Welfare state regimes and social policy resistance to austerity

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Abstract

How do institutions condition social policy resistance to austerity? We study how welfare state regimes, health care systems, and privatization influence the impact of episodes of fiscal consolidations on the four components of the welfare state: social investment, pensions, health care and labour market insurance. Using data from 1980 to 2014 in 16 OECD countries we study both levels and relative budget shares of expenditures. We find that labour market insurance is more likely to be cut back in Liberal regimes, that social investments are most resilient to austerity in Social-Democratic regimes and that in the Southern European regime, pensions are particularly difficult to retrench. In the Continental welfare state regime, which overlaps with Social Health Insurance systems, health care is considerably more resilient to austerity. Moreover, we show that public pensions and education are more likely to be retrenched during fiscal consolidation episodes when the share of private pension/education expenditure is high, but that private health care has no effect on the politics of austerity. These findings contribute to the study of the comparative political economy of welfare state retrenchment, notably by modelling regime variations in the effect of austerity and by theorizing how the politics of health care differs from other social policies.

The resistance of social policy to austerity differs significantly between countries. Whereas governments had to back down from ambitious pension reforms in France on several occasions, Sweden significantly retrenched its pension system (Bridgen, 2021). Health care has been relatively resilient to austerity in most countries, but radical cutbacks happened in Canada in the 1990s (Jordan, 2009). Similarly, income protection systems for the working age population remained generous in some jurisdictions such as Norway, but suffered from massive cutbacks in others, like in the United States in the 1990s (Pierson, 2001).

Since Pierson's seminal theory developed in *Dismantling the Welfare State?* (1994), the social policy literature has been concerned with the conditions of social policy resistance to austerity. Both Esping-Andersen (1999) and Pierson (2001) described how retrenchment and adjustments to external pressures differ by welfare state regimes. The comparative welfare state literature argues that welfare state regimes follow different trajectories over time since they generate policy feedbacks that constrain policy choices by shaping partisan competition, public opinion and interest groups' preferences (Esping-Andersen, 1990; Esping-Andersen, 1999; Pierson, 2001; Manow et al., 2018; Beramendi et al., 2015). One of the core lessons of the Esping-Andersen's (1990) theory is that countries cluster on policies because they cluster on politics (Shalev, 2007). Indeed, there are distinct patterns of alignment between core electoral groups and political parties in the four worlds of welfare capitalism (Manow et al. 2018).

Because of these distinct pollical alignments, several studies contend that welfare state regimes condition the effect globalization on social expenditures (Swank, 2001; Santos and Simões, 2021; Kim and Zurlo, 2009), whereas others have argued that income protection was more likely to be retrenched in liberal regimes (Pierson 2001; Swank 2001). However, these studies have not analyzed the impact of specific episodes of consolidation. Rather studying the evolution of social policies during a broad era of "permanent austerity" (e.g., Nelson 2007), we contend that austerity is not permanent since public finances are characterized by episodes of expansion and of consolidation. In this paper, we focus on episodes of fiscal consolidations, as they force governments to roll back popular programs, reveal their priorities and to make difficult arbitration between budget categories (Starke, 2007).

This paper asks how do institutions condition the resistance to austerity of the four main components of the welfare state: social investment, pensions, health care and labour market insurance? While most previous studies of retrenchment focus on income protection (Starke, 2007) or contrasted social investment and social consumption (Breunig and Busemeyer, 2012; Jacques, 2021), we compare

the resistance to austerity of all the main components of the welfare state, including health care. This allows us to contribute to comparative welfare state research by identifying which categories of social policy are more or less firmly entrenched in each of the four main welfare state regimes. We limit our study to social policies rather than study other areas of public spending such as government total consumption, investment or gross fixed capital formation (Bamba et al., 2020; Alesina et al., 2019).

We argue that welfare state regimes, health care systems and social policy privatization condition the politics of austerity, as the feedback effects of existing institutions influence the paths that governments can take when implementing austerity. Relying on time series cross sectional data from 1980 to 2014 in 16 OECD countries, we use seemingly unrelated regressions to analyze how austerity influences the relative proportion of spending allocated to each of the four categories of expenditures in different welfare state regime. Using conventional linear regressions, we also model the impact of austerity on levels of spending, conditional on welfare state regimes, health system types and social policy privatization. To our knowledge, we are the first to study the effect of episodes of austerity on both levels and shares of four categories of social policies, conditional on institutional characteristics.

In Liberal welfare regimes, labour market insurance is considerably more means tested than in other regimes and is also more means tested than health care, pensions or social investment (OECD, 2014). As such, public support for labour market insurance is lower in the Liberal regime it is more likely to be cut back during episodes of austerity than other social policies (Pierson 2001; Swank 2001). Social investments in education, childcare and active labor market policies are most resilient to austerity in the social-democratic Nordic regime. We suggest that social investment has been entrenched for a longer period in the Nordic regime, which shapes citizen's expectations (Bonoli 2013). Moreover, the Scandinavian countries have a larger share of service sector workers, of female labour force participation and of socio-cultural professionals, constituencies that are particularly in favor of social investment and that are crucial to any governing coalition (Beramendi et al., 2015). In the Southern European regime, pensions are particularly difficult to retrench during austerity, as they reflect the interest of core labour market insiders that governments wish to please (Lynch, 2006).

The conservative Continental welfare state regime is the only regime overlapping with social health insurance (SHI) systems which are characterized by contributory funding and the delivery of care by social partners. We find that health care is considerably more resilient to austerity in SHI systems (and in Continental regimes) in part because governments have more incentives to raise contributions

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than to cut spending (Manow, 2010; Truchlewski, 2020). Governments can more easily impose spending cuts to the health care sector in tax-funded National Health services.

Finally, we study if the divergent degree of social policy resistance in different welfare state regimes may be explained by social policy privatization. We are the first to test if privatization of social policy reduces its resistance to austerity. While our results are not clear cut, we find that public pensions and education are more likely to be cut back during austerity episodes when the share of private pension/education expenditure is high. In contrast, the privatization of the health care sector doesn't influence the resistance of public health care spending to austerity.

The theory section starts by presenting our main argument about how welfare state regimes, health care systems and privatization influences social policy resistance to austerity. We back our theoretical claims with public opinion data, showing that the public is more supportive of pensions in Southern Europe, of education in Nordic countries and less supportive of unemployment insurance in Liberal regimes. The third section presents the data and the modelling choices, which compares levels and relative shares of expenditures. The fourth section presents the results, while the last section discusses the relevance of our findings for the comparative political economy of the welfare state.

The politics of austerity in four policy areas and welfare regimes.

Welfare regimes differ in their degree of universalism, means testing and privatization of social expenditures. Korpi and Palme (1998) contend that universal social policies are associated with more redistributive outcomes than means-tested policies because citizens are more willing to sustain redistribution with their taxes when they also see themselves as beneficiaries of the welfare state, as with universal social policies. The literature has shown that universal social policies are more popular than means tested ones, as they are more likely to be perceived as fair and just, whereas means tested policies fuel debates about the deservingness of welfare state beneficiaries and create a polarization between the beneficiaries and taxpayers (Brady and Bostic, 2015) (but see Laenen and Gugushvili (2021). However, the resistance to austerity of universal relative to means-tested policies has not been thoroughly demonstrated. Analyzing a period of ten years without modelling the effect of specific periods of austerity, Nelson (2007) finds that both universal and means-tested welfare state entitlements suffered from cutbacks, while social insurance was slightly more resistant to cuts. Starke (2007) argues that while

universal welfare states were more resilient to austerity than residual welfare states, universal programs are not necessarily less likely to be retrenched than means tested ones in the same country, since right wing parties may prefer a targeted and less costly welfare state.

