Online Annex 2.1. Methodology for Energy Subsidy Reform Measures (ESREM) and the Global Pension Reform Database (GPRD)[1]

This section focuses on the methodology to create the database on Energy Subsidy Reform Measures (ESREM) as well as the Global Pension Reform Database (GPRD) through advanced deep learning techniques and staff expertise.

Energy Subsidy Reform Measures Database (ESREM)

Sources and Extraction

Measures are defined as discretionary policy actions, including changes to fuel prices, utility tariffs, and State-Owned Enterprise (SOE) reforms.[2] Data on energy subsidy measures were collected from IMF staff reports covering 196 economies over 1995-2024. Using Natural Language Processing (NLP), the reports were filtered with keywords to retain only the 2,930 reports discussing energy subsidy reform, extracting relevant passages. Prompts were applied to these excepts to capture information on the type of measure, design features, size of existing subsidies and the savings/costs of measures.[3] Each step was validated by staff expertise.[4] IMF economists then filled a unified template of the data based on the validated extracts. Additionally, data from retail fuel prices (Kpodar and Abdalla 2017; Global Petrol Prices database) helped identify further measures based on domestic fuel price fluctuations in countries with administratively set prices. The ESREM data includes countries with at least one IMF staff report over the period or, for administrative cases, those also with at least one month of diesel prices in the Retail Fuel Price Database.[5] In the dataset, fuel price measures correspond to price changes in countries with administratively set prices, as well as changes in passthrough for countries with flexible prices. Thus, any substantial changes which typically precede the adoption of automatic price mechanism or fuel price liberalization are captured in the data.

Announcements, implementation, and reversal dates of energy subsidy measures are identified as follows:

- *Announcement* dates are identified using announcement dates frequently mentioned in news articles and spikes in the number of news articles related to energy subsidy reforms. Article spikes are determined as at least 2 standard deviations above the country average number of articles.
- *Implementation* dates are supplemented using fuel price data from Kpodar and Abdallah (2017), Global petrol prices, and Bloomberg.
- Countries with administrated fuel prices. Missing months of implementation are assumed to be the first month of the implementation year when a diesel price change occurred. Additional implementation

[1] Prepared by Diala Al Masri, Hussein Bidawi, Emine Hanedar, Yudong Rao, Christoph Freudenberg, and Alexandre Balduino Sollaci.

[2] State owned enterprises (SOEs) measures are structural reforms affecting SOEs in the energy or fuel sectors such as privatization and restructuring and others that would improve their financial viability, efficiency, reduce technical losses or promote competition in those sectors.

[3] Example of the prompts include full title of document, document date, and reform steps on price/tariff changes – implemented.

[4] For example, the AI responses to the prompts were carefully validated by economists on random subset of reports, and the extracts were analyzed and validated by staff economists to create the final reform database.

[5] Countries covered are those that have either a published staff report in that year (which is filtered further to review, program, Article IV, MEFP, memorandum, arrangement.) or have price availability. Staff reports could sometimes indicate measures in previous years, in which case, if a measure is reported in a year where a staff report isn't available, the country is considered covered in that year. For example, descriptive statistics take that into account to avoid misrepresenting missing measures, due to lack of coverage, as non-existent measures.

dates are included when diesel retail prices change (by at least 1 percent), after remaining constant for at least 6 months.

- Countries with flexible fuel prices. Missing implementation months are imputed using dates where there is (1) a change in passthrough of diesel prices (relative to international prices) that exceeds 2 standard deviations above or below the country mean, and (2) an increase in the number of articles mentioning fuel prices that exceeds 2 standard deviations above the country mean (concurrently with the change in passthrough, or in any of the 3 preceding months). The passthrough of international oil prices to the diesel retail prices, where passthrough is defined:

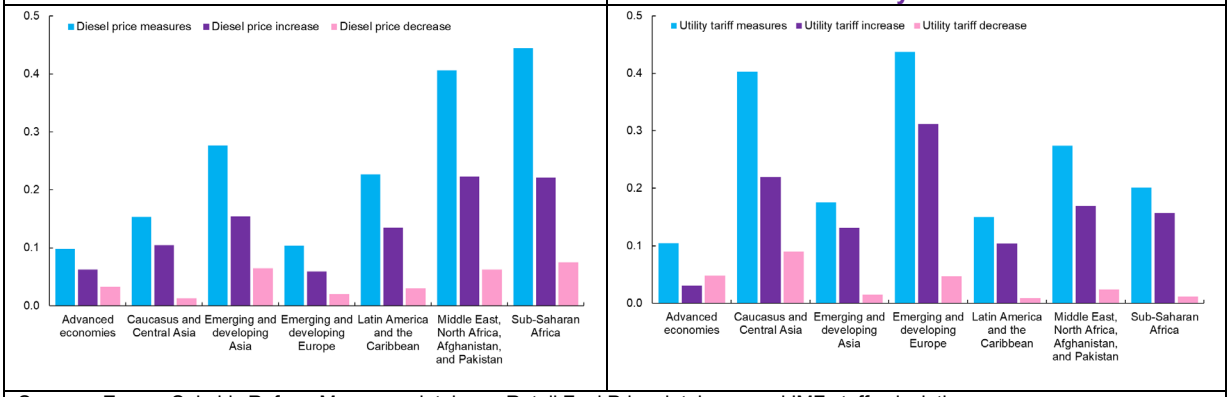
$$PT_{i,t} = \frac{P_{i,t}^{domestic} - P_{i,t-1}^{domestic}}{P_{i,t-1}^{internatinal} - P_{i,t-2}^{international}} \qquad \text{(A2.1.1)}$$

- *Reversals,* in countries with administrated prices, are all declines in diesel retail prices in the 12 months. following the implementation of a reform measure.

Descriptive Statistics

Online Annex Figure 2.1.1 shows the average number of fuel price and utility tariff measures per region (sum of measures across countries in a region divided by the number of countries) in the ESREM. Sub-Saharan Africa and the Middle East have the highest fuel price measures per country and advanced economies the lowest; emerging and developing Europe leads in utility tariffs measures and advanced economies and Latin America are in the bottom.

Online Annex Figure 2.1.1. Average Number of Measures by Region



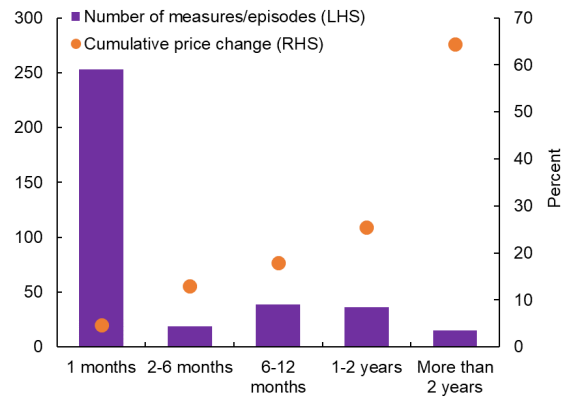
Sources: Energy Subsidy Reform Measures database; Retail Fuel Price database; and IMF staff calculations.
Note: The average number of measures per region group is the sum of number of measures per region and divided by the number of countries covered, for the period 2000 to 2023. Diesel measures are those implemented, and utility measures included implemented or planned. The sum of price increases and decreases may not necessarily add to the total as there are measures without price data.

Diesel price measures can be classified by duration and intensity. Online Annex Figure 2.1.2 shows that most measures are taken in isolation (not followed by another measure within 12 months) and typically result in a price increase of about 5 percent. Measure episodes (series of measures taken within 12 months of each other) occur less frequently but lead to a higher cumulative price change. The ESREM also identifies measure reversals, defined as instances where fuel prices decrease following previous increases.

Single measures are almost twice as likely to be reversed compared to episodes. On average, reversals happen within 8 months of the last price increase and negate more than 60 percent of the price increase.[6]

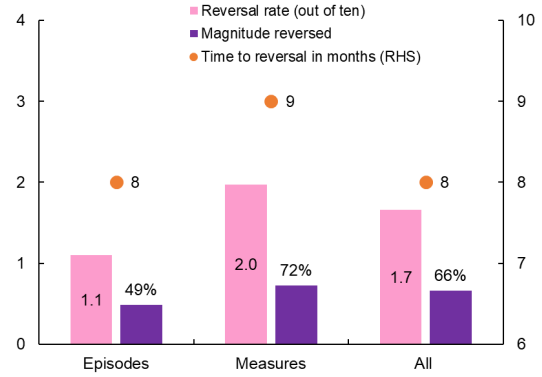
Online Annex Figure 2.1.2. Characteristics of Diesel Price Measures

Duration and Intensity



Sources: Energy Subsidy Reform Measures database; Retail Fuel Price database; and IMF staff calculations.
Note: The graph plots the distribution of cumulative diesel price changes for single measures versus reform episodes (left hand side) and the frequency of duration of a reform episode against the median of the cumulative price change (right hand side). A single measure is an isolated measure that is not part of a reform episode. A reform episode is defined as a series of diesel price measures taken within 12 months of each other. Counts show for all episodes or measures even if price change is missing. Episodes and measures may have a negative cumulative price change if they contain price-decreasing ESREM measures (that are kept regardless of their impact on prices), or a price decrease occurring mid-episode that does not meet the definition of a measure.

Reversals and Magnitude



Sources: Energy Subsidy Reform Measures database; Retail Fuel Price database; and IMF staff calculations.
Note: The graph plots for diesel reform episodes and measures, the reversal rate, the magnitude reversed and the time to reversal. The reversal rate is the number of measures or episodes with price increases that were reversed within one year. The magnitude reversed reflects the proportion of the cumulative price change from a reform episode or measure that is undone during a reversal, expressed as a fraction of the cumulative price increase from the preceding episode. Time to reversal is the number of months between the last price increase and the first price decrease, and the average is plotted. Sample tracks the measures or episodes with price increases that were later reversed.

Global Pension Reform Database (GPRD)

Sources and Extraction

Data for the GPRD is extracted from the Economist Intelligence Unit (EIU) country reports (covering 189 countries quarterly from 1952 onward) and complemented by information from the U.S. Social Security Administration (SSA) International Update (providing monthly reports focused on pension measures since October 2003). The EIU is likely to cover key pension reforms but could omit some smaller or more technical pension measures, especially those taken between publication periods. The SSA's updates provide timely insights into global pension reforms with high level of specificity. Together, these sources offer broad coverage and consistent updates on pension reforms worldwide.

The construction of the GPRD involves a structured methodology comprising similar steps as the ones described for ESREM. Using NLP, the methodology extracts the passages with keywords associated with pensions, such as "social security," "pension," and "early retirement," that co-occur with action-related terms like "enact," "passed," or "approve". This helps identify the year of each pension measure. Prompts

[6] The rates of reversals are calculated for reversals happening within one year, are limited to the administrative price countries and the sample where it can be traced to the episode or measure that was reversed. Reversals can occur after one year from the last price increase and are more prevalent.

were applied to these excepts to capture information on the design features and rationales for reform. A key focus of the database is on retirement age changes which are identified based on previous research and Factiva new coverage, cross-checked and supplemented by desk research. This process collects additional information on the magnitude of retirement age increases, the implementation timeline for changes, the coverage of reform, and whether retirement age changes are linked to life expectancy. A legislation introducing a link of retirement ages to life expectancy is considered as a pension age reform. Moreover, the database indicates whether a pension age measure is part of a larger pension reform, providing further details when captured. Overall, this comprehensive information of retirement age reforms is available for 51 countries, including 31 advanced economies and 20 emerging market economies (Online Annex Table 2.1.1.).

The stages of *pension age reforms* are identified as follows:

- *Announcements,* which cannot be identified based on desk research, are supplemented using dates with spikes in the number of pension related news articles in the 12 months before legislation.
- *Legislation* dates reflect the date a reform is adopted in parliament. Legislated reform episodes of major retirement age reforms are identified based on previous research (OECD Pension at Glance publications; Romp 2024 and Bi and Zubairy 2023), complemented by desk research.
- *Implementation* dates represent when a reform becomes effective based on law. In cases where the exact implementation date cannot be identified by desk research, the date is set to January of the given year.
- *Reversal* dates constitute a roll back of pension measures enacted. This includes full abolishment and deferral of previous pension age changes as well as exceptions which allow for early retirement (without deductions) before the increased retirement age. Reversal dates are identified based on desk and previous research (OECD Pension at Glance publications; Romp 2024; Bi and Zubairy 2023).

For *pension reforms other than retirement age changes*, the database provides the year of legislation. These other reforms may cover a package or a single pension reform measure. The announcement date is identified by month and year based on the largest spike in the number of news articles (related to pension reforms) in the legislation year and the six months before the legislation year. A spike is only considered as an announcement if it exceeds 2 standard deviations above the country mean.

Online Annex Table 2.1.1. Countries with Retirement Age Reforms Covered in the Database

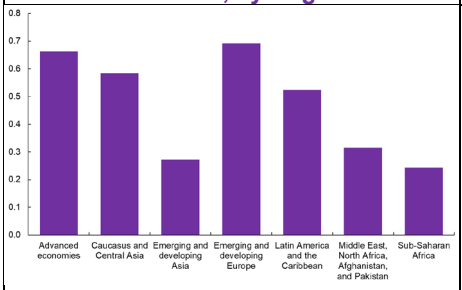
Advanced Economies			Emerging Market Economies	
Australia	France	Netherlands	Argentina	Indonesia
Austria	Germany	New Zealand	Azerbaijan	Kazakhstan
Belgium	Greece	Norway	Belarus	Morocco
Canada	Ireland	Portugal	Bolivia	Poland
Croatia	Israel	Singapore	Bulgaria	Romania
Cyprus	Italy	Slovak Republic	China	Russia
Czech Republic	Japan	Spain	Colombia	Saudi Arabia
Denmark	Korea	Sweden	Egypt	Türkiye
Estonia	Latvia	Switzerland	Georgia	Uruguay
Finland	Lithuania	United Kingdom	Hungary	Vietnam
		United States		

Descriptive Statistics

Pension measures are more prevalent in Europe and the Western Hemisphere, regions characterized by older populations and more developed pension schemes (Online Annex Figure 2.1.3). The dataset shows that retirement age increases are typically implemented over a long-time horizon (Online Annex Figure 2.1.3), with about 62 percent implemented over 5 to 15 years and averaging an increase of about 4 years. Fiscal concerns are the primary motivation for these reforms, with around 82 percent of Factiva articles citing fiscal reasons as the main rationale (Online Annex Figure 2.1.3). Other considerations include improving benefit adequacy (9 percent) and supporting economic growth (7 percent). In terms of pension age reversals, three out of 35 countries in the database have fully reversed the pension age, namely Poland and Canada (both in 2016) as well as Croatia (in 2019). In all cases, the reversals were driven by elections and political commitments to lower retirement ages.[7] Five countries have enacted partial reversals of retirement ages, deferring the implementation of retirement age increases (like Austria in 1997 and Ireland in 2020), granting earlier retirement without penalties for selected groups (like Germany in 2014 or Turkey in 2023) or eliminating retirement age increases to some degree (like Slovakia abolishing the life expectancy factor in 2019, while introducing a retirement age increase from 63 to 64 years instead).[8]

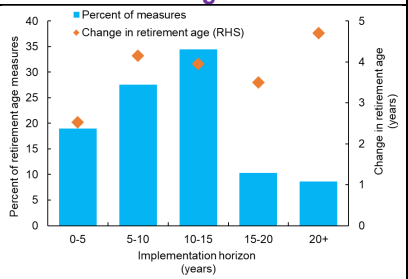
Online Annex Figure 2.1.3. Selected Results from the Global Pension Reform Database

Share of Countries with Pension Measures, by Region



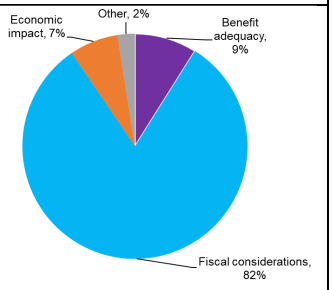
Sources: Global Pension Reform Database; and IMF staff calculations.
Note: The graph presents the average share of countries with pension measures per year and within each region. The graph plots the average over 2000-2023 for a sample of 134 countries.

