

# Online Appendix

Public Pension Reforms and Retirement Decisions: Narrative  
Evidence and Aggregate Implications

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## A ADDITIONAL FIGURES AND TABLES

Data	Description	Data Source
LFPR	Labor force participation, aggregate, by age: 20-49, 55-59, 60-64, 55-64, gender and age: Female/Male 55-59, 60-64, 55-64	OECD
Pension spending	Old age public spending as % of GDP	OECD
GDP	National accounts, expenditure approach, GDP	OECD
CPI	Consumer price index	OECD
Government spending	National account, expenditure approach, government expenditure	OECD
Tax revenues	Total tax revenues as percent of GDP	OECD
Elderly pop. share	People aged 65 and over as share of total pop.	OECD
Life expectancy	Life expectancy at birth, total (years)	World Bank
Fiscal consolidation	Fiscal consolidation variable	Guajardo et al. (2014)
Labor reform dummy	Emp. protection legislation reforms and unemployment benefit reforms for regular workers	Duval & Furceri (2018)

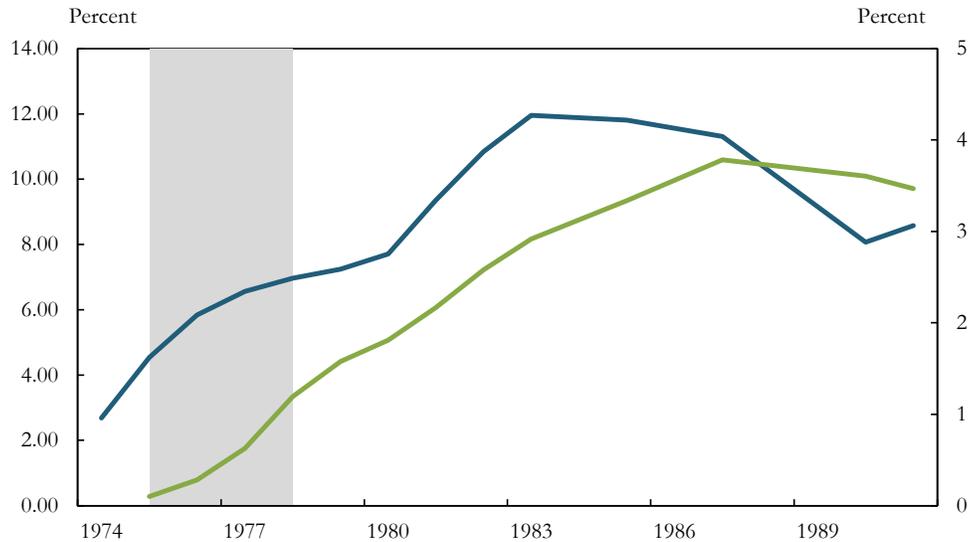
Table A.1: Our analysis is conducted for the sample period 1980-2018, as the old-age pension spending data starts in 1980. The LFPR data starts at later dates for some countries: in 1983 for Belgium and Denmark, 1984 in UK and 1986 in New Zealand. All other data covers this time period unless indicated in the text.

	Low-credibility group	High-credibility group
No lags	0.33	0.33
Age & contr. lags	0.44	0.46
Other lags	0.24	0.21
Short lags	0.54	0.44
Long lags	0.13	0.19
Age & contr. short lags	0.33	0.31
Age & contr. long lags	0.11	0.15

Table A.2: Public pension policy distributions across low- vs. high-credibility country groups. It shows the percentage of each type of public pension policy reform in the two sets of countries. For instance, the shares for reforms with no lags, age and contribution based reforms with lags, and other reforms with lags round to 1. High-credibility countries: Australia, Belgium, Denmark, Finland and New Zealand; low-credibility countries: France, Italy, Japan, Spain and UK.

Figure A.1: Belgium: early retirement programs had a significant impact on the labor market and pension spending.

