



Pension saving responses to anticipated tax changes: Evidence from monthly pension contribution records



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HIGHLIGHTS

- Denmark passed a tax reform in May 2009 taking effect from the beginning of 2010.
- The reform lowered the tax rate on top bracket taxable income from 63% to 56%.
- This increased pensions savings before the change in taxation was enacted.
- Savings in tax deferred pension accounts as well as total pension savings increased.

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ABSTRACT

A Danish tax reform, passed in May 2009 and taking effect from the beginning of 2010, lowered the marginal tax rate on top bracket taxable income from 63% to 56%. Because contributions to pension accounts are tax deductible, the reform provided an incentive to increase pension contributions before the change in taxation. Using high frequency panel data, we document a temporary increase in pension contributions in the second half of 2009 in response to the anticipated change in taxation, and that this led to an increase in total savings in this period. The response is driven by less than 5% of those affected by the policy.

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1. Introduction

It is a long-standing topic of interest whether tax incentives effectively increase savings at the individual level, but due to a lack of high quality data on savings the economic literature has struggled to provide decisive answers (Bernheim, 2002). In a recent paper, Chetty et al. (2014) use high quality annual data on savings for the Danish population to show that a permanent change in the tax subsidy to pension contributions is ineffective at increasing savings in private pension accounts. A small minority of people shift their savings to other accounts when the tax incentives are changed, while the large majority do not respond at

all. A hitherto neglected temporary tax incentive for saving in tax deferred accounts arises in connection with the announcement of income tax reforms that change the value of future tax deductions by altering the marginal tax rate (MTR). We use a recent tax reform in Denmark as a natural experiment to identify the short run behavioral response to an anticipated change in taxes by exploiting a new data source with information of pensions contributions at the monthly frequency.

2. The 2010 Danish tax reform, data, and method

The Danish tax system consists of proportional taxes (a regional tax, a church tax, a labor market tax, and a bottom bracket income tax) and a progressive schedule on top of that. In 2009 the proportional taxes amounted to 43.5% and the progressive schedule consisted of a middle bracket tax rate of 6% and a top bracket tax rate of 15%. The middle and top tax brackets applied to income above DKK 377,000 (one USD corresponds to around

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DKK 6.5). A tax reform, passed by parliament on May 28, 2009 and taking effect from January 1, 2010, removed the middle bracket tax and increased the top-tax threshold to DKK 424,000. The tax reform lowered the MTR from almost 63% to 56% for people paying top taxes while leaving the marginal tax rate practically unchanged for others.¹ Because contributions to pension savings accounts are deductible the reform gave an incentive during the announcement period to advance pension contributions to 2009 while the tax rate was high.

The Danish pension system consists of three components that are typical of retirement savings systems in developed countries: a state-provided defined benefit (DB) plan (analogous to Social Security in the United States), employer organized defined contribution (DC) accounts (analogous to 401(k)s in the United States), and privately organized DC accounts (analogous to IRAs in the United States). 90% of all DC contributions are made to employer organized accounts. For further details, see [Chetty et al. \(2014\)](#). In Denmark, as in the US, there is increased reliance on DC schemes and this raises the interest in understanding the factors determining these contributions.

Our analysis is based on a new administrative register (called the *elIncome* register) with monthly information from employers about wages, salaries and contributions to employer organized pension accounts for all employees in Denmark. We have access to data covering the 48 months from January 2008 to December 2011. The *elIncome* register contains the identification number of the employee, which we use to link the data to annual records with additional information about financial wealth.

To identify the effect of the reform on pension contributions during 2009, we split the sample into taxpayers who experienced a reduction in their MTR and taxpayers who did not, where people are allocated to a tax bracket based on income in 2008. The treatment group (T-group) includes employees with monthly gross earnings above DKK 35,000 in 2008, roughly the 75th percentile of the income distribution. The control group (C-group) includes individuals with a monthly income in the range DKK 30,000–35,000.

Our sample consists of all individuals who are employed in the private sector, and where we have 48 consecutive observations from January 2008 to December 2011 with positive wage income. We further limit the sample to individuals with contributions to annuity pension schemes of less than DKK 100,000 in 2008.² The final sample consists of 116,724 individuals in the T-group and 64,287 individuals in the C-group.