Implementation Horizon of Retirement Age Increases



Sources: Global Pension Reform Database; and IMF staff calculations.
Note: The left axis shows the distribution of the implementation years of retirement age changes. The right axis shows the average change in retirement ages.

Reasons for Pension Age Reforms



Sources: Factiva; Global Pension Reform Database; and IMF staff calculations.
Note: The chart shows the most frequent reasons for pension age reforms mentioned in Factiva news articles.

[7] In 2019, three major trade unions launched the "67 je previše" ("67 is too much") campaign, gathering 700,000+ signatures for a referendum. To avoid a likely defeat, the government preemptively reversed the reform before the national election.

[8] Partial reversals of pension age reforms, which often affect only selected groups, are often less documented. The GPRD is, therefore, likely to underestimate partial reversals.

Online Annex 2.2. Drivers of Measures[9]

This Online Annex presents the empirical methodology, data sources, and additional results for the analysis of drivers of energy subsidy and pension measures.

The Role of Macroeconomic and Political Factors

The sample comprises a country-by-year panel covering 194 countries from 2000 to 2024. Macroeconomic data, including government debt, fiscal balance, and GDP growth is from the IMF World Economic Outlook (WEO) database. Demographic information, such as life expectancy comes from the UN World Population Prospects Database, while pension expenditures data is drawn from the OECD Data Explorer. Data on the projected future change in pension expenditures is based on the pension projections of the European Commission (Ageing Working Group) available for EU countries, published in 2001 and in three-year intervals from 2006 until 2024. The efficient fuel price gap, which reflects the difference between efficient prices (supply cost and environmental costs) and domestic retail prices, is from Black and others (2023). The timing of recessions is based on Bettarelli and others (2024) and election data is obtained from Varieties of Democracy (V-Dem) project.

The association between the existence of a measure and a set of lagged macroeconomic indicators is estimated by equation A2.2.1 using OLS:

$$I_{it} = \alpha + \gamma_t + \beta m_{i,t-1} + \eta_i + \epsilon_{it} \quad \text{(A2.2.1)}$$

where $m_{i,t-1}$ is the lagged standardized macroeconomic variable. γ_t and η_i are time and country fixed effects. I_{it} is a dummy indicating an energy subsidy measure or, for pensions, a legislative action, announcement, implementation, or reversal. Heterogeneous effects are estimated using equation A2.2.2:

$$I_{it} = \alpha + \gamma_t + \beta_1 m_{i,t-1} + \beta_2 m_{i,t-1} \mathrm{x}\, \mathrm{W_i} + \eta_i + \epsilon_{it} \quad \text{(A2.2.2)}$$

where $\mathrm{W_i}$ is a dummy is a dummy for advanced economies or oil-importing countries. The reform episode analysis is estimated using the following equation A2.2.3:

$$D_{it} = \alpha + \gamma_t + \beta m_{i,t-1} + \epsilon_{it} \quad \text{(A2.2.3)}$$

where D_{it} is the episode duration in months, intensity as cumulative price change, or reform sustainment measured by the time to reversal from the last to the first price decrease. The lagged macro variable refers to the lagged value relative to the year at the start of the reform. Data is at the episode year level, where year is the start year of the episode, and therefore the sample shrinks a lot in these estimations.

Online Annex Figure 2.2.1 shows that in oil-importing economies, a wider fuel price efficiency gap strongly predicts price hikes. The sustainability of an episode or a measure—proxied by the interval from the last price increase to the subsequent decrease—extend by roughly 1.6 to 2 months when associated with a wider fuel gap, stronger growth, and improved fiscal balance. As for pensions, Online Annex Figure 2.2.1 demonstrates that reversals of pension age increases are more likely in countries with lower pension expenditures (measured in terms of GDP). The analysis also examined role of reforms in neighboring countries. The results suggest a posited correlation between domestic and neighbors price measures but not for pension measures.[10]

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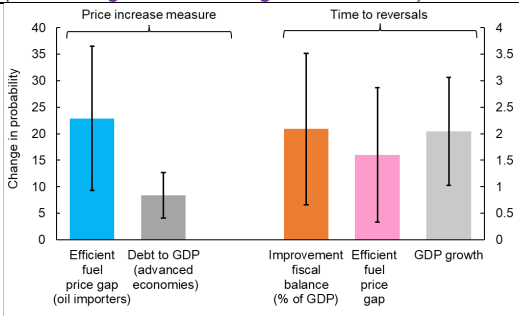
[9] Prepared by Diala Al Masri, Hussein Bidawi, Christoph Freudenberg, and Ana Sofia Pessoa.

[10] The analysis examined the role of political polarization in influencing the probability of pension and energy measures. The results were mixed, potentially reflecting reverse causality issues: no impact using the polarization variable of the Varieties of Democracy

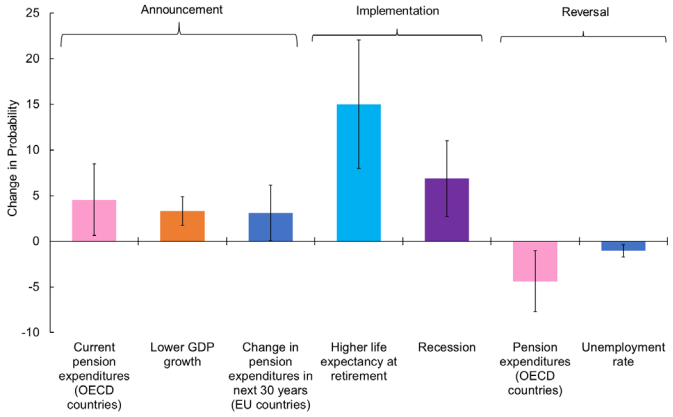
Online Annex Figure 2.2.1. Association of Price Increases, Pension Age Reform, and Reversals with Macroeconomic Conditions

Probability of a Diesel Price Increase Measure, length of reform and Macroeconomic Conditions
(Percentage Point Change and Months)



Sources: Energy Subsidy Reform Measures database; and IMF staff estimates.
Note: The chart plots the coefficients from separate OLS regressions as per equation (A2.2.2) for lefthand side bars and based on equation (A2.2.3) for righthand side bars. The coefficients represent the change in the probability of a price increase measure, including utility or diesel, (lefthand side bars) and change in time to reversals in month (righthand side bars) resulting from a one standard deviation increase in the independent variables. The sample is from 2000-2024 and is for measures of one month and episodes of at least 2 months. Robust standard errors are clustered at the country level. 90 percent confidence bands are shown.

Probability of Pension Age Reform Stage and Macroeconomic Conditions
(Percentage Point Change)



Sources: Global Pension Reform Database; and IMF staff estimates.
Note: The chart shows the association between reform stages of pension age measures and macroeconomic variables. Each coefficient represents the estimates from a separate regression of each measure on each (lagged) macro variable. The coefficients represent the change in probability of a measure due to a one standard deviation increase in the independent variable (except for the dummy variables Election and Recession). Robust standard errors are clustered at the country level. 90 percent confidence bands are shown.

Identification of Robust Predictors

Random Forest

The Random Forest method is used to examine the role of sentiment in influencing the probability of announcement, implementation, and legislation of reform measures. This machine learning technique has two main advantages compared to traditional empirical methods (e.g. OLS or logit regressions). First, it is particularly well-suited for multi-dimensional data as it can capture non-linear relationships and interactions between variables. Second, it provides insights into the most relevant predictors, allowing a direct comparison of sentiment with other factors such as economic conditions, electoral contexts, and governance quality.

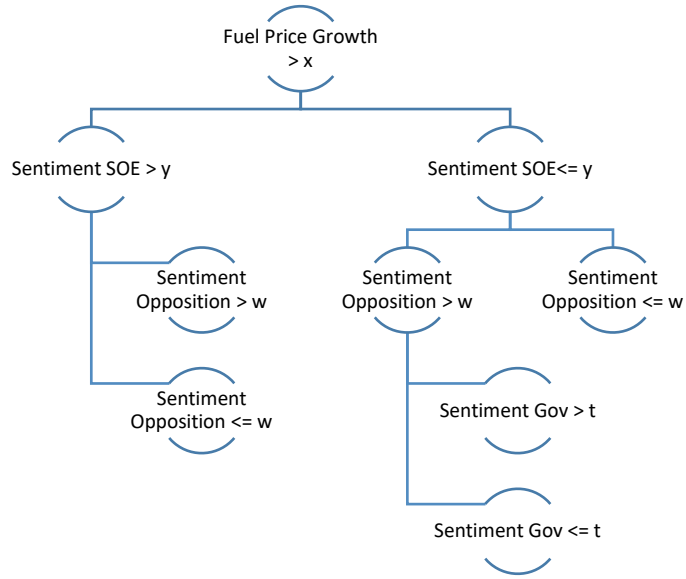
This method generates many decision trees, like the illustrative one depicted in Online Annex Figure 2.2.2. A random sample of the data is divided based on the variables in the dataset. The splitting continues until each subsample is homogenous, at which point, each branch of tree makes predictions based on the most common outcome, such as whether the measure is announced. By comparing these random trees, this

(V-Dem) project; a significant correlation between sentiment polarization (difference in government-opposition sentiment) and energy and pension measures; no impact between lagged sentiment polarization and measures.

method computes the importance score of each regressor for the prediction accuracy of the outcome variable. All scores are normalized by dividing by the maximum score, with1 representing the maximum importance and 0 indicating no importance. While this approach does not provide causal estimates of the drivers of reforms, it effectively identifies the most robust predictors. The data used in the random forest analysis includes:

- Macroeconomic variables: lags of GDP growth, logarithm of inflation rate, logarithm exchange rate from IMF WEO, recession shocks (Alesina and others 2024); indicator for IMF programs from MONA dataset; ethnic tensions index from ICRG; poverty rate and inequality rate form the World Bank.
- Fiscal variables: lagged fiscal deficit to GDP; public debt level to GDP from the IMF WEO; indexes measuring the strength of fiscal rules and fiscal councils.
- Institutional factors: World Governance indicators, such as government effectiveness, voice and accountability, rule of law, control of corruption, and regulatory quality; level of democracy index and media censorship from V-Dem.
- Political and social factors: lagged of mass mobilization indicator from V-Dem; indicator for election year; share of government seats; and political polarization index from V-Dem.
- Labor-demographic factors: lagged employment, unemployment rates of 55-64 and 65+ year-olds from ILO; old age dependency ratio from United Nations; and life expectancy from the World Bank.
- Fuel prices: lagged annual growth of domestic retail diesel prices and international crude oil prices (Kpodar and Abdallah 2017; Global petrol prices; and Bloomberg).
- Sentiment toward reforms: lags of overall sentiment, negative sentiment of stakeholders (opposition, household, union, and CSO), and sentiment by stakeholders that is favorable or neutral about reforms (all other not mentioned before). More details on the extraction of sentiment can be found in Online Annex 2.3.

Online Annex Figure 2.2.2. Decision Tree Example in Random Forest



Source: IMF staff.

Instrumental Variable Approach

An instrumental variable (IV) approach is employed to identify the causal effect of domestic sentiment on the probability of advancing through reform stages. As in Alesina and others (2024), sentiment in trading partners is used as an instrument for domestic sentiment. The approach relies on the plausible assumption

that sentiment towards reforms in trading partners is unlikely to affect reform outcomes other than though domestic sentiment about the same type of reforms.

First, Online Annex Table 2.2.1 presents the results of the first stage, showing that the instrument is strong, with the Kleibergen–Paap rk Wald F statistic—equivalent to the F-effective statistic for non-homoskedastic error in case of one endogenous variable and one instrument (Andrews, Stock, and Sun 2019)—higher than the rule of thumb critical value of 10 and the associated Stock-Yogo critical value.

Second, Online Annex Table 2.2.1 also shows that the exclusion restriction is unlikely to be violated. This approach relies on the plausible assumption that sentiment towards reforms in trading partners is unlikely to affect reform outcomes other than through domestic sentiment about the same type of reforms. To test for this, and following Furceri, Ganslmeer, and Ostry (2023), the residuals of the baseline specification are regressed on the instrument. If the coefficient turns out to be significant, one can argue that the instrument is part of the error term and thus does not satisfy the exclusion restriction. The results presented in columns (3)-(4) and (7)-(8) show that this is not the case for both energy subsidy and pension measures, supporting the validity of the instruments.

Online Annex Table 2.2.1. IV First Stage and Exclusion Restriction

	Energy Subsidy Measures				Pension Measures			
	First Stage		Exclusion Restriction		First Stage		Exclusion Restriction	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Domestic Sentiment	Domestic Sentiment	Announcement	Implementation	Domestic Sentiment	Domestic Sentiment	Announcement	Legislation
Instrument: Sentiment Negative Stakeholders in Trade Partners	0.14***	0.23***	0.02	0.02	0.27***	0.11**	0.02	0.02
	(0.01)	(0.06)	(0.03)	(0.03)	(0.02)	(0.04)	(0.04)	(0.04)
Kleibergen-Paap Wald rk F statistic	76.0	15.2			84.7	33.1		
Controls and country fixed-effects		x	x	x		x	x	x

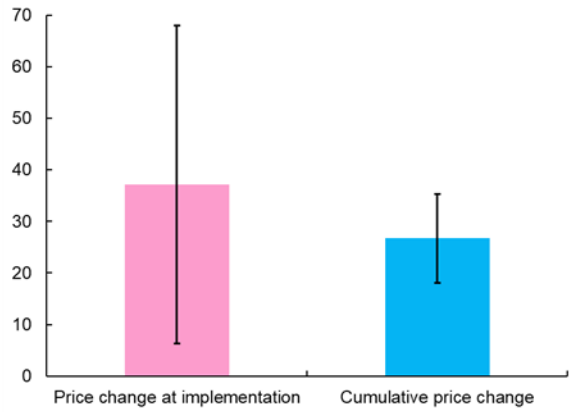
Sources: Energy Subsidy Reform Measures database; Global Pension Reform Database; and IMF staff estimates.
Notes: Columns (1)-(2) and (5)-(6) show the results of the first stage regressions, including the F-statistic to test for weak instrument. Columns (3)-(4) and (7)-(8) show the results of the exclusion restriction test, which regressing the residuals of the baseline regression with controls and country fixed-effects on the instrument. Similar results are obtained when adding year fixed-effects. For energy subsidy measure, controls include one-year lags of real GDP growth, fiscal deficit, retail diesel price growth, crude oil price growth, IMF programs, indicator for electoral democracy index, and a dummy for election years. For pension measures, controls include one-year lags of real GDP growth, fiscal deficit, debt to GDP ratio, IMF programs, unemployment rate, old age dependency ratio, and a dummy for election years. Negative sentiment category includes the sentiment of households, CSO, unions, and opposition. For pension measures, only advanced economies were included. Significance levels: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

The second-stage results presented in Figure 2.11 of the main text show that positive sentiment increases the probability of energy subsidy and pension reform measures. Moreover, improving sentiment contributes to implementing larger fuel price measures (Online Annex Figure 2.2.3) as well as multiple measures within an episode (Online Annex Figure 2.2.4).

