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Pension Reform Policy in Latin America: A Fuzzy-Set Qualitative Comparative Analysis

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ABSTRACT *Latin American countries have been at the forefront of pension privatization and since 2008 they have also pioneered reform reversals. Previous studies have focused on single cases or a small number of them, given that pension reform is a complex phenomenon arising from the combination of different causes. Using fuzzy-set Qualitative Comparative Analysis (fsQCA), the article analyzes a set of 32 pension reform cases in eight countries from the early 1990s until 2021. It finds four different pathways that combine institutional, structural and policy legacy conditions. It demonstrates that fsQCA is a useful tool for broader comparative policy work.*

Keywords: pensions; fsQCA; comparative; politics; institutions; Latin America

Introduction

Pension reforms have long been considered path-dependent processes par excellence, yet Latin America has challenged this approach as countries in the region have been at the forefront of both pension privatization ("first" reform wave) and reform reversals ("second" reform wave or re-reforms) (Orenstein 2011). The literature analyzing both reform waves is vast and provides useful analytical insights on the factors that shape them, especially with regard to structural causes, policy legacies and institutions (Kay 1999; Orenstein 2008; Datz and Dancsi 2013; Mesa Lago 2014; Baba 2015; Castiglioni

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2018; Borzutzky 2019; Carrera and Angelaki 2021; Kay and Borzutzky 2022; Niedzwiecki and Pribble 2023).

Most of these studies focus on either single or a small number of cases, while applying different methodological approaches and highlighting different factors to explain reform outcomes. We argue that as pension reform is a complex phenomenon resulting from the interaction of different causal conditions, the use of fuzzy-set Qualitative Comparative Analysis (fsQCA)[1] designed mainly for small to mid-sized *N* research designs allows us to account for *causal complexity* (where a combination of different causes may lead to an outcome of interest) and *equifinality* (whereby different configurations of causal conditions (paths) can lead to the same outcome). We thus analyze a set of 32 pension reforms in eight countries (Argentina, Bolivia, Brazil, Chile, Colombia, Mexico, Peru and Uruguay) from the early 1990s until 2021.

From a comparative perspective, scholars have debated whether it is possible to identify a single "Latin American welfare regime" or multiple ones (for a comprehensive discussion on welfare regime typology in the region see Cruz-Martínez et al. 2024). Notwithstanding the different typologies, it is possible to identify a certain homogeneity in the evolution of the welfare regimes, and pension systems, in the region. The introduction of social security legislation at the beginning of the twentieth century was followed by a period of expansion and consolidation of social security along the corporatist model. The diffusion of neoliberal ideas from the early 1980s resulted in the promotion of reforms that strengthened individualism through the privatization of pension systems (albeit to varying degrees). The economic boom and the irruption of the left since 2000 resulted in re-reforms altering the balance between the public and private pillars in favor of the former, while the COVID-19 pandemic has impacted on the future sustainability and adequacy of the systems (Carrera and Angelaki 2022; Cruz-Martínez et al. 2024).

We focus on pension policy change and our outcome of interest is "significant pension reform" (SPR), defined as a paradigmatic change altering the architecture of the pension system (Hinrichs and Kangas 2003) via the introduction of a private pillar that replaces the public one or that eliminates it. However, our outcome is far from dichotomous: reforms may also introduce a mandatory private pillar but keep the public one or change rules in the existing pillars. Therefore, the use of fsQCA, which assumes cases as combinations of different values for the outcome of interest and the causal conditions, is appropriate to understand the combination of causes that explain when this outcome may occur. Our analysis identifies four paths to significant pension reform. Broadly, our findings suggest that significant policy legacies, or their absence, must be combined with other structural and institutional causes to lead to significant reforms.

Using fsQCA, we seek to validate or refute existing theories on pension reform in Latin America. As such, we aim to contribute to the literature on policy change in the region and beyond. More broadly, we aim to contribute to the literature on the methods and approaches used for the study of welfare state and pension politics, while acknowledging some of its limitations.

Pension Reform Pathways in Latin America

The literature on social policy expansion and retrenchment in Latin America (see Niedzwiecki and Pribble 2023), and more specifically pension reforms, highlights

different factors to explain state retrenchment since the 1980s and state expansion since the mid-2000s in pension provision. Broadly, this literature has considered conditions such as ideology, institutions and political competition, policy legacies, societal veto players and structural economic conditions.

Regarding ideology, considering that many social policy reforms at the beginning of this century took place under left-wing governments, Huber and Stephens (2012) argued that the irruption of the left and its commitment to social justice was central to the adoption of reforms (see also Madrid et al. 2010). Yet some observers have correctly pointed out examples of reforms that took place under center-right governments (Niedzwiecki and Pribble 2017), leading scholars to focus more on the role of institutions. Thus, they argue that when politicians face intense competition, they have an incentive to capture more voters and embrace significant reform (Ewig 2016, p. 197). This explains why even center-right parties facing a strong opposition may push for marginally expansive social policies, as in Chile and Argentina in the 2010s (Niedzwiecki and Pribble 2017, p. 88).

Analyses focusing on the role of institutions have shown that governments with large majorities have been able to pass significant retrenchment reforms in the 1990s (Madrid 2002; Brooks 2009) and re-reforms since the mid-2000s eliminating or significantly altering the role of the private system in pension provision (Arza 2012; Mesa Lago 2014). Some scholars have also argued that the level of concentration of power in the executive, such as the extent to which the president can take decisions without consulting members of their cabinet or coalition, or through the use of emergency decrees or provisional measures, has impacted pension and social policy reform (Kay 1999; Valdes-Prieto 2009; Castiglioni 2018).

