35.581 million euros

A2.12   1989

A2.12.1   Law 37/1988, General State Budget for 1989, of December 28

War pensions

1989-TI: 8.799 million euros

An increase of expenditure on war pensions.

Contributory pensions of the Social Security System

1989-TI: -142.723 million euros

Pension adjustment below CPI inflation.

Minimum pensions

1989-TI: 205.283 million euros

Minimum pension adjustment above CPI inflation.

LISMI pensions

1989-TI: 25.020 million euros

The "socio-economic benefits by Law 13/82 of Social Integration of the Handicapped (LISMI) that experienced a strong increase in the 1989 bud-

get, increasing by 200% for those allocated to minimum income and 159% for third-party assistance" ("prestaciones socio-económicas de la Ley 13/82 de Integración Social del Minusválido (LISMI) que experimentan un fuerte incremento en el presupuesto de 1989, aumentando un 200% para las destinadas a ingresos mínimos y un 159% las ayudas a terceras personas") (Economic-Financial Report for 1989, page 470).

We consider the increase in spending net of the increase in the number of beneficiaries and the evolution of inflation (y-o-y CPI November). Measure motivated by the desire to increase the protective action of the Social Security System.

FAS pensions

1989-TI: 30.084 million euros

The EFR for 1989, p. 248-51, includes an increase in the generosity of FAS pensions.

"3. Acción social a) Ancianos y enfermos incapacitados para el trabajo. Se establece una prestación económica de 19.450 ptas/mes y 14 pagas al año que representa un incremento respecto de 1988 de 13%. b) Minusválidos. Prestación económica de subsidio de ingresos mínimos, establecidos actualmente en 19.450 pts/mes y 14 pagas/año, frente a las 17.200 de 1988."

We consider the increase in spending net of the increase in the number of beneficiaries and the evolution of inflation (y-o-y CPI November). Measure motivated by the desire to increase the protective action of the Social Security System.

According to the Annex to the 2015 Social Security budget, total FAS pensions expenditure in 1988 amounts to 461.45 million euros. The increase in expenditure from 1988 to 1989 was 19.5%. The estimated increase in the number of beneficiaries was 5.6%. The interannual variation of the CPI November in 1989 was 7.3%. A net increase of 6.5%.

461.45*0.065 = 30.084 million euros

A2.13   1990

A2.13.1   Royal Decree Law 7/1989, of December 29

Contributory pensions of the Social Security System

1990-TI: 171.447 million euros

The RDL 7/1989 establishes an increase on account that could be derived from the GSB Law for 1990, of 5% for pensions of the Social Security System. Adjustment of pensions above the evolution of the CPI.

Minimum pensions

1990-TI: 434.586 million euros

Minimum pension adjustment above CPI inflation.

A2.13.2   Law 4/1990, General State Budget for 1990, of June 29

War pensions

1990-TIII: 77.993 million euros

Increase in spending on war pensions due to the change in the regulation. "By Law 4/1990 GSB for 1990, are entitled those who have suffered deprivation of liberty in penitentiary establishments for three or more years as a result of the cases contemplated in Law 46/1977 of amnesty" ("por Ley 4/1990 de PGE para 1990, quedan incluidos quienes hubieran sufrido privación de libertad en establecimientos penitenciarios durante tres o más años como consecuencia de los supuestos contemplados en la Ley 46/1977 de amnistía")(Economic-Financial Report for 1991, pg 227).

LISMI pensions

1990-TIII: 22.404 million euros

Increase in the expenditure for LISMI pensions. We consider the increase in spending net of the increase in the number of beneficiaries and the evolution of inflation (y-o-y CPI November). Measure motivated by the desire to increase the protective action of the Social Security System.

A2.14   1991

A2.14.1   Law 31/1990, General State Budget for 1991, of December 27

War pensions

1991-TI: 262.107 million euros

A significant increase in expenditure in war cause because of the rolling out of new benefits established by Law 4/1990, GSB for 1990.

Contributory pensions of the Social Security System

1991-TI: 136.874 million euros

Pension adjustment above CPI inflation.

Minimum pensions

1991-TI: 187.186 million euros

In the Economic-Financial Report for 1991, pg. 182, we find: "The estimate of pension expenditure has been made [...] following the guidelines of the Government-Unions agreement [...] plus an additional item of 16,324 million, to match the widow's minimum to the individual minimum

of the retirement pension" ("La estimación del gasto en pensiones se ha realizado [...] siguiendo las directrices del acuerdo Gobierno Sindicatos [...] más una partida adicional de 16.324 mill, para equiparación de las mínimas de viudedad a la mínima individual de la pensión de jubilación"). In addition, there is an adjustment of pensions and an increase in other minimum pensions above the CPI inflation.

0.39*6187135*(0.067-0.057)*258.97*14 + 98.109 = 187.186 million euros

FAS pensions

1991-TI: 7.813 million euros

Modification of the statutory age to access an old-age subsidy from the Social Assistance Fund (FAS) from 68 to 66 years. Reform motivated by the desire to improve the protective action of the Social Security.

"Artículo 40. Determinación inicial de pensiones asistenciales. Durante 1991, las pensiones asistenciales que puedan reconocerse, en virtud de lo dispuesto en la Ley de 21 de julio de 1960 y del RD 2620/1981, de 24 de julio, se fijarán en la cuantía de 23.590 pesetas íntegras mensuales, abonándose dos pagas extraordinarias del mismo importe, que se devengarán en los meses de junio y diciembre. Podrán ser beneficiarios, en las ayudas por ancianidad, quienes hayan cumplido sesenta y seis años, sin perjuicio del cumplimiento de los demás requisitos legales establecidos."

We calculate the increase of expenditure net of the inflation rate and the increase in the number of disability subsidies. The increase in the number of old-age subsidies is attributed to the change in legislation. As in the previous modification of the statutory age to access a subsidy of the FAS (see section 1988) we understand that the measure has an ideological motivation.

According to the Annex to the Social Security budget for 2016, the expenditure on FAS for disability and old-age in 1990 amounts to 322.94 and 313.36 million euros respectively. The increase in spending on disability pensions was 11.19%, of which 4.20% corresponds to a greater number of beneficiaries and 5.7% to the inflation rate. Net increase of 1.29%. We

assume that without the change in legislation the number of beneficiaries of old-age subsidies would have been the same as in the previous year, of 4.66%, with the measure the number of benefits decreased 3.56%. We quantify the measure as the difference in spending:

	A *Beneficiaries*	*B* *Annual pay (eur)*	*C = AxB* *Spending (million eur)*
With measure	*162,457*	*1,984.900*	*322.461*
Without measure	*160,612*	*1,984.900*	*318.798*
Difference	*1,845*	*0.00*	*3.662*

0.0129*322.94 + 3.662 = 7.813 million euros

A2.14.2   Law 26/1990, of December 20

Non-contributory pensions of the Social Security System

1991-TI: 56.081 million euros

Law 26/1990, of December 20, establishes the modern system of non-contributory benefits of the Social Security System. It supposes the universalization of the benefits of the System and is developed according to article 41 of the Constitution[7], for that reason, it is understood with a clear motivation of redistribution, justice and consolidation of the protective action offered by the Social Security System. In addition, it completes the "basic reforms of the Social Security System initiated with Law 26/1985, of July 31" ("reformas básicas del Sistema de la Seguridad Social iniciadas con la Ley 26/1985, de 31 de julio").

The benefits are set in the corresponding GSB Laws and are updated "at least, in the same percentage that in said law is established as a general increase in contributory pensions of the Social Security" ("al menos, en el

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[7]Article 41 says that "The public authorities will maintain a public Social Security system for all citizens that guarantees adequate assistance and social benefits in situations of need, especially in the case of unemployment. Supplementary assistance and benefits shall be optional." ("Los poderes públicos mantendrán un régimen público de Seguridad Social para todos los ciudadanos que garantice la asistencia y prestaciones sociales suficientes ante situaciones de necesidad, especialmente en caso de desempleo. La asistencia y prestaciones complementarias serán libres"). The Constitution, particularly Article 41, can be understood as the legal basis for the modern Social Security System in Spain.

mismo porcentaje que en dicha ley se establezca como incremento general de las pensiones contributivas de la Seguridad Social"). For this reason, we estimate the legislated increase in non-contributory pensions as the maximum increase between the adjustment of contributory pensions of the Social Security System, and the increase in the amounts of non-contributory pensions set in the GSB for each year. The first non-contributory pensions were collected in January 1991. Furthermore, upon its entry into force, "it terminates the minimum income subsidy and the subsidy for third-party assistance of Law 13/1982, of 7 April, of Social Integration of the Disabled" ("quedan suprimidos el subsidio de garantía de ingresos mínimos y el subsidio por ayuda de tercera persona previstos en la Ley 13/1982, de 7 de abril, de Integración Social de Minusválidos"). However, those who have the right before Law 26/90 can continue to perceive it. This reform implies that beneficiaries of LISMI benefits who opt for non-contributory pensions may experience an increase in the perceived subsidies. The following table shows the evolution of non-contributory pensions of the Social Security System during its first decade.

Table A2.9: Non-contributory pensions

Year	Beneficiaries	Million euros	legislated increase (%)	Inflation (%)
1991	28,569	62.50	...	5.7
1992	129,147	326.00	15.4	5.1
1993	232,542	616.93	5.1	4.7
1994	293,275	805.32	4.4	4.4
1995	348,419	998.82	4.4	4.4
1996	391,128	1,160.49	3.5	3.2
1997	422,504	1,297.94	3.5	2.0
1998	449,534	1,410.10	2.1	1.4
1999	464,336	1,482.90	2.7	2.7
2000	476,202	1,612.96	6.1	4.1
2001	483,836	1,706.23	4.1	2.7

Notes: Author's calculations based on the Anexo al Informe Económico Financiero a los presupuestos de la Seguridad Social 2016, Annual reports of IMSERSO, Banco de España, Ministry of labour and social security. Minimum pension as euros per month. Inflation refers to the y-o-y change in CPI November. Legislated increase can include additional adjustment for deviation of inflation from the government's forecast.