The baseline results presented in Figure 2.11 in the main text are broadly robust to the inclusion of controls and fixed-effects that account for common time trends, time invariant country characteristics, and country-specific macro-fiscal contexts. Despite the smaller sample size due to the inclusion of fixed-effects, the

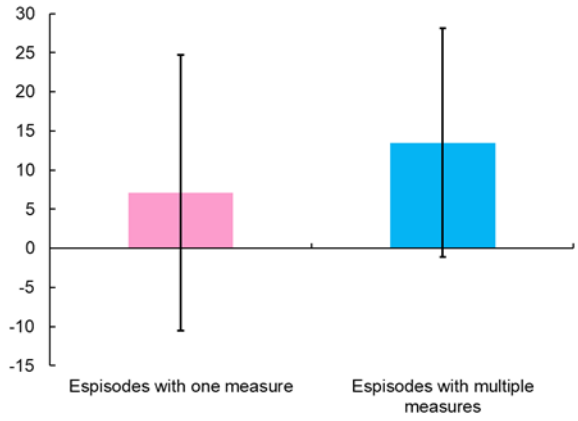
results for announcement and implementation of energy subsidy measures remain positive and significant for LICs and EMDEs, as well as for new age pension legislation (Online Annex Table 2.2.2).

Online Annex Figure 2.2.3. Effect of Sentiment on the Size of Fuel Price Measures
(Percent)



Sources: Energy Subsidy Reform Measures database; and IMF staff estimates.
Note: The figure shows the impact of sentiment on the probability of implementing one-off measures and implementing measures as part of an episode. The figure depicts the average effects of a two standard deviations shock to sentiment, i.e., driven by the instrument, relative to the average price change at implementation and cumulative change. These results were estimated using an instrumental variable approach, where domestic sentiment is instrumented with sentiment in trade partners. The analysis refers to stakeholders with negative average sentiment towards fuel price and pension measures, (households, unions, CSO, and opposition groups). Bands represent 90 percent confidence intervals.

Online Annex Figure 2.2.4. Effect of Sentiment on the Probability of Implementing Fuel Price Measures
(Percent)



Sources: Energy Subsidy Reform Measures database; and IMF staff estimates.
Note: The figure shows the impact of sentiment on diesel price changes. The figure depicts the average marginal effects of a two standard deviations shock to sentiment, i.e., driven by the instrument, relative to the unconditional probability of implementing measures. The results were estimated using an instrumental variable approach, where domestic sentiment is instrumented with sentiment in trade partners. The analysis refers to stakeholders with negative average sentiment about fuel price and pension measures (households, unions, CSOs, and opposition groups). Bands represent 90 percent confidence intervals.

Online Annex Table 2.2.2. Robustness Checks: Energy Subsidy and Pension Measures

	Energy subsidies				Pensions	
	Announcement		Implementation		Announcement	Legislation
	(1)	(2)	(3)	(4)	(5)	(6)
IV Probit	1.32***	1.41***	0.80+	1.33***	1.32***	1.23***
	(0.28)	(0.12)	(0.55)	(0.27)	(0.24)	(0.27)
Avg. marginal effects	9.72*	19.57**	6.13	14.70+	5.05	4.03+
	(5.34)	(8.03)	(4.65)	(9.09)	(4.15)	(2.77)
Controls	x	x	x	x	x	x
Country and year fixed-effects	x	x	x	x	x	x
Sample	All	EM, LIC	All	EM, LIC	AE	AE
N	4804	2694	9663	7118	5292	5316

Sources: Energy Subsidy Reform Measures database; Global Pension Reform Database; and IMF staff estimates.
Note: Negative sentiment category includes the sentiment of households, CSO, unions, and opposition, while other stakeholders are included in the positive/neutral sentiment group. Controls, country fixed-effects, and year fixed-effects. For energy subsidy measure, controls include one-year lags of real GDP growth, fiscal deficit, retail diesel price growth, crude oil price growth, IMF programs, indicator for electoral democracy index, and a dummy for election years. For pension measures, controls include one-year lags of real GDP growth, fiscal deficit, debt to GDP ratio, IMF programs, unemployment rate, old age dependency ratio, and a dummy for election years. Average effects computed at the mean level of domestic sentiment. Significance levels: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Online Annex 2.3. Methodology for Extracting Sentiment on Energy Subsidy and Pension Measures[11]

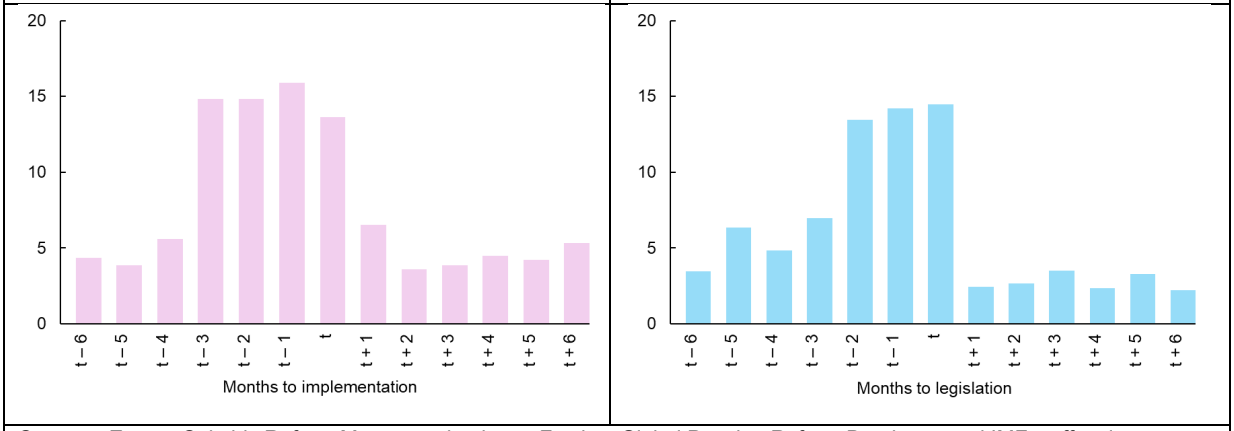
This annex describes the methodology used to construct and analyze public sentiment about energy subsidy and pension reform measures. Sentiment reflects the spectrum of stakeholder opinions and responses to measures, as reflected in print media.

Data Source and Extraction

Sentiment data was gathered through Factiva, a media aggregation platform that provides extensive global coverage of news articles. Articles were filtered to ensure their relevance to these measures, emphasizing critical issues such as subsidies, energy prices, and pension age.[12] The resultant dataset comprises about 1.4 million articles for energy subsidies and 0.6 million articles for pensions in multiple languages— English, French, Spanish, and Arabic energy subsidies and additionally German and Chinese for pensions— spanning 1990 to the present.

The volume of published articles related to these measures increases three to four times in the periods preceding and during the implementation of fuel price measures and the enactment of pension age legislation (Figure 2.3.1). Media attention intensifies when reforms are imminent, reflecting heightened public debate, stakeholder mobilization, and potential scrutiny before the measures take effect.

Online Annex Figure 2.3.1. Number of Print Media Articles



Sources: Energy Subsidy Reform Measures database; Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: The figure shows the number of articles published around the implementation date for energy subsidy reforms (panel 1) and around the legislation date for pension reforms (panel 2). In the horizontal axis, *t* is the month of implementation (panel 1) and legislation enactment (panel 2). The vertical axis indicates the number of articles divided by number of media outlets.

[11] Prepared by Radhika Goyal, Mengfei Gu, Emine Hanedar, and Sultan Orazbayev.

[12] Filtering was conducted using a predetermined list of keywords : fuel price measures: fuel prices, Petroleum, Energy prices, Diesel, Gasoline, Electricity prices, Utility prices, Gas prices, LPG, LNG, Kerosene, Water prices, Heavy fuel, Coal Prices, Jet oil prices Heating prices, Power prices, Power sector, fuel, gas, electricity, water, fuel subsidy, electricity subsidy energy subsidy, fuel subsidies, energy subsidies, electricity subsidies, utility subsidies, Gas subsidies, Jet oil subsidy, Coal subsidies, Jet oil subsidies, Heating subsidies, Power subsidies, Cost recovery, Distribution losses, IPPs, Independent power producers, Commercial losses, Power producers, Heating subsidies, Power subsidies, Utility subsidies, Gas subsidies; pension keywords: pension*, annuit*, retirement system, retirement age, superannuation, contribution rate and pension reform keywords reform*, change*, modif*, overhaul, amend* and revers*, revision, rollback, enact*, suspend*.

Transformer-Based Analysis

For article analysis, a transformer-based approach was employed. Large language models (LLMs), specifically GPT-4o, were utilized to automate the identification of stakeholders, sentiment extraction, and the uncovering of relevant topics. This methodology enabled the categorization of sentiments across 17 stakeholders, 5 qualitative sentiment categories, a quantitative sentiment score from -5 (most negative) to +5 (most positive) and 7 topics of concern. It builds upon the foundational work of Blei, Ng, and Jordan (2003) regarding latent Dirichlet allocation for theme and topic extraction from textual data. The sentiment analysis methodologies are informed by Gentzkow, Kelly, and Taddy (2019) concerning media content analysis and Soroka, Stecula, and Wlezien (2015), who investigate media narratives about economic policies. By incorporating stakeholder identification techniques, the analysis evaluates the sentiment of various actors during the life cycle of measures. This analysis advances the existing literature by applying contemporary deep learning techniques to multilingual datasets.

Stakeholder Identification and Sentiment

The analysis to identify stakeholder sentiments followed a three-step approach:

- *Identification of Stakeholders:* From each newspaper article, each mention of a stakeholder in relation to fuel price or pension measure was captured and categorized into the following categories: government officials, households, civil society groups, opposition, private sector, international organizations, oil companies for energy subsidy reform measures.[13] For pension reform the stakeholder categories include: government officials, central bank, pension regulator, courts, public pension fund, opposition party, labor or trade union, employers and business associations, private financial institutions, civil society organizations, households, IMF, international organizations other than IMF, academics and researchers, pension commissions.
- *Distinction between quotes and mentions:* distinction was made between direct quotes (explicit statements by the stakeholder about their sentiment and concern) and indirect mentions (inferred positions through other stakeholders). Both are used in the analysis.
- *Quantification of sentiment:* sentiment was classified into the qualitative categories of strongly supportive, supportive, neutral, opposing, strongly opposing, and not explicitly mentioned. Additionally, sentiment was quantitatively rated on a scale ranging from -5 to 5.[14]

Topic Modeling: Identifying Key Themes

In addition to sentiment analysis, topic modeling was employed to uncover the underlying themes associated with energy subsidy reform measures and pension reforms. This approach facilitated the following:

- *Identification of concerns:* key concerns raised by stakeholders in response to energy and pension reform measures include issues such as a rise in inflation, fiscal considerations, and environmental implications.
- *Analysis of support and opposition:* the methodology enabled the identification of reasons for support or opposition to measures, thereby providing a deeper understanding of public reactions.

[13] The data do not provide sufficient granularity to differentiate households by income groups.

[14] Stakeholder sentiment at the monthly level was scaled using number of mentions and country-specific standard deviation in sentiment for each stakeholder.

Data Validation

- *Validation of AI-generated responses:* Data validation was conducted by comparing AI-generated responses with a manually created database of sentiment across stakeholders.. Accuracy assessment based on a manually coded sample (85 English, 50 French, 50 Arabic articles) shows stakeholder identification matches of 98 percent (English), 94 percent (French), and 95.5 percent (Arabic), with minimal hallucinations (0.2%) and misclassifications (1.7 percent across all languages). Conditional on correct stakeholder identification, sentiment classification achieved 99 percent accuracy

Online Annex 2.4 The Impact of Reforms on Sentiment[15]

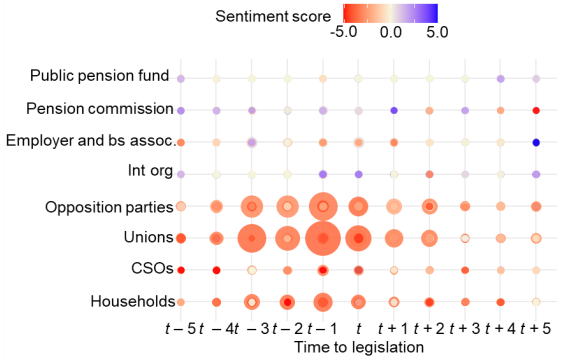
The annex presents stylized facts on how stakeholder sentiment evolves around different reform stages, and the empirical methodology used to estimate the impact of fuel price and pension measures on sentiment.

Stakeholder Sentiment around Reform Stages

The results in the chapter show that households, unions, and opposition groups are the most vocal stakeholders during and after the announcements of both fuel price changes and pension measures (Figure 2.7 in main text). For fuel price measures, the analysis does not find significant differences in the key opponents—households, civil society organizations, unions, and opposition parties—or in their sentiment toward reform announcements between different regions and between oil-importing and oil-exporting countries.

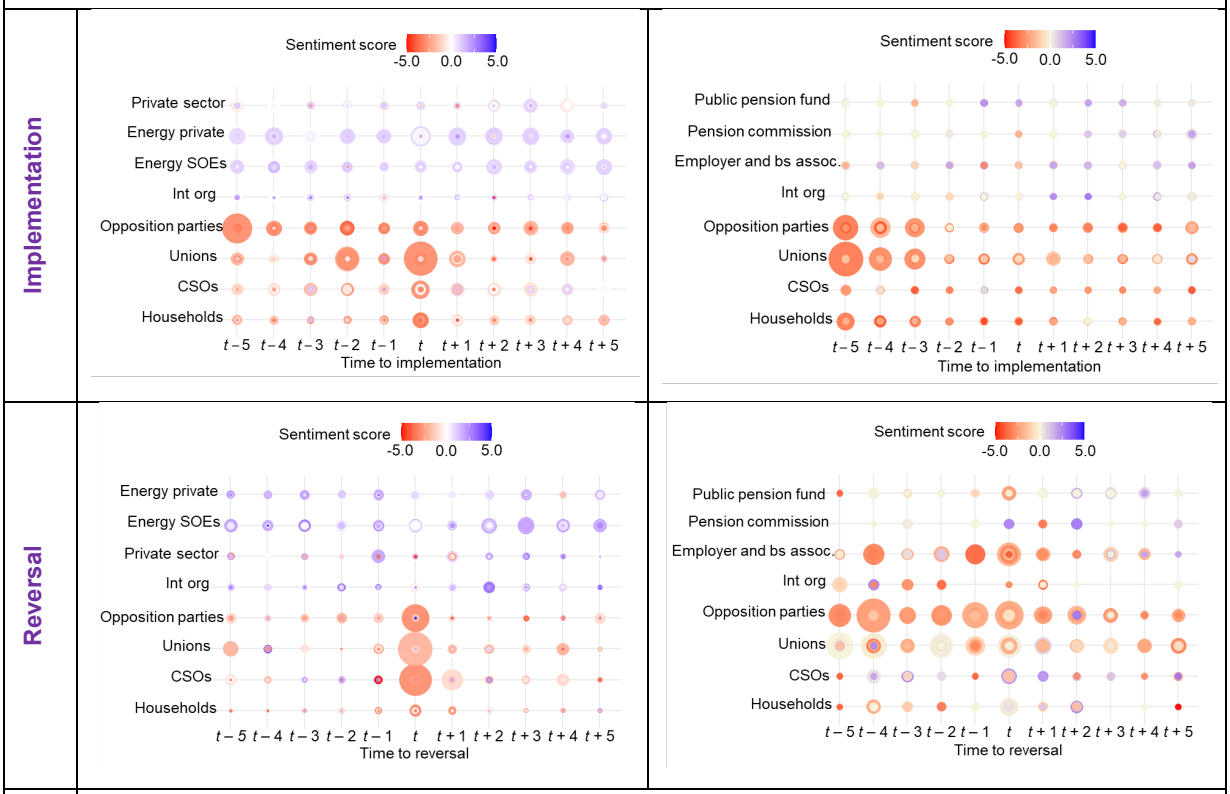
Online Annex Figure 2.4.1 illustrates the evolution of sentiment around reform stages, differentiated by stakeholders for fuel price and pension age measures. Throughout the legislative and implementation phases, households, unions, civil society organizations, and political opposition parties remain the most vocal stakeholders. For pension reforms, sentiment declines leading up to legislation and stays negative during legislative passage, indicating strong early opposition. However, negativity subsides by the implementation phase, suggesting adaptation or reduced contestation. In contrast sentiment regarding fuel price measures starts subdued, becomes most negative at implementation, and remains low, indicating prolonged dissatisfaction and limited acceptance over time. Regarding the reversal of pension age measures, responses from households and unions are muted. Opposition groups express negative sentiment, although it is less negative immediately following the reversal. Conversely, for fuel price measures, resistance peaks just before the reversal but quickly fades, likely due to the immediate financial relief that follows the policy change.