More recently, scholars studying "second wave" reforms have focused on the role of policy legacies and policy feedback, particularly the performance of the private system and the actors generated by it, to understand reform outcomes. For example, Baba (2015) argues that the type of compromise among policymakers and veto actors during the first generation of reforms, and the nature of the policymaking process, condition the type of re-reforms pursued. Analyzing re-reforms in Chile, Borzutzky (2019) argues that negative policy legacies, in terms of low expected future pensions, played a significant role during the 2008 reform.

The power resources theory has placed focus on the role of class struggle and political mobilization, usually led by strong labor unions. While the role of organized labor in Latin America is much weaker than in advanced industrialized countries, scholars have argued that both unions and other civil society organizations' support has been crucial in the enactment of social policy reforms (Niedzwiecki 2014; Niedzwiecki and Pribble 2022). Anria and Niedzwiecki (2016) highlighted the role of unions and grassroots organizations in Bolivia to ensure the passing of the universal reform during the second reform wave. Similarly, Borzutzky (2019) stressed the role of the emerging No Mas Administradoras de Fondos de Pensiones (No+ AFP) movement in Chile since 2016.

Yet, as argued by Kay (1999), interest group strength, as measured in terms of resources and union density, cannot by itself provide an explanation for reform processes. In fact, in his study on reforms in Uruguay, Argentina and Brazil, Kay (1999) finds no clear correlation

between interest group strength and policy outcomes. This finding highlights the need to examine further the role of political institutions in providing interest groups with the varying opportunities to veto policies (Tsebelis 2002).

Business interests and their interaction with conservative policy experts may also influence reform outcomes (Dorlach 2021). For example, Bril-Mascarenhas and Maillet (2019) showed how the powerful private pension industry has been successful in resisting reforms that would otherwise affect the private pillar. Overall, higher levels of social mobilization, led by unions, social movements or industry stakeholders, seem to play a role in significant pension reforms, yet they may not be enough to influence those outcomes.

Analyses of the first reform wave have in addition stressed the role of structural economic conditions such as budget and economic crises in triggering reforms, given the significant weight that public pension systems have on public finances. Crises have also brought attention to the role of international financial institutions in domestic reform processes. Scholars (Orenstein 2011; Béland and Orenstein 2013) have stressed their role in shaping economic and social assumptions that legitimize or challenge institutions and policies, while others have analyzed more specifically the role of international actors (the World Bank in particular) in the diffusion of pension privatization (Weyland 2005; Orenstein 2008). While pension reforms in the 1990s were often part of structural economic reforms and advocated by the World Bank, it was not the case that most indebted nations (and thus dependent on international organizations' loans) went for outright privatization reforms (see Brooks 2008, p. 183). For example, while Brazil and Uruguay had high levels of debt and governments proposed pension reform as part of the structural reform package, actual reforms varied from changes to the public pillar in the former to the introduction of a private pillar only for workers above a certain income in the latter.

Fiscal balances may limit or provide an opportunity for significant reform. Brooks (2009, ch. 5) points to the emergence of a "double bind": privatization contributes to long-term fiscal balance, yet it simultaneously increases the short-term risk of capital flight related to the transition costs. This may explain why in the 1990s countries with less extended public pillars were more likely to replace them with private ones than countries with significant public pillars (Brooks 2009, p. 311). However, fiscal imbalances have also played a role in recent reforms that have expanded the role of the state in pension provision, as in Argentina in 2008, by incentivizing governments to access private pension savings given the lack of access to international markets (Angelaki and Carrera 2015).

More recently, scholars have analyzed the impact of the COVID-19 pandemic on pension systems, and more specifically the introduction of measures allowing withdrawals from pension savings as a measure to support individuals in economic distress (Carrera and Angelaki 2022; Kay and Borzutzky 2022). Overall, while scholars acknowledge that challenging economic conditions may speed up the reform process and/or highlight the need for implementing them, they are far from directly influencing the outcome by themselves. Rather, they can be one contributing condition for significant reforms to take place (Datz and Dancsi 2013).

This review of the literature indicates that institutions, policy legacies and structural and economic conditions seem to play a key role in shaping pension reform outcomes. Based on the theoretical approaches presented above, we formulate the following hypotheses regarding pension reform:

H1: Following the approaches focusing on structural and economic conditions, significant pension reforms can be expected when a country faces negative economic conditions, such as a significant government deficit.

H2: The expectation from the institutional and veto player literature is that significant reforms are expected when a government has strong support in Congress or when not facing actively mobilized social movements.

H3: The literature on policy legacies expects significant reform to be less likely where the pensions system has significant legacies such as a broad public pillar or high levels of coverage.

The above review lays out the expectation that pension reforms are complex phenomena resulting from the interaction of a variety of factors. Thus, we can expect different paths out of the combination of different causal conditions.

Research Design, Method and Data

Fuzzy-set Qualitative Comparative Analysis has been proposed by many scholars in public policy analysis as an alternative to case-oriented and quantitative regression-based approaches, as it can handle research designs with a relatively small number of observations, while still providing parsimonious results and acknowledging the complexity of each case (Rihoux and Ragin 2009). FsQCA can also explain *causal complexity*, due to the fact that a combination of different causes may lead to an outcome of interest (Ragin 2000; Rihoux and Ragin 2009). Furthermore, fsQCA can account for *equifinality* – a situation in which an outcome may follow from different combinations of causal conditions, i.e. from different causal "recipes" (Ragin 2008, p. 23). Causal complexity and equifinality are important aspects to be considered when comparing cases of pension reform as they are likely to result from complex combinations of conditions (Gelepithis 2018). Yet, as pointed out by Rihoux and Ragin (2008), fsQCA does not make a statement on the causal process, but rather on the causes or combination of them that must be present for an outcome to occur. It is then up to the researcher to use substantive knowledge on each case to identify the causal mechanism at play.