The GBS for 1991 fix non-contributory benefits at 2,187.68 euros per year. This translates into a total expenditure of 62.50 million euros. Of this

amount, 55,425 million euros are attributable to the new non-contributory pensions. Also, 3,234 LISMI beneficiaries opted for non-contributory pensions in 1991 (annual report IMSERSO 2001). The minimum income subsidy of LISMI was set at 1,984.92 euros per year.

(25335/28569)*62.50 + 3234*(2187.68-1.984.92) = 55.425 + 0.656 = 56.081 million euros

A2.15   1992

A2.15.1   Law 31/1991, General State Budget for 1992, of December 30

War pensions

1992-TI: -2.753 million euros

Starting in 1992, war pensions experience a change in trend. "The general trend of these groups, since the origin of pensions dates back to the Civil War, is decreasing" ("La tendencia general de estos colectivos, dado que el origen de las pensiones se remonta a la Guerra Civil, es decreciente") (GSB Economic-Financial Report for 1991).

Because the decrease in spending is due to the decrease in the population affected, and the origin of pensions is due to the Civil War, we continue to consider the total change in spending.

Contributory pensions of the Social Security System

1992-TI: 93.556 million euros

Pension adjustment above CPI inflation.

Minimum pensions

1992-TI: 312.507 million euros

In the Economic-Financial Report for 1992, p. 498, we find: "Following the guidelines of the Government-Unions agreement [. . .] an additional item of 42,206 million pesetas to equalize the widow's minimum and additional items for the Special Regimes of the Self-Employed and Housing services" ("siguiendo las directrices del acuerdo Gobierno-Sindicatos [. . .] una partida adicional de 42.206 millones de pesetas para equiparación de los mínimos de viudedad y pasas adicionales en los Regímenes Especiales de Autónomos y Hogar"). In addition, there is an increase in the rest of pensions and minimums above the CPI. Both measures are motivated by the desire to increase the protective action of the Social Security System.

0.39*6347973*(0.057-0.051)*279.47*14 + 253.663 = 312.507 million euros

Non-contributory pensions of the Social Security System

1992-TI: 244.719 million euros

The introduction of non-contributory benefits of the Social Security System continues. The following text is taken from the preamble to the GSB for 1992: "In the matter of public pensions and remuneration of the personnel at the service of the Public Administration, the Law [...] incorporates the non-contributory pensions of the Social Security to the concept of public pensions, thus converting certain legal expectations of certain citizens into full and enforceable rights before the Administration" ("En materia de pensiones públicas y retribuciones del personal al servicio de la Administración Pública, la Ley, [. . .] incorpora las pensiones no contributivas de la Seguridad Social al concepto de pensiones públicas, convirtiendo así unas expectativas jurídicas de determinados ciudadanos en derechos plenos y exigibles frente a la Administración").

We consider the increase in spending due to the new beneficiaries of non-contributory benefits, the increase in benefits received by LISMI beneficiaries who opt for non-contributory pensions, and the legislated increase of the already existing benefits in 1991 in deviation to the annual change rate of the CPI November.

Of the 1991-1992 difference in the number of benefits, 93,146 are new,

and 7,432 come from LISMI (annual IMSERSO report). The PGE for 1992 set the non-contributory benefit at 180 euros / month for 14 payments, which is equivalent to 2,524.25 euros per year. The legislated increase compared to the previous year is 15.4%. The minimum income subsidy of LISMI for 1992 is 149.86 euros / month and 14 payments, or 2098.04 euros per year. The y-o-y variation of CPI November was 5.1% in 1992.

93146*2524.25 + 7432*(2524.25-2098.04) + 62.5*(0.154-0.051) = 244.719 million euros

A2.15.2   Royal Decree-Law 5/1992 of urgent budget measures, of July 20

FAS pensions

"Also in matters of public expenditure, benefits from the extinguished Social Assistance Fund are repealed, derogation that operates in the future, without affecting therefore the pensions already caused or in process of resolution, and without affecting the protection of its possible beneficiaries, since the situations of need in old age or disability are already covered, since the entry into force of Law 26/1990, through the non-contributory pensions of the Social Security" ("También en materia de gasto público, se derogan las prestaciones procedentes del extinguido Fondo de Asistencia Social, derogación que opera de futuro, sin afectar por tanto a las pensiones ya causadas o en trámite de resolución, y sin que la misma afecte a la protección de sus posibles beneficiarios, ya que las situaciones de necesidad en la vejez o incapacidad están ya cubiertas, desde la entrada en vigor de la Ley 26/1990, a través de las pensiones no contributivas de la Seguridad Social"). This reform does not imply a change of social coverage for existing or potential beneficiaries of welfare pensions regulated in the Law of June 21, 1960 and RD 2620/1981, of July 24. However, as for beneficiaries of LISMI benefits, opting for non-contributory benefits may represent an increase in the benefits received.

Figure A2.2 compares the evolution of expenditure and number of non-contributory pensions by Law 26/1990, LISMI and FAS. The transfer of
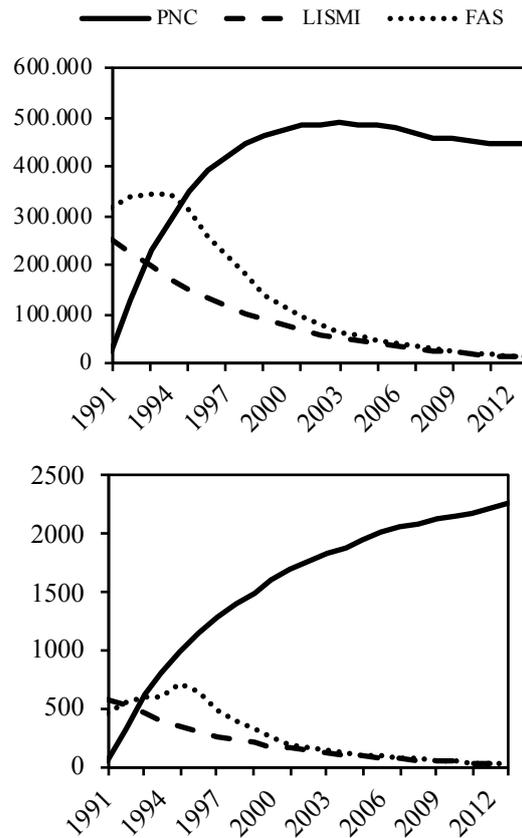
Figure A2.2: Number of pensions (top) and expenditure (million euros; bottom) in non-contributory pensions (PNC), LISMI and FAS 1991-2013

Notes: Author's calculations based on the Anexo al Informe Económico Financiero a los presupuestos de la Seguridad Social 2016, Annual reports of IMSERSO, Ministry of Labour and Social Security.

LISMI and FAS beneficiaries to non-contributory pensions is evident. However, the number of non-contributory pensions stabilizes as of 1998.

A2.16   1993

A2.16.1   Law 39/1992, General State Budget for 1993, of December 29

Contributory pensions of the Social Security System

1993-TI: 73.752 million euros

Pension adjustment above CPI inflation.

Minimum pensions

1993-TI: 39.313 million euros

Minimum pensions adjustment above CPI inflation.

Non-contributory pensions of the Social Security System

1993-TI: 146.238 million euros

Article 40 of the GBS for 1993 set non-contributory benefits at 189 euros/month for fourteen payments, equivalent to 2,652.99 euros per year. The increase is equivalent to the average adjustment of contributory pensions for 1993 (5.1%). The annual rate of CPI November was 4.7%. Of the 1993-1992 difference in the number of beneficiaries, 8,721 come from LISMI (annual IMSERSO report), and we estimate 52,942 come from FAS benefits; in 1993 we estimated 41,732 new beneficiaries of non-contributory benefits. The minimum income subsidy of the LISMI benefits and the FAS pension for 1993 is 2098.04 euros per year.

41732*2652.99+(8721+52942)*(2652.99-2098.04)+326*(0.051-0.047)= 146.238 million euros

A2.17   1994

A2.17.1   Law 21/1993, General State Budget for 1994, of December 29

Non-contributory pensions of the Social Security System

1994-TI: 91.831 million euros

New non-contributory pensions and transfer of LISMI and FAS beneficiaries. The final adjustment coincides with inflation for 1994. The ad-

ditional adjustment for deviation of the CPI is reflected in the Royal Decree 2319/1993, of December 29, which develops the GSB Law for 1994 regarding the adjustment of pensions: "The indicated revaluation percentages have as objective maintaining the purchasing power of Social Security pensioners, so, assuming that the actual evolution of the CPI during 1994 exceeded the initial forecasts, they would have to be made, in due time and in relation to said financial year, the appropriate compensations in favor of the pensioners of the Social Security, as well as taking into account the deviation produced with respect to the revaluation of pensions in the following year." ("Los porcentajes de revalorización indicados se enmarcan en el objeto de mantenimiento del poder adquisitivo de las pensiones de Seguridad Social, por lo que, en el supuesto de que la evolución real del IPC durante 1994 superase las previsiones iniciales, habrían de efectuarse, en su momento y en relación con dicho ejercicio económico, las oportunas compensaciones en favor de los pensionistas de la Seguridad Social, así como tener en cuenta la desviación producida respecto a la revalorización de las pensiones en el ejercicio siguiente").

On June 26, 1993, we found the following news from El País: "The Ministry of Labor and Social Security has approved a royal decree establishing that Spaniards who emigrated during the period 1936-1942, as a result of the civil war, and that they have returned to Spain or intend to do so, they will be entitled to be temporary beneficiaries of a pension for old age until they have access to a Social Security pension. Aid pensions are also established for old age in favor of emigrants who reside abroad and who lack sufficient means to meet their basic needs, according to the Royal Decree." However, it seems that as of December 1993, most of the requests had not been attended and remained pending of payment (El País, December 13, 1993). According to the Minister of Social Affairs, Cristina Alberdi, the budget included an item of 3,000 million pesetas to be able to pay pensions to emigrants without means in 1994. (El País, April 26, 1994). In 1995, a new benefit for elderly migrants will be effective, regulated by Royal Decree 728/1993 of 14 May.