Online Annex Figure 2.4.1. Stakeholder Sentiment around Legislation, Implementation, and Reversal

	Fuel Price Measures	Pension Age Measures
Legislation	Not applicable for fuel price measures	

[15] Prepared by Alexandre Balduino Sollaci, Christoph Freudenberg, Radhika Goyal, and Mengfei Gu.

Online Annex Figure 2.4.1. Stakeholder Sentiment around Legislation, Implementation, and Reversal (Concluded)



Sources: Energy Subsidy Reform Measures database; Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: This graph shows sentiment across stakeholder groups over time for energy subsidy reform (left panel) and pension reforms (right panel). The horizontal axis represents the timeline, with t being the legislation, implementation or reversal month, and t-5 to t+5 indicating periods before and after. The vertical axis lists the different stakeholder groups. The size of the bubbles reflects the frequency of sentiment, while the color indicates its direction, with red representing negative sentiment and blue representing positive sentiment. Scaled sentiment is the average weighted sentiment of all stakeholders divided by the country specific standard deviation.

Impulse Response Calculation: Baseline Estimates

The analysis relies on the local projections framework (Jorda, 2005) with stacked regressions. In the case of energy subsidy measures, the following equations are estimated for the announcement, implementation, and potential reversal of each measure.

- Announcement

$$\Delta y_{i,t+h} = \beta_h^A \cdot A_{i,t} + \gamma_h^I \cdot I_{i,t+h} + \gamma_h^R \cdot R_{i,t+h} + \sum_{l=1}^{2} \delta_{h,l} Y_{i,t-l} + \eta_h^i + \mu_h^t + \varepsilon_{i,t+h} \quad (2.4.1)$$

- Implementation

$$\Delta y_{i,t+h} = \beta_h^I \cdot I_{i,t} + \gamma_h^A \cdot A_{i,t} + \gamma_h^R \cdot R_{i,t+h} + \sum_{l=1}^{2} \delta_{h,l} Y_{i,t-l} + \eta_h^i + \mu_h^t + \varepsilon_{i,t+h} \quad (2.4.2)$$

- Reversal

$$\Delta y_{i,t+h} = \beta_h^R \cdot R_{i,t} + \gamma_h^A \cdot A_{i,t} + \gamma_h^I \cdot I_{i,t} + \sum_{l=1}^{2} \delta_{h,l} Y_{i,t-l} + \eta_h^i + \mu_h^t + \varepsilon_{i,t+h} \quad (2.4.3)$$

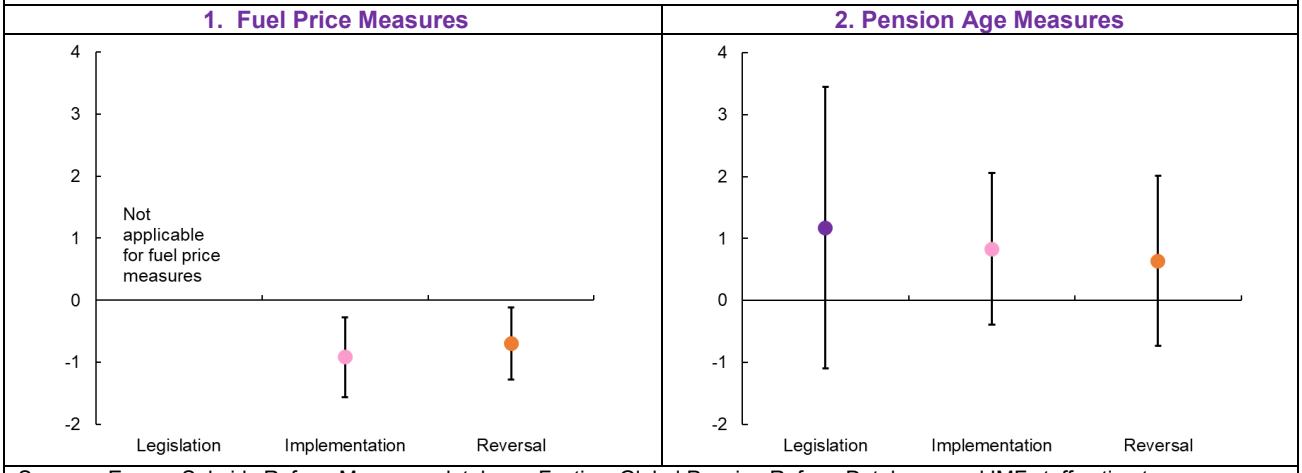
where $A_{i,t}$, $I_{i,t}$, and $R_{i,t}$ represent indicators that equal 1 when an announcement, implementation, or reversal of a measure, respectively, takes place in country *i* and month *t* and zero otherwise, and *h* (from 0 to 6) is the horizon over which the cumulative change is calculated. Following Bernardini, De Schryder, and Peersman (2020), the dependent variable is the cumulative change in the scaled sentiment score ($Y_{i,t}$) in country *i* between periods *t-1* and *t+h*:

$$\Delta y_{i,t+h} = \sum_{j=0}^{h} (Y_{i,t+j} - Y_{i,t-1}) \quad (2.4.4)$$

In the stacked regressions framework, each $Y_{i,t}$ represents the pooled sentiment scores of households, CSOs, unions, and the political opposition. The explanatory variables include two lags of the normalized sentiment score for pooled stakeholder to capture potential influence of past sentiment, as well as stakeholder-by-country and stakeholder-by-year fixed effects, η_h^i and μ_h^t, to control for country and time specific factors for each stakeholder. In each case, all three "events" (announcement, implementation, reversal) are included in the specification. When estimating the impact of announcements on sentiment, leads of the implementation and reversal indicators are included to control for their effect on future changes in sentiment. For implementation, leads of the reversal indicator and contemporary announcements are included, while for reversals, contemporary announcement and implementation indicators are included. In the case of pension reform, a fourth stage (legislation) is included following the same regressions above.

The impact of the announcement of measures is shown in Figure 2.12 in the main text; while the impact of the other events is reported in Online Annex Figure 2.4.2 (for brevity, the figure plots only the cumulative impact after 6 months of each event). Similar to announcements, the implementation of fuel price measures impacts sentiment scores. While reversals tend to boost sentiment among household, they decrease it for other stakeholders, leading to an overall negative effect. In the case of pension measures, most effects related to legislation and implementation are not statistically significant, as public debate and sentiment spike primarily at the time of announcement.

Online Annex Figure 2.4.2. Medium-term Impact of Reform Stages on Stakeholder Sentiment



Sources: Energy Subsidy Reform Measures database; Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: The impulse response shows the cumulative impact of reform event stages in energy subsidy reform and pension age measures on sentiment after 6 months of the legislation, implementation and reversal. The estimation accounts for baseline sentiment and includes fixed effects for stakeholder-by-country and stakeholder-by-year (equations 2.4.1—2.4.3). The regression analysis was conducted for pooled stakeholder group including Households, CSO, Unions and Opposition. The error bands indicate the 90 percent confidence interval around the estimates.

Heterogeneous Effects

The chapter also estimates how the impact of measure announcements varies under different conditions, using the following regression:[16]

$$\Delta y_{i,t+h} = \beta^{A}_{h,L} \cdot A_{i,t} \cdot F(z_{i,t}) + \beta^{A}_{h,H} \cdot A_{i,t} \cdot [1 - F(z_{i,t})] + \Gamma^{A}_{h} \cdot X_{i,t,h,l} + \varepsilon_{i,t+h} \quad (2.4.5)$$

For notational ease, the other covariates and fixed effects in the model are subsumed by

$$\Gamma^{A}_{h} \cdot X_{i,t,h,l} = \gamma^{I}_{h} \cdot I_{i,t+h} + \gamma^{R}_{h} \cdot R_{i,t+h} + \sum_{l=1}^{2} \delta_{h,l} Y_{i,t-l} + \eta^{i}_{h} + \mu^{t}_{h} \quad (2.4.6)$$

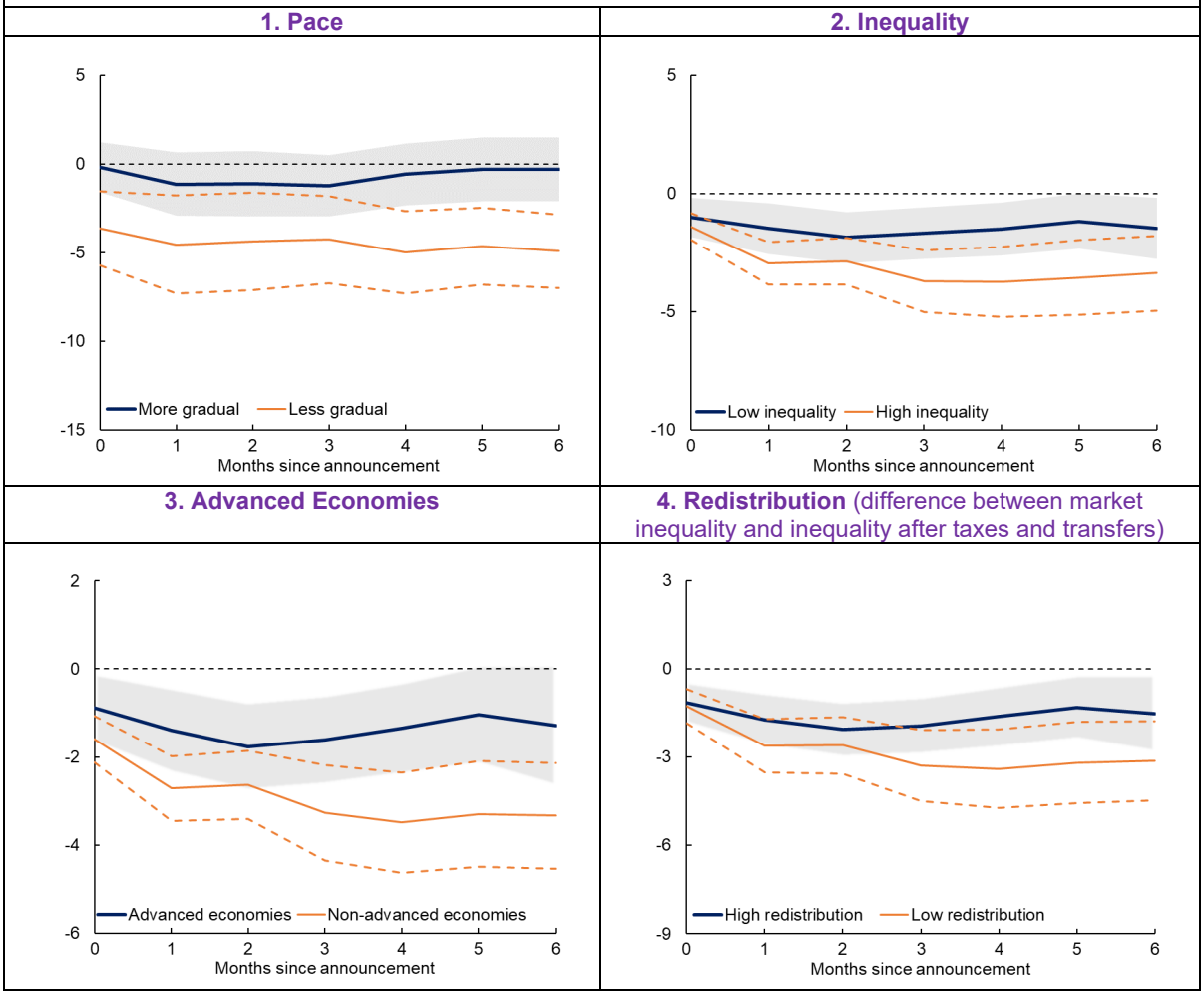
The term $F(z) = \frac{\exp(-\gamma z)}{1+\exp(-\gamma z)} \in (0,1)$ is a smooth transition function and $z_{i,t}$ indicates heterogeneity across countries/periods. For example, if $z_{i,t}$ is the growth rate of country i in month t, $F(z)$ can be interpreted as the probability a country grows at rate z in a given year, and the coefficients $\beta^{A}_{h,L}$ and $\beta^{A}_{h,H}$ capture the impact of announcements on sentiment under low and high economic growth, respectively. The results for key variables are shown in Figure 2.13 in the main text. Online Annex Figures 2.4.3 and

[16] Note that the same exercise can be run for other stages of measures as well; only the results on announcements are displayed as the findings for implementation are similar and due to space limitations.

2.4.4 illustrate the impact of measure announcements on additional economic, institutional, and reform design features, which are discussed in the main text.[17]

Factors Influencing Sentiment Toward Reforms

Online Annex Figure 2.4.3. Factors Shaping Sentiment for Fuel Price Measures



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The graphs depict the dynamic response of stakeholder sentiment (Households, CSOs, Unions, and Opposition) to announcements of fuel price measures under different conditions, along with the associated 90 percent confidence bands. Impulse response functions are estimated using local projections with a smooth transition function (equation 2.4.4). The horizontal axis represents months since the announcement (t = 0).