Cases in fsQCA are understood as combinations of different, set theoretic values for the outcome of interest and for the causal conditions. The outcome to be explained and the different causal conditions are assumed to range from no membership (fuzzy-set value 0) to full membership (1) in a given set condition. Partial memberships in a set condition are given values between 1 and 0. Membership scores greater than 0.5 indicate that a case is "more in than out" in the set condition, scores close to 1 indicate that a case is "mostly in" a set condition, scores close to 0 indicate that a case is "mostly out", and so on. Full membership (1) and full non-membership (0) are understood as qualitative states, not arbitrary values (i.e. the highest and lowest observed scores). Thus, the calibration of membership in a fuzzy set involves both quantitative and qualitative assessments and must be grounded in theoretical and substantive knowledge of the cases being analyzed. This means the researcher must be clear how the anchors for

membership levels are established to calibrate cases in the set conditions and the outcome (Ragin 2008, p. 161).

The fsQCA software identifies necessary and sufficient conditions by using the concepts of sets and subsets. A necessary condition represents one that, if the outcome of interest is present, the condition must also be present. Thus, if a condition is necessary, it implies that it contains the outcome of interest (the outcome is a subset of the cause). If a condition (or combination of conditions) is sufficient, it means that the condition must be present for the outcome to take place. In this case, the outcome contains the cause (the cause is a subset of the outcome). FsQCA accounts for the complexity of social phenomena by identifying the different necessary conditions and the combination of different causes that may be sufficient to observe an outcome of interest (Ragin 2008).

Cases, outcome and calibration

We analyzed 32 cases of pension reforms in Argentina, Brazil, Chile, Uruguay, Bolivia, Peru, Colombia and Mexico. As highlighted in the introduction, all countries are in the same region and, with some variations, they all implemented significant reforms and re-reforms during the period under study. By selecting these cases, we aim to provide maximum generalizability in our analysis, while still comparing cases that share significant similarities.

We aim to explain the combination of causes that lead to pension policy change. Thus, our outcome of interest is SPR. The literature on pension reform has distinguished between parametric and paradigmatic/structural reforms (Hall 1993; Myles and Pierson 2001; Hinrichs and Kangas 2003; Bonoli and Palier 2007; Brooks 2008; Immergut et al. 2009). Parametric reforms typically include changes such as to the retirement age or the benefit indexation formula. By contrast, structural reforms include change in the architecture of the system, such as in our case the introduction or elimination of an existing pillar.

We build on this latter categorization to define and calibrate SPR. Namely, we define SPR as a reform that changes the architecture of the current system (Hinrichs and Kangas 2003) so that the components of retirement income are altered altogether, via the introduction or elimination of a mandatory private pillar. In fsQCA the qualitative anchors of full membership and non-membership must be as faithful as possible to the concepts they reference (Ragin 2000, pp. 158–60). Given that our outcome of interest is significant pension reform, the cut-off for determining full membership in this set is given by whether a reform entails the introduction or the elimination of a mandatory private pillar. This is because such a reform alters the components of retirement income by making the retirement income dependent only on private accounts or the state pillar. These cases are given a fuzzy-set value of 1. The cut-off for non-membership in this set is given by whether a reform entails only administrative changes or benefit indexation changes. These cases are given a fuzzy-set value of 0.

To further construct the remaining fuzzy-set values for SPR we considered other policy components such as changes in retirement age, minimum contribution levels and the funding principle. In assigning the values, we used the categorization of reforms in each country as proposed by the literature on pension reforms in the region (Baba 2015; Mesa-Lago 2021). Table 1 summarizes the full fuzzy-set

Table 1. Calibration of the outcome: significant pension reform

Fuzzy-set value	**0**	**0.25**	**0.75**	**1**
Qualitative anchors: changes that must be present for cases to fall within specific set membership	The reform must contain at least *one* of the following: • Administrative changes (e.g. changes to regulatory bodies) • Changes to benefit indexation mechanism	The reform must contain at least *one* of the following: • Increase in retirement age • Increase in contribution rates	The reform must contain at least *one* of the following: • Introduction of a mandatory private pillar but without eliminating the public one • Change in funding principle for first pillar	The reform must contain one of the following: • Introduction of a mandatory private pillar replacing the public pillar • Elimination of the private pillar

calibration for the outcome. We did not include a 0.5 membership, which would be neither in nor outside the set of SPR. This is because, as indicated by the literature, pension reforms will always *tend* to be of a structural or parametric nature. In fuzzy-set terms, reforms with a structural tendency will be "mostly in the set" (0.75) or "in the set" (1) of significant pension reform and parametric ones will be "mostly out" (0.25) or "out" (0) of the set. Among structural reforms, these cases will include instances of reforms that replace the public Pay-as-you-go (PAYG) pillar by a private one (Mexico 1995) or that eliminate it (Argentina 2008, Bolivia 2010), which receive a fuzzy-set value of 1, or that add a new private pillar, complementing the public one (Peru 1992, Colombia 1994, Uruguay 1995), that receive a fuzzy-set value of 0.75. Parametric reforms that do not alter the structure of the current pillars and just "deepen" the current setting (Hinrichs and Kangas 2003) will include cases of reforms that increase the retirement age or contribution levels (0.25) or instances of reforms that include administrative changes or changes to benefit indexation (0).

Causal Conditions

We selected causal conditions that take into consideration institutional, socio-economic factors and policy legacies, as highlighted in the literature. Table 2 summarizes the full fuzzy-set calibration for the causal conditions. Regarding institutional factors, scholars agree that the strength of key veto players in pension reforms such as political parties and social movements may play a key role in pension reform. Thus, we have built two causal conditions: significant fragmentation (SF) and social mobilization (SM). To capture the economic factors that influence pension reform outcomes we have built a causal condition of significant government deficit (SD). Finally, as much of the literature on pension

Table 2. Calibration of causal conditions

FS value given causal condition	0	0.25	0.5	0.75	1
Significant deficit (gov net lending as % of GDP)	≥ 0 %	< 0 % > −1	= −1 %	< −1 > −3 %	≤ −3 %
Significant fragmentation (effective number of parties in government)	≤ 2.5	> 2.5 < 3	= 3	> 3 < 3.5	≥ 3.5
Significant social mobilization (mentions in national media)	> 0 < 10	≥ 10 < 30	= 30	>30	N/A
Significant policy legacies (% of workers contributing to a pension)	≤ 20 %	> 20 % < 33 %	= 33 %	> 33 % ≤ 55 %	> 55 %

reform has focused on the role of legacies as facilitators or impediments for reforms (Pierson 1996; Pribble 2013), we built a policy legacy (PL) causal condition.