Article 38 of the GSB for 1994 set non-contributory benefits at 196 euros/month for fourteen payments, equivalent to 2,745.96 euros per year. Of the 1994-1993 difference in the number of beneficiaries, 6,487 come from LISMI (annual IMSERSO report), and we estimate 37,826 come from FAS

benefits; in 1994 there are 16,420 new beneficiaries of non-contributory benefits. The minimum income subsidy of LISMI and the FAS pension for 1994 was 2098.04 euros per year.

16420*2746.96 + (6487+37826)*(2746.96-2098.04) + 3000/166.386 = 91.831 million euros

A2.17.2 Royal Legislative Decree 1/1994, of June 20, approving the Consolidated Text of the General Law of Social Security

Royal Legislative Decree 1/1994, of June 20, rationalizes Social Security legislation. The consolidated text integrates, duly regularized, clarified and harmonized, the specific legal texts of Social Security, as well as provisions in matters of Social Security contained in norms with the rank of Law of other branches of the legal system. Together with the Spanish Constitution of 1978 (Article 41), and RDL 36/1978 with origin in the Pacts of the Moncloa, the new consolidated text of the General Law of Social Security constitutes one of the legal bases of the Security System Social.

We highlight Article 48, which establishes that if the CPI forecast deviates from the accumulated CPI between November of the previous year and November of the fiscal year to which the revaluation of pensions refers, the difference will be paid in a single payment before April 1 of the subsequent year.

In 1995, the percentage of revaluation of pensions adds an extra 0.9% for the CPI deviation in 1994. We followed the national accounts criteria and applied this addition to the revaluation of pensions to 1994. The final adjustment coincides with inflation for 1994. Minimum and non-contributory pensions did not increase by an additional percentage.

A2.18   1995

A2.18.1   Law 41/1994, General State Budget for 1995, of December 30

Non-contributory pensions of the Social Security System

1995-TI: 69.470 million euros

New beneficiaries of non-contributory pensions and transfer os beneficiaries from LISMI and FAS. The increase in non-contributory benefits matches the inflation rate for 1995.

Article 35 of the GBS for 1994 set non-contributory benefits at 2,866.71 euros per year. Of the 1995-1994 difference in the number of beneficiaries, 5,914 come from LISMI (annual IMSERSO report), and we estimate 36,322 come from FAS benefits; in 1995, we estimated 12,908 new beneficiaries of non-contributory benefits. The minimum income subsidy of the LISMI and the FAS pension for 1995 was 2098.04 euros per year.

12908*2866.71 + (5914+36322)*(2866.71-2098.04) = 69.470 million euros

A2.18.2   Royal Decree 728/1993, of May 14

Non-contributory pensions of the Social Security System

1995-TI: 44.842 million euros

In 1995, a new benefit for elderly migrants became effective. "The entry into force of Royal Decree 728/1993 of May 14 supposes the establishment of the normative regulation for welfare pensions in favor of elderly migrants lacking resources, establishing a protection mechanism, as a personal right, that guarantees a minimum of subsistence for them. The credits to this program for the year 1995 amount to 7,461 million" ("La entrada en vigor del Real Decreto 728/1993, de 14 de mayo supone el establecimiento de la regulación normativa para las pensiones asistenciales a favor de ancianos emigrantes carentes de recursos, estableciendo un mecanismo de protección,

como derecho subjetivo, que garantice un mínimo de subsistencia para los mismos. Los créditos a este programa para el año 1995 ascienden a 7.461 millones") (Economic-Financial Report GBS for 1995). Such measure has a motivation of justice and to improve the protective action of the Social Security System.

A2.18.3   Pacto de Toledo, of April 6

The report known as the Toledo Pact (Pacto de Toledo) passed on April 6, 1995. The Pacto de Toledo analyzed the structural problems of the Social Security system and formalized the structural reforms necessary to ensure its sustainability in 15 recommendations.

1. Social insurance contributions should suffice to cover contributory benefits, while general taxation and transfers from the General Government should finance non-contributory benefits.

2. Constitute a reserve fund.

3. Contribution base enlargement.

4. Better financing of the specific regimes.

5. Better tax collection mechanisms.

6. Simplification and integration of the specific schemes.

7. Management combination.

8. Enhance social insurance contributions.

9. Improve the equity and contributivity of the system.

10. Standard retirement age at sixty-five.

11. Guarantee the automatic indexation of benefits.

12. Reinforcement of the solidarity by raising the maximum age to collect a survivors benefit [orphanhood], and increasing the survivors' benefits [widows].

13. Better management.

14. Promote complementary and private saving.

15. Analysis and monitoring of the evolution of the system.

A2.19   1996

A2.19.1   Royal Decree Law 12/1995, of December 28

Contributory pensions of the Social Security System

1996-TI: 77.150 million euros

RDL 12/1995, of December 28, establishes an adjustment of 3.5% for all pensions, including non-contributory pensions due to "The return to the Government of the Draft Law of General State Budget for 1996 [...] supposes in practice, among other consequences, the freezing of salaries and pensions " ("La devolución al Gobierno del Proyecto de Ley de Presupuestos Generales del Estado para 1996 [...] supone en la práctica, entre otras consecuencias, la congelación de las retribuciones y pensiones"). As such, we understand that the revaluation of pensions aims to maintain the purchasing power of the beneficiaries.

25716.57*(0.035-0.032) = 77.150 million euros

Minimum pensions

1996-TI: 34.532 million euros

Regarding minimum pensions, we infer that the adjustment is motivated by the desire to improve the social protection of the Social Security. "As regards the remuneration of the public sector and public pensions, an increase is being made since it is not possible to delay this decision until the next Budget Law is approved since for a broad sector of the population their main source of income depends on these salaries and pensions. For these purposes, it is important to bear in mind that the updating of pensions is one of the guiding principles of the social and economic policy

that, according to article 50 of the Constitution in relation to article 53,[8] must inform the action of the public powers. Also, the introduction of these rules in the Decree-Law derive from the need to comply with agreements with unions on the matter." ("En materia de retribuciones del sector público y pensiones públicas se procede a un incremento de las mismas puesto que no es posible demorar esta decisión hasta que se apruebe la próxima Ley de Presupuestos, en la medida en que para un amplio sector de la población su principal fuente de ingresos depende de dichas retribuciones y pensiones. A estos efectos, es de tener en cuenta que la actualización de pensiones es uno de los principios rectores de la política social y económica que, según el artículo 50 de la Constitución en relación con el artículo 53, han de informar la actuación de los poderes públicos. Asimismo, la introducción de estas normas en el Decreto-ley derivan de la necesidad de dar cumplimiento a los acuerdos con los sindicatos sobre la materia").

$$0.35*70393678*323.99*14*(0.035-0.032) = 34.532 \text{ million euros}$$

Non-contributory pensions of the Social Security System

1996-TI: 40.500 million euros

As for minimum pensions, we infer that the revaluation of non-contributory pensions is motivated by an improvement of social protection. There continues to be a significant transfer of beneficiaries of LISMI benefits and FAS benefits to non-contributory pensions of the Social Security System.

Non-contributory benefits for 1996 are set at 2,967.04 euros per year. Of the 1996-1995 difference in the number of beneficiaries, 4,717 come from LISMI (annual IMSERSO report), and we estimate 37,807 come from FAS benefits; in 1996 we estimated 185 new beneficiaries of non-contributory benefits. The minimum income LISMI subsidy and the FAS pension for 1996 were 2098.04 euros per year.

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[8]Article 53.3. of the Spanish Constitution states that "The recognition, respect and protection of the principles recognized in Chapter Three will inform positive legislation, judicial practice and the actions of public authorities. They can only be alleged before the ordinary Jurisdiction in accordance with the provisions of the laws that develop them." ("El reconocimiento, el respeto y la protección de los principios reconocidos en el Capítulo tercero informarán la legislación positiva, la práctica judicial y la actuación de los poderes públicos. Sólo podrán ser alegados ante la Jurisdicción ordinaria de acuerdo con lo que dispongan las leyes que los desarrollen") Article 50 is included in Chapter Three.

185*2967.04+(4717+37807)*(2967.04-2098.04)+998.82*(0.035-0.032)=
40.500 million euros

A2.20   1997

A2.20.1   Law 12/1996, General State Budget for 1997, of December 30

Contributory pensions of the Social Security System

1997-TI: 170.747 million euros

In the Economic-Financial Report for the GSB 1997, p. 156, we find:
'Pensions for 1997 are oriented around the two primary objectives: to guar-
antee the purchasing power of pensions, updating them according to the
CPI foreseen for 1997" ("Las pensiones para 1997 se orientan en torno a
los dos objetivos prioritarios: garantizar el poder adquisitivo de las pen-
siones, actualizándolas en función del IPC previsto para 1997").

28457.87*(0.026-0.02) = 170.747 million euros

Minimum pensions

1997-TI: 70.053 million euros

The preamble to the GSB for 1997 adds: "The General State Budget
for 1997 intends to strengthen welfare and solidarity, making an effort to
increase the levels of coverage and quality of social benefits, through the
introduction of measures of social protection, improving the management
of resources and the fight against fraud [...]. One of the objectives of the
Budget for 1997 is maintaining levels of coverage and protection of social
spending and, in particular, preserving the purchasing power of pensions
according to the inflation objective. Thus, public pensions,[...] despite the
control of public spending that the Budget foresees for 1997, increase by
2.6%, with respect to the amounts received as of December 31, 1996." ("los

Presupuestos Generales del Estado para 1997 pretenden fortalecer el bien-
estar y la solidaridad, haciendo un esfuerzo de aumento de los niveles de
cobertura y calidad de las prestaciones sociales, a través de la introducción
de medidas de protección social, de mejora de la gestión de los recursos y de
la lucha contra el fraude [...]. Uno de los objetivos de los Presupuestos para
1997 es el mantenimiento de los niveles de cobertura y protección del gasto
social y, en especial, preservar la capacidad adquisitiva de las pensiones en
función del objetivo de inflación. Así, las pensiones públicas, [...] a pesar
del control del gasto público que pretenden los Presupuestos para 1997, se
incrementan un 2,6 por 100, respecto de las cuantías percibidas a 31 de
diciembre de 1996").