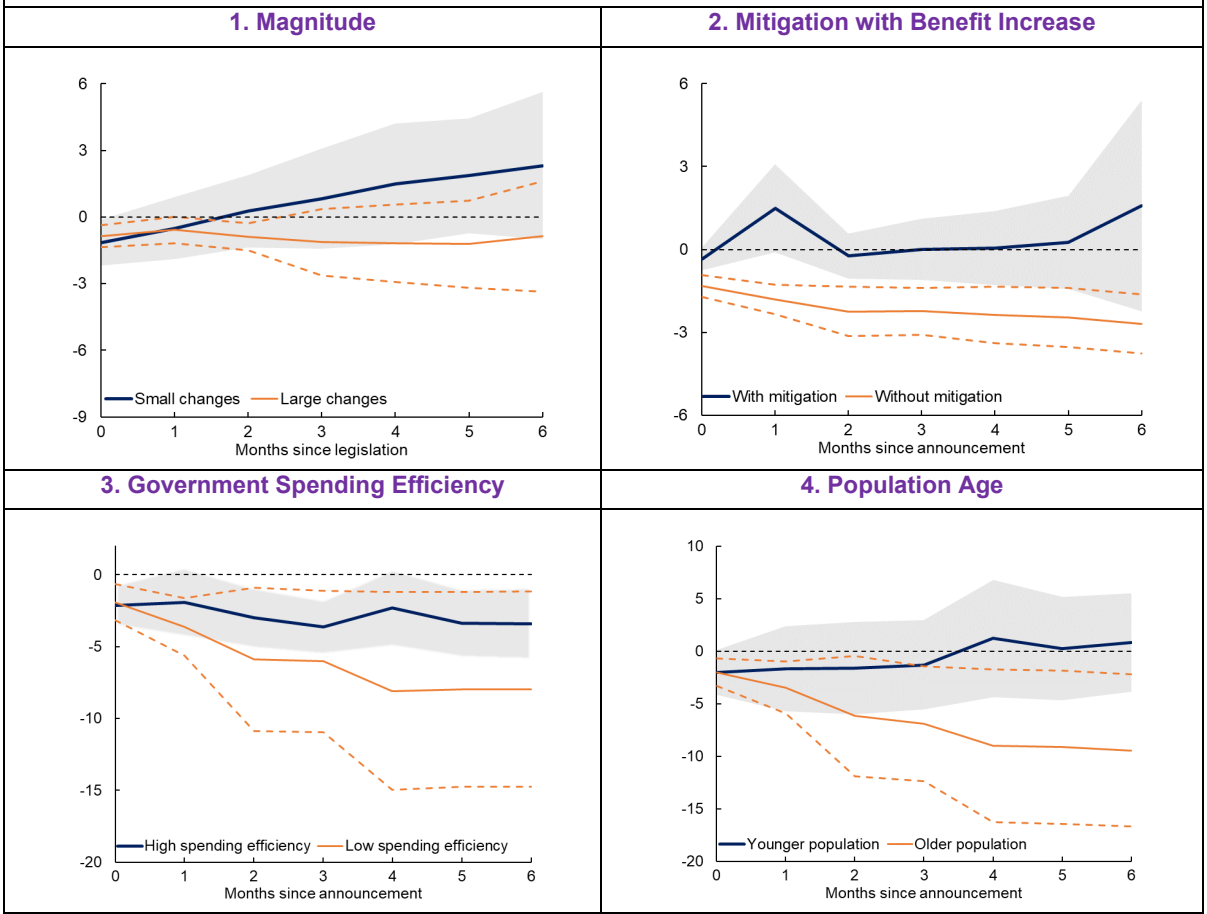
A triple interactions version of the model above is also estimated, where the same set of controls is kept but the indicator $A_{i,t}$ is interacted with two variables, $z_{i,t}$ and $w_{i,t}$. Formally, the interaction term can be written as $\beta^{A}_{h,\cdot} \cdot A_{i,t} \cdot \Lambda_{i,t}$, where $\beta^{A}_{h,\cdot}$ is a matrix of coefficients and $\Lambda_{i,t}$ collects the interactions:

$$\Lambda_{i,t} = \{F(z_{i,t})F(w_{i,t});\ F(z_{i,t})[1-F(w_{i,t})];\ [1-F(z_{i,t})]F(w_{i,t});\ [1-F(z_{i,t})][1-F(w_{i,t})]\} \quad (2.4.7)$$

[17] In addition, countries with high media censorship exhibit a marginally lower drop in sentiment compared to those with greater press freedom, although this difference is not statistically significant.

This exercise focuses on the impact of fuel and pension measures on sentiment in environments where there is high/low economic growth and high/low corruption indicators.

Online Annex Figure 2.4.4. Factors Shaping Sentiment for Pension Age Measures



Sources: Factiva; Global Pension Reform Database; and IMF staff estimates.
Notes: The graphs depict the dynamic response of stakeholder sentiment (Households, CSOs, Unions, and Opposition) to pension age measure reform stages under different conditions, along with the associated 90 percent confidence bands. Impulse response functions are estimated using local projections with a smooth transition function (equation 2.4.4). The horizontal axis represents months after the announcement (t=0). For magnitude of pension age measures, the dynamic response to legislation as often measure details are not revealed at the time of announcement.

Robustness Checks

One important concern is that sentiment may drive the announcement, implementation, legislation, or reversal of a measure/reform. For example, it is plausible that governments delay the announcement of a particular measure when they know that a section of the population is already unhappy, and an unpopular policy can trigger protests or other forms of political manifestations.

To address this issue, the chapter employs an Augmented Inverse Probability Weighted (AIPW; see Jorda and Taylor, 2016). The AIPW estimator consists of two stages. The first stage estimates the *probability of treatment,* $P(T_{i,t}|X_{i,t})$, given a set of covariates. In this application, the chapter focuses on the

announcement of measures only (due to space limitations), so the 'treatment' variable refers to measure announcements $T_{i,t} = A_{i,t}$. To mimic the results in the chapter, the stacked regressions specification is once again adopted, where the sentiment of households, CSOs, unions and opposition are analyzed.

This probability of treatment is estimated through a relatively parsimonious probit model, where the covariates $X_{i,t}$ include two lags of the normalized sentiment scores (of the four stakeholders identified above) and a series of macroeconomic indicators. The macroeconomic indicators contain the rate of inflation and GDP growth, which measure overall economic conditions in a country, plus a set of specific variables that pertain to the reform type. For energy subsidy measures, an indicator for IMF programs, the gap between international and local diesel prices, and the annual growth in international diesel prices are included as explanatory variables.[18] In the case of pension age measures, the country's fiscal balance and debt (both as a ratio of GDP) are included.

Despite the cross-country nature of the data and the parsimonious model used to estimate the probability of announcements in the first stage, the model has a relatively high predictive power, with an AUROC (area under the receiver operating characteristic curve) of about 0.66 in the case of energy subsidy measures and 0.62 in the case of pension measures. Re-weighting the sample using the inverse of the estimated probabilities leads also to a better balance between the treatment and control groups (defined according to the value of $T_{i,t}$).[19] The second stage of the AIPW estimator uses equation (2.4.1) to produce an estimate of $\Delta y_{i,t+h}$ for each value of the treatment indicator, denoted by $\hat{m}_{i,t+h}(T_{i,t})$—that is, $\hat{m}_{i,t+h}(1)$ estimates $\Delta y_{i,t+h}$ when treated, and $\hat{m}_{i,t+h}(0)$ estimates $\Delta y_{i,t+h}$when untreated, all else constant. The average treatment effect is then calculated as:

$$ATE_h = \frac{1}{n}\sum_{i,t}\left\{\left[\frac{T_{i,t}\Delta y_{i,t+h}}{\hat{p}_{i,t}} - \frac{(1-T_{i,t})\Delta y_{i,t+h}}{1-\hat{p}_{i,t}}\right] - \frac{T_{i,t}-\hat{p}_{i,t}}{\hat{p}_{i,t}(1-\hat{p}_{i,t})}\left[(1-\hat{p}_{i,t})\hat{m}_{i,t+h}(1) + \hat{p}_{i,t}\hat{m}_{i,t+h}(0)\right]\right\} \quad (2.4.8)$$

where n is the total number of observations and $\hat{p}_{i,t}$ is the estimated probability of treatment from the first stage (to avoid extreme values in the inverse-probability-weighting, only values of $\hat{p}_{i,t} \in (10^{-4}, 1-10^{-4})$ are considered). Intuitively, the average treatment effect above consists of the difference in weighted outcomes (using the inverse probability as a weight), controlling for the effect of covariates through $\hat{m}_{i,t+h}(1)$ and $\hat{m}_{i,t+h}(0)$. This estimator consistently estimates the ATE under the assumption of selection on observables, and is "doubly robust", meaning that it remains consistent if either the first or the second stage models are correctly specified (Glynn and Quinn, 2010).

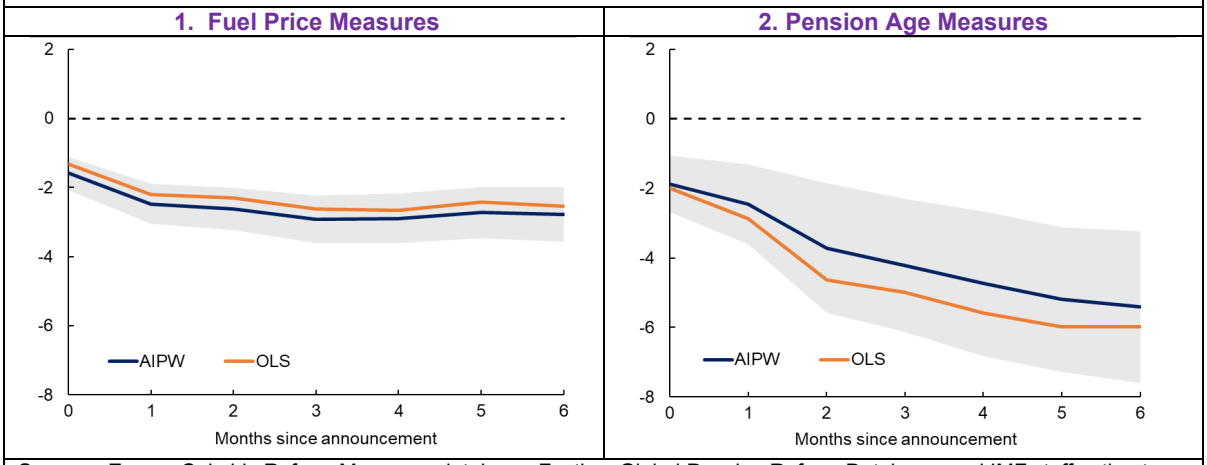
The estimated treatment effects are shown in Online Annex Figure 2.4.5. They are largely consistent with the results shown in the main text of the chapter, sometimes even surpassing the effects shown there, as the OLS estimation can be biased towards zero if sentiment influences the probability of treatment. Given that this bias is nevertheless small, and taking into account that other specifications such as triple interactions and other sample splits can be cumbersome to estimate with an AIPW (since the ATE of all possible combinations of the interacted variables need to be computed separately using the method above),

[18] To account for perennial country differences, the growth rate and diesel price gaps are transformed into a country specific z-score, by removing the country average and dividing by its standard deviation.

[19] To arrive at this conclusion, the means and variances of all variables used as regressors in the probit model are calculated for the treated and untreated observations. In almost every case, the distance between the means/variances in the treated and untreated samples is smaller when inverse probabilities are used as weights.

the chapter opts to keep the OLS as the baseline specification and use the AIPW as a robustness check to alleviate possible concerns about endogeneity or selection bias.

Online Annex Figure 2.4.5. Impact of Announcement of Measures on Sentiment (AIPW Estimates)



Sources: Energy Subsidy Reform Measures database; Factiva; Global Pension Reform Database; and IMF staff estimates.
Notes: The impulse response shows the cumulative impact of announcement in fuel price measures (left panel) and pension measures (right panel) on pooled stakeholder sentiment (Households, CSOs, Unions, Opposition). The model accounts for prior sentiment, and fixed effects for stakeholder-by-country and stakeholder-by-year. Impacts are calculated using the average treatment effect derived from an AIPW estimator and the error bands indicate the 90 percent confidence interval around those estimates. The local projection/OLS estimates are also shown for comparison.

Online Annex 2.5 Case Studies of Energy Subsidy and Pension Measures[20]

This Online Annex presents case studies of energy subsidy measures from Colombia, France, and Morocco as well as pension age measures from Australia, Germany and Uruguay which provide valuable insights into the effective design and implementation of reform measures.

Colombia: A Partially Successful Reform

A. Context

In Colombia, fossil fuel consumer prices have historically been regulated to shield final consumers from international oil price variations. This protection is provided through a smoothing mechanism applied to fuel pricing formulas financed by a price stabilization fund (Fondo de Estabilización de Precios de los Combustibles - FEPC). However, successive governments have not consistently implemented this mechanism, leading to persistent deficits for the FEPC from its inception in 2007 and up until 2023 (with surpluses only in 2008, 2009 and 2020). The fund's deficit increased from an average of about 0.2 percent of GDP between 2014 and 2020 to 1 percent of GDP in 2021, 2.7 percent of GDP in 2022 and 1.1 percent of GDP in 2023. This situation has resulted in significant government expenditures to cover the price difference to fuel producers and importers, particularly the vertically integrated national oil company Ecopetrol, which holds the largest domestic market share.[21]

To address this issue, the government initiated a gradual increase in gasoline prices to align them with international prices, raising domestic gasoline prices by about 60 percent from September 2022 to November 2023, triggering a heightened media debate (Online Annex Figure 2.5.1).

B. Key Drivers

Colombia's economic context has been characterized by a significant widening of the current account deficit since 2020, driven by high public sector consumption and investment needs to address the impacts of COVID-19 and support post-pandemic recovery. In addition, the country experienced less favorable external financing conditions, reflected in increased risk premiums, currency depreciation, and inflationary pressures.

In 2022, a progressive party won the presidential elections, advocating for significant social reforms. However, the widening fuel price gaps following the 2022 energy crisis and the peso's devaluation escalated the costs of fuel subsidies.

C. Political Economy Considerations

From a political economy perspective, reducing gasoline subsidies was seen as politically feasible for creating fiscal space in 2023. First, the incoming government could leverage political capital from voters who had favored its social agenda along with a broad communication campaign against subsidies initiated by the previous government, and backed up by international institutions, including the IMF.
Second, the initial focus on removing the gasoline subsidy would have limited inflationary effects—usually detrimental to poor households—because the transport sector primarily relies on diesel, whose price remained unchanged. Third, stakeholders in the fuel sector, chiefly Ecopetrol, supported the resolution of part of the government's arrears, especially as the new government aimed to continue reducing budget reliance on fossil fuel revenues. Finally, the incoming government effectively translated a campaign

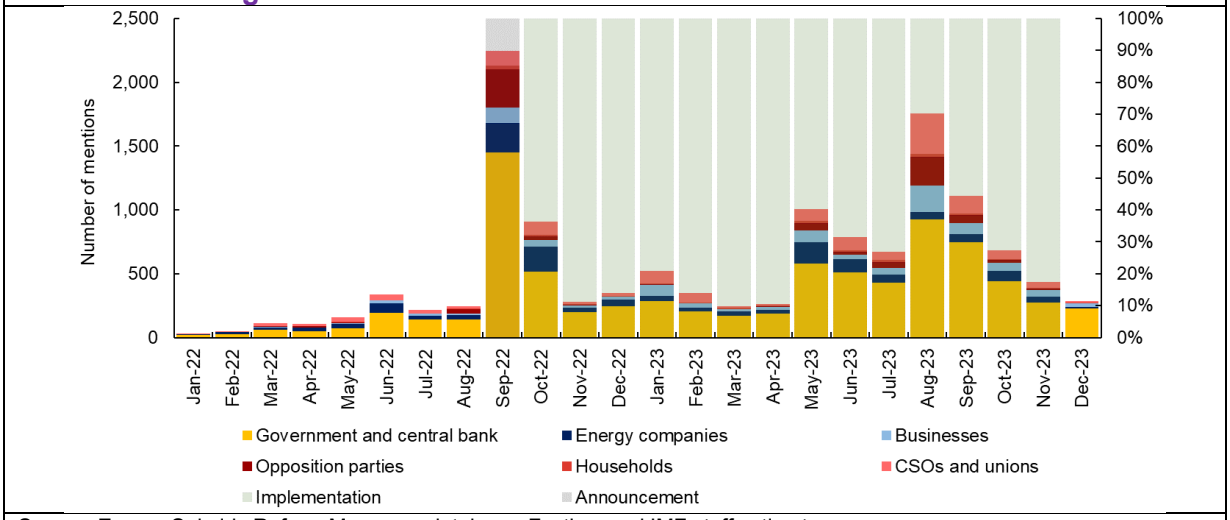
[20] Prepared by Nusrat Chowdhury, Christoph Freudenberg, Samir Jahan, Julieth Pico-Mejia and Delphine Prady.