Significant Deficit

We used data from the International Monetary Fund (IMF) on government net lending, defined as the difference between government net revenue and spending. We used the value for the year before the reform was considered in Congress. In that way, we account for the fact that it takes some time between government finances worsening and the government deciding to implement a significant pension reform. A fuzzy-set value of 1 was given to cases with −3 per cent or more (i.e. with a deficit), which is a somewhat agreed standard for a deficit level that must be addressed in the short term, as evidenced in different IMF lending programs and in the EU Stability Pact. The cut-off for no membership in this set was 0 or more. The intermediate value of 0.5 was set at −1 per cent. Thus, cases with values higher than 0 per cent but lower than −1 per cent were given a fuzzy-set value of 0.25. And cases with deficit values of more than −1 per cent but less than −3 per cent were given fuzzy-set values of 0.75.

Significant Fragmentation

We used data on the effective number of seats in the lower house, usually the Chamber of Deputies. We use the effective number of party seats (number of parties with seats) in the lower chamber in the year in which the pension reform started to be treated to construct a fuzzy-set condition of legislative fragmentation.[2] This data comes from Gallagher (2022). The higher the number of effective party seats the higher the fragmentation in a given polity and in its government.

Our understanding of significant fragmentation is one in which coalitions are hard to achieve. A solid three-party system may have a tendency towards a bipartisan logic if the center is occupied by a party open to forming alliances. A political system with four or more effective parties with seats could make such behavior more difficult given the need

to provide specific concessions to more than one party (Laasko and Taagepera 1979). Therefore, we assume that an effective number of party seats of 3.5 or more is "fully in the set" of significant fragmentation and receives a fuzzy-set value of 1. An effective number of parties of 2.5 or less is "fully out of the set" of significant fragmentation and receives a value of 0. An effective number of parties of 3 is "neither in nor out" and receives a value of 0.5. An effective number of more than 2.5 and less than 3 will be "mostly out of the set" of significant fragmentation and receives a fuzzy-set value of 0.25. An effective number of more than 3 and less than 3.5 is "almost in the set" and receives a value of 0.75.

Significant Social Mobilization

This causal condition aims to capture whether social movements and unions participate in pension reform processes. Given that qualitative sources are best to capture this, we have referred to national media in each country[3] in the year prior to the reform being debated, along with the related literature and coded cases according to the reported participation of social organizations and unions in the reform process. We acknowledge the inherently qualitative nature of this assessment but, referring to the substantive sources, we have coded cases as mostly in the set (0.75) if there were 30 or more articles, totally out (0) if there were fewer than 10, neither in or out if there were 30 (0.5) or mostly out (0.25) if there were 10 or more but fewer than 30.

Policy Legacies

We use coverage of the system, as measured by the percentage of workers contributing to a pension as the most appropriate source to build this causal condition. Given the distribution of the available data and the fact that labor informality is an issue across the region, we considered cases with coverage of 55 per cent or more to be fully in the set (1). Cases with coverage values of 20 per cent or less are fully out of the set (0). The cross-over fuzzy-set value of 0.5 was then fixed at 33 per cent. Thus, values of more than 33 per cent but less than 55 per cent receive a fuzzy-set value of 0.75 and cases with coverage values of more than 20 per cent but less than 33 per cent receive a fuzzy-set value of 0.25.

Analysis

The fsQCA software analysis involves two steps. First, a "truth table algorithm" (Ragin 2008) is used to transform the fuzzy-set membership scores for each case into a truth table. This algorithm uses the direct link between the rows of the truth table and the corners of the property space, whereby the latter is the multidimensional space consisting of the logically possible combinations of causal conditions. If there are k conditions, the property space has 2^k corners. In this article, the property space has 2^4 (= 16) corners.

In the second stage, the researcher examines the distribution of cases across the corners of the property space (the resulting rows of the truth table) and establishes the degree to which membership in a corner is a subset of the outcome – that is, to what extent a case's placement in a specific combination of conditions is sufficient for the outcome (significant pension reform) to occur (see Ragin 2000). Table 3 shows the resulting truth table.

Table 3. Truth table

SD	SF	SM	PL	*N*	Outcome SIGREF	Consistency
1	0	0	0	1	1	1
1	0	1	0	1	1	1
0	0	1	1	3	1	0.882353
0	0	0	1	1	1	0.846154
0	0	1	0	1	1	0.818182
1	1	0	0	1	1	0.8
1	0	0	1	1	1	0.789474
0	1	0	0	1	0	0.666667
1	1	1	1	2	0	0.642857
1	0	1	1	2	0	0.619048
0	0	0	0	0		
0	1	1	0	0		
0	1	0	1	0		
0	1	1	1	0		
1	1	1	0	0		
1	1	0	1	0		

The "Number" column indicates how many cases match a specific combination. The researcher must then set a frequency threshold. The present analysis uses a frequency threshold of 1. Combinations with 0 number of cases are discarded. The next step is to look at the consistency column and decide on a threshold to set out which combinations are a subset of the outcome (sufficient) and thus will receive a value of 1 in the outcome column. Consistency ranges from 0 to 1 and measures the degree to which a causal combination is a subset of the outcome (sufficient) (Rihoux and Ragin 2009). In general, consistency values below 0.7 denote high inconsistency (Rihoux and Ragin 2009, p. 118). Thus, we choose a consistency cut-off of 0.7 for our analysis.