3. Results

Fig. 1, panel A displays the average monthly contribution rate – measured in proportion to total monthly gross payments to the individual – to employer organized pension accounts. The contribution rate for the C-group is more or less constant at a level of 4.5% throughout the observation period. For the T-group the level is slightly higher. More importantly, there is a spike in the contribution rate towards the end of 2009. This is consistent with

the tax incentive to increase payments while the deduction rate is still at a high level.

The graph does not reveal whether the effect is driven by many individuals who change their contributions a little, or whether it is driven by a few individuals who change their contributions a lot. In order to identify individuals who made extraordinarily large pension contributions, we construct a dummy indicator that equals one for an individual if the pension contribution rate in December 2009 is 25 percentage points higher than its level in December 2008.³ Panel B of **Fig. 1** is similar to panel A with the exception that the treatment group is divided into a group consisting of individuals who made extraordinarily large contributions according to the dummy indicator (T-group2) and another group consisting of individuals who did not (T-group1). 4818 persons made extraordinary contributions according to this definition, and panel B shows that the entire increase in the average monthly rate of pension contribution from panel A is driven by the group who made extraordinary contributions.

Fig. 1 documents higher contributions to employer organized pension accounts, but it does not reveal whether this increase is offset by reduced savings in other accounts. We address this issue in **Table 1**, which is based on annual data from the income-tax register on savings in privately organized retirement savings accounts and in financial assets in each of the years 2006–2011. To quantify the effect of the increased contributions to employer organized accounts on savings in privately organized pension savings accounts, we estimate the following equation

$$P_{it}^{Priv} = \beta_0 + \beta_1 D_t + \beta_2 P_{it}^{Empl} + \mu_i + u_{it} \quad (1)$$

where P_{it}^{Priv} are contributions to privately organized pension savings accounts in year t measured as a fraction of total annual gross payments, D_t is a vector of year dummies, P_{it}^{Empl} are contributions to employer organized accounts measured as a fraction of total annual gross payments, μ_i is an individual specific effect, which is potentially correlated with the explanatory variables, and u_{it} is an error term. The parameter of interest β_2 measures the effect of increasing contributions to employer organized accounts on contributions to privately organized accounts. We instrument P_{it}^{Empl} using the interaction $D_{2009} \times D_i^{Treat}$ where the indicator D_i^{Treat} is one for individuals belonging to the treatment group. This isolates the changes in contributions to employer organized accounts that are related to the anticipated tax change.

Columns (1) and (2) in **Table 1** present the results from the estimation. Column (1) is based on the full sample. The results show that when contributions to employer organized accounts increase by one unit then contributions to privately organized accounts increase by 0.156 units. The positive coefficient means that contributions to employer accounts crowd in contributions to private accounts. Crowding in is expected since the tax incentive also applies to private accounts. In column (2) we limit the treatment group to include only the 4818 individuals who made extraordinary contributions to their employer organized accounts. The parameter estimate from this regression based on the T-group2 and the C-group is smaller, showing that the group contributing extraordinarily to employer organized accounts is only partially overlapping with the group that contributes extra to privately organized accounts.

Finally, we estimate the effect of the total increase in contributions to tax favored pension savings accounts, i.e. both employer organized and privately organized accounts, on savings

¹ Formally, there is a gross labor market contribution (*LMC*), a regional tax (*RT*), a bottom tax (*BT*), a middle tax (*MT*), a top tax (*TT*), and a church tax (*CT*). Before January 1, 2010 the marginal tax rate for a top taxpayer was $MTR = LMC + (1 - LMC) \times (RT + BT + MT + TT + CT) = 8 + (100 - 8) \times (32.8 + 5.04 + 6 + 15 + 0.7) \simeq 63\%$. After January 1, 2010 the marginal tax rate for a top taxpayer was $MTR = 8 + (100 - 8) \times (32.8 + 3.67 + 0 + 15 + 0.7) \simeq 56\%$. See [Kreiner et al. \(2016\)](#) for more details about the tax system and the 2010 reform.

² The latter selection is imposed because the tax deductibility for contributions to annuity schemes was capped at DKK 100,000 from 2010, and we want to avoid interference from this rule change when measuring the effect of the change in the marginal tax rate on contributions in 2009.

³ Results are very similar if we use other thresholds than 25 percentage points or use a dummy indicator that equals one if an individual has extraordinarily high contribution rates in any of the months after the reform was decided.

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