[21] Comité Autónomo de la Regla Fiscal (2022).

promise, with strong media coverage (Online Annex Figure 2.5.2), into action, breaking the cycle of "announcement not followed by implementation" and gaining public goodwill.

The initial focus on removing gasoline subsidies rather than diesel allowed the government to achieve some fiscal savings (about 0.5 percent of GDP; IMF 2024), while maintaining a focus on a broader reform agenda and mitigating the risk of reform fatigue, as key social programs, including pensions, were also undergoing changes. Unlike gasoline, diesel consumption is less regressive and has more uniform indirect effects on household budgets through transportation costs, which are harder to mitigate in the short term. However, the continued delay of the diesel subsidy reform remains a substantial fiscal drag (IMF 2024).

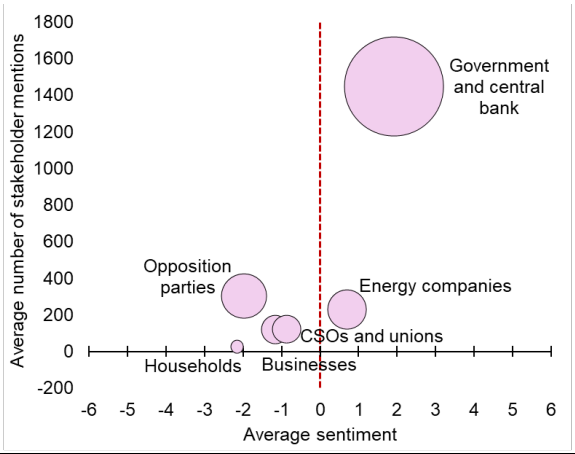
Online Annex Figure 2.5.1 Number of Mentions of Stakeholders in News Outlets



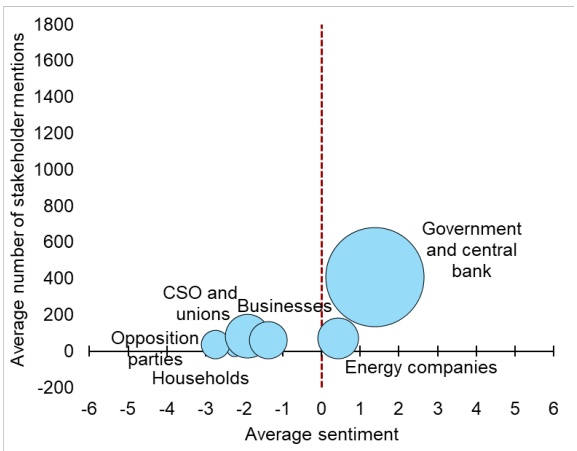
Source: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The light gray shade areas indicate the months when the measures were announced, while the light green shade represents the implementation period.

Online Annex Figure 2.5.2. Evolution of Stakeholders' Sentiment Between Reform Announcement and Implementation

a. Announcement



b. Implementation



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

France: Industrial and Fiscal Choices at the Decarbonization Crossroad

A. Context

France has one of the highest levels of dieselization in the European Union, particularly in road transport, a result of decades of energy policy choices. Diesel subsidies, established through preferential taxation since the 1950s, aimed to promote agricultural mechanization and support heavy road transport. This policy also facilitated the repurposing of fuel stocks as the electricity sector transitioned from fossil fuels to nuclear energy and encouraged domestic automakers to specialize in diesel engines. Consequently, diesel demand surpassed gasoline, with road transport accounting for 75 percent of refined petroleum consumption in France in 2018, reflecting a diesel/gasoline split of 77-23 percent, compared to the EU average of 65-35 percent (FuelsEurope 2023). This dieselization has led to tangible regional economic impacts, creating industrial job opportunities, and enabling affordable commutes outside metropolitan areas. The refining industry directly employs about 7,000 workers in 2019, and supports an additional 30,000 jobs indirectly across related sectors. Affordable diesel and a dense network of gas stations have allowed households to reside outside urban centers, where housing is cheaper but public transport access is limited.

The introduction of a carbon tax in 2014 provided a reliable revenue source but disproportionately affected diesel consumption due to its higher CO2 emissions, impacting peri-urban and rural households more significantly. From 2014 to 2017, revenue from the Domestic Consumption Tax on Energy Products (TICPE) grew by about 8 percent annually, reaching 1.3 percent of GDP, driven by a gradually increasing carbon component and the planned convergence of TICPE rates for diesel and gasoline.[22]

Three-quarters of the additional revenue was earmarked for a business tax credit (CICE). Car reliance for commuting remained high, with 60 percent of metropolitan residents using cars compared to 90 percent in rural areas (INSEE 2021). The burden of fuel costs varied across income groups; in 2017, households spent an average of 3 percent of their disposable income on fuel, while low-income households spent over 5 percent.

B. Key Drivers

Shortly after 2017 election, the government initiated structural reforms aimed at enhancing labor market flexibility, competitiveness and reducing public spending. These reforms included changes to the labor code, reductions in the labor-tax wedge, and tax relief measures (e.g., lower social contributions and accommodation taxes). To offset the fiscal costs, the government streamlined public spending, while increasing taxes on tobacco, pensions, corporate income and accelerating the convergence of diesel excise with that of gasoline. Initially, the welfare impacts of higher diesel taxes was limited due to low international fuel prices in early 2018. However, as global fuel prices rose later that year, the tax increases became more apparent, leading to increased public dissatisfaction.

By the end of 2018, in a context of rising fuel prices, the government proposed a budget law that confirmed the diesel tax increase. Concerned with the regressive impact of the carbon tax on diesel users, and despite relatively robust economic growth from 2017 to 2019, the grassroots "Yellow Vests" movement emerged, driven by perceived inequities in government policies, culminating in mass protests in November 2018 (Schubert 2019).

[22] The convergence consisted in a €1 per hectoliter increase in the diesel rate and a €1 per hectoliter decrease in the petrol rate in 2016 and 2017. The 2018 budget law planned to accelerate this convergence by increasing the diesel tax by €2.6 per hectoliter.

C. Political Economy Considerations

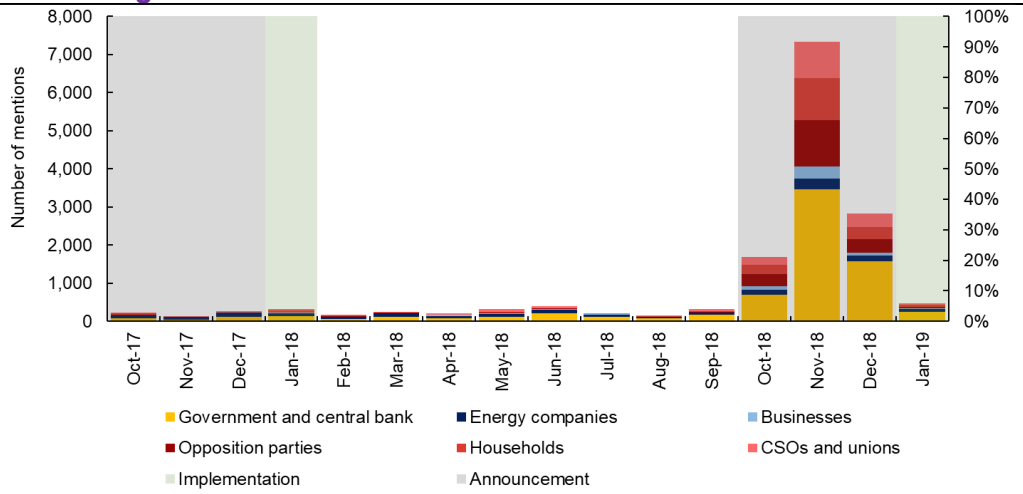
Between November 2018 and May 2019, tens of thousands of workers and retirees occupied traffic circles around the clock on the edge of small and midsized towns, voicing concerns about the inequitable burden of "fighting climate change". These protests highlighted the disparity between rural and peri-urban residents, who relied on cars for longer commutes, and city-dwellers with greater mobility options.[23] The movement embodied a social divide that coincided with a sharp political divide and increased media attention (Online Annex Figure 2.5.3).

The 2019 budget could not rally sufficient supporters. As tensions rose over the planned increase in diesel tax—driven by fuel pump prices reflecting higher supply costs—the government stressed the role of international oil markets in fuel prices' volatility. At the same time, the negative sentiment among CSOs and unions toward the diesel tax and its objectives swung between the announcement and the implementation of the 2019 budget (Online Annex Figure 2.5.4).

The government eventually froze diesel excise tax increase at their 2018 levels, halting the planned convergence of diesel and gasoline tax rates. Despite accompanying measures, such as tax cuts targeting the middle classes, the reform reversal failed to restore public confidence.

Despite ongoing political support for the carbon tax across two successive administrations, broader backing from socioeconomic stakeholders quickly diminished when the acceleration of diesel taxation coincided with rising international prices (timing effect) and the introduction of additional structural reforms by the new administration (reform fatigue effect). The environmental benefits from the carbon tax lacked strong champions and were rapidly diluted.

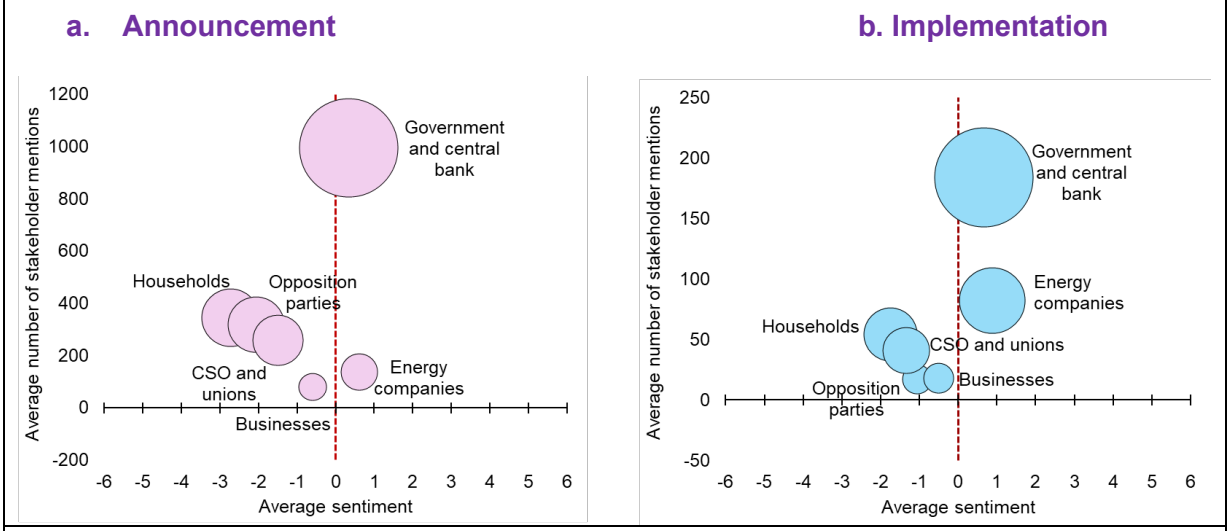
Online Annex Figure 2.5.3. Number of Mentions of Stakeholders in News Outlets



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The light gray shade areas indicate the months when the measures were announced, while the light green shade represents the implementation period.

[23] This occupation was complemented by weekly demonstrations in large cities, including Paris.

Online Annex Figure 2.5.4. Evolution of Stakeholders' Sentiment Between Reform Announcement and Implementation



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

Morocco: Paced and Gradually Implemented Reform

A. Context

Longstanding fuel subsidies compounded Morocco energy dependency and structural vulnerability to international oil price volatility. Between 2000 and 2012, robust real GDP growth of 5 percent per year led to a 50 percent increase in gasoline consumption and a 75 percent rise in fuel oil demand, primarily for electricity generation in thermal plants. These subsidies encouraged higher fossil fuel consumption instead of diversifying energy sources. As an oil-importing economy with a pegged exchange rate, the inability to pass through international price volatility to consumers reduced budget predictability and depleted international reserves.

The persistent subsidies discouraged competition, entrenched dominant players in the fuel market, and undermined institutional credibility. The 1990s privatization of the fuel sector did not lead to consumer price flexibility, stifling competition from new importers and distributors The main refinery (SAMIR) covered most domestic consumption and was shielded by specific tariffs, which were gradually removed only by 2009. Additionally, the government failed to make regular adjustments to consumers fuel prices, leading to arrears with fuel distributors. Only large distributors with access to credit could absorb these revenue shortfalls, fostering an oligopolistic fuel distribution.[24] These failures to implement structural reforms heightened public concerns about governance, with 83 percent of respondents in a 2012 Arab Barometer survey believing that "corruption was widespread within state institutions".

Prior to the 2012 subsidy reform, food and fuel subsidies reached 6 percent of GDP, with fuel subsidies accounting for more than 90 percent. Public spending on education and health stood at 5.6 and 2.4 percent of GDP, respectively, above regional averages but with mixed results. Income inequality remained high, with Morocco ranking among the most unequal in the region in 2012. High unemployment, low labor force

[24] Only five distributors controlled 81 percent and 74 percent of the gasoline and diesel markets respectively in 2012.

participation, and a regressive redistributive system anchored in subsidies exacerbated these inequalities. Notably, 42 percent of subsidies for gasoline and diesel went to households in the top quintile, while only 18 percent benefited the bottom 40 percent. Subsidies for LPG, primarily used for cooking, were more evenly distributed but still regressive.

B. Key Drivers

In November 2011, a new opposition party won the general elections, running a platform that prioritized social and development needs and the elimination of regressive fuel subsidies. In the wake of the Arab Spring movement, constitutional reform in the country brought to power "Parti de la Justice et du Développement" (PJD). The PJD advanced a strong reform agenda focused on addressing poor and middle-class concerns. The incoming government outlined a five-year plan aimed at creating fiscal space for social and economic reforms with the elimination of regressive fuel subsidies as a key component.

In 2012, rising international oil prices severely impacted Morocco's energy bill, straining fiscal and external accounts. The current account deficit soared to 10.8 percent of GDP in 2012, down from a surplus of 2.3 percent in 2006, while foreign exchange reserves declined significantly. The overall budget deficit increased from 1.6 percent of GDP in 2009 to 6.6 percent in 2012, driven largely by subsidies, which rose from 1.6 percent of GDP in 2009 to 6 percent in 2012. In response, the new government implemented its first fuel price increase in June 2012 and announced a 25 percent cut to its planned 2013 investment budget, emphasizing the tradeoff between sustaining subsidies and financing growth-enhancing public investments.

C. Political Economy Considerations

After the emergency increase in fuel prices in June 2012, the new government implemented gradual reform that led to the elimination of fuel subsidies by December 2015. The macro-fiscal crisis generated by the ballooning fuel subsidy bill, coupled with the public demand for action, sealed the subsidies' fate. While the fiscal cost of subsidies declined from about 6 percent in 2012 to lower than 2 percent in 2015, about half of this reduction was due to the lower price of imported fuel products. The government careful reform design further facilitated a smooth rollout from September 2013 (new partial indexation of pump prices with international reference prices) and December 2015 (fuel price liberalization).