(a) Early retirement programs were introduced in response to rising unemployment rate in the late 1970s. The gray bar highlights the introduction of three early retirement programs in 1975, 1976 and 1978. The blue line shows the unemployment rate, and the green line shows the population in early retirement as a share of the total labor force.



(b) Early retirement programs have been scaled back since the late 1980s, and the spending on early retirement as a share of GDP has been trending down at a very gradual pace. The dashed lines show that retrenchment measures were taken in 1987 (A), 1997 (C), 2006 (D), 2012 (E), and 2015 (F), while an expansionary measure was taken in 1994 (B).



Figure A.2: Denmark: the early transitional retirement scheme and the LFPR for elderly population. The early program was introduced in 1992 and expanded in 1994, with entrance to the scheme shutting off in 1996. The blue line shows the LFPR for population between age 50 and 59 years, and the green line shows the early retirement spending as share of GDP.

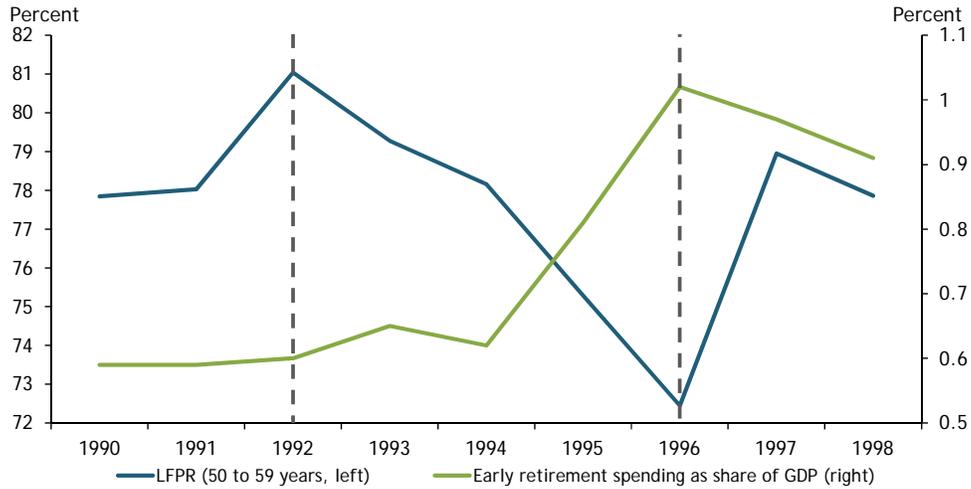


Figure A.3: France: the early retirement program and the LFPR for elderly population. Incentives to encourage early retirement were provided in 1981. The blue line shows the LFPR for population between age 55 and 59 years, and the green line shows the early retirement spending as share of GDP.

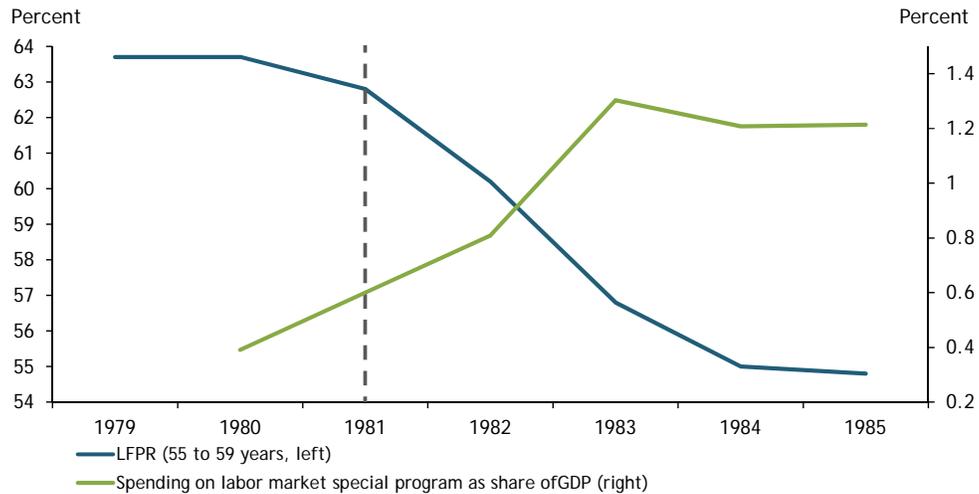


Figure A.4: Implementation lags associated with major structural pension changes (measured in years). Each dot represents the implementation lag associated with one policy change. Green dots are associated with pension retrenchments, while blue dots are for pension expansions.