0.34*7222993*335.35*14*(0.026-0.02) = 70.053 million euros

Table A2.10 summarizes the evolution of contributory and minimum
pensions between 1996 and 2005.

Table A2.10: Evolution of Pensions

Year	Benefi- ciaries	million euros	min. pension	average (%)	min. (%)	Inflation (%)
1996	7,222,993	40,367.3	335.35	3.5	3.5	3.2
1997	7,364,232	42,538.6	344.08	2.6	2.6	2.0
1998	7,476,202	44,793.9	351.32	2.1	2.1	1.4
1999	7,561,781	46,854.8	355.72	2.7	3.3	2.7
2000	7,649,392	51,077.8	382.41	4.1	7.8	4.1
2001	7,715,679	53,374.6	392.74	2.7	2.7	2.7
2002	7,793,805	56,852.5	410.32	3.9	4.6	3.9
2003	7,855,750	60,151.4	424.20	2.8	3.5	2.8
2004	7,920,695	64,453.2	444.08	3.5	4.9	3.5
2005	8,107,268	68,950.1	475.57	3.4	7.0	3.4

Notes: Author's calculations based on the Anexo al Informe Económico Financiero a
los presupuestos de la Seguridad Social 2014, the web of the Social Security, Banco de
España. Minimum pension as euros per month. Inflation refers to the y-o-y change in
CPI November. Pensions increases Include the additional adjustment for deviation of CPI
inflation from the forecast.

Non-contributory pensions of the Social Security System

1997-TI: 58.612 million euros

In the Economic-Financial Report for 1997, p. 113, we find: "It is necessary to maintain and improve the mechanisms of social protection that enable the most disadvantaged groups of society to participate in growth. This priority is fundamental in the budget policy objectives" ("Es necesario mantener y mejorar los mecanismos de protección social que permitan hacer partícipes del crecimiento a los colectivos más desfavorecidos de la sociedad. Esta prioridad es fundamental en el cuadro de objetivos de política presupuestaria").

Article 34 of the GSB, determines the non-contributory pensions of the Social Security: "For 1997, the total amount of retirement pensions and disability of Social Security, in its non-contributory form, will be set at 511,140 pesetas annually." ("Para 1997, la cuantía íntegra de las pensiones de jubilación e invalidez de la Seguridad Social, en su modalidad no contributiva, se fijará en 511.140 pesetas anuales") The new benefits represent an increase of 3.5% compared to the previous year. Therefore, there is a revaluation of non-contributory pensions above the CPI. The measure is motivated by the desire to improve social protection. There continues to be a significant transfer of beneficiaries of LISMI benefits and FAS pensions to non-contributory pensions.

Of the 1997-1996 difference in the number of beneficiaries, 3,462 come from LISMI (annual IMSERSO report), and we estimate 23,050 come from FAS; we estimate 4,864 new beneficiaries of non-contributory benefits. The minimum income LISMI benefits and the welfare pension for the FAS for 1997 is 2098.04 euros per year.

4864*3072.01+(3462+23050)*(3072.01-2098.04)+1160.5*(0.035-0.02)= 58.612 million euros

A2.20.2   Law 24/1997, of July 15

Contributory pensions of the Social Security System

1997-TIII: -97.610 million euros

Rolling out of part of the recommendations contained in the so-called Pacto de Toledo. Law 24/1997, of July 15, seeks to reinforce the inspir-

ing principles of contributivity, equity and solidarity. The measures also aim at financial equilibrium. The fundamental objective is "the consolidation and rationalization of the Social Security System" ("la consolidación y racionalización del Sistema de Seguridad Social").

The measures with effect on spending are:

1. The financial separation of Social Security according to the nature of the benefits. "todas las prestaciones de naturaleza no contributiva y de extensión universal pasan a ser financiadas a través de aportaciones del Estado, mientras que las prestaciones netamente contributivas se financian por cotizaciones de empresas y trabajadores". This measure does not imply a change in the beneficiaries' coverage.

2. The constitution of reserves to mitigate the effects of economic cycles. This measure has a counter-cyclical nature.

3. "Extension of the period of determination of the regulatory basis of the retirement pension, placing that period, after a gradual process of application [from 1997 to 2002], in the last fifteen years of contribution, instead of the eight anticipated in the current regulations". ("Ampliación del período de determinación de la base reguladora de la pensión de jubilación, situando ese período, tras un proceso gradual de aplicación [desde 1997 hasta 2002], en los últimos quince años de cotización, en vez de los ocho previstos en la actual normativa").

   Change in "carencia cualificada" requiring only two years of contribution within the last fifteen years.

   "Accentuation of the proportionality of the years of contribution credited by the interested party, in order to apply it to the regulatory base of the retirement pension for the calculation of its amount, in such a way that, maintaining the right to receive 100% with thirty-five years of contributions, at twenty-five, 80% is reached and with the minimum period required to access this contributory pension, 50% of its regulatory base." ("Acentuación de la proporcionalidad de los años de cotización acreditados por el interesado, en orden a su aplicación a la base reguladora de la pensión de jubilación para el cálculo de su cuantía, de tal manera que, manteniendo el derecho a la percepción del 100 por 100 con treinta y cinco años de cotización, a los vein-

ticinco años se alcanza el 80 por 100 y con el período mínimo exigible para acceder a esta pensión contributiva, el 50 por 100 de su base reguladora"). The changes in the calculation of pensions of retirement represent a reform.

4. "Preparation of a list of diseases, and their assessment for the purposes of the reduction in work capacity and, correlatively, of the presumable loss of earning capacity" ("Elaboración de una lista de enfermedades, y de su valoración a los efectos de la reducción en la capacidad de trabajo y, correlativamente, de la presumible pérdida de la capacidad de ganancia"). This measure does not imply a change in coverage for beneficiaries.

5. Increase in the "duration of survivors' [orphans] pensions, by extending the age limits in order to be able to benefit from them" ("duración de las pensiones de orfandad, ampliando los límites de edad para poder ser beneficiario de las mismas"). The increase in the age-cap to receive survivor's pensions implies a reform.

6. "Improvement in the amounts of minimum pensions in their lower amount for widowhood, when the beneficiaries of them have an age under sixty years" ("Mejora de las cuantías de las pensiones mínimas en su cuantía inferior de viudedad, cuando los beneficiarios de las mismas tengan una edad inferior a los sesenta años"). This measure is included in the discretionary increases of minimum pensions of the following years.

7. "Establishment of an automatic revaluation of pensions, depending on the variation in prices" ("Establecimiento de la revalorización automática de las pensiones, en función de la variación de los precios"). Law 24/1997 automates that deviations from the forecast of the annual variation of the CPI November are compensated in a single payment in the first quarter of the subsequent year, and for all pensions.

We quantify measures 3 and 5 as the increase in pension expenditure, net of the increase in the number of beneficiaries, revaluation, substitution effect and others. The Economic-Financial Reports to the GSB for 1997-2002 offer an estimate for these three concepts. From the Annex of the Economic-Financial Report to the Social Security budget we obtain addi-

tional information on the revaluations and deviations by IPC. The following table summarizes the calculations.

|	Spending	Δ%	Δ% number of pensions	Inflation adjustment	Substitution effect and other	Months	Present value (million euros)
1996	40367.31						
1997	42538.64	5.4	1.8	2.6	0.83	5	105.5
1998	44793.86	5.3	1.9	2.1	1.68	12	-146.4
1999	46854.78	4.6	1.8	2.7	1.90	12	-743.4
2000	51077.84	9.0	1.4	4.1	2.21	12	541.0
2001	53374.62	4.5	1.1	2.7	1.46	12	-331.8
2002	56852.50	6.5	1.1	3.9	1.59	12	-10.5
					Total	65	-585.7

The total expenditure from August 1997 to December 2002 attributable to measures 3 and 5 is -583.658 million euros. In annualized terms, we quantified a change in expenditure in August 1997 of -97.610 million euros.

A3   Items by type of expenditure

Table A1: Items by Type of Expenditure

Expenditure	Items
Food	Rice, flour, bread, cereals, pulse, cakes, pasta, meat, delicatessen, fish, shellfish, milk, yogurt, butter, cheese, eggs, oil, fruit, juice, nuts, vegetables, potatoes, sugar, coffee, tea, cocoa, jelly, honey, chocolate, ice creams, spices, mineral water, other non-alcoholic drinks.
Shelter	Rent (real or imputed); bills including local taxes, trash taxes, water, electricity, telephone, heating, house community expenditures; house repairs; cleaning products and services.
Apparel	Clothes, footwear, and accessories including repairs.
Leisure	Media (phones, TVs, laptops, etc.), sports equipment, books, instruments, other small gadgets for leisure and repairs; shows (cinema, theater, concerts, etc.), museums, pet and garden care expenditures, journal and magazines, stationery, bars and restaurants, hotels, holidays, bet games, and other services for leisure and culture.
Furnishings	Furniture, house textile, large and small appliances (microwaves, fridges, blenders, etc.), tableware, garden tools, electric material, and repairs.
Transport	Vehicles and spare parts, repairs in a garage, fuel and lubricants, car renting, insurances, parking expenditures, tolls, urban transport (subway, bus, etc.), cabs, trains, air transport, sea transport, telegraph, and postal expenditures.
Non-Durables	Food and non-alcoholic beverages, shows, pet and garden care expenditures, press and stationery, bars and restaurants, hotels, holidays, bet games, hairdresser, stylist, beauty products, services fees, donation to other members of the household, donation to other households or institutions, alcoholic beverages, tobacco and cigarettes, medicines, medical services, education.
Durables	apparel, furnishings, vehicles and spare parts, media equipment, sports equipment, books (including textbooks), instruments, orthopedic material, tombstones, jewelry, suitcases, buggies, small personal appliances (e.g., electric razor).