Ownership: The government capitalized on a strong public desire for structural change, breaking away from older political parties that had failed to complete fuel price reforms initiated during the 1990s privatization wave.

Paced medium-term agenda: The reform unfolded over more than 2 years, allowing the government to clearly communicate the purpose and achievements of each milestone.

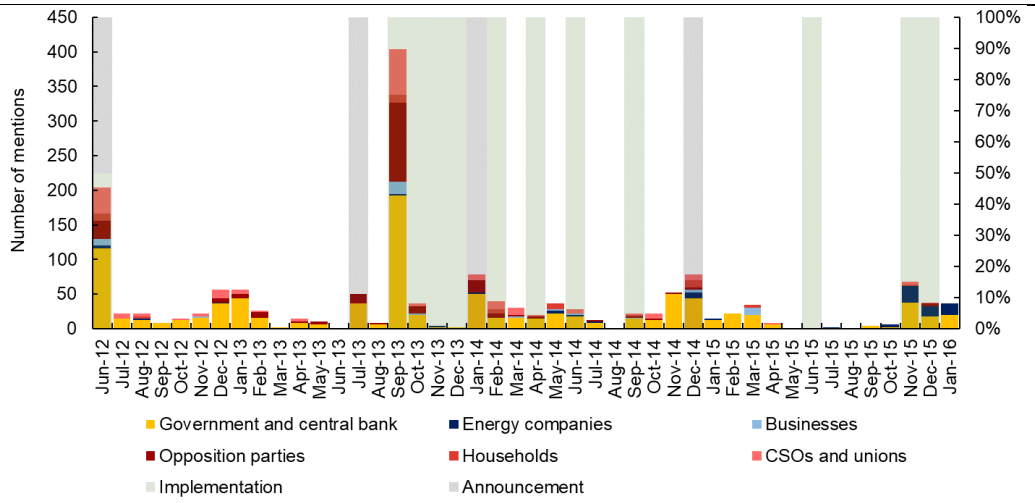
Accompanying measures: While the reform included few direct measures to support vulnerable households (i.e., 10 percent of savings were allocated to existing social assistance programs), its gradual design (excluding butane gas), and successful negotiations with the transportation sector were significant. The government established price moderation agreements with transporters and committed to quarterly financial support to offset diesel price increase. This agreement represented about 12 percent of the savings generated from the partial indexation and helped contain the indirect effects of fuel price increases, especially among poorer families (Agueniou 2013). The fall in international fuel prices that started in 2014 also numbed negative welfare impacts from second round price effects as it contained inflationary pressures.

Strategic communication: The authorities implemented a comprehensive and well-orchestrated communications strategy to accompany the reform with public TV and radio debates, newspaper articles, advertisements, and clear explanations of the economic rationale behind price adjustments and the multiple benefits to society (El-Katiri 2017). The government effectively facilitated dialogue, allowing reform opponents to

voice their concerns. Public expressions of discontent declined after the first two significant price increases of June 2012 and September 2013 (Online Annex Figure 2.5.5).

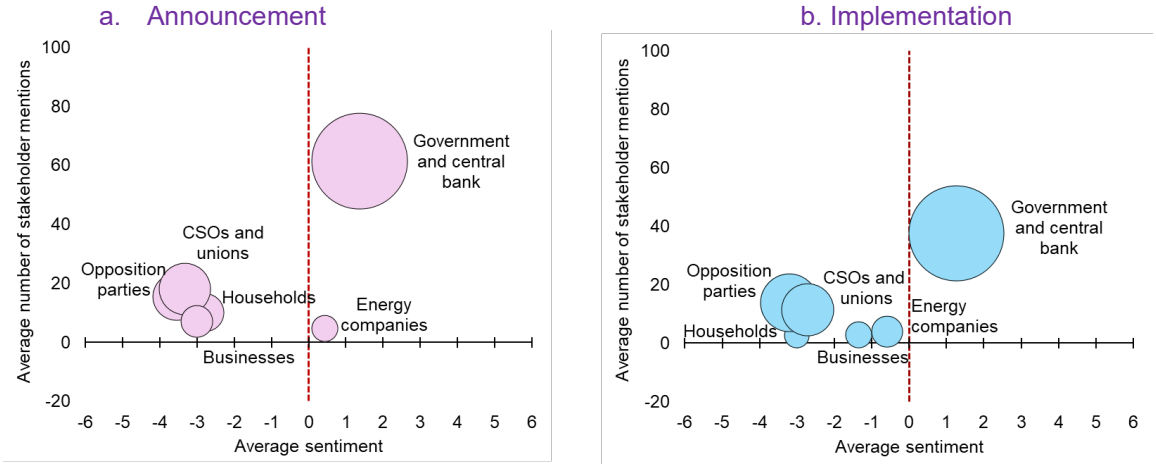
Between the announcement and implementation, the sentiment of businesses shifted toward neutrality, partly due to successful negotiations with the government (Online Annex Figure 2.5.6). Fuel companies generally supported the reform, although the refinery SAMIR opposed it due to concerns about losing its dominant market position amid financial difficulties. Meanwhile households' sentiment remained negative and unchanged throughout the reform milestones. The notable decrease in overall discontent further underscores the effectiveness of the government's communication strategy.

Online Annex Figure 2.5.5. Number of Mentions of Stakeholders in News Outlets



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The light gray shade areas indicate the months when the measures were announced, while the light green shade represents the implementation period.

Online Annex Figure 2.5.6. Evolution of Stakeholders' Sentiment Between Reform Announcement and Implementation



Sources: Energy Subsidy Reform Measures database; Factiva; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

Australia: Effective Communication and Policy Framing

A. Context

At the onset of the 2009 global recession, Australia was in a strong economic position, characterized by nearly two decades of continuous growth, supported by sound macroeconomic policies, structural reforms, and a stable external environment. The preceding commodity price boom significantly boosted national income, lowering unemployment to historical lows but creating inflationary pressures due to stretched productive capacity. Notably, the crisis did not hit real activity in Australia as severely as in many other advanced economies.

A review of the pension system began in 2007, focusing on balancing long-term fiscal sustainability considerations, highlighted by the 2007 Intergenerational Report, and benefit adequacy concerns, emphasized by the Harmer Review launched in May 2008 (Commonwealth of Australia, 2007; Harmer, 2009). The Harmer review involved senior government officials and policy experts, including representatives from the Treasury and the Department of the Prime Minister and Cabinet. Consultations engaged labor unions, business associations, and academic experts to address stakeholder concerns at an early stage of the reform process. The Harmer Review's findings were released in May 2009 and provided the blueprint for the 2009 pension reform.

B. Key Drivers

In May 2009, the Australian government announced a comprehensive pension reform, which was legislated in September 2009. The reform aimed to balance pension adequacy with long-term fiscal sustainability, framed under the goal of providing 'Secure and Sustainable Pensions'. A key measure was the gradual increase of the Age Pension age from 65 to 67 years, to be implemented between 2017 and 2023, allowing for a transition period of at least eight years for those affected.

The reform also increased the non-contributory, means-tested Age Pension by approximately 1,700 AUD per year for singles and 527 AUD per year for couples, focusing on enhancing support for low-income single pensioners. To target benefits more effectively, the pension income test was tightened, ensuring fiscal resources were directed toward those in greatest need, while containing overall expenditures. Additionally, the pension indexation mechanism was modified, with the introduction of the Pensioner and Beneficiary Living Cost Index (PBLCI), which more accurately reflected retiree-specific consumption patterns. While the reform was expected to increase net pension expenditures in the short to medium term, pension-related fiscal outlays are projected to decline substantially in the longer term. Moreover, the reform is expected to further increase medium-term fiscal saving by boosting labor force participation and GDP (Kudrna and Woodland, 2011).

C. Political Economy Considerations

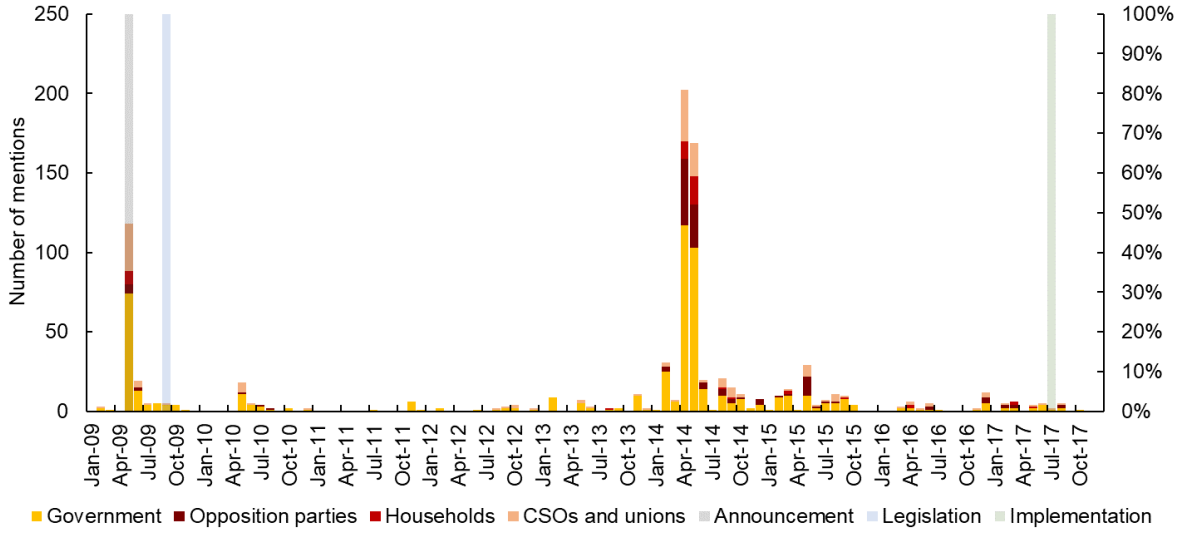
The announcement of the pension reform in May 2009 garnered significant media attention (Online Annex Figure 2.5.7), with the government portraying the measures in a positive light, while trade unions, households, and the opposition party voiced concerns, reflecting negative sentiment (Online Annex Figure 2.5.8). Public and media attention waned during the legislation month of September 2009, leading to relatively neutral perceptions by the main stakeholders. In the following years, adjustments to the pension age resurfaced, particularly in 2013, 2015, and 2016, when the Liberal-National government proposed raising the pension age to 70 years. These proposals faced strong public opposition and were ultimately not legislated.

The 2009 Australian pension reform represents a best-practice example in terms of communication, policy packaging, and framing of pension age adjustments. The government fostered strong political ownership,

with the Prime Minister and Treasurer actively communicating the reform through television and radio appearances, emphasizing its necessity. Government officials engaged with print and broadcast media, giving interviews in major newspapers, while advertisements, brochures, and online fact sheets framed the reform as fair, fiscally responsible, and essential (e.g. Commonwealth of Australia, 2009).

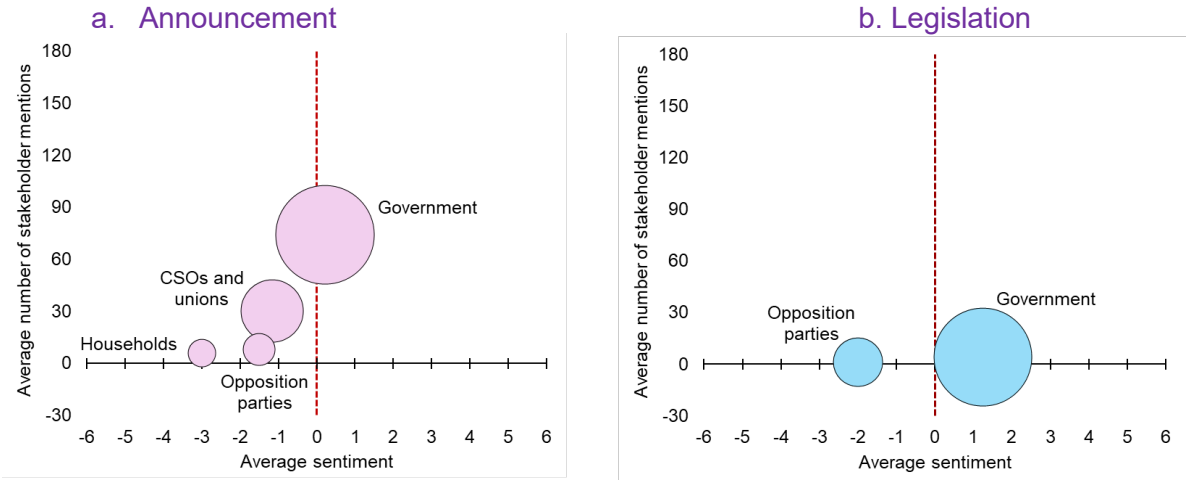
The timing of the pension age announcement coincided with the release of the Harmer Review, which highlighted the demographic and fiscal challenges necessitating reform. The pension age increase was presented as a necessary response to rising life expectancy and benefit duration since the establishment of the Age Pension in 1909. Comparisons to international reform trends in OECD countries, including the United States, Germany, and the United Kingdom, further reinforced the rationale for reform. The simultaneous enhancement of pension benefits for low-income retirees helped garner broader support, particularly addressing trade unions concerns that raising the pension age could disproportionately affect low-income workers, especially those in physically demanding jobs who might struggle to extend their working lives.

Online Annex Figure 2.5.7. Number of Mentions of Stakeholders in News Outlets



Sources: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: Only articles covering pension age changes are included. The light gray shaded areas indicate the announcement months, the light blue area marks the legislation month, and the light green shade represents the implementation period.

Online Annex Figure 2.5.8. Stakeholders' Sentiment at Reform Announcement and Legislation



Sources: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

Germany: Successful pension age implementation followed by partial reversal

A. Context

In 2003, Germany faced a challenging macroeconomic context characterized by three consecutive years of stagnation in output and a budget deficit that exceeded the 3 percent of GDP limit set by the European Union's Stability and Growth Pact. The economic landscape was further complicated by rising unemployment rates, which prompted urgent calls for action.

In this context, following a narrow electoral win in 2002, the German government introduced a comprehensive reform strategy under the Agenda 2010, aimed at revitalizing the economy through structural reforms. These reforms included reducing jobless entitlements and reforming social programs to manage non-wage labor costs effectively. Additionally, the strategy focused on fiscal consolidation by cutting subsidies and tax expenditures while advancing scheduled tax relief to stimulate domestic demand.

B. Key Drivers

Pension reform fit into the reform strategy as it was essential for alleviating the financial pressures on the budget. By restructuring the pension system to encourage later retirement, penalize early exit, and link annual increases to demographic factors, the government sought to ensure long-term sustainability of the pension system.

In November 2002, the Rürup Commission was convened by the German government to tackle these pressing issues and proposed a series of reforms aimed at stabilizing the pension system. Key recommendations unveiled August 2003 included gradually increasing the state retirement age from 65 to 67 between 2011 and 2035, penalizing early retirement, and implementing a sustainability factor to adjust annual pension increases based on the ratio of retirees to contributors in the system. These measures were seen as crucial to ensuring the long-term viability of the pension system and preventing contribution rates from skyrocketing to unsustainable levels.