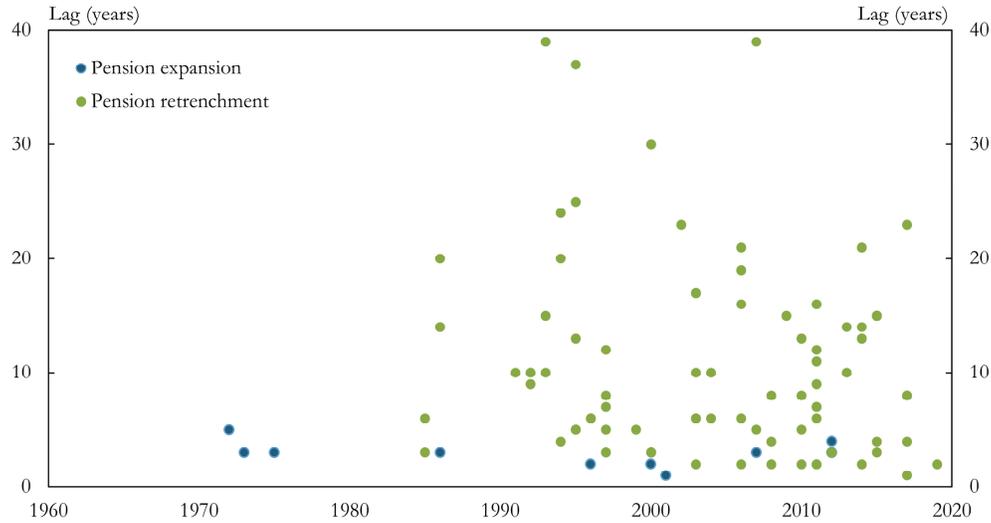


Figure A.5: Distribution of all major structural reforms: lag (blue bars) and no lag (orange bars), enacted across good (solid bars) and bad times (patterned bars). High/low GDP growth and unemployment are periods where GDP growth and unemployment rate are above/below the country-specific sample average.