The software will then simplify – using Boolean algebra – the combinations that are a subset of the outcome and produce a simplified solution with combinations or "paths" for our outcome of interest. The software produces a complex, parsimonious and intermediate solution. We used only the complex solution as it is the only one that does not make simplifying assumptions. Simplifying assumptions are statements about the hypothetical outcome of the logical remainders, which are the combinations that may be possible but for which there are no cases. Table 4 reports the fs/QCA software solution.

Table 4. fsQCA solution

	Raw coverage	Unique coverage	Consistency
~SF*~SM*PL	0.41	0.112	0.7
~SD*~SF*PL	0.294	0.079	0.75
SD*~SM*~PL	0.412	0.196	0.84
~SF*SM*~PL	0.314	0.059	0.888

The fsQCA analysis provides values of consistency and coverage for each term of the solution and for the solution as a whole. The fsQCA output also produces an estimate of coverage. Coverage indicates the proportion of membership in the outcome explained by the whole solution or by each term of the solution. As such, the coverage coefficient bears some resemblance to the R^2 (coefficient of determination) in regression analysis. The overall coverage of our model is over 0.78, indicating that more than 78 per cent of instances of the outcome are explained by the four combinations identified in the solution.

The software also provides a coverage value for each combination, which includes raw and unique coverage. Raw coverage measures the proportion of memberships in the outcome explained by each term of the solution. Unique coverage measures the proportion of memberships in the outcome explained solely by each individual solution term (memberships not covered by other solution terms). Thus, unique coverage is always lower than raw coverage as it is a much more restrictive measure.

The results indicate that there are no necessary conditions, as there is no single condition that is in each of the four solutions. The results also indicate that there is not a single sufficient condition as all the pathways entail the combination of different conditions for the outcome to occur. This finding is consistent with the broad literature on pension reform that highlights the complexity of such processes, resulting from the combination of different factors (Myles and Pierson 2001; Madrid 2003; Brooks 2008; Pribble 2013). The results also illustrate the concept of equifinality as there are four different solutions or "paths" leading to significant pension reform. While our review of the literature had found that policy legacies, institutions or socio-economic conditions were expected to be related to significant pension reforms, as laid out in our hypotheses, our analysis shows that, by themselves, these conditions are not sufficient to lead to such an outcome and that they must be combined with other conditions.

Broadly, we can identify two paths characterized by the presence or absence of significant policy legacies. The "significant policy legacies" paths are characterized by significant policy legacies either combined with the absence of political fragmentation and social mobilization (*first path*) or combined with the absence of significant deficits and the absence of significant fragmentation (*second path*). We believe these two pathways are interesting for indicating how significant reform may happen in countries where the pension system has built in significant legacies which make reform difficult (Pierson 1996).

The "absence of significant policy legacies" paths are characterized by the absence of significant policy legacies combined either with significant deficit and the absence of social mobilization (*third path*) or with the absence of significant fragmentation and the presence of social mobilization (*fourth path*). The *third path* illustrates cases where governments implement reforms in the context of economic urgency, but in the absence of significant mobilization and a strong legacy that would otherwise make changes difficult. The *fourth path* illustrates situations in which significant reforms may only be possible when a rather strong government must somehow negotiate reforms with social movements (Niedzwiecki and Anria 2019). This also provides support to the veto player theory arguing that a less fragmented political system may be more conducive to reform,

although it may be necessary to negotiate with societal veto groups (Bonoli 2001; Tsebelis 2002).

We performed some robustness checks on our analysis and found no variation in the combination of conditions that lead to significant pension reform (see Table A1 in the Appendix).

How well do the three combinations identified in this analysis cover the cases of significant pension reform? To illustrate this, Table 5 shows the fuzzy scores for the outcome and the four casual combinations for each case.

Instances of the outcome (values over 0.5, indicating reforms that are mostly significant or significant) are marked in bold in the first column.[4] Combinations that are a subset of the outcome (sufficient) are equal or less than the value of the outcome and are also marked in bold. It should be noted that a high difference between the value of the outcome and a given sufficient causal combination denotes high inconsistency (Ochel and Rohwer 2009). Visually, we could interpret that cases that are covered by each combination must fall in the upper quadrant of an X–Y plot where the membership of the cases for the identified path (combination) is on the X-axis and the membership for the outcome is on the Y-axis. This is shown in Figures A1–A4 in the Appendix.

The combination of legacies and the absence of fragmentation and mobilization (*first path*) largely explains Argentina's pension reform reversal in 2008. This solution is consistent with some analyses that highlighted how the government could pass this reform as a "quick fix". Cristina Fernandez de Kirchner enjoyed a majority in both the Chamber of Deputies and the Senate which allowed her to pass the reform with 68 per cent of votes in the former and 72 per cent in the latter. The social partners openly supported the reform, given their strong opposition to the 1994 reform. Furthermore, the economic stagnation of the late 1990s resulted in a decline in affiliates to the private system and an increase in those relying on the public one. This and the poor performance of the private system in the aftermath of the 2001 economic crisis contributed to low levels of support from the public. The combination of these factors ultimately allowed the government to pass the reform swiftly and access the much-needed funding accumulated by private pension administrators as the country had no access to international financial markets and faced significant budget pressures (Arza 2012; Angelaki and Carrera, 2015).