Both Esping-Andersen (1990) and Paul Pierson (2001) posited that income protection for the working age population, which we label labour market insurance, is more likely to be retrenched in Liberal regimes, because it means tested. Citizens do not equally face the risk of unemployment, the main labour market risks; it is strongly correlated with income and education and therefore, support for labour market tends to be more polarized by risk exposure (Rehm, 2016). As it is particularly redistributive, there are large differences in preferences between the left and the right regarding the coverage of labour market risks (Jensen 2014). This polarization regarding labour market insurance is particularly acute when it is means tested and available only to poorer segments of the population while being paid for by higher income individuals.

On average from 2000 to 2011, 27% of working age cash transfers are means tested in the five Liberal welfare states for which data is available (Australia, Canada, Ireland, UK and the USA), against 3.5% in the social democratic regime, 6.6% in the Continental regime and 5.7% in the Southern European regime (OECD 2014). In comparison, pensions are considerably less means tested in the Liberal regime (only 5,3% in the UK and 11.7% in the United States). Moreover, health care is provided via universal National Health Services in all Liberal countries, except in the USA. As such, retrenchment is less likely to happen for pensions and health care in the liberal regime than for labour market insurance (Pierson 2001).

Previous studies support this expectation. Swank (2001) finds that public debt is associated with lower social expenditures in general and cash benefits in particular in countries with Liberal welfare institutions but not in other welfare regimes, but the period under study remains short (1980-1995) and public debt remains an indirect measure of austerity. Similarly, Kiess et al. (2017) find that cash benefits were more likely to be cut in the United Kingdom and the United States than in Sweden after the 2008 crisis. Korpi and Palme (2003) argue that the largest decline in replacement rates of sickness benefits, work accidents and unemployment insurance happened in the Liberal regime. Both Swank (2002) and

Santos and Simões (2021) find that globalization leads to lower social expenditures in Liberal regimes, but not necessarily in other regimes[1]. Hence, we propose the following hypothesis:

Hypothesis 1. Labour market insurance is less resilient to fiscal consolidations in Liberal welfare state regimes than in other welfare states.

Generally, when social policies are targeted on the poor, the middle and upper classes rely on private social insurance (Jacques and Noël, 2018). Hence, the degree of privatization of social spending is a crucial variable to consider in analyzing how welfare states influence the politics of austerity. Social policy markets reshape the relationship between citizens and the state by reducing the incentives of low risk, high-income groups to stay in the public insurance market, leaving low quality risks for the public insurance (Gingrich, 2021). When private insurance is prevalent, fewer people rely on state benefits and the interest of the middle class are decoupled from those of the working class, thereby reducing the size of the pro-welfare constituency (Pierson, 1996; Korpi and Palme, 1998). Several studies have established that private social expenditures influence public opinion. Lindh (2015) finds that support for market provision of social services is higher in countries with more private social spending. Private pensions, education or health care reduce support for the public system, particularly among the upper classes (Busemeyer, 2014; Busemeyer and Iversen, 2020; Zhu and Lipsmeyer, 2015).

Fewer studies have analyzed the effect of social policy privatization on government policy choices. Horn and Kohl (2022) find that when the level of private pension or health expenditures is high, market-oriented political parties are more likely to cut public pensions or public health expenditures. In contrast, Gelepithis (2019) argues that means tested and private pensions put political pressures for a universalistic policy expansion, especially among non-left parties. Hence, one of the contributions of the current study is to analyze how private social expenditures condition the effect of austerity on social policy choices.

Hypothesis 2. Public social expenditures in one area are less resistant to austerity when the share of private social expenditures in this same policy area is high.

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[1] It is worth noting that globalization and austerity are different: while austerity has only negative effects on welfare state spending, globalization may actually increase welfare spending, since government may compensate workers displaced by international trade by expanding social protection

What distinguishes the Nordic regime from the others is not necessarily the lower degree of privatization or means testing (Jacques and Noël, 2018), or the generosity of labour market insurance and pensions, but rather the timing and development of social investment (Beramendi et al. 2015). Social investment relies on active capacitating social policies aiming foster human capital development and empower citizens to earn a living on the labour market (De Deken, 2017; Bonoli, 2013). Education, childcare, and active labour market policies are generally the main social investment policies (Beramendi et al. 2015; De Deken 2017). Nordic welfare states have been the first to implement large scale child care and active labour market policies and sustained the largest levels of social investment spending in OECD countries (Bonoli 2013). This should create stronger feedback effects than in countries where social investments are more recent and residual.

Welfare regimes shape employment structure, while occupational groups have different policy preferences (Beramendi et al., 2015; Oesch, 2015b). In their study of the *Politics of Advanced Capitalism*, Beramendi et al. (2015) argue that each welfare regime has a core constituency of voters that must be included in any plausible winning coalition because of its size, of the nature of the party system and of previous policy legacies. The preferences of this core constituency should be particularly important to policy prioritization during periods of fiscal consolidations. Social investments helped to increase female labour force participation, while Nordic welfare states aimed to smooth the transition to a post-industrial economy by creating jobs in the public service sector (Iversen and Wren, 1998). Women and service sector workers are a large constituency in favor of social investment (Beramendi et al. 2015). In fact, socio-cultural professionals, who are often women working in the public service sector, are particularly numerous in Nordic countries (Oesch, 2015a) and are at the core of most potential electoral coalitions in these countries. They are also the constituency the most in favor of social investments (Beramendi et al. 2015). In brief, because social investment is well entrenched and supported by numerous constituencies in the Nordic regime, we expect that:

H3. Social investments are more resilient to fiscal consolidations in Nordic welfare state regimes than in other welfare states.

Pensions are covering life cycle risks and have direct impacts on large segments of the population, thereby conferring very strong feedback effects in any welfare regime. However, we contend that pensions are in a unique situation in Southern European welfare states. Southern Europe is characterized by particularistic political competition, which fostered clientelistic and targeted policies. In this welfare

regime, politicians have electoral incentives to favour selective groups such as retired former labour market insiders. Italy's myriad pension systems catering for narrow groups are a case in point (Lynch, 2006). They are tailored to the needs of labor market insiders that are crucial to any electoral coalition in the Southern European regime (Beramendi et al. 2015). Southern Europe remains the champion of the coverage of old social risks, like aging, and a laggard in the coverage of new social risks via social investments (Tepe and Vanhuysse 2010). When pension reform happened in southern Europe, it often led to some forms of dualization, as the interest of core workers were protected (Bridgen 2021). We do not contend that pension reform is unlikely in the Southern European regime as several countries have been implementing large cutbacks in future entitlements (Pierson 2001). However, these cuts should only slow the growth of expenditures in the long term, while pension expenditures continue to grow in the short term because of past arrangements. We thus pose the following hypothesis:

H4. Pensions are more resilient to fiscal consolidations in Southern welfare state regimes than in other welfare states.