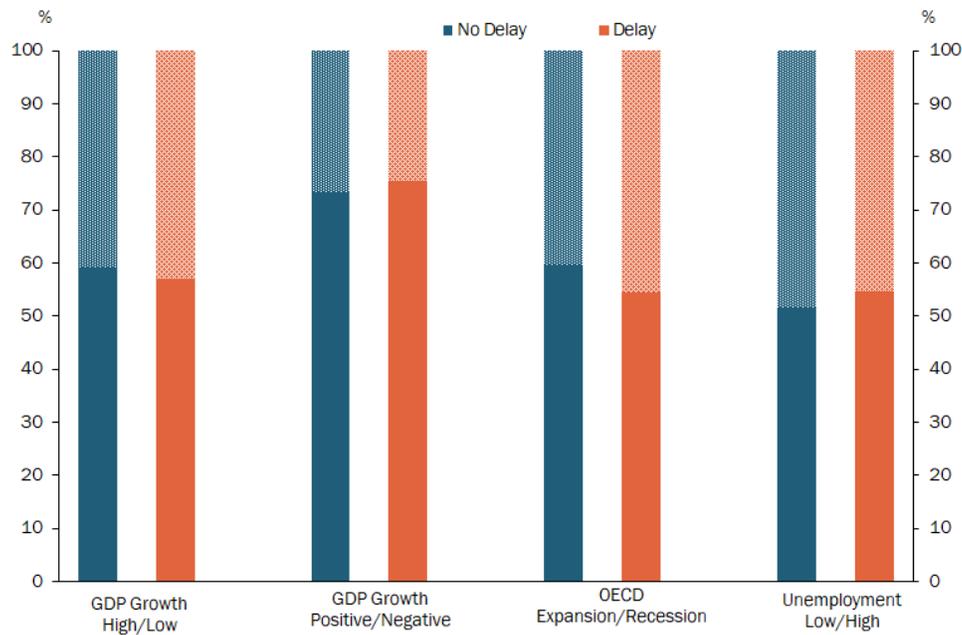
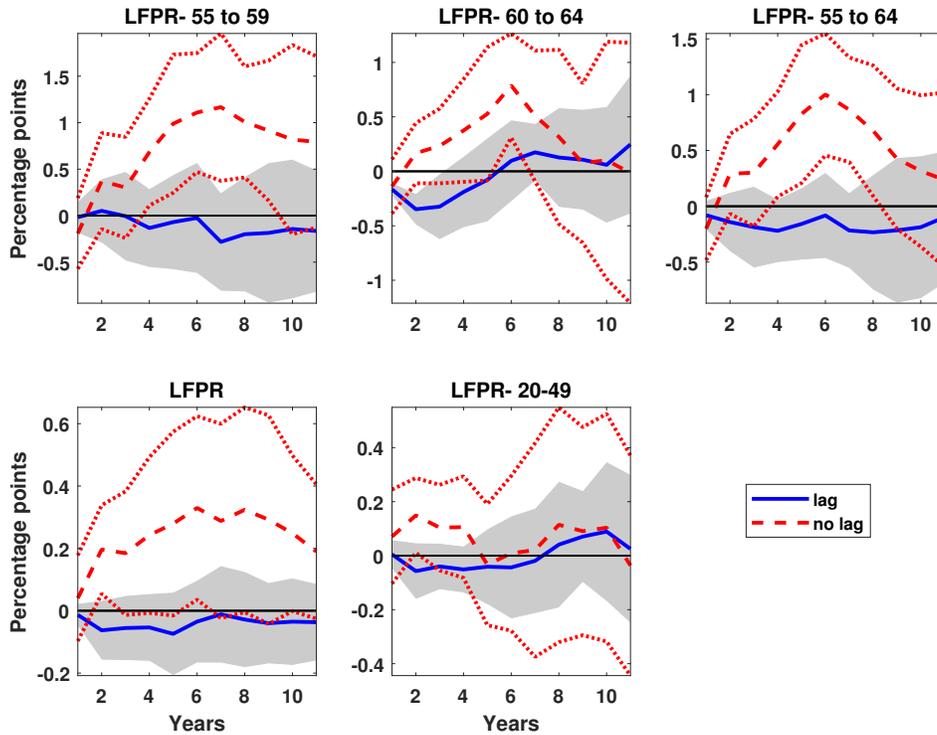
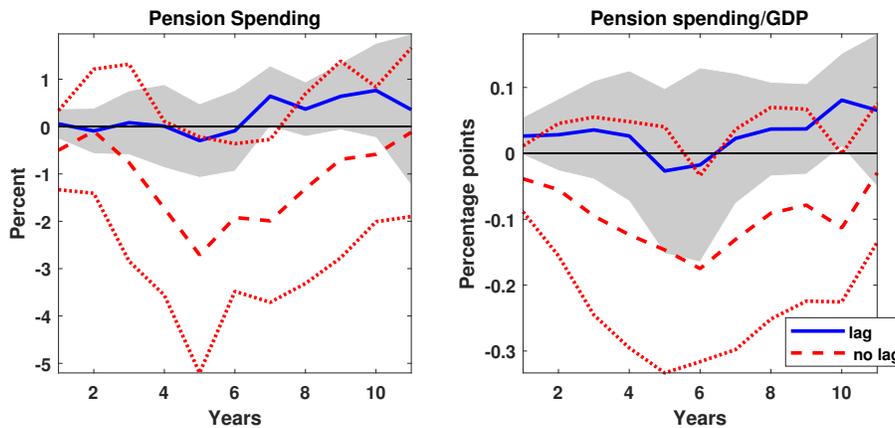


Figure A.6: Responses of labor market and pension spending to structural pension retrenchments for data between 1980 and 2017. The blue solid lines show the responses to reforms implemented with lags and red dashed lines correspond to reforms implemented without lags. The corresponding bands show 90% confidence bands.