The Rürup Commission's recommendations regarding pension reforms were largely enacted into legislation in 2004, with the exception of the gradual increase of the retirement age from 65 to 67. With improved

economic conditions, the new government advanced the reform, aligning closely with the commission's proposals. Legislation passed in March 2007 mandated the gradual increase in the statutory retirement age from 65 to 67 between 2012 and 2029. According to the fiscal estimates provided in the law (Bundestag, 2006a), the increase in retirement ages will lower contribution rates by 0.5 percentage points in 2030, when the reform will be fully implemented, while central government budget transfers are expected to be reduced by about 4 bn. Euro in 2030. This corresponds to a reduction in contribution payments of around 0.2 percent of GDP and of government budget transfers of around 0.1 percent of GDP in 2030, with similar fiscal gains expected in following years.

C. Political Economy Considerations

Efforts were made to inform the public about the necessity of these pension reforms, as discussions on the public pension system had been ongoing since the early 1990s. Governments over the years highlighted themes such as population aging and high labor costs, emphasizing the importance of the reforms.

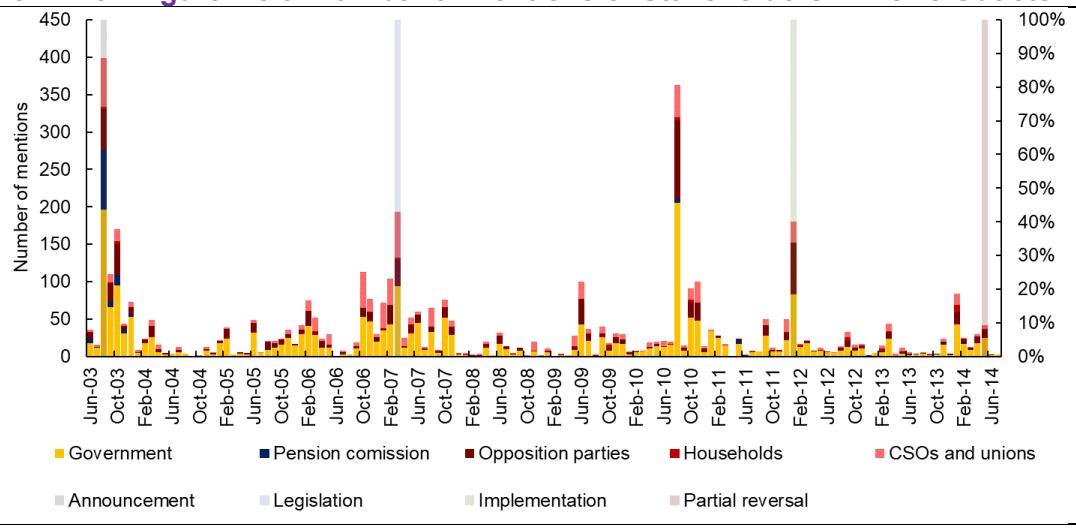
The delay in introducing reforms from 2003 and 2007 due to high unemployment and poor economic conditions, likely increased the acceptability of the 2007 reform. Key efforts ensured that pension reform remained a bipartisan issue, with the Labor Minister, a social democrat with strong ties to trade unions, actively supporting the policy to reduce resistance from labor organizations. The gradual implementation timeline, which raised the retirement age by one month each year from 2012 to 2023, followed by a slightly faster pace thereafter further facilitated acceptance. Additionally, measures were introduced to enhance access to rehabilitation, allowing individuals to work longer, and to better integrate older unemployed in the labor market (Initiative 50plus). The costs of a main component of these mitigating measures, the Initiative 50plus, were around 250 million Euro, equal to 0.01 percent of GDP in 2007 (Bundestag 2006b). Overall, the costs of these mitigating measures are expected to be more than compensated by the long-term fiscal gains (outlined above). The law mandated regular reporting to the German Parliament on the employment situation of older workers, enabling policymakers to evaluate the reform's effectiveness and make necessary adjustments, reinforcing a commitment to balance fiscal sustainability with social equity.

The German case also underscores the need for political consensus on the necessity of reform. The establishment of the independent Rürup Commission helped depoliticize the need for reform, fostering broad political consensus and easing the passage of the 2007 legislation. By 2014, though, the rationale for reform became politicized due to dissatisfaction with pension benefit adequacy and low immediate fiscal pressures, prompting the government to propose a partial reversal of the retirement age reform.

Political negotiations during the formation of a new government coalition and concerns over low benefit adequacy and rising old-age poverty prompted a partial reversal of the pension age reform in 2014 (Blum, 2019). The new law of 2014 allowed individuals with at least 45 years of contributions to retire early with a full pension, effectively reducing the legal retirement age by two years for about 30 percent of new retirees. Similar measures were subsequently adopted in other European countries, including Austria, France, Italy, Spain, and Sweden, significantly undermining the anticipated fiscal savings from earlier reforms.

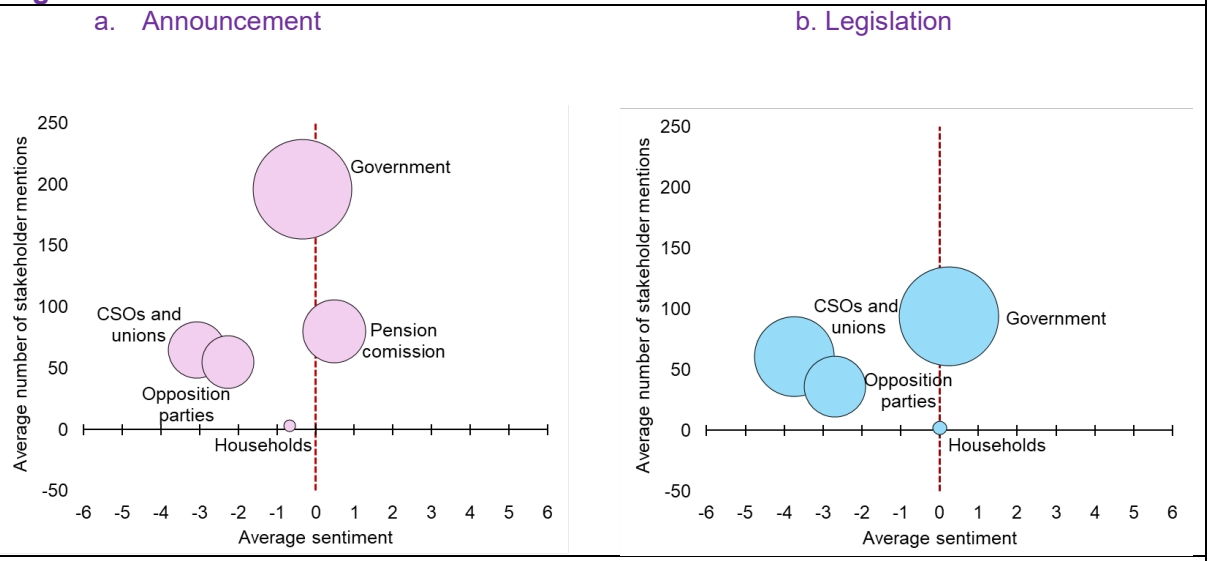
Media discourse surrounding the pension age reform in Germany was dynamic (Online Annex Figure 2.5.9), with sentiments reflecting the involvement of various stakeholders. The 2003 proposal by the commission to increase the statutory retirement age sparked public debate, with opposition parties, the pension commission, the unions and the government playing key roles (Online Annex Figure 2.5.10). An intensified discussion unfolded ahead of the legislative enactment in 2006–2007, with labor unions and opposition parties driving negative sentiments towards the reform. The implementation in January 2012 garnered limited media attention, while public discourse remained relatively quiet leading to the 2014 partial reversal, as critics, many from academia, did not raise their voices significantly.

Online Annex Figure 2.5.9. Number of Mentions of Stakeholders in News Outlets



Source: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: Only articles covering pension age changes are included. The light gray shaded areas indicate the announcement months, the light blue area marks the legislation month, and the light green shade represents the implementation period.

Online Annex Figure 2.5.10. Stakeholders' Sentiment at Reform Announcement and Legislation



Source: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

Uruguay: Sustainable pension reform despite resistance

A. Context

In early 2020, Uruguay faced significant fiscal challenges, with projected deficits of the Non-Financial Public sector rising to 3 percent of GDP in 2019. The new administration, which took office in March 2020, inherited a complex situation that required immediate action to restore fiscal balance while maintaining social stability. The political landscape was marked by a mandate for reform, as the new

government sought to address economic challenges. There was broad consensus among political factions regarding the need for structural reforms to enhance fiscal sustainability and economic growth.

B. Key Drivers

With pension spending reaching about 11 percent of GDP in 2019, pension reforms were prioritized to maintain the integrity of the social security system, especially in light of an aging population. Early action on pension reform was seen as essential to ensure sustainability and to free up resources for other critical areas.

The new government established the independent pension commission (Comisión de Expertos en Seguridad Social, CESS) in July 2020 to diagnose issues within the pension system and propose reforms. Members were selected through consultations with political parties and civil society organizations, ensuring bi-partisan representation that balanced technical needs with political feasibility. The commission's recommendations, published in November 2021, laid the groundwork for significant reform—the first since 1996. The reform is expected to substantially mitigate the growth trajectory of pension expenditures, particularly over the long term. By 2050, pension expenditures of the Banco de Previsión Social (BPS), the national social insurance institution, are projected to be approximately 1 percent of GDP lower, primarily driven by the phased increase in retirement ages (Ministry of Finance, 2023).

C. Political Economy Considerations

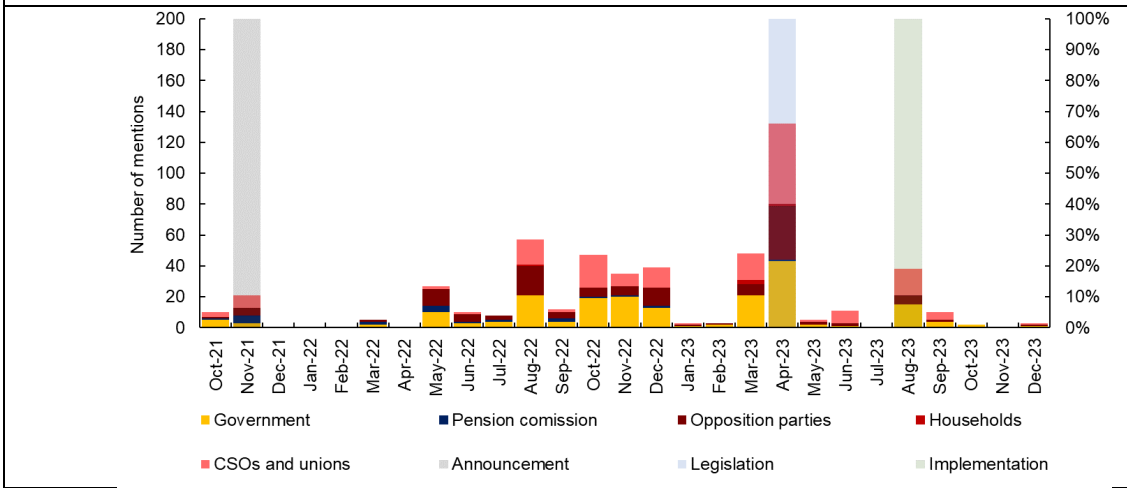
The commission framed the increase in the retirement age as essential for maintaining pension benefit levels, aligning with demand for minimum benefits identified in surveys. Engaging stakeholders, the commission utilized social media, aided by a professional communication expert, and emphasized quick responses to online debates. The commission educated journalists specializing in pension issues across various media platforms. To ease resistance, the commission allowed for a gradual increase in retirement age, exempted certain occupational schemes, and avoided contentious changes to pension financing.

President Lacalle Pou championed these proposals, making them central to his administration and securing support from the ruling coalition and the legislature. In April 2023 Parliament approved a pension bill, despite negative sentiments towards the reform by unions and the opposition party (Online Annex Figure 2.5.11). The new law raised the retirement age incrementally from 60 years (for those born before 1973) to 65 (for those born after 1976) with 30 years of work, with exemptions for those individuals with very long contribution or work histories, and those in physically demanding jobs (Ley No. 20.130, 2023).

Despite facing resistance, including a March 2023 poll showing 54 percent opposition (MercoPress, 2023) and labor strikes in April, the reform process continued. Public debate surged, reflected in increased media coverage, with opposition parties and unions leading the criticism (Online Annex Figure 2.5.12).

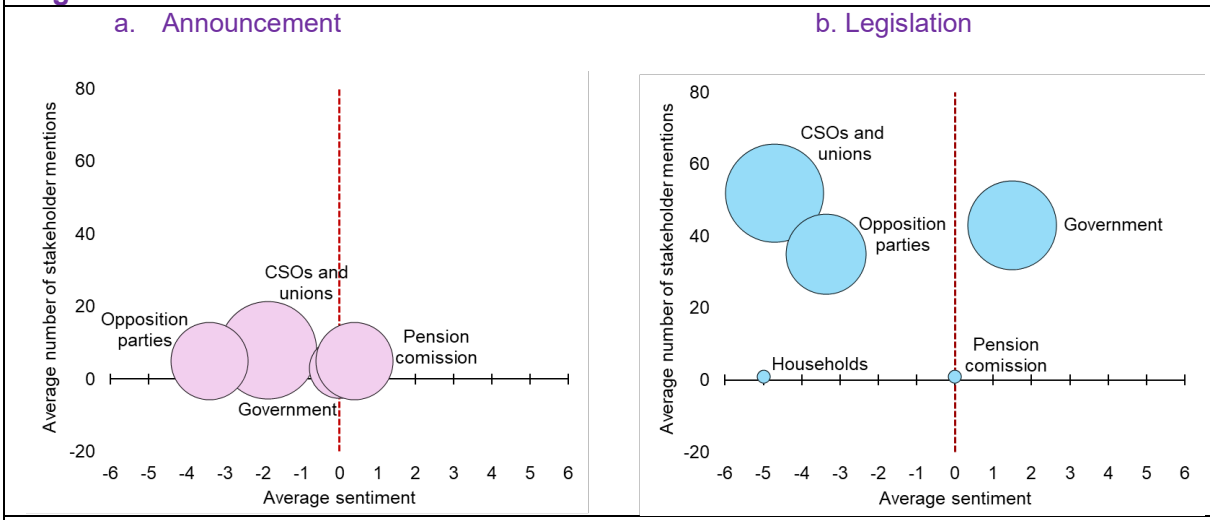
Attempts to reverse the reform failed, likely due to the proposed radical changes combined with presidential politics. In April 2024, a union backed by left-leaning parties initiated a referendum to reverse retirement age increases, prohibit the private pension system, and guarantee that no pension would fall below the national minimum wage (Montevideo Portal, 2024). The referendum, held alongside Presidential elections in October 2024, was ultimately rejected. Main presidential candidates cited the risk to fiscal sustainability, a pressing concern in a region that has a history of economic crises (The Economist, 2024). The failed reversal also stemmed from its association with radical pension reforms and the commitment to fiscal stability from both the outgoing President and leading candidates as well as the clear articulation of the need for reform, which helped alleviate public discontent with the changes. Transparent communication by the Ministry of Finance (2023) regarding the fiscal and welfare implications of the reform also contributed to enhancing public acceptance.

Online Annex Figure 2.5.11. Number of Mentions of Stakeholders in News Outlets



Source: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: Only articles covering pension age changes are included. The light gray shaded areas indicate the announcement months, the light blue area marks the legislation month, and the light green shade represents the implementation period.

Online Annex Figure 2.5.12. Stakeholders' Sentiment at Reform Announcement and Legislation



Source: Factiva; Global Pension Reform Database; and IMF staff estimates.
Note: The size of bubbles represents the number of mentions.

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