Health care has generally not been incorporated in theories of the welfare (Schwander, 2019). Health care systems are different from the worlds of welfare regime framework, as they are not created by political power constellations (Schwander 2019). Health care is situated in between social investment and social consumption. The shift from passive to active social policy has parallel developments in health policy: instead of simply curing for illnesses, recent health policy focus on preventing illness from occurring (Goijaerts et al., 2022). Health care is also distinguishable by its unique degree of popularity, as it is the most popular welfare state policy (Busemeyer and Garritzmann, 2017). In fact, health is a valence issue supported by both left and right parties (Immergut, 2021).

Health care system types should influence the politics of welfare state reform since it has a strong impact on the capacity to control health care cost growth. We contrast National Health Services (NHS), characterized by state-based regulation and financing, with the Social Health Insurance (SHI) systems giving an central role to social partners in the financing (and sometimes regulation) of health care (Böhm et al., 2013). NHS exist in the Nordic countries, Southern Europe, the United Kingdom, Australia, and Canada, whereas SHI are present in German-speaking countries, France, the Benelux, and Japan (Immergut, 2021). It is worth noting that all the countries included in this study having a SHI system are Continental welfare states.

SHI are mostly funded by social security (health insurance) contributions, whereas NHS are funded by general taxation. To ensure that contributions match costs, contributions increase, sometimes automatically, to cover the rising expenditures of health care systems (Manow, 2010). Automatic increases allow politicians to deflect the blame for higher contributions and to point towards economic or demographic factors that they cannot control, whereas tax increases inevitably attract blame (Manow, 2010). In SHI, citizens perceive a direct link between contributions and benefits and retrenchment would involve cutbacks to benefits that have already been paid for (Truchlewski, 2020). Moreover, these systems decentralize the management of the health care funds and health care provision to social partners who are often able to block retrenchment (Swank 2002). Reeves et al. (2014) find that reductions of government revenues and episodes of austerity reduce health care expenditures from 1995 to 2011, but SHI systems are less susceptible to revenue fluctuations.

In NHS systems, by contrast, taxes do not increase with the cost of the health care system, which accentuates fiscal pressures on public finances, and incentivizes governments to implement retrenchment measures to contain rising costs. Moreover, in tax-based systems, ministries of Finance exert a strong influence on the budget process and have the necessary leeway to impose cutbacks. In contrast, in systems based on social security contributions, social insurance and health care are more isolated from the formal budget process since they are paid for by social security contributions (Bonoli and Palier, 2000). Finance ministers cannot easily impose cutbacks and it is often a minister with a pro-spending bias that is responsible for the funding of health and social insurance in SHI systems (Manow, 2010). Indeed, previous studies have found that adopting a social health insurance financing rather than tax financing leads to 3-4 percent higher health expenditures per capita on average (Wagstaff, 2009). Thus, we expect that cost control will be easier to achieve in NHS systems and that health care will be less resilient to austerity.

Hypothesis 5a. SHI are more resilient to austerity than NHS.

Since all countries in the Continental welfare state regime have a SHI, we expect that:

Hypothesis 5b. Health care is more resilient to austerity in Continental welfare regimes.

Public opinion evidence

We start the empirical section by showing that the hypotheses presented above are congruent with public opinion dynamics in the four different welfare state regimes. To do so, we use the INVEDUC survey (Busemeyer and Garritzmann, 2017) which asks different questions about education expansion in trade-off situations, in which more education spending involves higher taxes, or cutbacks to pensions or unemployment insurance. These trade-off questions mirror public policy choices in situations of fiscal pressures and force respondents to be realistic, preventing them from wanting something for nothing, for example by preferring more expenditures in all policy fields, without any tax increases. The INVEDUC survey has been conducted in representative samples in two countries in each of the four welfare regimes we study: Spain and Italy in the Southern regime, Denmark and Sweden in the Nordic regime, the UK and Ireland in the Liberal regime and France and Germany in the Continental regime. Figure 1 presents the impact of a country-level categorical variable measuring welfare state regimes on three questions about trade-offs to fund higher public education spending. We use ordered logistic models including individual-level controls, such as income, education, gender, age, place of living and number of children (see the appendix for details on controls and question wording).

The first column uses the Nordic regime as a reference category. It shows that respondents are less likely to accept higher education spending if it means higher taxes in Continental and Southern regimes than in Nordic and Liberal regimes. The second column uses the Southern regime as a reference category to show that respondents are more likely to accept higher education spending even if it means cuts to public pensions in the other regimes, with significant effects for the Liberal and Continental regimes. The third column reveals that respondents are significantly more likely to support increasing education spending by cutting unemployment insurance in the Liberal regime than in other countries. These findings support our expectations that unemployment insurance is the least popular in the Liberal regime, that pensions are the most popular in the Southern regime and that education is most popular in the Nordic regime. Unfortunately, no cross-national surveys exist with regards to health care policy trade-offs with other welfare state expenditures.

Figure 1. Trade-off questions by welfare regimes, INVEDUC survey, 8 countries, N about 2000, individual level controls included.
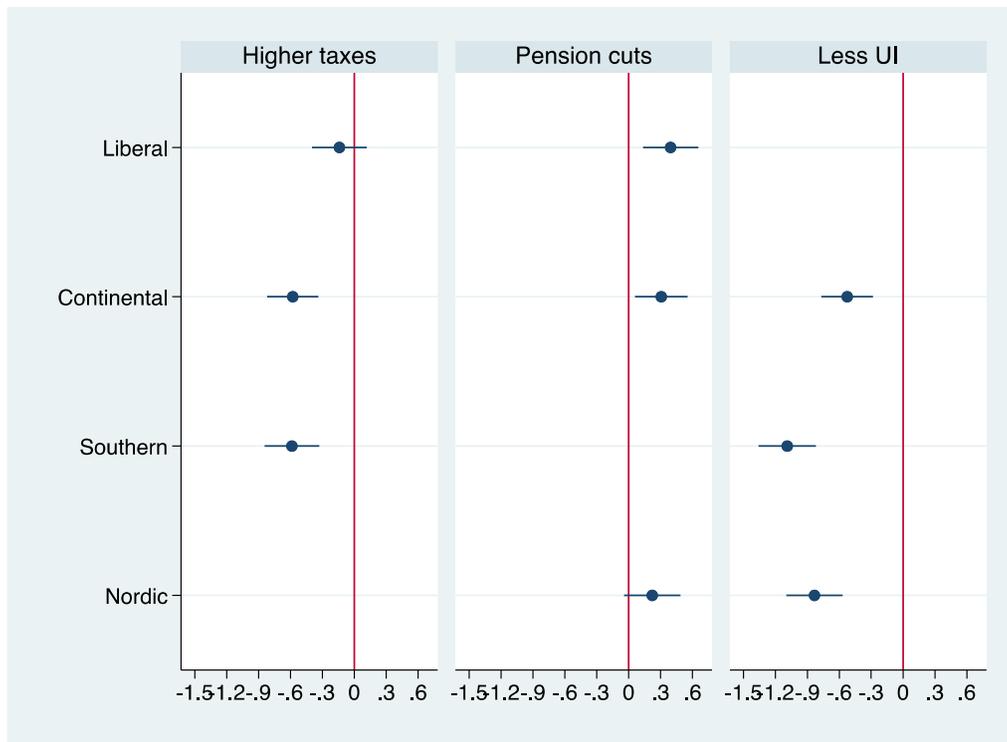
Data