(a) Labor force participation rates



(b) Old-age pension spending



## B EXAMPLES OF PENSION POLICY CHANGES

In this section, we use three examples associated with pension policy changes in Belgium to explain how we extract information from the OECD Economic Surveys, and how we classify policy changes along the four aspects as laid out in Section ??.

**B.1 PENSION CHANGE IN 1968** According to the Survey of Belgium in 1970, the government formulated monetary and fiscal policy “with a closer view to the needs of short-term demand management” in the last couple of years. As shown in Figure B.1, while capital outflow required a shift to restrictive monetary policy in 1968, fiscal policy were eased to cope “with the slack in fixed investment.” Government adopted a wide range of measures, including increased pension payments, to support economic activity. We consider that the government expanded pension benefits through higher payments, and classify the change as motivated by cyclical concerns and implemented without lags.

**B.2 PENSION CHANGE IN 1994** The Survey of Belgium in 1995 provides a calendar of main economic events for the year 1994, as illustrated in Figure B.2. In December 1994, a major change in early retirement age was passed against the backdrop of historically high unemployment rate, 12.9 percent as the end-June official figure. The Survey further elaborated: “The interprofessional agreement (accord interprofessionnel) for 1995-96 concluded by the social partners late last year gave priority to the defence and promotion of employment.” The new agreement includes a range of policy changes, including a larger reduction in social contributions for firms that created more jobs, a new ‘hiring plan’ targeting the long-term unemployed, and lowering the age limit for early retirement for two years. We classify the change as motivated by cyclical concerns and implemented without lags. It was an expansionary policy change through lowering retirement age.

**B.3 PENSION CHANGE IN 2015** The Survey of Belgium in 2017 provides an in-depth discussion on the pension reform of 2015, which was viewed as “an important step towards long-term fiscal sustainability.” As shown in Figure B.3, the reform took a wide range of measures, including

1. The statutory retirement age would be increased from 65 to 66 years in 2025 and to 67 years in 2030. This measure changes retirement age with a phase-in period of 10 to 15 years.
2. Early retirement conditions was made more stringent. The minimum age and number of career years required to qualify for early retirement would progressively increase: starting from 62 years and 40 years respectively in 2016, they would increase to 62.5 and 41 years in 2017, then to 63 and 41 years in 2018 and finally to 63 and 42 years in 2019. We classify it into two changes, that associated with retirement age, and that related to contribution years. Both changes would be fully implemented within 4 years.
3. The terms for pre-pension benefits was also made more stringent. The minimum age was increased from 60 years to 62 years in 2015, subject to transitional arrangements. This measure changes retirement age with implementation lags.

Figure B.1: The Surveys provided general discussion on fiscal policy prior to 1973. Example: the Survey report for Belgium (1970).

### III ECONOMIC POLICIES IN BELGIUM

Economic policies seem to have had some stabilizing effect on demand during the phase of recovery of economic expansion in 1968, and perhaps during last year's boom. In the former year, there had been a certain conflict between internal and external aims, with the expansionary policies adopted to support domestic demand contributing to the heavy, largely speculative, capital outflows. The conflict was removed last year, when internal as well as external considerations called for a shift to more restrictive policies. It is not possible to know precisely the role played by policy action, as distinct from autonomous factors, in strengthening demand during 1968 and containing last year's boom, and the stabilizing effect of individual policies is difficult to judge. The policy mix relied on monetary and budgetary instruments in both periods, but with the adjustments in response to the changing circumstances affected more promptly in the monetary field than in that of the budget.