A4   The distribution of pensioners across Spain
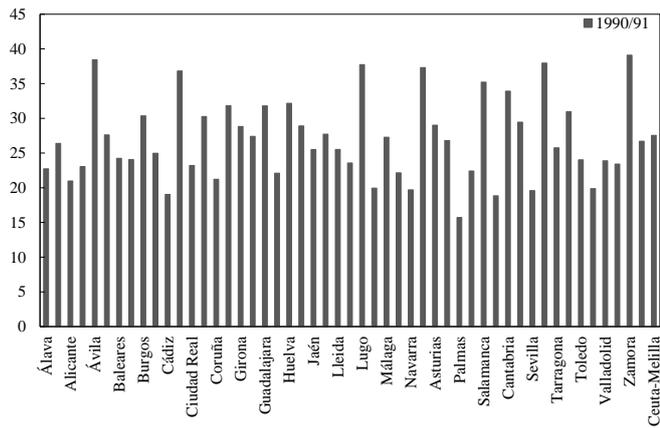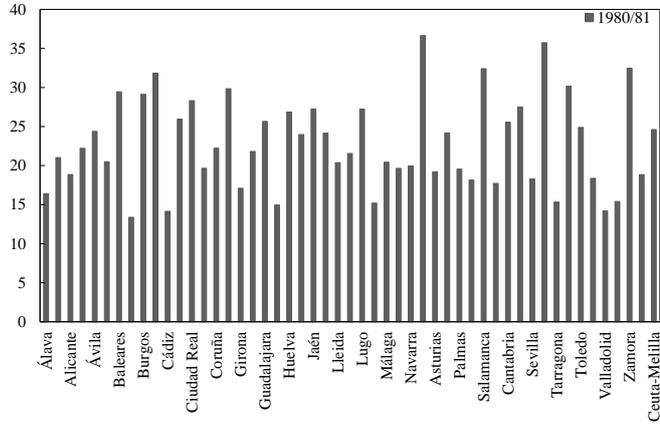
A5   Imputation of capital income to pensioners in the EPC

Figure A1 shows the empirical distribution of the predicted probabilities from the estimation of a probit model for whether households own an average level of capital income above the median on household characteristics common to the EPC and the ECPF85. The covariates include the age, sex and education of the reference person, the household size, a dummy for wether the household owns real estate, and regional dummies. The histograms show a similar profile, albeit more households have intermediate predicted probabilities in the EPC. This is partly compensated by more predicted probabilities close to zero in the ECPF85. All in all, more probabilities below 0.5 were predicted for the EPC.

Pensioners in the EPC were assigned a level of capital income above the median ($y = 1$) if their predicted probabilities were in the upper half of the distribution of probabilities. This classification implies similar characteristics for pensioners with $y = 1$ in both surveys (Table A2).

Alternatively, we could use the one-time survey of 1980-81 to estimate the probabilities that pensioners have a positive level of capital income. However, less than 50% of pensioners reported a definite amount of capital income. As a result, the probit model was modified such that the dependent variable $y = 1$ if the pensioners reported a definite level of capital income, and zero otherwise.

Again, pensioners in the EPC were assigned a positive level of capital income ($y = 1$) if their predicted probabilities were in the upper half of the distribution of probabilities. Table A3 shows that this classification implies crucial differences between pensioners with $y = 1$ in either survey, especially the number of observations and their tenure of real estate, an essential component of wealth. Even so, Figure A2 shows that the estimated effects on spending using these alternative probabilities are halfway the effects grouping pensioners according to their real estate, and using the ECPF85 to determine the likelihood that pensioners have a level of capital income above the median.
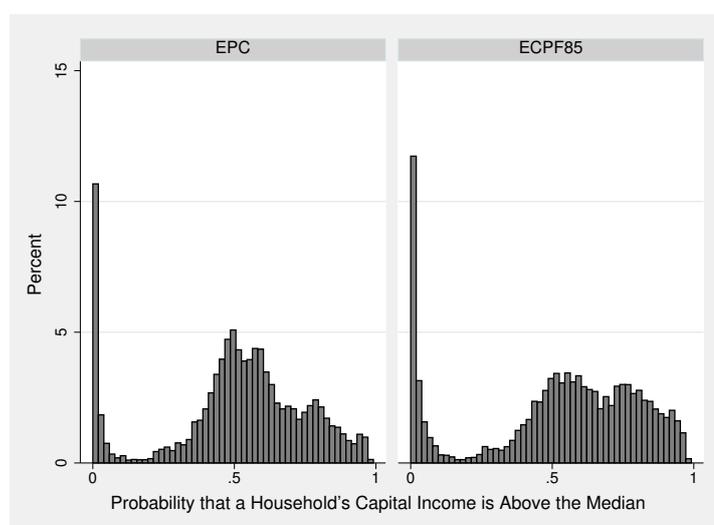
Figure A1: Empirical Distribution of Predicted Probabilities by Survey

Table A2: Predicted Charateristics of Pensioners with Capital Income Above the Median in the EPC based on the ECPF85

	EPC	ECPF85
$y = 1$	48.0%	50.0%
Age	71	70
Woman	17.9%	25.9%
Primary education	86.8%	86.9%
Home owner	95.1%	98.5%
Other real estate	23.2%	20.7%
Ratio 80/20 total expenditure	2.7	2.3

Table A3: Predicted Charateristics of Pensioners with a Positive Capital Income in the EPC based on the EPF80/81

|	EPC	EPF80/81
$y = 1$	50.7%	36.2%
Age	71	71
Woman	19.0%	25.8%
Primary education	86.4%	89.6%
Home owner	87.8%	77.1%
Other real estate	23.0%	4.9%
Ratio 80/20 total expenditure	3.8	3.8
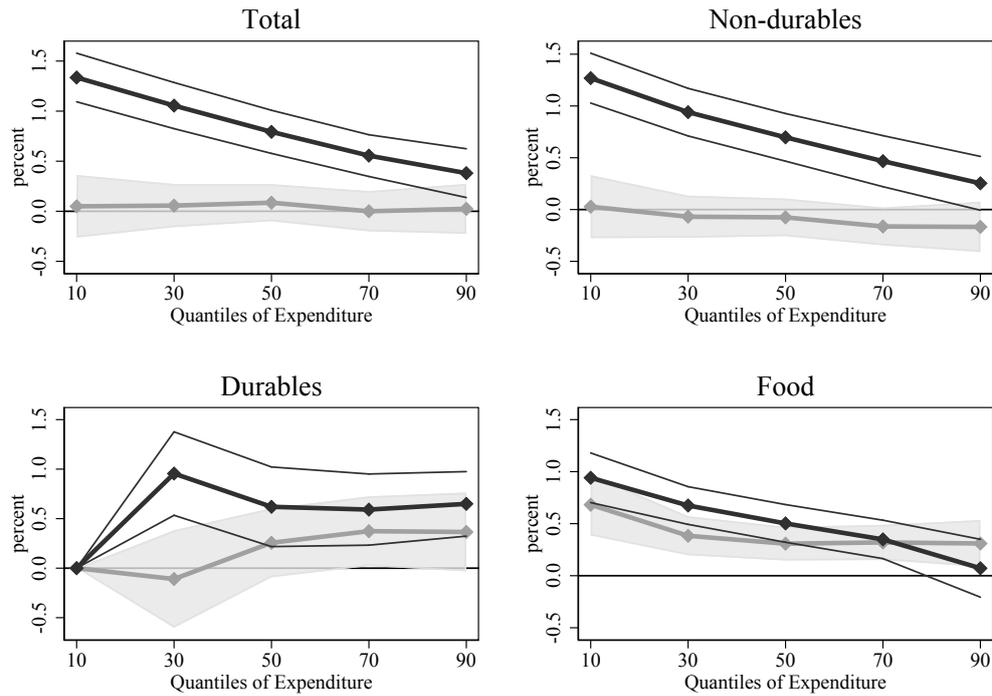
Figure A2: Effects on Spending by Quantile of Household Expenditure, Grouping of Pensioners Based on their Capital Income

Notes: The dark lines with marker report the response of pensioners with a positive level of capital income to an increase of 1,000 pesetas in the average pension. The light lines with marker report the response of pensioners with no capital income. The solid lines and shaded area report 95 confidence level intervals. Predicted probabilities for observations without information on household income using the EPF80/81. (Censored) Median regression estimates for (durables) total expenditure, non-durables, and food. Regressions include controls for household characteristics and time effects. Estimation sample 1977q2 to 1997q1; Observations 130,621.

A6   A simulation exercise for the confidence intervals

This appendix presents a simple simulation exercise to compare the efficiency of alternative methods to compute standard errors for quantile regression with dependent data. In a recent paper, Parente and Santos Silva (2016) developed a standardized routine to compute clustered standard errors for quantile regression estimates. Machado, Santos Silva and Wei (2016) prove the necessary modifications for the method to be applied to quantile regressions for corner solutions data. Alternatively, the influential paper by Abrevaya and Dahl (2008) suggests a bootstrap method to compute standard errors for (censored) quantile regression estimates when the data are dependent. The bootstrap samples are generated by repeatedly drawing (with replacement) a unit from the sample of G groups, and including all observations for such unit. However, it appears that so far does not exist a formal comparison of both methods to guide the empirical researcher. The gap is even more so for censored quantile regression. Thus, this appendix contributes to the discussion with a simulation exercise that compares the efficiency of the clustered and bootstrap-computed confidence intervals for censored quantile regression with dependent data.