We now present our main empirical analysis. As discussed above, we distinguish between four categories of expenditures. We measure them with the OECD Social Expenditures Dataset, except for education, which is calculated in the Comparative Political Dataset (Armingeon et al., 2019). As mentioned above, social investments include public expenditures in education, active labour market policies and child care (measured with family benefits in kind).[2] Pensions and health are a separate category in the OECD social expenditure dataset. Labour market insurance includes unemployment, disability benefits, unemployment insurance, family benefits in cash, survivors' benefits and "other social expenditures" (which includes social assistance). Hence, labour market insurance measures income protection for the working age population, which, along with pension, forms the traditional core social policies in classical welfare state studies. All these expenditures are expressed as a proportion of GDP. We sum these four categories to calculate total welfare spending and model the shares of spending as the

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[2] We follow Kuitto (2016) and exclude from social investments family benefits in cash or on parental leave schemes that are often included within social investment categorization. In our view, they represent an insurance against income losses due to having a child, which can be considered as a labor market risk.

relative proportion of each category on the total. We recognize that levels of expenditures expressed as a proportion of GDP may hide important policy changes and therefore present robustness tests using the pension and unemployment generosity index of the Comparative Welfare Entitlements dataset (Scruggs et al., 2017). These cannot, however, by modelled as shares of a total spending. To our knowledge, no index of health care or social investment generosity exists.

We measure both the shares and levels of private social expenditures, based on the OECD Social Expenditure Dataset for health and pensions and on the Comparative Political Dataset for education. Private markets remain marginal for the other types of social expenditures. Unfortunately, we cannot include tax breaks for social purposes in our measure of private social expenditures (Gingrich, 2021), since they are only available from 2000, which would utterly reduce the sample size.

To measure austerity, we use the narrative approach to fiscal consolidation. It consults policy documents such as reports from national fiscal authorities and budget speeches to identify the precise amount of spending cuts implemented to reduce budget deficits, relative to a baseline of no policy change (Alesina et al., 2019). We focus on spending-based consolidations expressed as a percentage of GDP since we are interested in how policies change when government implement cuts, not when it increases taxes. Data from Alesina et al. (2019) is available from 1980 to 2014 in 16 OECD countries. We add Netherlands based on Gupta et al. (Gupta et al., 2017). This measurement strategy is significantly more accurate to identify austerity than using an arbitrary threshold based on changes to the cyclically adjusted primary balance since it can be affect by exogenous factors that are unrelated to the decision to implement consolidations (Guajardo et al., 2014).

As discussed above, we code health care systems with a dummy variable distinguishing between NHS and SHI systems. We measure welfare regimes with dummy variables, which has the advantage of capturing regime-specific institutions that are difficult to measure otherwise. Worlds of welfare regimes result "from the interactive and cumulative number of interdependent causal factors (Pierson 2001, 428)", there are no master independent variables that can be used to measure each regime. We classify four worlds of welfare regimes similarly to what recent research has done (Manow et al., 2018; Beramendi et al., 2015): Australia, Canada, Ireland, the United Kingdom and the United States are classified as Liberal welfare regimes, while Denmark, Finland and Sweden compose the social democratic regime. Austria, Belgium, France, Germany and the Netherlands are the Continental regime, while Italy, Portugal and Spain are the Southern European regime. We believe that politics and policies

in Southern Europe are different enough from the Continental regime to be measured separately (Beramedi at al. 2015; Manow et al. 2018). We must exclude other advanced democracies for which we do not have measures of fiscal consolidation such as Greece, New-Zealand, Norway and Switzerland. Although we have the consolidation measure for Japan, we do not include it in the regime analysis because it is an hybrid between Continental or Liberal regimes, or could be included in an additional East Asian regime.

We include several control variables that could be potential confounders of both austerity and policy choices. We measure government partisanship with a right-left index based on the Comparative Manifesto Project (Seki and Williams, 2014), but use cabinet shares of the left and the right as robustness check presented in the appendix. We also include unemployment, the share of elderly population, GDP growth and an election dummy, which reflect economic and political conditions that should influence the decision to consolidate (Hübscher, 2016; Starke, 2007).

Modelling strategy

We innovate by modelling both levels of expenditures and their shares relative to the total of the four categories. The analysis of shares of spending is useful to model trade-offs between expenditure priorities and to measure the relative importance that policy makers give to each policy. In contrast, analyzing levels of spending allows us to verify if a policy resist to austerity in absolute terms, rather than to analyze if it changes relative to the others. Moreover, we use different modelling strategies to analyze levels and shares, allowing us to ensure the robustness of our results.

We use a compositional dependent variable analysis focusing on the relative change in the proportion of a category relative to the other pieces of the pie. The values of our dependent variables fit between zero and one and their total sum equals to one. Thus, we model an explicit trade-off between budget categories which is very close to the reality of decision makers allocating scarce resources (Philips et al., 2016; Breunig and Busemeyer, 2012; Jacques, 2021). We use seemingly unrelated regressions in all models to consider the negative correlation between individual components that happens naturally when dependent variables are a composition of the total.

We use the *dynsimpie* package in Stata developed by Jung et al. (2020) for compositional dependent variable analysis. *Dynsimpie* does a log transformation of the data to free them of the constraint of summing to zero, making them unbounded and independent, so that conventional linear

techniques can be used. Finally, it transforms the log variables back into their real values and present graphical representations of the models based on simulations of a counterfactual shock in the value of austerity. The simulations keep all the other independent variables at their sample mean (Phillips et al. 2016).

Unit root tests (IPS and LLC) reveal that the compositional dependent variables are stationary around a trend, while the welfare state regime dummy and the consolidation variable (which includes many 0) cannot have a unit root. Hence, we use a dead start model, which includes the laggedvalues of the covariates and a lagged dependent variable to model time dynamics. We also include an AR1 correction for serial correlation in the error term to estimate the following equation:

$$Y_{kit-0} = \sum(\beta_0 Y_{k,i,t-1} + \beta_1 X_{it-1} + \tau)(W) + \varepsilon_{kit} \qquad (1)$$

For each log ratios Y_{kit}, the models specify an equation regressing Y_{kit} on its lagged value, a vector of covariates X_{it-1}, and a linear time trend parametrized by τ to control for the rising trend in health and pension expenditures. W is a dummy variable coded one or zero for each of the four welfare state regimes, which is interacted with all the covariates. We also replicate the equation with a dummy for health care systems type rather than welfare regimes. Such a model can generate both short-run effects (the contemporary value of a covariate) and a long run multiplier, which is the cumulative effect of X on Y occurring through the influence of the lagged dependent variable. Long-term effects are calculated as $(\beta_1 X_{kit-1} / 1 - \beta_0 Y_{kit-1})$,, while short-run effects simply reflect the coefficient of each covariate. Because our interaction relies on regime dummies representing very few countries, we do not include country fixed effects into the models, although, as shown in the appendix, the results are robust to their inclusion, but the confidence intervals of the coefficients widen. The results are also robust to using the contemporaneous rather than the lagged value of the covariates.