The expansionary policy phase had started with an active easing of monetary conditions from early in 1967 on. Early in 1968, then this had not yet succeeded in coping with the slack in fixed investment, and external influences made it technically difficult to pursue a policy of active monetary easing, expansionary fiscal action was taken. For this, the authorities relied on measures, such as public works, aid for dwellings and increased pension payments, which could be expected to involve a relatively small import leakage and quite strong employment and income effects. Combined with the continued easy posture of monetary policy, this was followed later in the year by the beginning of a revival of fixed investment. It is true, of course, that the revival was importantly influenced by autonomous factors as well, in particular, the continued buoyancy of exports, rising capacity utilization in industry and a marked improvement of business profit.

4. In addition, the possibility to use a complementary pension to retire earlier and to bridge the income gap until being eligible to a full pension was abolished, subject to transitional arrangements. As the measure phased out a complementary pension plan, we classify it as a change on pension coverage that come with some implementation lags.

We also categorize all the measures in 2015 as structural changes, as they were motivated by long-run concerns. As explained in Section ??, we give intensity score to our pension dummy to capture the scope of reforms. The 2015 reform in Belgium has an intensity of “-5”. The high intensity is qualitatively consistent with the assessment from the Survey, as it says that “(T)he Working Group on Ageing Populations and Sustainability projects pension spending to increase from 11.8% of GDP in 2013 to 13.1% of GDP in 2060, compared to an increase to 15.1% of GDP in 2060 in a no-reform scenario (EC, 2016b).” [OECD Economic Survey

Figure B.2: The Surveys provided chronologies of major economic policy events between 1973 and 2002. Example: the Survey report for Belgium (1995)

<i>Annex</i>	
<b>Calendar of main economic events</b>	
<b>BELGIUM</b>	
<b>1994</b>	
<b>January</b>	<p>The standard VAT rate is increased from 19.5 per cent to 20.5 per cent.</p> <p>The National Bank of Belgium cuts its central rate in three stages to 6.85 per cent.</p> <p>Financial intermediaries approved by one EU country are allowed to become members of the Belgian Futures and Options Exchange.</p>
<b>February</b>	<p>The National Bank of Belgium cuts its central rate in three stages to 6.4 per cent.</p>
<b>March</b>	<p>The social partners in the Central Economic Council fail to reach unanimous conclusions about Belgium's competitiveness. The trade unions conclude that the statistical information is insufficient to assess the competitive position, while employers' organisations argue that competitiveness has only been stabilised by the measures in the global plan and ask for further measures.</p> <p>The National Bank of Belgium cuts its central rate three times to 6.05 per cent.</p>
<b>April</b>	<p>Employers' contributions on low salaries have been reduced, resulting in a 10 per cent reduction in labour costs for low-skilled workers.</p> <p>The National Bank of Belgium cuts its central rate in four stages to 5.6 per cent.</p>
<b>May</b>	<p>The National Bank of Belgium cuts its central rate in four stages to 5.25 per cent.</p>
<b>June</b>	<p>The Finance Minister announces the introduction of a new clearing system enabling private retail investors to hold, in a special account, government Treasury bills and linear bonds (OLOs) a facility previously available only to banks and institutional investors.</p> <p>The National Bank of Belgium cuts its central rate in five stages to 4.95 per cent.</p>
<b>July</b>	<p>The Government presents the 1995 Budget. Federal government spending is projected to decline by 1.6 per cent in real terms. The Budget aims to reduce the general government deficit to 4.3 per cent of GDP, in accordance with the Convergence Plan.</p> <p>The federal government reaches agreement with the governments of communities and regions on the targets in the convergence plan.</p> <p>The National Bank of Belgium cuts its central rate twice to 4.85 per cent.</p>
<b>September</b>	<p>The Government suggests an additional budgetary norm, requiring the primary surplus to remain above 6 per cent of GDP in the period beyond 1996.</p>
<b>December</b>	<p>An interprofessional agreement (<i>accord interprofessionnel</i>) is concluded for the period 1995-96. Social charges are reduced for enterprises which create additional jobs by reducing working hours and for the recruitment of long-term unemployed or receivers of minimum benefit. The age limit for early retirement is lowered to 55, subject to special conditions, for two years.</p>

of Belgium (2017, pg 36)]

Figure B.3: The Surveys have been providing in-depth discussions on economic challenges and policy recommendations since 2003. Example: the Survey for Belgium (2017)

### Box 3. Main elements of the 2015 pension reform

A number of measures were taken in 2015 to increase the effective average age of retirement from the labour market, thereby improving the sustainability of the pension system.