The exercise uses a simple linear model with one covariate such that

$$
\begin{aligned}
y &= \max\{0, -0.5 + x + (0.25 + 0.25x)e\} \\
x, e &\sim N(0, 1)
\end{aligned}
$$

The number of observations is set to 10,000 and the number of clusters to 1,250. The average number of observations per cluster is 8, with a minimum of 1 and a maximum of 18 observations per cluster. The relation between the number of observations and the number of clusters has been chosen to resemble the Spanish ECPF85 household expenditure survey. Moreover, to mimic real applications, I draw 200 bootstrap samples (see Kowalski 2016).

The first subplot of Figure A3 shows the censored quantile estimates along with the normal based 95 percent confidence intervals using either method. For the bootstrap method, the confidence intervals are obtained

**Censored Quantile Regression Estimates**   **Confidence Interval Range**
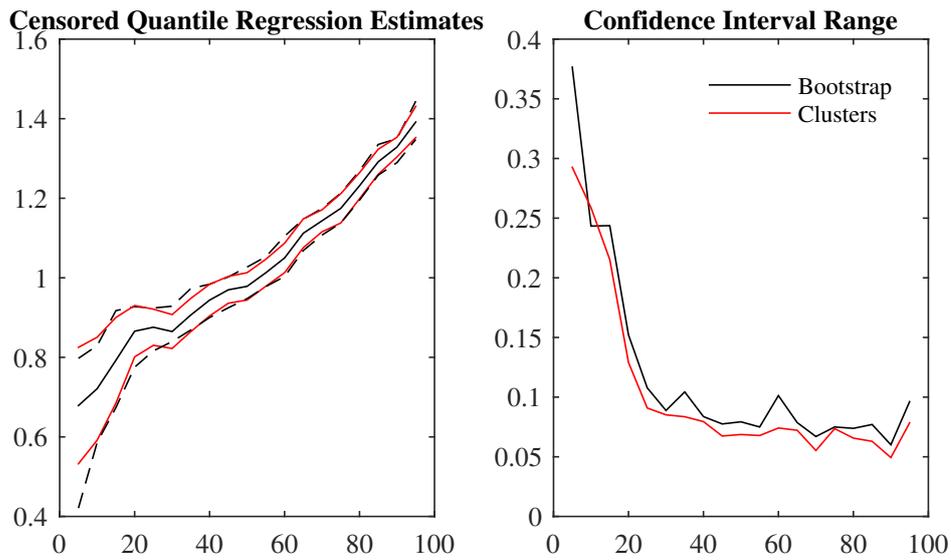
Figure A3: Simulation Results

as the 0.025 and 0.975 quantiles of the bootstrap coefficients. In a standard desktop computer, the cluster-method (solid and red lines) took 16 seconds, while the bootstrap-method (dashed and black lines) took 38 minutes and 28 seconds. These timings side with the known unfeasibility of bootstrap methods in similar real applications, which may involve a more substantial number of covariates and/or observations. On the other hand, both methods yield similar confidence intervals, albeit clustered standard errors tend to be slightly tighter (second subplot).

Appendix B

Appendices to Chapter 3

B1   Data appendix

The following table describes the data definitions and sources. Most of the data was retrieved from the Bureau of Economic Analysis' NIPA Tables, last downloaded on 23rd June 2014. Another useful source was the database of the Federal Reserve Bank of St. Louis. Nominal variables were converted into real terms using the GDP deflator (NIPA Table 1.1.9 line 1) and transformed in per-capita terms dividing by total population (Ramey (2011). All variables with the exception of rates were logged.

Series	Source	Definition
Output	BEA	Real GDP (NIPA Table 1.1.3 line 1) divided by population.
Government spending	BEA	Real federal government consumption expenditures and gross investment (NIPA Table 1.1.3 line 23) divided by population.
Government income transfers	BEA	Social security benefits to persons (NIPA Table 2.1 line 18) divided by the GDP deflator and population.
Personal Income Tax Base	BEA	Personal income (NIPA Table 2.1 line 1) less government transfers (NIPA Table 2.1 line 17) plus contributions for government social insurance (NIPA Table 3.2 line 11) deflated by the GDP deflator and divided by population.
Federal Funds rate	Romer and Romer (2010)	Consistent series back to 1950:I.

AMITR	Ramey(2011)	Barro-Redlick average marginal income tax rate. Sum of the Average Marginal Individual Income Tax Rate (AMIITR) and Average Marginal Payroll Tax Rate (AMPTR).
Total Tax Revenues	BEA	Sum of current tax receipts (NIPA Table 3.2 line 2) and contributions for government social insurance deflated by the GDP deflator and divided by population.
CPI	FRED	Consumer Price Index for urban wage earners and clerical workers. Series CWSR0000SA0
Consumption (non-durables and services)	BEA	Sum of real personal consumption expenditures of non-durable goods (NIPA Table 1.1.3 line 5) and services (NIPA Table 1.1.3 line 6) divided by population.
Durable goods purchases	BEA	Real personal consumption expenditures on durable goods (NIPA Table 1.1.3 line 4) divided by population.
Non-residential fixed investment	BEA	Real gross private domestic non-residential investment (NIPA 1.1.3 line 9) divided by population.
Residential fixed investment	BEA	Real gross private domestic residential investment (NIPA 1.1.3 line 13) divided by population.
Employment	Francis and Ramey (2009)	Total economy employment divided by population.
Labor force	FRED	Sum of Employment and number of unemployment (series UNEMPLOY) divided by population.
Hours per worker	Francis and Ramey (2009)	Total economy hours worked divided by employment.
Real wages business	Ramey (2011)	Consistent series back to 1947.
Productivity	FRED	Real output per hour of all persons in the non-farm business sector. Series OPHNFB.
Unemployment rate	FRED	From the Current Population Survey, civilian unemployment rate (series UNRATE).

B2   Extension of the narrative variable for transfers shocks

Table B2 reports the extension of Romer and Romer's (2016) narrative variable of social security benefits increases from 1992:I to 2007:IV. The cost-of-living adjustments were retrieved directly from the Social Security website (https://www.ssa. gov/oact/cola/ colaseries.html) and are expressed in percentages. The benefits increases are expressed as percentages of the last quarter's total taxable personal income.

Table B2: Extension of the Series of Legislated Increases in Social Security Benefits.

Date	COLAs	Benefits change
Jan-92	3.7	0.20
Jan-93	3.0	0.16
Jan-94	2.6	0.15
Jan-95	2.8	0.15
Jan-96	2.6	0.14
Jan-97	2.9	0.16
Jan-98	2.1	0.11
Jan-99	1.3	0.07
Jan-00	2.5	0.12
Jan-01	3.5	0.17
Jan-02	2.6	0.13
Jan-03	1.4	0.07
Jan-04	2.1	0.11
Jan-05	2.7	0.14
Jan-06	4.1	0.21
Jan-07	3.3	0.17

B3   Government income transfers

Figure B1shows the evolution of the shares of different components of government income transfers over the sample period. The long run share of Social Security benefits is 40.8%. Social security benefits include old-age, survivors, and disability insurance benefits that are distributed from the federal old-age and survivors' insurance trust fund and the disability insurance trust fund. Figure B2 shows that within social security benefits, old-age benefits stand as the most important category. Data from the Social Security Administration.
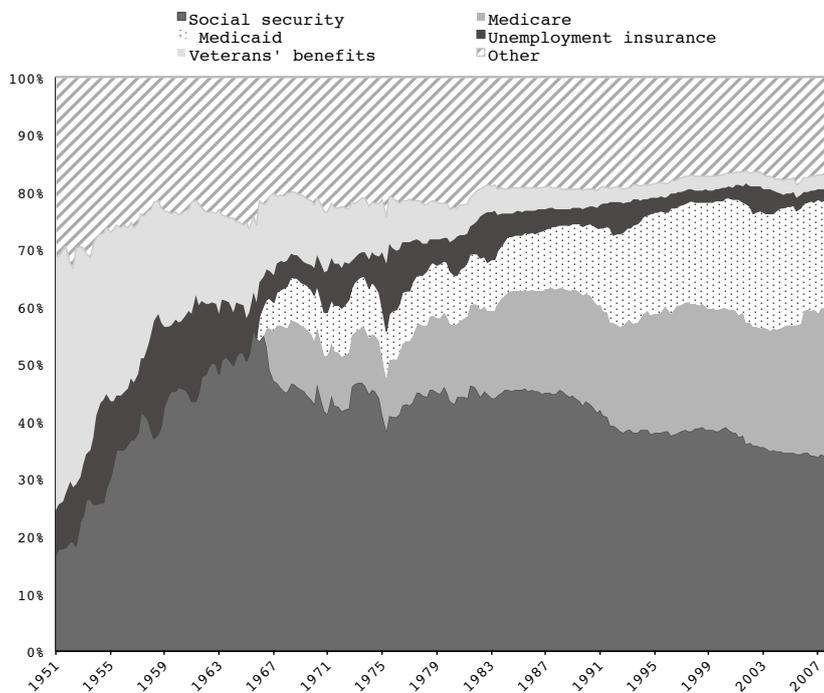
Figure B1: Shares of Social Benefits, 1951:I-2007:IV
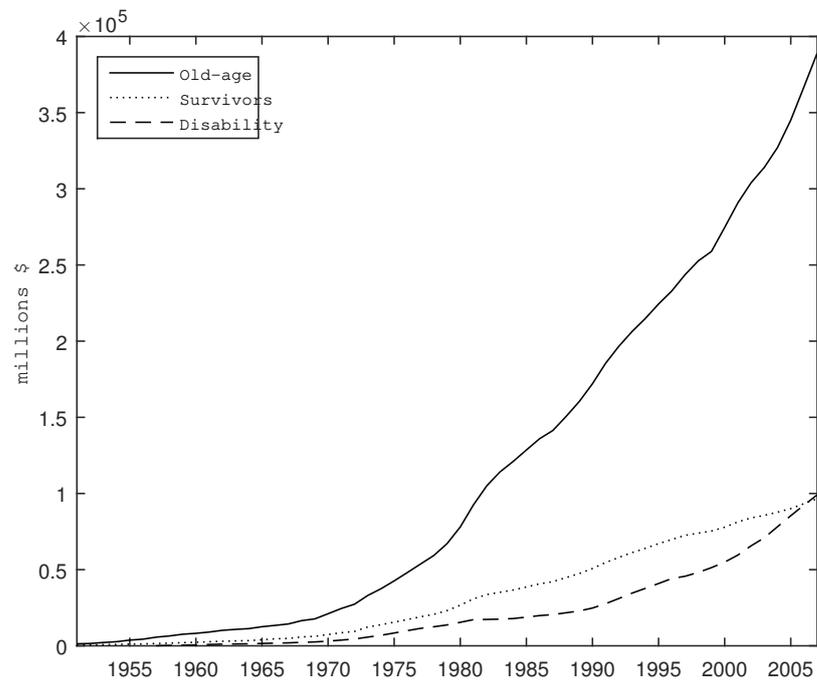
Figure B2: Annual Benefits Paid from the OASI and DI Trust Fund, 1951:I-2007:IV