The combination of policy legacies with the absence of significant deficit or fragmentation (*second path*) seems to explain first-wave reforms such as those adopted in Argentina (1994), Mexico (1995) and Uruguay (1995). In all three, the lack of significant fragmentation (or broad consensus among parties) was key for the reform. In the case of Mexico, the reform replaced the old public pillar, whereas in Argentina the reform introduced a new private pillar and reduced the generosity of the old public pillar. In the case of Uruguay, following a series of failed reform attempts, the Sanguinetti coalition government (1995–2000) succeeded in adopting a reform that led to the introduction of a mixed system, along the lines of that adopted in Argentina. As argued by Kay (1999, p. 415), "the threat of defeat and the precedent-setting agreement to form a coalition to pass key structural reforms helped to overcome traditional incentives for policy deadlock in the legislature". The reform was the result of a process of building inter-party coalitions to minimize opposition

Table 5. Membership score in the outcome and solutions

	SPR	**SD**	**SF**	**SM**	**PL**	**~SF* ~SM*PL**	**~SD* ~SF*PL**	**SD*~SM* ~PL**	**~SF* SM*~PL**
Chile 2008	0.25	0	0	0.25	1	0.75	1.00	0.00	0.00
Peru 1992	**0.75**	0.75	0	0	0	0.00	0.00	**0.75**	0.00
Peru 2007	0.25	0	1	0	0	0.00	0.00	0.00	0.00
Peru 2011	0.25	0	1	0.5	0	0.00	0.00	0.00	0.00
Argentina 1994	**0.75**	0	0.25	0.75	0.75	0.14	**0.56**	0.00	0.14
Argentina 2004	0.25	0.75	0.75	0.5	0.75	0.09	0.05	0.09	0.03
Argentina 2007	0.25	0.75	0	0.5	0.75	0.38	0.19	0.09	0.13
Argentina 2008	**1**	1	0	0.25	0.75	**0.56**	0.00	0.19	0.06
Argentina 2017	0.25	1	0.75	0.25	1	0.19	0.00	0.00	0.00
Argentina 2019	0.25	1	0	0	1	1.00	0.00	0.00	0.00
Uruguay 1995	**0.75**	0.75	0.75	0.75	1	**0.06**	**0.06**	0.00	0.00
Uruguay 2000	0.25	1	0.75	0.75	1	0.06	0.00	0.00	0.00
Uruguay 2004	0.25	1	0	0.75	1	0.25	0.00	0.00	0.00
Uruguay 2008	0.25	0.75	0	0.75	1	0.25	0.25	0.00	0.00
Uruguay 2013	0.25	0	0.25	0.75	1	0.19	0.75	0.00	0.00
Colombia 1994	**0.75**	1	0	0.5	0.25	0.13	0.00	**0.38**	**0.38**
Colombia 2003	0.25	1	0.75	0.5	0.25	0.03	0.00	0.38	0.09
Colombia 2005	0.25	1	0.75	0.5	0.25	0.03	0.00	0.38	0.09
Mexico 1995	**1**	0	0.25	0.75	0.75	0.14	**0.56**	0.00	0.14
Mexico2007	0.25	0.75	0.5	0.5	0.75	0.19	0.09	0.09	0.06
Mexico 2008	0.25	0.75	0.5	0.5	0.75	0.19	0.09	0.09	0.06
Mexico 2020	0.25	0.75	0	0.5	0.75	0.38	0.19	0.09	0.13
Bolivia 1997	**1**	0.75	1	0.25	0	0.00	0.00	**0.56**	0.00
Bolivia 2007	0.25	0	0	0.75	0	0.00	0.00	0.00	0.75
Bolivia 2010	**1**	0.75	0	0.75	0	0.00	0.00	0.19	**0.75**
Brazil 1998	**0.75**	1	1	0.75	0.75	0.00	0.00	**0.06**	0.00
Brazil 2003	0.25	0.75	1	0.25	0.75	0.00	0.00	0.14	0.00
Brazil 2005	0.25	0.75	1	0.25	0.75	0.00	0.00	0.14	0.00
Brazil 2012	0	0.75	1	0	0.75	0.00	0.00	0.19	0.00
Brazil 2015	0	1	1	0	0.75	0.00	0.00	0.25	0.00
Brazil 2019	0.25	1	1	0.75	0.75	0.00	0.00	0.06	0.00

from unions and other non-state actors. Furthermore, as major party fractions were clustered around the center they supported incremental policy options (Castiglioni 2018).

This seems to indicate that in countries with developed pension systems, a significant pension reform is possible only when governments have enough support in Congress and do not face acute budget constraints. This is consistent with some analyses that have highlighted how the support in Congress was critical for passing these reforms in Mexico and Argentina in the 1990s (Madrid 2003; Brooks 2008). Yet they also stress the importance of some degree of financial leeway for such reforms, a point highlighted by Brooks (2008).

A (*third*) *path* to significant reform takes place in settings with no policy legacies and when this is combined with significant deficit and the absence of social mobilization against the reform. This path is relevant to explain the cases of Peru (1992) and Bolivia (1997). In Peru, President Fujimori had recently closed Congress and the reform of the pension system was swiftly passed by decree as one of the measures to address the high levels of government deficit. In the case of Bolivia, economic conditions (along with an unsustainable and unbalanced pension system with low coverage) placed the need for reform on the political agenda. Timing was also an important element in the process, as the Sanchez de Lozada government's strong majority in Congress was key in approving the law. At the same time, the reform was discussed at the end of the mandate, allowing the government not only to minimize the political cost but, on the contrary, to acquire political gains through the introduction of Bonosol, a non-contributory benefit. In addition, the government succeeded in gaining the support of the labor federation (Escobar and Osvaldo 2004). This combination is also sufficient for the case of Brazil in 1998, where a new social security factor was introduced, by which new pensions are calculated according to the amount of contributions and life expectancy at retirement. Yet we know that this reform was largely opposed by the opposition and grassroots movements. Therefore, we would urge caution as to the relevance of this finding.