Levels of spending tend to have a unit root. Unit root tests reveal that the share of elderly population[3], labour market insurance and pensions have a root. Pensions or labour market insurance are cointegrated with the share of elderly population according to Westerlund and Pedroni tests; the linear combination of non-stationary cointegrated series is stationary. Pension spending is also cointegrated with the share of private pension spending. Health care expenditures are stationary around a trend, but

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[3] In the models based on equation 1, the share of the elderly population is transformed into first differences to make it stationnary.

private and public health care expenditures are jointly cointegrated. Unit root tests reveal that all other variables are stationary. To analyze levels of spending, we use models based on equation 2.

$$Y_{t-0} = a_0 + \alpha_1 Y_{it-1} + \beta_1 austerity_{it-1} + \beta_2 indepvars_{it-1} + \beta_3 austerity_{it-1} * indepvars_{it-1} + \beta_4 controls_{it-1} + \psi_i + \tau_{it} + \varepsilon_{it} \quad (2)$$

These models allow us to analyze the interaction of the regime/health system dummies with austerity, but also of privatization with austerity. These variables are represented by *indepvars* in equation 2. Because shares of private social expenditures change very slowly overtime, it would not be realistic to simulate a large growth of private expenditures, conditional on a dummy variable measuring episodes of austerity. Hence, we refrain from using the *dynsimpie* models to analyze the conditional effects of the share of private expenditure. Moreover, *dynsimpie* can only proceed to interactions with dummy variables. ψ represent country fixed effects. It is worth noting that we modify the lag structure of both equation 1 and of equation 2 in the appendix to ensure that our results are not model dependent.

Results

Figure 2 presents the evolution of the four categories of expenditures and of the consolidation variable by welfare regimes overtime. In the Liberal regime, labour market insurance and, to a much lower extent, social investment, seem to decline with austerity, whereas we see a slow increase in health and pensions, which are much less costly than in other regimes. In the Nordic regime, social investment is considerably higher than in other regimes and has been increasing during the consolidations of the early 1990s. At the same time, labour market insurance has declined significantly, but has remained constant ever since, while pensions are now the costliest expenditures in this regime.

Figure 2 shows that in the Southern regime, the cost of pensions is constantly increasing, even during the severe consolidations following the 2008 financial crisis, whereas the three other categories follow similar trends. It's difficult to detect changes related to consolidations in the continental regime, but health care and pensions are growing overtime, while labour market insurance has been reduced in the 1990s. It is worth noting that while the Southern regime implements larger consolidation measures on average, the difference between the three other regimes is marginal.

Figure 2. Evolution of expenditures in health care (orange), pensions (grey), labour market insurance (yellow), social investment (light blue), and spending-based consolidations (dark blue), % of GDP, by welfare regimes, 16 OECE countries, 1980-2017
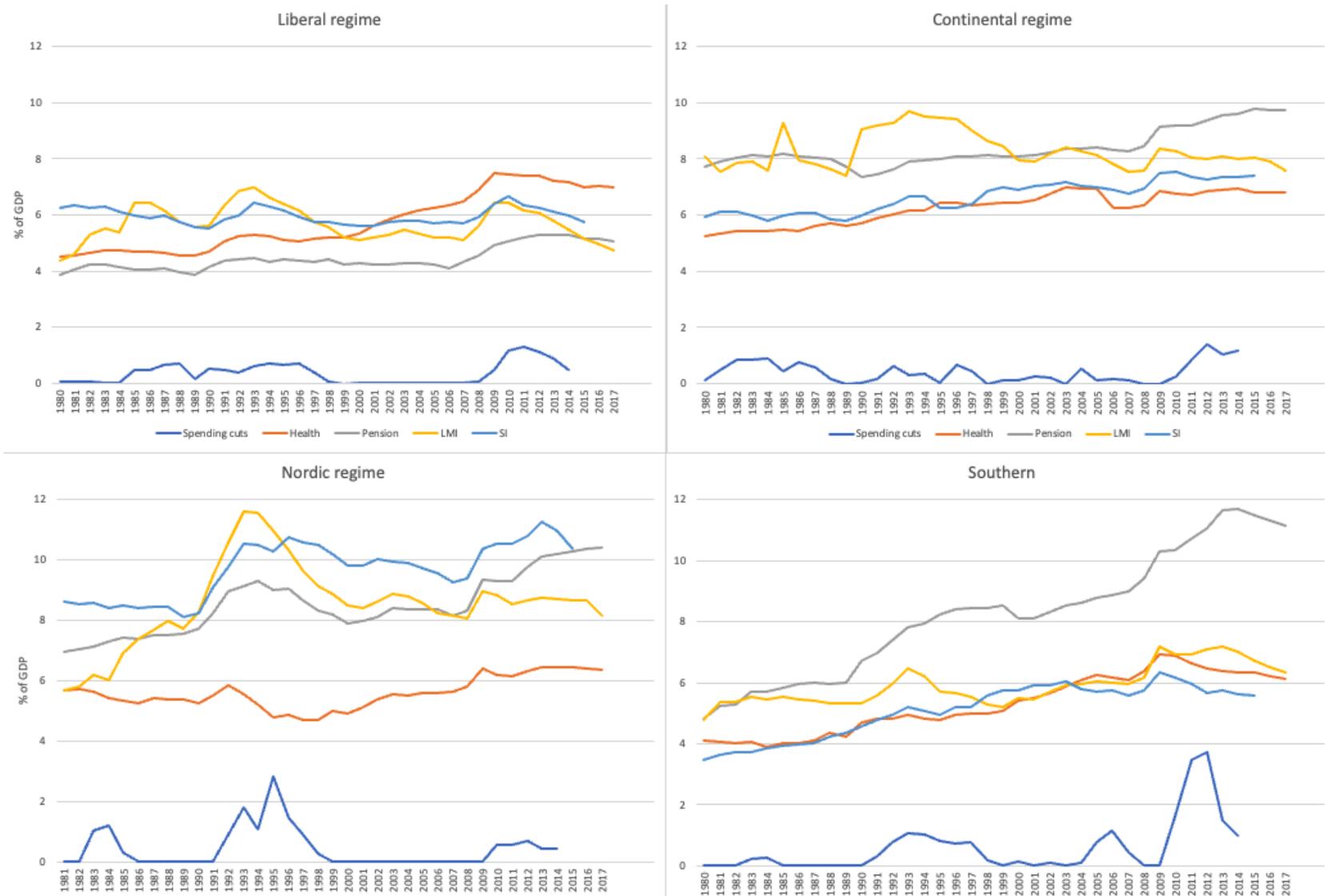
For the compositional dependent variable analysis, we focus on a graphical representation of the results of the shares of spending since the output tables are difficult to interpret. Figure 3 presents the results of an interaction between spending-based consolidation and the regime dummies. In the Liberal regime, labour market insurance is likely to be crowded out by austerity, whereas the proportion of pensions tends to increase during consolidations. The proportion of expenditures allocated to social investment are not affected by austerity. The results are robust to changing the reference category, the lag structure and to including fixed effects, although the impact of austerity on health is model dependent. In the Nordic regime, austerity is correlated with an increase of the proportion of expenditures allocated to social investment, whereas it decreases health expenditures. The null coefficient on labour market insurance becomes positive if we change the lag structure, but the results are robust to fixed effects and to different reference categories.