B4 Alternative price indices

Figure B3 shows the inflation response for alternative price indices: the CPI for urban wage earners and clerical workers, the personal consumption expenditures implicit deflator (PICE), and the implicit GDP deflator. The CPI and the PICE yield very similar inflation responses. The GDP deflator implies a similar inflation response to a shock to social security benefits, but inflation initially drops in response to a government spending shock. The estimated output responses are not significantly affected by the choice of a particular price index.
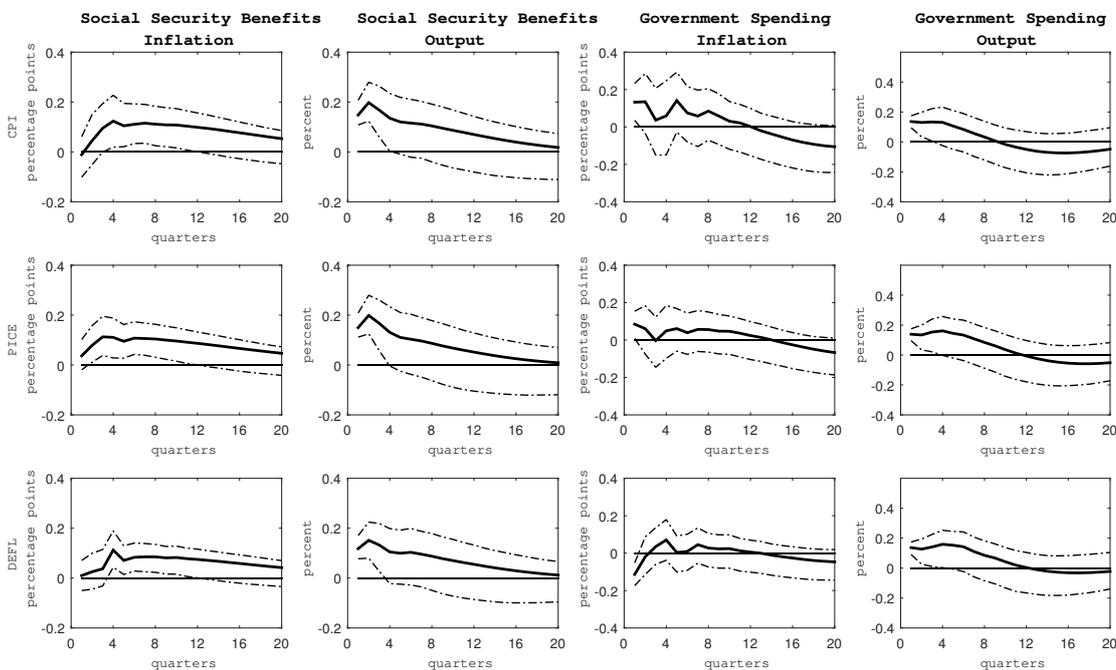

Figure B3: Inflation and Output Responses for Alternative Price Indices

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B5   Alternative specifications

Figure B4 shows the output responses when all of the variables are included in first differences. First-differencing yields very similar positive effects on output, albeit the effects of public expenditure shocks become much less persistent.

Figures B5 to B8 show the aggregate effects of different public expenditure shocks using alternative identification schemes. The SVAR scheme orders the respective public expenditure first, followed by output, the average marginal income tax rate, the Federal Funds rate and CPI. The narrative scheme augments the system with the corresponding narrative measure, ordered first, and uses the shocks to the narrative variables as the shock. In either case, a standard Choleski decomposition is used to identify the shocks. All IRF are normalized such that the initial response of the public expenditure equals one.
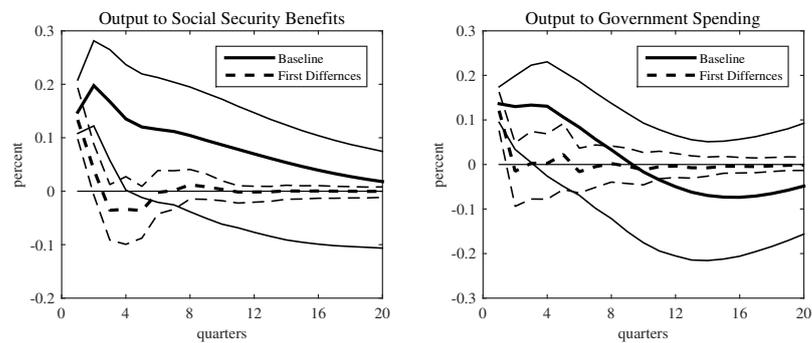

Figure B4: Variables in First Differences
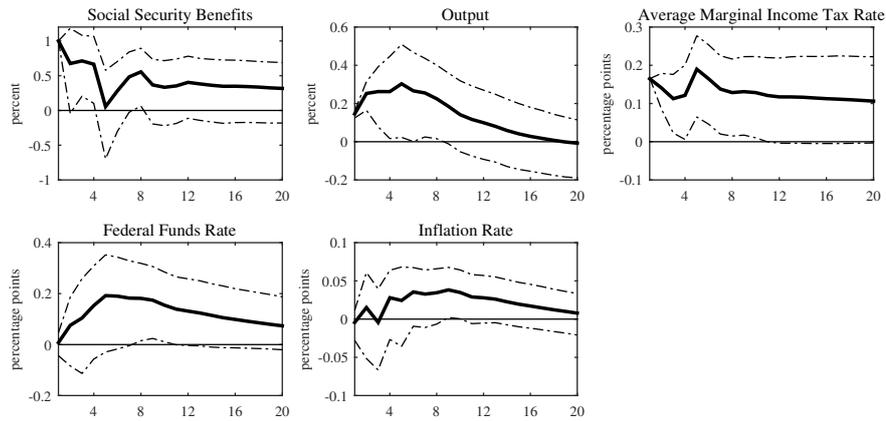
Figure B5: Social Security Benefits: Narrative Approach
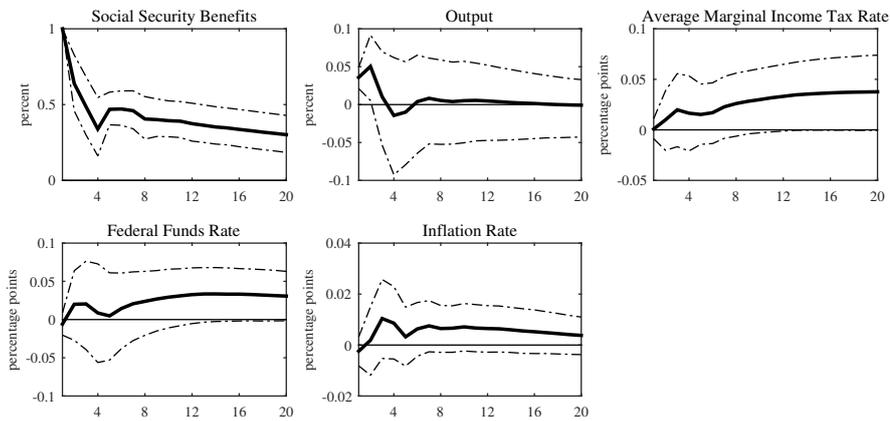

Figure B6: Social Security Benefits: SVAR Approach
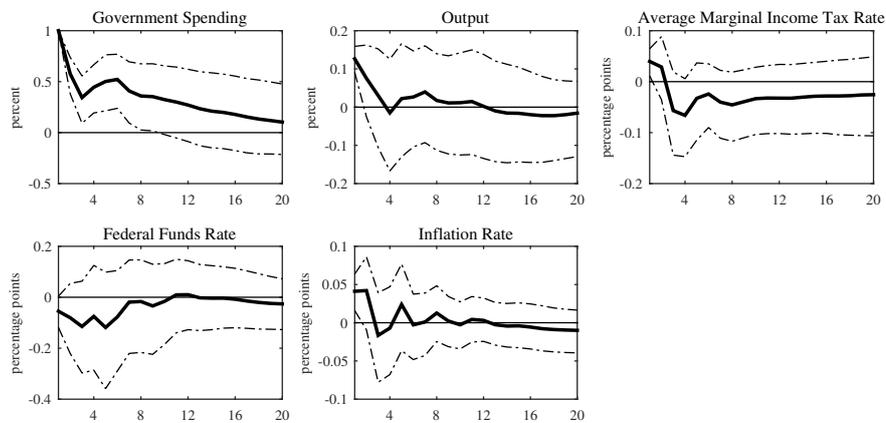
Figure B7: Government Spending: Narrative Approach
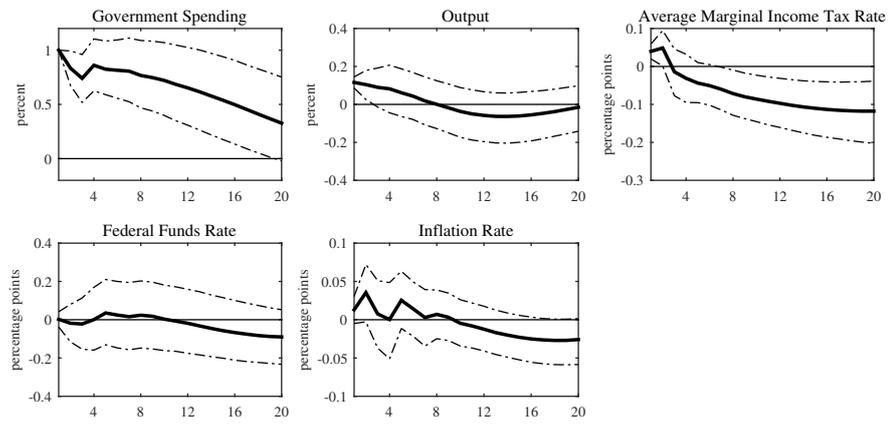
Figure B8: Government Spending: SVAR Approach

B6 Subsamples

Figure B9 shows IRF to an increase in public expenditures of 1 percent using different subsamples. The solid lines represent the baseline estimates, with the corresponding shaded areas representing the 95 percent confidence intervals. The full sample for Social Security benefits corresponds to 1951:I-2007:IV, and starts in 1969:I for government spending. The dashed gray lines estimation sample ends in 1979:II, just before the Volcker chairmanship; the dashed black lines sample corresponds to 1982:I to 2007:IV, the period known as the Great Moderation. While the baseline VAR includes four lags, the smaller subsamples include only two lags.