Finally, the absence of policy legacies combined with the absence of fragmentation but with mobilization (*fourth path)* largely explains the 2010 Bolivian reform that eliminated private pension administrators but maintained individual accounts under a new state administrator. In this case, an agreement was reached with the strong union federation, while a debate was held in the national assembly leading to the reform being approved by a two-thirds majority (Niedzwiecki and Anria 2017). This solution highlights that in countries with not very high levels of coverage, significant reforms are possible when the government has broad support in Congress and is also faced with significant mobilizations. This path can also explain the parallel reform introduced in Colombia in 1994. The reform was introduced to a fragmented, financially unstable system with low coverage and was part of wider neoliberal reforms. While the initial proposal for replacing the public pillar with a private one had the support of the president and actors from the Ministry of Finance, Planning Directorate and the Central Bank, the opposition from the Congress and unions led to the cancellation of the bill. The parallel system was finally approved in 1994 following negotiations and concessions (Mesa-Lago 2021).

Discussion and Conclusions

Over the past decades, Latin American countries have implemented a series of significant pension reforms. Our analysis has aimed to move away from the dichotomy (privatization/renationalization) by analyzing the conditions that must be present or absent for significant pension reform to take place, defined as one that significantly alters the architecture of the system. By using fsQCA we have been able to show that none of the key conditions identified in the literature on structural socioeconomic factors, institutions and policy legacies can alone lead to significant reform. By contrast, we have found four paths to significant pension reform. The "significant policy legacies" paths are characterized by significant policy legacies combined with (a) the absence of political fragmentation and social mobilization or (b) the absence of fragmentation and significant deficits. In both paths, the absence of fragmentation plays a role in making reform possible, as highlighted in the cases of Argentina (1994 and 2008), Uruguay (1995) and Mexico (1995). However, the analysis shows that the absence of fragmentation, and hence a government that does not face a fragmented Congress, is not sufficient by itself to lead to significant pension reform.

Two further paths are characterized by the absence of significant policy legacies combined with (a) significant deficit and the absence of social mobilization or (b) absence of fragmentation and social mobilization. The first alternative can explain the 1997 reform in Bolivia which introduced a mandatory private pillar that replaced the old public pension pillar, and the 1992 reform in Peru, which introduced a private pillar parallel to the public one. Under the second alternative, significant reforms are possible when a government has support in Congress and there is significant mobilization. This is an interesting finding and illustrates that social movements under certain conditions may play a role in significant pension reform, as has been analyzed in the case of Bolivia in 2010 (Niedzwiecki and Anria 2017). Through the use of substantive knowledge, we argue that the case of Colombia in 1994, where, as in Peru, a parallel private pillar was introduced, seems to be better explained by the fourth combination, which is supported by scholars who have analyzed this process (Mesa-Lago 1999).

Overall, we believe these findings are consistent with the extant literature on pension reform that has highlighted the inherent complexity of such reform processes (Pierson 1996, Brooks 2009; Pribble 2013; Anria and Niedzwiecki 2016). Through our analysis we have demonstrated how, by using fsQCA, we can gain a better understanding of how different causal conditions may combine to explain complex social phenomena such as pension reforms and as such provide an appropriate approach to understand other complex public policy issues. However, we caution that fsQCA is not without its limitations – most notably how to consistently calibrate a complex outcome and a set of causal conditions. Using substantive knowledge of cases is key to address this major concern, although robustness checks can also be appropriate (Oana et al. 2021). We have also shown that fsQCA is not a deterministic method (Schneider and Wagemann 2012). With the introduction of parameters of fit such as consistency, we have shown that while solutions may be sufficient, they may not be consistent. This may mean that further qualitative research is needed to understand cases covered by inconsistent sufficient combinations, as discussed for the case of Brazil or Uruguay.

Notes

1. Fuzzy-set Qualitative Comparative Analysis (fsQCA) was proposed by Ragin (2000) and further developed by other scholars (Rihoux and Ragin 2009; Oana et al. 2021).
2. More specifically, we took the number corresponding to the last election before a reform was introduced as we assume that the government composition is a result of such an election.
3. See list of media sources in Table A2 in the Appendix.
4. This approach to interpreting the results is consistent with other fsQCA analyses (see e.g. Vis 2009).

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Disclosure Statement

No potential conflict of interest was reported by the authors.

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Appendix

Robustness Checks

Researchers have suggested the use of robustness in fsQCA analyses to show how changes in calibration affect the findings (Oana et al. 2021). In QCA, solution terms are considered robust if they contain similar necessary and sufficient conditions, have approximately the same consistency and coverage scores, and do not substantially change the interpretation of the solution across different model specifications

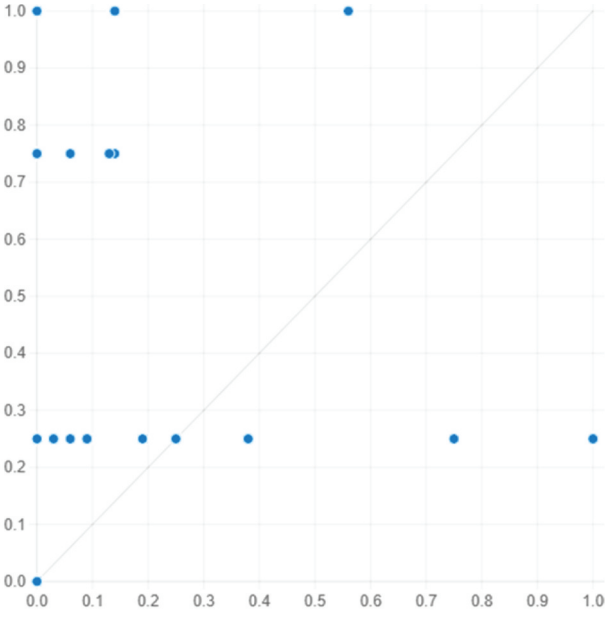
Table A1. fsQCA solution with policy legacy crossover change

	Raw coverage	Unique coverage	Consistency
~SF*~SM*PL	0.42	0.105	0.7
~SD*~SF*PL	0.312	0.064	0.74
SD*~SM*~PL	0.396	0.145	0.83
~SF*SM*~PL	0.312	0.045	0.887

Solution coverage: 0.764; solution consistency: 0.71

(Schneider and Wagemann 2012, pp. 285–286). Changes in the calibration lead to changes in the fit parameters. However, in most cases, such changes are too small to be of any significance. Only if the position of the crossover point is changed significantly can the terms of the solution be different. If the changes are significant, the calibration justification becomes critical (Schneider and Wagemann 2012, p. 289).