In the Continental regime, austerity is associated with an increase in the proportion of health and pension expenditures. The main absorber of this increase is social investment, which declines with austerity in all models, whereas changes to the lag structure of the inclusion of fixed effects reveals that the effect of austerity on labour market insurance is null. Finally, in the Southern regime, pensions crowd out health and social investment, a result robust to alternative specifications. Hence, the main difference between the Southern and the Continental welfare state is the resistance of health care in the Continental regime compared to its vulnerability in the Southern European regime, a result that mirrors the impact of health care system types, as discussed below. In brief, this analysis confirms our theoretical expectations. It is worth noting that simulating the effect of government partisanship on top of the regime/austerity interaction reveals that the left is much more likely to preserve labour market insurance than the right in all welfare regimes, a result that confirms previous studies (Lipsmeyer, 2011; Jacques, 2020).

Figure 3. Compositional dependent variables with seemingly unrelated regressions. Effect of austerity on shares of social expenditures, conditional on welfare regimes, 16 OECD countries 1980-2014.
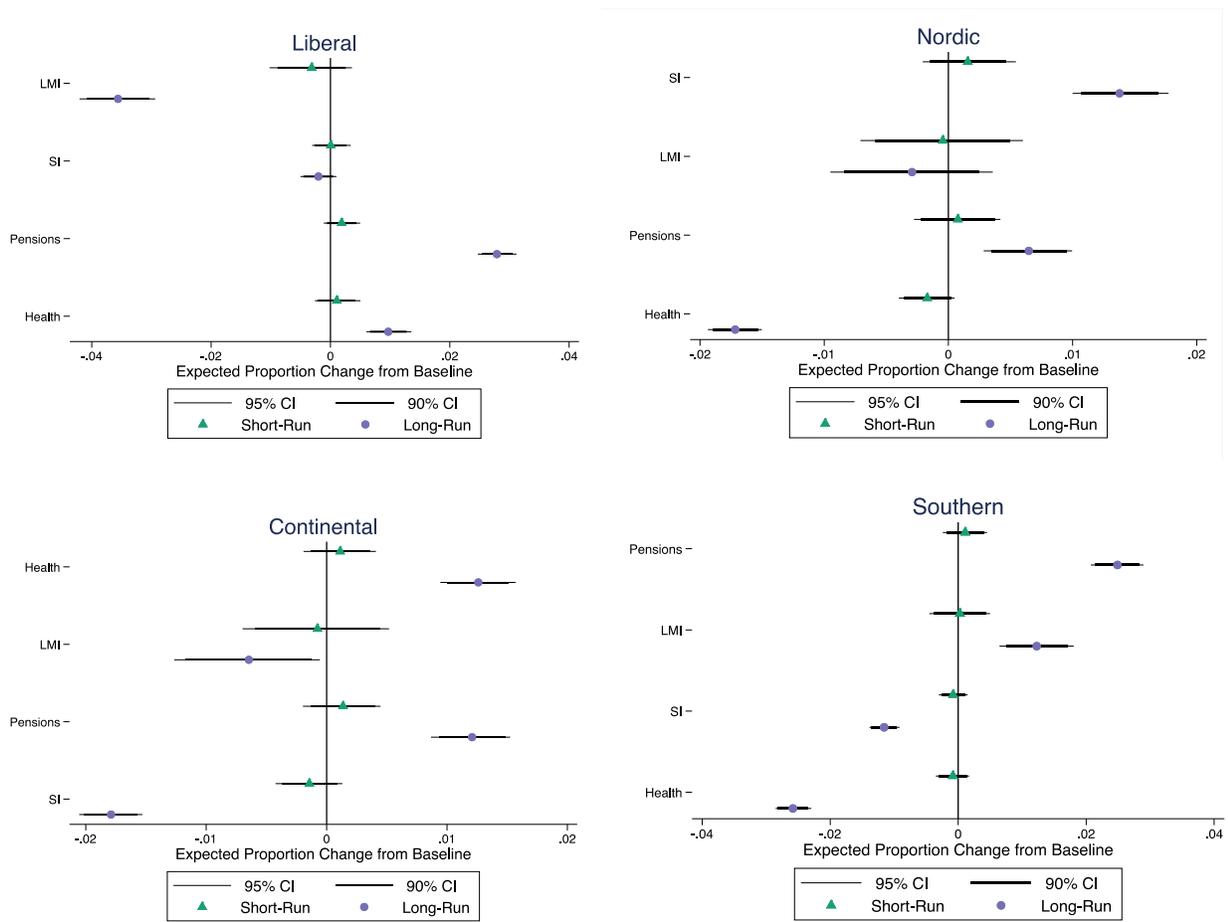
We confirm these results with an analysis based on levels of spending presented in table 1. Model 1 reveals that levels of health care expenditures are not cut back during consolidations in Continental welfare regimes, in contrast to Liberal, Southern and to a lesser extent Nordic regimes. Model 3 shows that labour market insurance is less likely to be cut in all other regimes relative to the Liberal regime. In fact, marginal effect plots presented in the appendix reveal that consolidations have negative effects on labour market insurance only in Liberal regimes, whereas the effect is indistinguishable from zero in the other regimes.

Table 1. Models predicting levels of spending (1 to 8) and generosity (9-10), 16 OECD countries, 1980-2014, country fixed effects .

	1	2	3	4	5	6
						UI
	Health	Pensions	Labour market insurance	Social investment	Pension gen.	generosity
Lagged dependent variable	0.924***	0.933***	0.850***	0.887***	0.909***	0.935***
	(0.0213)	(0.0290)	(0.0803)	(0.0279)	(0.0298)	(0.0352)
Consolidations t-1	0.0394	0.0877***	-0.117*	0.0461	-0.137**	0.0113
	(0.0263)	(0.0237)	(0.0558)	(0.0674)	(0.0561)	(0.0320)
Liberal * consolidation t-1	-0.0759**	-0.0903**		-0.102	0.161**	
	(0.0279)	(0.0313)		(0.0735)	(0.0615)	
Nordic * consolidation t-1	-0.0662*	-0.0926***	0.163*		0.168***	0.0208
	(0.0337)	(0.0263)	(0.0859)		(0.0444)	(0.0408)
Continental * consolidation t-1		-0.0483	0.146**	-0.0694	0.104	-0.0820
		(0.0277)	(0.0666)	(0.0765)	(0.0637)	(0.0987)
Southern * consolidation t-1	-0.0833**		0.172***	-0.0873		-0.0552
	(0.0288)		(0.0576)	(0.0697)		(0.0709)
Right-left index t-1	-0.00109	-0.00236**	-0.00334*	-0.00185	-0.00152	-0.00361*
	(0.00116)	(0.000873)	(0.00179)	(0.00114)	(0.00111)	(0.00201)
Δ elderly t-1	-0.0525	0.0653	0.0149	-0.0241	-0.0710	-0.0780
	(0.0790)	(0.0848)	(0.170)	(0.118)	(0.130)	(0.255)
GDP growth t-1	-0.0122*	-0.0416***	-0.0744***	-0.0305**	-0.0232***	0.0257
	(0.00676)	(0.00722)	(0.0197)	(0.0113)	(0.00733)	(0.0278)
Unemployment t-1	-0.0302***	-0.0191*	-0.0389	-0.0169*	-0.0152	-0.0150
	(0.00806)	(0.00947)	(0.0283)	(0.00842)	(0.0103)	(0.0127)
Election year dummy	-0.000950	-0.0253	-0.0383	0.0321	0.0230	0.0438
	(0.0179)	(0.0309)	(0.0706)	(0.0268)	(0.0334)	(0.0575)
Time trend	0.00529*	0.00393*	-0.00966**	0.00327	-0.000947	-0.00478
	(0.00270)	(0.00193)	(0.00443)	(0.00321)	(0.00292)	(0.00675)
Constant	0.679***	0.714***	1.790***	0.936***	1.345***	0.710*
	(0.125)	(0.148)	(0.355)	(0.136)	(0.386)	(0.389)
Observations	544	544	544	541	448	476
R-squared	0.928	0.943	0.764	0.863	0.844	0.934
Number of countries	16	16	16	16	16	16

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model 4 reveals a negative but statistically insignificant sign on the interaction between austerity and welfare state regimes to predict social invetsment. The marginal effect plot presented in the appendix reveal that social investment is reduced under austerity in Liberal regimes, but the coefficient is close to zero in other regimes relative to the Nordic regime. Hence, while the proportion of social invetsment tends to increase with austerity in the social democratic regime and stays the same or decrease in the other regimes, the absolute level of social investment is not influenced by austerity in three of the four welfare state regimes.