The statutory *retirement age* will be increased from 65 to 66 years in 2025 and to 67 years in 2030.

Early retirement conditions will be made more stringent.

- The minimum age and number of career years required to qualify for early retirement will progressively increase: starting from 62 years and 40 years respectively in 2016, they will increase to 62.5 and 41 years in 2017, then to 63 and 41 years in 2018 and finally to 63 and 42 years in 2019.
- Exceptions for long careers will also be tightened. The required career length to retire at 60 (61) will increase from 42 (41) years in 2016 to 43 (42) years in 2017 and 44 (43) years in 2019.
- In the civil servants scheme, the years of studies taken into account in the aforementioned career condition for early retirement will be progressively phased out as from 2016 (by steps of 4 to 6 months/year).

The terms for *pre-pension benefits* (unemployment benefits with employer top-up) have been made more stringent:

- The minimum age has been increased from 60 years to 62 years in 2015, subject to transitional arrangements.
- The age limit for pre-pension benefits for loss-making and restructuring companies is to increase from 55 years in 2015 to arrive at 60 years in 2020.
- The minimum age for pre-pension benefits after very long careers (40 years) has been increased from 56 years to 58 years in 2015.
- The minimum age for pre-pension benefits in case of night and shift work or incapacity to work in the building sector has been increased from 56 years to 58 years in 2015 and will be raised to 60 years on a date to be set by the National Labour Council.
- The minimum age for pre-pension benefits in case of arduous jobs will be raised to 60 years on a date to be set by the National Labour Council.

## C PROJECTED BUDGETARY IMPACT OF PENSION REFORMS: ITALY CASE STUDY

We rely on Alesina, Barbiero, Favero, Giavazzi, and Paradisi (2017) and their corresponding data appendix to construct the projected budgetary impact of major pension reforms in Italy since 1990s. Their study presents the budgetary impact in the year when the legislation was passed and also for up to 5 years out, i.e.  $\sum_{j=0}^5 \text{budgetary impact}_{t+j}$  for the reform that was passed at period  $t$ . The authors rely on contemporaneous sources including OECD Surveys and country-specific reports.<sup>1</sup> We include reductions in spending and transfers as a result of pension reforms in the relevant years from their database. As a first pass, we do not include savings from increased contributions. The top panel of Figure C.1 compares our major structural reform dummies (blue bars) to their 5-year projected budgetary impact of pension reforms for the corresponding years (orange bars). If we also include savings from increased contributions, the budgetary impact in some years, notably 1995, are increased, see the bottom panel of Figure C.1.

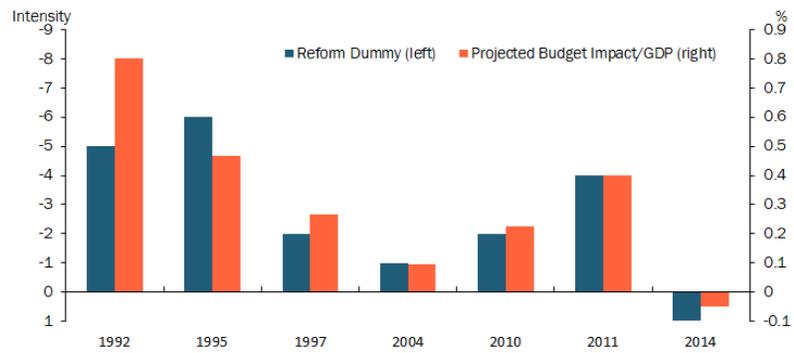
Overall, our reform dummies with intensity line up reasonably well relative to the short-run projected budgetary impact. However, this projected budgetary impact does not account for the projected long-run savings. It is particularly relevant for reforms with very long phase-in periods. For example, the OECD Economic Survey 1997 estimated that the largest expenditure savings associated with the 1995 Dini reform wouldn't materialize until 2025, as shown in Figure C.2. This also illustrates the difficulty in summarizing the projected budgetary impact of pension reforms, because of added uncertainty with such long-run horizons.