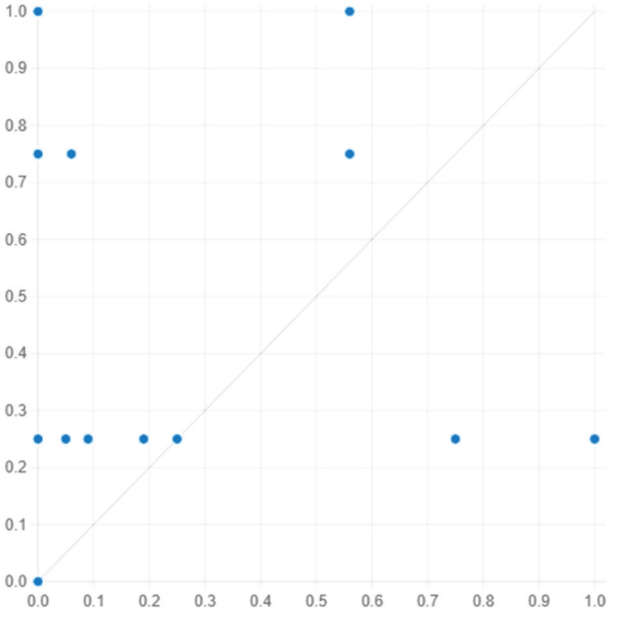
Figure A1. XY sufficiency plot of ~SF*~SM*PL



Consistency: 0.69 Coverage: 0.27

Given the relevance of the legacy condition, we tested for robustness by changing the crossover point from 33 per cent to 35 per cent, to account for the fact that unionization

Figure A2. XY sufficiency plot of ~SD*~SF*PL



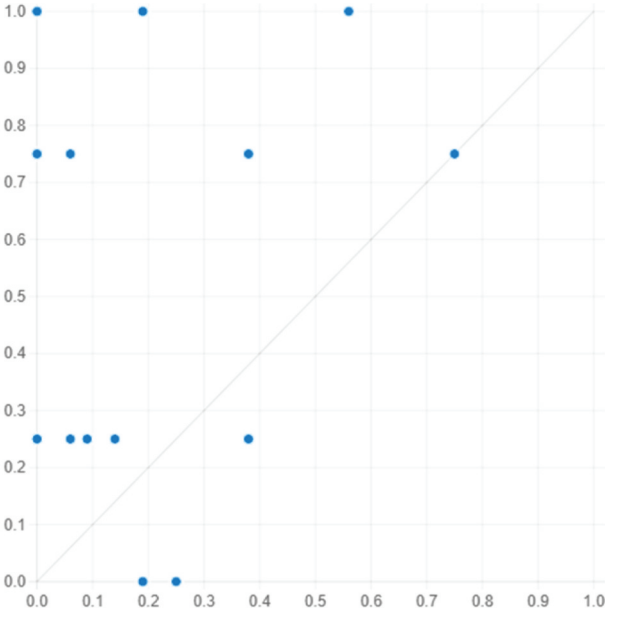
Consistency: 0.67 Coverage: 0.19

rates are far from consistent across countries. The identified sufficient combinations do not change, although there is some change to the parameters of fit of consistency and coverage.

FsQCA XY Sufficiency Plots

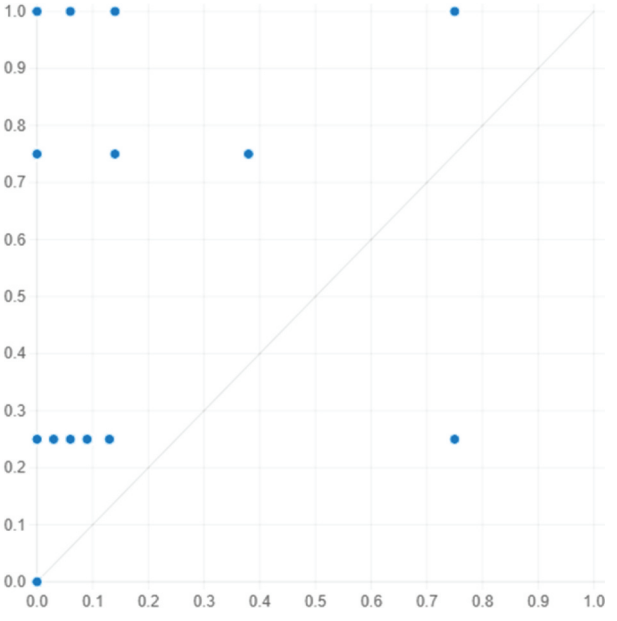
Figures A1–A4 plot each term of the solution on the X-axis and the outcome on the Y-axis. A majority of cases falling in the upper left quadrant indicate that the combination of causes in the term is sufficient for the outcome to occur, meaning that the combination is a subset of the outcome. Each plot reports a consistency value that shows the degree to which the subset relationship holds and a coverage value.

Figure A3. XY sufficiency plot of SD*~SM*~PL



Consistency: 0.83 Coverage: 0.26

Figure A4. XY sufficiency plot of ~SF*SM*~PL



Consistency: 0.82 Coverage: 0.18

Table A2. List of media for each country for the significant mobilization causal condition. The following sources were used by using LexisNexis

Country	Sources
Argentina	La Nación; Clarín
Bolivia	El Diario; El Deber
Brazil	O Globo; Folha de Sao Paulo
Chile	El Mercurio; La Tercera
Colombia	El Tiempo; El Espectador
Peru	El Comercio; La República
Mexico	Reforma; El Universal
Uruguay	El País; El Observador