The effect of consolidations on pensions deserves particular attention. Model 2 reveal that levels of pension spending are more likely to be cut back during austerity in the Liberal and Nordic regime than in the Southern regime. However, model 5 reveals the opposite for the pension generosity index: pension generosity is more likely to decrease during austerity in the Southern regime than in the Liberal or Nordic regime. In contrast, model 6 reveals that the unemployment insurance generosity index are not influenced differently by austerity in any welfare state regimes. How can we explain these differences between the pension generosity index and pension expenditure? As shown in figure 2, pension expenditures constantly increase in the Southern regime and government try to reduce the future costs of pensions by limiting replacement rates and coverage during consolidations. For example, the pension reforms in Italy in 1992 and 1996-97 reduced projected pension spending from over 23% of GDP in 2035 to 14% (Pierson 2001), while pension expenditures still kept growing in the short term.

Two other results are worth noting. Firstly, all types of expenditures overlap with 0 during austerity in the Nordic and Continental regime, suggesting that these government concentrate cuts in other public expenditures that are not part of the welfare state. Secondly, the models of table 1 reveal that right-wing governments reduce all types of expenditures, except health expenditures and that they are also associated with a reduction of unemployment insurance generosity, but not of pension generosity.

The two plots of figure 4 show that the proportion of spending allocated to health care is likely to decrease during austerity in NHS systems, but not in SHI. The effects are robust to dividing SHI and NHS in two subtypes (Böhm et al. 2013), to changing the lag structure, the reference category and to including fixed effects. Simulating the effect of government partisanship during a period of austerity reveal that both the left and the right make similar decisions about health care (as shown in the appendix). The bottom plot of figure 4 shows the result of a regression similar to equation 2 using of levels of public health care spending as a dependent variable. Clearly, health care is likely to be cut during austerity in NHS systems, but not in SHI.

Figure 4. Impact of austerity on health care spending (shares and levels), conditional on health care systems type.
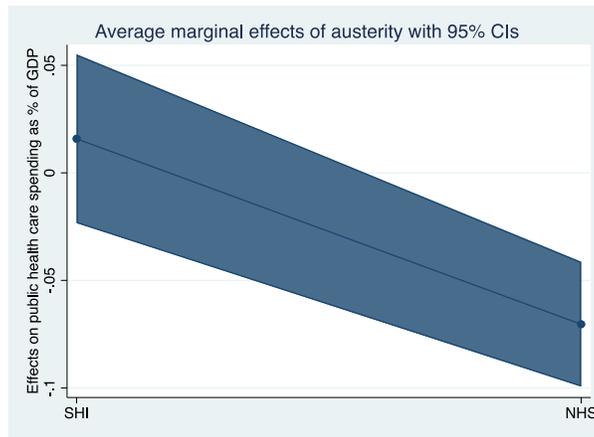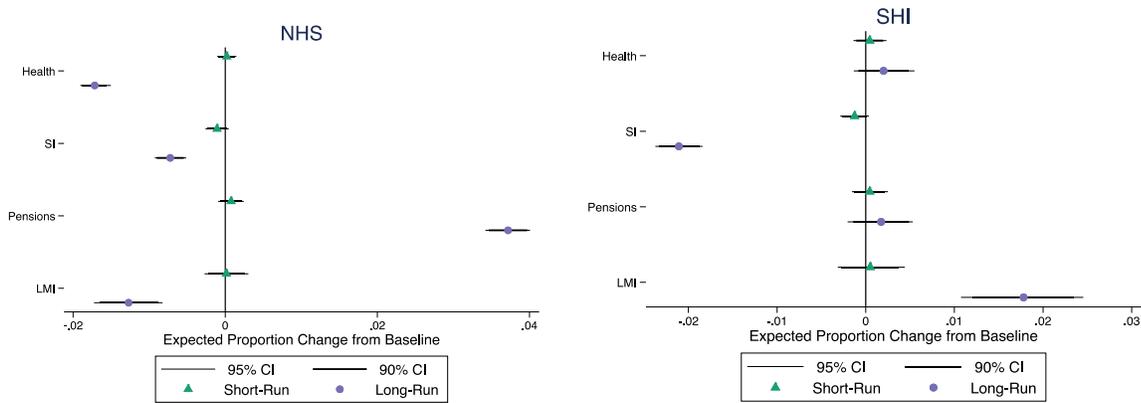
Finally, table 2 analyzes the effect of social policy privatization on the resistance of levels and shares of education, pension and health care expenditures. Model 1 reveals that public education expenditures are more likely to be cut during episodes of austerity when the share of private education spending is high. Figure 5 presents a marginal effect plot based on model 1 which reveals that the effect of austerity is significant and negative only when private education is higher than 30% of total education spending, which is the case for about 15% of observations. Model 3 in table 2 and its marginal effect plot presented in figure 5 show that public pension expenditures increase during austerity, except for the 30% of observations that have a higher share of private pensions. This reflects the fact that pensions increase overtime in most welfare regimes.

However, these results are model dependent. They are not robust to changing the lag structures, or, in the case of pensions, to using the generosity index. It is worth noting that interactions between privatization and austerity do not influence the shares of expenditures allocated to public education or to public pensions. These shares are measured as the proportion of each expenditure relative to the sum of social investment, pensions, health care and labour market insurance. Models 5 and 6 in table 2 reveals that public health care expenditures are unaffected by the share of private health spending, possibly for two reasons. There is few variations overtime and between countries in the private proportion of total health care expenditures, while private health care systems do not constrain the demand for public health care nor its cost (Colombo and Tapay, 2004).

Table 2. Interactions between private expenditures and austerity, 17 OECD countries, country fixed effects.