Regarding government spending, the existent literature has found a loss in the strength of its effects on output during the Great Moderation. However, the first sample period for this exercise is too short to draw strong conclusions. Regarding government income transfers, the results for the two subsamples suggest that excluding the high-inflation period of the early 1980s from the estimation samples conditions the strength and persistence of increases in benefits on output.
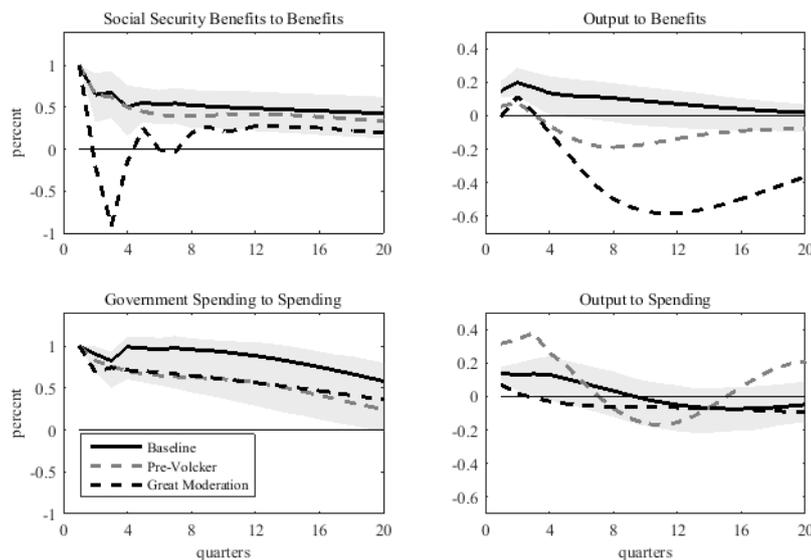

Figure B9: Public Expenditures and Output Responses for Different Subsamples

Appendix C

Appendices to Chapter 4

C1   References for the narrative analysis

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C2 Policy actions in Spain

Next table summarizes the source, motivation, and description for all Spanish policy actions reported in the fiscal questionnaires between 2007 and 2015. The implementation year and descriptions are directly taken from the fiscal questionnaires; all remaining information builds on the data reported in the questionnaires.

Table C1: Policy Actions in Spain, 2007-2015

Year	Source	Policy action	Motivation	Notes and Methodology
2007	General State Budget Law 42/2006, 28 December	Improvement in minimum pensions, with an increase of 4.5% if the pensioner has a dependent spouse, 3% if he/she does not and 1 point for SOVI (compulsory old-age and disability insurance) pensions. These in addition to a 2% increase corresponding to the expected change in the CPI.	Purchasing power	The benchmark for indexation of pensions is the rate of CPI inflation from November t-1 to November t. A measure is defined as the legislated pension increases above (below) this benchmark, multiplied by total expenditure in t-1. Minimum pensions have more often a final adjustment (including deviations of the expected change in the CPI from realized inflation) that deviate from the rate of CPI inflation.
2008	General State Budget Law 51/2007, 26 December	Improvement in minimum pensions, with an increase of 6.5% if the pensioner has a dependent spouse, 5% if he/she does not, and 22.3% if the pensioner is a widower with family obligations. 1% increase of SOVI pensions above the expected change in the CPI.	Purchasing power	

Year	Source	Policy action	Motivation	Notes and Methodology
2009	General State Budget Law 2/2008, 23 December	Improvement in minimum pensions, with an increase of 3% in addition to the increase due a deviation of the forecast from real inflation in the previous year. The rise is equivalent to additional 15 euros per month to minimum pensions for pensioners with dependant spouse, and pensioners that constitute a single economic unit of survivors, retirement or disability pensions. Guaranteed purchasing power to other pensioners with an increase of 2%, together with an increase due to a deviation of the forecast from real inflation in the previous year.	Purchasing power	The benchmark for indexation of pensions is the rate of CPI inflation from November t-1 to November t. A measure is defined as the legislated pension increases above (below) this benchmark, multiplied by total expenditure in t-1. Minimum pensions have more often a final adjustment (including deviations of the expected change in the CPI from realized inflation) that deviate from the rate of CPI inflation.
2010	General State Budget Law 26/2009, 23 December	Improvement in minimum pensions, with an increase of 2% on average for all minimum pensions from the Social Security and SOVI. The increase is equivalent to 15 euros per month for pensioners with dependent spouse or that constitute a single economic unit.	Purchasing power	

| 2010 | Royal Decree-Law 8/2010, 20 May | Withdrawal of transitory regime for partial retirement | Reform | The benchmark is the hypothetical counterfactual of no change in the legislation. The measure is defined as the difference in expenditure from what this would have been absent the change in the legislation. Estimation from official source. Policy action due to an "external" imposition: "[...] speed, security and determination in action is part of the commitment of the member countries of the euro zone to strengthen confidence in the single currency and the stability of the euro zone." |

Year	Source	Policy action	Motivation	Notes and Methodology
2011	Royal Decree-Law 8/2010, 20 May	Pensions freeze.	Reform	Legislation implies measures to reduce the public deficit due to an 'external' imposition: "The measures outlined require the adoption of a legal rule. The need for immediate application in some cases, to ensure their effectiveness in reducing spending, and its realization, knowledge and security in other, so that their credibility and immediate effect on financial transactions and the relevant actions to guarantee for the stability of the euro [...]."

| 2012 | Royal Decree-Law 20/2011, 30 December | No adjustment in pensions for the deviation of forecast from real inflation in the previous year. | Reform | Measures to reduce the public deficit due to an 'external' imposition: "Spain was granted an additional year, until 2014, to bring the deficit below 3% also modifying the deficit targets of the intervening years. This concession did not mean at all a relaxation but, on the contrary, a tightening of fiscal consolidation efforts" (Stability Programme 2013-2016). |
| 2013 | General State Budget Law 17/2012, 27 December | Increase of pensions above CPI, with an increase of 1% for all pensions. | Cyclical | Percentage increase retrieved from the presentation project of the General State Budget. Increase in compensation for no adjustment due to a deviation of expected change in the CPI from real inflation in the previous year. In a press conference, 30th November 2012, vice-president Soraya Sáenz de Santamaría said: "We are well aware that you cannot ask all pensioners the same effort and that we must discuss the matter [no adjustment in pensions] with fairness, hence, in January 2013 pensions will be increased, in general, 1 percent, but 2 percent for pensioners who earn less than a thousand Euros." |

C3   Alternative controls for fiscal policy

Figure C1 presents estimates for multiplier effect and alternative controls for fiscal policy. The controls include the primary surplus (line with marker), and interest payments of outstanding debt (gray line). The primary surplus is defined as net lending/borrowing of general government (Eurostat's series B9) minus interest payments (Eurostat's series D41 PAY). To help in the comparison, black lines reproduce baseline estimates discussed in the main text. Figure C1 also includes estimates without controls for monetary or fiscal policy (thin black line) though all regressions include country and year fixed effects. The differences between coefficients are not statistically significant and range from 0.39 to 0.50 upon impact.
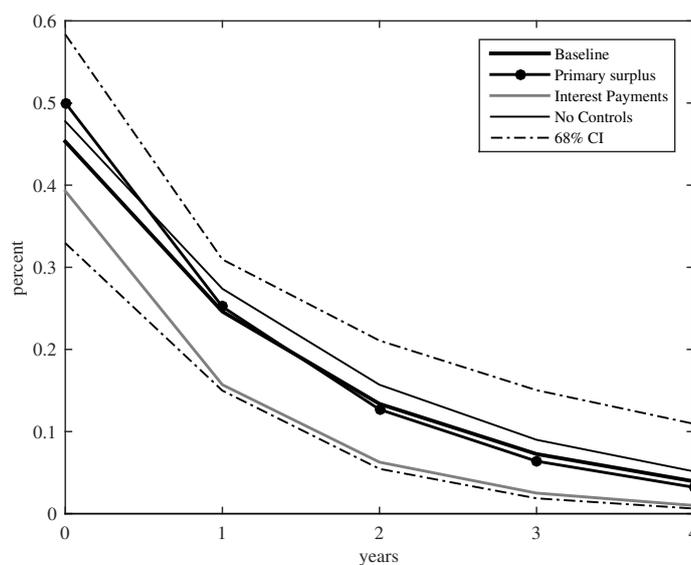

Figure C1: Alternative Controls for Fiscal Policy

Notes: Response to an exogenous shock in old age pensions equivalent to 1 percent of GDP. Full lines are point estimates; broken lines indicate 68 percent confidence interval for baseline estimates.

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