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<sup>1</sup>They are given in terms of local currency in their Appendix and we convert them in terms of percent of GDP.

Figure C.1: Major structural reform (on the left axis) and the five-year projected budgetary impact as a percentage of GDP from Alesina, Barbiero, Favero, Giavazzi, and Paradisi (2017) (on the right axis) under alternative computations.

(a) Projected 5-year budgetary impact/GDP with expenditure savings.



(b) Projected 5-year budgetary impact/GDP with expenditure and contribution-based savings.

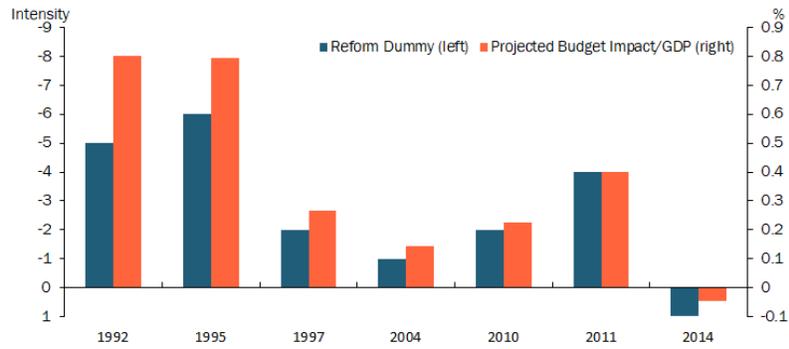
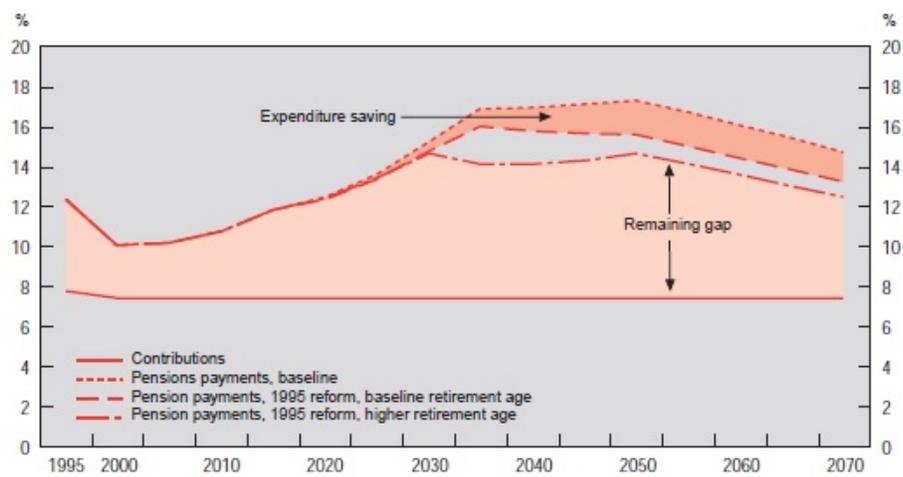


Figure C.2: Projected budgetary impact as a percentage of GDP of the 1995 pension reform in Italy in OECD Economic Survey 1997, pg 84.

Figure 28. TRENDS IN PENSION PAYMENTS AND CONTRIBUTIONS  
Per cent of GDP



Source: OECD.

## REFERENCES

ALESINA, A., O. BARBIERO, C. FAVERO, F. GIAVAZZI, AND M. PARADISI (2017): “The Effects of Fiscal Consolidations: Theory and Evidence,” Working Papers 23385, National Bureau of Economic Research.