	(1) Education % GDP	(2) Education shares	(3) Pensions % of GDP	(4) Pensions share	(5) Health, % GDP	(6) Health shares
Lagged dependent variable	0.746***	0.834***	0.930***	0.887***	0.932***	0.868***
	(0.0606)	(0.0509)	(0.0314)	(0.0316)	(0.0213)	(0.0342)
Consolidations t-1	0.0347	-0.000391	0.0589***	0.00167**	0.00331	0.000787
	(0.0243)	(0.000631)	(0.0169)	(0.000631)	(0.0912)	(0.00342)
Other interaction component	-0.00547	-1.86e-05	-0.00238	5.33e-05	-0.00239	-0.000269***
	(0.00368)	(0.000147)	(0.00174)	(4.87e-05)	(0.00317)	(8.57e-05)
Private education share t-1 * consolidation t-1	-0.00339**	-1.96e-06				
	(0.00155)	(3.20e-05)				
Private pensions share t-1 * consolidation t-1			-0.00133**	-1.00e-05		
			(0.000551)	(2.01e-05)		
Private health share t-1 * consolidation t-1					-0.000392	-1.36e-05
					(0.00139)	(4.68e-05)
Right-left index t-1	0.00104	3.69e-05	-0.00190	-9.76e-06	-0.00132	-7.18e-06
	(0.000777)	(3.72e-05)	(0.00147)	(4.13e-05)	(0.00115)	(4.91e-05)
Δ elderly t-1	0.0741	0.000270	0.0395	0.00274	-0.0375	-0.000175
	(0.121)	(0.00239)	(0.0857)	(0.00273)	(0.0793)	(0.00224)
GDP growth t-1	-0.0523***	0.000444***	-0.0428***	-0.000571**	-0.0134**	0.000589***
	(0.00770)	(0.000151)	(0.00652)	(0.000202)	(0.00577)	(0.000160)
Unemployment t-1	0.00170	0.000197	-0.0238*	0.000386	-0.0316***	-0.000639*
	(0.00961)	(0.000138)	(0.0125)	(0.000237)	(0.00741)	(0.000363)
Election year dummy	0.0672**	0.00162	-0.0323	-0.000631	-0.00982	-0.000226
	(0.0272)	(0.00101)	(0.0317)	(0.00153)	(0.0166)	(0.000709)
Time trend	-0.00313	-0.000140	0.00561*	8.39e-05	0.00500	0.000231***
	(0.00324)	(0.000114)	(0.00264)	(7.05e-05)	(0.00292)	(5.46e-05)
Constant	1.583***	0.0329**	0.816***	0.0251**	0.828***	0.0494***
	(0.297)	(0.0141)	(0.170)	(0.00893)	(0.222)	(0.0125)
Observations	380	377	507	504	557	554
R-squared	0.763	0.831	0.943	0.842	0.933	0.864
Number of countries	17	17	16	16	17	17

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 5. Marginal effects plots based on model 1 (left) and model 3 (right) in table 2.
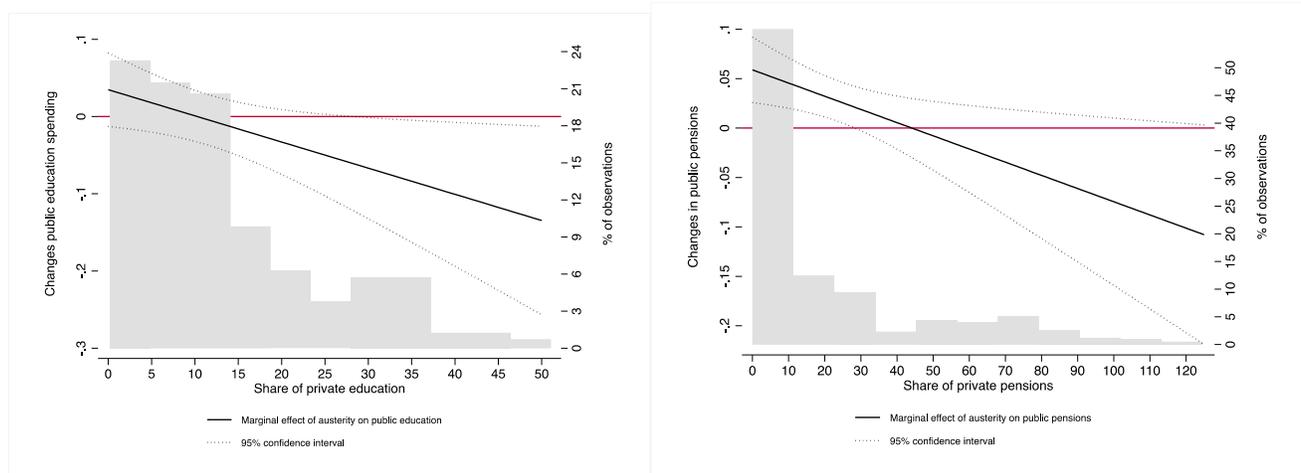
Discussion and conclusion

The main contribution of this paper is to model the effect of austerity on levels and relative shares of four theoretically defined categories of social expenditures, conditional on welfare state regimes, health care system types or privatization. We find some evidence that private pensions, but especially private education, increases the vulnerability of public systems during episodes of austerity. We find robust conditional effects of welfare state regimes and health systems type both on levels and shares of expenditures and that these patterns reflect the public's preferences.

Confirming the vulnerability of working age cash benefits in Liberal welfare regimes, which has been demonstrated by several other researchers (Kiess et al. 2017; Korpi and Palme 1998l Pierson 2001; Santos and Simões 2021; Swank 2001), we find that labour market insurance is less resilient to austerity in the Liberal regime, possibly because it is means tested. Social investment budget shares are most resilient to austerity in the Nordic regime, as it benefits from the support of influent constituencies and has been entrenched for a longer period. It seems that social investment levels are difficult to retrenched in all welfare regimes, except in the liberal regime where education is also more privatized. Pensions are particularly resilient to austerity in the Southern European regime, as they cater to the interest of core labour market insiders. However, Southern European governments have been reducing the generosity of public pensions during consolidation episodes. While pensions are quite resilient to austerity in the Continental regime as well, the main distinction of the Continental regime is the resistance of health care to austerity, because this regime overlaps with social health insurance systems. SHI's contributory funding and management by social partners limit governments' capacity to impose cost controls.

This study leaves several questions unanswered that should be addressed in future research. First, welfare regimes and austerity have potentially an endogenous relationship. Hubscher and Sattler (2022) have shown that countries relying on export-led growth models are significantly more likely to implement austerity measures than demand-led growth models, as dominant economic interest groups demand restrictive fiscal policies in the former. Similarly, governments may refrain from austerity measures precisely because universal policies are more popular than means-tested ones. Although figure 2 revealed that apart from the Southern regime, differences in the size of consolidation episodes between welfare state regimes is marginal, more remains to be done to tease out the sources of endogeneity between austerity and welfare regimes.

Second, our brief analysis of public opinion data highlights that no comparative surveys have analyzed trade-offs between health care and the rest of the welfare state. While the comparative political literature has been developing policy trade-off surveys, particularly to study the relationship between social investment and social consumption, very few of them have analyzed how citizens perceive policy trade-offs regarding the health care system. One of the objectives of this current study is to bring health care into comparative political economy of the welfare state, but surveys on the micro-foundations of the politics of health care are needed to further develop this research agenda.

Third, in this study, we could not directly test the causal mechanisms explaining why some social policies are more or less resilient in each welfare regimes. Future studies should tease out for example why social investments are more resilient to austerity in the Nordic welfare state regime. Fourth, we did not study the effect of austerity conditional on veto points, electoral systems, and corporatism, since we do not have clear expectations about how these three institutions should influence each of the four categories of expenditures we study. However, these are crucial variables in welfare state research and more theorizations should be done to identify how these institutions could mediate the effect of austerity on different social policy fields. Finally, future research should compare situations of fiscal expansions with moments of fiscal consolidations. It is possible that the politics of prioritization of programmatic expansions may be different than decisions about retrenchment.

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